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Municipality of Anchorage

Community Development Department

Planning Division

MEMORANDUM

Date: October 12, 2015

To: Planning and Zoning Commission

Thru: HHH. Hal H. Hart, AICP, Planning Director

Thru CW Carol C. Wong, Long-Range Planning Manager

From: KB Kristine Bunnell, Senior Planner, Long-Range Planning Section

Subject: Case No. 2015-0036, UMED District Plan Update

Planning and Zoning Commission Review and Approval

The Planning and Zoning Commission is scheduled to open the public hearing on the *UMED District Plan October 2015 Draft* (*UMED Update*) (Exhibit A) on October 12, 2015. Included for your information and review are Community and Agency Comments (Exhibit B), the *UMED District Plan Supporting Documents* report (Exhibit C), a list of the UMED Steering Team members (Exhibit D), and the *UMED Cogeneration Report Update 2013* (Exhibit E). The Commission will deliberate the matter after closing the public hearing and forward its recommendations to the Anchorage Assembly for their consideration.

The *UMED Update* is to be adopted as an element of the comprehensive plan in the Anchorage Bowl section (AMC 21.01.080) in Table 21.01-1: Comprehensive Plan Elements. This update will replace the 2003 *U-MED Universities and Medical District Framework Master Plan (2003 U-MED Plan).*

Background

Funding for this project was secured by the UMED organizations through the Designated Legislative Grant Program managed by the State of Alaska. The UMED organizations that initiated the grant request include the Alaska Native Tribal Health Corporation (ANTHC), Alaska Pacific University (APU), Alaska Psychiatric Institute, Alaska Public Telecommunications, Inc., Anchorage School District, McLaughlin Youth Center, Providence Alaska Medical Center (PAMC), Southcentral Foundation, and the University of Alaska Anchorage (UAA). The organizations then approached the Municipality of Anchorage (MOA) to partner in and complete the planning project.

The MOA subsequently entered into a funding agreement with the Alaska Department of Commerce.

Four elements were required: a robust public outreach process, update to the *2003 U-MED Plan*, an active transportation/parking utilization study, and an investment grade cogeneration energy feasibility study. The UMED project grant ends December 31, 2015.

UMED Steering Team, Public, and Commission Outreach Summary

The planning process created a cohesive team of advocates with participation from the UMED organizations, community councils, student groups, neighborhoods, experts in cogeneration, real estate development, finance and transportation, campus architects and planners, and MOA departments. The plan is influenced by organizational master plans, transportation and parking studies, the latest in cogeneration technology, the *Chester Creek Watershed* and *Anchorage Wetlands Management* plans, the Northern Access road project, and a specific and targeted range of case studies.

UMED Steering Team: Comprised of MOA and UMED organizational staff, three community councils, Alaska Legislators, and interested parties (UMED Steering Team members – Exhibit D). Steering Team members participated in every aspect of this effort, from the consultant team selection process to workshop facilitation, case study analysis, and plan editing. The UMED Steering Team met as a group 13 times. A positive working relationship was formed between the UMED Steering Team to the extent that quarterly meetings will continue after the plan is adopted to provide guidance, continued partnerships, and to assist in plan implementation. (See Implementation Action #3.3.a, page 77.)

Public Outreach Process: The UMED District planning process was initiated in March 2013 with a public workshop and several group one-on-one briefings, a website, and a Facebook page. Over 5,000 postcards were mailed to the UMED District and the surrounding community council areas. Additional workshops were held in June and December 2013, and January 2014. All meetings were well attended. Monthly progress reports went to community councils. UAA and APU students were engaged by specific presentations that resulted in lively discussions.

Public Open House – Public Review Draft: On March 17, 2015, a public open house was held to present the *UMED Public Review Draft* of the plan. Hard copies of the plan were distributed in addition to compact disks. Forty-one (41) people attended; this included the general public and UMED Steering Team members. A plan overview was given by staff. Participants had the opportunity to comment and confirm their top priorities. Preference for the following implementation items included:

- That the UMED District remain and become more pedestrian friendly.
- Maintain and provide adequate trail connections within the District to and including the Northern Access Road.
- UMED District adopted design standard for the Northern Access Road.
- Identify trail connectivity through a district-wide trail plan.
- Prohibit off-leash dogs at both Goose and University Lake parks.
- Complete master plans for Goose Lake and University Lake parks.
- Natural areas and corridors are important to recognize and enhance.
- All roadway projects must mitigate impacts to natural areas, wildlife habitat, and wetlands.

- Support for a potential APU wildlife corridor/conservation area.
- A UMED cogeneration pilot project.

These over-arching priorities have consistently been at the forefront of discussion throughout the planning process. This translates to direct support for the seven priority projects identified in the *UMED Update* Executive Summary.

Public Hearing Draft Distribution – September 2015: Copies of the *UMED Update Public Hearing Draft* were distributed to MOA departments, various agencies, community councils, and UMED Steering Team members. The plan was accessible online at the Planning Division's website, UMEDPlan@wordpress.com, and in hard copy.

Planning and Zoning Commission (PZC) Work Sessions: Two work sessions were held for the PZC, January 12, 2015, and September 14, 2015.

During the January 2015 work session, staff briefed the commission on the planning process and distributed an *UMED Update Internal Review Draft* for commissioners to provide early input into the planning process.

The Commissioners asked about the following: a land use plan map, the Northern Access Road, trails and parks, the BLM patents, how organizational master plans fit with in the context of the UMED District Plan, parking, acquisitions by organizations, utilities and other services, tax base in the UMED, deed restrictions that might be in conflict with the land use plan map, how development will occur in the next 10-20 years, and the cogeneration report. Staff and the UMED Steering Team addressed these PZC comments in the October 2015 draft plan and also reviewed and discussed these comments at length during the September 14, 2015 PZC work session.

At the September 2015 work session, the *UMED Update Public Hearing Draft* was distributed along with the *Supporting Documents* and *Cogeneration* reports. A presentation was given to the PZC by staff and members of the UMED District Steering Team. PZC issues from the January work session were directly addressed. Issues mentioned during this work session included public participation, location of parking and night-time use of parking areas on campus, trails on private land becoming public trails over time. UMED Steering Team members provided insight on what the positive planning process achieved and anticipated within the community, and the inclusionary public outreach effort that was achieved.

With respect to parking on UAA campus, there is now a signed and recorded parking agreement between UAA and the MOA that calculates parking on a campus-wide basis and is calculated on student enrollment and employment (faculty and staff). If enrollment and employment go up, so does the amount of required parking and vice versa. Parking is no longer tied to building square footage, distance from a building, or location on campus. Based on this approach and actual parking utilization studies, UAA currently has a significant surplus of parking on campus.

UAA is now working on a strategic plan for campus improvements to improve walkability, bike-ability and shuttle ridership to increase use of those lots that are not right next to campus buildings.

Concerning public use trails on private UAA property, title to or interest in land owned by the University of Alaska Anchorage is not in the public domain (AS Sec 14.40.291). Therefore, UAA property in uses such as trails may not be acquired by adverse possession (historic use of trails over a certain time frame), prescription, or any other manner except by conveyance from the University.

Public Hearing Draft Plan, UMED District Plan – October 2015 Draft

The result of the community's input and targeted analysis and research is an updated plan that provides relevant, timely, and sustainable direction for the future of the UMED District that takes into consideration the many important aspects that make the District a desirable place to live, work, and play.

Significant to this planning process was the completion of an economic analysis. Findings from that analysis supports growth and development on organizational campuses, improvements to public infrastructure, and investments in commercial and residential development (*Plan Update* Appendix: Mixed-use Case Studies and *Supporting Documents* – Chapter 8). This analysis assessed the District's strengths and challenges to attract investment in several development sectors (residential, retail, and office) noting that much of that development will be driven by the UMED organizations. This analysis also led to recommendations for the land use plan map included in the plan. Quality of life, and natural resource management were also important topics for research and best practice recommendations.

Plan Components*:* The *UMED Update* consists of three separate documents:

- *UMED District Plan Update Public Hearing Draft, October 2015*;
- *UMED District Plan Supporting Documents* report; and
- *UMED District Cogeneration Report* 2013.

***UMED District Plan Public Hearing Draft* - October 2015** (Exhibit A): Includes the purpose, process, context, methodology, challenges and opportunities, vision, goals, and implementation strategies. Different from the *2003 U-MED Plan* is the neighborhood inclusion, economic analysis, natural resources, transportation, and cogeneration research and reports, and the formation of the UMED Steering Team. Highlights of the *Plan Update* include the following:

- Organizational Mission and Purpose*:* There are 13 distinct organizations within the UMED District core. These organizations function together on a daily basis within their varying missions. Organizational master plans guide development by UAA, APU, PAMC, and ANTHC the primary private property holders in the District. As these organizations continue to grow there are opportunities for cross-organizational and community collaboration, commercial, job and housing growth, public/private partnerships, and sustainable project development.

- Residential Areas: Located within the UMED District boundaries are desirable, well-kept and stable neighborhoods. This indicates pride of ownership and community commitment. District residents expressed much about natural areas, trails and connectivity, future development, infrastructure improvements including neighborhood drainage issues, the lack of sidewalks, and potential impacts from the Northern Access project. Residents also relayed concerns regarding organizational growth and potential impacts on their quality of life.

The neighbors feel their concerns have gone unheeded. The recommendation for the UMED Steering Team to maintain quarterly meetings is meant to ensure continual community engagement opportunities between the organizations and the neighborhoods.

- Natural Areas: The Chester Creek Watershed includes undeveloped natural areas that support wildlife corridors and habitat. Most of the natural area is located on organizational land and is privately owned. Much of these natural areas will be developed by the UMED organizations over time. The *Anchorage Wetlands Management Plan*, the *Chester Creek Watershed Plan*, Title 21, and the UMED District design guidelines will guide future development. Impacts to the natural areas will be mitigated to the greatest extent possible. Natural area protection was viewed as the sole responsibility of the UMED organizations, the Municipality of Anchorage, and DOT&PF. However, area residents and visitors must also take part in resource protection. This can be achieved by reducing environmental impacts on residential property, through responsible pet management, observing posted park and trail rules, and respecting all property boundaries

- Parks: Several parks are located within the UMED District. Of primary interest during the planning process were were issues identified by the UMED Steering Team and the public regarding off-leash dogs, the lack of parking at University Lake Park, and lack of resource management of the Goose Lake and University Lake Parks. The recommendation to relocate off-leash dogs from the University Lake Park is seen as a positive management action to reduce environmental degradation, wildlife-dog conflicts, and dog-trail user conflicts. The recommendation to fund and complete management plans for both Goose Lake and University Lake Parks resulted in funding and the initiation of a management plan for the University Lake Park. The management planning effort includes 2015 summer and fall research by MOA Park staff and consultants. The public engagement process for the management plan was initiated on September 10, 2015. There are also several items of consideration for these park management plans identified in the *UMED Update* including implementation of the Chester Creek Watershed Plan and Wetlands Management Plan.

- Economic Development: The *UMED Update* considered specific issues that reflect development changes, forecasted housing and economic development and the growth needs of the Community. The *UMED Update* further implements many goals and policies of the *2020 Anchorage Bowl Comprehensive Plan* directed to “Major Employment” centers (page 50). The feasibility of mixed-use commercial and retail development proposed changes to the land use plan map to enable higher density development at key locations. A UMED Village was found to be economically viable—given the right location and increased higher-density housing.

  Market conditions and available infrastructure, road improvements or capacity, and willing land owners or developers will determine where the Village can be located. This plan advocates for public incentives and public/private partnerships (Mixed-use Development Case Studies) that could incentivize further investment in the District.

- Transportation, Trails and Parking Analysis: Brought to light were areas where immediate improvement could be made. To that end, the MOA and UAA approved a new parking agreement during this process. Also encouraged is a transportation demand management program, and funding for additional network, transit and bicycle facility improvements.

  The MOA regional trail system is depicted on the UMED District transportation map (page 51). A few trail links are shown to minor trails on organizational property to depict connectivity to campus areas.

  Maintaining and increasing neighborhood-accessible opportunities is also a high priority reflected through the proposed Pedestrian Projects included on page 50 that would provide additional pedestrian connectivity and safety.

  Multi-use trails and pedestrian facilities are important to the District as commute and recreation routes. Chester and Campbell creek trails are MOA owned and maintained and connect to trails on the private properties of PAMC, ANTHC, UAA, and APU. Each of the organizations identifies trail connections in their master plans, which are implemented in subsequent projects. As new campus development occurs, the organization-maintained trails may be realigned from certain sections of their property and the public must accept that there will be changes to the private trail system with new development.

- Northern Access: The preferred route and fully built-out cross-section was identified by DOWL in 2014. DOWL shared this information with the community in a series of public meetings. The built-out cross-section includes separated sidewalks, multi-use trail, overpasses, trail connections, and roundabouts meeting adopted UMED District design standards, and in response to public input. The Northern Access alignment is included on the UMED District transportation map.

- Quality of the Built Environment: The *2003 U-MED Plan* design guidelines are reaffirmed in this update to provide consistency. Infill development and identification of under-utilized properties is encouraged. Streamlining development review and approvals, public/private partnerships and development incentives were found to be very important. Natural areas will also be conserved with quality sustainable development.

  Implementation of cogeneration projects will become the norm as fuel cost increases continue to impact the organizational bottom line. High utility costs impact operations and the ability to provide high-demand medical and educational services and opportunities.

- Case Studies: The *UMED Update* includes several case studies that were used to inform plan elements and specific implementation items. Case studies on the following topics are found in the appendix of the *UMED Update*: Transportation Demand Management, Mixed-use development and UMED Village feasibility, Town/Gown relationships, Community gardens and food security, Outdoor Lighting, Natural Resource Protection Best Practices, and management of dog waste in public areas.

Community and Agency Comments (Exhibit B)

The public comment period was re-opened for the *UMED Update October 2015 Public Hearing Draft*. Included in Exhibit B are the community and agency letters and memos received by the cut-off date. UAA submitted correspondence regarding the expired BLM land patents and a reference to Adverse Possession of UAA lands. Alaska DOT&PF provided comments on the implementation table and DOT&PF participation. Four municipal departments provided comments, one mostly related to the Northern Access project, trails, and plan nomenclature. The Tudor Area Community Council commented on traffic impacts. We expect participation at the public hearing from the UMED organizations, including the UMED Steering Team members (Exhibit D), community councils, and the public.

Supporting Documents Report (Exhibit C)

UMED District Plan Supporting Documents Report - May 2014 (Exhibit C): The report provides an overview of nine topic areas for consideration: project overview, historic context, BLM patents, organizational development from the 1950s-2000s, organizations today, natural resources, parks, recreation and trails, commercial, retail, and housing market analysis, transportation network, and regulatory framework.

Cogeneration Report (Exhibit E)

UMED District Plan Cogeneration Report - 2013 (Exhibit E): The report analyzed the 2003 UMED cogeneration project and provided information on all aspects of cogeneration, including technology, financial, structural, and tariff requirements. This updated study also recommended the UMED District Cogeneration Pilot Project, which was found highly feasible with participation by Municipal Light and Power.

The Importance of Adopting the UMED District Plan

The *UMED Update* implements many of the *Anchorage 2020: Anchorage Bowl Comprehensive Plan* goals and objectives and provides land use guidance through the updated land use plan map for the UMED District planning area.

The *UMED Update* will function as a guiding document for future development efforts in the planning area undertaken by the UMED organizations, by private property owners, and by local and state governments. The *UMED Update* will also help inform future capital improvement project funding and work program priorities.

Department Recommendation

The Department recommends approval of the *UMED District Plan Update October 2015 Public Hearing Draft* (Exhibit A).

Attachments:
Exhibit A: *UMED District Plan Public Hearing Draft*, October 2015
Exhibit B: Community and Agency Comments
Exhibit C: *UMED District Plan Supporting Documents,* May 2014
Exhibit D: UMED Steering Team Membership
Exhibit E: *UMED District Plan Cogeneration Report Update 2013*

Exhibit A

UMED DISTRICT PLAN UPDATE

PUBLIC HEARING DRAFT

OCTOBER 2015

PZC Case No. 2015-0036

ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

1.1 PLAN PURPOSE AND PLANNING TEAM

This plan was funded by an Alaska Legislative grant at the request of the UMED District organizations and completed in partnership with the Municipality of Anchorage (MOA). The plan was to achieve specific goals defined in the grant request and agreement between the MOA and the State of Alaska.

The primary purpose of the District Plan Update is to assess current needs and to identify future actions and land use changes to address those needs. Planning updates for the UMED District are recommended on a five-year basis to re-ground the thinking and development in the district, identify new strategies and programs for implementation, and to engage the community in an open public process.[1]

The UMED organizations include Alaska Public Media (KAKM), Alaska Native Tribal Health Consortium (ANTHC), Alaska Pacific University (APU), Alaska Psychiatric Institute (API), Anchorage School District (ASD), McLaughlin Youth Center (MYC), Providence Alaska Medical Center (PAMC), Southcentral Foundation (SCF), Trust Land Office (TLO), and the University of Alaska Anchorage (UAA). The organizations provided staff representatives to the UMED District Steering Team, along with project partners including several Alaska Legislators and the Airport Heights, Rogers Park, and University Area Community Councils.

The Municipality of Anchorage began working with Page & Turnbull (prime consultant), Kittelson & Associates, RSA Engineering, and Strategic Economics to prepare the UMED District Plan Update in the spring of 2013.

The planning team met with the UMED organizations, student groups, community councils, and the public through several workshops and one-on-one interviews. A detailed overview of the public outreach process is included in Methodology-Section 2.4.

This plan presents visions, goals, recommendations, and implementation items related to the built environment, natural areas, transportation systems, recreational opportunities, economic development, and organizational support. The plan is intended to provide a framework for future actions to be taken by the Municipality of Anchorage, the UMED District organizations, developers, residents, and community partners.

The plan also includes an updated land use plan map which amends the Anchorage Bowl land use plan map that will guide future development. The multimodal transportation system and Transportation Demand Management program is encouraged. Watershed and natural resource protection, trail and park planning and management is supported.

The Plan encourages master plan development, mixed-use commercial, retail and housing development, and helps maintain stable neighborhoods. The plan defines the sensitive natural landscape and distills the "sense of place" that defines the District.

The plan will be implemented by: the District Plan recommendations, master plans, Anchorage Wetlands Management Plan, Chester Creek Watershed Plan, Metropolitan Transportation Plan, University Lake Park Master Plan, MOA Capital Improvement Program, and legislative requests.

1.2 PLAN SUMMARY

Good planning leads to healthy communities by striking the right balance of services, economic and physical development, aesthetics, and recreational opportunities. The Plan Update presents a cohesive strategy that integrates these aspects as they relate to the UMED District. The Plan Update includes the following sections:

- ***Introduction:*** The introduction sets the District's boundaries and further discusses the purpose of the Plan Update. This Plan Update will replace the 2003 U-MED Universities and Medical District Framework Master Plan (2003 UMED Plan). The Public participation process is also summarized.
- ***Context:*** The context describes the setting, planning considerations, master planning processes, UMED transportation system, natural resources including parks and lakes, trail and pedestrian system, and the involvement of the various stakeholders within the UMED. Planning influences include the proposed Northern Access Road, increasing density, infill and mixed-use development, the Chester Creek Watershed Plan, and MOA Title 21.
- ***Challenges and Opportunities:*** This section discusses existing conditions and viable opportunities for: ongoing development of the educational, medical, and public service offerings, parks, trails, public land management strategies, parking, and the multi-modal transportation system.

The desire for more food options, stable neighborhoods with housing choices and redevelopment opportunities, and the perception of public versus privately held lands was considered in many of the recommendations. The UMED District is well positioned to capitalize on its many strengths and opportunities to continue toward sustained growth, expanded education and research opportunities, and the provision of world-class medical services.

- ***Vision Elements:*** The Vision Elements contain eight specific subject areas: Supporting Organizational Missions, Quality of Life, Quality of the Built Environment, Transportation & Mobility, Community & Partnerships, Natural Resources, Economic Sustainability, and Growth & Change. This chapter describes each Vision Element, recommendations and implementation items.
- ***Implementation:*** This section includes the implementation matrix for the recommendations listed in the Vision chapter. Implementation phasing, potential responsible parties and funding are listed.
- ***Resources:*** Case Studies, Examples, and the ***2013*** *UMED Plan Cogeneration Report* (Cogen Report) executive summary are included. This section contains analysis in specific subject areas that informed the development of the recommendations. The Case Studies examine Transportation Demand Management and mixed-use "village" development combining retail and residential uses.
- The Examples cover topics important to the area, but contain less detailed analysis than the case studies. They cover the topic of town-gown relationships, night lighting, and fresh food access. The Cogen Report executive summary gives an overview of the technology, cost analysis and recommendations. Cogen is financially feasible in the UMED District with a change in the ML&P Tariff, which is further explained in the Cogen Report.
- ***Supporting Documents:*** The *Supporting Documents* report is a separate publication that contains an in-depth summary of various existing conditions within the District. The analysis presented in this document provided beneficial information critical to shaping the Plan Update. The *Supporting Documents* report is referred to throughout this plan and is available online or in hard copy.

1.3 PLAN PRIORITIES

The UMED District Plan Update recommends the following seven priorities for early action funding and implementation:

1. UNIVERSITY LAKE PARK MASTER PLAN

It was consistently heard that off-leash dogs around University Lake Park impact surrounding private properties. The UMED Steering Team suggested a master planning process for University Lake Park. The master plan would be used to further identify issues, funding, and management options. The MOA Parks and Recreation Department agreed to provide $30,000 for the University Lake Park Master Plan.

It is anticipated that additional funding will be necessary to upgrade the level of management at this park and for proposed mitigation elements that may come from the Park Master plan. The Chester Creek Watershed Plan will also be considered during this Park Master planning process scheduled for fall 2015. MOA Park staff supports this recommendation.

2. TRANSPORTATION DEMAND MANAGEMENT FEASIBILITY STUDY

Traffic management and parking were also discussed at length during the planning process. The parking analysis completed by Kittelson & Associates found that there is adequate parking in the District. With the latest parking information, the transportation focus shifted from parking to roads, trails, pedestrian amenities, transit and shuttle services.

This District Plan Update recommends several improvements that will contribute to the completion and operation of the District's multi-modal transportation network. However, as the District grows there will be a need to mitigate travel demand through increased transit, carpools, vanpools, and other Transportation Demand Management (TDM) options. The intent of the proposed TDM study will be to examine incoming traffic from all parts of the Anchorage Bowl and the Mat-Su Valley to determine options for reducing single-occupant vehicle travel into the District and the potential for increasing transit-related access options. People Mover staff provided comments in support of a TDM study.

3. DISTRICT-WIDE TRAILS AND PEDESTRIAN SYSTEM MASTER PLAN

This plan is essential to the continued funding and management of the Anchorage Trail and Pedestrian System. The UMED District sits at the junction of two major trail corridors; Chester and Campbell Creek. Identifying desired connections, and also providing connectivity to the future Northern Access Road, will ensure that the District remains and supports a first-class multimodal transportation system to and within the UMED District. This effort could also address trail grooming, maintenance, snow plowing, patrols, future pedestrian improvements, and connections on District neighborhood streets.

This project would also help facilitate communication between the community councils as they submit projects for the MOA's annual capital improvement programming process. Recommendations from the UMED District Plan will be an important element of the AMATS trail planning effort. AMATS staff support this recommendation.

4. ANCHORAGE AREA TRANSIT FEASIBILITY STUDY WITH FOCUS ON THE UMED DISTRICT

An Anchorage-area Transit Study would complete analysis and recommendations for increased transit opportunities with a focus on the UMED District. Ridership in the UMED District is the highest in the Anchorage area. The District has not been studied for improvements or potential increases to service for several years according to People Mover staff. An updated transit study would help justify future federal funding for transit. People Mover staff support this recommendation.

5. UMED DISTRICT COGEN ENERGY CONSERVATION PILOT PROJECT

The 2013 UMED District Cogeneration Study Update (Cogen Report) was requested by the UMED organizations in their grant application. Analysis and recommendations were completed as a tool for future Cogen implementation in the UMED District. The Cogen Report has positive implications for the UMED and Cogen implementers across the State of Alaska. Priority five supports the recommendation for a UMED District Cogen Energy Conservation Pilot Project. The details of the Pilot Project would be developed by interested parties among the UMED organizations, the MOA, and the State of Alaska. The Executive Summary can be found in section 5.7 of the appendix. The full report is available online at Muni.org. The UMED Steering Team supports this recommendation.

6. ONGOING OUTREACH AND COMMUNICATION

UMED Organizational Leadership, the UMED District Plan Steering Team, community councils, and the public expressed a desire for early-on and continuing communication between the neighborhoods, the organizations, and the MOA as projects are planned and developed. Therefore, UMED Steering Team quarterly meetings are recommended along with other public outreach and engagement programs. Currently MOA staff facilitate the Steering Team meetings and will continue to do so as identified in the Community and Partnerships vision. The UMED Steering Team supports this recommendation.

7. NEW TITLE 21

The MOA is tasked to create an educational program for the new Title 21. Title 21: Section 21.03.110-Institutional Master Planning was developed to facilitate increased communication between organizations and residents and to foster submittal of organizational master plans for Assembly approval. Section 21.03.110 provides tools to streamline the approval process for new development on a more holistic and campus-wide basis. The MOA recognizes that amendments to this section may be necessary as issues are discovered when a master plan is submitted for MOA review and approval.

The MOA will continue to work with the UMED District organizations to facilitate a cohesive master plan adoption process, along with any changes that might be necessary to this specific section of Title 21. A summary overview and action items will be developed in partnership with the organizations to enable a better understanding of this section for future institutional master plan submittals as a product of this priority. Identification and resolution of potential regulatory barriers to development are acknowledged in the Quality of the Built Environment vision to enable desired development in the UMED District. The UMED Steering Team and MOA staff support this recommendation.

2. INTRODUCTION

INTRODUCTION

2.1 LOCATION

The District Plan Update planning area is bound by the entire University Area Community Council (UACC) area in Anchorage, Alaska. Community council boundaries are typically used for neighborhood and district planning processes throughout Anchorage. The boundaries of the UMED District planning area are Lake Otis Parkway to the west, Northern Lights Boulevard to the north, Baxter Road to the east, and East Tudor Road to the south. The District includes a large cluster of organizations in the north and west, and residential neighborhoods to the south and east. A variety of small-lot commercial and retail businesses, a strip mall, and multi-family housing are located along Lake Otis Parkway, Tudor Road, and Boniface Parkway.

Already in progress when the UMED Plan update was initiated, the East Anchorage District Plan (EADP) included a portion of the UMED District during its planning process. The UMED Plan Update carries forward the adopted land use classifications from the EADP for the areas between Boniface and Baxter roads, and Northern Lights Boulevard and Tudor Road.

2.2 PURPOSE OF THE PLAN UPDATE

The primary purpose of the District Plan Update is to assess existing development and infrastructure issues; identify future land uses, help reground planning elements identified in 2003, and assist in identifying new strategies and programs for implementation.[2] The public process included input from the organizations, neighborhoods, general public, and professional developers and planners. Each of these stakeholder groups contributed to the Plan Update through a robust planning process.

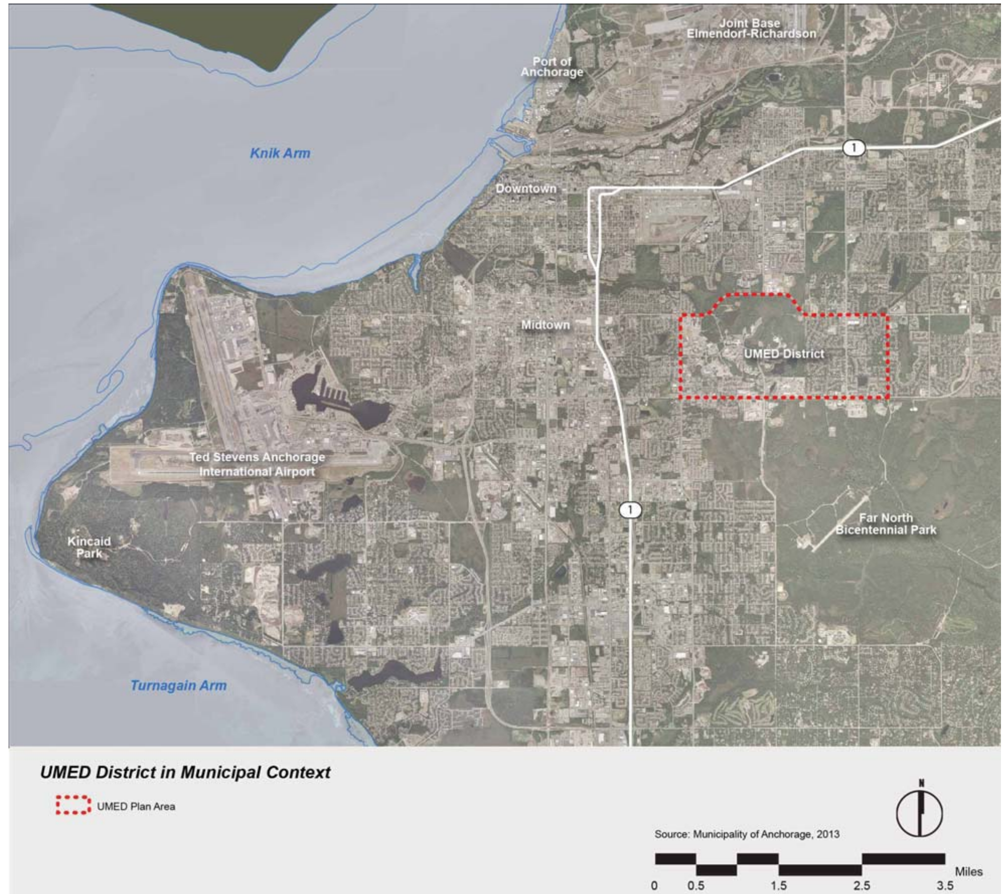


Figure 1. UMED District Plan Boundary in context with the Anchorage Bowl

2003 U-MED FRAMEWORK PLAN

The 2003 Plan is an adopted element of the Anchorage Comprehensive Plan. The 2003 UMED Plan was amended twice: in 2009 to depict local street changes for Piper and Laurel streets and East 40th Avenue, and in 2012 to approve the Alaska Pacific University master plan land use map. This 2015 UMED Plan Update replaces the 2003 UMED Plan.

The 2015 UMED Update includes several items that were not addressed in the 2003 UMED Plan. The 2015 UMED Update incorporates the commercial fringe and residential neighborhoods located within the University Area Community Council boundary; provides a cogeneration feasibility study; updates design guidelines consistent with Title 21; recognizes the BLM land patents; includes the real estate and mixed-use development analysis in support of high-density development and the UMED Village; and identifies a route for the Northern Access project.

VISION FOR THE FUTURE

The Plan Update presents a broad vision for the future of the UMED District as the location of Alaska's second largest employment center. Civic leaders, municipal and urban planners, designers, engineers, and local residents will use the Plan Update as a framework for supporting and enhancing the outstanding elements that make this area of Anchorage so desirable. The community will be able to use the plan to guide future growth and development, while supporting the protection of the natural resources and the continued enhancement of park, trail, and recreation amenities in the UMED District.

Figure 2. Residential and organizational areas in the UMED District

PRIMARY OBJECTIVES OF THE PLANNING PROCESS:

- Provide relevant analysis, recommendations, and case studies that respond to current economic trends and transportation needs and that support the Visions, Goals, Objectives, and Implementation items.
- Take a fresh look to determine cogeneration feasibility.
- Complete a robust and engaging public outreach process.
- Develop a holistic approach to managing parking.
- Include the eastern residential neighborhoods into the expanded UMED District planning area to create a cohesive community, to support future infill and redevelopment, and to identify capital projects or programs that benefit the residential neighborhoods adjoining the organizational core.
- Provide the planning tools to enable a diverse set of stakeholders with individual missions to flourish in the UMED District.

VISION ELEMENT COMPONENTS:

- ***Vision Elements:*** Where we want to go.
- ***Goals:*** The goals are the road map.
- ***Recommendation or Implementation Elements:*** The nuts and bolts of getting the job done.

Several of Alaska's prominent higher-education and medical facilities are located within the District, as well as residential enclaves, and retail and commercial properties. The District continues to realize a high demand for growth in the education and health services sectors with much of the commercial development devoted to medical service providers. The two universities also continue to develop new programs and facilities to meet demand for degree programs such as engineering, nursing, liberal arts and professional and technical education offerings. The social service programs and medical care provided by MYC, API, ANMC, and PAMC also continue to grow with Alaska's population, therefore increasing treatment offerings.

The planning process engaged those who live, work, study, and recreate within the UMED District. The Plan Update gives the neighborhoods, businesses, and organizations the opportunity to fulfill their individual and collective missions in a community of sustained viability and vitality.[3]

This Plan Update will guide future growth and development in the core UMED area, in the neighborhoods located in the eastern and southern peripheries of the District, and in the commercial perimeter areas. The ongoing implementation and development efforts subsequent to the adoption of the Plan Update will build on continued inclusion and participation of the residential neighborhoods, commercial businesses, the organizations, the MOA, and other partners. Management of publicly owned parks and trails, the newly adopted MOA Title 21 land use code, implementation of the Anchorage Wetlands Management Plan, and the Chester Creek Watershed Plan are addressed.

Recommendations for the multimodal transportation system and a Transportation Demand Management (TDM) program may have implications for the Anchorage Metropolitan Area Transportation Solutions (AMATS) regional planning and funding process.

2.3 VISION ELEMENTS

Eight Vision Elements were developed to articulate the District's planning needs: Supporting Organizational Missions, Quality of Life, Quality of the Built Environment, Transportation & Mobility, Community & Partnerships, Natural Resources, Economic Sustainability, and Growth & Change.

1. ***Supporting Organizational Missions*** contains recommendations for facilitating resourceful and context-sensitive organizational growth.
2. ***Quality of Life*** addresses issues of recreation, district identity, and stimulating social gathering places.
3. ***Quality of the Built Environment*** focuses on urban design that is sustainable, responsive to the natural environment, and aesthetically pleasing.
4. ***Transportation and Mobility*** advocates for a variety of transportation improvements that improve safety and walkability and that are executed with consideration to natural resources.
5. ***Community & Partnerships*** summarizes a variety of planning issues that can benefit from cross-organizational collaboration and partnership with the residential community.

6. ***Natural Resources*** highlights measures that encourage future development in ways that preserve resources valued by stakeholders within the UMED District.
7. ***Economic Sustainability*** provides recommendations for strengthening the District's economic potential through mixed-use development and increased housing, and provides tools for financing these developments.
8. ***Growth and Change*** outlines the key principles that will shape future growth and calls for participatory planning processes on the part of the Municipality to allow for transparency and public outreach.

2.4 METHODOLOGY

This was a participatory planning process. Vision Elements were developed from stakeholder and public input received during meetings held with both organizational representatives and the public. Stakeholder feedback helped the UMED District planning team formulate areas of specific interest and concern. This important input and guidance led to the development of each Vision Element, Goal, Recommendation, and Implementation Item.

Extensive analysis of local transportation systems, sustainable energy, housing, and economic conditions within the UMED District and the Anchorage Bowl was conducted. Case studies and examples from comparable cities and university campuses also shaped the recommendations.

Topics covered include: "town-gown" relationships (working models for communities with a high concentration of higher educational facilities), public-private partnerships, strategies for mixed-use development, campus parking management, natural resource management, trail and pedestrian connectivity, and Transportation Demand Management concepts. Applying these various analyses, the Vision Element chapters range in detail—starting with broad goals for the entire District, to focused recommendations for implementation items.

PLANNING PROCESS PHASES

The planning process consisted of three major phases:

- ***PHASE 1:*** Public Input: Stakeholder engagement was completed to distill the prominent planning issues and opportunities in the UMED District.
- ***PHASE 2:*** Existing Conditions and Formulating the Plan: Review of the Anchorage Wetlands Management Plan, Chester Creek Watershed Plan 2015, and new Title 21. Case study research, stakeholder check-ins through the UMED Steering Team, Community Council presentations, one-on-one meetings, and the formulation of recommendations was completed
- ***PHASE 3:*** Public Input: Public Review and Public Hearing drafts of the Plan completed. Open House presentation and Steering Team meetings held. Anchorage Planning and Zoning Commission presentations, and Assembly approval.

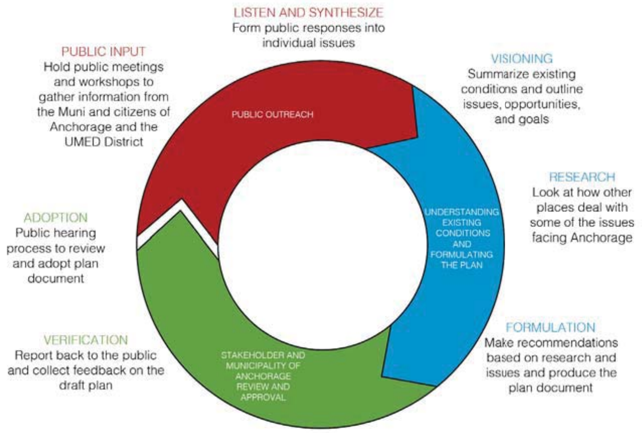


Figure 3. Phases of the process for creating the UMED District Plan Update

PHASE 1: PUBLIC OUTREACH AND ENGAGEMENT

The stakeholder engagement process was conducted to ensure and encourage active participation in the planning process by neighborhoods, organizations, property owners, and businesses. Organizational meetings, public workshops, a visioning session, focus groups, and the UMED Steering Team were organized into four separate outreach and engagement efforts initiated in March 2013 and carried through January 2014. During each engagement effort a public workshop was scheduled and several organizational stakeholder meetings were held. Over 6,000 post card invitations were sent to property owners to kick off the planning process.

An online survey of staff, students, and residents was conducted. The survey notice was also sent to more than 4,000 members of AK Public Media. Two workshops were also held with students at the UAA and APU campuses in addition to staff presentations at student government meetings. Subsequent and ongoing student outreach by staff includes class presentations with updates about the UMED District Plan.

The first and second series of public meetings focused on gathering information about existing conditions in the UMED District, and generated thoughtful discussion on future growth needs, quality of life issues, and the natural environment. Input gathered during these meetings was combined to form the eight Vision Elements that provide the foundation for the UMED District Plan Update.

The third and fourth series of public meetings focused on fine-tuning the Vision Elements, crafting the related Goals, and determining Recommendations and Implementation items.

UMED Steering Team

UMED Steering Team was established to provide guidance and input on a regular basis throughout the planning process. The Steering Team includes staff from the organizations, MOA Departments, three community councils, and Alaska State representatives below:

- The ***Alaska Native Tribal Health Consortium (ANTHC) and Southcentral Foundation (SCF)***, non-profit health organizations owned by and for Alaska Native Peoples They jointly own the ***Alaska Native Medical Center (ANMC)***.
- ***Alaska State Legislators (AK LEG)*** Geran Tarr, Andy Josephson, and their staffers.
- The ***Alaska Pacific University (APU)***, a private, four-year, liberal arts college that offers undergraduate, graduate, and doctoral degrees.
- The ***McLaughlin Youth Center (MYC)***, a rehabilitation and detention center run by the Alaska Department of Health and Social Services.
- The ***Providence Alaska Medical Center (PAMC)***, the largest hospital in Alaska that provides care for a broad range of medical needs.
- The ***Trust Land Office (TLO)*** manages the land of the Alaska Mental Health Trust, a state corporation that provides integrated mental health programs.
- The ***University of Alaska Anchorage (UAA)***, a state-run, public university that offers associate, baccalaureate, and graduate degrees, in addition to cooperative/collaborate master's and doctoral programs with other universities.
- The ***University Area, Rogers Park, and Airport Heights Community Councils (UACC, RPCC, AHCC)***, volunteer-led neighborhood organizations which were established by the MOA to provide a means for local residents, property owners, and businesses owners to communicate directly with community partners, local government and developers.
- MOA Traffic, Anchorage Metropolitan Area Transportation Solutions (AMATS), and Parks and Recreation Departments.

It should be noted that the UMED Steering Team volunteered countless hours to attend regular monthly meetings, review and comment on plan drafts, and provide support and participation at all public workshops. The Steering Team will continue to meet on a quarterly basis after plan adoption to assist in implementing the plan. Their work and dedication to this process is most appreciated by the planning team.

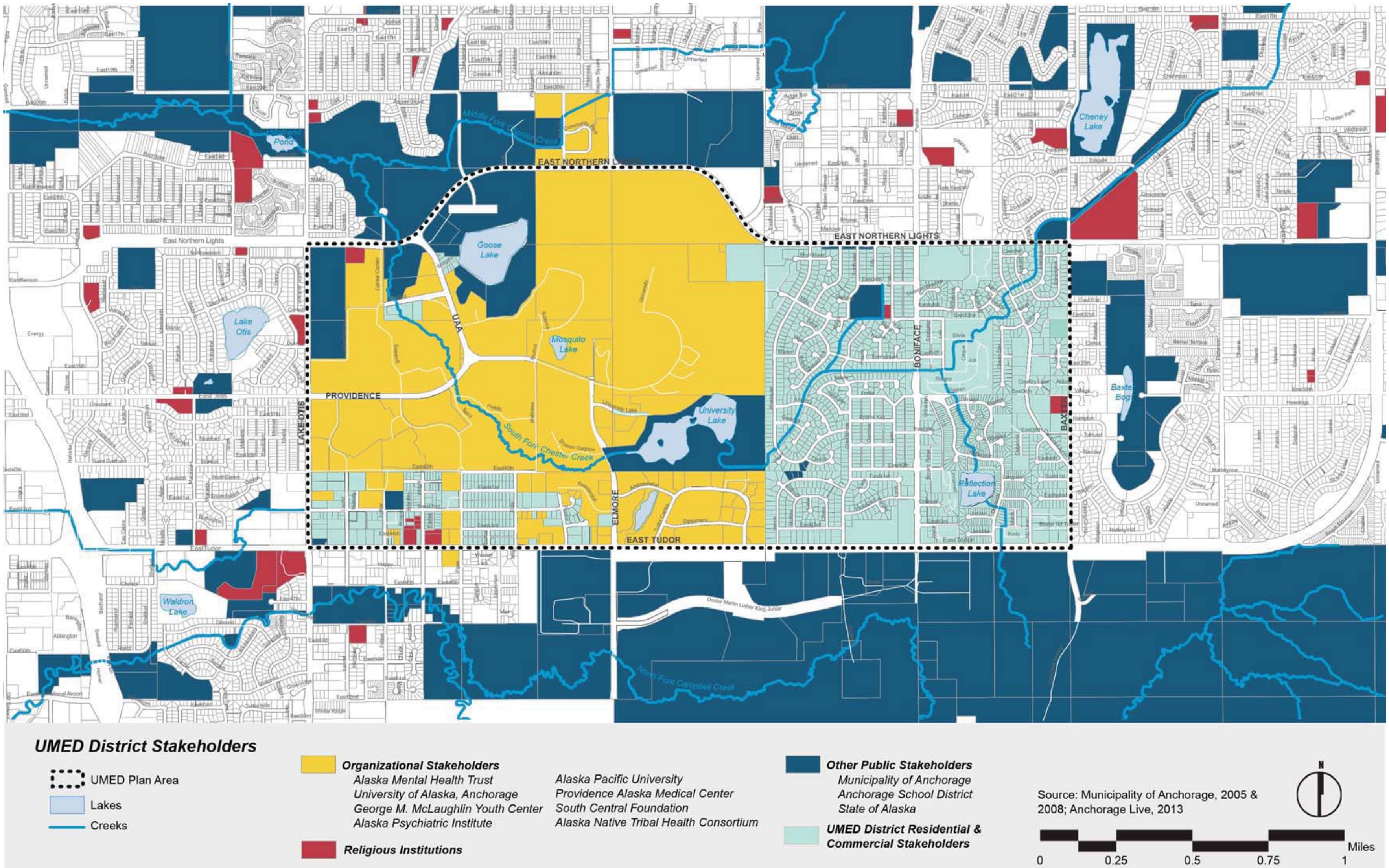


Figure 4. UMED District stakeholders

Summary of Meetings and Surveys

All stakeholders were invited to attend through email, Facebook, and the project website. Federation of Community Council Meeting notices were distributed, and state legislators also informed their constituents by email throughout the public engagement process. The UMED District planning team met with representatives from the UMED organizations, APU and UAA students, several MOA departments, and the Northern Access Road planning team.

Public Workshop #1 – Kick-off Meeting: March 28, 2013

Workshop goals were: To introduce the project scope and objectives, the planning team, and to gather information and ideas from the public. The workshop provided the UMED District planning team an opportunity to listen and interact in a meaningful way with those participating, and to confirm the best ways to communicate during the entire planning process. Substantive information was gathered to assist the team in forming an overall public perception and desire for the district well into the future. A report-out of the evening was presented at the end to inform the planning team and participants of the highlights of the workshop.

Public Workshop #2 – Open House and Visioning Session I: June 4, 2013

Open house and visioning session goals were: To engage citizens, local groups, and community organizations in a series of focus groups organized by general topic. Focus groups provided input on historic preservation, natural resources, organizational land development, residential and commercial land development, market conditions, and transportation and circulation. The focus groups also mapped areas of interest for further discussion and research by the planning team. A report-out of the evening was given at the end to inform the planning team and participants of the highlights of the workshop.

Figure 6. Public workshop #1

Figure 5. Public workshop #1

Figure 7. Public workshop #2

Public Workshop #3 – Open House and Visioning Session II: August 8, 2013

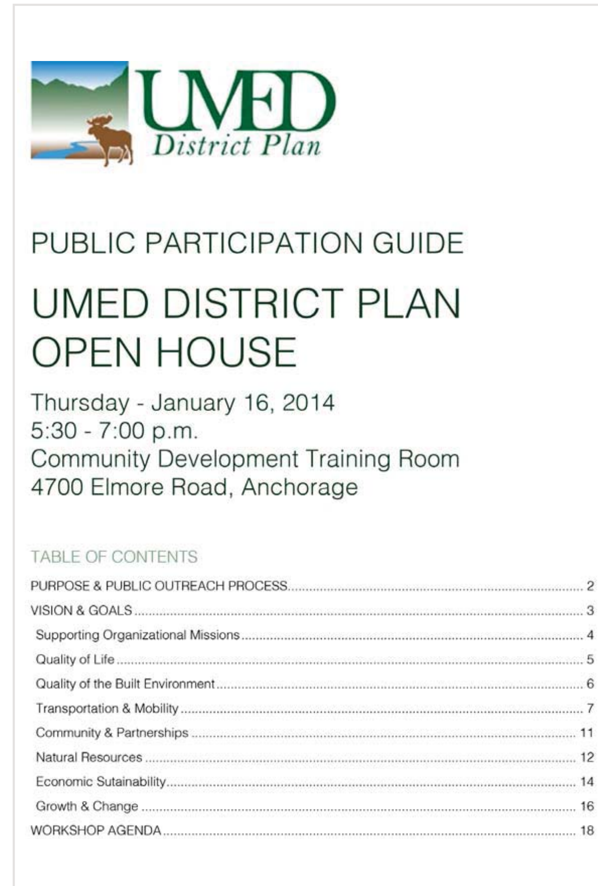
Open House and Visioning Session Goals: To fine-tune each vision element and to begin the organization of Goals, Recommendations, and Implementation items under each Vision. The planning team members presented the draft Goals, Recommendations, and Implementation items at the public open house to receive final input and comment. Break-out groups focused in at their round-table discussions on issues relevant to each group. A report-out was given at the end of the evening to inform the planning team and participants of the highlights of the open house.

Figure 8. Invitation to public workshop #3

Public Workshop #4 – Open House: January 16, 2014

The draft recommendations for the plan update were introduced at the Steering Team meeting and at the public open house. Individual and group discussions were facilitated by members of the UMED planning team. The comments from the open house and the Steering Team meeting constituted the final draft of the Vision, Goals, Recommendations and Implementation Items. From this point forward the team would use this vital information to begin the narrative portion of the plan. Additional research was also completed based on what the planning team heard and the results of the open house comment. As with the previous public engagement efforts, a report out was given to inform the planning team and participants of the highlights of the open house.

Figure 10. Participants at public workshop #3



UMED
District Plan

PUBLIC PARTICIPATION GUIDE

UMED DISTRICT PLAN
OPEN HOUSE

Thursday - January 16, 2014
5:30 - 7:00 p.m.
Community Development Training Room
4700 Elmore Road, Anchorage

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Figure 9. Participant guide to public workshop #4

Public Meeting Comments Analysis

A comparison was made between the information received from the general public and that voiced by the organizations, which included the UMED Steering Team members on the eight Vision Elements. That comparison is charted in Figure 11. Quality of Life, Transportation and Mobility, Community and Partnerships and Natural Resources were found to be important to both groups.

This information helped the planning team to formulate recommendations for implementation items in light of these important areas of concern.

GENERAL PUBLIC AND STEERING TEAM PRIORITIES

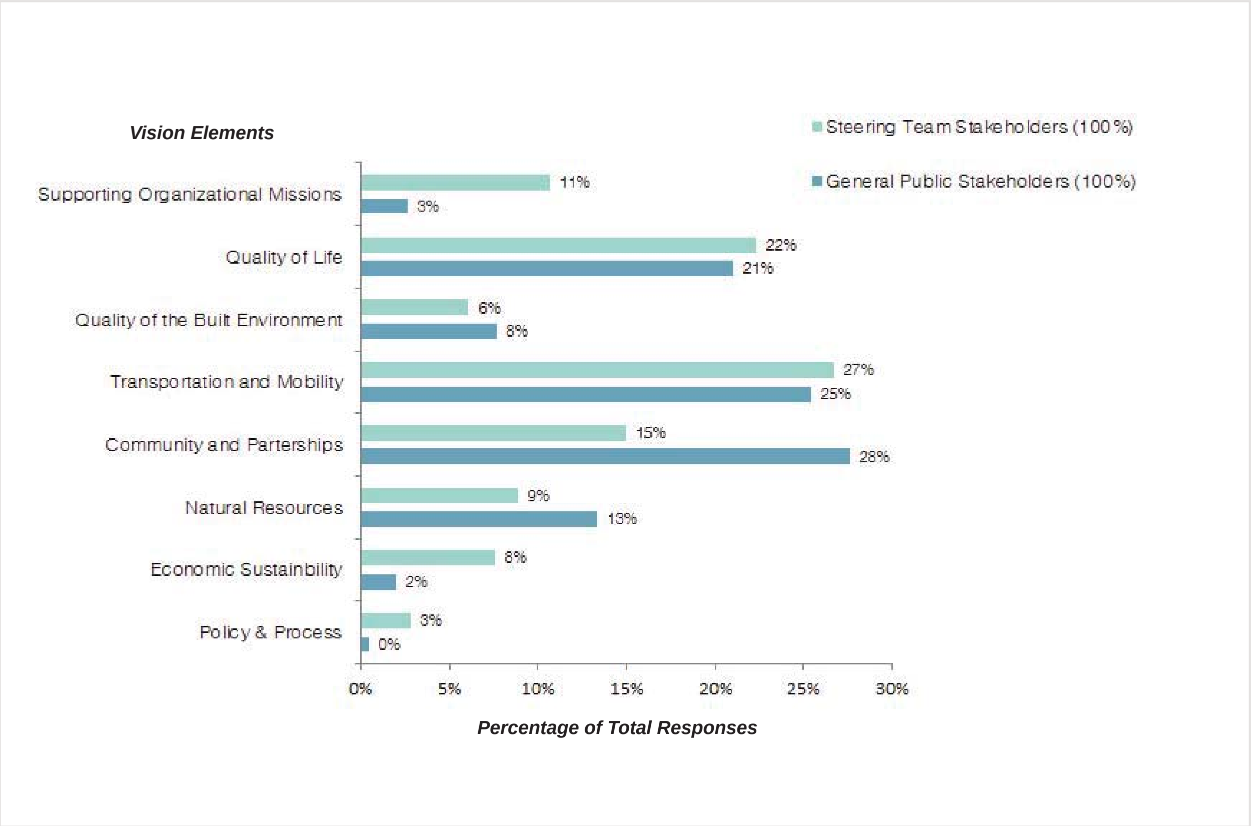


Figure 11. General public and steering team priorities.

SAMPLE QUESTION FROM THE ONLINE PUBLIC SURVEY

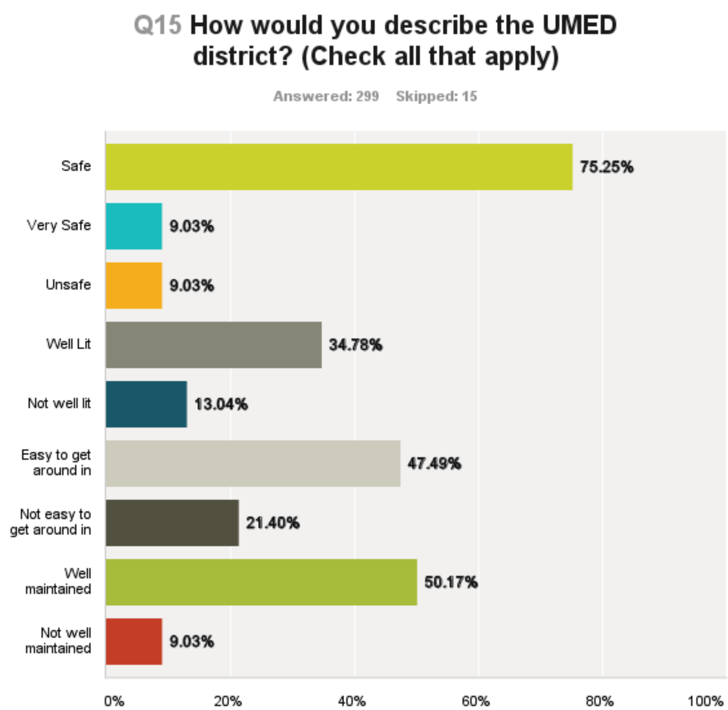


Figure 12. Sample question from the online survey.

Online Survey Analysis

In addition to public meetings, public input was gathered via an online survey consisting of twenty-one questions. The survey was conducted in July 2013. Survey participants were drawn from students, employees, business owners, residents, and other relevant stakeholders. Figure 12 illustrates one of the survey questions, which covered the topics of transit, housing, services, and recreation within the District.

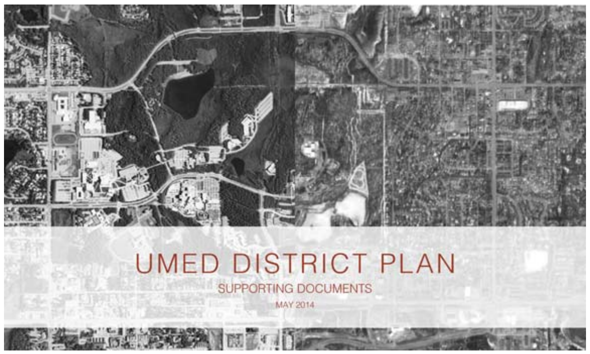


Figure 13. Cover of the *Supporting Documents*

PHASE 2. UNDERSTANDING EXISTING CONDITIONS AND FORMULATING THE PLAN

Supporting Documents

The UMED District planning team compiled and published an external report entitled ***UMED District Plan Supporting Documents*** (***Supporting Documents***) early on in the planning process.

This report established certain baseline information for the UMED District core and the surrounding neighborhoods. This information was used to determine relevant case study research and helped the planning team to formulate a foundation for the UMED District Plan. The report contains a large volume of information compiled in a single comprehensive overview and is a first for the UMED District area.

The ***Supporting Documents*** also introduces and provides a detailed look at existing conditions in the UMED District including: development history; physical characteristics of the natural and built environment; an overview of the groups that use it; a description of the District's trail, park and recreational resources; local economic drivers including commercial, retail and housing conditions; and transportation systems.

The ***Supporting Documents*** lastly includes a summary of general planning processes and regulations that currently govern the District, from the 1983 Goose Lake Plan to the 2003 U-MED Universities and Medical District Framework Master Plan, to the BLM land patents.

The ***Supporting Documents*** is referenced throughout this plan as noted in the Introduction. Hard copies are available from the MOA's Community Development Department—Long Range Planning Section and online at: muni.org/departments/ocpd/planning/publications/Pages/default.aspx.

Formulating this Plan

The UMED District Plan includes the primary planning document and several appendices comprised of Case Studies, Examples, ***Supporting Documents*** Table of Contents, and the Cogen Report Executive Summary.

PHASE 3. STAKEHOLDER REVIEW AND APPROVAL

The final phase of the planning effort involves the publishing and review of the 2015 UMED District Plan Update-Public Hearing Draft . A public workshop and open house, along with a work session and presentation to the Anchorage Planning and Zoning Commission (PZC), will be held. MOA staff will present the Public Hearing Draft Plan to the Anchorage Assembly for adoption. It is important that the stakeholders, including the UMED Steering Team, provide comments and support during this public meeting process in order for the PZC and Assembly to understand and support the Plan Update.

FORMULATING THE PLAN: APPENDICES HIGHLIGHTS

APPENDICES	HIGHLIGHTS
Appendix 5.1—Case Studies: Transportation Demand Management (TDM)	• The TDM case study analyzes management programs throughout the country and extracts relevant concepts for the UMED District. • The case study focuses on: accessibility, congestion, parking management, existing infrastructure maximization, transportation user costs, transportation development costs, environmental sustainability.
Appendix 5.2—Case Studies: Mixed-Use Development	• This section explains the financial mechanisms and the partnerships that enable mixed-use development to occur. • The case study examines three developments within relevant university neighborhoods: University Square in Madison, Wisconsin; the Uptown in Cleveland, Ohio; and the University Marketplace in Vancouver, Canada. These case studies explain how revitalization of strip commercial centers, public-private partnerships, and cross organizational collaboration come together in realizing mixed-use development
Appendix 5.3—Case Studies: Natural Resources	• This section analyzes how various cities address the issues of water quality, urban forests, land development, and urban wildlife.
Appendix 5.4—Examples: Positive Town-Gown Relationships	• This section analyzes town-gown relationships from four perspectives: empowering neighbors to communicate with organizations, city planning and policy tools for community-organization interactions, organizational goodwill and commitment to neighbors, and economic benefits of organizational-residential districts. Examples on each topic are briefly summarized and online sources are provided to direct more in-depth.
Appendix 5.5—Examples: Night Lighting	• This section directs readers to online resources from the International Dark Sky Association, which works to improve night-time lighting and sky friendliness, while ensuring safe night-time lighting.
Appendix 5.6—Examples: Fresh Food Access	• This section discusses examples of mobile food vendors which provide good interim access to fresh foods while the UMED District plans for growth. Online resources are provided to direct more in-depth research. This section also supports the ongoing research on food security.
Appendix 5.7— Cogeneration 2013 Executive Summary	• This section provides the executive summary of the 2013 Cogeneration Report. The Cogeneration Report examines Centralized versus Distributed Heat and Power Generation (Cogen) that was considered for the UMED District in a 2008 Cogeneration study. The 2013 updated study presents the latest information on combined heat and power generation technologies, and supports the feasibility for micro turbine generation that would provide cost-effective and sustainable heat and power systems.
Appendix 5.8— Supporting Documents Table of Contents and Summary	• The Summary gives a brief overview of the ***Supporting Documents.*** Analysis in the ***Supporting Documents*** supports many of the recommendations in this plan.

Figure 14. Partial view of the UMED Core Area looking northwest

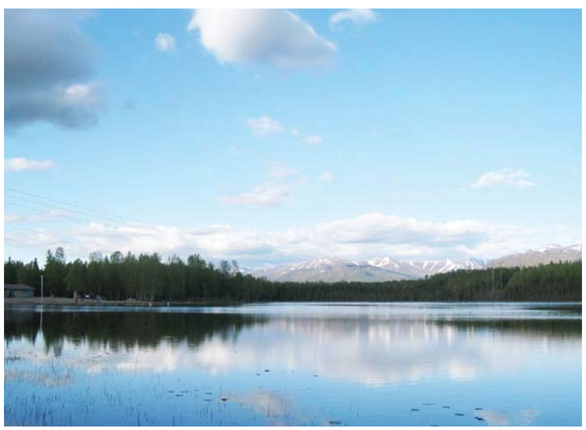


Figure 15. Views within the UMED

2.5 CONTEXT

LOCATION

The UMED District is located approximately 3 miles southeast of downtown Anchorage. Two university campuses, multiple hospitals, 2 primary schools and 1 secondary school, and several social service providers prosper in the District. Approximately 6,300 people call the District "home." The District is the second largest (and steadily-growing) employment center in the region, and is a major economic driver for the State of Alaska. Such a strong economic base indicates that the UMED District will continue to grow in the coming years in population, programs, and services. The UMED District Plan Update includes a revised district boundary that newly incorporates the neighborhood area that borders the organizational core to Baxter Road, and that is located within the boundaries of the University Area Community Council. The inclusion of these areas enables a closer look at the potential for mixed-use and higher-density housing development.

PLANNING CONSIDERATIONS

Key planning considerations in the UMED District include; master planning and development, mixed-use development and economic sustainability, cogeneration opportunities, the multi-modal transportation system including trails and pedestrian elements, support of the vibrant natural resource areas located in the Chester Creek watershed, parks and lakes, new Title 21, relevant design guidelines, and collaborative outreach and communication.

The UMED District Plan is an element of the Anchorage Comprehensive Plan. *See Figure 16: Anchorage 2020*.

MASTER PLANNING AND DEVELOPMENT

The UMED organizations, which includes the Municipality of Anchorage (MOA), conduct master planning processes that encourage public input and participation by community councils, surrounding neighborhoods, and other interested parties. Master planning facilitates a better understanding of future development needs, articulates the access and management of private land held by the organizations, and is intended to identify important public access opportunities on MOA-managed lands. UMED District plans should be formulated to provide support to these long-term master plans to sustain and grow the UMED District.

The new Title 21 includes section 21.03.110 – Institutional Master Planning: Establishes a framework for development of large institutions such as hospitals and universities. An institutional master plan is intended to "…permit flexibility for large institutions to have greater control over its own land use decision, while providing a level of understanding to the surrounding community about the potential growth of the institution and the resultant impacts, and to the Municipality about the public infrastructure and services that may be necessary to serve the planning area and adjacent neighborhoods." The institutions within the District are encouraged to develop their Master Plans under this framework to implement the visions and goals of this District Plan. In addition, one of the implementation priorities of this plan is the education of users and property owners on the new Title 21 and the Institutional Master Plan section.

MIXED-USE DEVELOPMENT AND ECONOMIC SUSTAINABILITY

Encouragement of mixed-use development and increased density in the UMED District through infill development and small lot parcel consolidation can provide growth opportunities, economic sustainability, and increased job opportunities. The potential for realizing reduced development costs may also enable developers to conserve the area's valued natural resources consistent with the Anchorage 2020 Comprehensive Plan.[5] The mixed-use development concept provides goods and services easily accessible by walking or biking, and is important to those who live, work and study in the District. This is especially important considering that the UMED District hosts a permanent residential population, a growing student population, and hundreds of Alaska-wide residents who access the District.

Vibrant local commercial centers developed as mixed-use with housing, office, retail and commercial could provide multiple benefits. The opportunity for a more walkable district that could include a local grocer or other amenities has the ability to reduce vehicle trips outside the District for services that are not currently located there.

Anecdotal information from students and staff alike confirm that once they are in the UMED—they stay in the UMED for the day. Therefore the desire for more food and dining options was high on the priority list of desired amenities.

This planning process capitalized on the opportunity to recommend mixed-use, and higher density housing development with the inclusion of the residential areas.

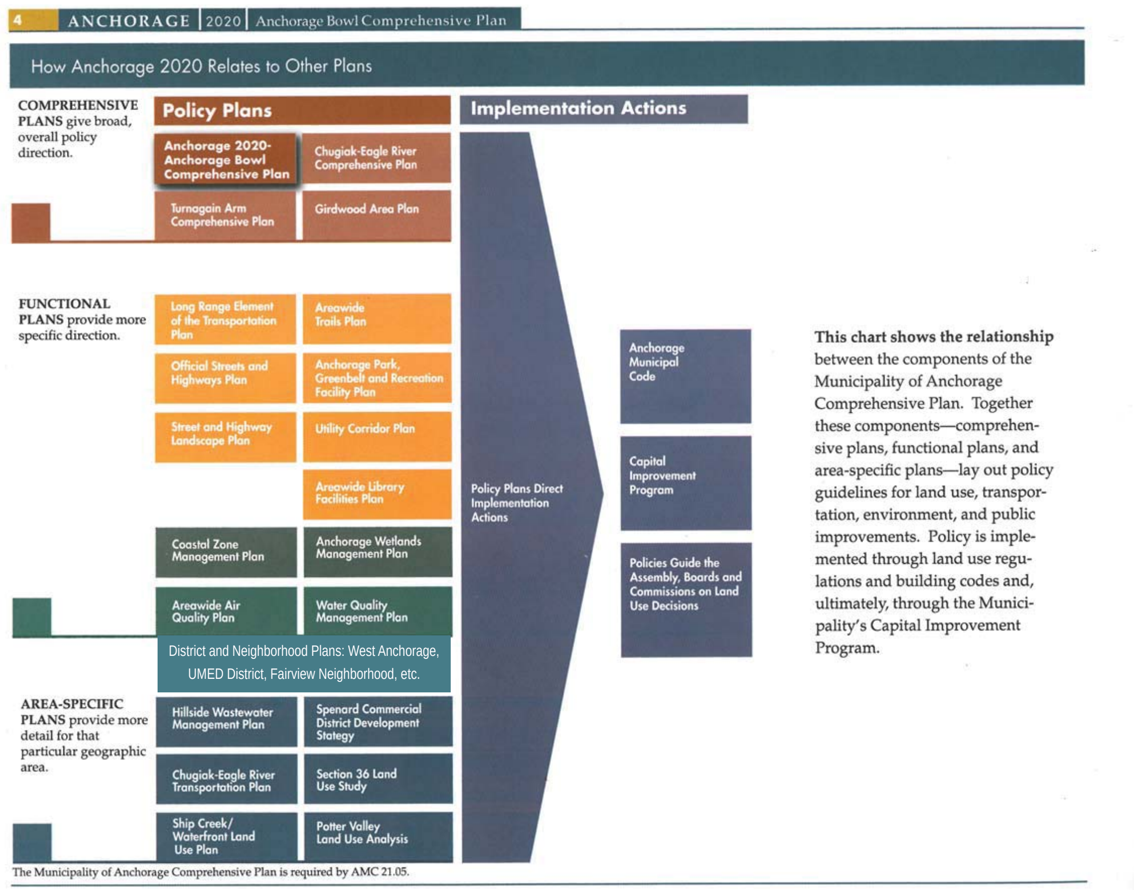


Figure 16. Hierarchy of planning and implementation elements – Anchorage 2020 - Source: Anchorage Bowl 2020 Comprehensive Plan

Figure 17. Partial view of the UMED Core Area looking north

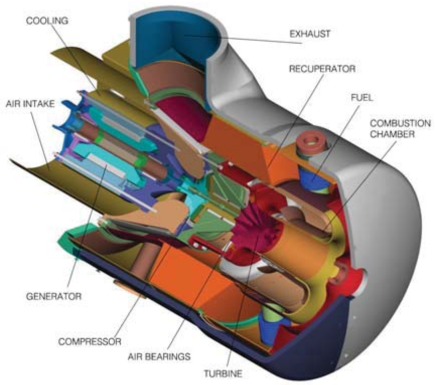


Figure 18. Microturnbine model from the Cogeneration study

MOA participation could also become a factor when public-private partnerships are considered for new development. This could potentially be through Chapter 12.35-Deteriorated Properties ordinance or Federal Tax Credits.

The 2012 Anchorage Housing Market Analysis found that the Anchorage Bowl area will be in a deficit of 8852 housing units by 2030, without increasing the current rate of redevelopment. Higher-density and mixed-use development at strategic locations could help fill some of the gap.

The identification of appropriate land use designations in the Plan area could lead to zoning changes initiated by private property owners. Increased density and compact housing options are consistent with the 2012 Anchorage Housing Market Analysis. The MOA has the opportunity to identify specific opportunity areas for housing development at increased density with this plan.[6]

COGENERATION—COMBINED HEAT AND POWER

The feasibility of a large cogeneration facility to provide combined heat and power (CHP) was explored for the UMED District in 2003. The 2003 study resulted in a multi-million dollar proposal that was later dismissed due to a lack of funding and required infrastructure. Evolving technology in the cogeneration field, that does not require the significant infrastructure or financial investment documented in the 2003 plan, is now a viable option under consideration by the UMED organizations.

The organizations desire to reduce their liability and secure a secondary source of cost-effective power in light of roller coaster fuel costs associated with increased operating costs. This would be possible in two ways; new CHP technology, and a legal shift in operations by Anchorage Municipal Light and Power (ML&P). To that end, organizations within the Anchorage area are seeking relief from the current ML&P tariff with assistance from the Alaska Regulatory Commission. Several large power users are watching in anticipation of a positive outcome for CHP.

CHP is now a requirement on all large Federal Housing and Urban Development funded projects. CHP is one of the most sustainable methods to significantly reduce annual energy costs, while more fully utilizing limited fossil fuels used to generate electrical power. The average efficiency of fossil-fueled power plants in the U.S. is 33%. This has remained virtually unchanged for 40 years. This means that two-thirds of the energy generated from that fuel is lost in waste heat. CHP systems capture the waste heat and convert it to useful energy for either heating or cooling. CHP achieves overall efficiencies of close to 80%.[7] CHP efficiencies can translate into increased investment in patient care and student programming notwithstanding the unprecedented fossil fuel efficiencies to be gained.

UMED DISTRICT TRANSPORTATION SYSTEM

The UMED District is bordered by several major arterials: Tudor Road, Lake Otis Parkway, Northern Lights Boulevard, and Boniface Parkway. In addition, several collector streets are located within the District: Elmore Road, UAA Drive, 36th Avenue/Providence Drive, and Baxter Road. The major arterials accommodate and are key links to and from the UMED District. Approximately 90% of Anchorage’s total travel is by single-occupant vehicle or carpool.[8]

UMED District drivers arrive by these primary roadways from destinations throughout the Anchorage Bowl, Girdwood, Eagle River, and the Matsu Valley. Traffic delays are mostly experienced during AM and PM peak rush hours.

Users of the UMED enjoy the walkability of the District and typically access the local streets and trails for exercise during breaks away from the job or classes. It is important then to provide a connected multi-modal transportation network to facilitate access to, from, and around the core UMED District area.

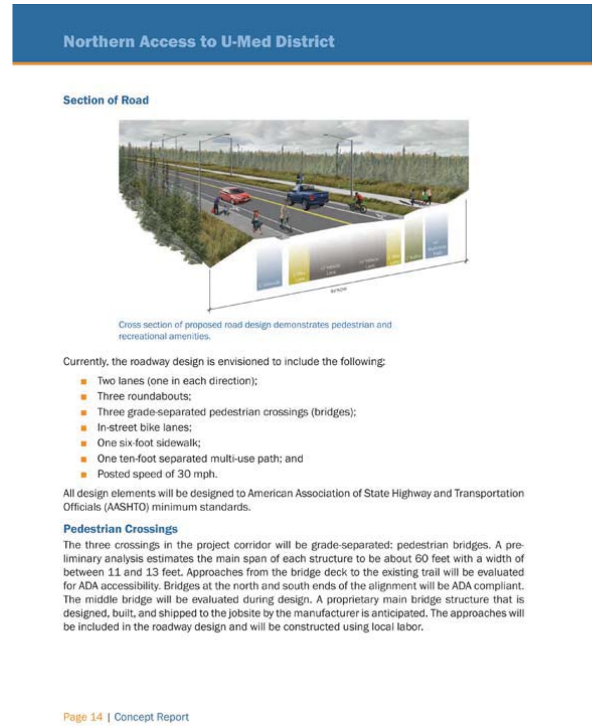
TRAILS AND PEDESTRIAN FEATURES

The UMED District is at the convergence of the Chester and Campbell Creek trail systems. Recent trail improvements provide a contiguous multi-modal trail network for all types of trail users in and through the UMED. However, snow and icy conditions make winter trail and pedestrian corridor maintenance costly. The community relies on the Nordic Ski Association to maintain the public trails throughout Anchorage, including the Chester and Campbell Creek trails. APU trails are popular for cross-country skiing in winter and walking in summer. APU's trails are private and are primarily dedicated to APU ski team training. The APU trails are maintained to support that function. UAA also has a system of internal trails that connect to the MOA trail system. The public is welcome on both APU and UAA trails. However, future projects may necessitate the removal or relocation of APU or UAA trails as time goes on and new development occurs.

PROPOSED NORTHERN ACCESS ROAD

Occurring during the UMED District Plan update process was the initiation of the Northern Access engineering study by the engineering firm DOWL. Identification of a feasible connection through the UMED core was completed by DOWL in the Northern Access Reconnaissance Study Report (2011), which contains a "technical evaluation of transportation needs and potential solutions to meet those needs." This report presented potential alternatives for transportation improvements, including the implementation of a TDM program. The follow-up 2014 engineering study is intended to further determine an alignment for a proposed northern access through the core UMED area.

The Northern Access to UMED District Concept Report published in June 2014 recommended the roadway cross section depicted in Figure 19. The new road would be built with two lanes, in-street bike lanes, a 10-foot separated multi-use path, and three roundabouts for access to APU, UAA, and at the Providence/Elmore Road intersection. Three grade-separated pedestrian crossings (bridges) are planned connecting to a 6-foot sidewalk and a 10-foot separated multi-use path. The pedestrian facilities would connect to the existing public trail system.[10] With changes in administrations within the UMED organizations, the idea of a northern access project has become more feasible. However, a project would need to be fully funded and be able to mitigate the impacts to the natural area within the core area of the District. This natural area includes Class-A wetlands and prime wildlife habitat.


Northern Access to U-Med District

Section of Road

Cross section of proposed road design demonstrates pedestrian and recreational amenities.

Currently, the roadway design is envisioned to include the following:

- Two lanes (one in each direction);
- Three roundabouts;
- Three grade-separated pedestrian crossings (bridges);
- In-street bike lanes;
- One six-foot sidewalk;
- One ten-foot separated multi-use path; and
- Posted speed of 30 mph.

All design elements will be designed to American Association of State Highway and Transportation Officials (AASHTO) minimum standards.

Pedestrian Crossings

The three crossings in the project corridor will be grade-separated: pedestrian bridges. A preliminary analysis estimates the main span of each structure to be about 60 feet with a width of between 11 and 13 feet. Approaches from the bridge deck to the existing trail will be evaluated for ADA accessibility. Bridges at the north and south ends of the alignment will be ADA compliant. The middle bridge will be evaluated during design. A proprietary main bridge structure that is designed, built, and shipped to the jobsite by the manufacturer is anticipated. The approaches will be included in the roadway design and will be constructed using local labor.

Page 14 | Concept Report

Figure 19. Section of the proposed Northern Access Road - DOT&PF - WWW.UMEDnorthernaccess.com/planview

PARKING

Parking in the UMED District is provided by the individual organizations for their operational purposes. Parking requirements are found in Title 21. UAA charges its students, faculty, and staff for parking to help defray the cost of providing parking on campus. All other parking within the UMED core area is free. Case study information can be found in the Appendix 5.1 on providing and managing parking.

TRANSIT AND SHUTTLE SERVICES

People Mover Public Transit service in the UMED District experiences the highest ridership demand in the Anchorage area. There is strong potential for implementing an organized Transportation Demand Management (TDM) program in the District to increase transit ridership, carpool and vanpool use in an effort to reduce single-occupant vehicle travel, and to provide cost effective travel options. This could be accomplished by incentivizing the use of alternative modes, redistributing transportation demand to transit, biking, walking, skiing, car-sharing, and/or telecommuting. TDM advocates the increased availability of travel options, manages congestion, reduces constraints on existing parking supplies, can reduce transportation costs to users, may reduce development costs such as off-site parking, and can contribute to meeting the environmental and sustainability goals identified in the Anchorage 2020. Shuttle service is provided in and to the UMED District by UAA and ANTHC from several locations in the Anchorage bowl, and on the respective campus areas. Shuttle stops on organizational campuses are located for convenient access to several locations including outlying parking lots where easier access to adequate parking is found.

NATURAL RESOURCES

Moose, fox, black bear, loons, waterfowl, and migratory song birds are found in the UMED District area.[11] A portion of the Chester Creek Watershed containing the south fork of Chester Creek meanders through the UMED District constrained by neighborhoods, roads, trails, and development in the organizational core. Chester Creek is valued for views, trails, wildlife habitat, its contribution to the health of the overall watershed system, and as a unique urban amenity.

However, this portion of the watershed is severely impaired by a variety of impacts from 1970's and 80's development. The importance and functions of the watershed were not considered then.[12] Early development allowed construction within creek corridors including fill and loss of important salmon tributaries. Science and research on these trends led to the formation and adoption of environmental protection laws and code that now guide the development of natural areas in Anchorage.[13] [14]

The South Fork of Chester Creek flows through University Lake (a former gravel pit) and Goose Lake, providing important habitat for a variety of salmon and trout. Recent efforts to restore creek habitat see increased salmon return numbers at local fish counters as a result. The UMED District Plan Update supports rehabilitation of Chester Creek and its important watershed. This is accomplished by aligning UMED District Implementation Items with the Anchorage Wetlands Management Plan; the Chester Creek Watershed Plan and the individual organizational master plans. Compatible development adjacent to natural areas is defined in the UMED Design Guidelines.

BUREAU OF LAND MANAGEMENT PATENTS

There are five separate Bureau of Land Management Land Patents in the UMED District Core. These patents were obtained in the early 1970s for the most part by Alaska Methodist University (AMU). AMU subsequently conveyed large portions of the patented properties to the Alaska University system with specific development restrictions. The land patents describe the allowed uses in the area. The patents on APU land have expired. In the larger undeveloped areas of UAA campus, "For School Purposes only" is indicated.

PARKS AND LAKES

Three lakes are located in the core district area close to the UAA and APU campuses. The Goose Lake and University Lake Parks function as regional parks and are owned and managed by the Municipality of Anchorage. These parks draw visitors from across the Anchorage Bowl. A resounding need for adequate parking, public education, and management of these two important recreation resources quickly moved to the forefront of this planning process.

Mosquito Lake is part of a large wetland area located on UAA property. Mosquito Lake is better accessed during winter when the ground freezes and there is snow. Mitigation efforts to manage Mosquito Lake and the adjoining A-class wetlands will be necessary with any future large infrastructure project.

Reflection Lake and the ANTHC pond may also receive attention and additional management actions identified in the Chester Creek Watershed Plan.

MOA TITLE 21 – LAND USE PLANNING CODE

In 2013, the Municipality completed a comprehensive rewrite to its development code—Title 21. At that time, the Assembly committed to creating a community education process for the new code. The Assembly continues to allow projects to be submitted under either the new or old code through the end of 2015. This decision is at the discretion of the developer.

DESIGN GUIDELINES

The Design Guidelines in the 2003 UMED Plan are included and amended with this plan to provide continuity in development for all large projects. They are incorporated in Vision 3: Quality of the Built Environment.

COLLABORATION AND COMMUNICATION

UMED planning processes have consistently recommended continued collaboration and communication by and among the many UMED stakeholders. The 2015 Plan Update also supports an ongoing collaborative communication process. This can be accomplished a variety of ways. Recommendations are found in Vision 5: Community & Partnerships. The UMED Steering Team was formed to help lead the 2015 UMED planning effort. That steering team process will continue to meet on a quarterly basis to facilitate ongoing communication and collaboration.

Figure 20. Goose lake and view of the mountains

2.6 CHALLENGES AND OPPORTUNITIES

The UMED District is classified as a Major Employment Center slated for continued growth potential in Anchorage 2020. The District has stable and well-kept residential neighborhoods and local schools, a variety of recreational opportunities, and contains a large portion of the South Fork of Chester Creek, which is considered a prized urban amenity in the midst of our city. Numerous factors will be addressed as the various organizations move forward in their missions to provide much-needed and desired services for Anchorage, and Alaska as a whole.

The stable neighborhoods found within the UMED District enjoy the close proximity and access to urban wooded areas that comprise part of the Chester Creek Watershed system. However, much of the wooded area located in the core of the UMED is privately owned. Over time this area may be developed. Planned and new development would provide increased services and educational opportunities, anticipated to generate necessary revenue to support the long-term financial needs of educational and research programs.

Ongoing development of the multi-modal transportation system will continue to present challenges and opportunities. The governmental agencies, including the Municipality of Anchorage and Alaska Department of Transportation & Public Facilities, both responsible for roads and public trails, must seek to mitigate impacts of the multi-modal transportation system on the surrounding property owners and the prized natural areas.

Figure 21. View of the eastern portion of the UMED looking south

Figure 22. Residential development in the UMED

Infill and redevelopment of under-utilized properties also present a future opportunity to provide office, retail, commercial, and housing options. The Mixed-Use Case Study by Strategic Economics gave robust recommendations for this type of redevelopment, including public/private partnership success stories and potential locations for development. Property owners considering projects in the UMED District can capitalize on this analysis to pursue future development as the UMED District further grows to meet the needs of our community. Strategic Economics also analyzed the real estate market conditions and identified areas along the perimeter of the UMED District with the most potential for redevelopment. Both efforts support the feasibility of a UMED Village.

ORGANIZATIONAL MISSIONS

Two university campuses—Alaska Pacific University (APU) and University of Alaska Anchorage (UAA)—multiple healthcare centers—Alaska Native Medical Center (ANMC), Alaska Psychiatric Institute (API), and Providence Alaska Medical Center, and community service providers including the McLaughlin Youth Center (MYC)—are located within the UMED District. In addition to providing educational and medical services to the region, these organizations also benefit the immediate community through health and wellness programs and community-based research. As these organizations grow, opportunities arise for cross-organizational and neighborhood collaboration, commercial development, and additional jobs and housing. In addition, this plan aims to improve town-gown relationships by recommending organizational-residential collaboration, community organizing among residents, and expansion of community outreach efforts.

RESIDENTIAL NEIGHBORHOODS

The UMED District has longtime stable neighborhoods interspersed with single-family and a variety of multi-family housing types. There are also two mobile home parks in the area: one of approximately 30 acres on Boniface Parkway, and a second park of over 7 acres on Baxter Road. The two mobile home parks have provided an affordable home ownership option to the community. However as these larger parcels undergo new ownership or increases to land values redevelopment should be planned for and expected.

These UMED District neighborhoods are well situated with easy access to the jobs and services located in the District, Joint Base Elmendorf Richardson, and the industrial belt south of Tudor, Midtown and Downtown, Anchorage. Numerous bike and pedestrian trails link the neighborhoods to the area's parks and schools providing access and recreational opportunities for residents.

For sale and rental housing does not stay on the market for long. The neighborhood areas were largely builtin the 70's and early 80's. Much of it during the oil boom years. At that time the cost for constructing off-site infrastructure improvements such as sidewalks, lighting, and adequate drainage were often outweighed by the high demand for housing. The result is a lack of sidewalk and pedestrian improvements in most neighborhoods. In the ensuing years the Municipality, Department of Transportation & Public Facilities, and developers have been incrementally upgrading existing right-of-ways with Municipal-code required improvements.

Complete streets with sidewalks, adequate lighting, relocated utility boxes and poles, and buffer landscaping is highly-desired. This is in support of the exceptional quality of life found in these neighborhoods as is consistent with the UMED District Design Guidelines.

Neighborhood residents expressed concern increasing traffic associated with organizational growth would impact the residential quality of their neighborhoods. The recent Piper Street improvements that include a raised intersection and a round-about are successful examples of traffic calming that could be used to mitigate increased traffic through the neighborhoods to allay resident concerns. Annually the Municipality of Anchorage develops a five-year capital improvement program with input from the neighborhood community councils.

The University Area Community Council is encouraged each spring to submit their list of capital projects such roadway safety, drainage, parks, and trail improvements to the MOA CIP program. The UMED District Plan Update is a means for realizing the Council's annual requests for improvements. Future residential development is envisioned through infill and redevelopment of under-utilized properties.

THE NATURAL ENVIRONMENT

Much of the District's appeal is traced to the wooded landscape of Chester Creek and the natural areas of the Chester Creek watershed found in the District core and throughout. This includes high value wetlands classified as A, B, or C that provide wildlife habitat and contribute to the overall health of the watershed.[15]

The natural areas include wooded areas, wetlands, a continuous creek, several lakes, and varied wildlife all set against panoramic views of the Chugach Mountains. The Chester Creek watershed system serves important biological and ecological functions and contributes to the unique character and quality of life for the District.

This natural environment also serves an important social function in the UMED District. Major parks within the UMED District include Goose Lake Park, University Lake Park, Castle Heights Park, and Folker Park. The Chester Creek Wetlands is also used seasonally with ski and walking trails that are only accessible in winter.[17]

Trails within the District include, but are not limited to: the Chester Creek Trail, Chester/Campbell Creek Trail Link, and trails within University Lake and Goose Lake Parks. Opportunities for recreation make the UMED District a desirable place to work as well as live; and this environment serves to attract students, staff, and faculty to the District. The natural environment found in the UMED District is indicated as an important contributing factor for students when choosing where to pursue a university education.

The multitude of users, however, impacts the very natural resources that draw them to the UMED. Balancing land management, allowed uses, and watershed protection presents both an opportunity and a challenge. Adjoining organizational property owners presented ongoing issues regarding off-leash dogs and the impacts that this issue poses to the many users of their trails and property. This includes children during summer school camps, on posted trails, and in interactions with wildlife.

Figure 23. Views within the UMED

Figure 24. Chester Creek

The University Lake Master planning effort will help identify ideas for future management of this important natural area.

Future growth also presents challenges to this natural setting as development continues. The desire for achieving a good balance between the District's unique combination of residential, organizational, and natural environments was clearly articulated by stakeholders throughout the development of this plan. Efforts to maximize these development and recreation opportunities, while not further degrading the watershed presents some unique challenges.

The Chester Creek Watershed Plan includes low impact development priority items for funding in Table 6.3.[18] Environmental conservation and protection is in the best interest of all stakeholders interested in the long-term development and sustainability of the UMED District. Residents within the UMED District can also participate in such efforts by maintaining their property, addressing dog and other harmful waste, volunteering to maintain lakes and creeks, and choosing alternative transportation modes of travel.

Similarly, academic organizations have an opportunity as educators of future generations to encourage stewardship of our finite resources through future development decisions, and educational programming that provides student participation and support. Residential and organizational growth and natural resource protection will continue to co-exist through unique place-making projects, as funding and programming of natural resource strategies and conservation are found, that help protect our wildlife diversity, and support our growing economy.

The UMED District Plan acknowledges and supports the many important functional plans that guide development in the Anchorage Bowl, including the Chester Creek Watershed Plan. The acquisition of conservation easements was proposed in the 2003 U-MED Plan. However, a conservation easement program was not established or funded. This UMED Plan Update supports a conservation easement program with funding from public, private, and land conservation entities such as the Great Land Trust. The program would be established to give private land owners the opportunity to voluntarily identify portions of their property for conservation, watershed protection, and wildlife habitat preservation purposes throughout the Chester Creek Watershed.

Recently, APU mapped an area of "B" wetlands and known moose habitat for a potential conservation easement. APU has communicated their intent to offer the property for protection as an easement .[20] Purchase of the APU property by a conservation group or public/private partnership would result in important wildlife habitat protection and management.

Figure 25. Paved trails within the UMED

Figure 26. Unpaved trails within the UMED

TRAILS ON PUBLIC AND PRIVATE LAND

A portion of MOA's world-class trail system is located along Campbell Creek and the Lanie Fleischer Chester Creek trail. These public trails connect with a system of sidewalks and multi-use pathways, paved and dirt multi-use trails located along roadways, through the parks and wooded areas. Much of this system is located on MOA rights-of way. However, trail users can make connections to the private trails on several of the organizational campuses including PAMC, UAA, ANTHC, and APU. A high value is placed on the recreation opportunities that the public and private trails provide.

There is a challenge for the community as trails on organizational properties are relocated through master plan development. For that reason trails located on private property including the four organizations mentioned above were not considered as part of the multi-modal public trail system for planning purposes. The organizations will continue to provide updated trails maps as development occurs or changes are made to their private trail systems.

TRANSPORTATION SYSTEM

The 2003 UMED Plan, and Northern Access Reconnaissance Study Report recommended Transportation Demand Management (TDM) strategies, transit service increases, and connector street and trail improvements to facilitate an increase the availability and use of alternative modes of travel in and to the UMED District.

Multi-modal transportation elements including roadway improvements, parking management, increased transit and shuttle services, along with neighborhood pedestrian access are also important elements of this plan.

The UMED District is a hub for commuters. Therefore, financially feasible and pedestrian friendly transportation systems are desired by users and residents of the UMED District. The ability to fund and maintain a multi-modal transportation system in the UMED will present opportunities and challenges well into the future as the costs of providing facility improvements, transportation alternatives, and maintenance and operations costs rise.

The MOA must recognize the UMED District as a major provider of employment, and therefore increase the percentage of funding spent within the District on multi-modal transportation system improvements. This funding could be obtained in the AMATS project approval process. This desire was expressed throughout the public outreach process.

Figure 27. Roads within the UMED

Figure 28. Bus stops within the UMED

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3. VISION ELEMENTS

3.1 Supporting Organizational Missions

3.2 Quality of Life

3.3 Quality of the Built Environment

3.4 Transportation and Mobility

3.5 Community & Partnerships

3.6 Natural Resources

3.7 Economic Sustainability

3.8 Growth & Change

VISION ELEMENTS

CREATING THE VISION

Several primary themes became evident during the planning process. These themes were then translated into eight inter-related, and complementary Vision Elements. The Vision Elements are intended to provide the foundation for a continued prosperous and successful future in the UMED District, while recognizing the unique attributes that make this area so special.

The Vision Elements serve as central concepts around which to organize the various goals and recommendations, while also addressing the planning concerns of the Municipality of Anchorage, the UMED organizations, and UMED residents.

The eight Vision Elements are:

1. Supporting Organizational Missions
2. Quality of Life
3. Quality of the Built Environment
4. Transportation and Mobility
5. Community & Partnerships
6. Natural Resources
7. Economic Sustainability
8. Growth & Change

The Vision Elements are interrelated—brought together to beneficially shape and address a variety of issues including land use and development, communication, transportation, economic sustainability, partnerships, and natural resource protection. To some extent, the Vision Elements may rely on the economic viability of the district. The organization of these distinct Vision Elements allows for the creation of focused and concrete goals and recommendations that address the eight major themes.

To that end, each Vision Element is comprised of an overarching concept statement, a series of goals and recommendations and/or implementation items for achieving the goal.

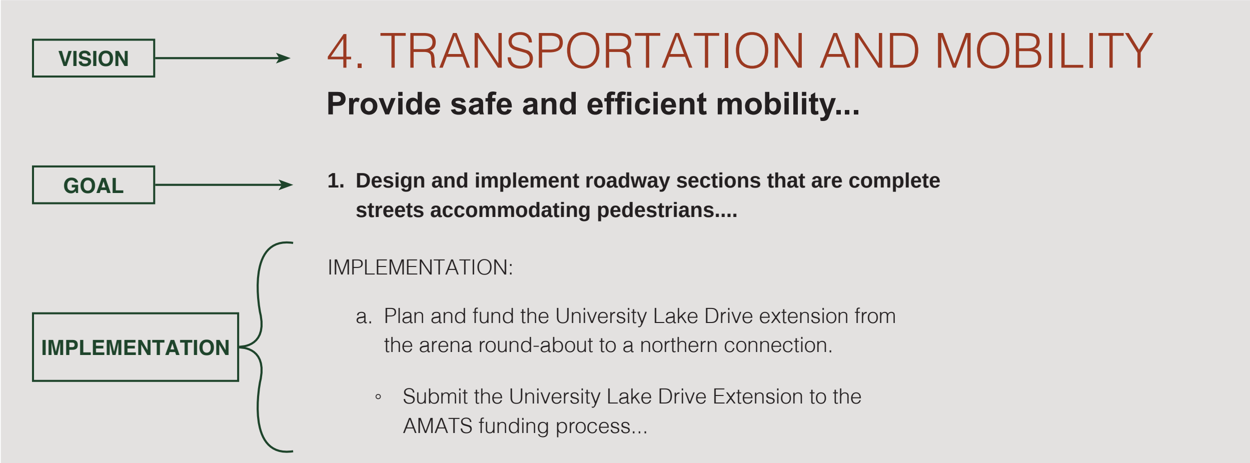


Figure 29. Hierarchy of the Vision Elements

Throughout the text there are references to Case Studies and Examples, and cross-references to related visions when there is thematic or conceptual overlap.

The Implementation Table found in Chapter 4 takes the Vision Elements, goals and recommendations and formats these items into table format. The table identifies a timeframe for achieving these recommendations, participating partners, and potential funding or resources to carry out the recommendations.

3.1 SUPPORTING ORGANIZATIONAL MISSIONS

The organizations that comprise the UMED District provide services that are unique and important to the entire state of Alaska. This plan recognizes that the District would not be what it is without these organizations and that support of their missions provides benefits to all.

BACKGROUND

The UMED District is unique in Alaska, containing a diversity of neighborhoods, commercial areas, and organizational development that does not exist elsewhere in the State. Residential neighborhoods are located in the eastern and southern portions of the District. The organizations are clustered in the west. These organizations are non-profit entities that contribute significantly to the economy of Anchorage. The majority serve educational and medical purposes. Other organizations include providers of youth detention, training, social services, religious organizations, and Alaska Native and American Indian people support organizations. A concise description of the UMED organizations, including plans for future growth is found in the “UMED District Plan Supporting Documents.”

The UMED District is the second largest employment center in the State, with 13,700 jobs, accounting for 9% of all jobs in the Municipality of Anchorage. Almost 80% of these jobs are in the education and health sectors. The organizations have created a thriving nexus of economic growth, education, research, and health services. The momentum of this success has spurred an environment in which rapid growth is both needed and feasible.

Expanding services, enlarging facilities, housing, and improving transportation are a few of the many organizational challenges in light of funding prospects and available land. Continued success will include coordinated efforts, maximized potential and open lines of communication between all interested parties. Dialogue with the local community is especially important and can be achieved through the community councils, stakeholder meetings, and the UMED Steering Team.

The goals listed in this Vision Element reinforce the importance of enabling organizational growth, continued collaboration and partnerships, to help shape the future and recognize a holistic approach to development. The goals under this Vision Element also build on concepts found in the UMED organizational master plans. The purpose of acknowledging existing master plans is to encourage a comprehensive planning strategy and collaboration that coordinates the efforts of the organizations with input from local residents, the Municipality of Anchorage, and other governing agencies.

Collaborative efforts abound throughout the UMED between the Southcentral Foundation (SCF) and the Alaska Native Tribal Health Consortium (ANTHC), Providence Alaska Medical Center and ANTHC, and UAA and APU. These efforts present a history of coordinated service efforts that started early on.

ORGANIZATIONS WITHIN THE UMED DISTRICT:

- Alaska Native Tribal Health Consortium (ANTHC)
- Alaska Pacific University (APU)
- Alaska Psychiatric Institute (API)
- Anchorage School District (ASD)
- McLaughlin Youth Center (MYC)
- Providence Alaska Medical Center (PAMC)
- Southcentral Foundation (SCF)
- Trust Land Office (TLO)
- University of Alaska Anchorage (UAA)

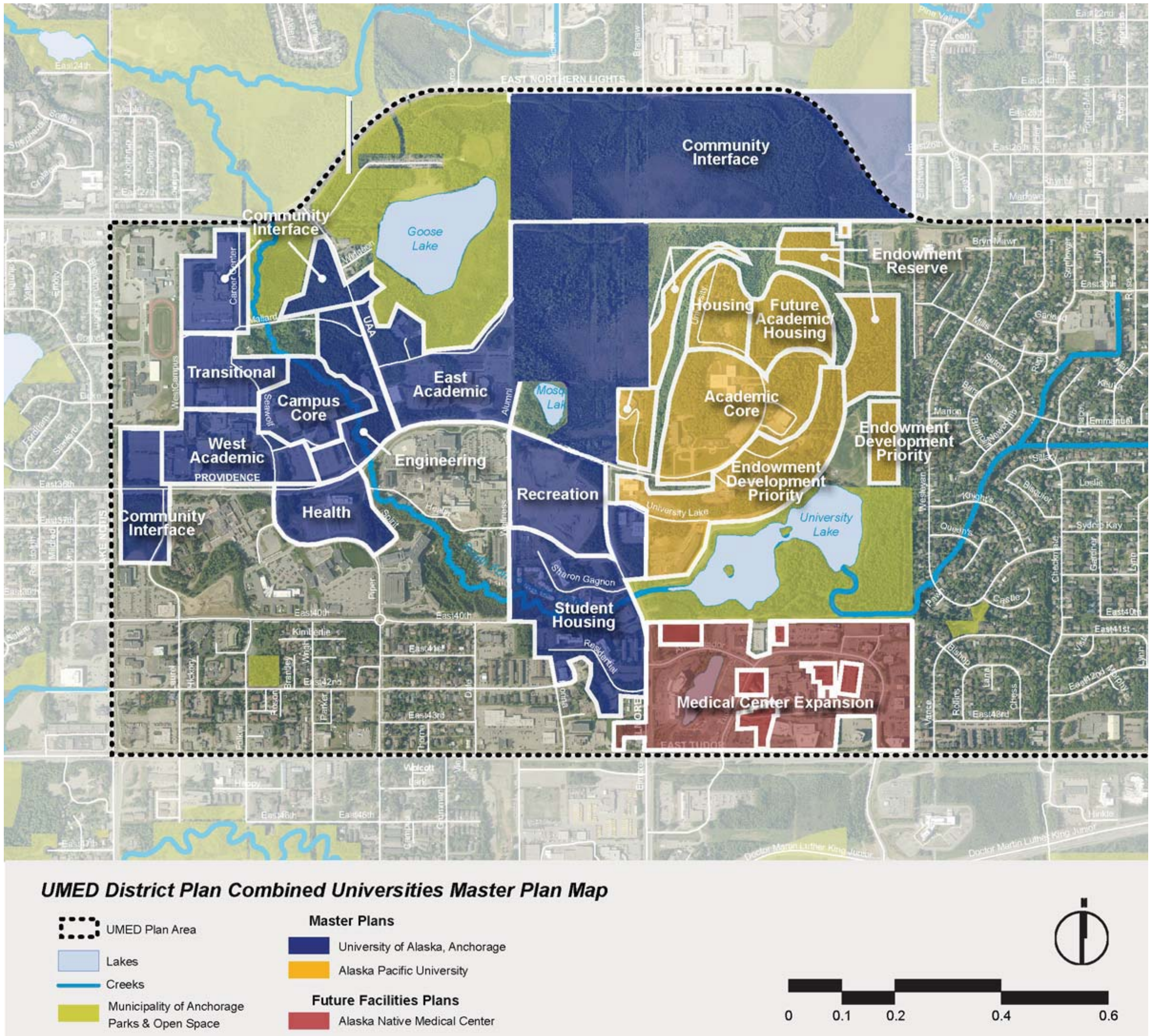


Figure 30. Combined universities master plan map

This collaborative process began with the adoption of a comprehensive approach to development and shared growth initiated in the early 1980's with the Goose Lake Area Plan and has progressed as the area evolved and became the UMED District. A cooperative approach can create efficiencies and economies of scale that can benefit everyone. For example, the potential for pooling real estate assets could enable more flexible development mechanisms such as public-private partnerships which can plan and finance the desired mixed-use retail, commercial, and housing in the District.

This Vision Element also focuses on the many important attributes needed to support the long-term growth and change that will happen in the UMED District through supporting, listening, educating, modifying, and establishing a regular plan update process. Supporting growth includes acknowledging the characteristics that make the UMED District area unique to our community. Listening provides opportunities for early and ongoing community input.

Educating the UMED organizations and stakeholders will provide them with the tools for development and management of their properties. There may be changes required to policies, codes, and guidelines. Lastly, it is the desire of the community to establish a regular 5-year timeline for updates to the UMED District plan. This timeline is anticipated and accepted as the norm for this planning area by our community. This Vision Element is also meant to inform the different supportive elements for the UMED organizations and to ensure the stakeholders that their ideas for this thriving UMED District are heard and incorporated.

GOALS

1. Identify a comprehensive land use strategy for the entire District to allow for institutional growth and ancillary uses that support organizational missions

IMPLEMENTATION:

a. Fund and complete corridor studies adjacent to the District in key locations to allow for institutional growth and ancillary uses that support organizational missions.

When completing future studies consider the following:

- Consider new land use designations in key locations to allow for institutional growth and ancillary uses that support the organizational missions.
- Seek to implement and fund public/private partnerships on priority projects to provide housing, commercial, and retail space within the UMED.
- Foster commercial and retail development that withstands market realities and responds to the desires and recommendations of UMED management, students, staff, and nearby residents.

Figure 31. View of the northwest portion of the UMED, looking southwest

2. **Shape future growth in accordance with the distinct values expressed in this plan.**

IMPLEMENTATION:

a. Encourage the UMED organizations to seek Assembly approval of adopted master plans.

The following may be considered as the organizations complete and implement their master plans:

- Create a pedestrian friendly environment that prioritizes non-vehicular modes of transportation. *See TDM Case Study.*
- Encourage the development of a UMED Village to accommodate the needs of a growing population and foster the sense of community found in the UMED. *See Mixed Use Development Case Study.*
- Incentivize new housing on private and organizational property in the planning area.
- Ensure that transportation and infrastructure projects enhance rather than detract from the District character.
- Encourage the redevelopment of existing commercial areas to provide goods and services that serve the needs of residents, employees, and students.
- Encourage the individual organizations to manage project development with a broader campus and district-wide approach, in lieu of a project-by-project or single-campus basis, in order to reinforce a holistic UMED District environment.

3. **Develop community building opportunities for the public to better understand the operational challenges and development missions of the UMED organizations.**

IMPLEMENTATION:

a. Hold regular UMED District Steering Team meetings to discuss issues of mutual interest that could include housing, employment, and provide progress reports in these areas. The UMED Steering Team has committed to continue meeting on a quarterly basis to help fulfill the recommendation.

The Community Engagement process may include the following:

- Listen to and incorporate residential neighborhood and community council input early in the process.
- Use a community engagement process to allow all stakeholders, including District employees, students, area residents, and community councils to receive ideas and provide input.
- Provide greater transparency by facilitating public online access to the Municipality of Anchorage's data.

4. **Educate and provide UMED organizations and stakeholders with guidance on how to apply District development standards including Title 21 and specifically Chapter 21.03.110-Institutional Master Planning.**

IMPLEMENTATION:

a. Conduct annual or bi-annual public education meetings on Title 21 updates to ensure understanding and use of the code.

3.2 QUALITY OF LIFE

Maintain and improve the characteristics that make the plan area an enjoyable place to live, work, and play—especially walk-ability, connection to nature and open space, recreation, and the sense of District identity.

BACKGROUND

Quality of Life encompasses overall wellbeing and happiness. It is an intangible quality that is not easily measured and relates to many planning values and factors. Among the numerous factors it encompasses, Quality of Life includes the desire for security and peace of mind, health, comfort, cleanliness, recreation, relaxation, and access to valued amenities. It is influenced by every other Vision element of this plan, but for the purpose of creating concrete recommendations, the goals of this Vision element have been limited to recreation within a natural setting, amenities available in that natural setting, establishing a district-wide identity, and the feasibility of new development with a programmed lively public space.

RECREATION WITHIN A NATURAL SETTING

The natural setting and spectacular views are key ingredients that contribute to the quality of life in the UMED District. The positive identity of each organizational campus relies to some degree on its natural setting, which provides outdoor recreational opportunities and respite for students and staff, medical patients, and residents. It is one of the few places in Anchorage that has an abundance of trails located in a natural setting with wildlife and year-round views that provide a sense of peacefulness. In the organizational core, the natural areas, parks, trail corridors and Chester Creek provide unifying features within the UMED District.

Maintaining public access to, and continued use of, these elements found both on public and private property presented for lively discussions during the public process. Parks, trails and the associated facilities are maintained for the benefit of all users on MOA-owned and managed property and right-of-way.

The distinction is made in this plan between MOA-owned and organization-owned lands containing trails because of the potential for future development on APU and UAA property where trails may currently be located. The organizational master plans clearly delineate existing trail corridors as locations where future development may occur. While there is a large network of trails on APU and UAA property, the discussion on the management and funding of trails in this plan will be directed to those trails and trail facilities that the MOA manages and maintains.

The planning process identified significant upgrade and management issues at University and Goose Lakes, and along the trail corridors that access both lakes. These issues such as dog control, trail maintenance, safety, and accessibility, may change in the future with a better informed public, adopted park management plans and dedicated funding for conservation, operation, and maintenance.

Figure 32. Cross-country skiing in the UMED

Figure 33. University Lake

DISTRICT-WIDE IDENTITY

Input from the public engagement process supported the need for the acknowledgment of the UMED District as a special place within Anchorage. Many of the organizations within the core area have gateway features that identify their district location. Piper Road also has a gateway feature into the core area. Creating a unified identity for the UMED to be used by perimeter businesses, special events, and for marketing UMED services is proposed with this Vision.

NEW MIXED-USE DEVELOPMENT

The UMED community has expressed a desire for new mixed-use development that would provide both retail and housing to create a focal gathering point to reinforce the District's unique sense of place. A mixed-use development in the District—a UMED Village—has been a goal for many years and was addressed in the 2003 UMED Framework Master Plan. In light of the continued desire and importance of such a project, it is emphasized again in this plan. Recommendations for the UMED Village are also found in Economic Sustainability with focus on the economic aspects and potential benefits of a village development.

UMED VILLAGE CONCEPT

The UMED Village is envisioned to be a mixed-use commercial and residential area that will meet housing and retail demand and reduce reliance on cars. Moreover, the Village is seen as a vibrant gathering place for the UMED community. The District's unique combination of organizations, residences, commerce, and nature give it the potential to be an exciting and interesting destination, and the UMED Village will be a point for galvanizing these elements, where the District's unique sense of place and identity can be materialized and experienced.

The UMED Village will also bolster the competitiveness of the universities within the District. Campus life is critical to attracting students and staff. If placed strategically within walking distance of UAA, APU, and the Alaska Airlines Arena, the District's students, staff, and visitors will be able to contribute to the success of retail, entertainment, food, and beverage tenants within the Village and reduce vehicle trips. The proximity of the Village and these organizations also ensures efficient use of resources. The UMED Village will be a catalyst for investment in an environment where private sector companies can collaborate with the UMED organizations to spur workforce development, education, business start-ups and may encourage nearby properties to redevelop.

A UMED Village was considered economically viable through the Strategic Economics Study published during this planning process. According to the Commercial, Housing, & Market Conditions found in Chapter 8 of the Supporting Documents, the UMED District has a demand for centralized commercial space and the development of more housing. Although there is over 150,000 square feet of retail existing within the District, there is room for an additional 35,000 square feet. In addition, the location of existing retail is not accessible on foot. Existing retail businesses are dispersed on the outskirts of the UMED District and most of it is not in a location that is easily accessible by the District's large student and employee population. For example, residents and workers in the center of the District are over two miles from the nearest supermarket and thus do not have access to fresh food and groceries. The development of the UMED Village is an opportunity to create a pedestrian-oriented and accessible commercial center.

The UMED Village can provide housing for the universities and the greater community. The market analysis estimates demand for between 750 and 1,125 residential units in the UMED District over the next 20 years. Compact housing types such as townhouses and apartments are more sustainable and create walkable neighborhoods, but this housing type is not yet financially feasible for private developers due to high land costs and high construction costs per the 2012 Anchorage Housing Market Analysis. However, there will be an increasing demand for compact housing due to Anchorage's growing population, land scarcity, and the projected lack of real income growth, all of which will drive people to seek more economical and sustainable housing.

The section entitled Case Study: Mixed-Use Development, in the Resources chapter, analyzes the financial mechanisms for creating mixed-use developments in three university towns. Public-private partnerships and private development were both used and cross organizational collaboration was critical. On the part of the Municipality, appropriate development standards, land use plans, and contributing public resources where necessary were also important.

UMED VILLAGE

The UMED Village will serve as an economic engine and anchor for the District. Moreover, from a quality of life perspective, the UMED Village would become a vibrant core used by students, staff, residents, and visitors.

A targeted real estate and cost-benefit analysis completed by Strategic Economics determined the economic viability of the UMED Village. The UMED Village is a viable and would be an active successful commercial and residential center. A public-private partnership along with potential development incentives are realistic means to finance the UMED Village.

A market analysis focused on the UMED District core was also conducted by Strategic Economics to examine mechanisms necessary to realize mixed-use development. Case studies were also conducted relevant to the Anchorage area. The market analysis is included in the Supporting Documents, Chapter 8: Commercial, Housing & Market Conditions. Both of these efforts were used to inform the recommendations within this Vision. The case studies are included in the Case Studies Appendix of this Plan.

Alaska Pacific University is in the process of completing the APU Campus Land Use Sustainability Study for Campus Endowment Properties. Through this study, APU leadership found that there is potential for development along the Northern Access road project that maybe available in the future for this type of project. APU therefore supports the inclusion of the "commercial village" language in this Plan.[31] Ultimately the market will direct the location for the UMED Village. Specific locations will not be mapped with this plan.

POTENTIAL PARTNERSHIPS

The UMED Steering Team received a presentation and held an ensuing discussion on parking development with the Director of the Anchorage Community Development Authority (ACDA) at the April 2014 Steering Team Meeting. ACDA is a Department within the Municipality of Anchorage.

ACDA brings together resources and partners to facilitate development and redevelopment opportunities in Anchorage, Alaska. ACDA will act as a catalyst for—and investor in projects that help implement the economic and community development goals of the Anchorage community as expressed in our community plans and initiatives.[32] At the Steering Team meeting the ACDA Director discussed the public/private partnership option for long-term development projects that are beneficial to the community. There is potential for ACDA to partner with one or more of the organizations within the UMED District on projects such as a UMED Village.

ALASKA HOUSING FINANCE CORPORATION

House Bill 50, passed in 2013, authorizes the Alaska Housing Finance Corporation to fund commercial uses in multi-unit residential developments. Supporters recognize the role of mixed-use developments in creating vibrant neighborhoods and ensuring walkability to goods and services.[33]

GOALS

1. **Consider the development of a UMED District Marketing and Branding Plan to create a cohesive identity and sense of place for the perimeter areas of the District.** *See Positive Town-Gown Relationships Example for models for social and community services in university districts.*

IMPLEMENTATION:

   a. Fund and develop a UMED Marketing and Branding Plan for areas without a marketing and branding plan.

2. **Plan for a pedestrian-oriented UMED Village to serve as the identifiable heart of the District to be a go-to destination for the District to serve the needs of residents, students, staff, and visitors.** *See Mixed-Use Development Case Study for models for the UMED Village.*

IMPLEMENTATION:

   a. Fund and prepare a conceptual plan for the UMED Village

Consider the following when planning for the UMED Village:

- Provide multi-use spaces that encourage use by a broad local constituency.
- Confirm real estate market conditions to clarify costs and benefits of the UMED Village in order to complete a pro forma and feasibility report to support investment and development of the UMED Village. This may include appropriate implementation strategies and potential locations within or on the edge of the District.
- Develop uses and programming that provide for activity at different times of the day.
- Consider a grocery store and restaurants in the UMED Village.
- Encourage indoor-outdoor interactions such as outdoor restaurant seating areas.
- Provide all-weather paving materials and amenities.

Figure 34. Swimming at Goose Lake

3.3 QUALITY OF THE BUILT ENVIRONMENT

Promote a built environment that is responsive to the natural setting and views, complements its neighbors and is environmentally sustainable.

BACKGROUND

The Quality of the Built Environment vision supports four development aspects of the UMED District; the exceptional development found throughout the UMED District, a unified identity for the District perimeter, encouragement of infill and high-density development, and implementation of sustainable development and operational practices including a cogeneration pilot project.

UMED DISTRICT DESIGN GUIDELINES

The UMED District built environment includes award-winning architecture complemented by the surrounding natural features. This includes buildings such as the ANSEP Building, the UAA/APU Consortium Library, Conoco Phillips Integrated Science Building, and the Alaska Airlines Center on UAA campus, the Atwood Center and Grant Hall at APU, and the ANMC Medical Center.

Buildings and landscapes throughout the UMED District celebrate Alaska's natural beauty, many cultures, and provide state-of-the-art teaching, research, and medical management opportunities. From steel pile construction to protect an underground stream to Alaska Native art located throughout campus areas, the UMED District abounds in context sensitive design that respects the surrounding environment and enhances the visitor, student, employee and resident experience.

The updated UMED District design guidelines will continue to shape development and solidify the District's identity. These design guidelines consider buildings, signage, lighting, noise, sunlight, views, compatible uses, roadways, trails and pedestrian paths from the perimeter to the core of the District. UMED District design guidelines were first adopted in the 2003 U-MED Universities and Medical District Framework Plan.

The 2003 design guidelines were intended to be flexible and invite innovation and integrity consistent with the overall Vision of the UMED District. The 2003 design guidelines are reaffirmed and amended in this Vision element to address the following topical items: Public Infrastructure, District Identity, District Development, District Open Space, District Access,Circulation and Parking. These guidelines should be addressed by master planning and major projects built and envisioned in the UMED District.

Figure 35. The ANSEP Building

UMED DISTRICT IDENTITY

The perimeter of the District provides the first impression. This makes it desirable to instill a clear sense of place as people approach and enter the UMED District. Therefore a UMED District identity and way finding plan is proposed to provide unifying elements located on publicly-owned and maintained roadways and trails leading into the District. This is an opportunity to celebrate Alaska's premier university and medical district through context-sensitive signage, street furnishings, and creative and thoughtful use of color and materials.

INCREASED DENSITY

Sustainable development must be a central value shaping development throughout Anchorage and within the UMED District. The pursuit of higher density development is a means to provide increased housing, medical, commercial and retail spaces in compact locations that will help preserve natural areas, trails, and views to the greatest extent possible. Compact new development will help maintain the natural open spaces, and also provide efficiency in the provision of transit services, capital infrastructure, and greater available services to those who live, work, and study in the District.

Title 21 development code supports increased density in several ways; small lot and infill development, reduced parking requirements on a case-by-case basis, mixed-use development, and zoning amendments. The UMED District Land Use Plan Map found in the Growth & Change vision depicts potential areas for higher density development. There may be occasions where amendments to code and policies may be desired.

This vision element supports the analysis of regulatory barriers to desired development in the UMED and seeks to create partnerships to identify solutions and resolve issues that may arise.

2013 UMED DISTRICT COGENERATION OPPORTUNITIES

The 2013 UMED District Plan Cogeneration Report (2013 Cogen Report) specifically examines the feasibility of combined heat and power in the District. Cogeneration (CHP) delivers two forms of energy; electricity and hot/cold water from a single fuel source. CHP provides substantial cost-efficiencies and substantial reductions in green house gas emissions. The 2013 Cogen Report found that cogeneration through the use of micro-turbines is a feasible cost-effective solution for Municipal Light & Power (ML&P) and the UMED organizations to pursue. The 2013 Cogen Report includes a cost analysis, overview of tariff restrictions, and clearly portrays the methodology for conversion to the micro turbine platform using existing utility and building infrastructure. The resultant information from the 2013 Cogen Report is timely and appropriate as the organizations experience budget cut-backs, which force more cost-effective ways of doing business.

A Cogen Pilot Project is recommended for the UMED District. There are many details to consider in this pilot project including the ML&P tariff agreement.

The Executive Summary from 2013 Cogeneration Report is included in the appendix. The full report is available at www.muni.org/departments/ocpd/planning/publications/Pages/default.aspx. Also see: Neighborhoods, Community Design & Built Form chapter in Supporting Documents.

Figure 37. APU's Atwood Center Historic American Buildings Survey photo

Figure 36. Higher density housing example adjacent to the UMED

TITLE 21

Many of the goals and recommendations in this Vision Element build on code standards that outline the path toward contextual district development. Title 21, chapter 21.07 Development and Design Standards focuses on issues that are reinforced throughout the Visions: protecting natural resources and open space, planting more landscaping, creating a unique sense of place through quality design, and physically connecting places through multi-modal transportation networks. Quality of the Built Environment and the other Visions highlight and reinforce elements of Title 21 that are especially relevant to the UMED District.

GOALS

1. **Support development of an environmentally sustainable district through energy-efficient and cost-effective solutions in buildings, infrastructure, and other district programs.**

IMPLEMENTATION:

a. Encourage implementation of the recommendations from the 2013 UMED Co-Generation Feasibility Study through a UMED pilot project.

b. Apply the UMED District Design Guidelines to proposed major commercial, residential, and organizational development to ensure a cohesive, context sensitive development setting in the UMED District.

2. **Develop a UMED District identity to unite the publicly-owned rights-of-way at primary entrances to the UMED (streetscape improvements, signage & way finding, colors and materials, outdoor furniture and fixtures, interpretive information, etc.).**

IMPLEMENTATION:

a. Fund and complete UMED District way-finding plan.

Considerations: It should be noted that the focus of the UMED District Way Finding Plan will be on MOA-owned rights-of-way.

3. **Analyze regulatory barriers to achieving desired development within the UMED District core and create partnerships to identify and resolve solutions to such regulatory barriers.**

IMPLEMENTATION:

a. Work with stakeholders, design firms, engineers and contractors to identify and implement ways of streamlining review and approval processes.

Considerations may include the following:

- Policies to allow administrative approval of cross boundary activities such as temporary construction staging within the PLI zone.
- Consideration for exemptions to height, maximum floor area ratios and setbacks under clearly defined conditions in approved district planning projects.
- Fund and implement the Electronic Plan Review to facilitate project delivery by developers.
- Changes to Municipal code, policies, and regulations must be carefully considered and weighed against the goals of the entire community.

UMED DISTRICT DESIGN GUIDELINES

The Design Guidelines from the 2003 U-MED Plan are updated in this plan. These guidelines ensure the vision and values important to future development, as well as the community are addressed as organizational, private and other public investments occur in the District. Major developments are those projects that require major site plan review, conditional use approval, or master planning as defined in Title 21.

PUBLIC INFRASTRUCTURE

Ensure thoughtful direction and timing of public investments in infrastructure to leverage private investments in ways that will benefit the District as a whole.

- Sequence implementation of District public improvements to:
    - Stimulate private development,
    - Enhance the existing parks, natural areas, and trail system, and
    - Address immediate and long-range circulation needs.
- Maximize opportunities for shared use and funding of infrastructure projects throughout the District.

ORGANIZATIONAL AND PRIVATE DEVELOPMENT

This plan provides a policy framework that will ensure coordination of all improvements with one another and with the plans for adjacent properties.

- Design and sequence development so that the natural qualities of the district are protected. All development should be consistent with the Plan's vision, goals, and land use designations.
- Address conservation of historic buildings through master plan implementation.
- Encourage infill development and redevelopment of under-utilized property such as surface parking lots or low-density parcels.
- Consider rain gardens, green roofs and other best management practices in new commercial and residential building.
- Work to reduce the amount of impervious surface resulting from all development in the UMED District area including the UMED core, neighborhoods, and commercial perimeter to protect watershed health.
- Enable increased height and/or small lot development in select areas.
- Encourage the redevelopment of existing commercial areas to provide goods and services that serve the needs of residents, employees, and students.
- Pursue incentives for new housing on private and organizational property.

GATEWAYS

Acknowledge, through design and signage, the points of entry to the District and to institutions within it.

- Treat Bragaw Street, UAA Drive, Elmore Road, and Providence Drive as principal gateways into the District.
- Treat Tudor Centre, Providence East, Seawolf Drive, Dale Street, Piper Street, Florina Street, Wright Street, Cornell Court, E. 40th Avenue, E. 42nd Avenue, and MLK Learning Center Drive as entrances to campuses and other properties.

ENTRANCE AND ORIENTATION

Simplify way-finding by clearly identifying major destinations throughout the District.

- Provide each campus entry with a permanent monument and landscape treatment appropriate to its context.
- Coordinate standards for lighting, street furnishings and signage on public rights-of-way throughout the District to create a consistent and understandable circulation system.
- Extend direction-finding signage to trails where appropriate.

MIX AND ARRANGEMENT OF USES

Reduce the need for vehicular trips by encouraging service, retail and other support functions close to places of work, residence and study in the District.

- Encourage a mix of uses within blocks and, where feasible, within buildings.
- Public attractions should be located so that public access and activity do not disrupt every day users of the District.
- Attractions should be designed to complement the natural setting of the District and should be compatible with adjacent uses.
- Expand the local street and pedestrian circulation systems throughout the District to accommodate direct access between facilities.
- Incentivize new housing on private and institutional property in the planning area.

BUILDING MASS

Configure each building to be compatible in scale with adjacent natural and built features.

- Design buildings so that their apparent bulk does not overwhelm the size and character of nearby buildings, parks, natural areas, and public trails.
- Protect solar access to significant public open spaces by limiting the height of buildings to the south.
- Avoid features such as large blank walls that increase the apparent bulk of a building.
- Fund and implement a special study to identify properties that would qualify for higher densities, increased building heights and/or small lot sized development.
- Enable increased height and/or smaller lot development in select areas.

BUILDING ORIENTATION

Orient buildings to face streets and other public spaces and to conserve energy.

- Encourage active ground floor uses along pedestrian routes.
- Orient buildings and related structures to maximize shared views.
- Provide balconies, terraces, lobbies and entrances facing parks, plazas and special streets.
- Provide links from plazas and courtyards to major open spaces.
- Face doors and windows towards public open spaces. Avoid turning the back of any development on public open space.
- Configure windows to capitalize on natural light and avoid solar gain in summer.
- Coordinate building design with existing trees and other natural features to provide shelter from prevailing winds.
- Orient buildings to create favorable micro-climates for new and existing landscape, and to protect building entrances and usable outdoor spaces.

BUILDING ARTICULATION

Reconcile the need for improved local access between campuses and support facilities with the established character of District development.

- Site and articulate new campus buildings to reinforce the center of each campus as a walkable environment.
- In residential portions of the District, maintain a sense of traditional blocks, street walls and intersections within the established street system.
- Avoid development of remote facilities that would subdivide natural areas.

PUBLIC ART

Consider art in public spaces.

- Integrate public art into the development projects.
- Use regional and local themes in selecting public art.
- Scrutinize the suitability of art objects, especially memorials, introduced to public spaces for their possible influence on future improvements.

MATERIALS AND SIGNAGE

Set a precedent for future development with the quality of signage and of conspicuous building materials. It is important that consistent, high quality be maintained.

- Use building materials that suggest permanence and dignity and that are appropriate for Alaska.
- Develop specific guidelines for each institution and the neighborhood development (commercial and residential). For non-institutional development, these may take the form of Covenants, Conditions and Restrictions [CC&Rs].

HIERARCHY OF OPEN SPACE AND NATURAL AREAS

A full range of open space types can be found in the District. The primary value of some natural space is as undisturbed natural habitat or natural area. At the other extreme are open space areas designed and built for active recreation. The District is capable of meeting both of these needs.

- Provide passive and active public open space.
- Consider the relationships in the sense of organizational missions, public access, size, habitat uses, and other specialized uses such as Nordic skiing and snowshoeing.
- Connect public open space with multi-use pathways consistent with MOA trail plans connecting adjacent neighborhoods and the regional trail system.
- Integrate private open space with the public access system to the extent that compatibility with other private uses permits.

LANDSCAPE BUFFERS

Protect natural areas from inappropriate access, from 'visual pollution' such as an open view of a parking lot, and from untreated runoff from developed areas. Natural areas, especially those designated as Preservation Open Space, merit special protection, which can be provided in part by planted buffers.

- Favor use of native plant materials, but ensure that view corridors will not be obstructed when trees and shrubs approach maturity.
- Conserve and integrate established native plants in the disturbed areas near development.

NATIVE LANDSCAPES

Reinforce the natural landscape and ecology of the District by use of appropriate materials and techniques.

- Emphasize native plantings in naturalistic patterns.
- Coordinate native plantings adjacent to habitat corridors with mixed plantings in associated streets and open spaces.
- Protect steep slopes from erosion.
- Protect and restore existing wetlands.
- Maintain campus and neighborhood safety and security through regular selective trimming or removal of trees and shrubs. Avoid use of tall, dense plantings that at maturity obstruct sight lines.
- Use native plantings to protect nesting areas and other sensitive habitat from human access.

HABITAT PROTECTION

Protect surviving native flora and fauna in the District and encourage their continued presence.

- Maintain existing wildlife corridor linkage among habitat areas to the greatest extent possible.
- Restrict pedestrian access to sensitive areas.
- Minimize the widths of disturbance zones when constructing trails.
- Identify and protect especially vulnerable plant and animal habitats.

RECREATIONAL FACILITIES (TRAILS, BEACHES AND SPORTS FIELDS)

Integrate recreational facilities with the circulation system to provide access for all who live or work in the District.

- Complete the system of local streets and public trails to interconnect the other primary public open spaces.
- Vary the spatial experience along public trails in response to orientation and to natural and built features.
- Configure and landscape the trails and contiguous private open spaces to create a series of connected yet discrete open spaces, each related to buildings and capitalizing on views.
- Celebrate significant points of connection of the trails.
- Maintain the integrity of ski trails over or under vehicular streets.
- Connect local public trails to the regional trail system.

ROADWAYS

Design the circulation system to serve all users. In the past, some streets have been built to meet only vehicular needs, conflicting directly with the principles of the current plan.

- Design every street to accommodate automobiles, transit, bicycles and pedestrians equitably.
- Design streets to encourage driving at appropriate speeds, making appropriate use of traffic calming measures.
- Design roads and driveways to conform with the existing topography, minimizing cutting and filling, yet adhering as closely as possible to transit gradient and turning parameters.
- Provide direct connections to the public trail system.
- Accommodate the needs of transit to serve major destinations in the District effectively.
- Implement the roadway cross-sections.

TRANSPORTATION MANAGEMENT

Manage vehicular movements in the District to meet access needs without compromising uses or environmental quality.

- Promote the use of transit, walking, bicycling and skiing for circulation to and within the District.
- Maintain equity between modes within streets and intersections throughout the District.
- Manage parking on campuses to encourage carpooling.
- Control street intersections to regulate vehicular flows to acceptable levels.
- Minimize conflicts between vehicles and pedestrians by introducing controls at busy crossing points.

PUBLIC TRANSIT

Promote public transit as a viable mode of travel within and beyond the District.

- Provide transit routes and stops that give public transit priority over other vehicles.
- Provide convenient transit stops that are close to destinations and include adequate seating, shelter and other furnishings as appropriate.

PEDESTRIAN AND BICYCLE ACCESS

Expand the circulation system to provide safe and convenient access on foot and bicycle between all major destinations within and adjacent to the District.

- Seek opportunities to establish pedestrian connections between the campus and the adjacent neighborhoods.
- Design streets in the adjacent neighborhood that encourage pedestrian use.
- Direct pedestrian and bicycle traffic to street crossings with adequate sight distances and appropriate traffic controls.
- Provide sidewalks on both sides of every street.
- Identify and respond to the needs on each sidewalk for pedestrian through-zone width, building frontage zone, furnishing zone, curb and loading zone dimensions.

- Connect all streets to others at both ends to create a flexible grid. Similarly, connect all sidewalks, trails and walkways to one another or to building entrances
- Provide safe off-street, short-cut pedestrian connections where possible.

SERVICE ACCESS

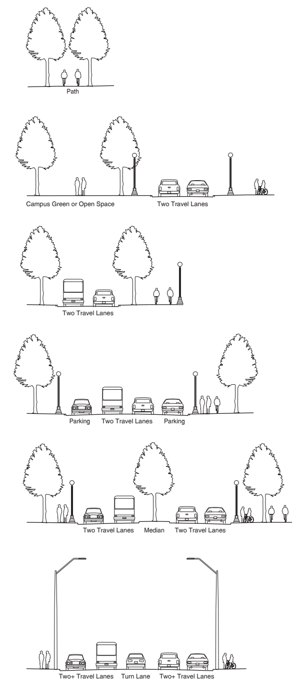
Provide access for service vehicles that is discrete yet efficient.

- Locate service, drop-off and pick-up areas away from corners and major building entries, so that they minimize disruption to vehicular and pedestrian traffic patterns.
- Discourage loading, service and parking access from primary pedestrian streets and public trails.
- Ensure adequate sight lines for maneuvering service vehicles.

PARKING FACILITIES

Locate and configure parking facilities for convenience without undue visibility. They should be less dominant in the landscape than occupied buildings or major landscape features.

- Provide convenient but inconspicuous parking.
- Minimize frontage areas used for surface parking.
- Provide landscape buffers between roadways and parking lots.
- Limit parking areas so they are not immediately visible from the municipal trails.
- Provide adequate but not excessive parking at designated access points to trail system.
- Lay out surface parking with clear and direct pedestrian access routes.
- To the extent practicable, use shared parking facilities.
- Discourage parking entrances and exits on pedestrian-oriented streets or close to corners.
- Buffer structured parking at street level with active, pedestrian-oriented uses or landscaping.
- Wherever practicable, locate parking facilities out of public view on the perimeter of campuses to reduce conflicts with pedestrians.



Illustrative District Street and Path Sections

It is no longer acceptable to tolerate streets without sidewalks in a district second only to downtown for non-automobile circulation. Walking, bicycling and skiing are established as part of the way of life in the District and are to be fully and safely accommodated.

It is important that all streets be built with safe, lit sidewalks, and that sidewalks and trails be connected with good sightlines for safety. Transit should be fully anticipated in all street improvements, with stops located at safe crossing places.

Pedestrian and Bike Path
Both Scenarios — May be paved or unpaved depending on use and location

Campus Entry
Integrated Campuses — Campus drives and roadways

2 Lane Local Access &
2 Lane Local Access w/ Parking
Both Scenarios — Neighborhood streets and streets within individual property boundaries

District Collector
Integrated Campuses — Bragaw Street; Providence Drive at Lake Otis Parkway and east of UAA Drive; UAA Drive

Regional Arterial
Both Scenarios — Tudor Road; Lake Otis Parkway; Northern Lights Boulevard; Boniface Parkway

Subdistricts — Bragaw Street; Providence Drive

Figure 38. Illustrative District street and path sections.

3.4 TRANSPORTATION AND MOBILITY

Provide safe and efficient mobility in and around the UMED District for all transportation modes while respecting the District's intrinsic qualities including its natural setting, wetlands, wildlife, recreational values, and walk-ability.

BACKGROUND

TRANSPORTATION DEMAND MANAGEMENT AND WALKABILITY

Transportation was at the forefront throughout the public outreach process, hence the many recommendations within this chapter. Coordinated urban design promotes accessibility and sustainability by accommodating multiple transportation modes, including walking, bicycling, transit, VAN and carpooling. This Vision Element proposes improved and new sidewalks, bike paths, trails, and traffic calming measures that increase safety, visibility, and convenience for pedestrians, cyclists, and skiers. It recommends the funding of a Transportation Demand Management (TDM) feasibility study to identify a wide array of complementary TDM actions in support of the current TDM components now functioning in the District. The feasibility study will assess the existing program to determine additional needs and potential funding. For example, incentivized carpooling and organization-run shuttle services currently reduce the demand from single-occupant vehicle travel and reduce parking requirements. The feasibility study would research off-site parking, potential for increased vanpool service, and increased transit routes. The recommendations within this Vision Element are informed by public comment and the Transportation Demand Management Case Study Report included as Appendix 5.1.

This Vision Element is intertwined with Quality of Life. The Transportation and Mobility Recommendations play a key role in reducing dependency on driving, making the District a safer and more vibrant place. Supporting a walkable district is a priority for UMED stakeholders, and could help support the success of the UMED Village. The District is inhabited and crossed by moose, birds, and other wildlife. The goals and recommendations in this chapter reconcile these concerns by stipulating that new infrastructure development must be sensitive to preserving the valued natural environment.

The largest concerns voiced by the UMED District community regarding transportation were the Northern Access Road, parking management, multi-modal trails and walkability. The large majority of existing parking facilities are surface parking lots, which take up a substantial portion of developable land. Multi-level parking lots are encouraged and becoming more cost effective. This plan recommends other transportation alternatives to lessen the need for additional and expensive parking and to reduce single-occupant vehicle use. The desire for walkable streets is addressed through funding recommendations to improve several pedestrian facilities within the UMED neighborhoods. Multi-modal trail projects are also included, along with mitigation for the Northern Access Road.

NORTHERN ACCESS TO UMED DISTRICT

During this planning process a separate planning effort for the Northern Access Road was initiated by the MOA and AKDOT&PF. The Northern Access Road is intended to provide additional access within the District, relieve congestion and meet the need for an improved transportation link through the District. Depending on which alignment is selected could have significant impacts on the natural landscape, wildlife habitat, and wetland areas while bisecting the organizational property.[28]

Figure 39. Cycling in the UMED

Figure 40. Roads within in the UMED

GOALS

1. **Design and implement roadway sections that are complete streets accommodating pedestrians, active transportation, public transit, and vehicles.** *See Figure 43 for depiction of the following proposed transportation projects.*

IMPLEMENTATION:

a. Identify and fund the following roadway system projects to facilitate multi-modal access, safety, reduce congestion and to provide adequte parking in various areas to provide service to the UMED District. *Project #s 4-R and 5-R:*
   - 4-R: University Lake Drive Extension from the arena round-about to a northern connection.
   - 5-R: Determine needed drainage and curb and gutter projects throughout the UMED District residential neighborhoods in conjunction with sidewalk project improvements.

2. **Provide recommendations for the Northern Access Road Project to ensure trail connectivity, safe wildlife circulation, appropriate speed limit, overall design requirements, and mitigation of the construction, operation, wildlife and traffic impacts.**

IMPLEMENTATION:

a. Design the Northern Access Road to provide direct northern access to the UMED District to improve circulation of people and goods, relieve arterial streets, respond to projected traffic and development growth within the UMED District, and to create safer streets for motorized and non-motorized traffic. *Project # 1-MTP: Adopted design considerations for the Northern Access Road found in this plan include:*
   - Two travel lanes with striped bike lanes each side.
   - Sidewalk and 10-foot paved path with buffers between pedestrian facilities and motorized traffic.
   - Non-motorized grade separated crossings.
   - Curbs, gutters, and storm drains.
   - Multiple roundabouts.
   - Lighted transit stops, roads, and paths.
   - Speed limit must be clearly posted.
   - Signal improvements at Northern Lights Blvd.
   - Provide connections from new to existing trails and paths identified in AMATS bicycle, pedestrian, and trail plans.

3. **Continue to support the pedestrian-friendly walking environment found in the UMED District.**

IMPLEMENTATION

a. Nominate and fund the following proposed improvements to the pedestrian network. *Project #s: 2-NM, 3-NM, 4-NM, 5-NM*
   - 2-NM - Add sidewalks to Career Center Drive between Northern Lights Boulevard and Mallard Lane. This improvement would provide non-motorized connection into the central part of the UAA campus from Northern Lights Boulevard.
   - 3-NM - Add sidewalks to 42nd Avenue between Lake Otis Parkway and Dale Street.
   - 4-NM - Add sidewalks to Wright Street between 40th Avenue and Tudor Road.
   - 5-NM - Add sidewalks to Dale Street between 40th Avenue and Tudor Road.

b. Fund and complete District-wide non-motorized multi-modal transportation projects consistent with Anchorage area bike, pedestrian, and trail plans.

Use the following considerations when developing the plan:

- Encourage wider sidewalks that accommodate more business and pedestrian activity and are consistent with the MOA Design Criteria Manual (January 2007)
- Keep utility boxes and light poles out of sidewalk and path rights-of-way to meet Federal accessibility standards and provide safe passage by wheel chair and other users.
- Increase lighting in high pedestrian areas on streets and at transit stops, which also aides in pedestrian and bicycle safety.
- Encourage pedestrian facilities to be accessible to all users. See MOA Design Criteria Manual (January 2007).
- Plan for and encourage relocation of large parking lots away from the center of the District toward the perimeter or to shared garages, to allow for infill and pedestrian-scaled development, as redevelopment within the UMED core occurs in future master plan implementation.
- Identify and provide pedestrian and bicycle-only connections where vehicular street connections are not feasible or appropriate.
- Incorporate safety and visibility considerations at crossings, sidewalks, and streetscapes.
- Recognize and enhance the unique natural setting in master planning efforts, trails, and transportation projects.
- Connect to MOA-wide trails network identified in the AMATS' bicycle, pedestrian, and trails plans to be consistent and build upon each of these individual planning efforts.

4. Improve MOA and DOT&PF snow removal and storage procedures to allow greater pedestrian, bicycle, and transit usage.

IMPLEMENTATION:

a. Work with MOA and DOT&PF departments to increase snow removal functions as funding becomes available.

5. Nominate and fund a Transportation Demand Management (TDM) program for the UMED District. *For more information on TDM and models from around the country, refer to Case Studies: Transportation Demand Management in the Resources chapter.*

IMPLEMENTATION:

a. Complete a UMED TDM study

The following recommendations may be included in that study:

- Continue to investigate the possibility for Valley Mover to provide direct peak period bus service to the UMED District from Palmer/Wasilla and Eagle River.
- Identify potential park-and-ride locations in the Mat-Su valley for UMED commuters.
- Support a District-wide Bike Share Program.

Figure 41. Bus stops in the UMED

Figure 42. Bicycle parking in the UMED

- Increase Shuttle service.
- Determine feasibility of car-share system district-wide.
- Establish a remote MOA coordinated ride-share service to and from the District, and/or encourage local employers to establish carpooling or vanpooling.
- Implementation of a Ride-home program.
- Equip bicycles in the Bike Share Program with studded tires for winter use.

b. Fund and construct off-site parking outside of the UMED District to meet demand for park-and-ride options and to support TDM program initiatives. *Project #: 2-PK – Location TBD*

c. Fund and Implement the TDM program.

To ensure people are aware of their transportation options consider the following public outreach and engagement tools as part of the TDM Program:

- Hold an Alternative Transportation fair to highlight the user benefits and costs of utilizing alternative transportation modes for the day-to-day travel to and from the UMED District.
- Routinely survey employees and students to determine progress towards desired mode split and other goals

6. Plan and design new transportation facilities and multi-modal systems in ways that minimize impacts to natural resources including the wetlands, wooded areas, and wildlife corridors, while enhancing and maintaining the existing trails and corridors found in the District to the greatest extent possible.

IMPLEMENTATION:

a. Implement adopted design guidelines for roadway cross-sections.

Use the design guidelines to address the following:

- Consider wildlife crossing safety in the design of roadway and trail sections.
- Retain the natural flora where not in conflict with pedestrian safety and snow removal procedures.

b. Fund and construct an expanded parking area at University Lake. *Project #: 1-PK*

FUTURE TRANSPORTATION SYSTEM IMPROVEMENTS *(FIGURE 43)*

The following list summarizes proposed transportation system improvements projects for the UMED District. These projects have been identified following review of the AMATS 2035 Metropolitan Plan, comments from stakeholders, and assessment of transportation facilities in the UMED District. The list below is also contained within the Plan Update's recommendations.

ROADWAY PROJECTS

- ***4-R*** University Lake Drive Extension- extension from Arena round-about to a northern connection, TBD.
- ***5-R*** Multiple drainage, curb and gutter projects throughout residential areas in conjunction with sidewalk improvements.
- ***1-MTP*** Proposed Northern Access Road alignment.

PEDESTRIAN PROJECTS

- ***2-NM*** Career Center Drive – add sidewalks between Northern Lights Boulevard and Mallard Lane. This improvements would provide non-motorized connection into the central part of the UAA campus from Northern Lights Boulevard.
- ***3-NM*** 42nd Avenue – add sidewalks between Lake Otis Parkway and Dale Street.
- ***4-NM*** Wright Street – Add sidewalks between 40th Avenue and Tudor Road.
- ***5-NM*** Dale Street – Add sidewalks between 40th Avenue and Tudor Road

PARKING PROJECTS

- ***1-PK*** MOA University Lake Parking – MOA to provide sufficient parking spaces and enforcement.
- ***2-PK*** Off -site park and ride(s) in Matsu Valley or other areas determined by future TDM plan.

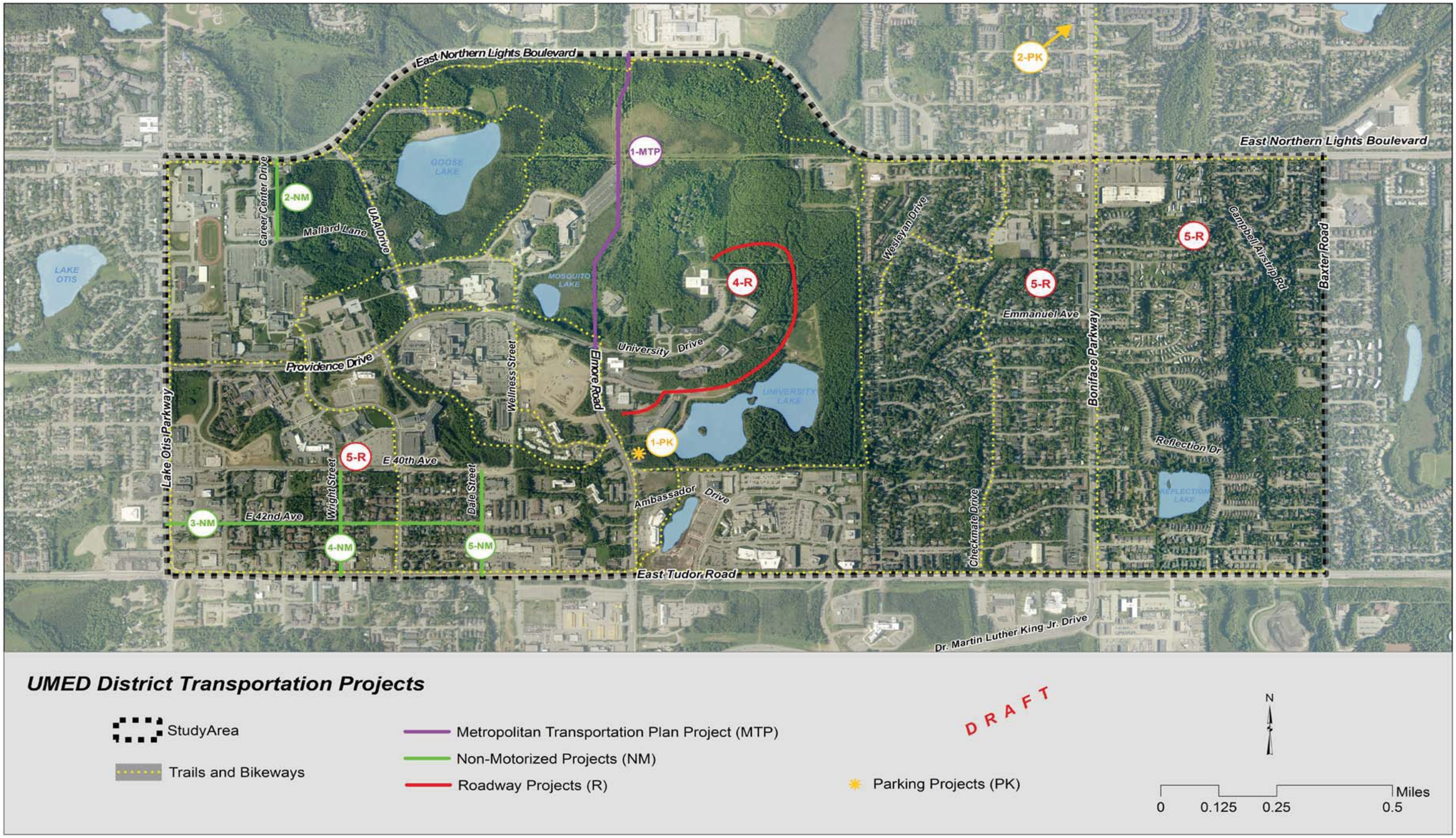


Figure 43. Future Transportation System Improvements

MULTI-USE TRAILS WITHIN THE UMED DISTRICT

The UMED trail system provides a recreational linkage between downtown, community destinations, and residential districts within this urban Anchorage environment. UMED trails function as a multi-modal transportation system fulfilling a variety of quality of life experiences including health and wellness, team training, scenic and wildlife viewing. Appropriately placed trails can buffer abutting land uses and delineate community boundaries.[23] These trails are used by a wide variety of users: joggers, walkers, hikers, wildlife viewers, bicyclists, skiers, people with strollers, people using mobility aids, dog walkers, moose and other wildlife. Conflict resolution is therefore an important aspect of trail planning and management for the UMED District.

Multi-use trail management agencies in fifteen states were surveyed on conflict resolution issues. Most conflicts were found to arise between pedestrians and bicyclists, equestrians and bicyclists, and skiers and snowmobilers. Respondents to the survey advocated for education on trail etiquette, trail design to accommodate different uses, separate trails for different users, clear signage, closure during wet conditions, and increased patrolling and monitoring as solutions.[24] The National Recreational Trails Advisory Committee participated in the survey and provides the following recommendations:

- Provide sufficient trail mileage and different trail experiences.
- Create trail etiquette educational programming and materials.
- Track progress to guide future policies and programs.
- Reduce user contact in conflict areas.
- Involve users to: assess user needs, identify sources of conflict, develop mutually acceptable solutions, promote proper trail behavior.[25]
- As future planning projects and new trail routes are completed for the UMED including at Goose Lake and University Lake Parks, these ideas may be considered.
- Incorporate the proposed trail and bikeway alignments found in the adopted trail, pedestrian, and bike plans for the Anchorage Bowl.

3.5 COMMUNITY & PARTNERSHIPS

Develop collaborative practices within the UMED District that provide operational efficiencies, increased communication and cooperation, and a sense of shared community.

BACKGROUND

The UMED area has benefited from cross-collaboration and community involvement – and therefore has the fundamental relationships in place for enhancing community and organizational partnerships since its inception. The Consortium Library, founded in 1970, is shared by nine partners, including UAA, APU, and the Anchorage Public Library. Similarly, UAA's Center for Community Engagement and Learning aims to connect academic programs with community needs, and the Learning Institute at Providence Alaska Medical Center hosts community events on mental and physical health.

The organizations provide public access to recreational facilities through continuing education classes, memberships, or punch-cards. By providing these various opportunities, the intuitions foster a sense of community within the District.

Three area community councils (University Area, Rogers Park, and Airport Heights) provide a central forum for residents. Community councils are established by Municipal Charter. Collectively they work to provide an effective means for active public participation in urban planning and public discussion issues within the District. This plan identifies concrete planning strategies to support communication between the residential community and the organizations in order to facilitate ongoing coordination and cooperation.

Collaborative planning is a participant driven process that ensures that a variety of views may guide future developments within the District.

The process can also be viewed as a cost-saving mechanism which allows stakeholders to identify opportunities for pooling resources, leveraging existing processes and programs, and defining much needed management and operational tools. These savings can then be spent on furthering shared development goals or mission priorities.

The UMED Steering Team was formed during the update of the UMED Plan to provide valuable and timely direction on a variety of topics.

The UMED Steering Team was comprised of representatives from the major organizations, the community councils, and elected representatives. The Steering Team found the meetings to be very useful to share ideas and concerns. Because of this useful interaction, the Steering Team will continue to meet on a quarterly basis after the adoption of the Plan Update in 2015.

Figure 44. The residential and organizational areas of the UMED District

There is a wide breadth of planning issues that can benefit from a collaborative and coordinated process. The section entitled Examples: Positive Town-Gown Relationships, found in the Resources chapter, further highlights ideas for fostering community interaction within educational and medical districts.

GOALS

1. **Continue the established UMED District coordination process through the UMED District Steering Team with regularly scheduled quarterly meetings to leverage resources and implement the UMED District plan.**

IMPLEMENTATION:

a. Establish and fund a MOA staff position to facilitate district-wide coordinated efforts required to implement the UMED District Plan. This may include public outreach and communication, input on TDM district programs and activities, Chester Creek Watershed projects, grant writing and funding research, parks and trail planning, input on animal control and wildlife management issues, etc.

Consider the following action items for this position:

- Identify and implement potential organizational collaborations to achieve sustainable and efficient planning and development projects in the UMED community.
- Encourage development of communication and public outreach tools for common information and user feedback.
- Encourage development of public-private partnerships for housing and/or retail opportunities.
- Encourage community and institutional collaboration on environmental stewardship.

2. **Support and fund food security research and projects that bring Alaska-grown food to the UMED District on a year-round basis through a small store, farmers markets, co-ops, and community gardens.** *See Fresh Food Access Example for more information.*

IMPLEMENTATION:

a. Support food sustainability opportunities within the UMED District through grant applications, public outreach and community engagement to help support existing and new projects.

b. Identify appropriate locations within the District for fresh produce and food vendors.

COLLABORATIVE PLANNING AND SHARED RESOURCES THROUGH COMMUNITY AND PARTNERSHIPS

As the organizations in the UMED District continue to grow, they will face many challenges, such as finding adequate funding, rallying support from their boards and regents, responding to changing technology, and balancing growth with preserving the natural environment. Collaborative planning towards shared goals will be a key strategy for environmentally and financially sustainable growth among the organizations.

Stanford University has a shared parking model that was introduced as resource information for this plan (*see the TDM Case Study*). The Stanford example illustrates how it is possible to reduce parking within the UMED District.

3.6 NATURAL RESOURCES

Promote environmental sustainability and manage natural resources.

BACKGROUND

The natural setting and connection to the outdoors are community and organizational values shared throughout the UMED District. The proximity of wooded areas, lakes, and creeks, along with panoramic views of the mountains in the distance, greatly contribute to the attractiveness and quality of daily life in the District. In fact, the natural setting is the UMED District's greatest physical asset, and sets it apart in comparison to other areas of Anchorage.

Figure 45. Open space and University Lake

Both wintertime and summertime activities flourish around the District's major lakes and along miles of public and private skiing and hiking trails. Those who live, study, and work in the area take advantage of its aesthetic and recreational amenities. Creating a future for the UMED District where this unique environment is sustained was a value repeatedly expressed in surveys and meetings with stakeholders throughout the planning process. Participants ranging from UAA and APU administrators, faculty, and students, to ANMC administrators, staff, and patients, to community councils and neighborhood residents spoke about desired access to natural ares.

Healthy lifestyle choices including walking, biking and skiing make the UMED District a much desired livable and workable community.

The UMED District Plan Update takes a holistic approach in its recommendations, focusing on ways a wide spectrum of stakeholders can work together to retain and manage these local natural resources in a manner that benefits all users. Local pressures on natural resources can range from housing demand and organizational expansion, to infrastructure improvements and other development needs associated with a growing local population and economy. This Plan Update seeks to provide information regarding future development projects in the District, and engage the community in stewardship of the natural environment. Further information can also be found in vision elements Supporting Organizational Missions and Transportation and Mobility.

Natural resources management plans on public lands are one way to guide on-going and future activity while ensuring across the board participation from all affected stakeholder groups. The proposed management plan identified for University Lake could address many of the localized issues that stem from uninformed or irresponsible use of the park area.

A focused look at wildlife patterns around the lake, and recommendations for stewardship can influence users in simple ways which can have large positive impacts on the environment.

It's very likely that if dog-owners were made more aware of the types of negative interactions commonly resulting from off-leash dogs around the lake, such as beaver habitat destruction, it would galvanize future participation in compliance with leash regulations. Similarly, off-leash dogs have been known to cause human-moose interactions in this area. These types of conflicts have a negative impact not just on recreational park-users, but on local habitat conservation.

As the natural environment is such a commonly held value, it is in everybody's interest to facilitate the discussions on appropriate access to the trails and lakes, while formulating and enforcing regulations that protect users, managers, and natural systems.

A major challenge of the UMED Plan Update is to balance recreational use of natural areas while minimizing human/animal conflicts. Important factors to consider include:

- Wildlife movement occurs along the South Fork of Chester Creek due to continuity of wetlands and habitat. The creek also functions as a source of food.
- The natural areas including lakes and wetlands provide habitat and forage opportunities throughout the UMED District.
- Animals move between these regardless of intervening urban land uses and infrastructure. This results in conflicts including vehicle/animal collisions, and occasional bear and moose interactions.

The natural areas within the UMED District also include an interspersed habitat that supports a variety of birds, animals, flora, fauna, and fish. Chester Creek and the wetland areas within the UMED District are an important element of the city-wide watershed system in Anchorage. Natural resource planning efforts to restore and enhance the Chester Creek watershed are ongoing at the city level throughout the Municipality. Examples of this commitment include new language in the recently updated Title 21, the newly adopted 2014 Anchorage Wetlands Management Plan, and the 2015 Chester Creek Management Plan.

Continued management of UMED natural resources will require coordinated actions by all District stakeholders. Strategic partnerships between organizations, neighborhood residents, local businesses, the Municipality of Anchorage, and resource agencies will be essential. Working with the US Fish and Wildlife Service, Alaska Fish and Game, US Army Corps of Engineers, among others, can lead to more informed, coordinated, and robust results. The Natural Resources Vision Element recommendations are intended to provide guidance that will help manage, protect, and restore the lakes, creeks, and parks within the UMED District. The potential for partnerships to maintain appropriate wildlife habitat could be ideally considered through incentives such as conservation easements or long-term leases, etc.

Figure 46. Views within the UMED

GOALS

1. Develop and implement park management plans for University and Goose lake parks within the UMED District

IMPLEMENTATION:

a. Fund and implement the University Lake and Goose Master Plans that encourage uses and activities compatible with their natural setting and value, address the adverse impacts of park activities on neighboring property owners, and promote these sites as special community amenities.

Consider the following issues, projects, and mitigation when completing the park master plans:

- Implementation of restoration projects within the UMED District to improve fish habitat.
- Improve the shoreline of University Lake in a few select locations to allow safe access and visibility while preserving water quality and natural wildlife and plant habitat surrounding the lake.
- Provide designated access points to University and Goose lakes and nearby trails by providing adequate parking and trail maintenance to prevent damage to the environment and prevent adverse impacts for neighboring property owners.
- Incorporate information and recommendations from the Chester Creek Watershed Management Plan into the master planning process.
- Develop an interim and long-term program to end conflicts and safety issues between off-leash dogs, trail users, and neighboring property owners.
- Coordinate with and support creek restoration projects related to drainage practices around University Lake.
- Address scenarios of human and animal wildlife conflicts within the UMED District, such as those that occur between dogs and beavers near the District's lakes.
- Prohibit off-leash dogs at University Lake and Goose Lake.
- Prepare Habitat Preservation and Enhancement Design Guidelines for the restoration of wildlife habitats.
- Determine options for providing sufficient parking spaces and parking management at University Lake Park.
- Identify action items to minimize human/animal conflicts and to protect watershed health.

Figure 47. Nesting Loons at Goose Lake Park

2. Educate and encourage citizen participation in environmental stewardship projects.

IMPLEMENTATION:

a. Encourage stakeholders to organize and participate in environmental stewardship programs.

Opportunities for stakeholders may include the following:

- Engage UAA, APU, ASD faculty and students to assist with research studies that may provide data for park management plans.

- Celebrate the Chester Creek corridor and its forested buffer zone as the primary unifying feature of the UMED District.
- Include Natural History and Habitat Management information in an interpretive information and signage program for the UMED District.
- Provide educational information on ways to minimize human/animal conflicts and to protect watershed health.

3. Design roadways and trails to minimize vehicle and human/animal conflicts.

IMPLEMENTATION:

a. Install wildlife fences; provide adequate sight lines in roadway and trail corridors through adopted MOA roadway design standards.

4. Map and document wildlife corridors within the District and connections to surrounding habitat areas that includes recommendations for wildlife management and impact mitigation.

IMPLEMENTATION:

a. Seek grant funding to complete and publish wildlife corridor research, mapping and project report for the UMED District.

5. Identify and fund potential conservation easement properties between consenting parties.

IMPLEMENTATION:

a. Pursue the option to preserve areas of wildlife habitat within the UMED core area through public/private partnerships.

WETLANDS MANAGEMENT IN ANCHORAGE, ALASKA

A wetland is defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (Federal Clean Water Act, Section 404, Part 328.3, 7(b))."[30]

The *Anchorage Wetlands Management Plan*, adopted on July 9, 2014, categorizes wetlands into class A, B, and C categories (depicted on **Figure 48**), representing various levels of environmental significance and associated setback requirements. Class A wetlands perform the most important biological and hydrological functions. The UMED District planning area contains Class A, B, and C wetlands. **Figure 49** depicts the known wildlife corridors found in the Anchorage Bowl that are located on natural areas and riparian corridors. These 2 figures were provided to bring attention to the need for integrating wildlife movement and the prime habitat that these natural areas and riparian corridors provide throughout Anchorage and the UMED District.

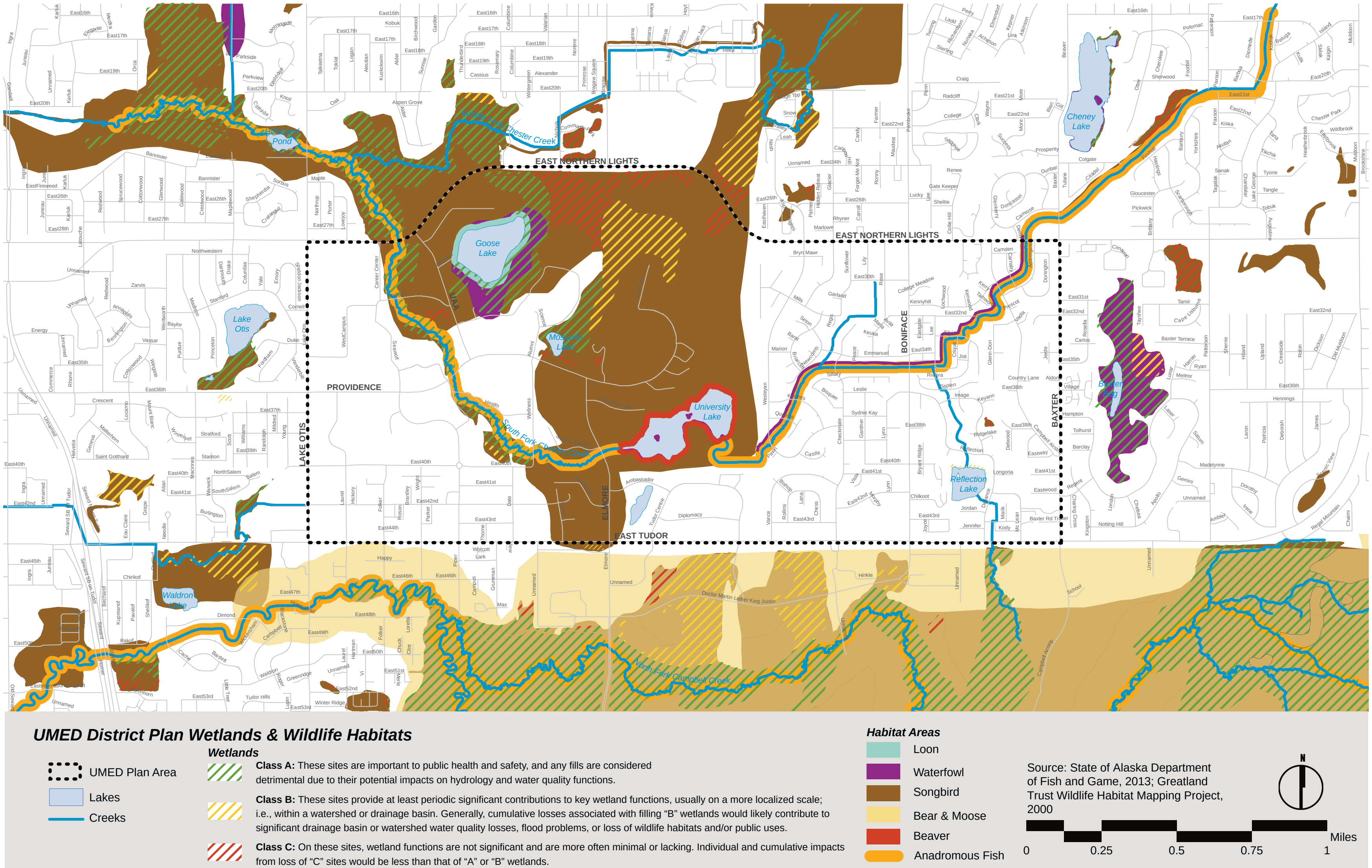


Figure 48. Wetlands and wildlife habitats

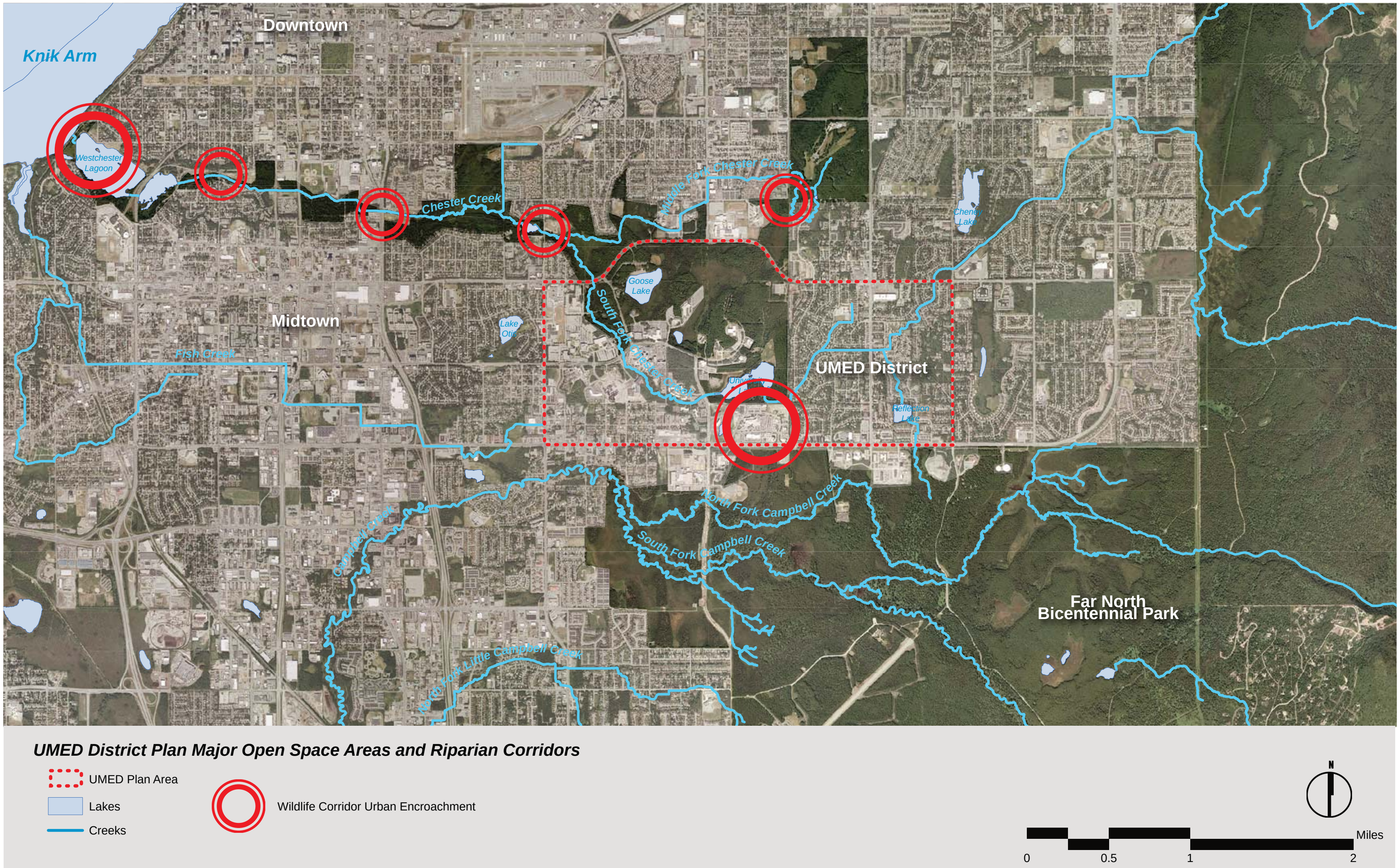


Figure 49. Open space areas and riparian corridors

3.7 ECONOMIC SUSTAINABILITY

Encourage development that is financially feasible, attractive and contributes to the quality of life of District users and residents.

BACKGROUND

As the UMED District plans for growth it is important to tie visions for the future to the realities of the market. This Vision Element provides tools for making the proposed developments in this plan financially feasible. It recommends meeting current demand and creating new demand for commercial development and housing which will in turn activate the local economy. These projects could come together in several ways: as redevelopment along the perimeter roadways including Tudor Road, Boniface Parkway, and Lake Otis; through infill and higher-density development

PERIMETER REDEVELOPMENT AND HIGHER DENSITY

Redevelopment along the perimeter roadways of the UMED District on under-developed parcels could include mixed-used commercial, retail, and housing. Higher-density could also support increased transit use and additional services currently not found in the District. Additional housing would bring new residents, house employees, and would continue to support the medical community. There was a high housing demand evidenced through the market study completed for this plan. As mobile home parks convert from single family to higher density development there is also opportunity for increased housing options, which are detailed in the 2012 Anchorage Housing Market Analysis.

It is anticipated that targeted area studies would identify under-utilized properties for redevelopment. Coupled with the analysis and recommendations completed by Strategic Economics developers would have the tools to seek the types of development the UMED District will support. To that end, the implementation item to fund and completed targeted area studies is included in this vision element.

Figure 51. Low-rise development in the UMED

Figure 50. The University Marketplace a higher-density mixed-use development in Vancouver

GOAL

1. Support reinvestment in commercial and residential areas that reinforces a sense of place and sustains the financial requirements of the property owners

IMPLEMENTATION:

a. Fund and complete targeted area studies to determine whether specific under-utilized properties could be developed with higher densities, increased building heights, and/or small lot development

Planning tools to assist in redevelopment within the UMED District could include:

- Pursue synergies between existing uses when selecting a location for pedestrian-oriented mixed-use development.
- Seek participation from the Department of Urban Housing and Development, the MOA, the State of Alaska, the Alaska Housing Finance Corporation, UMED partners, and other contributors.
- Encourage a range of higher housing densities in targeted areas to provide a variety of housing options that can serve as workforce housing and reduce commute times to the District.
- Encourage housing types that respond to market demand including town homes, condos, senior housing, and mixed-use development.
- Support mixed-use (retail, restaurants, and services) development that could potentially include a housing component in locations throughout the UMED District.
- Find opportunity sites and conduct economic analysis for low-income and workforce housing.
- Explore tax financing options such as New Market Tax Credits (NMTC) and Economic Development Property designation under MOA Municipal Chapter 12.35 to incentivize redevelopment with new housing in the planning area.
- Support public-private partnerships that enable development identified through this planning process.
- Enable increased height and/or smaller lot development in select areas.
- Continue MOA's efforts to seek state-wide legislation that permits Tax-Increment-Financing and Cogeneration tax relief.

3.8 GROWTH & CHANGE

Balance future growth and change in the UMED District to improve quality of life and the workplace environment.

BACKGROUND

As a successful, desirable, and growing area, change within the UMED District is inevitable. This Vision highlights the desired goals and implementation items that will help to direct and shape the District's growth in the neighborhoods, maintain communication and participation between residents, the community councils and the UMED organizations, and ensure ongoing participation in the UMED District plan update process. Successful growth and change in the UMED District relies on a holistic sense of how the distinct elements of this plan are interrelated and on a planning process that enables coordination among the large organizations and participation from the UMED community.

Though the Visions are presented as distinct elements, they are interrelated and overlap in many areas. It is important that any development consider the interdependent aspects of growth. As such, this Vision emphasizes the key values presented in this plan. Growth & Change also highlights the processes for participatory planning. The Municipality can encourage public participation by increasing community engagement efforts and greater transparency. In addition, MOA can improve community relations by educating the UMED organizations and stakeholders on how to apply various codes and regulations. Finally, Growth & Change recommends flexibility.

GOALS

1. Shape future growth in accordance with the values represented in this plan.

IMPLEMENTATION:

a. Provide Community Council participation on the UMED District Steering Team.

b. Review and comment on UMED projects through the Community Council notification process.

c. Complete an annual Capital Improvements Program list of projects for pedestrian, park, and roadway projects to be submitted to the MOA.

d. Provide Assembly and Alaska Legislators input on issues facing the UMED neighborhoods.

e. Provide input to projects that support and enhance a pedestrian friendly neighborhood environment that prioritizes non-vehicular modes of transportation.

f. Participate in the concept development of the UMED Village to accommodate a growing population and create a sense of community.

g. Review transportation and infrastructure projects to ensure that projects enhance rather than detract from the District character

2. Listen to and incorporate residential neighborhood and community council input early in the process.

IMPLEMENTATION:

a. Use the community engagement process to allow all stakeholders including District employees, students, area residents, and community councils to share ideas and provide input.

b. Encourage UMED organizations to communicate and coordinate efforts of community interest on a regular basis.

c. Provide greater transparency by facilitating public online access to the Municipality of Anchorage's data, project information, etc.

d. Develop annual capital programs and operating budgets to respond to Community Council requests for district-wide improvements such as a snow plowing services, signage, interpretive plans, road, park and pedestrian improvements, etc.

3. **Provide Community Council participation in the next UMED District plan update.**

IMPLEMENTATION:

a. Nominate Community Council members to represent the neighborhoods on the UMED District Plan update team.

4. **Establish a recommended revision/amendment date for next UMED District plan update.**

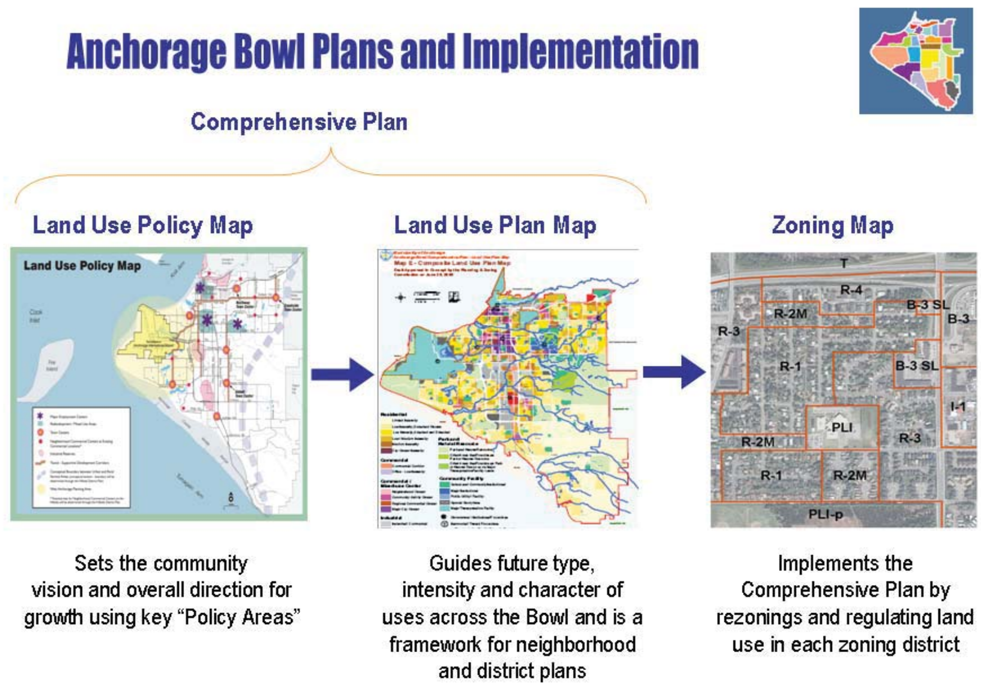
IMPLEMENTATION:

a. Evaluate and fund the UMED District plan update every 5-7 years.

LAND USE PLAN MAP OVERVIEW

The foundation for any land use plan map begins with Anchorage 2020 land use planning policies, and an adopted Anchorage Bowl Land Use Plan Map. Land use policies are translated to land use classifications, that when depicted on the land use plan map can provide the current and future development scenarios. From that foundation specific district planning area land use categories are then developed using several factors; existing land use, a district-specific planning process, development proposals, and to some degree—by a highest and best use determination.

The UMED District land use plan map is intended to guide a coordinated and compatible development pattern that balances the residential, commercial, retail, organizational and community facility, park, natural area, and utility corridor and trail land uses in well defined locations within the UMED District. Future zoning and discretionary land use changes in the UMED District will be based on the land use plan map adopted with the UMED District Plan update. The UMED District has experienced a fairly consistent development pattern since the early1970s. This development was formalized by the 1983 Goose Lake Plan, and amended with the 2003 U-MED Universities and Medical District Framework Plan, subsequently amended in 2009 and 2012. Detailed information is on pages 68-74. The Illustration on page 65 providea a snap shot of how the UMED District Land Use Plan fits into the overall development sceanario of the Anchorage Bowl.



Source: 2015 Anchorage Bowl Land Use Plan Map planning process

KEY POLICY DIRECTIONS

The Land Use Plan Map identifies the intentions for future land use types and intensities of development within the UMED District planning area. The accompanying Table explains the implementation zoning districts most compatible with each land use designation along with the range of residential dwelling units that this plan intends per gross acre of residential and/or mixed-use areas.

The table is color-coded with the corresponding land use plan map categories. A description of each land use category follows with the implementing zoning to further explain how the UMED District may be developed.

Dwelling units per gross acre (DUA) is a measurement of the gross property size, which includes in the calculation of that gross acre of property the following:

- The area that will be occupied by the development,
- Any required public rights-of-way,
- Any required utility easements, and
- Any other non-residential uses that may require a dedication from the gross area of the property

LAND USE PLAN MAP DESIGNATIONS	ZONING DISTRICTS	RANGE OF RESIDENTIAL DENSITIES
RESIDENTIAL		
Low Intensity, Detached	R1-A	1-5 DUA
Low Intensity, Attached & Detached	R-2A, R-2D	5-10 DUA
Low to Medium Intensity	R-2M,	Up to 15 DUA
Medium Intensity	R-3	Up to 35 DUA
High Intensity Mixed Use	R-4A	>40 DUA
COMMERCIAL		
Commercial Corridor	B-3	
Office I Low Intensity	RO-Residential Office	Up to 40 DUA
Neighborhood Commercial Center	B-1A	> 35 DUA
Community Commercial Center	B-3	40+ DUA
UMED Village (Location TBD)	B-1A	>35 DUA
COMMUNITY FACILITY		
School and Community Institutional	PLI	
Major Institutional	PLI	
Public Utility / Facility	PLI	
PARK & NATURAL RESOURCE		
Parks	PR, PLI	
Natural Area	Varied	

Figure 52. Zoning Categories

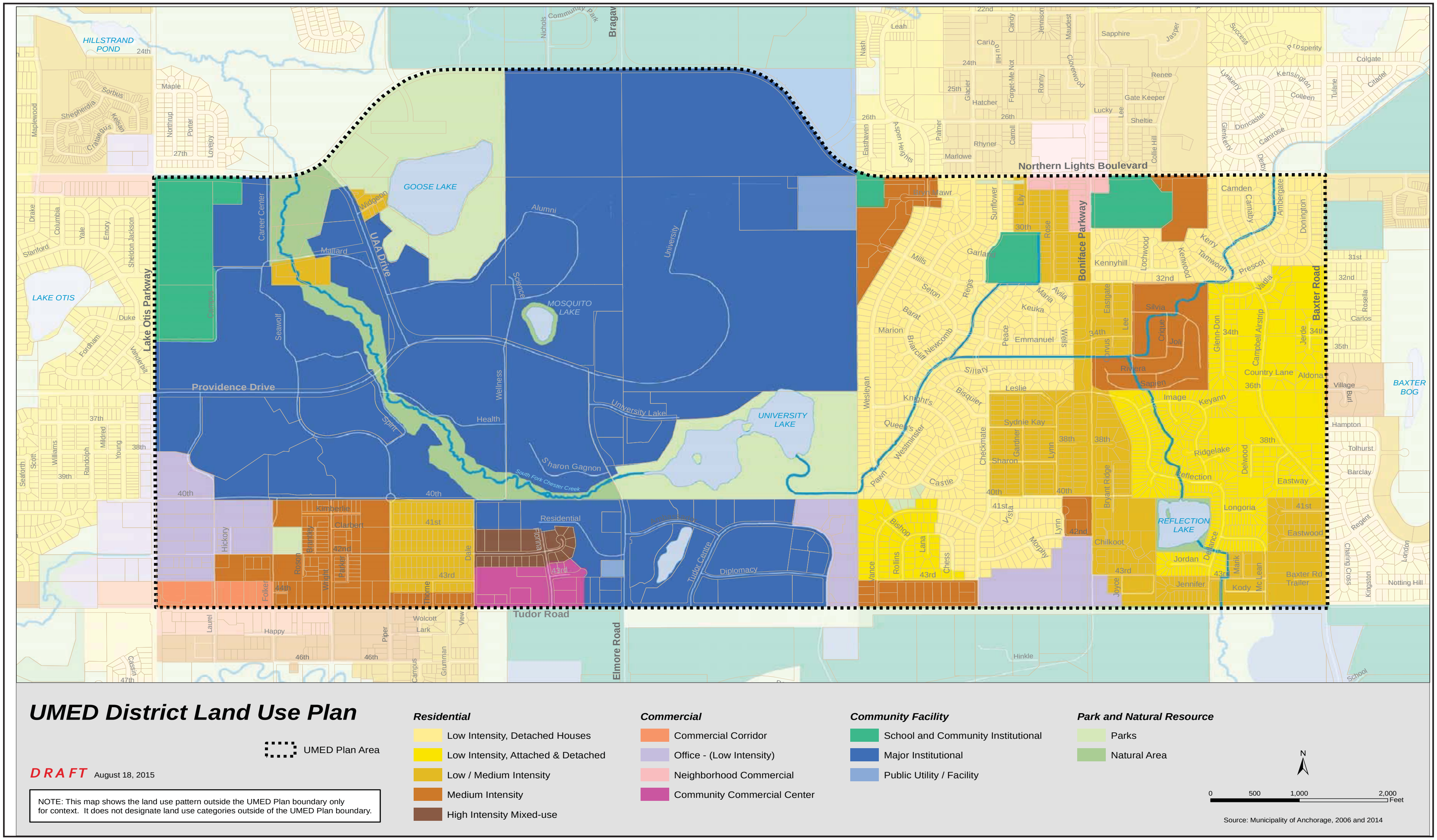


Figure 53. UMED land use plan map

LAND USE TERMINOLOGY

Consistent land use terminology and definitions are desired throughout the Anchorage area. However, with the District-specific plans there is the ability to compile land use definitions to meet the needs of a District-specific plan. This was done for the UMED to define the UMED Village use category.

Additionally, the UMED District Plan incorporates similar terminology and definitions from the East Anchorage District Plan (EADP), such as Town Center and Medium Density Residential due to an overlap in the two planning areas between Boniface Parkway and Baxter Road. Therefore, the UMED District Land Use Plan map carries forward the land use designations from the EADP in this overlapped area for consistency between these two plans.

For the UMED District land use plan map, there are four major categories of land uses: Residential, Commercial/Mixed-use, Community Facility, and Park and Natural Resource. Under these four major categories are the applicable land use designations, descriptions of development types and densities, as well as the zoning districts that implement the land use designation.

RESIDENTIAL AREA OVERVIEW

Most of the UMED District residential neighborhoods were developed in the early 1970s with a mix of single family and multi-family development. A majority of the residential areas in the planning area are developed with stable residential neighborhoods, and no significant changes are anticipated in this Plan. However, there are some opportunities for new residential development on residential designated lands that are vacant, under- utilize or infill sites. Additional housing can also be realized through mixed use development in Commercial designated areas. Higher density residential development is encouraged at appropriate locations where there are sufficient roadways and other infrastructure, to support this level of development. Combined, these additional residential developments will help meet some of the housing demand articulated in the 2012 Anchorage Housing Market Analysis. Further, the mixed-use case studies completed for the UMED District Plan found that higher density mixed-use projects are financially feasible and would encourage and provide a more walkable pedestrian-oriented District. This intent is implemented through concrete actions found in Quality of Life vision element of the UMED District Plan.

RESIDENTIAL CLASSIFICATIONS

The Residential Classifications identify areas already substantially developed for residential purposes and are expected to remain residential for the duration of the Plan. They also include vacant, underutilized and re-developable lands best suited for residential development.

In addition to the residential characteristics described below, other uses such as schools, churches, parks, child care facilities and other public or institutional uses may be allowed in residential areas if determined to be compatible with and oriented toward the needs of the immediate neighborhood.

Low Intensity, Detached Housing: 1- 5 dwellings per gross acre.

This land use designation provides for single family detached homes on individual lots that are already found in much of the existing residential neighborhoods in the District. This includes single family detached houses located on individual lots that are generally between 6,000 and 20,000 square feet in size. The intended density range is greater than 1 and up to 5 housing units per gross acre.

Locational Criteria:

- Areas with established single-family detached development pattern;
- Areas not severely impacted by land uses of incompatible scale or intensity;
- The building scale, landscaped setbacks and low traffic volumes on local streets contribute to this low intensity living environment; and
- Areas outside of designated redevelopment/ mixed use areas, neighborhood centers and transit supportive development corridors.

This designation is to be implemented by the R-1A zoning district.

Low Intensity Attached & Detached: 5 - 10 dwellings per gross acre.
This land use designation provides for a variety of single family detached and dual-family (duplex) residential areas. It provides for increased land use efficiency and greater housing opportunities. The intended density range is greater than 5 and up to 8 dwelling units per gross acre.

Locational Criteria:

- Areas with established single-family detached and two-family development pattern;
- Areas served by well-developed infrastructure and municipal services;
- The building scale, landscaped setbacks and low traffic volumes on local streets contribute to a low intensity living environment; and
- Areas outside of designated redevelopment/mixed use areas, neighborhood, town centers and transit supportive development corridors.

This designation is to be implemented by the R-2A and R-2D zoning districts.

Low / Medium Intensity: 8 - 15 dwellings per gross acre.
This land use designation provides for a variety of single family detached and multi-family housing units in neighborhoods that offer a compatible diversity of housing choices. Residential uses include conventional single family homes on small lots, duplex structures, town houses and low density multifamily developments. It provides for more efficient use of land and greater housing choices. The intended density range is greater than 8 up to 15 dwelling units per gross acre.

Locational Criteria:

- Areas with a mix of single and multi family housing;
- Areas that provide a transition from more intense residential and mixed use areas to lower intensity residential areas;
- Areas within walking distance of schools, parks, transit and local commercial services;
- Areas within ¼ mile of a transit route;
- Areas served by well-developed infrastructure and municipal services including paved streets, lights, water and sewer; and
- Areas outside of designated redevelopment/mixed use areas, neighborhood, town centers and transit supportive development corridors.

This designation is to be implemented by the R-2M zoning district.

Medium Intensity: 15 to 35 dwellings per gross acre.
This land use designation provides for a variety of town house and multi-family housing development. Housing at this density threshold supports a diversity of housing choices, efficient provision of public infrastructure and more frequent transit service. New housing development will have private open space and recreation areas. The intended density range is greater than 15 up to 35 dwelling units per gross acre.

Locational Criteria:

- Areas with an established mix of multi family housing;
- Areas that provide a transition from more intense residential and mixed use areas to lower intensity residential areas;
- Areas accessible to arterials without the need to travel through less intensive uses;
- Areas within walking distance of schools, parks, transit, shopping and employment;
- Areas within ¼ mile of a transit supportive development corridor; and
- Areas near or within a designated Neighborhood Center or the UMED Village.

This designation is to be implemented by the R-3 zoning district.

High Intensity Residential/Mixed Use: 40 or higher dwellings per gross acre.
This land use designation provides for mixed used development that allows for both commercial and multifamily development at a density of 40 dwelling units or higher per gross acre. Housing at this density supports a diversity of housing choices, efficient provision of public infrastructure and more frequent transit service. New projects can maximize the Locational advantages using structure parking and an intensive multi-story design. Development is designed and oriented to the sidewalk with active uses, windows and entrances.

This orientation provides an inviting pedestrian environment.

This designation is implemented by the R-4A district.

Locational Criteria:

- Areas formerly designated for office or medium density residential development that are underutilized and well positioned for high-density residential/mixed use development;
- Areas that provide a transition from major institutional university or medical center uses; more intense residential and mixed use areas to lower intensity residential areas;
- Areas accessible to arterials without the need to travel through less intensive uses; and
- Areas within ¼ mile walking distance of schools, parks, transit, shopping and employment.

This land use designation is implemented with the R4-A zoning district.

COMMERCIAL AREA OVERVIEW

Commercial areas found along the border areas of the UMED support a variety of businesses. Some of this commercial area is stable and well used, while other areas are under-utilized and redevelopment is encouraged that includes mixed-use commercial, retail and residential offerings. Mixed-use could provide opportunity for additional employment and housing with the right mix of related retail, commercial and housing options. Timing and marketing must align to meet the critical mass to ensure development is successful and cost effective. The UMED District is a prime area for this type of development with the universities and medical campuses in close proximity and the high demand for a variety of housing types and retail offerings not currently found in this area.

COMMERCIAL CLASSIFICATIONS

The Commercial classifications describe five different commercial and retail development scenarios that encourage infill, mixed-use, and higher density residential development to meet the demand for commercial, retail, office and housing needed in the UMED District. Portions of the commercial lands located within the UMED District boundaries are under-utilized and ripe for redevelopment. A new neighborhood commercial center is envisioned for the UMED District which is further described below as the "UMED Village".

Commercial Corridor

This land use designation provides for local and regional retail sales and services on major street corridors, which are already developed for commercial purposes.

Locational Criteria:

- The established commercial area with single-use retail or multi-tenants near the intersection of Tudor Road, Tudor Center, and Lake Otis Parkway; and
- Not intended for geographic expansion at the expense of Residential areas.

This designation is to be implemented by the B-3 zoning district.

Office – Low Intensity

This land use designation provides for situations where a range of office uses may be appropriate but not a broad spectrum of commercial or retail uses. Predominant uses consist of small to medium sized office buildings with business and professional medical services. Stand alone multi-family or a mix of office and multifamily residential are highly encouraged at a minimum density of 20 dwelling units per gross acre.

Locational Criteria:

- The established existing office designated areas located at Tudor, Lake Otis Parkway, and Boniface Parkway;
- Intended to serve as a transition between intense commercial uses and residential neighborhoods; and
- Not intended for geographic expansion at the expense of Residential designated areas.

This designation is to be implemented by the RO zoning district.

Neighborhood Commercial Center

Provides for small to medium size commercial centers to serve the surrounding neighborhood or cluster of neighborhoods. Predominant land uses may include small scale, non-obtrusive convenience retail and personal services, such as food markets, drug stores, restaurants and professional services.

The larger centers may be anchored by a full-sized grocery store. Stand alone multi-family or a mix of office and multifamily residential are highly encouraged at a minimum density of 20 dwelling units per gross acre.

Locational Criteria:

- The existing neighborhood commercial area located at the four corners of the Northern Lights and Boniface Parkway intersection;
- Neighborhood Commercial center should serve a surrounding area population of up to 30,000 people;
- Areas within walking distance of, or that can provide conveniences to adjacent neighborhood(s), reducing vehicle trips or driving distances;
- Areas having frontage on two streets and a locally important street corner;
- Spaced at least 1 mile from the nearest designated Neighborhood Commercial center; and
- Not intended for geographic expansion at the expense of Residential designated areas.

This designation is to be implemented by the B-1A zoning district.

Community Commercial Center

The Community Commercial Center designation provides a focal point of activity that integrates community serving retail, housing, public services and civic facilities. A range of retail shopping and services, provide most of the daily needs of residents of surrounding neighborhoods. Low-to-medium rise offices provide services and employment. Within this center, mixed-uses and residential multifamily at a density of 40 dwelling units per gross acre is highly encouraged. .

Locational Criteria:

- The existing Community Commercial area located at Tudor and east of Dale, and south of 43rd;
- Community Commercial center should serve a surrounding population of 30,000 – 40,000 people which include residents, employees, patients and students;
- Area is within walking distance of, or that can provide conveniences by walk-in trade for nearby employment and to adjacent neighborhood(s), reducing vehicle trips or driving distances;
- Areas should be served by collector or higher and have frontage on an arterial street that is served by transit;
- Spaced at least 2-4 miles from the nearest designated Community Commercial center; and
- Not intended for geographic expansion at the expense of Residential or Major Institutional designated areas.

This designation is to be implemented by the B-3 zoning district.

UMED Village

An economic analysis was conducted in 2013 for the UMED District planning area that demonstrated a new commercial neighborhood level center is viable within the UMED District. The UMED District Plan envisions a “UMED Village” developed consistent with the recommendations outlined in UMED goal 3.2.3. The size and scale of the UMED Village is envisioned to be similar to scale and intent of a Neighborhood Commercial Center as defined in the 2020 Anchorage Bowl Comprehensive Plan.

To develop the UMED Village, the key findings from the case study conducted as part of the Update should be considered by future partners which include: market conditions and residential rental rates, identification of shared goals and outcomes for the village, the pursuit of creative financial strategies to support the new development, establishing appropriate development standards, identifying an applying available public resources, and ensuring quality of life is the compelling motivation to supply associated retail amenities.

The specific location of the UMED Village is not identified by this Plan, either through narrative or on the Land Use Plan Map. The UMED District Plan leaves it up to market trends and the individual institutional property owners to self nominate a site that generally meets the following:

Locational Criteria:

- Site to be 20-25 acres in size;
- Site is not located on the edges of the UMED District planning boundary;

- Site is within walking distance of primary target clientele of university students, patients and employees within the UMED district;
- Site is or planned to be served by an arterial, with connections to bicycle and pedestrian facilities;
- Site has been conceptually planned for and included in an organizational master plan.

The zoning district to implement the UMED Village is B-1A

This Plan anticipates that an amendment to the UMED District land use plan map will be necessary when the UMED Village location and concept is presented and approved. The land use plan map amendment should be processed concurrently with the rezone of to B-1A on the site. The land use designation to be applied is Neighborhood Commercial.

COMMUNITY FACILITY – MEDICAL, EDUCATIONAL, SOCIAL SERVICES OVERVIEW

Early planning anticipated ongoing institutional growth on the large tracts of federal land located in the UMED District core. The Goose Lake Plan stated that growth was expected in a “relatively coordinated manner while not detracting from the park-like setting and open spaciousness of the Goose Lake area.” This grouping of institutional uses was found to be “both compatible and in a desirable location for the many purposes and organizational expansion” desired by the community. Over the last 32 years the UMED organizations have achieved world-wide recognition for contributions to the health, education, and social well-being of Alaskans, therefore solidifying the positive impact of the UMED District.

The UMED organizations support their missions by providing sustainable financially-feasible programs. Interface and conservation of natural areas, providing connectivity and access to trails, active and passive recreation are also found in the community facility areas.

COMMUNITY FACILITY

The Community Facility land use designation includes small, medium and large scale development found in the UMED District and supports implementation of the many organizational master planning efforts including the Alaska Native Tribal Health Consortium, Alaska Pacific University, Anchorage School District, Mental Heath Trust Land Office, McLaughlin Youth Center, Municipality of Anchorage, Providence Alaska Medical Center, and University of Alaska Anchorage.

Other public facilities supported by this land use designation include an area owned and managed by Municipal Light and Power.

School and Community Institutional

The School or Community Institution designation provides for small to medium scale institutions that are integrated into the local neighborhood and provide a community service or focus for the area.

Locational Criteria:

- Sites as identified through a school site selection plan;
- Existing school or community institution designated areas;
- Intended to primarily serve nearby residential neighborhoods; and
- Not intended for geographic expansion at the expense of Residential.

This designation is to be implemented by the PLI zoning district.

Major Institutional

Provides for university, medical centers, and social service providers (organizations) that serve a wide area of the community, region, or state that collectively function as a major activity and employment center and are not usually integrated into residential areas. Large hospitals, university campuses, and major public administration campuses that provide services for the public may locate here. Supportive uses such as food, lodging, student housing, group housing or offices are allowed. Physical design and setbacks mitigate the external impacts of scale and allows the facilities to relate positively to surrounding street, natural areas and trail network. Natural areas can serve to tie the built environment of the campus areas together.

However, these natural areas are subject to organizational needs and authority to grow and develop in order to meet their individual mission. As the organizations develop within their identified development areas, they will need to carefully prioritize the open space system delineating between that which is built (designed or incorporated as part of development) and those intended to be left in their natural state to ensure that the Chester Creek Watershed and supporting wetland and riparian system is maintained to the greatest extent possible. Future site specific decisions will clarify the location and character of development and preservation of these areas.

Historically, some of the natural area was established through formal agreements, land patents, subdivision, easements or permits designating park or natural resource uses. These formal mechanisms have expired on some properties. Public recreation is subject to the owner/organizational decision.

Locational Criteria:

- The designated areas located south of Northern Lights, north of Tudor, east of Lake Otis Parkway, and west of the MLP power line that are primarily owned by the UMED organizations;
- To be served by transit and connecting to non-motorized facilities within the campus areas and those outside of the District; and
- Not intended for geographic expansion at the expense of Residential areas.

This designation is to be implemented by the PLI zoning district. This plan acknowledges that there are parcels designated as Major Institutional that are developed with land uses consistent with the land use designation. However, the underlying zoning for these parcels may be a zoning district other than PLI. Future development and, or redevelopment of these parcels should be consistent with the Major Institutional land use designation and those uses permitted under the PLI district.

Public Utility/Facility

This land use designation provides for public facilities and infrastructure that are industrial in character located at strategic locations to serve customers within a defined geographic area or distribution grid system. Types of public utilities include: sewer and water treatment plants, power generation plants, substations, industrial yards, water tank reservoirs, pump stations and maintenance/fleet yards. It may also include fire stations that are not oriented to on-site customer service.

Locational Criteria:

- Sites as identified in a utility master plan;
- Sites as identified in a site selection study; and
- Not intended for significant geographic expansion at the expense of Residential areas.

This designation is to be implemented by the PLI zoning district.

PARK AND NATURAL AREA OVERVIEW

The Chester Creek watershed and corridor defines the natural area found within the UMED District. Large swaths of this natural area are in organizational ownership. Some of this natural area will continue to be developed as organizational master plans are implemented. However, much of the natural area will remain, primarily those lands maintained in the Municipal park system which includes several lakes, parks, and much of the Chester Creek corridor. Conservation and restoration initiatives will need to occur in these areas consistent with the 2015 Chester Creek Watershed Plan in order to restore the health of Chester Creek and its tributaries. Active and passive recreation is allowed in these areas with paved and natural trails and park amenities.

Park

Parks located with the UMED District provide for active and passive outdoor recreation, conservation of natural resources, wildlife habitat, and trail corridors connecting the UMED core, neighborhoods, and the regional trail system. Uses include neighborhood and regional parks, special use parks that are dedicated or designated by an adopted plan for parkland or their natural resource values including wildlife habitat conservation, watershed protection and restoration, recreation and trails. Other municipal lands of high natural value that are environmentally unsuitable for development are also included. Areas are to be protected and maintained in order to "sustain and enhance environmental, social and economic functions and values of the land and watercourse" thereby supporting the natural functions of a stream, creek, and wildlife corridor within an urban environment.

Locational Criteria:

- Sites as identified in a municipal or state park master plan; and
- Sites as identified in a watershed plan.

This designation is to be implemented by the PR and PLI zoning districts.

Natural Area

Natural areas are depicted on organizational and private properties within the Chester Creek corridor and includes Class A wetlands and riparian features. This defined natural system ties the UMED Core together and serves as a bridge between the natural and urban environments. This corridor will be preserved from development. As part of the larger Chester Creek Watershed this area will continue to serve in its natural function as a creek, wetland, and riparian area providing wildlife habitat, storm water, flood relief, stream and water quality protection.

Locational Criteria:

- Sites as identified in municipal and/or organizational master plans;
- Sites described in Alaska Administrative Code, Anchorage Municipal Code, and the National Environmental Protection Act.
- Sites identified in a watershed master plan or wetland management plan; and

This designation is to be implemented across a variety of zoning districts.

4. IMPLEMENTATION

4.1 Implementation Matrix

IMPLEMENTATION TABLE

The Implementation Table includes the implementation items, proposed time line, potential participating parties and potential funding sources or resources that would be used to accomplish the implementation item.

Short term items would be implemented in 1-3 years. Intermediate items would be implemented in 3-7 years. Long term items would take from 7-10 years for implementation.

The "Ongoing" timeline indicates items that the UMED Steering Team and the public considered for continued support and attention. This includes the UMED Steering Team facilitation process, community engagement, review of transportation and other infrastructure projects, and support of reinvestment in the District as examples.

It is anticipated that this plan would have a 5-7 year time line, with an evaluation of the plan and the success of it's implementation coming in around the 7th year to determine at that time whether or not the plan should be updated.

The Implementation Table does not include the bulleted text found in the vision section description under some implementation items. The bulleted information will be used and considered during completion of those specific implementation items. PP

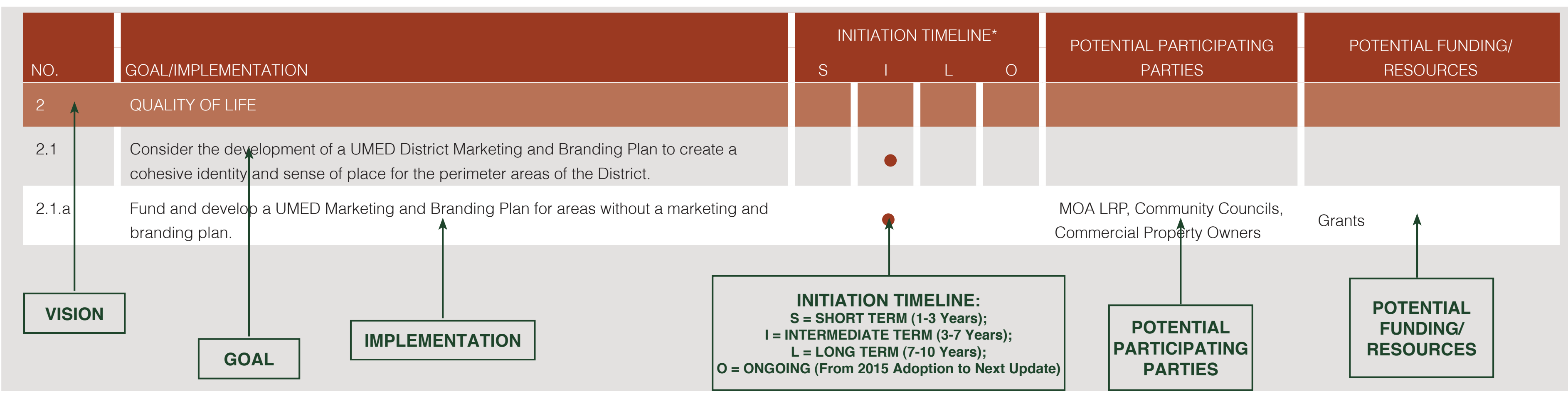


Figure 54. Hierarchy of the Implementation Table

NO.	GOAL/IMPLEMENTATION	INITIATION TIMELINE*				PARTICIPATING PARTIES	FUNDING/ RESOURCES
		S	I	L	O		
1	SUPPORTING ORGANIZATIONAL MISSIONS						
1.1	Identify a comprehensive land use strategy for the entire District to allow for institutional growth and ancillary uses that support organizational missions.						
1.a	Fund and complete corridor studies adjacent to the District in key locations to allow for institutional growth and ancillary uses that support organizational missions.		●			MOA LRP	Grants
1.2	Shape future growth in accordance with the distinct values expressed in this plan						
1.2.a	Encourage the UMED organizations to seek Assembly approval of adopted master plans.				●	UMED Organizations, Developers, MOA LRP AND CP	UMED Organizations, Developers, MOA LRP AND CP
1.3	Develop community building opportunities for the public to better understand the operational challenges and development missions of the UMED organizations.						
1.3.a	Hold regular UMED District Steering meetings to discuss issues of mutual interest that could include housing, employment, and provide progress reports in those areas. The UMED Steering Team has committed to continue meeting on a quarterly basis to help fulfill this recommendation.				●	UMED Organizations, Developers, MOA LRP, Community Councils	MOA LRP, CC'S, UMED Steering Team
1.4	Educate and provide UMED organizations and stakeholders with guidance on how to apply District development standards including Title 21 and specifically Chapter 21.03.110-Institutional Master Planning.						
1.4.a	Conduct annual or bi-annual public education meetings on Title 21 updates to ensure understanding and use of code.	●				MOA LRP & CP, UMED Organizations, Stakeholders	
2	QUALITY OF LIFE						
2.1	Consider the development of a UMED District Marketing and Branding Plan to create a cohesive identity and sense of place for the perimeter areas of the District.						
2.1.a	Fund and develop a UMED Marketing and Branding Plan for areas without a marketing and branding plan.		●			MOA LRP, Community Councils, Commercial Property Owners	Grants
2.2	Plan for a pedestrian-oriented UMED Village to serve as the identifiable heart of the District to be a go-to destination for the District to serve the needs of residents, students, staff, and visitors.						
2.2.a	Fund and prepare a conceptual plan for the UMED Village.	●				MOA LRP, UMED Steering Team, Community Councils, Developers	Grants

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NO.	GOAL/IMPLEMENTATION	INITIATION TIMELINE*				PARTICIPATING PARTIES	FUNDING/ RESOURCES
		S	I	L	O		
3	QUALITY OF THE BUILT ENVIRONMENT						
3.1	Support development of an environmentally sustainable district through energy-efficient and cost-effective solutions in buildings, infrastructure, and other district programs.						
3.1.a	Encourage implementation of the recommendations from the 2013 Co-Generation Feasibility Study through a UMED pilot project.	●				MOA LRP, ML&P, Anchorage Assembly, Cogen Industry Partners, UMED Steering Team	
3.1.b	Apply the UMED District Design Guidelines to proposed major commercial, residential, and organizational development to ensure a cohesive, context sensitive development setting in the UMED District.				●	Developers, UMED organizations, MOA Departments	Developers, UMED organizations, MOA Departments
3.2	Develop a UMED District identity to unite the publicly-owned rights-of-way at primary entrances to the UMED (streetscape improvements, signage & way finding, colors and materials, outdoor furniture and fixtures, interpretive information, etc.).						
3.2.a	Fund and complete a UMED District Way-finding plan.		●			MOA LRP, Community Councils, UMED Steering Team, Commercial Property Owners	Grants
3.3	Analyze regulatory barriers to achieving desired development within the UMED District core and create partnerships to identify and resolve solutions to such regulatory barriers						
3.3.a	Work with stakeholders, design firms, engineers and contractors to identify and implement ways of streamlining review and approval processes.						
4	TRANSPORTATION AND MOBILITY						
4.1	Design and implement roadway sections that are complete streets accommodating pedestrians, active transportation, public transit, and vehicles.						
4.1.a	Identify and fund the following roadway system projects to facilitate multi-modal access, safety, reduce congestion, and parking.	●				AKDOT&PF, MOA PM&E	AKDOT&PF STIP, AMATS
	4-R: University Lake Drive Extension from the arena round-about to a northern connection.	●				AKDOT&PF, MOA PM&E	AKDOT&PF STIP
	5-R: Determine needed drainage and curb and gutter projects throughout the UMED District residential neighborhoods in conjunction with sidewalk project improvements.	●				Community Council, MOA PM&E, DOT&PF	AKDOT&PF STIP, MOA PM&E CIP

NO.	GOAL/IMPLEMENTATION	INITIATION TIMELINE* S	I	L	O	PARTICIPATING PARTIES	FUNDING/ RESOURCES
4	TRANSPORTATION AND MOBILITY						
4.2	Provide recommendations for the Northern Access Road Project to ensure trail connectivity, safe wildlife circulation, appropriate speed limit, overall design requirements, and mitigation of the construction, operation, wildlife and traffic impacts.						
4.2.a	1-MTP: Design the Northern Access Road to provide direct northern access to the UMED District to improve circulation of people and goods, relieve arterial streets, respond to projected traffic and development growth within the UMED District, and to create safer streets for motorized and non-motorized travel.	●				UMED Steering Team, Community Councils, Public	DOWL, AMATS, AKDOT&PF, MOA PM&E
4.3	Continue to support the pedestrian-friendly walking environment found in the UMED District.				●		
4.3.a	Nominate and fund the following proposed improvements to the pedestrian network.	●				AMATS, AKDOT&PF, MOA PM&E	AMATS, AKDOT&PF, MOA PM&E
	2-NM: Add sidewalks to Career Center Drive between Northern Lights Boulevard and Mallard Lane. This improvement would provide non-motorized connection into the central part of the UAA campus from Northern Lights Boulevard.	●				AMATS, AKDOT&PF, MOA PM&E	AMATS, AKDOT&PF, MOA PM&E
	3-NM: Add sidewalks to 42nd Avenue between Lake Otis Parkway and Dale Street.	●				AMATS, AKDOT&PF, MOA PM&E	AMATS, AKDOT&PF, MOA PM&E
	4-NM: Add sidewalks to Wright Street between 40th Avenue and Tudor Road.	●				AMATS, AKDOT&PF, MOA PM&E	AMATS, AKDOT&PF, MOA PM&E
	5-NM: Add sidewalks to Dale Street between 40th Avenue and Tudor Road.	●				AMATS, AKDOT&PF, MOA PM&E	AMATS, AKDOT&PF, MOA PM&E
4.3.b	Fund and complete District-wide non-motorized multi-modal transportation projects consistent with Anchorage area bike, pedestrian, and trail plans.		●			UMED Steering Team, Community Councils, Public	State Grant
4.4	Improve MOA and DOT&PF snow removal and storage procedures to allow greater pedestrian, bicycle, and transit usage.				●		
4.4.a	Work with MOA and DOT&PF Departments to increase snow removal functions as funding becomes available.	●				AMATS, AKDOT&PF, MOA PM&E, Community Councils, UMED Steering Team, Public	MOA PME&E, AKDOT&PF, AMATS
4.5	Nominate and fund a Transportation Demand Management (TDM) program for the UMED District.						

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NO.	GOAL/IMPLEMENTATION	INITIATION TIMELINE* S	I	L	O	PARTICIPATING PARTIES	FUNDING/ RESOURCES
4	TRANSPORTATION AND MOBILITY						
4.5.a	Complete a UMED TDM Study with recommendations for funding and implementation.	●				AMATS, PeopleMover, AKDOT&PF, MOA PM&E, MATSU	AMATS, PeopleMover, AKDOT&PF, MOA PM&E, MATSU
4.5.b	Fund and construct off-site parking outside of the UMED District to meet demand for park-and-ride options and to support TDM program initiatives. Project # 2-PK - locations TBD.		●			AMATS, PeopleMover, AKDOT&PF, MOA PM&E, MATSU	AMATS, PeopleMover, AKDOT&PF, MOA PM&E
4.5.c	Fund and Implement the TDM program.		●				
4.6	Plan and Design new transportation facilities and multi-modal systems in ways that minimize impacts to natural resources including the wetlands, wooded areas, and wildlife corridors, while enhancing and maintaining the existing trails and corridors found in the District to the greatest extent possible.						
4.6.a	Implement adopted design guidelines for roadway cross-sections.				●	AKDOT&PF, MOA PM&E	AKDOT&PF, MOA PM&E
4.6.b	1-PK: Fund and construct an expanded parking area at University Lake Park.	●				MOA PM&E and Parks	MOA PM&E and Parks
5	COMMUNITY AND PARTNERSHIPS						
5.1	Continue the established UMED District coordination process through the UMED District Steering Team with regularly scheduled quarterly meetings to leverage resources and implement the UMED District Plan.						
5.1.a	Establish and fund a MOA staff position to facilitate district-wide coordinated efforts required to implement the UMED District Plan. This may include public outreach and communication, input on TDM district programs and activities, Chester Creek Watershed projects, grant writing and funding research, parks and trail planning, input on animal control and wildlife management issues, etc.	●				MOA Community Development	MOA Community Development
5.2.	Support food security research and projects that bring Alaska-grown food to the UMED District on a year-round basis through a small store, farmers markets, co-ops, and community gardens.						
5.2.a	Support food sustainability opportunities within the UMED District through grant applications, public outreach and community engagement to help support existing and new projects.				●	MOA, Community Councils, public, non-profits, farms	Grants
5.2.b.	Identify appropriate locations within the District for fresh produce and food vendors.				●	MOA, Community Councils, public, non-profits, farms	Grants

NO.	GOAL/IMPLEMENTATION	INITIATION TIMELINE* S	I	L	O	PARTICIPATING PARTIES	FUNDING/ RESOURCES
6	NATURAL RESOURCES						
6.1	Develop and implement park management plans for University and Goose Lake parks within the UMED District.	●					
6.1.a	Fund and implement the University Lake and Goose Lake Master Plans that encourages uses and activities compatible with their natural setting and value, address the adverse impacts of park activities on neighboring property owners, and promote these sites as special community amenities.	●				MOA Parks, Anchorage Waterways Council, MOA Watershed Division	MOA, Grants
6.2	Educate and encourage citizen participation in environmental stewardship projects.		●				
6.2.a	Encourage stakeholders to organize and participate in environmental stewardship programs.		●			Anchorage Waterways Council, MOA Watershed Division	Anchorage Waterways Council, MOA Watershed Division
6.3	Design roadways and trails to minimize vehicle and human/animal conflicts.	●					
6.3.a	Install wildlife fences; provide adequate sight lines in roadway and trail corridors, incorporated adopted MOA roadway design standards.		●			MOA PM&E and Watershed, AKDOT&PF, Anchorage Waterways Council	MOA PM&E and Watershed, AKDOT&PF, Anchorage Waterways Council
6.4	Map and document wildlife corridors within the District and connections to surrounding habitat areas that includes recommendations for wildlife management and impact mitigation.		●				
6.4.a	Seek grant funding to complete and publish wildlife corridor research, mapping and project report for the UMED District.		●			Anchorage Waterways Council, MOA Watershed Division, AK Fish & Game, AK Legislators	Legislative Grant
6.5	Identify and fund potential conservation easement properties between consenting parties.		●				
6.5.a	Pursue the option to preserve areas of wildlife habitat within the UMED Core area through public/private partnerships.		●			MOA Watershed, MOA LRP, UMED Organizations, Great Land Trust, The Nature Conservancy, AK Center for the Environment	Great Land Trust, The Nature Conservancy, Grants
7	ECONOMIC SUSTAINABILITY						
7.1	Support reinvestment in commercial and residential areas that reinforces a sense of place and sustains the financial requirements of the property owners.	●			●		

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NO.	GOAL/IMPLEMENTATION	INITIATION TIMELINE* S	I	L	O	PARTICIPATING PARTIES	FUNDING/ RESOURCES
7.1.a	Fund and complete targeted area studies to determine whether specific under-utilized properties could be developed with higher densities, increased building heights, and/or small lot development.	●			●	MOA LRP, Realtors, Developers, Community Councils	MOA, Grants, Developer
8	GROWTH AND CHANGE						
8.1	Shape future growth in accordance with the values expressed in this plan				●		
8.1.a	Provide Community Council participation on the UMED District Steering Team.				●	Community Councils	
8.1.b	Review and comment on UMED projects through the Community Council notification process.				●	MOA, Community Councils, UMED organizations.	
8.1.c	Complete an annual Capital Improvements Program list of projects for pedestrian, park, and roadway projects to be submitted to the MOA.	●				Community Councils	
8.1.d	Provide Assembly and AK Legislators input on issues facing the UMED neighborhoods.				●	Community Councils	
8.1.e	Provide input to projects that support and enhance a pedestrian-friendly neighborhood environment that prioritizes non-vehicular modes of transportation.				●	Community Councils	
8.1.f	Participate in the concept development of the UMED Village to accommodate a growing population and create a sense of community.				●	Community Councils	
8.1.g	Review transportation and infrastructure projects to ensure that projects enhance rather than detract from the District character.				●	Community Councils.	
8.2	Listen to and incorporate residential neighborhood and community council input early in the process.						
8.2.a	Use the community engagement process to allow all stakeholders including District employees, students, area residents, and community councils to share ideas and provide input.				●	UMED Organizations, MOA Departments, AKDOT&PF	UMED Organizations, MOA Departments, AKDOT&PF
8.2.b	Encourage UMED organizations to communicate and coordinate efforts of a community interest on a regular basis.				●	UMED Organizations, MOA Departments, AKDOT&PF	UMED Organizations, MOA Departments, AKDOT&PF

NO.	GOAL/IMPLEMENTATION	INITIATION TIMELINE* S	I	L	O	PARTICIPATING PARTIES	FUNDING/ RESOURCES
8.2.c	Provide greater transparency by facilitating public online access to the Municipality of Anchorage's data, project information, etc.				●	MOA Departments	MOA Departments
8.2.d	Develop annual capital programs and operating budgets to respond to Community Council requests for district-wide improvements such as a snow plowing services, signage, interpretive plans, road, park and pedestrian improvements, etc.				●	MOA Departments	MOA Departments
8.3	Provide Community Council participation in the next UMED District Plan Update					Community Councils	
8.3.a	Nominate Community Council members to represent the neighborhoods on the next UMED District Plan update team.		●			Community Councils	
8.4	Establish a recommended revision/amendment date for the next UMED District Plan update.						
8.4.a	Evaluate and fund the UMED District Plan Update every 5-7 years.		●			UMED Steering Team	Grants

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5. APPENDIX

APPENDIX CONTENTS

INTRODUCTION

Examination of best practices on a variety of topics was primary to crafting the Vision Elements of this plan. This research was compiled into in-depth case studies and less detailed examples that can direct further research and education. The UMED District Plan Cogeneration Report Update 2013 was a required element of the state of Alaska grant. Since its publication in 2013 the report has been used extensively by the UMED organizations and other interested parties throughout the state of Alaska.

CASE STUDIES

The Transportation Demand Management case study analyzes methods for: improving access, relieving traffic congestion, managing parking, and leveraging existing transportation infrastructure, reducing transportation costs for users, reducing transportation development costs, and meeting sustainability goals. This section presents detailed analysis of TDM issues and identifies examples from around the country. Sources are also provided for additional research.

The case study on mixed-use land development focuses on the financial mechanisms and the partnerships that enable mixed-use development to occur. The case study examines three developments within relevant university neighborhoods: University Square in Madison, Wisconsin; the Uptown in Cleveland, Ohio; and the University Marketplace in Vancouver, Canada. These case studies explain how revitalization of strip commercial centers, public-private partnerships, and cross organizational collaboration come together in realizing mixed-use development.

Finally, the case study on natural resources examines topics relating to the Natural Resources vision element in the UMED District Plan Update. Topics covered in this case study include water quality, urban forests, land development, and urban wildlife.

EXAMPLES

The Examples are less in-depth than the Case Studies and are meant to highlight best practices, generate creative ideas, and provide resources to guide further research. The examples of positive town-gown relationships examine methods for encouraging relationships between organizations and the residential communities they are situated in. The examples of night lighting and light pollution focus on the prevention of light pollution at night. Finally, the examples of fresh food access provide examples of farmers' markets and mobile food vendors which provide good interim access to fresh foods while the UMED District plans for growth. Finally, cross organizational collaboration focuses existing positive models within the UMED District for coordinated planning and growth.

SUPPORTING DOCUMENTS SUMMARY

This section contains a detailed summary of the Supporting Documents. The Supporting Documents report is a separate publication that contains an in-depth summary of various existing conditions within the District. The analysis presented in this document provided beneficial information critical to shaping the UMED District Plan Update.

5.1 CASE STUDY: TRANSPORTATION DEMAND MANAGEMENT

This section summarizes Kittelson & Associates, Inc.'s assessment of Transportation Demand Management (TDM) strategies for the UMED District Master Plan Update in Anchorage, Alaska. It includes relevant background on TDM and its effectiveness, as well as case studies featuring new emerging transportation practices and TDM strategies from other areas. It concludes with a menu of proposed TDM strategies for consideration at the UMED District.

INTRODUCTION

Transportation Demand Management or Travel Demand Management (both TDM) is the application of effective strategies and policies to reduce travel demand [specifically that of single-occupancy private vehicles (SOV)], or to redistribute this demand in space or in time. TDM efforts are targeted in a way that strives to balance the relationship, in both convenience and cost, between driving alone and using "alternative modes," which include transit, biking, walking, skiing, car-sharing, and/or telecommuting. The most successful TDM programs are (a) directed toward meeting clear targets or goals for trip choice across all modes and (b) tailored to the unique qualities and factors that distinguish an access area or supply.

There are many reasons for pursuing TDM plans and measures. These include:

- Creating more access options for users;
- Managing congestion;
- Reducing constraints on existing parking supplies/ avoiding costly parking expansions;
- Leveraging existing resources (e.g., transit, bike lanes, shuttles, park & ride lots);
- Reducing transportation costs to users;
- Reducing development costs; and/or
- Contributing to and meeting environmental and sustainability goals.

Although TDM programs and measures are often focused on employers, some elements are also applicable to residential developments. Government support (particularly related to zoning, development regulations, and infrastructure provisions) can be influential in maximizing the effectiveness of TDM programs.

Many areas have opted to create a transportation management association (TMA) to develop and support a TDM program.

TMAs are associations of public and private entities that work to solve traffic congestion and transportation issues in a specific area. Typically, TMAs help facilitate commuter support strategies for businesses in the area. The TMA may help advocate on behalf of its membership. TMAs can typically provide and manage TDM programs more efficiently than individual organizations.

EFFECTIVENESS

A variety of research has been conducted to assess the effectiveness of TDM strategies. Based on a review of relevant research, the following conclusions were made:

- The trip reduction that can be achieved at a given development is heavily influenced by the environment in which the development is located. Factors like transit service, the pedestrian and bicycle environment, parking availability, density, and mix of uses significantly impact the types of trips generated to and from the development.

- Although a number of employers have conducted employee surveys to track the impact of TDM programs, research has found it difficult to isolate the impact of individual strategies on overall trip reduction. This is due to issues like differences in survey definitions of TDM strategies, lack of specificity regarding level of employer program support (particularly in terms of financial incentives), lack of tracking of individual employee travel patterns over time, and lack of knowledge of environmental conditions at a particular employer (e.g., carpool lane provision, level of transit service, pedestrian environment).
- Research has shown that the effects of individual strategies are not additive: a particular strategy may have a stronger effect when it is the only strategy provided, compared to when it is included as part of a package of strategies.
- The combination of good environment and good TDM can result in significant trip reduction.

RESOURCES

The following resources were reviewed as part of this project and are recommended for further reading on TDM:

TCRP REPORT 95, CHAPTER 19: EMPLOYER AND INSTITUTIONAL TDM STRATEGIES (2010)

The Transit Cooperative Research Program (TCRP) Report 95: Traveler Response to Transportation System Changes Handbook series consists of 19 chapters. The chapters were published as separate volumes over a period of years. The handbook provides information on the travel demand effects of a variety of urban transportation policies, such as transit pricing and fares (Chapter 12), transit-oriented development (Chapter 17), and parking management (Chapter 18). Chapter 19, Employer and Institutional TDM Strategies, is the most recent comprehensive review available of the relative importance and impacts of TDM strategies.

Chapter 19 of the handbook provides a description of the various TDM strategies, and classifies them in to the following broader types of strategies:

- Employer or Institutional support Actions
- Provision of Transportation Services
- Financial Incentives or Disincentives
- Alternative Work Arrangements

The report compiled the data from four independent studies to amass a sample of 82 TDM programs in order to make assessments about the effectiveness of the different types of TDM strategies. To assess effectiveness, the report uses vehicle trip reduction (VTR), defined as the "incremental reduction achieved in the vehicle trip rate, expressed as a percentage of the starting-point trip rate."

It also discusses employee participation and the cost effectiveness of the types of TDM strategies. Lastly, the report provides five case studies of TDM programs that include marketing and outreach programs, transit programs, staggered work hours and a transportation management association (TMA).

This handbook was primarily used to provide a comprehensive overview of a large variety of TDM strategies and estimate the effectiveness of the strategies recommended for the UMED District. It is available for download online at: www.trb.org/Publications/TCRPReport95.aspx

TCRP REPORT 95, CHAPTER 13: PARKING PRICING AND FEES (2006)

Chapter 13 of TCRP Report 95 provides a review of traveler response to the introduction of parking pricing and fees and to changes in parking fees. It discusses a variety of types of parking pricing strategies and the anticipated traveler response. The report concludes that TDM programs based on carefully balanced cost incentive/disincentive actions and offering realistic travel alternatives tend not only to have visibly grater effect on employee vehicle trip rates, but also to sustain those changes over time."

The report discusses the underlying factors that impact how travels respond to parking pricing strategies. Understanding these factors is important for predicting how successful a parking pricing program will be and maximizing the effectiveness of such a strategy.
The factors include:

- Income: higher income travelers may be less sensitive to changes in prices for parking.
- Parking Supply/Management: parking fee programs are more easily implemented in environments where the parking supply is limited.

- Land Use and Site Design: favorable land use characteristics and site design make parking pricing much more likely to be successful.
- Travel Alternatives: attractive, available travel alternatives will impact the degree to which parking pricing will be effective.

The report includes four case studies of different parking programs. It is available for download online at: www.trb.org/Publications/TCRPReport95.aspx

ONLINE TDM ENCYCLOPEDIA

Todd Litman of the Victoria Transport Policy Institute, based in Victoria, British Columbia, compiles and regularly updates research findings on TDM and publishes them on the web as the Online TDM Encyclopedia. The "TDM Strategies" section provides individual pages relating to specific TDM strategies, organized into the following major categories according to how the strategy affects travel:

- Improved Transport Options
- Incentives To Use Alternative Modes and Reduce Driving
- Parking and Land Use Management
- Policy And Institutional Reforms

The encyclopedia provides a description of each strategy, anticipated travel impacts, benefits and costs, equity impacts, applications, relationships with other TDM strategies, guidance on implementing, best practices, examples, and references for more information.

The breadth of strategies covered is very extensive and the encyclopedia serves as a search tool for accessing other relevant research. The encyclopedia is available at: www.vtpi.org/tdm

TCRP REPORT 107: ANALYZING THE EFFECTIVENESS OF COMMUTER BENEFIT PROGRAMS (2005)

Transit Cooperative Research Program (TCRP) Report 107 provides research from metropolitan areas across the US that examines the effectiveness of transit benefits programs on employee travel behavior and on transit agency ridership, revenues, and costs. The report is broken in to three chapters, which include:

- An overview of commuter benefits
- Guidance on how to evaluate the effectiveness of a transit benefits program, although the guidance can be applied to all types of commuter benefits programs.
- Research on the effects of transit benefits programs.

The report details the pros and cons of a variety of types of transit pass programs and provide examples. It is available for download online here: www.trb.org/Publications/Blurbs/156427.aspx.

TDM CASE STUDIES

The following case studies feature the application of TDM strategies in developments, cities, and colleges across the country. They provide relevant examples for transportation practices and strategies that may be applicable to the UMED District. Each case is summarized below, with an emphasis on the potential applicability to the UMED District.

ANCHORAGE DOWNTOWN IMPROVEMENT DISTRICT (ANCHORAGE, ALASKA)

The Anchorage Downtown Improvement District (ADID) was established by the Anchorage Assembly with an ordinance in 1998. The purpose of the improvement district is to provide additional municipal services in the 113 square blocks of the downtown Anchorage area. The additional services include downtown ambassadors to provide information and safety/security assistance, cleaning crews for sidewalks, graffiti removal, coordination with Municipal law enforcement, and active promotion of public events in downtown.

The Anchorage Downtown Partnership (ADP) was formed with the mission to "increase cleanliness, occupancy rates, and investment values and lease income, to decrease crime, and to generally stimulate economic development and improve the quality of life in downtown Anchorage."

The ADP includes administrative staff, security staff, and a maintenance team. In addition, the Anchorage Community Development Authority (ACDA) works to support public-private partnerships and develop creative parking solutions in the downtown area.

The majority of the funding for the ADID was established in the ordinance process and consists of additional property assessments administered through the MOA. Additional funds are raised for the ADIP in the form of donations and grants as well as dues paid by the members of ADP.

Potential Applicability to UMED District

The Municipality of Anchorage could consider creating an improvement district for the UMED area to help fund common services like street cleaning, snow removal, and parking facilities. However, the funding of the improvement district would require special assessments or dues as large portions of the property in the UMED District currently have tax exempt status.

LLOYD CENTER TMA (PORTLAND, OREGON)

Transportation Management Associations (TMAs) within the City of Portland serve as the institutional framework and coordinating entities for TDM programs.[34] The TMAs are non-profit, member-controlled organizations that provide transportation services within a defined area such as a commercial district, mall, medical center or industrial park. The Lloyd District TMA is a commonly cited example and represents a partnership between property owners and businesses within the Lloyd District, the City of Portland, and TriMet (public transportation agency).

First formed in 1994, the Lloyd District TMA developed a comprehensive partnership agreement that was implemented in 1997. The TMA's recommended package of improvements included efforts to:

- Improve transit service;
- Improve access and amenities for bicycling and walking;
- Set maximum parking ratios for new office and retail development;
- Manage and limit the supply of parking on large surface parking lots;
- Develop a plan for installing parking controls and parking meters in the district to eliminate free on and off-street commuter parking spaces;
- Complete agreements by the private sector to support and implement employee transit subsidy programs;
- Establish a private sector funding program through formation of a Business Improvement District;
- Implement the Lloyd District Partnership Plan and its associated employer based transportation program; and
- Share parking meter revenues (through the Lloyd District TMA) to support transportation and parking services within the Lloyd District.

The TMA partnership approach exemplified by the Lloyd District TMA appears to be a win-win for the City and locals as it helps the City by monitoring the TDM success and failures as well as offering local business and residents an opportunity to participate in efforts to reduce traffic and vehicle trips.

Separate from the TMAs, the City of Portland also offers individualized TDM marketing to all downtown employees through its Smart Trips program.

Potential Applicability to UMED District

The TMA approach appears viable and applicable to the UMED District. Due to the number of individual employers and institutions within the District, creating one over-arching organization to develop and administer TDM programs could be most efficient. A TMA can mitigate traffic congestion and transportation issues in a specific area and facilitate commuter support strategies for participating businesses and institutions. The TMA may help advocate on behalf of its members, help secure discount transit passes, provide car-sharing services, or facilitate Guaranteed Ride Home programs. The TMA may also facilitate discussions and programs related to a district-wide shuttle bus system, shared parking, and snow removal. Many employer-based programs and services may be more effectively and efficiently provided through a TMA than by individual businesses.

CITY OF BEND, OREGON

The City of Bend has a TDM option that allows a developer/applicant to reduce their trip generation for traffic study purposes by creating a TDM Program.[35] Chapter 4.7 of the Bend Development Code states "The applicant may choose to develop a TDM program to reduce net new trip generation for a proposed project when trip reductions are necessary to minimize off-site mitigation requirements. Proposed elements of the TDM program will be evaluated to determine trip reduction rates."

Per Bend Development Code Chapter 4.7, the following trip reduction rates shall be applied if a TDM program with these elements is developed by the applicant:

- Provide employee showers, lockers, and secure bike parking according to requirements of the Bend Development Code - five percent (5%) trip reduction;
- Project is located within ¼ mile of a transit route – five percent (5%) trip reduction;
- Project is located within ¼ mile of a transit route and employer provides free or significantly reduced monthly bus passes to employees - ten percent (10%) trip reduction;
- Project provides free priority parking for carpools/ vanpools – five percent (5%) trip reduction;
- Project provides free priority parking for carpools/ vanpools but fee non-priority parking for other employees - ten (10%) trip reduction;
- Other TDM elements as approved by the City Engineer;
- Maximum trip reduction for combined TDM program elements - twenty-five (25%) trip reduction.

The Transportation Impact Study is required to show that the proposed trip reductions will be adequate to reduce the development's trips and bring the transportation system into compliance with the operations criteria. A modification to the original site plan approval must be obtained if TDM program elements change significantly.

Separate from the developer driven TDM effort, the City of Bend created the TravelSmart program to provide public outreach that encourages people to use alternate modes of transportation and reduce single occupant vehicle trips. The TravelSmart program includes direct contact with individual households to help people evaluate and choose alternate modes as well as encouragement to use mobility options throughout the day for all trips.

While Bend Development Code Chapter 4.7 allows for the reduction of vehicle impacts as part of the entitlement process, it is unclear to what extent this mechanism has been used or how it is enforced beyond the initial land use conditions of approval for off-site mitigation measures.

Land Use	Minimum Size Triggering TMP
Office	50,000 or more square feet of usable space.
Retail	40,000 or more square feet of usable retail sales space.
Industrial	150,000 or more square feet of usable industrial space.
Residential	250 or more dwelling units.
Mixed-use	Any combination of space including one or more of the foregoing uses, at the threshold size applicable to that use. If the threshold is satisfied in any of the uses, the TMP must be prepared for all uses present in the project.

Figure 55. Land Use Sizes to Prepare TMP

Potential Applicability to UMED District

The Municipality of Anchorage could consider creating an incentive-based program to encourage existing and new developments in the District to develop TDM plans and/or provided TDM programs for the UMED District. An incentive-based program would require modification to the traffic impact analysis process under the direction of the Municipal traffic engineer or an amendment to the Municipality of Anchorage Development Code.

ALEXANDRIA, VIRGINIA

The City of Alexandria has operated and maintained a TDM program for over 20 years (the implementing ordinance dates to May 1987).[36] The City recently updated their Long-Range TDM plan (called Local Motion) that incorporates goals and objectives and offers ways to achieve them.

As part of the TDM program, the City requires developments of a certain minimum size to create a transportation management plan (TMP) prior to the issuance of building permits. These plans must be funded and monitored by the developers/applicants and are enforced closely by staff.

Per the local ordinance requirements, the land uses in the following chart must prepare TMPs. The TMPs are conveyed in perpetuity with the land. To ensure the TMP continues, applicant/developer parties are required to prepare appropriate language to inform tenants/owners of the TMP special use permit and conditions therein prior to the signing of any lease/purchase agreements. The City Attorney's office reviews and approves the language.

To provide flexibility, the Transportation and Environmental Services Department Director (the department administering the TMPs) is allowed to approve modifications to TMP activities if the changes are consistent with the goals of the TMP.

The City conducted an audit in July of 2006 and found that 54 transportation management plans had been prepared to date. Of the 54 plans, 45 were active; 3 were prepared but the projects developed in a manner that did not require a TMP or were not developed, and 6 had been prepared and were in the approval process. City staff administers a compliance verification program that includes:

- A Semi-annual Fund Report used to record the TMP financial contributions made by a TMP holder to support the transportation activities;
- Residential and commercial surveys used by residents and employees of developments holding a TMP;[37] and
- A TMP Annual Report with a narrative of the TMP activities completed each year, including a summary of the survey and identification of TMP activities are planned for the coming year.

Potential Applicability to UMED District

The Municipality of Anchorage could consider creating a requirement for developments of a specified size to develop TDM plans. The requirement for TDM plans would an amendment to the Municipality of Anchorage Development Code.

PORTLAND COMMUNITY COLLEGE (PCC)

The Parking & Transportation Department at PCC created its first TDM plan for the community college in 1992. Since then, PCC conducted a transportation study in 2007/2008 to assess transportation needs and options, travel behavior and opinions, and transportation related goals and strategies. The intent of the study was to review progress made through the TDM program and provide recommendations for improvements. PCC updated its TDM plan in 2012 through a process that involved broad outreach and targeted involvement as well as an extensive review of existing transportation facilities at each of the campuses throughout the Portland area.

The recommended parking and access management strategies in the TDM plan are organized by the following categories:

- Policy Actions
- Transit Access
- PCC Shuttle Access
- Single Occupant Vehicle Access
- Rideshare Access
- Organization for Implementation & Monitoring
- Bike/Walk Access
- Technological Access
- Communication/Awareness
- External Partners
- TDM Support

Within each category, strategies are organized in to a “core program” and “support strategies.” PCC’s TDM plan is available online here: http://www.pcc.edu/resources/parking/sustainability.html

Potential Applicability to UMED District

Three elements of the PCC TDM plan that may be utilized in the UMED District are as follows:

- Parking Pricing Strategy – development of a parking price structure for the various user groups to encourage non-SOV usage. Parking rates were developed for full-time students, part-time students, faculty and staff, visitors, ride-share, and seniors.
- TDM & Sustainability Program Website – development of an interactive website to provide a general description of the TDM program, assistance with alternative travel mode choices, purchasing of parking permits, and explanation of rules and operations.
- Employee Transportation Options Coordinator – assignment of a transportation options coordinator to assist employees with commuter travel choices.

UNIVERSITY OF WASHINGTON

The University of Washington (UW) is the largest university in the Northwestern United States and one of the oldest universities on the West Coast. The university has three campuses, with its largest campus in the University District of Seattle. UW also has two other campuses located in Tacoma and Bothell. UW has approximately 4,000 instructional faculty and 43,000 students.

The University of Washington uses a program called the U-Pass. Developed in 1991, the program is so successful that almost 80% of all trips made to UW Seattle are non-SOV. All students are automatically enrolled in the U-Pass program and can only “un-enroll” if they purchase a parking permit for the quarter. As part of the program, UW has secured partnerships with other local businesses to offer discounts to all students, staff, and faculty that use the U-Pass. UW conducts an annual survey to determine the reduction of daily vehicle trips. UW conducts a biennial survey of all U-Pass riders.

The University of Washington is working with King County, the City of Seattle, and their green team to implement a cohesive Climate Action Plan. As part of the plan, UW utilizes the following TDM measures:

- Inter-campus shuttle service
- Fee-based parking
- Guaranteed Ride Home
- Carpool matching, vanpool subsidy, and car sharing
- Bicycle parking

Potential Applicability to UMED District

The University of Washington TDM program has been very successful and the five primary elements listed in the previous section may help reduce SOV trips within to the UMED District.

STANFORD UNIVERSITY

Stanford University (Stanford) is a private research university on an 8,180-acre campus in Palo Alto, CA. It is situated approximately 20 miles northwest of San Jose and 37 miles southeast of San Francisco. Stanford has a student body of approximately 6,900 undergraduate and 8,400 graduate students.

Due to the high cost of housing, Stanford provides an opportunity for faculty members to live within walking or biking distance of campus. The faculty housing is composed of land owned entirely by Stanford. Similar to a condominium, the houses can be bought and sold but the land under the houses is rented on a 99-year lease. The program offers a free 15-route shuttle system that runs on biodiesel with two diesel-electric hybrid buses. Annual ridership on shuttle buses climbed to over 1.4 million in 2009.

Stanford’s transportation program utilizes the county Eco-Pass. It also has a 7,500 member carpool database, and offers transit discounts for Cal train, VTA, Dumbarton Express and AC Transit’s Line U. The program includes car sharing, commute planning, vanpools, and a bicycle support program.

Stanford has seen a 30% increase in shuttle ridership at the Cal train commuter rail station (30% between 2004 and 2009). In 2010, 52% of employees used alternative transportation to commute compared with 24% in Santa Clara County.

The Stanford TDM program focuses on “no net new commute trips during peak hours” as measured in 2001 for all new development and population growth.

The primary TDM measures at Stanford University include:

- Fee based parking
- Go Pass/ECO Pass Program
- Inter-campus shuttle
- Car rental subsidy and car sharing
- Bicycle parking

Stanford also provides a good model for a development-wide parking strategy. The Santa Clara County General Use Permit (GUP) for Stanford University sets a parking limitation for the campus as a whole. No one building has a designated maximum; rather, the quota limits the amount of parking allowed within the geographic area encompassing the university. Stanford's transportation planners use discretion in deciding where to build parking, and within the campus no parking lots have been made exclusive to specific buildings. For example, parking located beneath the Stanford Graduate School of Business is also used for people attending nearby sporting events. This holistic parking strategy gives the university the flexibility to reassess overall parking needs in an ongoing basis, without having to request parking permits from the county for every new project. Instead, the university meets with the county every ten to fifteen years to reassess the parking limitation set by the GUP.

- Per the current GUP, Stanford is given a limit of 2,300 additional parking spaces for the whole campus—Stanford already has 20,000 existing spaces.
- Permits may be granted for parking that is part of housing developments that exceed 3,018 units or housing in areas that are low and medium density. In addition, the GUP stipulates that the university will participate in a residential permit program to control parking in residential areas.

Potential Applicability to UMED District

The five primary elements of the successful Stanford TDM program listed above may be tailored to help the UMED District reduce SOV trips. Regarding shared parking, the Municipality of Anchorage could consider a parking limitation for the UMED District. This would require collaboration among the institutions to assess their collective parking needs.

UNIVERSITY OF CALIFORNIA – SAN FRANCISCO

The University of California at San Francisco (UCSF) is the second-largest employer in San Francisco, with approximately 22,500 paid faculty and staff (including both University and UCSF Medical Center employees). It has approximately 3,000 students enrolled in degree programs, 1,600 residents, and 1,000 postdoctoral scholars. The University has three main locations, including the original campus at Parnassus, the teaching and research campus at Mission Bay, and the Mount Zion campus, which is a hub of specialized medical center clinics and surgery services. All three campuses are located near downtown San Francisco.

UCSF qualified for the Bay Area's Best Workplaces for Commuters in 2012, which recognizes employers that are committed to "reducing traffic and air pollution and improving quality of life for commuters."

UCSF utilizes a number of TDM strategies at its campuses, including:

- Fee based parking
- Priority parking for "green vehicles"
- Discounted parking for registered carpools
- Shuttle service between campuses, San Francisco general hospital, and BART stations (with front bike racks)
- Bicycle parking, "Bike Access Pass" shower program, and discounted bike rentals
- Vanpool program with 12-passenger vans provided
- Emergency Ride Home service
- Discounted Car Share membership
- Pretax transit passes

The University is a partner in the San Francisco County Transportation Authority TDM Partnership Project. The project is intended to advance TDM throughout the city and build partnerships with and among private and institutional actors to more efficiently implement TDM programs.

Potential Applicability to UMED District

The elements of UCSF's TDM plan most applicable to the UMED District include discounted parking for registered carpools, vanpool program, and Emergency Ride Home service.

UNIVERSITY OF MINNESOTA – MINNEAPOLIS

The University of Minnesota, Twin Cities, is a public research university with its flagship campus in Minneapolis. There are about 52,500 students enrolled at the Twin Cities campus. The University has adopted a parking policy that "supports transportation alternatives to the single occupant vehicle." As a result, the policy states that "fewer parking spaces are needed on campus." The University's parking policy is a result of recommendations made by the 1999 Parking and Transportation Task Force.

Goals of the policy include reducing vehicular traffic, encouraging the use of park and ride facilities, reaching a split of 50 percent or fewer trips by private automobile (including carpooling), and set an upper limit on parking spaces.

The University provides a number of TDM programs, including:

- Fee based parking
- Campus shuttle service
- Discounted bus passes
- Bicycle parking and lockers
- Bicycle sharing program (in partnership with the City of Minneapolis)
- Pedestrian walkways, tunnels, and skyways connecting many buildings on campus

Potential Applicability to UMED District

The campus shuttle service and bicycle sharing program included in the University of Minnesota's TDM plan are likely most applicable to the UMED District.

TDM FOR THE UMED DISTRICT

Transportation Demand Management (TDM) strategies could be effective in the UMED District to:

- Capitalize on the mixed-uses in the area by encouraging non-SOV trips between the different uses and sharing resources (i.e. parking and shuttle service) across the development;
- Facilitate cooperative transportation services and programs among the diverse academic, medical, governmental, residential and commercial uses in the District;
- Utilize existing transit service and bicycle and pedestrian facilities, while strategically planning multi-modal facilities for the future;
- Efficiently plan facilities (i.e. parking and roadway improvements) for the future that meet transportation needs;
- Enhance the livability and sustainability of the UMED District by minimizing SOV-trips during peak periods and encouraging alternative modes of travel;
- Proactively guide the future development of the District to encourage multi-modal trips.

The following is a comprehensive menu of TDM strategies that may be applicable to the UMED District. The strategies are organized into employer-based programs and services, parking management, and development-based strategies. A short description of each strategy is provided. The strategies are summarized in Table 2.

EMPLOYER-BASED PROGRAMS AND SERVICES

Employers can set policies or create programs to manage travel demand. These may be individual – such as offering flexible work hours – or collective through a TMA that coordinates TDM programs for all participating employers. A TMA can mitigate traffic congestion and transportation issues in a specific area and facilitate commuter support strategies for participating businesses. The TMA may help advocate on behalf of its members, help secure discount transit passes, provide car-sharing services, or facilitate Guaranteed Ride Home programs. Many employer-based programs and services can be more effectively and efficiently provided through a TMA than by individual businesses.

In the UMED District, a TMA may be helpful in implementing effective TDM for businesses by working across the different uses to implement these strategies. The employer-based strategies are applicable to the academic, medical, governmental, and commercial uses in the District. Strategies include:

- Alternative work hours or tele-working: Alternative work schedules allow employees to work non-traditional hours to avoid traffic or reduce their number of trips to the office. There are several types of alternative work schedules, including flextime, compressed work week, and staggered shifts. Telecommuting programs allow an employee to work at a remote location (such as his or her home) one or more days a week instead of commuting to the work site. All of these strategies are intended to reduce total trips to the office, especially during peak hours.

- Transit Financial Incentives: Employers can offer prepaid or discounted transit passes to employees who agree to commute by transit. Fares can be partially or fully subsidized, or employees can be given the option to buy transit passes pre-tax. Employers could develop their own transit incentive programs or work together with the MOA Public Transportation Department to develop a program.
- Shuttle Bus Services: A private shuttle service operated by a TMA can supplement vital transit connections where gaps exist. Connections between the nearby transit stations or park-and-ride lots may allow employees to use non-auto commuting modes. In some cases, employers can use these shuttles to provide connections between different office locations in the area. The Seawolf Shuttle (UAA) and the ANMC Shuttle already operate in the UMED District and the routes may be modified and/or expanded to serve the entire District. Shuttles could meet commuters in a remote lot, thus reducing the SOV trips to the District, not just within it.
- Ridesharing: Ridesharing programs encourage carpooling or vanpooling. Carpooling typically uses participants' own automobiles, while vanpooling usually uses rented vans. Employers may put compatible commuters in touch with one another through simple employee match listings or computerized matching programs.

TDM Strategy	Implementation Time Frame			Effectiveness	Cost	Cost-Effectiveness Ratio
	Short-Term	Mid-Term	Long-Term			
Employer Based						
Alternative Work Schedules/Telecommuting	■			▲	$	★★
Transit Financial Incentives	■			▲	$-$$	★★
Shuttle Bus Services	■			▲	$$	★★
Ridesharing	■			▲	$	★★★
Commuter Support Services	■			▲	$	★★★
End of Trip Facilities	■	■		▲	$-$$	★
Parking Management						
Parking Supply	■	■		▲	$$	★★
Parking Pricing	■			▲	$	★★★
Employer-Focused Parking Strategies	■			▲	$	★★★
Development-Wide Parking Strategies	■	■		▲	$	★★★
Development-Based Strategies						
Increasing Connectivity		■	■	◊	$$-$$$	★★
Streetscape Improvements	■	■	■	◊	$$-$$$	★★
Area Pedestrian Improvements		■	■	◊	$$-$$$	★★
Area Bicycle Improvements		■	■	◊	$$-$$$	★★
Area Transit Improvements		■	■	◊	$$-$$$	★★

Figure 56. TDM Strategies for the UMED District

- Ridesharing (continued): Employers may also use marketing programs, sponsor vanpools, provide preferential parking spaces, or offer financial incentives to encourage ridesharing. Employers could develop their own ridesharing incentive programs or work together with the MOA Public Transportation Department to develop a program.
- Commuter Support Services: Employers provide support services and programs that replace employees' reliance on having a personal vehicle and encourage employees to bike, walk, take transit, or rideshare instead. These programs can be tailored to address employees concerns with commuting by alternative modes, such as traveling to meetings, getting home in an emergency, or working late. Potential services include providing a Guaranteed Ride Home (GRH), the use of company vehicles, a corporate car sharing account, and reimbursement for business travel by transit or bike.
- End-of-Trip Facilities: Employers provide bicycle amenities like secure bicycle storage, lockers, showers, and changing facilities to encourage employees to bike or walk to work. Some communities have started to create standards for the minimum number of bicycle parking spaces required at buildings and other facilities. In some cases, bicycle parking may be substituted for a portion of automobile parking. Bicycle facilities are also a requirement for LEED Certification and to be eligible to be a "Bicycle Friendly Workplace."

PARKING MANAGEMENT

Parking management strategies provide incentives to non-single-occupant vehicle travel by eliminating or reducing subsidies for storing vehicles at the destination. Parking strategies should be comprehensive throughout the UMED District. Strategies like unbundled parking, shared parking, and parking pricing may be appropriate for the area. Rather than requiring individual entities to provide their own parking, parking could be provided for the area as a whole, with organizations funding a share of the cost, to the benefit of all.

A parking management program should be pursued along with other TDM strategies to ensure that there are attractive alternative travel choices in the UMED. It is important to ensure that adequate parking is provided (so as not to create problems like parking spill-over to adjacent uses, driver frustration, or discouraging people from traveling to the District).

However, opportunities exist to pursue strategies to discourage the construction of excess parking and relax once inflexible parking requirements. The parking needs of the UMED District should be closely assessed to ensure that an appropriate amount of parking is provided and that there are opportunities to strategically minimize the parking supply. Potential strategies to be pursued as part of a parking management plan include:

- Manage Parking Supply: The supply of parking can be managed to achieve strategic objectives, such as reducing the share of commuters that drive alone to work. If insufficient parking is provided, parking may spillover into adjacent areas or travelers may choose alternate destinations.

However, if too much parking is available, resources are wasted and drivers have less incentive to choose other modes of transport. Parking can be managed for an entire development, residential area, employment center, or commercial area. Some jurisdictions are developing parking maximums (as opposed to traditional parking minimums) for land uses and developments.

- Parking Pricing: Employers and institutions can impose parking pricing to reduce single occupancy vehicle (SOV) use, pass along the actual cost of parking from the provider to the user, and decrease the supply of parking spaces demanded. Parking pricing programs can be flat (i.e. same for all users) or variable depending on parking duration or vehicle occupancy. Fees can be collected via a parking permit program or meters.
- Employer-Focused Parking Strategies: Employers implement parking strategies to discourage employees from driving alone and instead encourage alternative modes of commuting to work. Strategies include:
    - Parking Cash Out: Employers offer employees the option of exchanging their free parking spaces for the cash equivalent. The intent is to encourage employees to use the cash-out to offset the cost of other transportation options, such as walking, biking, or transit.
    - Preferential Parking: Reserved parking spaces for employees that carpool or vanpool. Reserved spaces may be located near a building entrance or in a sheltered location.

- Development-Wide Parking Strategies: there are several other strategies that can be used to manage parking. Rather than identifying and constructing parking spaces for each land use in a development, parking can be strategically placed, priced, and managed to limit the amount of parking needed. Other strategies for managing parking include:
    - Share parking: design parking to serve multiple uses at different times of the day (e.g., a restaurant can share parking with an office complex; a school can share parking with a church).
    - Establish parking maximums: place limits on the maximum amount of parking capacity allowed at a site or within an area.
    - Improve walkability: improve pedestrian facilities and plan developments so that visitors can easily walk between multiple destinations.
    - Unbundle parking: instead of bundling the price of parking with building costs, sell or rent parking separately from building space.
    - Increase capacity of parking facilities: design parking facilities to hold the maximum number of vehicles possible by using wasted spaces, angled parking, and appropriately sized spaces.

DEVELOPMENT-BASED STRATEGIES

The design of transportation infrastructure has a profound impact on mode choice for local travel within and adjacent to the site. A complete street with comfortable, attractive sidewalks and bike lanes is much more likely to encourage employees, residents, and visitors to walk or bicycle to nearby destinations. Likewise, a vibrant street front with diverse land uses, interesting windows, and buildings adjacent to the sidewalk make walking a more desirable option.

As the UMED District continues to develop, opportunities to implement complete street and street-scaping strategies can encourage walking and biking. The UMED District should continue to look for strategies to support year-round walking and biking (i.e. underground pathways to connect uses) as well as opportunities to facilitate cross-country skiing. Dense, mixed-use development throughout the area will help encourage non-auto travel and improve the vibrancy and economy of the development. Connectivity in the development is also critical, as non-auto travel is directly affected by distance, and out-of-direction travel can pose a major deterrent. It is important that plans for key connections and street improvements are identified so development can support these changes, rather than reinforce or inhibit them.

- Increasing Connectivity: Connectivity refers to the density of connections in paths and road networks and the directness of the links. A well-connected road or path network has many short links, numerous intersections, and minimal dead ends. Increasing connectivity decreases travel distances and provides greater route choices – which allows more direct travel between destinations.

Full street connections are most desirable, but pedestrian- and bicycle-only connections should be provided where street connections are not feasible.

- Streetscape Improvements: Streetscape refers to urban roadway design and conditions that impact street users. Street-scaping considers all roadway users and activities that occur on a street. It seeks to create streets that accommodate all forms of travel, provide access to nearby destinations, function as linear parks, and improve the livability of the community. Streetscape improvements include a variety of strategies, such as:
    - Creating wider sidewalks that accommodate more business and pedestrian activity.
    - Adding landscaping, particularly between vehicle travel and other modes.
    - Adding bike lanes and pedestrian crossing elements.
    - Increasing lighting on streets and at transit stops.
- Area Pedestrian Improvements: Improving the walkability of an area can encourage travelers to walk between destinations. Walkability is based on a variety of factors, including pedestrian facilities, roadway conditions, connectivity between land uses, and security. There are numerous ways to improve walkability, including:
    - Increase the quantity and quality of sidewalks and crosswalks, including bulb-outs and refuge islands

- ◦ Provide pedestrian crossing signals.
  - ◦ Mix land-uses and create connections between common destinations.
  - ◦ Reduce vehicle speeds and implement traffic calming strategies.
  - ◦ Design pedestrian facilities to be accessible to all users.
  - ◦ Add street lighting to improve security.
- Area Bicycle Improvements: Improving the safety and convenience of biking may increase the use of bicycles as an option for more trips. A variety of strategies can be implemented to improve conditions for bicycling, such as:
  - ◦ Increase the quantity and quality of bike lanes and paths.
  - ◦ Improve bike parking facilities.
  - ◦ Increase bicycle connections between common destinations.
  - ◦ Integrate bicycling with transit.
  - ◦ Reduce the speed of vehicles through traffic calming

In addition, a bike sharing program can provide convenient bike rentals for short trips within the UMED District and surrounding area to encourage bicycle use as a potential travel option for more people.

- Transit Improvements: A variety of things can be done to improve transit service and make it a more attractive option for commuters, residents, and other travelers.

For example, service can be increased by adding more routes, increasing frequency, and extending operating hours. Lowering fares, creating more convenient fare payment, or increasing the comfort of transit can encourage transit ridership. Giving transit priority on the road with bus lanes, transit priority traffic signals, or grade separation can significantly improve transit service.

  - ◦ Investigate the possibility of Valley Mover providing direct peak period bus service to the UMED District from Palmer/Wasilla. Also, investigate the possibility of People Mover providing direct service from Eagle River to the UMED District. This would significantly reduce the existing bus transit travel time by eliminating the need to transfer buses in downtown Anchorage.
  - ◦ Also discuss park and ride, and UMED shuttle service here [find a parking lot in the valley for commuters to leave their cars and hop in a shared car, van, or shuttle].

PLAN IMPLEMENTATION

Marketing, education, enforcement, and use of incentives and disincentives are key components in the application of the TDM measures that the UMED District pursues. A TMA could be useful in promoting TDM programs and providing the necessary support for a TDM program. It is recommended that the UMED District regularly review progress towards its TDM goals and monitor the success of TDM programs. The following strategieare intended to bolster the effectiveness of the TDM strategies outlined above.

- Adopt clear, quantifiable goals that can be measured for progress: examples include mode split targets for employees, parking occupancy and utilization (auto, bicycle, other), ratios of bike spaces and transit passes to employees, and shuttle service productivity.
- Promote programs: whether through a website, brochures, employer-run sessions, new employee/student orientations, or other marketing strategies, promotion of TDM programs is essential to ensure people are aware of their transportation options.
  - ◦ Alternative Transportation Month - Hold an alternative transportation fair to highlight the user benefits and costs of utilizing alternative transportation modes for the day-to-day travel to and from the UMED District. Participates would receive information about public transportation service, bicycle routes, walking, ride-sharing programs.

Provide “friendly” competition between organizations to promote alternative transportation travel for a one month period. Provide gift certificates or other incentives for participants.

- Routinely survey employees/students to determine progress towards desired mode split and other goals: this will help measure progress and assess the effectiveness of TDM strategies. Seeking employees’/students’ input IS essential to addressing concerns with TDM programs.
- Establish TMA to monitor the TDM program: a TMA is well-suited to both organizing TDM programs as well as monitoring their success.

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5.2 CASE STUDY: MIXED USE DEVELOPMENT

This section summarizes Strategic Economics' research on mixed-use development in university districts. The analysis touches upon a range of issues that intersect in mixed-use development, such as financing, programming, and collaborative planning. The research results are divided into five sections. The first and last sections introduce and summarize the key findings. The middle three sections focus on case studies in three North American locations.

INTRODUCTION

Strategic Economics conducted three case studies of mixed use projects in campus contexts in order to identify and illustrate potential implementation strategies for the Universities and Medical (UMED) District Plan. This report is intended to help the Municipality of Anchorage, UMED District institutions, residents and other community stakeholders understand the range of approaches that might be used to implement the visions established for the District, which include:

- Mixed-use retail development that would create a concentrated node of activity in one or more strategic locations.
- Development that contributes to quality of life for UMED District residents, students and employees and supports economic activity in the district.
- The consideration of public-private partnerships to enable this type of development, helping organizations to further their individual missions while supporting broader UMED District goals.

This report presents each of the case studies, covering a broad range of topics, including partnership structure, site assembly, design, financing and retail strategy. The report concludes with a summary of key findings and implications for the UMED District.

CASE STUDY SELECTION:

The three case studies presented in this report were selected through a process of initial research and subsequent refinement in collaboration with the consulting team and Municipality of Anchorage staff. The process was focused on identifying projects that were applicable to the UMED District context in at least several of the following aspects:

- Mixed-use, "village" development combining retail and residential uses,
- Revitalization and/or redevelopment of strip commercial centers,
- Public private partnerships,
- Cross institutional collaboration, shared parking facilities and/or district level parking management.

In addition to these features, it was also important that the case study context be comparable to the UMED District in key aspects such as institutional size, city size, development density and/or climate. Because the UMED District is unique in many ways, including its geographic location, historical development patterns, and large areas of open space, it was not realistic to find case studies that were a match for the Anchorage context in every respect; however, even with some differences, the case studies are able to offer important implementation lessons.

Acknowledging that differences in governance, market conditions and development patterns can make some implementation strategies viable in one location but not in another, each case study begins with a project overview and a description of the context in which the project was developed. The case study then goes on to describe project financing, design, and outcomes, concluding with key lessons that are potentially applicable to the UMED District.

	University Square	Uptown Phase I	University Marketplace
Location	Madison, Wisconsin	Cleveland, Ohio	Vancouver, Canada
Project Uses	Retail, Residential, Office	Retail, Residential	Retail, Residential, Office
Year Completed	2008	2012	2001
Financing	Public-Private Partnership	Public-Private Partnership	Private Development
Institutional Campus	University of Wisconsin-Madison	Case Western Reserve University and other University Circle institutions	University of British Columbia
Institutional District Area *UMED District: 1,760 acres*	930 acres	500 acres (University Circle)	1,000 acres
Institutional Daytime Population *UMED District: 30,000*	60,000	50,000 (All University Circle institutions)	64,000
City Population *Anchorage: 300,000*	240,000	390,000	600,000

Figure 57. Summary of Case Studies

Figure 57 summarizes the three case studies selected for this report. The first two case studies involved joint ventures between public and private entities; the final case study is an example of private sector development.

University Square in Madison, Wisconsin, consists of two mid-rise towers with 130,000 sq.ft. of retail space, 350 apartments, a university-run student services center and underground parking. Completed in 2008, the project was a public-private partnership between a private developer and the University of Wisconsin-Madison (UW-Madison). Each component of the project (retail, housing, parking, office space) is owned and managed by a different party. The 3.4 acre development site was assembled from two parcels: an aging strip mall owned by one of the developers and a university-owned surface parking lot. By joining forces, both parties were able to build a more ambitious project than would otherwise have been possible. The project is notable for its scale—it is the largest infill project completed in Madison—and the consensus achieved among the multiple stakeholders, including the City of Madison. In order to energize the perimeter of the building and create a pedestrian friendly environment, the project includes extensive redevelopment of the streetscape, including outdoor seating and strategically located bike parking.

Uptown Phase I in Cleveland, Ohio is a mixed-use project with 56,000 sq.ft. of retail space and 114 apartments. Initiated by Case Western Reserve University (CWRU) and executed by a local developer, the project is part of a broader effort to create a vibrant mixed use district at the heart of University Circle, a major institutional district in Cleveland.

In addition to the strong commitment of the two main partners, Uptown's success also relied on the involvement of other anchor institutions, philanthropic foundations and the City of Cleveland. In particular, creative, nontraditional financing was necessary to put the project together under challenging market conditions. Completed in 2012, the project illustrates the critical role that institutional commitment can play in making a project successful, and the benefits of collaboration among diverse community partners.

University Marketplace is a six-story mixed use project adjacent to the University of British Columbia (UBC) campus in Vancouver, Canada, with 75,000 sq.ft. of retail space, 75,000 sq.ft. of office space, and 108 apartments. The project was built by a private developer without direct institutional involvement. By filling a need for campus amenities, the commercial portion of the project effectively serves as the retail village for the university's staff and students. The project attracts a large share of customer traffic on foot because of its strategic location, proximity to transit and pedestrian-oriented design.

UNIVERSITY SQUARE - MADISON, WI

PROJECT OVERVIEW AND CONTEXT:

Completed in 2008, University Square is the result of a public-private partnership to redevelop an aging strip mall into a high density project combining retail space, rental apartments and university-run student services at the eastern edge of the University of Wisconsin-Madison (UW or UW-Madison) campus.

The UW-Madison campus occupies 930 acres one mile to the west of downtown Madison, a city of 240,000 residents. The campus is bound by Lake Mendota to the north, and urban development on the remaining three sides.

In 2005, during an update to its Campus Master Plan, the university concluded that it could no longer expand its boundaries outward, and must instead direct future growth within its existing footprint.

As part of the 2005 Campus Master Plan, the university decided to focus infill development at the East Campus Gateway (Figure 62).

The plan established the vision for a seven-block pedestrian mall through an area whose existing uses included surface parking lots and several outdated university facilities. Rather than obtaining funds to construct the entire East Campus Mall at once, UW-Madison aimed to build the plan out incrementally by locating campus projects with committed funding—such as housing, athletic and dining facilities—along the corridor. As each project was built, it paid for its share of the East Campus Mall improvements. The East Campus Mall was also able to leverage funding from infrastructure projects associated with the university's need for a north-south utility corridor.

A local real estate developer, Executive Management Inc (EMI), owned one of the only privately-owned parcels along the mall, a single-story 1970s-era shopping center (Figure 66). Seeing the momentum building along the East Campus Mall, EMI wanted to redevelop the site into a higher density mixed-use project, recognizing that population and employment growth in Madison had created more demand for retail space. Because their site was adjacent to a UW-owned parking lot, EMI approached the university about developing the project together. UW recognized that partnering with EMI would enable the university to address several longstanding campus needs, including a consolidated University Health Services center for students and a home for student organizations.

Figure 58. University Square in Madison, Wisconsin


Figure 59. Uptown Phase I in Cleveland, Ohio


Figure 60. University Marketplace in Vancouver, Canada.

The location was ideal in terms of centrality and convenience for students. Eventually, private housing developer Steve Brown Apartments also joined the project.

University Square consists of two mid-rise towers with 130,000 sq.ft. of retail space, 350 private apartments, a university-run student services center and underground parking. To energize the perimeter of the facility, and create a pedestrian friendly environment, the project includes extensive redevelopment of the streetscape, including outdoor seating and strategically located bike parking. The project is notable for its scale—it is the largest infill project completed in Madison—and the consensus achieved among the multiple stakeholders, including the City of Madison.

SITE

The University Square site was assembled from two smaller parcels: an existing shopping center owned by EMI, and an adjacent surface parking lot owned by UW (Figure 64). The total combined area of the University Square site is 3.4 acres.

The partnership was structured to allow EMI and UW-Madison to retain ownership of their respective parcels of land: in order to enable development, both owners entered into a 98-year ground lease with a limited liability company set up exclusively for the project. Ownership of buildings was divided into five condominiums corresponding to the project's components (retail space, retail parking, apartments, residential parking and UW office space).

This arrangement enables separate ownership and maintenance of each partner's portion of the project. In retrospect, the team acknowledged that this ownership structure introduced a high degree of complexity into the project.

FINANCING

UW-Madison provided $57 million for the construction of the UW student services tower, an amount equivalent to one-third of the project's total $175 million cost (Figure 63). Obtaining funding required approval from UW's Board of Regents, the Wisconsin State Building Commission and the State Legislature, requiring the development team to navigate the state's biennial budget process.

Of the $57 million in state funding, $40 million was financed by state-issued bonds, while the remaining $17 million was provided by a $20 per semester increase in student fees over the course of 20 years, approved by students in a 1999 referendum.

The need for institutional and political budget approval significantly influenced the direction of University Square. UW-Madison originally planned to include an 800-bed student dormitory in the project, but the Board of Regents did not approve the $112 million estimated cost. As a result, the development team had to seek a private developer for University Square's residential component.

Project	University Square
Location	Madison, Wisconsin
Project Timeline	Initial Vision: 1998 Construction: 2006 Opened: 2008
Site	3.4 acres
Project Uses	Retail, residential and office
Retail Area	130,000 sq.ft.
Key Retail Tenants	Walgreens , Fresh Madison Market
Office Area	250,000 sq.ft.
Residential Units	350 apartments
Parking	440 parking stalls (structured parking) 612 bike/moped stalls
Development Team	Executive Management, Inc (EMI) University of Wisconsin-Madison Steve Brown Apartments

Figure 61. University Square Project Summary

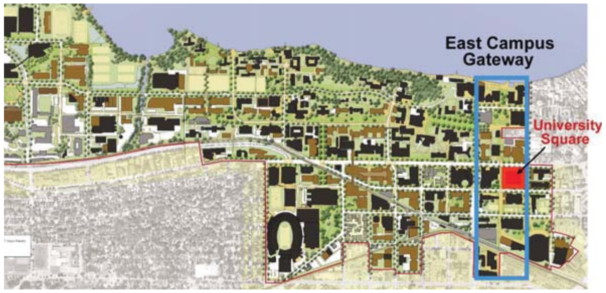

Figure 62. University of Wisconsin-Madison Campus

Although the development team did not originally intend to seek any local government contribution to the project, the City of Madison provided a $3 million in tax increment financing (TIF) in 2008 to address a last-minute financing gap.
The remainder of the project's financing was obtained by the private developers.

DESIGN

University Square consists of two towers—one containing UW student services and the other containing residential apartments—sharing a base that contains two floors of retail and parking (Figure 65). The project also features a green roof on the third floor, and substantial streetscape improvements along East Campus Mall, such as benches and bike parking. Achieving consensus among the three partners on the design quality and public realm improvements required significant negotiation.

Source	Amount
UW-Madison State-Issued Bonds	$40 million
UW-Madison Student Fees	$17 million
City of Madison TIF Loan	$3 million

Figure 63. University Marketplace Public Financing Sources

For example, while UW facilities are typically built with a 100-year time horizon, private developers, who must realize financial profit within the first few years of a building's operation, typically assume a project life of several decades. Responsibility for the extensive public realm improvements was also a topic of negotiation, because while the East Campus Mall was UW's vision, the retail component also stood to benefit. The 12-story northeast tower, known as Lucky apartments, contains 350 units of rental housing, ranging from one to four bedrooms. Students are the target market for the apartments. The project was designed to appeal to professionals as well.

The 10-story southwest tower contains UW functions, including a Student Activities Center which includes meeting spaces, a study lounge, and office space rented to student organizations; University Health Services, which consolidates both counseling and medical services in one location; and the Offices of the Bursar, Registrar and Student Financial Services.

One of the ways in which the City of Madison encourages high density development in the central area of the city is through its progressive parking policy, which does not impose minimum parking requirements, instead allowing market forces to set parking ratios. Relative to the amount of residential, office and retail space in the project, University Square's 440 parking stalls represent a relatively small amount of parking, a factor which helped to reduce overall construction costs. The lower parking ratios at University Square also reflect the high level of pedestrian, bike and transit usage on the U-W Madison campus and the project's orientation towards students who are much less likely to own a car, particularly when living directly adjacent to the campus.

KEY PLAYERS:

The **University of Wisconsin-Madison** (UW-Madison) is a public research university with over 40,000 students and 18,000 faculty and staff. UW-Madison is a property owner and joint partner in the project.

Executive Management Inc (EMI) is a Madison-based firm that offers a range of real estate development services, including property management, leasing and development. EMI is the property owner of two-thirds of the University Square site and acted as master developer for the project. EMI owns and manages the retail component and associated underground parking.

Steve Brown Apartments (SBA) is a Madison-based residential development firm that was brought into the project to develop private rental housing. SBA owns and manages the apartments.

The **City of Madison** supported the project through the development approval process and provided a $3 million tax-increment financing (TIF) loan.

The **University of Wisconsin Board of Regents** is an 18-member body that governs the UW System. The Board of Regents approves capital budget requests for state consideration, and therefore acted as a gatekeeper for University Square's public funding.

The **Wisconsin State Legislature** reviews UW capital budget requests as part of the state's biennial budget deliberations, and is therefore responsible for approving public funding for all major UW capital projects, including University Square.

No parking was provided for the UW offices uses, as UW faculty and staff have access to an existing UW parking structure across the street.

The lack of new parking for the UW Tower likely also reflects the university's comprehensive transportation demand management program and decision to cap the total number of parking spaces on campus at 13,000 as part of its 2005 Long Range Transportation Plan. It is estimated that 50 percent of the university's 18,000 faculty and staff arrive on campus by carpooling, biking, walking, and taking transit, rather than driving alone.

PROJECT APPROVALS

The development team worked closely with the City of Madison throughout the entitlement process. Although UW-Madison—as a state entity—does not need city-issued building permits, it is required to follow local land use regulations. Furthermore, the privately-developed portions of the project were required to apply for city building permits.

There was widespread agreement that a new, higher intensity project would be a better use of the site than the existing mall, the project was largely met with approval from elected officials and staff at the City of Madison.

However, as a major redevelopment that represented a significant increase in density over the prior use, it was subject to scrutiny through multiple design reviews.

The project was subject to the City of Madison's standards for a Planned Unit Development in the Downtown Design Zone, which enabled density but also established bulk requirements such as front and rear setbacks. The City of Madison was interested in seeing the project succeed and did not introduce additional conditions or constraints in the project entitlement process, other than those that were already in the development standards.

Figure 64. Site Ownership

Figure 65. Site Plan

Figure 66. University Square Site Prior to Redevelopment

OUTCOMES

University Square is perceived as a positive addition to the area, benefiting the university, downtown workers, and the city in general. The project is credited with helping to activate public space through its attention to urban design and streetscape.

By providing restaurant and retail amenities, the project creates synergies with surrounding uses, such as the nearby campus sports arena and art museum, both destinations that attract visitors into the area.

RETAIL PERFORMANCE

Retail tenants in University Square include a mix of local and national businesses, primarily supported by students and employees who travel to the area on foot, and visitors to athletic events. One of the challenges in tenanting the space is that it is not a retail destination, and very few people drive to this location. Because of the dependence on the student population, sales are slow during winter and summer breaks.

Two of the great successes of the retail component are the grocery store and Walgreens anchors. The grocery store was an amenity that the university was eager to secure for its students. It took over a year to attract a tenant into a small, urban-format retail space.

They eventually leased the space to Fresh Madison Market, an independent local chain. The owner has reported that sales are well above projections. The Walgreens provides a convenient "one-stop shop" for students, employees and residents.

Despite the central location, high density and pedestrian-oriented environment, retail on the second floor of the project has struggled. EMI initially created a 20,000 sq.ft. food court on the second floor, but it was forced to close. To address the lack of visibility of second floor retail, the new second-floor tenants are destinations that are not as dependent on passing customer traffic, such as yoga studios and a hair salon.

Figure 67. University Square Project After Redevelopment

Figure 68. UW Student Services Tower at University Square

Figure 69. Pedestrians at University Square

Although EMI controls the retail leasing, UW included covenants that stipulate that EMI cannot rent the space to certain types of retail, such as liquor stores, tattoo stores and credit card companies.

ECONOMIC BENEFITS

In addition to the public realm contributions of the project, the city has acknowledged that the project will have a positive fiscal impact on the city, through increased property tax revenues. Although the university-owned office tower is tax exempt, the residential and retail components are privately owned and remain taxable. However, city staff believe that the project would still have been viewed favorably if it was entirely tax-exempt, given that UW-Madison is considered a major driver of economic growth and employment in the city.

OBSERVATIONS AND LESSONS LEARNED

Creating a land use plan enables stakeholders to prioritize resources and direct future investment towards implementation of strategic goals. The plan for the East Campus Gateway was initially controversial for its ambitious scope, without resources available to fund its implementation. Ultimately, the plan became a framework that enabled the university to prioritize resources and direct capital investments to the East Campus area, steadily achieving incremental build out of the original vision.

Public-private partnerships can enable both parties to build a larger project than would otherwise be possible. In partnering to build University Square, UW-Madison and the private development team were able to align their interests and resources to meet their distinct goals.

The university-owned parking lot was too small for the university to develop, and it did not have the financial resources to buy out the developer. By partnering with the university, the developer had a larger site to work with, which provided more flexibility in site configuration, and a larger project area. However, the partnership and specifics of the ownership structure also contributed to the complexity of the project, which was a challenge to the development process.

Tying a project's financing to institutional and political processes can be challenging for a developer's timeframe. Obtaining budget approval from the Board of Regents and State of Wisconsin subjected University Square to a lengthy and often political decision-making process. In particular, the time frame of the state-level biennial budget approvals was challenging for the project's financial feasibility, as construction costs and interest rates rose prior to 2006. To compensate for a slow start to the project, EMI pursued a compressed construction schedule to keep costs down and enable the project to open in time for the start of the 2008 academic year.

Private developers and institutions have different investment motivations and timeframes. Institutions such as UW-Madison—which are mission-driven—typically plan to hold, operate, and maintain property over a much longer period of time than private developers. While private developers are required to pay off loans within 25 to 35 years, institutions have access to more patient forms of capital which support long-term ownership. As a result, institutions and private developers may have different approaches to building design and the quality of construction, which can present a challenge in public-private partnerships.

Communication and consensus-building among stakeholders are critical to a project's success. Successful public-private partnerships require all parties to be committed to good communication and genuine negotiation. Working through the details of University Square's design, financing and ownership structure required constant communication and negotiation among EMI, Steve Brown Apartments and UW-Madison.

Finding appropriate retail tenants for a pedestrian-oriented, mixed use space can be challenging. Many retailers, particularly national chains, favor spaces with good visibility, high ceilings, high traffic volumes and easy vehicle access. Ground floor retail in mixed use projects does not necessarily conform to all of these preferences, and as a result, it took the retail leasing team some time to find desired tenants for University Square. Retail tenants' success has depended on their visibility, ability to fill an unmet need, and ability to attract customers despite the seasonality of the campus activity. For example, the Walgreens and Fresh Madison Market have been very popular, whereas the second floor food court was unable to attract enough customers

THE UPTOWN - CLEVELAND, OH

PROJECT OVERVIEW AND CONTEXT

University Circle is a 550-acre neighborhood located four miles east of downtown Cleveland. It is home to over 40 educational, medical and cultural organizations, ranging from anchor institutions such as Case Western Reserve University (CWRU), University Hospitals (UH) and the Cleveland Institute of Art (CIA) to smaller nonprofit organizations. An estimated 30,000 workers and 13,000 students come into the neighborhood every day.

Despite its role as a major employment center and academic hub, the dominance of institutions rendered the district an "urban dead zone" that lacked retail and housing options for students, employees and visitors. Surrounding these institutions are low-income residential neighborhoods that have seen little investment in recent decades, with large numbers of vacant and abandoned properties.

To address the need for a "college town" main street where students and staff could shop, eat and gather, CWRU's 2005 Master Plan designated a "University Arts and Retail District" along the edge of campus.

Project	Uptown Phase I
Location	Cleveland, Ohio
Project Timeline	Initial Vision: 2005 Construction: August 2010 Opened: 2012
Site	4.65 Acres
Project Uses	Retail, Residential
Retail Area	56,000 sq.ft.
Key Retail Tenants	Barnes & Noble bookstore Small format grocery store, Constantino's
Residential Units	114 Apartments
Development Team	Case Western Reserve University MRN, Ltd.

Figure 70. Uptown Phase I Project Facts

This neighborhood, which later came to be known as Uptown, was envisioned as a mixed use, transit-oriented district that would increase activity adjacent to campus by providing housing, shops and entertainment venues.

To move forward with implementation, the university created a real estate department headed by experienced commercial developers. Critically, CWRU began to work on site assembly early in the process, selecting a location that was within walking distance of CWRU and other major University Circle institutions, and easily accessible via Cleveland's new bus rapid transit (BRT) system, the HealthLine. CWRU first acquired four acres at the southeast corner of Euclid Ave and Mayfield Rd, then negotiated an agreement with University Circle, Inc

Figure 71. Ground Floor Retail at Uptown Phase I

(UCI), a nonprofit community service organization, to acquire three acres of its land on the opposite side of the street. (See sidebars on 'Key Players' and 'University Circle Inc' for more information on UCI's mission and role.)

CWRU managed the initial planning of the Uptown District for several years and issued a request for proposals (RFP) to local and national developers in 2006. The project was awarded to MRN, a local firm that was attracted to the potential for Uptown to be a catalytic project in University Circle. Key factors in selecting MRN included their prior success creating walkable mixed use destinations in Cleveland and their willingness to take on complex financing structures.

Originally, Uptown was conceived as one large project with both condominiums and apartments. Eventually, due to the onset of the financial crisis and ensuing recession, the project was divided into three more manageable phases, with only apartments and retail in Phase I.

Around the same time that CWRU began planning the Uptown district, the Cleveland Foundation launched the Greater University Circle Initiative (GUCI) to convene local institutions in a reinvestment strategy for the surrounding neighborhoods. The foundation decided to focus on the Uptown district as one of GUCI's first projects, contributing significant financial resources and engaging other institutions as stakeholders in the process.

Recognizing the potential economic benefits associated with the Uptown, the City of Cleveland was also extremely supportive, providing financing and public infrastructure, in addition to planning and building approvals.

KEY PLAYERS:

Case Western Reserve University (CWRU) is a private university with approximately 10,000 students and 6,400 faculty and staff on a 155 acre campus. CWRU initiated the Uptown project, assembled the site, convened key stakeholders, issued the Request for Proposals (RFP) to developers and managed the project with the selected developer. CWRU also holds the master lease for two-thirds of the retail space and thus maintains a financial stake in the project.

University Circle Inc (UCI) is a unique nonprofit organization that started as a land bank for local institutions, but has since evolved to develop its own real estate projects, provide services such as parking and security for member institutions, and advocate for the University Circle district. (See sidebar "University Circle Inc." For more information on UCI's model) UCI owned a portion of the Uptown site and agreed to sell it to the developer for the project.

MRN is a local, family-owned real estate development firm that became the master developer for the Uptown after being awarded the RFP. MRN had prior experience with mixed use development on East Fourth Street in downtown Cleveland and was comfortable with complex financing deals.

The **Cleveland Foundation** is a community foundation that awards grants to local projects that benefit citizens, meet community needs, and test new ideas. Its activities are supported by a $1.9 billion endowment. The foundation was instrumental in convening University Circle institutions as stakeholders in the Uptown project and provided substantial financial support for planning and development.

The **City of Cleveland** was involved in the project in three different ways financing, public infrastructure construction, and project approvals.

Since Uptown Phase I opened in 2012, the University Circle community has begun to enjoy the benefits of new housing, shops, and public spaces, while anchor institutions such as CWRU have increased their competitiveness in attracting students and employees. Building off of Uptown Phase I's success, new real estate projects in the pipeline are expected to bring even more housing, entertainment and retail activity to the neighborhood.

Source	Amount
NMTC Tax Credits: Key Community Development Corp. Enterprise Community Investment Cleveland Development Advisors	$16.25 million
Cleveland Foundation Gund Foundation	$8 million
City of Cleveland, Vacant Properties Initiative Fund	$5 million

Figure 72. Uptown Phase I Public and Philanthropic Financing Sources

FINANCING

Assembling $44 million in financing during an economic recession was a challenging task, made possible by the commitment of numerous community partners and the development team's tolerance for complex, multi-layered deals.

Approximately 40 percent of the project's cost, $17.4 million, was provided by conventional lenders, Key Bank and First Merit Bank. The remainder was provided by non-traditional financing sources, including philanthropic grants and loans with below-market interest rates and flexible terms (Figure 72).

Enterprise Community Investment and Cleveland Development Advisors provided $16.25 million in New Market Tax Credit (NMTC) allocations. The NMTC Program incentivizes investment in distressed or low-income neighborhoods by providing federal tax credits to investors. The Cleveland Foundation and Gund Foundation provided loans and grants totaling $8 million.

The City of Cleveland provided a construction loan totaling $5 million through its Vacant Properties Initiative Fund, which was established to encourage the redevelopment of abandoned, idled or underutilized commercial properties. If the project meets specific job creation goals (280 permanent jobs), 45 percent of the loan amount is forgivable.

SITE

Uptown Phase I was constructed on 4.65 acres on the north and south sides of Euclid Ave at 115th St (Figure 73). The northern half of the site was a vacant lot used as an unpaved parking lot.

The southern side of the site consisted of a surface parking lot in front of an aging strip retail center with numerous vacant spaces. The site is now owned by MRN, who purchased the land at market rate from CWRU and UCI. Uptown Phase II will be constructed just south of Uptown Phase I, on the north side of Euclid Ave.

DESIGN

Uptown Phase I consists of two four-story buildings that face each other across Euclid Ave, with a total of 114 apartments and 56,000 sq.ft. of retail space. The south building contains 70 studios and smaller one-bedrooms, while the north building contains 44 larger one-bedroom and two-bedroom units. Twenty percent of the apartments are affordable to households earning up to 80 percent of the area median income.

The site's proximity to transit and existing CWRU parking facilities enabled the developers to avoid building structured parking, which helped to keep construction costs down. According to a market study, approximately half of retail customers arrive by foot. Those who arrive by car have access to surface parking lots at the rear of the buildings, with additional public parking in an existing CWRU parking garage located immediately to the south. The same garage also provides parking for Uptown residents. For student residents who do not own a car, the HealthLine bus rapid transit line stops immediately outside the Uptown, providing easy access to downtown and other locations along Euclid Ave. The Greater Cleveland Regional Transit Authority (RTA) also recently began construction on a new rapid transit station a few blocks away.

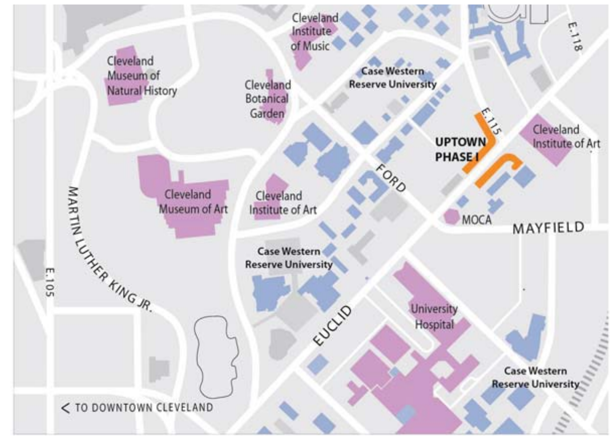

Figure 73. University Circle Context Map

Figure 74. Uptown Phase I

Given that a major goal of the Uptown is to create a livelier urban environment, designers paid close attention to the relationship between the buildings and the street, and aimed to create exciting new public spaces. Ground floor retail space features large floor-to-ceiling windows fronting onto Euclid Ave, which features new trees and other streetscape improvements. On the rear side of the south building, restaurants have outdoor patios that spill onto “Uptown Alley,” a new pedestrian-friendly space funded entirely by the City of Cleveland (Figure 75). The city agreed to use $2 million in general obligation funds to convert the existing property into a pedestrian alley. To invite pedestrians into this space, the first floor of the building is “perforated” by walkways that connect from Euclid Ave to Uptown Alley (Figure 76).

Adjacent to the Phase I apartment buildings is a new public plaza made possible by a gift from a CWRU alumna. Known as Toby’s Plaza, the space is intended to be a gathering place for spontaneous and planned events, installations and performances (Figure 77).

INSTITUTIONAL PARTNERSHIPS:

Although CWRU initiated the Uptown district and played a major role in Phase I, the overall momentum of the neighborhood’s development has been sustained by the participation of multiple institutional partners. These partnerships were formed through consistent efforts to convene University Circle institutions and identify how individual organizational goals aligned with opportunities in the Uptown district.

The Museum of Contemporary Art (MOCA) became an early partner when it agreed to relocate to the Uptown district, effectively becoming an anchor for the project (Figure 73). The museum had been looking to move out of rented space in downtown Cleveland, and moved into a new, custom-designed structure southwest of the Uptown Phase I. The Cleveland Foundation provided $1.6 million in financial assistance to help MOCA in its relocation and expansion. Because MOCA is located adjacent to Toby’s Plaza and Uptown Alley, it collaborates with CWRU and Uptown building managers on programming these public spaces.

The Cleveland Institute of Art, a college of art and design, is currently undergoing a $5 million expansion to be completed by late 2014.The CIA has become involved as a major tenant in Phase II of the Uptown, where it plans to lease student housing for 130 students.

The University Hospitals (UH) is a major regional medical center, located immediately southwest of the Uptown district. Although UH did not play a direct role in planning or financing, they were very supportive of the project because of their proximity to the site. The hospital recognized that investment in the Uptown district would have strategic benefits for their employees, patients and visitors, as well as the broader University Circle area.

OUTCOMES

Although the Uptown Phase I has been open for just one year, many of its anticipated benefits have already begun to be realized. The residential apartments have been very popular, and the retail space has been leased to a range of national and local tenants. While retail performance has been uneven, the presence of new restaurants and stores has injected vitality into the neighborhood.

Residential Leasing

The Uptown Phase I residential apartments leased up quickly and are currently at 100% occupancy, with a waiting list that will funnel prospective tenants to the Phase II apartments. The studios and smaller one bedroom units attract students, while the larger one-bedroom and two-bedroom units attract a mix of household types, including professionals who work in University Circle and empty nesters who want to be near cultural amenities.

Because of its central location in proximity to jobs, retail, transit and other amenities, the apartments have been able to achieve the highest per square foot rents in Northeast Ohio, approaching $2 per square foot. Rents range from $860 for a studio to $2260 for two-bedroom units.

Retail Leasing

Uptown’s retail strategy focused on restaurants and retailers that would help to create an active, pedestrian-friendly environment. MRN and CWRU have been successful in attracting a range of national and local retail tenants, although occupancy and lease rates are not as strong as the residential component.

UNIVERSITY CIRCLE INC.

University Circle, Inc (UCI) provides an example of how projects and programs with district-wide benefits can be achieved by identifying the shared interests of institutional stakeholders.

UCI was founded in 1957 by civic leaders and philanthropists to administer the University Circle Master Plan – which laid out an orderly plan for institutional growth within the Circle – and serve as a “service organization to all institutions” in the district. Funded by an initial endowment of $7 million from a Cleveland philanthropist, the organization’s original mission was to purchase and hold land for institutional expansion within the Circle. UCI’s purview quickly expanded to include the provision of district-wide services such as parking, shuttle bus service, public safety, architectural review, and landscaping of common areas. In the 1970’s, UCI began working to strengthen the relationship between the Circle’s institutions and the surrounding neighborhoods by building housing and providing educational programs for students at local schools. UCI operates as a nonprofit organization.

To reduce the risk for lenders associated with the retail portion of the project, CWRU signed on as the master lessee for two-thirds of the retail space. For certain spaces, rents paid to CWRU are tied to sales thresholds: if sales do not meet specific milestones, CWRU may subsidize a portion of the retail rent paid to MRN. However, CWRU will also receive a portion of returns from Uptown, so it is expected that CWRU’s real estate activities will eventually be self-supporting.

Approximately one-third of the CWRU’s retail space is leased to the campus bookstore, operated by Barnes and Noble. The bookstore’s performance has been negatively impacted by the shift towards online shopping.

CWRU also worked hard to attract Constantino’s Market—a 12,500 sq.ft. grocery store—to Uptown, believing that such an amenity would be important for attracting prospective residents (Figure 78). Constantino’s Market is an independent local business that had already experienced success in downtown Cleveland with an urban, small-format store emphasizing fresh produce, prepared foods and specialty goods. The grocery store was partially financed by a low-interest loan from UCI, who received a $660,000 grant from the U.S. Department of Health and Human Services’ Healthy Food Financing Initiative. While the store is primarily oriented towards students and young professionals, it also attracts residents from the surrounding neighborhoods, who previously were not within walking distance of a grocery store.

A majority of the remaining retail space is leased to fast casual restaurants such as Chipotle, Panera Bread, and several local businesses. The current occupancy rate is 90 percent.

Uptown retailers do quite well during the school year but tend to struggle in the summers when the student population is absent. The fast casual restaurants have been more successful than other retailers at attracting year-round business from University Circle employees.

Individuals involved in creating the Uptown district believe that it is still too early to judge the success of the Phase I retail component, given that it was the first project of its kind in the neighborhood. The hope is that ensuing phases of the project will help to build a critical mass of retail in the neighborhood, enabling it to become a destination that attracts a greater number of visitors.

Achieving Overall Objectives of the Plan

Although the retail component of the project is not yet profitable, it has been important to the overall appeal of the project by creating a node of activity and serving the needs of area students and employees. CWRU administrators credit the Uptown district with helping the university achieve record enrollment for its Fall 2012 freshman class, a group that was also notable for its high academic achievement and diversity compared to previous years.

In terms of catalyzing future development, there are already clear signs that the success of Uptown Phase I has helped to “prove the market” for residential apartments. In recent years, there has been increasing interest from developers, national hotel operators, and other private entities in investing in the Circle.

By providing a market comparable with rents at $2 per square foot, Phase I helps developers to obtain financing from traditional lenders, and reduces the amount of incentives that the city must provide to attract development to the area. According to MRN, the rent threshold to justify new construction in Cleveland is between $2.25-$2.50 per square foot.

Uptown Phase II is already under construction and is more market-driven than the first phase. MRN remains the master developer, but neither the city nor CWRU are involved in financing the project, which includes 43 market-rate apartments and 130 beds of student housing for the Cleveland Institute of Art.

The project will also include a highly anticipated bowling alley that is expected to draw even more people to the district.

OBSERVATIONS AND LESSONS LEARNED

An institution's involvement can be critical to making a project happen in a weak and unproven real estate market. CWRU decided it would need to be actively involved in creating the type of urban environment that its student population desired. The university recognized the importance of this effort to its overall mission, highlighting Uptown's development as part of its 2008-2013 strategic plan. Bringing commercial real estate expertise in-house also helped CWRU to partner well with a developer.

Before MRN was involved, the university took initiative on site assembly and began engaging with other organizations, such as UCI and MOCA. The university also agreed to be the master lessee for part of the retail space. Without CWRU, the Uptown would not have happened.

Identifying the shared goals of multiple stakeholders helps to bring resources to the table. MRN, CWRU, UCI and the Cleveland Foundation were intentional and consistent in their efforts to engage with University Circle stakeholders to build a shared vision for the Uptown district. Their work helped all of the institutions understand how their interests were aligned with the project's goals.

Figure 75. Restaurant Patio Seating on Uptown Alley.

Figure 76. Internal passageway at the Uptown project.

Figure 77. Toby's Plaza adjacent to Uptown Phase I and the new MOCA building

Figure 78. Constantino's Market in Uptown Phase I

Figure 79. Sidewalk Seating at Uptown Phase I

The team also convinced the local government of the Uptown's economic benefits, including construction and permanent jobs, retail sales and tax revenues. Involvement of multiple stakeholders enabled the project to weather many challenges. Although the financial crisis threatened to end the project several times, the project ultimately succeeded in getting financing in the midst of the recession, and was able to strategically leverage other valuable resources, such as public investment in streetscape.

Changing market conditions required flexibility in the project definition. The onset of the housing market crisis required the development team to make several changes to the project. Dividing the project into three phases made it more manageable and reduced associated risk. As financing terms for condominiums became stricter, the project was redesigned with only apartments. The impact of online shopping on brick-and-mortar store sales was a factor in the division of retail space. The campus bookstore was originally intended to be 22,000 square feet, but by the time construction was underway, it was scaled down to 18,300 sq. ft.

Building a successful pedestrian-oriented project depends not only on the project's design, but also on surrounding public infrastructure and proximity to other supporting uses. Although the Uptown is a formerly weak market area, the developers recognized the potential for the site because of its proximity to a major employment center, a large student population and transit. Without these factors, the project would not have been able to attract residents and retail tenants, even with public and philanthropic support.

The Uptown served to connect existing uses and meet unmet demand for retail and housing generated by the surrounding institutions.

There are creative ways for an institution to support new development, beyond providing direct financing for construction of a project. CWRU's willingness to take on the master lease for two-thirds of the retail space was a significant factor in Uptown Phase I's financing. It is unlikely that the grocery store or bookstore would be there without the university's involvement as the master lessee. Similarly in Phase II, the Cleveland Institute of Art is partnering with the developer by leasing student housing, which both fulfills the institution's need and provides the developer with more certainty around occupancy and lease-up.

UNIVERSITY MARKETPLACE – VANCOUVER, CANADA

CONTEXT, VISION AND PROJECT CONCEPT

University Marketplace is a six-story mixed use project adjacent to the University of British Columbia (UBC). It was built by a private developer without direct institutional involvement.

UBC's campus occupies 1,000 acres on the western edge of Vancouver, located five miles west of downtown, and two miles from the nearest commercial neighborhood (Figure 81). Despite a daytime population of over 64,000 students and employees, and 8,000 students in on-campus residences, the UBC campus lacked a critical mass of retail and services for many years, with the exception of the campus bookstore and a few businesses in the Student Union Building.

The area immediately east of the campus consists of a small residential neighborhood and 1,900 acres of forested parkland. This area, known as the University Endowment Lands (UEL), is under the jurisdiction of the BC provincial government.

By the late 1990s, the need for a wider selection of retail amenities near the UBC campus had become apparent. The campus planning and development organization, UBC Properties, had begun formulating a comprehensive long-term plan to build "a complete and vibrant community" by adding more housing and pedestrian-oriented retail to the campus.

At the same time, an opportunity for private development arose on a parcel immediately adjacent to the UBC campus, in the only commercially-zoned area of the University Endowment Lands.

The site was owned by the provincial government, who had decided they wanted to sell the land and had hired consultants to help them determine its highest and best use and apply for the necessary rezoning.

To take advantage of the site's central location, pedestrian traffic and the generally high cost of land in Vancouver, the consultants recommended that the site be redeveloped as a mixed use project. Given its proximity to campus, this site appeared to be an ideal location for meeting the demand for retail and services from students, employees and residents. Because of the strength of Vancouver's residential market, they also recommended the inclusion of residential uses on the upper floors to improve the profitability of the project.

The provincial government sold the land at market value to Trilogy, a private development firm, who partnered with Cressey Development Group on the financing and construction of the project.

The finished project, University Marketplace, has retail and office space on the first two floors, four floors of apartments and underground parking. By filling a void in campus retail amenities, the commercial uses effectively serve as the retail village for the students and employees who are on campus on a daily basis, while also serving daily needs of residents in the adjacent neighborhood. The project attracts a large amount of customer traffic on foot because of its central location and pedestrian-oriented design.

SITE

Located in the UEL's commercial zone, the development site comprises 1.4 acres formerly occupied by a gas station and parking lot, and adjacent to an aging strip shopping center. As noted, the site was owned by the British Columbia provincial government, which decided to sell the land when the lease came up in the late 1990s. By this time, the site was underutilized relative to the value of its location in proximity to major campus destination and an affluent residential neighborhood with high quality public schools. Within one block of the project are fraternity residences, UBC Hospital and other institutional buildings. Other key attractions on the UBC campus include The Chan Center for Performing Arts, a Museum of Anthropology and numerous athletic and aquatic facilities.

	University Marketplace
Location	Vancouver, Canada
Project Timeline	Initial Vision: 1999 Construction: 2001 Opened: 2002
Project Type	Apartments over retail and office
Site	1.4 acres
Retail Area	75,000 sq.ft.
Key Retail Tenants	Gold's Gym, Staples, Bank of Montreal
Office Area	75,000 sq.ft.
Residential Units	108 apartments
Development Team	Trilogy Properties Cressey Development Corporation

Figure 80. University Marketplace Project Facts

Figure 81. University Marketplace Context Map

KEY PLAYERS:

Trilogy is a private development firm based in Vancouver. Its stated focus is "the right product, the right place, the right time." Trilogy was the master developer and continues to handle retail leasing for the project.

Cressey Development Group is a Vancouver-based real estate developer who partnered with Trilogy.

The **Province of British Columbia** was the original landowner, and set the project in motion by hiring real estate consultants to handle the market research and rezoning of the site prior to sale.

The **University of British Columbia** (UBC) is a public research university with over 47,000 undergraduate and graduate students. Although the university was not directly involved in the project, retail and residential demand at the project site is driven by proximity to the campus.

University Endowment Lands (UEL) refers to an unincorporated area of land adjacent to the UBC campus that is under the jurisdiction of the provincial government. UEL administration is managed by an appointee of the provincial government, with input from a community advisory council comprised of elected representatives from the residential neighborhoods.

COMMUNITY PROCESS

The development team engaged with an advisory committee of representatives from the residential neighborhoods adjacent to the site. This process enabled developers to seek input from the residents and to help the community understand how the scale of the development would fit in with their neighborhood. For example, by taking residents on tours of existing mixed use, compact housing developments in Vancouver, the consultants were able to illustrate different building types that could achieve the desired density for the site. Through the process, the consultants incorporated community feedback on the desired physical form of the building, which ended up being low-rise, as well as the community's concerns about what types of retail should be included and excluded from the project.

Figure 82. University Marketplace

DESIGN

The 108 residential units are housed in two four-story structures above a two-level base. The unit mix is heavily weighted towards one-bedroom units with dens, which account for 68 units. The remaining units are 24 one-bedroom units, 8 two-bedroom units and 8 two-bedroom units with dens. Residential parking is underground.

Retail customers have convenient access to metered street-level surface parking on three sides of the project, supplemented by underground parking. The high level of pedestrian traffic and transit access to the site minimized the need for retail parking.

Figure 83. Apartment Interior at University Marketplace

Retail parking was provided at a ratio of about 1.5 spaces per 1,000 square feet, less than half the typical retail parking ratio of 4 spaces per 1,000 square feet.

The overall design of the project is pedestrian-oriented. To invite circulation, the building is bisected in both directions by airy ground floor passageways that also offer some protection from the elements (Figure 84).

Figure 84. Covered Passageway at University Marketplace

OUTCOMES

Residential Leasing

The residential apartments have been extremely successful in attracting a mix of households, with a vacancy rate of less than 5 percent. Students are estimated to account for 80 percent of the tenants. Because the project is located in an area with excellent public schools, it has also attracted families with school-aged children.

Commercial Leasing

The retail tenants consist primarily of local-serving businesses, particularly quick-serve restaurants and personal services, representing a mix of national and independent retailers. In the early stages of the project, the leasing team focused on acquiring national chains to give lenders confidence regarding project financing. Later on, the leasing team also targeted independent businesses that had already been proven in other locations. The tenants are largely oriented towards food, particularly those offering well-priced, convenient items targeted at university students. As a relatively small, local-serving retail node, it was more difficult to attract retail goods, such as apparel stores, although the project was successful in attracting at least one high-end outdoor clothing store, Helly Hansen. Other tenants include a produce store, a gym, a bank, a cellphone provider, stationery store and a variety of cafes.

Although the ground floor retail has been successful, retail space on the second floor has struggled, because of the lack of visibility and less convenient access. Office space on the second floor has also been challenging to lease because it is a relatively small increment of space, and there is not a strong office market in the area.

OBSERVATIONS AND LESSONS LEARNED

With available land and under the right market conditions, a private commercial development can satisfactorily fulfill a campus need. University Marketplace was developed because it was financially feasible and fulfilled unmet market demand from university students. Although the University was not involved as a stakeholder, the retail effectively functions as part of the campus, with students flowing from university-owned facilities across the street to the University Marketplace and back. However, because the University did not have jurisdiction over the site, the development was not coordinated with other campus projects and plans.

The community engagement process can be used to incorporate input from residents about building form and desired retail businesses. Despite University Marketplace's orientation to the campus staff and student population, nearby residents felt a strong stake in the development of a new mixed use project in their neighborhood. Showing examples of different types of density helped residents to envision what new development might look like and what it could bring to the neighborhood. The process also enabled residents to provide input on the types of retail that they wanted to see in their neighborhood.

Retail centers in campus contexts are likely to be local-serving rather than regional destinations. The University Marketplace businesses that have been most successful are those that primarily serve the daily needs of the campus population and nearby residents. Because of its isolation from other concentrations of retail and a broader customer base, University Marketplace is not a regional destination.

KEY FINDINGS AND IMPLICATIONS FOR THE UMED DISTRICT

This section summarizes the key findings that emerged from the case study and discusses how they may be applicable to the UMED District.

IMPLEMENTATION STRATEGIES

Real estate market conditions are a key factor in determining appropriate implementation strategies. Each of the three case studies represents a different approach related to the strength of the local market. In a weak and unproven real estate market, such as near the CWRU campus in Cleveland, institutional involvement can be critical to making a project happen. However, in strong market conditions, such as near the UBC campus in Vancouver, private developers may step in to fulfill market demand, particularly if developable sites are available. According to the July 2013 UMED District Market Analysis, the local medical office market is very strong, but residential and retail rents are not yet high enough to justify construction of new compact housing or mixed use product types. Institutional involvement may therefore be necessary to enable these types of development in the short-term. Because market conditions are likely to change over time, flexibility to adapt to changing economic conditions will also be important.

Identifying shared goals among district stakeholders is an important first step in fostering collaboration. In some cases, such as the University Square project in Madison, adjacent landowners may discover compatible development goals that form the basis of a joint venture.

In other cases, a consistent effort to convene organizations may be required to discover potential partnerships. In Cleveland, Uptown project champions were intentional in their efforts to convene other University Circle organizations and help them understand how their goals were aligned with the Uptown vision. The UMED District Plan provides an excellent opportunity to engage the district's diverse public and private organizations in a similar dialogue; indeed, facilitating collaboration is a primary goal of the Plan. Establishing a forum or working group that convenes institutional stakeholders on a regular basis is a potential starting point.

There are creative ways for institutions to support new development. The case studies illustrate a range of ways for institutions to support real estate development, beyond providing direct financing for construction. For example, CWRU played a critical role in the planning and site assembly of Uptown Phase I, but it did not finance construction. CWRU also maintains an ongoing role in the project as the master lessee for two-thirds of the retail space, which includes the campus bookstore and other student-oriented businesses. Similarly, there are a variety of ways that UMED District institutions might support new real estate development, ranging from direct financing and construction, to long-term leases for office space, retail space, student/workforce housing or other facilities needs, to active support and planning assistance.

Local governments can enable beneficial new development by setting appropriate development standards and contributing public resources where necessary. All three case study projects benefited from land use regulations that allowed high density, mixed use development.

The developer of University Marketplace in Vancouver was able to rezone a commercial site to accommodate residential uses on the upper floors, a factor which increased the financial feasibility of the project.

The lack of minimum parking requirements in downtown Madison allowed University Square developers to be as aggressive with parking ratios as the market would support. Recognizing the economic and placemaking benefits of University Square and Uptown, both the Cities of Madison and Cleveland provided loans to cover project financing gaps. The City of Cleveland also directed public roadway improvement funds towards a pedestrian alley behind the Uptown apartments. In the UMED District, the Municipality of Anchorage may be positioned to play the role of facilitator and convener for UMED District stakeholders. The Municipality can also help institutions, property owners and other stakeholders understand what the new Title 21 development standards mean for the District. Later on, as specific projects develop, additional opportunities to provide assistance or resources may arise.

A land use plan can provide a framework to help stakeholders prioritize resources and direct future investment. All three projects featured in the case studies were preceded by land use plans that designated activity nodes in strategic locations. The University of Wisconsin-Madison's East Campus Gateway Plan established an ambitious vision for a pedestrian mall supported by infill development on both sides. CWRU's 2005 Campus Master Plan identified a University Arts and Retail District in the area that later became the site of the Uptown project.

The UMED District Plan similarly has the potential to identify activity nodes and help orient landowners and district users towards future development options.

Improving quality of life for students and employees is a compelling motivation for adding retail amenities. The case studies illustrate how new retail and restaurants can effectively serve unmet retail demand (such as for a grocery store) and increase neighborhood vibrancy. Because these amenities contribute to an institution's ability to recruit employees and students, they represent an area in which multiple institutional interests may be aligned. In the UMED District Plan Update process, several institutional stakeholders have expressed an interest in creating a retail village that serves the needs of students, employees, patients and other visitors. The sponsorship of these institutions may enable new retail development to take place before the market will support private development of this type.

KEY CHALLENGES AND FACTORS FOR SUCCESS

Forming partnerships brings more resources to the table—and increases project complexity. As highlighted in the preceding section, collaboration can enable more ambitious projects than would otherwise be possible. Public and private partners contribute complementary types of resources to a project, which can make a project more robust in the face of political, market and financial challenges. However, convening stakeholder meetings, creating the legal structure to manage partnerships, and coordinating multiple layers of financing all add to project complexity, potentially increasing the development timeframe and costs.

Uptown and University Square took eight and ten years to develop respectively, whereas University Marketplace—a relatively simple, market-driven project—was completed in just a few years. UMED District organizations and landowners will have to weigh whether their development goals can best be met individually or in collaboration with other private and public entities.

Communication and consensus-building are critical. Successful partnerships require that all parties be committed to ongoing communication to negotiate potentially divergent goals. For example, whereas institutions typically plan to hold, operate, and maintain property over a long time period, developers are required to pay off loans within 25 to 35 years. As a result, institutions and private developers may have different approaches to building design and the quality of construction. Bringing commercial real estate expertise in-house is one strategy that can help institutions to partner effectively with developers.

Consider synergies with existing uses when selecting a location for pedestrian-oriented mixed use development. All three case study projects benefit from strategic locations in proximity to employment centers, campus populations and transit. Without these factors, the projects would not have been as successful in attracting residents, retail tenants and pedestrian traffic. In the UMED District, different locations have different advantages and disadvantages with regard to visibility, transit accessibility and convenience for various populations (workforce, students, etc).

As noted in the UMED District Market Analysis, retail within the district core could benefit from synergies with the Springhill Suites Hotel and Alaska Airlines Arena.

In an institutional district setting, successful retail is likely to be local-serving rather than regional-serving. All of the projects profiled in this report encountered similar challenges in attracting retail tenants. Including lack of critical mass, the seasonal nature of demand generated by university students, and an increasing shift towards online shopping. In general, the most successful campus-oriented establishments are food-related businesses, convenience goods and personal services. These findings are consistent with the UMED District Market Analysis, which concluded that the UMED district could potentially support a small increment of local-serving retail, but is unlikely to be a viable regional shopping destination.

The community engagement process allows all stakeholders, including District employees, students and local residents, to provide input about building form and desired retail businesses. Although new retail development in the UMED District is likely to be targeted at the student and employee population, nearby residents will likely feel a strong stake in the development of a new mixed use project in their neighborhood. Showing examples of different types of density can help residents envision what new development might look like and what it could bring to the neighborhood. The process also enables residents to provide input on the types of retail and building design that they would like to see in their neighborhood.

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5.3 CASE STUDY: NATURAL RESOURCES

INTRODUCTION

The Plan Update recognizes that the UMED organizations will develop their land holdings to the greatest extent feasible. Ongoing development is necessary to support and expand the health and educational services that the community enjoys and has come to expect from the UMED District. It is important, however, to guide future growth in accordance with natural resources best practices.

The community provided vital input about their view of the natural resources within the UMED District during the early stages of the planning process. From this community input, recommendations have been developed to address their concerns and to engage the community in several ways.

This report will serve to help the Municipality of Anchorage, UMED District organizations, residents, and other community stakeholders understand a range of approaches to implement the following four Goals and the associated Recommendations within the Natural Resource vision element.

- Fund and develop park management plans for the lakes, creeks, and parks within the UMED District.
- Educate and encourage citizen participation in environmental stewardship projects.
- Celebrate the Chester Creek corridor and its forested buffer zone as the primary unifying feature of the UMED District.
- Work to minimize human/animal conflicts and to protect watershed health.

Research examined several different areas of the U.S. to determine best practices that could be applicable in Anchorage. Information from the Anchorage Wetlands Management Plan, newly adopted in July 2014, is included to provide a brief context regarding the wetlands, lakes, and creek within the UMED District.

ANCHORAGE WETLANDS MANAGEMENT PLAN 2014

Surface water is abundant in the Anchorage area with an average flow of 274 million gallons per day discharging from various creek and stream corridors. The man made Campbell, Westchester, and University Lakes also have continuous inflow and outflow.[1]

Surface water is very important to the Municipality of Anchorage, with Eklutna Lake as the primary source of drinking water for most of the Municipality, Ship Creek as a secondary source, and numerous wells supplementing the remainder. Within the UMED District, the lakes and stream provide fish and wildlife habitat as well as opportunities for recreation and aesthetic enjoyment.

Wetlands are part of a vital ecological system. As described in the Anchorage Wetlands Management Plan, wetlands:

- Provide highly productive ecosystems that support an abundance of fish and wildlife.
- Regulate and modulate surface water flows through retention of excess runoff and release of this water over extended dry periods.
- Provide protection from erosion and act to reduce the velocity of flood waters from erosion or waves.
- Purify water through the uptake of nutrients, through settling of particles, and as a sink for toxic substances.
- Provide atmospheric regulation through storage of carbon within peat biomass. When wetlands are drained or cleared, that carbon is released into the atmosphere as carbon dioxide, a green house gas, which may affect global climates.

Potential outreach efforts on the AWMP have the ability to teach others the benefits of wetland management and preservation. The goals and objectives from the AWMP can be partnered with the UMED District plan and used to seek funding for water quality improvement projects along Chester Creek and at University Lake in the UMED District area.

PRIMARY NATURAL RESOURCE CONCERNS

Parks, Trails, and Dogs

Faced with limited Municipal resources, Municipal parks and trails within the UMED District are sparsely managed and maintained. Conflicts between user groups and the lack of owner responsibility for both clean-up and animal control have created ongoing issues. Goals and recommendations within the UMED District Plan are intended to mitigate these conflicts.

Wildlife and Natural Areas

The natural areas within the UMED District contain high-functioning wetland areas that contribute to the wetland functionality of the Chester Creek corridor. This natural area contributes to the well-being of a variety of plants and animals and is valued by those who recreate in the area. There is a hierarchy of wetlands, however, in terms of their importance in contributing to ecological functions. Less important wetland areas may be developed in the future with reasonable mitigation. The advancement of GIS mapping allows planners and developers to monitor the wetlands within the UMED area.

This Vision Element also addresses the need to minimize the everyday human-wildlife conflicts that may be caused by travel within the District; and the Vision Element seeks to mitigate transportation-related impacts to the natural areas, including streams and wetlands.

CASE STUDIES

The Natural Resources Case Studies considered three topic areas:

- Public Outreach and Education
- Park Management
- Urban Forested areas

LAKE TAHOE: PUBLIC OUTREACH AND EDUCATION[2]

Lake Tahoe was reviewed due to its similarity with Anchorage's construction season, which occurs only between winters. This requires construction companies to work around the clock to ensure that projects are completed on-time during the limited construction season.

In addition, the tourism component of Lake Tahoe applies to Anchorage. As good environmental stewardship means good business for Lake Tahoe, so it should for Anchorage. Over 1.9 million people visited Alaska in 2012-2013 to enjoy the pristine waters, views, natural amenities, wildlife, and recreational offerings (AEDC 3-Year Outlook Report). Anchorage receives many of these visitors as a destination in of itself and as a gateway to other areas of the state.

In Lake Tahoe, projects face stringent environmental mitigation demands to improve and protect the famed clarity of the lake. The requirements to prevent the flow of dust, dirt, and whatever else clouds the water is emphasized in every plan, project, and public outreach element that comes through the Tahoe Regional Planning Agency (TRPA) for approval, permitting, or informational purposes.

TRPA completes review and approves permitting in the Lake Tahoe Basin through a bi-state compact approved in the 1980s: http://www.trpa.org/bi-state-compact. Multiple counties and two cities are also governed by TRPA's adopted ordinances. Businesses, residents, and local and state governments are all involved in caring for Lake Tahoe. The Lake Tahoe business sector is highly dependent on visitors who rent cabins, hotel rooms, eat, drink and play.

LOCATION	Lake Tahoe, Nevada and California	Long Beach, CA	Seattle, WA
TOPIC	Public Outreach and Education	Water Quality and dogs	Urban Forested Areas

Figure 85. Locations and topics of case studies

The Lake Tahoe business sector as well as residents and property owners are therefore committed to the many efforts to protect the lake.

TRPA worked with the community over the last 10 years to update its Regional Plan, and ideas from the Regional Plan are being implemented now with community-wide participation and support. In addition, financing comes from the public/private Community Watershed Partnership.

COMMUNITY WATERSHED PARTNERSHIP

Public-private partnerships developed in the Lake Tahoe area over many years. The Regional Plan update, coupled with good science and new construction technologies, has assisted the community in maintaining and improving water quality and the ever important lake clarity. These partnerships will aid the community in meeting the demands of ongoing construction and tourism impacts, while maintaining for residents and businesses one of the most beautiful places to thrive on earth. The Community Watershed Partnership (CWP) intends to develop community-wide plans to promote erosion-resistant landscapes and runoff infiltration retrofits on private parcels in conjunction with public storm water improvements. The CWP program provides an avenue for property owners to obtain technical assistance with site evaluations and conceptual designs to implement on-site best management practices that would help minimize runoff and pollution. The success of the CWP will translate to increased community education, reduced sediment loads, and ultimately a more beautiful Lake Tahoe.

Potential Applicability to the UMED District

In Lake Tahoe, it was critical to form a specific community partnership of public agencies and residential and business property owners to learn and implement new ways to improve the water quality.

In the UMED District, the newly amended Anchorage Wetlands Management Plan (AWMP) and the Natural Resources Vision Element of this plan can inform the community about best practices. The UMED District would benefit from public outreach, primarily through the Community Councils, to educate the public on the AWMP. The Waterways Council, a local environmental advocacy group, can support this effort, and Capital Improvement Plan monies could be a source of funding, especially for improvements at University Lake Park and in the Chester Creek corridor.

WATER QUALITY AND DOGS[3]

Pollution from dogs has a significant impact on water quality. At some beaches it was found that dogs raised the level of bacteria so high that swimmers were warned to stay out of the water.

Traci Watson in a USA Today article, “Dog Waste Poses Threat to Water,” details her research, which postulates that science can prove that dog waste is an environmental pollutant. In the mid-1990s, scientists perfected methods for tracking the origins of bacteria in streams and sea water. From Clearwater, FL, to Arlington, VA, and Boise, ID the trail led straight to the dog – and to owners who don’t pick up after their pets. Several studies have found that only about 40% of Americans pick up after their dogs.

Wild birds and humans usually head the roster of water polluters, but in some areas, dogs pose a significant threat to environmental health. Additional studies have found that dogs were third or fourth on the list of contributors to bacteria in contaminated waters. This group includes E.coli, a bacterium that can cause disease and fecal coli form bacteria.

- Stevenson Creek in Clearwater, FL.: Residents were worried that a sewage treatment plant contaminated the creek, but when the water was tested, it was found that dog feces that washed from yards to the nearby creek, along with leaky septic tanks, and wild animals were to blame for high bacteria counts.
- Four Mile Run in Arlington and Fairfax counties, VA.: Studies show that dogs add to the contamination in this suburban Washington, D.C. stream. Officials calculate that the 12,000 dogs living in Four Mile Run’s watershed leave behind more than 5,000 pounds of “solid waste” every day.
- Boise River in Boise, ID.: The river suffers from high bacteria levels that make it unsuitable for swimming. Testing of streams and drainpipes flowing into the river showed that in urban areas, dogs were a leading contributor to water pollution. In some spots, dogs and cats account for even more of the bacteria than human feces — from dysfunctional septic tanks and leaky sewage pipes — do.

Even where dogs aren’t the prime offenders, they are one of the few polluters authorities have control over. At many California beaches, for example, seagulls and other birds are most responsible for high bacteria levels, but federal laws protect birds.

While some people find it humiliating to carry a plastic bag and pick up after their dog, a public education effort on the impact of pollution from dogs can change perceptions.
A survey by the Center for Watershed Protection in 1999 found that of the 41% of respondents who rarely or never clean up after their dogs, 44% would refuse to do so even in the face of fines and neighbors' complaints. Reasons included, "because it eventually goes away," "small dog, small waste," and "just because."[4] The Center for Watershed Protection is a non-profit organization that focuses on responsible land and water management.[5]

In Laguna Beach, Calif., a wealthy beach enclave, the city provides pooper-scoopers at the local dog park, and the city hired poop-scooping service to address the non-participation of locals. The city hired Entre-Manure, poop-scooping service based in nearby Dana Point whose motto is "#1 in the #2 Business." In a six month period, the service has collected 187 pounds of dog waste from the city. "I'm real proud of that fact," says Craig Stern, founder and chief picker-upper. "That's pollution that'll never reach the ocean." Entre-Manure (http://www.entre-manure.com/aboutus.html) is a thriving business that estimates they have disposed of thousands of pounds of dog waste since starting the business in 2002.

Potential Applicability to the UMED District

Two of the primary issues heard during the early stages of the UMED Update planning process was the issue of dog management at University and Goose Lakes and water quality impacts related to dog feces deposited in these parks and water features (UMED Public Comment Log).

Anchorage has an estimated 73,774 dogs that eliminate approximately 0.32 pounds of waste per dog, per day. That adds up to more than 10 tons of waste produced every day. A significant amount of that fecal matter is deposited into parks, common areas, and neighborhoods and is left to dissolve and run off into our local water bodies.

The Anchorage Water Ways Council is an advocacy group that tests water throughout the Anchorage area. One of the Council's goals is to educate pet owners about reducing the impacts to water quality by "scooping poop" and disposing of it properly. Results of water testing at University Lake confirm that dog feces is a source of pollution. Unfortunately, their annual "Scoop the Poop" event, which features University Lake Park as a primary site, does not succeed in changing people's behavior.[6] *See the Anchorage Waterways Council website at: http://anchoragecreeks.org/pages/scoopthepoop_about.php*
Laguna Beach, California may serve as a model for encouraging a private sector solution to the challenge. Fines, providing bags, and annual clean-up days do not seem to effectively mitigate this environmental hazard, but dog license fees could help defray the costs of managing and maintaining the muni's dog parks. For example, the UMED District could run a pilot project funded by a portion of dog license fees to hire a clean-up service at University Lake. This would require enforcement to ensure that dogs entering the park are licensed.

SEATTLE, WASHINGTON: URBAN FORESTS, WATER QUALITY AND LAND DEVELOPMENT, AND URBAN WILDLIFE

Urban Forest Management Plan

In 2004, the city of Seattle and the nonprofit Forterra (then-known as Cascade Land Conservancy) joined together to create the Green Seattle Partnership. This public-private partnership is based around a 20-year strategic plan to create "a healthy, livable city with a sustainable urban forest." The plan identifies 2,500 acres of green space managed by Seattle Parks and Recreation — Seattle has more than 6,000 acres of parkland in total — for restoration by 2025 and will focus specifically on addressing invasive plant issues plaguing the city and planting a sustainable, near-native forest for the future. It's estimated that without management, 70 percent of Seattle's forested land will be ecologically dead in 20 years due to invasive plant species.

Several programs have been developed by a variety of agencies to complement Green Seattle including: Seattle reLeaf, Tree Ambassador Program, Trees for Neighborhoods, Bridging the Gap, Residential Rainwise, and Green Seattle Partnerships.

Seattle City Light

Seattle City Light, the city's publicly owned electricity company, has made environmental stewardship one of their longstanding goals. The public utility adopted its first conservation program, "Kill-a-Watt", back in 1973 and has been working with nonprofit The Nature Conservancy since the early 1980s to protect wildlife habitats.

To date, Seattle City Light has purchased more than 10,000 acres to protect wildlife habitat, especially that of the various salmon and trout species in the Skagit and Tolt watersheds. As Lorraine Loomis with the Swinomish Indian Tribal Community's Fisheries Department related in 2009, "Whether it has been through the purchase of strategic parcels for protection of important habitats, its water management strategies or its funding of research or restoration projects vital to the ongoing protection of anadromous salmonids, City Light has demonstrated that a public utility can provide a reliable source of energy while at the same time conserving and enhancing natural resources."

Other Initiatives

The city of Seattle has created tree protection zones. In addition, when construction projects are underway, the city displays posters showing the monetary value of a tree so that contractors are reminded of the potential of construction to cause damage to trees,

Seattle's Plans for the Future

Seattle's urban forest success lies with the city's cooperative efforts. For decades an interdepartmental team representing various parties concerned with Seattle's trees has been making sure all departments are on the same page and coordinating with each other to accomplish similar goals for urban forestry. There are still inconsistencies that the city hopes to address.

Three different assessments of Seattle's urban forest have been completed over the years, but each study utilized a different methodology. The city is currently working on analyzing the different assessments to provide a more uniform view at Seattle's urban forest initiatives.

Other outstanding issues are finding funding for a robust management and maintenance program and updating the tree ordinance, which has not been updated since 1962.

Potential Applicability to the UMED District

The UMED District is valued for its forested area and wetlands. Much of the wetland and green space found in the central area of the UMED District is planned for development by Alaska Pacific University and University of Alaska Anchorage. The District can therefore benefit from the proactive planning and partnerships modeled in Seattle.

It is important that new development within the District be dense and allowed taller heights, as outlined in Title 21, so as to preserve surrounding open space. In addition, new roadway and trail projects within the District should be landscaped and reforested to reduce erosion and run-off; and planting around the lake embankments and the stream corridor within the District should be improved and maintained.

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5.4 EXAMPLE: POSITIVE TOWN GOWN RELATIONSHIPS

The Examples below focuses on how to foster positive relationships between organizations and the residential communities they are situated in. The subject is examined through four topics: empowering neighbors to communicate effectively, city planning and policy tools, organizational goodwill, and the economic benefits of positive town-gown relationships. Within each topic, related issues are discussed and resources for further research are provided.

The sources in this section are not meant to serve as absolute best practices—this would require rigorous peer reviewed analysis. Rather, this section is meant to highlight key issues and discussion points in town-gown relationships and provide guidance for further in-depth research.

EMPOWERING NEIGHBORS TO COMMUNICATE EFFECTIVELY WITH ORGANIZATIONS

COMMUNITY ORGANIZATIONS

Successful town-gown relationships require effective communication between the community, the local government, and the organizations.

Residents can effectively voice their concerns through community organizing as illustrated by the Ainslie Wood/ Westdale Community Association of Resident Homeowners Inc (AWWCA). The AWWCA was founded as a volunteer nonprofit organization in 1998 and acts as a forum for residents to communicate collectively with the City of Hamilton and McMaster University in Ontario, Canada.

Resources for Community Organizing around Town-Gown Relations

- Ainslie Wood/Westdale Community Association of Resident Homeowners Inc., http://awwca.ca/.
- A Guide to Reciprocal Community-Campus Partnerships, Community-Wealth.org, http://community-wealth.org/content/guide-reciprocal-community-campus-partnerships.
- UC/Community Interactions and Collaborations, A Study of Peer Institutions: Main Report, http://community-wealth.org/content/uccommunity-interactions-and-collaborations-study-peer-institutions-main-report.

CITY PLANNING AND POLICY TOOLS FOR COMMUNITY-ORGANIZATION INTERACTIONS

REGULATORY AND NON-REGULATORY PLANNING

Jurisdictions have regulatory and non-regulatory tools to guide development on organizational lands. Regulatory tools include land use and design review processes directly control organizational development. Non-regulatory controls, such as Memorandums of Understanding, define the roles and obligations of each party but do not have any legal implications. Cities such as Cleveland, Ohio, Portland, Oregon, and Tucson, Arizona, have each used different combinations of regulatory and non-regulatory planning tools to manage the growth of local universities. In Mansfield, Connecticut, a Town Council was formed to address concerns regarding quality of life issues that arise during spring break.

Resources on Regulatory and Non-Regulatory Planning Tools

- Special Committee on Community Quality of Life Committee Report, Connecticut, http://www.mansfieldct.gov/filestorage/1904/4724/200504_cocql_report.pdf.

- Town–Gown Collaboration in Land Use and Development, http://www.lincolninst.edu/pubs/1575_Town-Gown-Collaboration-in-Land-Use-and-Development.
- "Mechanisms for Cities to Manage Institutionally Led Real Estate Development." Lincoln Institute of Land Policy. April 2007. Web. 8 April 2014. http://www.lincolninst.edu/pubs/1234_Mechanisms-for-Cities-to-Manage-Institutionally-Led-Real-Estate-Development.

GOVERNMENT-LED STAKEHOLDER ENGAGEMENT

Government can play a key role in community organizing, and interfacing with organizations. When the University of Wisconsin-Milwaukee and the City of Milwaukee planned for developing the university and the surrounding neighborhood, the planning process engaged residents to discuss priorities, strategies, and key issues. Regarding organizational relations, the Mayor's Office in the City of Boston has a liaison dedicated to communicating with the city's institutions of higher education.

Resources on Government-Led Community Organizing

- A Strategy and Vision for the UWM Neighborhood, http://city.milwaukee.gov/ImageLibrary/Groups/cityDCD/planning/plans/UWM/UWMFinal.pdf.

- Town–Gown Collaboration in Land Use and Development, http://www.lincolninst.edu/pubs/1575_Town-Gown-Collaboration-in-Land-Use-and-Development.

ORGANIZATION AND RESIDENT JOINT EVENTS: FARMERS' MARKETS

Jurisdictions can facilitate organizational and residential relations through events that draw both communities. For example, a regular farmers' market is held on the parking lot of Kapiolani Community College in Hawaii. The event is sponsored by the Hawaii Farm Bureau, the Department of Agriculture, the Hawai'i Tourism Authority, and the City and County of Honolulu. Alternatively, the University Community Farmers Market at the University of Buffalo is a joint effort between the University of Buffalo, surrounding neighborhoods, and local organizations. These examples represent outdoor farmer's markets, however it is possible to also found a flexible space to hold indoor markets. One example is the Winter Farmers Market held at Vermont College Gym.

Resources on Developing Farmers' Markets

- KCC I Hawaii Farm Bureau Federation, http://hfbf.org/markets/markets/kcc/.
- University Heights Collaborative - Buffalo, New York, http://www.ourheights.org/farmersmarket/.
- Welcome to the Year-Round Capital City Farmers Market, http://www.montpelierfarmersmarket.com/.
- Starting a Farmers' Market, http://citeseerx.ist.psu.edu/viewdoc/download?rep=rep1&type=pdf&doi=10.1.1.177.6842.
- Making Farmers' Markets a Central Part in Food Systems Planning: A Case Study of Urbana, Illinois, https://www.planning.org/resources/ontheradar/food/pdf/PWDfarmersmarkets.pdf.
- Establishing and Operating a Community Farmers' Market,. http://www2.ca.uky.edu/agc/pubs/aec/aec77/aec77.pdf
- *See Fresh Food Access Example for information on indoor farmers' markets.*

RESIDENT AND ORGANIZATION JOINT SERVICES: DAY CARE CENTERS

Governments can also foster positive organization and resident relations by supporting services used by both parties. In Farmingdale, the New York State Senate funded the establishment of the Farmingdale State Children's Center. One justification for the project was that an on-campus day care will decrease the absentee-rate of parents who have children.

Resources on the Farmingdale Children's Center

Farmingdale State College Children's Center Groundbreaking, http://www.antonnews.com/farmingdaleobserver/news/25582-farmingdale-state-college-childrens-center-groundbreaking.html.

ORGANIZATIONAL GOODWILL AND COMMITMENT TO NEIGHBORS

COMMUNITY ENGAGEMENT OFFICES

Organizations employ a number of tools to dispel the notion of the "ivory tower". Many organizations create dedicated offices to community relations. Pennsylvania State University's Office of Community Relations runs programs to foster positive relationships with neighbors, such as the LION (Living in One Neighborhood) Walk. Similarly, the University of Virginia in Charlottesville holds an annual event wherein employees volunteer on public projects and donate to community-based charities.

Resources on Organizational Community Engagement

- Town-Gown Relations Explored at Community Meeting, http://www.news.cornell.edu/stories/2013/10/town-gown-relations-explored-community-meeting.

ACADEMIC ENGAGEMENT WITH THE COMMUNITY AND LOCAL ENVIRONMENT

The U.S. Department of Housing and Urban Development has developed categories to describe various ways organizations integrate academic goals and community engagement. Categories include service learning, student volunteerism, and applied research. A good example in the UMED District itself is the Center for Community Engagement and Learning (CCEL) at the University of Alaska in Anchorage. CCEL aims to connect academic programs with community needs.

For example, CCEL provides funding to professors whose academic work is locally bound, and has an online forum for students to find work in community-based research.

Similarly, faculty at the University of California in Los Angeles advise local government officials on housing issues, land reclamation, economic development and other planning issues.

Resources on Academic Engagement with the Local Community and Environment

- Center for Community Engagement & Learning (CCEL), http://www.uaa.alaska.edu/engage/.
- Community-Higher Education Partnerships Resources, http://www.pdx.edu/sites/www.pdx.edu.cae/files/LIT_REVIEW.pdf.
- Facilitators of Change OUP's Connections to Resources Continue to Transform and Empower Communities, http://www.huduser.org/publications/pdf/facilitators_of_change.pdf.
- Democracy, Civic Participation, and the University: A Comparative Study of Civic Engagement on Five Campuses, http://nvs.sagepub.com/content/33/1/74.abstract.
- Town and Gown in America: Some Historical and Institutional Issues of the Engaged University, http://www.ncbi.nlm.nih.gov/pubmed/14742021.
- Bridging 'Town & Gown' Through Innovation University-Community Partnerships, http://www.innovation.cc/volumes-issues/martin-u-partner4final.pdf.

STEWARDSHIP: PUBLIC HEALTH & WELLNESS

Medical organizations benefit the community they are situated in by providing easy access to essential medical care. Some organizations also provide special services to their community. For example the medical organizations at the University of Southern California provide community programs such as Fit Families, the Oral Health Center, and Community Health Fairs. They also operate a Mobile Dental Clinic which provides free dental care to those in need. An example from the UMED District itself is the Learning Institute at Providence Alaska Medical Center. The Learning Institute hosts community events that include talks on health related issues, courses on parenting, support groups, and clinical education.
Another example from the UMED District is Alaska Pacific University's opening of recreational facilities to the community. The public can purchase memberships or punch-cards that permit entry to the university's swimming pool and gym. The university also has a program for renting outdoor gear -such as canoes, bicycles, skis, and camping gear—to the public.

Resources on Public Health in the Local Community

- Health and Safety, https://communities.usc.edu/health-and-safety/.
- An Extraordinary Partnership Between Arizona State University and the City of Phoenix, file:///C:/Users/aranoff/Downloads/ASUandPhoenix_partnership.pdf.
- Providence Alaska Learning Institute, http://alaska.providence.org/media/education/Pages/default.aspx.

Also see Resources on Academic Engagement with the Local Community and Environment

STEWARDSHIP: SUSTAINABILITY

In addition to public health, universities have taken upon themselves responsibility for the surrounding natural environment. Our World web magazine compiled a list of thirteen sustainability projects led by universities. One example includes the Community Sustainability Partnership in Grand Rapids, Michigan. CSP is a partnership between three universities, the City of Grand Rapids, and Grand Rapids Public School and their sustainability work focuses on the environment, economic development, and social equity.

Resources on Sustainability

- Grand Rapids Learning and Living the Triple Bottom Line. Community Sustainability Partnership, http://www.grpartners.org/about.
- Universities Co-Creating Urban Sustainability, http://ourworld.unu.edu/en/universities-co-creating-urban-sustainability.

STEWARDSHIP: EDUCATION

Universities have also engaged in raising the quality of primary and secondary education. In Arizona, the Phoenix Union High School District has collaborated with the School of Letters and Sciences to provide students with a hands on study of the sciences.

Resources on Education in the Local Community

- An Extraordinary Partnership between Arizona State University and the City of Phoenix, file:///C:/Users/aranoff/Downloads/ASUandPhoenix_partnership.pdf. Integration through Urban Design

URBAN DESIGN AND URBAN UNIVERSITIES

Universities can achieve integration through urban design. Syracuse University, for example, has led the design for 1.5 mile corridor between the downtown and the university. Landscaping, bike baths, lighting, public art, and wayfinding have been integrating into the design.

Resources in Urban Design and Urban Universities

- Making Cities Livable Through Place Marketing, http://webapps.icma.org/pm/9006/public/pmplus1.cfm?author=Janet%20Cherrington&title=Making%20Cities%20Livable%20Through%20Place%20Marketing.

- Town–Gown Collaboration in Land Use and Development, http://www.lincolninst.edu/pubs/1575_Town-Gown-Collaboration-in-Land-Use-and-Development.

PAYMENTS IN-LIEU OF TAXES (PILOT)

Universities represent a loss in tax revenue for the jurisdictions they are located in. To offset these losses, some universities volunteer payments in lieu of taxes. In Providence, Rhode Island, organizations make voluntary payments in the event of certain factors such as endowments and the purchase of property. Recognizing the value of hosting universities, the states of Connecticut and Rhode Island reimburse cities a certain percentage of the taxes lost by nonprofit organizations.

Resources on PILOT

- College to Provide Funding to Town of Middlebury for $9 Million Bridge, http://www.middlebury.edu/newsroom/archive/2007/node/111794.
- Town–Gown Collaboration in Land Use and Development, http://www.lincolninst.edu/pubs/1575_Town-Gown-Collaboration-in-Land-Use-and-Development.
- Town-Gown: A New Meaning for a New Economy." Campus Contact, http://www.compact.org/resources/future-of-campus-engagement/town-gown-a-new-meaning-for-a-new-economy/4261/.

ECONOMIC BENEFITS OF ORGANIZATIONAL-RESIDENTIAL DISTRICTS

EMPLOYMENT AND THE MULTIPLIER EFFECT

Organizations provide employment and can anchor economies, serving as a center around which goods and services development. A 1999 study of the twenty largest cities in the United States found that educational and medical organizations accounted for 50% of the jobs in four of those cities. Similarly, a more current study by the University of California at San Diego found that the university creates "$2.275 billion in direct and indirect spending, 20,790 direct and indirect jobs, and $1.228 billion in direct and indirect personal income." Assessing the complete multiplier effect is complicated, however, with effects varying by organization type, size, and location: public v. private, single campus v. statewide system, city location v. small town.

Resources on the Economic Benefits of Universities

- Town–Gown Collaboration in Land Use and Development, http://www.lincolninst.edu/pubs/1575_Town-Gown-Collaboration-in-Land-Use-and-Development.

POSITIVE TOWN GOWN RELATIONSHIPS ENDNOTES

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3. City of Milwaukee. "A strategy and vision for the UWM neighborhood." City of Milwaukee. June 2003. http://city.milwaukee.gov/ImageLibrary/Groups/cityDCD/planning/plans/UWM/UWMFinal.pdf.
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5. "KCC l Hawaii Farm Bureau Federation." Hawaii Farm Bureau. n.d. http://hfbf.org/markets/markets/kcc/.
6. "University Heights Collaborative - Buffalo, New York." n.d. http://www.ourheights.org/farmersmarket/.
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10. Martin, Lawrence L., Hayden Smith, and Wende Phillips. 2005. "Bridging 'Town & Gown' Through Innovation University-Community Partnerships." The Innovation Journal: The Public Sector Innovation Journal 10 (2). http://www.innovation.cc/volumes-issues/martin-u-partner4final.pdf.
11. Yarime, Masaru, and Gregory Trencher. 2012. "Universities Co-Creating Urban Sustainability." Our World. May 23, 2012. http://ourworld.unu.edu/en/universities-co-creating-urban-sustainability.
12. "About." Grand Rapids Learning and Living the Triple Bottom Line. Community Sustainability Partnership. n.d. http://www.grpartners.org/about.
13. "An Extraordinary Partnership between Arizona State University and the City of Phoenix." Arizona State University. n.d. file:///C:/Users/aranoff/Downloads/ASUandPhoenix_partnership.pdf.
14. Campus Compact. "Town-Gown: A New Meaning for a New Economy." Campus Contact. n.d. http://www.compact.org/resources/future-of-campus-engagement/town-gown-a-new-meaning-for-a-new-economy/4261/.

5.5 EXAMPLE: NIGHT LIGHTING

Light pollution hinders astronomy, disturbs ecosystems, and interferes with human biological processes. The International Dark Sky Association works to prevent light pollution, and as part of their effort, they provide policy guidelines to governments. For example, they provide a Model Lighting Ordinance which covers lighting zones, requirements for outdoor lighting, and enforcement. Other resources provided by IDA include model legislation for outdoor lighting, guidelines for urban neighborhoods, a directory of other lighting ordinances, and a collection of relevant reports and studies.

Resources on Night Lighting/Model Lighting Ordinances

International Dark-Sky Association-Illuminating Engineering Society, Joint. “Model Lighting Ordinance (MLO).” International Dark-Sky Association, June 2011. Web. 23 April. 2014. http://www.darksky.org/assets/documents/MLO/MLO_FINAL_June2011.pdf.

International Dark-Sky Association. “State Model Outdoor Lighting Legislation.” International Dark-Sky Association, December 2012. Web. 23 April. 2014. http://www.darksky.org/assets/documents/Outdoor_Lighting/State_Model_Outdoor_Lighting_Legislation_rev_121212a.pdf.

International Dark-Sky Association. “Simple Guidelines for Small Communities, Urban Neighborhoods, and Subdivisions.” International Dark-Sky Association, n.d. Web. 23 April. 2014. http://www.darksky.org/lighting-codes/simple-guidelines-to-lighting-regulations.

International Dark-Sky Association. “Other Ordinances: Directory of Lighting Ordinances.” International Dark-Sky Association, n.d. Web. 23 April. 2014. http://www.darksky.org/lighting-codes/list-of-lighting-ordinances.

International Dark-Sky Association. “Sample Ordinances and Warranting.” International Dark-Sky Association, n.d. Web. 23 April. 2014. http://www.darksky.org/lighting-codes/sample-ordinances-warranting

5.6 EXAMPLE: FRESH FOOD ACCESS

Access to fresh produce and groceries is an unmet need in the UMED District, with residents and workers in the center of the District being over two miles from the nearest supermarket (*see chapter on Commercial, Housing & Market Conditions in the Supporting Documents*). A recent UAA initiative to sell fresh produce and baked goods to students at a twice-weekly farmers market has proven successful, further indicating demand for fresh produce. As the UMED organizations expand and more housing is added, demand will only increase. The following examples illustrate how to provide temporary fresh food while more expensive and long-term brick-and-mortar undertakings are considered.

INDOOR FARMERS MARKETS

Examples: Town-Gown Relationships provides examples for various farmers markets coordinated with organizations. Another model is large indoor markets that have various vendors. One popular market is the Newbo City Market, in Cedar Rapids, Iowa. The Newbo City Market is situated inside a formerly industrial building that was abandoned following a major flood that damaged the property in 2008. The building was refurbished by local citizens under support from the city and state. It is located on a block that includes performance spaces, restaurants, shops, and artist studios, much like Granville Island in Vancouver, Canada. It operates year round, with various vendors selling coffee, canned goods, meats, and fresh pasta during the winter months, and hosts holiday fairs, musical performances, children's play events, or cooking classes on the weekends. Similar examples of indoor markets with individual vendors are Reading Market in Philadelphia, Pennsylvania and Pike Place Market in Seattle, Washington.

Resources on Indoor Markets

- "About the Market." Newbo City Market, Cedar Rapids, Iowa. n.d., http://newbocitymarket.com/about/.
- Granville Island, Vancouver, B.C., Canada. n.d., http://granvilleisland.com/.
- "Welcome to Philadelphia's Reading Terminal Market, Philadelphia, Pennsylvania." Reading Terminal Market. n.d., http://www.readingterminalmarket.org/.
- "Public Market Center Pike Place Market." Pike Place Market, Seattle, Washington. n.d., http://www.pikeplacemarket.org/.

"A FARM MARKET ON WHEELS"

It costs between $50,000 and $100,000 to purchase and outfit a mobile food business, which is only a fraction of the costs for acquiring and equipping a brick-and-mortar grocery store (Iams 2010). This model provides good interim access to fresh foods while the UMED District plans for growth. Not only are mobile solutions more economical, but they enable suppliers to be responsive to demand at different times and locations. Mobile food businesses are commonly known as "food trucks" and are generally thought to cater one type of prepared food. However, the "market on wheels" concept is gaining popularity and offers a range of fresh produce in lieu of cooked meals. In addition, outdoor food facilities create new public spaces where none existed before and can accentuate already lively hubs.

With only ten percent of food-related businesses succeeding, mobile food vendors must have a solid business plan and savvy marketing skills (Iams 2010). Challenges include the reliance on weather and limited storage.
In addition, these businesses can have negative environmental impacts as such as noise, trash, parking, and pedestrian circulation issues. Municipalities can address part of these challenges by updating the regulatory process to apply to this revived form of commerce in the public realm.

In response to the need for fresh produce and groceries in the UMED District, a mobile grocer, like The Green Grocer's Veggie Van in Columbus, Ohio can serve as a model. The Green Grocer focuses on food access in low-income communities, but the concept is relevant to the UMED District.

Another example is the NYC Green Carts which sell only fresh produce and focus on areas of New York City that have limited access to these goods.

Resources on Mobile Food Vending

- Arroyo, Rod and Jill Bahm."Food Truck Feeding Frenzy: Making Sense of Mobile Food Vending." ClearZoning. 16 April 2014. http://www.clearzoning.com/2014/food-truck-feeding-frenzy-making-sense-of-mobile-food-vending-zoning/.
- Arroyo, Rod and Jill Bahm. "Food Truck Feeding Frenzy: Making Sense of Mobile Food Vending." Zoning Practice American Planning Association. 30.9 (2013): 1-8.
- Iams, Alex. "Food Without Walls: The Planning and Economic Development Benefits of Outdoor Food." News & Views American Planning Association Fall 2010: 8-10. https://www.planning.org/resources/ontheradar/food/pdf/EDDfoodwithoutwalls.pdf.
- "Who We Are." The Green Grocer, n.d., http://thegreenergrocer.com/who-we-are/.
- "NYC Green Carts." The New York City Department of Health and Mental Hygiene. n.d., http://www.nyc.gov/html/doh/html/living/greencarts.shtml.

5.8 COGENERATION 2013 EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report is an update to the 2009 UAA/ML&P Combined Heat and Power (CHP) Study which is a part of the overall UMED District Plan Update. The project is a stakeholder desired plan funded by the State of Alaska through a grant, and administered by the Municipality of Anchorage. The original CHP study envisioned a 10 megawatt (mW) power generation station using natural gas fired turbines that would make both heat and power. The heat was to be used by Providence Alaska Medical Center (PAMC) and the University of Alaska Anchorage (UAA) for their facilities. The plant, to be located on UAA property, was going to connect the PAMC and UAA with a series of buried enclosed pipes and pumps (utilidors) that would distribute the waste heat (hot glycol or steam) to the appropriate facilities. The cost of the utilidors alone was almost half of the total capital cost of the project, which made the project unfeasible after all of the overhead and operational costs were included.

CHANGES IN TECHNOLOGY:

In the last few years, micro turbines have entered the picture. "Micro turbine" is the terminology generally used for small, high speed gas turbines in the size range of 15 kW to 300 kW. Since the 2009 study, micro turbine technology has made it now possible to locate a small micro turbine (or several micro turbines to match loads) in many of the buildings within the UMED district where there is a significant demand for both heat and power. This arrangement is called "distributed cogeneration."

These micro turbines are referred to in this report as combined heat and power (CHP) units, since they make both heat and power simultaneously for use within the building where they are located. With the use of micro turbines in buildings, the original centralized project capital cost could be virtually cut in half because utilidors are no longer needed to distribute heat to the entire district, and no administrative interagency overhead would be required since there would be no need for a central plant. The buildings would still be connected to the Anchorage Municipal Light and Power (ML&P) grid for most of their power. It is noted that CHP units can also be manufactured using natural gas fired reciprocating engines as their power source - instead of high speed turbines, but the noise, maintenance, operating costs and emissions are all higher. For this reason the reciprocating engine technology was not given further consideration in this study.

STUDY PROCESS:

Interviews were conducted with representatives from each of the UMED stakeholders to determine their current needs, desires and plans, and to see if they were interested in installing a proof of concept (POC) CHP unit in one or more of their buildings. All stakeholders would consider such a project. The POC CHP units could range in size from 30kW to 1,000 kW, depending on the thermal load to be served.

COST ANALYSIS:

A cost analysis was performed to determine the potential payback for two generic installations, one producing 65 kW (C-65) and one producing 200 kW (C-200). If a C-200 unit were installed in the ML&P service area but connected to the customer's load side of the meter (contrary to ML&P's tariff requirements but in compliance with the CEA interconnection guidelines – more on this in section I), the payback period would be less than five years, and the 10-year Net Present Value (NPV) would be $339,481 dollars using existing tariff rates. See cumulative cash flow graph in Figure 1.

If the same C-200 unit were installed using the ML&P restrictions which require the customer to first sell all power generated back to ML&P for half of what they then pay to buy it back, the payback period would be infinity, and a 10 year NPV would be a loss of $870,752, making it financially infeasible. See the cumulative cash flow for this scenario in Figure 2.

Evaluation of smaller, less expensive 65 kW CHP unit reveals a similar result. If the stakeholder installs a C-65 and connects it directly to the grid to sell the power back to ML&P, rather than on the load side of their meter, they lose $330,697 over 10 years, with a payback period of infinity. However, if they are allowed to connect a 65 kW CHP to the load side of the meter, (using the CEA guidelines) thus reducing demand and power costs, they have a 10 year NPV of $28,870, with a 6.82 year payback. These paybacks were all prepared using conservative installation and maintenance cost estimates.

TARIFF RESTRICTIONS:

Since the ML&P interconnection requirements prohibit a customer from installing a CHP unit on load side of their electrical meter, they cannot reduce their demand charges or the overall amount of power they purchase from ML&P. Chugach Electric Association (CEA) which serves customers across Tudor Road, which forms the south boundary of the UMED district, does not have this requirement, so a CEA customer could install a CHP unit and expect to see excellent payback periods through demand charge, power use, and heating cost reductions. Whereas an ML&P customer will never realize a break even return on their investment. Therefore CHP units installed in the ML&P service area (north of Tudor Road) are financially infeasible under any circumstance.

Larger stakeholders in the UMED district pay approximately one million dollars ($1,000,000) each, annually, for demand charges alone. ML&P defines demand charges in their tariff as follows: "Demand charges are determined by using the maximum average rate of energy use for any 15-minute interval. The billing demand shall be greater of the following: the recorded maximum demand for the month, or 80 percent of the maximum demand recorded during the preceding 11 months, or the customer demand, under a special contract for a customer with on-site generation."

The UMED users are very interested in finding ways to redirect the cash used to pay high demand costs toward enhancement of their core mission, which is to provide increased patient care and better education services. These stakeholders employ a large number of Alaskans. As an example, PAMC is the #2 employer in the State of Alaska.

This report describes the characteristics of CHP units in more detail, payback periods, tariff requirements, interconnection requirements, and interview results.

RECOMMENDATIONS:

This report recommends that relief be sought from ML&P to allow customers to connect their CHP units on the load side of their electrical meter in order to reduce their annual power and demand payments to ML&P. This concept was discussed and rejected out of hand during a meeting with ML&P on August 27, 2013. If the request for relief is denied after a stakeholder application, relief could be sought through a Public Utilities Regulatory Poling Act (PURPA) case presented to the Regulatory Commission of Alaska (RCA). It may also be addressed through executive action by the Mayor and the Anchorage Assembly.

If relief is obtained from ML&P's interconnection restrictions, this report further recommends that POC CHP installations be made and closely monitored, in select facilities on the UMED campus.

If these interconnection requirements cannot be changed, there is only one option left for distributed cogeneration. Stakeholders can completely disconnect selected facilities or parts of facilities from ML&P and generate all of their own power, including emergency power. This is possible but not desirable for several of the larger stakeholders who already have on-site back-up power generation. This scenario has another down-side in that a complete disconnection of these larger facilities from the ML&P grid would preclude emergency power back-feed to the utility grid (or the other way around) in the event of an earthquake, major fire, or other catastrophic event.

Important note: The power and demand costs in Anchorage are not going down. At present there is a proposed tariff change by ML&P before the RCA (Issued 9-13-2013) that seeks approval of a 24.3% across-the-board interim and refundable rate increase to the currently effective energy and demand charges, effective for billings on or after October 24, 2013. The 24.32% increase is the first phase of a proposed 31.52% across-the-board rate increase to current demand and energy charges, over a two-year period. This information is in RCA Public Notice TA332-121 ML&P.

5.9 SUPPORTING DOCUMENTS SUMMARY

HISTORIC CONTEXT STATEMENT	
CONTENTS	HIGHLIGHT OF FINDINGS
Introduction • Project Background & Purpose • Definition of Geographical Area • Methodology & Research	• This Historic Context Statement documents the evolution of the UMED District from prehistory to the present in order to support and guide identification and evaluation of historic properties throughout the neighborhood, as well as to inform future planning decisions.
Previous Surveys, Studies, and Reports • Alaska Heritage Resources Survey (AHRS) • Archaeological Resources • National Register of Historic Places	• Previous surveys of the area include the Alaska Heritage Resources Survey (AHRS) and the National Register of Historic Places. These documents are on file at the Municipality of Anchorage Planning Department. • Five AHRS-listed properties are within the UMED District and one UMED District property is on
Historic Context of Anchorage • Alaska Native Peoples • Exploring Alaska • US Territory • Alaska Railroad & the Founding of Anchorage • Anchorage Townsite & Incorporation • World War II • Alaska Statehood • The 1964 Earthquake • Oil Industry • Municipality of Anchorage	• This section provides an abbreviated history of Anchorage to provide the background information required to understand the forces that shaped the development of the built environment in Anchorage.

DISTRICT PROFILE	
CONTENTS	HIGHLIGHT OF FINDINGS
Project Overview • Intent of Profile • Project Area • Organizational Collaboration • General Characteristics • Project Initiation and Timeline	• A central goal of the UMED District Plan is to facilitate collaboration between residential neighborhoods and the organizations. • The UMED District is home to 6,300 people, or 2.2 percent of the Municipality of Anchorage's residential population. • The natural setting is an important feature of the UMED District.
Neighborhoods, Community Design & Built Form • - Residential Neighborhoods • - Neighborhood Services • - Community Design and the Built Environment	• The residential neighborhoods include two mobile home parks, a neighborhood of primarily single-family homes, and a neighborhood with both single and multifamily housing. • The UMED District's location, setting, infrastructure, built environment, and branding reflect the balance between residential neighborhoods, institutional organizations, and the natural setting.
Organizational Profiles • Alaska Mental Health Trust Authority (The Trust) • Alaska Native Tribal Health Consortium (ANTCH) • Alaska Pacific University (APU) • Alaska Department of Transportation and Public Facilities • Alaska Psychiatric Institute (API) • George McLaughlin Youth Center (MYC) • Providence Alaska Medical Center (PAMC) • University of Alaska Anchorage (UAA	• This section discusses the mission statements and general services provided by: the Alaska Mental Health Land Trust, Alaska Native Medical Center, Alaska Pacific University, Alaska Department of Transportation and Public Facilities, McLaughlin Youth Center, Providence Alaska Medical Center, University of Alaska Anchorage.
Previous UMED District Plans • 1983 Goose Lake Plan • 2003 University Medical District Framework Master Plan	• Previous plans include the 1983 Goose Lake Plan and the 2003 University Medical District (U-MED) Framework Master Plan.
Organizational Master Plans • Alaska Native Medical Center (ANMC) • Alaska Pacific University (APU) • Providence Anchorage Medical Center (PAMC) • University of Alaska Anchorage (UAA)	• The Alaska Native Medical Center, Alaska Pacific University, Providence Anchorage Medical Center, and University of Alaska Anchorage have shared their master planning documents with the UMED District Update planning team.

DISTRICT PROFILE	
CONTENTS	HIGHLIGHT OF FINDINGS
Natural Resources • Anchorage Wetlands Management Plan • Chester Creek Watershed Plan • Principal Flora and Fauna • Wildlife	• Virtually all of the unbuilt land in the UMED District is either wooded or wetlands. • The District contains five lakes, a creek, and two hills. • Moose are present year round, the lakes provide habitat for birdlife, and a corridor along the creek provides for the movement of moose, fox, coyote, and black bear. • Anchorage completed the Anchorage Wetlands Management Plan in 1982, then updated, completed and adopted it in 1996, and in 2014, completed and adopted a third addition of this plan.
Recreation & Open Space • Park Plan • MOA Parks Within the UMED district • Anchorage Pedestrian Plan • Areawide Trails Plan	• Anchorage is a classic winter city with winter conditions for six months of the year. • The Municipality of Anchorage adopted the Anchorage Bowl Park, Natural Resource and Recreation Facility Plan in 2006, the Area-wide Trails Plan in 1997, and the Pedestrian Plan in 1978, with a revision in 1997. • Goose Lake Park and University Lake Park both serve important recreational needs.
Commercial, Housing, & Market Conditions • Key Findings • Demographics and Employment • Challenges to Development • Office Market Analysis • Residential Market Analysis • Retail Market Analysis	• The UMED District provides 13,700 jobs, making it one of the largest employment centers in the region and an important contributor to Anchorage's economy. • Over half of the UMED District is designated for organizational or public use. • In the short term, medical office development is likely to continue to be the highest and best use of developable land. • The addition of new households to the UMED District would increase the viability of new retail development, which is a common desire among District users and residents.
Transportation & Circulation • Introduction • District Motor Vehicle Access and Circulation • Public Transportation • Non-motorized Transportation • Parking Facilities	• Motor vehicular access remains the primary mode of transportation to and throughout the District, though efforts have been made to increase use of public transit, privately operated shuttles, cycling, and walking.
Regulatory Framework • Generalized Land Use Map, 1986 • Anchorage 2020: Anchorage Bowl Comprehensive Plan • Title 21 • 2035 Metropolitan Transportation Plan (MTP) • Anchorage Bicycle Plan	• Over the years, planning in the UMED District has been guided by the Generalized Land Use Map, the Anchorage Bowl Comprehensive Plan, Title 21, the 2035 Metropolitan Transportation Plan, and the East Anchorage District Plan.

HISTORIC CONTEXT STATEMENT	
CONTENTS	HIGHLIGHT OF FINDINGS
UMED District Area Development • 1950's • 1960's • 1970's • 1980's • 1990's • 2000-2015 • Alaska Pacific University (Alaska Methodist University) • Providence Alaska Medical Center • Alaska Psychiatric Institute (API) • George M. McLaughlin Youth Center • University of Alaska Anchorage (UAA) • Alaska Native Medical Center (ANMC)	• The historical narrative in this section traces property and organizational history beginning in the 1950's through the 2000's.

6. ENDNOTES - FIGURE CREDITS - ACRONYMS

ENDNOTES

1. UMED grant application to Alaska legislature.
2. UMED Legislative grant application.
3. 2003 UMED Framework Plan.
4. Paraphrased from Anchorage 2020.
5. Anchorage 2020, Page 50.
6. Anchorage Housing Market Analysis 2012, Page 51.
7. https://portal.hud.gov/hudportal/documents/huddoc?id=chpguide1.pdf.
8. Northern Access Reconnaissance Study Report, page 13.
9. Northern Access Reconnaissance Study Report, page 6
10. Northern Access to UMED District Concept Report, page 14.
11. Alaska Pacific University Master Plan, Page 10.
12. Chester Creek Watershed Plan Draft, September 2014.
13. Alaska Pacific University Master Plan 3.2.2 Design Guidelines.
14. UAA 2013 Campus Master Plan, Chapter 5 – Design Guidelines.
15. Chester Creek Watershed Plan, Rev. 4, September 2014.
16. Chester Creek Watershed Plan, Rev. 4, September 2014.
17. Chester Creek Watershed Plan, Rev. 4, September 2014.
18. Chester Watershed Plan, 2014-P66-68-Chester Creek, P60-70-Reflection Lake
19. Anchorage 2020 – pg. 63
20. Dean Kelly Smith correspondence 12/14
21. Chris Turletes correspondence.
22. https://www.southcentralfoundation.com/history.cfm
23. David, Paula. “Ensuring Successful Regional Planning for Multi-use Trails.” American Trails. May 2002. Web. 29 July 2014. http://www.americantrails.org/resources/planning/Successful-Regional-Trail-Plans.html
24. Gambill, Pauline. “Trail Maintenance and Management.” American Trails, Spring 1998, Web. 29 July 2014. http://www.americantrails.org/resources/managemaintain/actionarticgambill.html.
25. Moore, Roger L. “Conflicts on Multiple-Use Trails: Synthesis of the Literature and State of the Practice.” American Trails. 8 November 2003. Web. 29 July 2014. http://www.americantrails.org/resources/ManageMaintain/MooreConflictMgmt.html.
26. APU Dean Kelly Smith correspondence 12/5/14
27. Zehngebot Corey, and Richard Peiser. “Complete Streets Come of Age.” American Planning Magazine (May 2014): https://www.planning.org/planning/2014/may/completestreets.htm
28. Northern Access to UMED District Concept Report, June 2014
29. akforum.com, BikLeague.org
30. Quoted in the Anchorage Wetlands Management Plan Public Hearing Draft, (March 2012) 3.
31. Dean Kelly O. Smith, Correspondence October 29, 2014
32. http://www.acda.net/about-us/mission-vision.aspx
33. “Costello comments on House Bill 50 Signing.” Alaska State of House Representatives. 26 June 2013. Web. 29 July 2014. http://www.housemajority.org/2013/06/26/costello-comments-on-house-bill-50-signing/
34. Population of 566,143 per the 2009 U.S. Census estimates.
35. Population of 77,289 per the 2009 U.S. Census estimates.
36. Population of 150,006 per the 2009 U.S. Census estimates.
37. The respective surveys measure the effectiveness of the transportation strategies.

FIGURE CREDITS

Unless noted otherwise, all figures are accredited to the Municipality of Anchorage and the consultant team. Figure credits for the Mixed-Use Development Case Study are noted at the end of that section.

Figure 2. DOWL

Figure 14. DOWL

Figure 17. DOWL

Figure 18. UMED District Plan Cogeneration Report Update 2013

Figure 19. Northern Access to the UMED District Concept Report

Figure 21. DOWL

Figure 31. DOWL

Figure 35. RIM First People,, http://www.rimfirstpeople.com/portfolio/portfolio_project.asp?ProjectID=59.

Figure 37. “Atwood Campus Center,” Wikipedia, http://en.wikipedia.org/wiki/Atwood_Campus_Center.

Figure 44. DOWL

Figure 47. Anchorage Wetlands Management Plan, Maryc 2012.

Figure 51. Cressey Development. http://www.cressey.com/ Accessed 15 November 2013.

ACRONYMS

AKTV: Alaska Public Media

AMATS: Anchorage Metropolitan Area Transportation System

ANMC: Alaska Native Medical Center

ANTHC: Alaska Native Tribal Health Consortium

API: Alaska Psychiatric Institute

APU: Alaska Pacific University

ASD: Anchorage School District

AWWCA: Ainslie Wood Westdale Community Association of Resident Homeowners

CCEL: Center for Community Engagement & Learning

CSP: Community Sustainable Partnership

GUP: General Use Permit

LION: Living in One Neighborhood

MBA: Master's Degree in Business Administration

ML&P: Municipal Light and Power

MOA: Municipality of Anchorage

MYC: McLaughlin Youth Center

NARd: Northern Access Road

PAMC: Providence Alaska Medical Center

PILOT: Payments In-Lieu of Taxes

PLI: Public Lands and Institutions District

RPCC: Rogers Park Community Council

SCF: Southcentral Foundation

The District/The UMED District: University and Medical District, Anchorage, Alaska

The Plan Update: The UMED District Plan Update

TLO: Trust Land Office

TMA: Transportation Management Authority ***UAA:***

University of Alaska Anchorage

UACC: University Area Community Council

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MUNICIPALITY OF ANCHORAGE
Community Development Department
Long-Range Planning Section
4700 Elmore Road
Anchorage, Alaska 99507

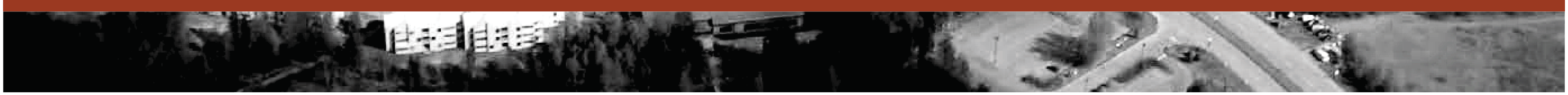

Exhibit B

Community and Agency Comments

UMED District Plan Update

October 2015

PZC Case No. 2015-0036

ADVERSE POSSESSION OF UNIVERSITY OF ALASKA LAND

Sec. 14.40.291. Land of the University of Alaska not public domain land. [See editor's note]...

(a) Notwithstanding any other provision of law, university-grant land, state replacement land that becomes university-grant land on conveyance to the university, land selected by and conveyed to the University of Alaska under AS 14.40.365 , and any other land owned by the University of Alaska is not and may not be treated as state public domain land. Land conveyed to the University of Alaska under AS 14.40.365 shall be managed under AS 14.40.365 - 14.40.368 and policies of the Board of Regents of the University of Alaska.

(b) Title to or interest in land described in (a) of this section may not be acquired by adverse possession, prescription, or in any other manner except by conveyance from the university.

(c) The land described in (a) of this section is subject to condemnation for public purpose in accordance with law.

This information will be added to the plan.

RECEIVED

SEP 30 2015

PLANNING DIVISION

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Anchorage Field Office
4700 BLM Road
Anchorage, Alaska 99507-2546
http://www.blm.gov/ak

In Reply Refer To:
2740 (AKA010)
A-043359

SEP 2 8 2015

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SEP 3 0 2015

PLANNING DIVISION

Patrick Kelly
Regional Resource Manager
UA Facilities and Land Management,
System Office
1815 Bragaw Street, Suite 101
Anchorage, AK 99508-3438

This information will be added to the plan.

Dear Mr. Kelly,

In response to your letter (enclosed) of September 15, 2015, the Bureau of Land Management (BLM) has reviewed the Recreation and Public Purpose's Act patent 50-64-0186 to the Alaska Methodist University dated June 2, 1964. This patent was transferred to the University of Alaska in 1972 and was approved by BLM by Certificate of Approval of Transfer on June 7, 1972. Pursuant to 43 USC 869-3 the revisionary interest from patent 50-64-0186 would cease to be in effect twenty-five years after the Secretary authorized the transfer. The reverter ceased to be in effect through operation of law on June 7, 1997, 25 years after the Certificate of Approval of Transfer.

Because there is no longer a revisionary interest on patent number 50-64-0186, held by the University of Alaska, the United States no longer holds an interest in the property nor is it necessary for the BLM to approve any University of Alaska proposals involving the property.

Sincerely,

Douglas Ballou

for Alan Bittner
Field Manager

Enclosure

Patrick Kelly, P.L.S., SR/WA
Regional Resource Manager
Phone: (907) 786-7795
Fax: (907) 786-7733
Email: pkelly1@alaska.edu

UNIVERSITY of ALASKA
Many Traditions One Alaska

UA Facilities and Land Management,
System Office
1815 Bragaw Street, Suite 101
Anchorage, AK 99508-3438
Web: www.ualand.com

September 15, 2015

Alan Bittner, Field Manager
BLM Anchorage Field Office
4700 BLM Road
Anchorage, AK 99507

Re: University of Alaska – Northern Access/U-Med road

Dear Alan:

This letter follows up on the conversation between you, Steve Scordino, and Matt Cooper in early August regarding whether the University needs BLM's approval to dedicate a public right of way for the construction of the Northern Access / U-Med road. The University and BLM agreed that 43 USC 869-2(a), which requires BLM's approval for a transfer of title or control or a change in use of the subject property, does not apply to the subject property because of the limitation on the United States' reverter right in 43 USC 869-3. The limitation in Section 869-3 was triggered because the BLM previously approved the transfer of the subject property from Alaska Methodist University to the University of Alaska in 1972. Thus, the reverter right and limitations on use expired in 1997.

— This information will be added to the plan.

Please confirm that BLM's approval is not required for this project and that dedicating part of the subject property to a public right of way does not trigger a reverter to the United States.

Best regards,

Patrick Kelly
Patrick Kelly

Cc: Michelle Rizk, Chief Strategy, Planning, and Budget Officer

Department of Transportation and Public Facilities

CENTRAL REGION
Planning & Administrative Services

4111 Aviation Avenue
P.O. Box 196900
Anchorage, Alaska 99519-6900
Main Phone: (907)269-0520
Fax: (907)269-0521
Web site: dot.state.ak.us

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SEP 29 2015
MUNICIPALITY OF ANCHORAGE
ZONING DIVISION

September 29, 2015

Erika McConnell, Planning Section Manager
MOA, Community Development Department
Planning Division
P.O. Box 196650
Anchorage, Alaska 99519-6650

RE: MOA Zoning Review

Dear Ms. McConnell:

The Alaska Department of Transportation and Public Facilities, DOT&PF, Central Region Planning section has comments on the following zoning application:

- **2015-0036; UMED District Plan Update, revision**
  - Thank you for addressing some of the comments submitted on the last review of this document.
  - The comments concerning the implementation section were not addressed, either through edits or a response back to DOT&PF. As such those are reiterated and additional ones are submitted as follows:
    - While a box was added on page 76 stating potential participating parties and funding/resources, this wasn't carried over to the other pages. Will it be carried over? It is recommended you do so, on every page of the implementation section. — Table will be edited.
    - It is recommended you breakout the funding/resources into two columns. DOT&PF can be listed a resource, however within the Anchorage Metropolitan Area Transportation Solutions (AMATS) boundaries, federal Statewide Transportation Improvements Program (STIP) funding is limited to National Highway Performance Program (NHPP) roads. In the UMED area these roads consist of Tudor Road, Lake Otis Parkway and Northern Lights Boulevard. It is recommended you coordinate with the department on the implementation projects that can include DOT&PF in the funding column. — This plan doesn't identify specific funding sources. Only potential

- 4.1.a lists projects 4-R the University Lake Drive Extension and 5-R in the short term with funding by the STIP. This funding source needs to be removed for these projects since they are not part of the NHPP and the only funding allocated by the Department for project 4-R is the previously obligated congressional earmark.

  — Specific funding source is not included

- 4.3.a list a number of sidewalk projects that are not part of the State road system or part of the NHPP. Remove DOT&PF as a funding entity for these projects.

  — agree

- 4.4.a deals with increasing "snow removal functions as funding becomes available". DOT&PF recently released a statement about a reduction in operating budget and the effect this has on winter maintenance for Alaska Roads, http://dot.alaska.gov/comm/pressbox/arch_2015/PR15-2552.shtml. Oil prices are not expected to rise in the short term, which will continue to impact winter maintenance.

  — This is a 5-10 year plan. Fiscal conditions may change

- 4.4a, AMATS funding is ineligible to be spent on maintenance activities and should be removed from this implementation item (participating parties and funding/resources).

  — agree

Sincerely,

Aaron Jongenelen
AMATS Transportation Planner

Cc: Craig Lyon, AMATS Coordinator, MOA
David Post, Surface Transportation Manager, DOT&PF

Municipality Of Anchorage
ANCHORAGE WATER & WASTEWATER UTILITY RECEIVED

MEMORANDUM

OCT 01 2015

MUNICIPALITY OF ANCHORAGE
ZONING DIVISION

DATE: September 25, 2015

TO: Erika McConnell, Supervisor, Planning Section, Planning Division

FROM: Paul Hatcher, Engineering Technician III, AWWU Planning

SUBJECT: **Zoning Case Comments**
Hearing Date: October 12, 2015
Agency Comments Due: September 30, 2015

AWWU has reviewed the materials and has the following comments.

2015-0036 UMED DISTRIC PLAN UPDATE, Recommendation by the planning and Zoning Commission to the Assembly in accordance with AMC 21.03.070 to adopt the UMED District Plan Update/Public Review Draft March 2015 as an element of the Comprehensive Plan, replacing the 2003 UMED District Framework Master Plan, Grid SW1534-1536, SW1634-1638, SW1734-1738

1. AWWU water and sanitary sewer are located within most portions of the UMED district.
2. AWWU has no objection to this Comprehensive Plan.

Thank you!

If you have any questions pertinent to public water and sanitary sewer, you may call me at 564-2721 or the AWWU planning section at 564-2739, or e-mail paul.hatcher@awwu.biz

G:\Community Development\Planning\Current\zon_plat\Agency Comments\AWWU\2015\2015-0036.docx

MUNICIPALITY OF ANCHORAGE

Planning & Development Services Dept.
Development Services Division

Building Safety

RECEIVED
SEP 30 2015
MUNICIPALITY OF ANCHORAGE
ZONING DIVISION

MEMORANDUM

Comments to Miscellaneous Planning and Zoning Applications

DATE: September 30, 2015

TO: Erika McConnell, Manager, Zoning and Platting

FROM: Ron Wilde, P.E.
Building Safety
343-8371

SUBJECT: Comments for Case 2015-0036
U-MED District Plan – Recommendation to Adopt

Thank you!

No Comment

Kimmel, Corliss A.

From: Wilson, Karleen K.
Sent: Friday, September 25, 2015 3:51 PM
To: Blake, Lori A.; Johnson, Sandra L; Kimmel, Corliss A.; Whitfield, David R.
Subject: Case No. 2015-0036

RECEIVED

SEP 25 2015

MUNICIPALITY OF ANCHORAGE
ZONING DIVISION

Doesn't look like anything I need to comment on.

Thanks.

Karleen Wilson
Addressing Official
Municipality of Anchorage
Address Data Management, GIS
907.343.8168 (my desk)
907.343.8222 (option #3)

Thank you!

Anchorage Metro Area Transportation Solutions

MUNICIPALITY OF ANCHORAGE
Community Development Department,
Transportation Planning Section
Non-Motorized Transportation Coordinator
Planning & Development Center, 4700 Elmore Road
P. O. Box 196650, Anchorage, AK 99519-6650
voice (907) 343-8368, facsimile (907) 249-7806
e-mail: schanchele@muni.org

DATE: September 24, 2015

TO: Erika McConnell, Current Planning Manager

FROM: Lori Schanche, Non-Motorized Transportation Coordinator

SUBJECT: **2015-0036 UMed District Plan Update**

Following are comments on the proposed Plan.

Trails and Pedestrian Features, Page 21
The fourth statement, "The community relies on the Nordic Ski Association to maintain the public trails throughout Anchorage, including the Chester and Campbell Creek Trails", is not accurate. The Municipality Of Anchorage, Parks Department has a maintenance section that coordinates tasks with the Nordic Ski Association (Nordic). In reality, Nordic sets tracks and grooms trails in winter for skiing, but they do not maintain the trails (year round sweeping, trash removal, pruning, repairs).

sentence will be revised.

Also you may want to add that Chester and Campbell Trails are multi-use trails and dog sleds are also active in this area during special events (Fur Rondy and Iditarod). In fact the Chester Trail connection around UAA/APU was designed to incorporate dog mushing teams.

– good idea!

The UAA Spur Trail, that branches off from the Chester Trail and connects to UAA housing, is maintained by UAA.

– Thank you for information!

Proposed Northern Access Road, page 21
First paragraph, last sentence should change tense to the past since the 2014 study is done.

– agree

Figure 19 details on the photo are difficult to read and would benefit from a larger photo.

– formatting constraints

2.6 Challenges and Opportunities
Last sentence in the section. It is important that impacts are mitigated but there may be a better way to phrase this, what agency or Plan should demand this mitigation?

– may revise.

Residential Opportunities, pg. 24
Second paragraph, please do not refer to trails as 'bike trails'. Typically, trails are in parks and pathways are alongside roads. – will change

Page 25 – second paragraph, 'roundabout' is one word. – agree

The Natural Environment, Page 25
Third paragraph. Chester Creek wetlands should not be capitalized. – agree

Page 26
Third paragraph, the Chester Creek Watershed Plan. Is this an actual document? Should include date of publication and underline or italics. – agree

"Other harmful waste" may want to add in (trash, grass clippings, etc.) – agree

Figure 25 – Please note that this is a photo of the Lanie Fleischer Chester Creek Trail. – will confirm

Trails on Public and Private Land, page 27
First sentence is confusing the creeks and the trails. Perhaps, "A portion of MOA's world-class trail system is located along Campbell Creek and Chester Creek". – agree

"A high value is placed on the recreation**al** opportunities…." – agree

Last paragraph is confusing. "organizational properties"? – agree

District Wide Identity, page 36
Piper ~~Road~~ Street – agree

Recreational Facilities…, page 45
Add a bullet "maintain tree buffers for trails to preserve the natural experience." – agree

Pedestrian and Bicycle Access, page 45
Fourth bullet, reword to note 'pedestrian facilities' instead of sidewalks. While sidewalks on both sides of the street are great, a sidewalk and a pathway(wider facility) on the other side is even better and allows room for bicyclists. – agree

Sixth bullet, add wording to add sidewalk access from parking lots to building entrances. – agree

Parking Facilities, page 46
Third bullet, add wording "Provide landscape buffers between roadways, parking lots **and trails**." - agree

Transportation and Mobility, page 47
Background. Third sentence, again with the "bike" trails. MOA does not use this term. It implies that bicycles do not belong on the roadway. - agree

Goals, 2. Implementation, Page 49
First bullet reword to note, "Two travel lanes with marked, striped bike lanes." Or better yet, "Two vehicular travel lanes with on-street bike lanes." - agree

Goals, 3. Implementation, Page 49
Please add these projects are identified in the *Anchorage Pedestrian Plan*, 1996 as project #117 – Neighborhood northeast of Lake Otis and Tudor Road to Dale Street. - agree

This section should reference Figure 43.

Added projects
Looking at the map, it would be important to connect Career Center Drive to the network. Suggest adding a sidewalk project along Mallard Lane or the southern roadway connector to UAA. - agree

Goals, 3. Implementation, page 49
Second bullet, Wheelchair is one word. - agree

Third bullet, "**aids**, not aides" - agree

Sixth bullet – "bicycle-only connections". Suggest changing to bicycle connections. - agree

First bullet, page 50
"Increase shuttle service" could be more specific. Should the shuttle service operate more routes, increase service area, or increase frequencies of trips or? - this is a consideration. The TDM plan would define

Figure 42. May want to give credit to whichever organization has been thoughtful and forward thinking enough to add a bicycle parking shelter. - good idea

Figure 43, This map already shows trails and bikeways but it would be important to add existing sidewalks to show existing pedestrian facilities and - not at this map extent.

illustrate how these additional transportation projects would complete the network. For example, Checkmate Drive (and others in that neighborhood) are actually sidewalks but are marked as a Trail/Bikeway. These are important to note as part of the transportation system.

Curious why the Northern Access route is identified as an MTP project, but the APU connection is just listed as a roadway project. What is the distinction? — APU project nds to be submitted to MTP.

Isn't there a roundabout planned for Elmore/Providence intersection? — too much detail

The map is missing a trail connection from Wesleyan and Castle Heights Park to the south east corner of University Lake Park. — will add

The map is missing a sidewalk connection from the north end of Checkmate Drive across the creek to College Gate Elementary School. — will check our data

Shouldn't schools be identified on this map? — No

Baxter Road has pedestrian facilities as well. — will add

Shouldn't the UAA Parking garage at Mallard and UAA Drive be included as a parking project? It's taking forever...... — No

Why isn't a future pedestrian connection from the corner of Elmore/UAA Drive continued along University Drive to APU recommended? APU students have to drive or take the bus? — Design Stds will require

Multi-use trails within the UMed District
Don't forget dog mushers during special events, Fur Rondy and Iditarod. — May add

Trail conflicts - mention that specifically there is a trail conflict between the off-leash dog area and the Chester Trail. — will add

Last bullet - shouldn't these plans be mentioned by name? *Areawide Trails Plan*, 1996, *Anchorage Pedestrian Plan*, 1996, *Anchorage Bicycle Plan*, 2010. — Didn't mention because names of plans can change.

Cc: Craig Lyon, AMATS

Tudor Area Community Council

09/30/2015

RECEIVED
SEP 30 2015
MUNICIPALITY OF ANCHORAGE
ZONING DIVISION

From: Tudor Area Community Council

To: Muni Planning Division

Subject: PZC Case 2015-0036 UMED District Plan Update – October 2015 Draft

The Tudor Area Community Council (TACC) submits the following comments on the UMED District Plan Update.

The Plan appears to give short shrift to UMED traffic impact in the areas immediately adjacent to the UMED. (We found this true in the planning for the UAA sports arena as well.)

We respectfully suggest that the MOA increase the area under study for traffic impact.

Thank you! – We believe this comment may refer to Northern Access project.

Sincerely,

Jacob G. Tuckerman

Jacob G. Tuckerman
President, TACC

Exhibit C

UMED DISTRICT PLAN

SUPPORTING DOCUMENTS

MAY 2014

PZC Case No. 2015-0036

INDEX

HISTORIC CONTEXT STATEMENT

A DEVELOPMENT HISTORY OF THE UMED DISTRICT

TABLE OF CONTENTS

INTRODUCTION

PROJECT BACKGROUND & PURPOSE

The UMED Historic Context Statement was produced as a part of the UMED District Plan Update in order to provide a greater understanding of the history of the project area. This Historic Context Statement documents the evolution of the University and Medical District (UMED) built environment from prehistory to the present in order to support and guide identification and evaluation of historic properties throughout the neighborhood, as well as to inform future planning decisions. The document identifies important periods, events, themes, and patterns of development.

It is important to note that while the context statement identifies key historical themes that shaped development in the UMED Survey Area, it is not a comprehensive history of the city, nor is it a definitive listing of all the neighborhood's significant resources. Instead, it provides a general discussion of the overarching forces that created the UMED's built environment.

DEFINITION OF GEOGRAPHICAL

The UMED District area is located approximately 2½ miles southeast of downtown Anchorage and covers some 1,757 acres. The District includes two universities (University of Alaska Anchorage and Alaska Pacific University), three hospitals, a career training center, two schools, two municipal parks, and residential neighborhoods with commercial areas that support them. The study area is bordered by Northern Lights Boulevard to the north, Lake Otis Parkway to the west, Tudor Road to the south, and Baxter Road to the east.

METHODOLOGY & RESEARCH

The UMED Historic Context Statement is organized chronologically, with sections that correspond to major periods in Anchorage's history from prehistory to the present. The content and organization of the document follows the guidelines of National Register Bulletin No. 15 *How to Apply the National Register Criteria for Evaluation;* National Register Bulletin No. 16A *How to Complete the National Register Registration Form;* National Register Bulletin No. 16B *How to Complete the National Register Multiple Property Documentation Form;* and National Register Bulletin No. 24 *Guidelines for Local Surveys: A Basis for Preservation Planning.*[1]

Research for the UMED Historic Context Statement was gleaned from primary and secondary sources held at local, regional, and online repositories. Materials were primarily gathered at the Anchorage Museum at Rasmuson Center (Atwood Resource Center); Z.J. Loussac Public Library (Alaska Collection); and the Consortium Library at University of Alaska, Anchorage (Archives & Special Collections, ARLIS, and Alaska Collection). Websites for the Alaska State Library, Alaska State Museums, Alaska Digital Archives, and Northwest Digital Archives were also especially useful.

Primary sources consulted included Sanborn Fire Insurance Maps, newspaper articles, city directories, census data, and historic photographs. Secondary sources included numerous books and publications (listed in the bibliography at the end of this document), GIS maps, previous historical reports and survey documentation, and Internet sources.

The UMED Historic Context also includes a number of current and historic images. Many of the historic images were obtained with permission from local repositories or gathered from secondary sources, which are cited in an appendix at the end of the document. The inclusion of these historic images is intended to be consistent with the "fair use" policies of the U.S. Copyright Office, which states that reproductions used for "criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright."[2] It is also worth noting that unless specific measures have been taken to renew image copyrights, all published works made prior to 1923 are now in the public domain.[3] This report has been prepared expressly as a scholarly research document, and the inclusion of these images was deemed vital for illustrating historic events and development patterns for which few, if any, alternative images are available.

PREVIOUS SURVEYS, STUDIES, AND REPORTS

The following section identifies prior historic resource surveys, studies, and plans conducted in Anchorage's UMED District. These documents are on file at the Municipality of Anchorage Planning Department or the Alaska Office of History and Archaeology.

ALASKA HERITAGE RESOURCES SURVEY (AHRS)

The Alaska Heritage Resources Survey (AHRS) is an inventory of all reported historic and prehistoric resources within the State of Alaska, including buildings, structures, objects, sites, districts, and landscapes that are over 50 years old. For each resource listed in the inventory, basic data about the property, a physical description, and relevant historical information are compiled. The AHRS is intended to prevent unwanted destruction of cultural resources, and although the inventory itself does not directly create protections, it can be used by various government agencies and private companies to responsibly plan for development projects that may affect historic resources. The AHRS is maintained by the Alaska Office of History and Archaeology. Access to inventory records is restricted to qualified personnel.[4]

To date, over 35,000 sites have been recorded across the state of Alaska. Five AHRS-listed properties are within the UMED District Plan boundary:

- Campus Center, Alaska Pacific University (AHRS # ANC-00251)
  - Listed on the National Register (see below).

- Providence Hospital Administration Building (former Alaska Psychiatric Institute Building) (AHRS # ANC-02799)
  - Eligible for listing in the National Register under Criterion A as the first publicly operated psychiatric care facility in Alaska.

- 2901 UAA Drive (AHRS # ANC-03391)
  - Residence built in 1963. Found ineligible for listing in the National Register as an individual resource or as part of any historic district.

- Eklutna Power Project Anchorage Substation (AHRS # ANC-00833)
  - Significant in association with the Eklutna Hydroelectric Project and the electrification of the Anchorage area (building dates to 1954)

- 3123 East 41st Avenue Building (AHRS # ANC-01370)
  - No statement of significance included in the form.

Please contact the Office of History and Archaeology for details about listed properties.

ARCHEOLOGICAL RESOURCES

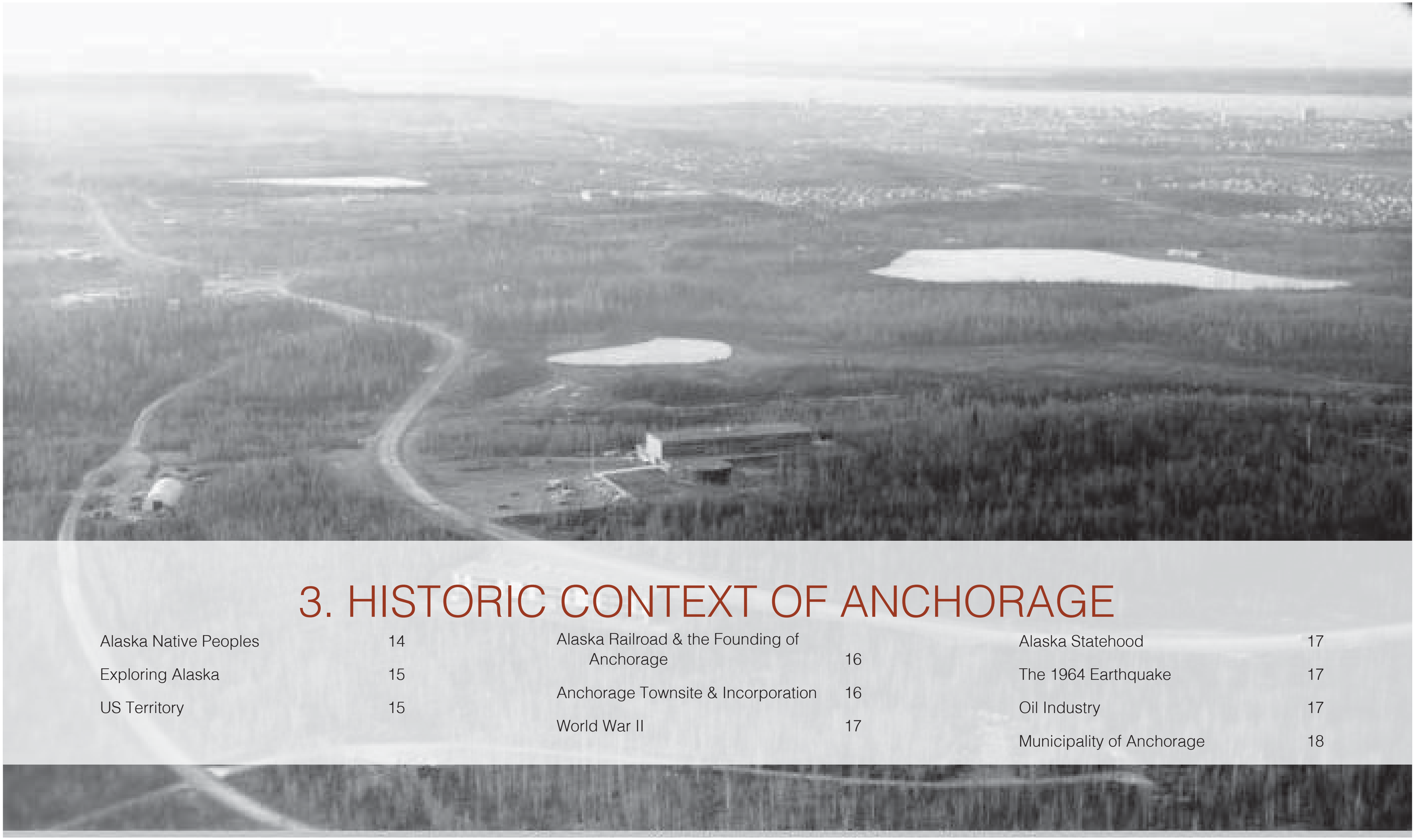
According to the Alaska State Historic Preservation Office, no archeological sites have been recorded in the UMED area. However, archeological resources may exist.

NATIONAL REGISTER OF HISTORIC PLACES

The National Register of Historic Places (National Register) is the official list of the nation's historic places worthy of preservation. Since the establishment of the National Register in 1966, more than 80,000 properties across the nation have been listed. One historic building in the UMED District has been listed in the National Register of Historic Places:

- Campus Center, Alaska Pacific University (listed 1979)

The nomination form for this building can be viewed online through the National Park Service's website: http://www.nps.gov/nr/research/.



3. HISTORIC CONTEXT OF ANCHORAGE

HISTORIC CONTEXT OF ANCHORAGE

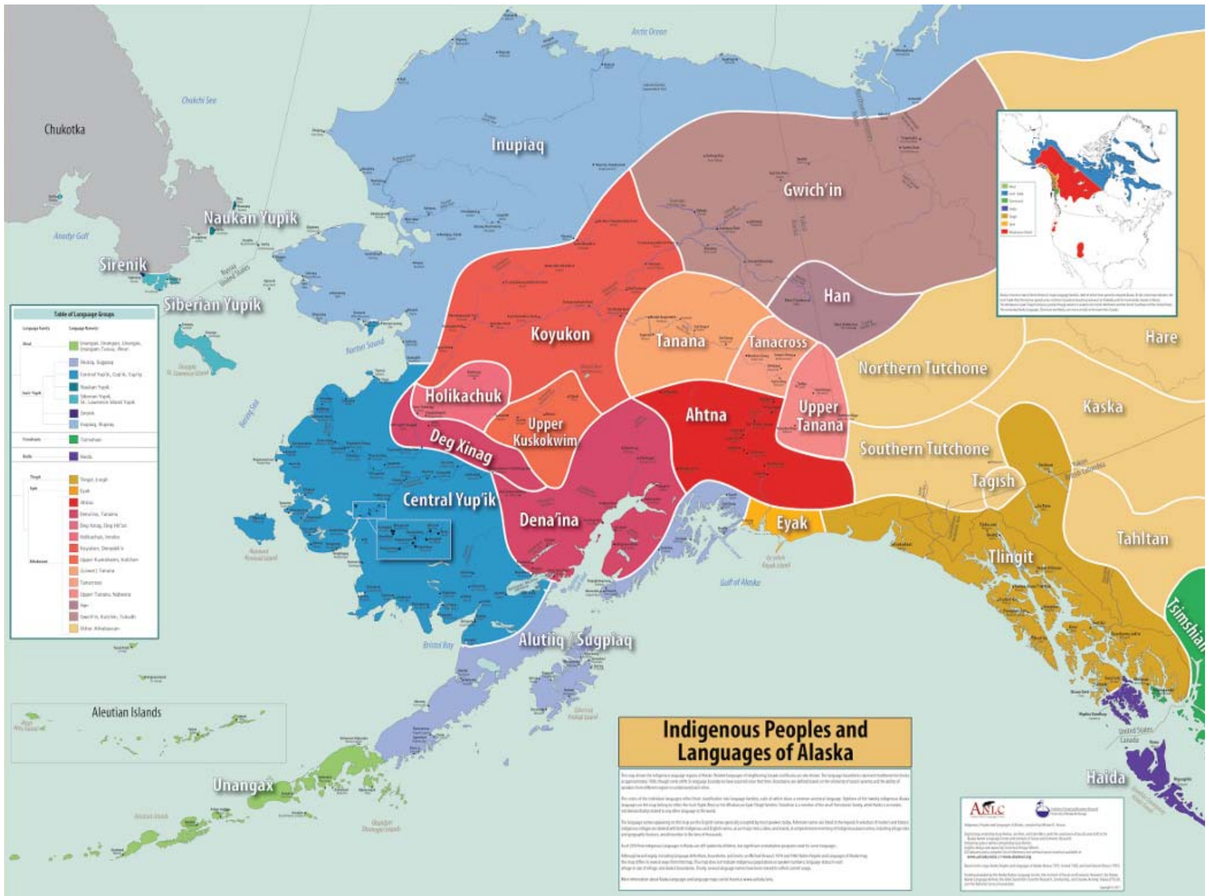


Figure 1. Map of Indigenous Peoples and Languages of Alaska.

The following abbreviated history of Anchorage provides the background information required to understand the forces that shaped the development of the built environment in Anchorage.

ALASKA NATIVE PEOPLES

The Athabascan (sometimes spelled "Athabaskan," "Athapascan," or "Athapaskan") people were the primary native group in and around present-day Anchorage.[5] There are 11 different Athabascan languages spoken throughout Alaska today. Dena'ina (Tanaina) is the linguistic subgroup of the Athabascans who live around the Cook Inlet.[6]

The Athabascans traditionally lived in Interior Alaska in groups of 20 to 40, and migrated seasonally between summer fish camps and winter villages in order to hunt, fish, and trap. A variety of traditional dwelling types were used, depending on the season and available resources.[7] While most Athabascan groups hunted large animals, particularly caribou, the Dena'ina people at the Cook Inlet partially adapted to the local maritime environment. Some Dena'ina developed tools and techniques for hunting sea mammals, as their Alutiiq neighbors had, and thus relied less on land animals for food.[8] These early hunting traditions and seasonal migrations likely occurred in the UMED district area, especially around Chester Creek.

EXPLORING ALASKA

Cook Inlet was named for Captain James Cook. A British explorer who is credited with making the first European claim in the Anchorage area, Cook sailed into the inlet in May 1778 on an expedition in search of the fabled Northwest Passage—a nonexistent water route through North America that geographers hoped would connect the Atlantic and Pacific Oceans—and claimed the area for England.[9] Prior to Cook's expedition, however, other parts of Alaska were visited by Russian explorers sailing east out of Kamchatka. Mikhail Gvozdev first sighted the Alaskan mainland in 1732, and Vitus Bering, a Danish explorer commissioned by Russia's Peter the Great, was the first to send boats ashore in 1741.[10] Although there were many early outposts along the Kenai Peninsula and Gulf of Alaska, Russian fur traders did not have much of a presence in the upper Cook Inlet.[11] This early exploration period is celebrated in Anchorage's historic neighborhoods: the Captain Cook Monument at Resolution Point was installed to commemorate the 200th anniversary of Cook's expedition to Anchorage.

U.S. TERRITORY

In 1867, the United States government purchased the entire Alaska territory from Russia for $7.2 million—just over 2 cents per acre—in a deal brokered by Secretary of State William H. Seward. Many were skeptical of Alaska's worth to the United States at the time, and called the purchase "Seward's Folly." From 1867 until 1884, the territory was known as the Department of Alaska and was controlled under a variety of federal departments.[12] The first civil government was formed in Alaska in 1884, at that time known as the District of Alaska.[13]

After the discovery of gold near Juneau in 1880 and in Canada's Yukon Territory in 1896, prospectors flocked to the Klondike and Alaska's population began to boom. Discovery of gold in Nome in 1899 and Fairbanks in 1902 further fueled the state's growth, and finally brought more U.S. attention to Alaska. While most of these prospectors were unsuccessful in the gold fields, many of these new arrivals decided to remain in Alaska and subsequently established permanent communities.[14] In response to increasing pressure for local control over Alaskan affairs, Congress established the Alaska Territory as an organized incorporated territory in 1912. Alaska remained a U.S. Territory from 1912 until it was admitted to the Union as the 49th State in 1959.[15]

Figure 2. Check for the purchase of Alaska, 1868.

ALASKA RAILROAD & THE FOUNDING OF ANCHORAGE

Anchorage is a classic railroad boomtown. Its early development followed many of the same patterns that accompanied the railroads across the American West. Anchorage was known by a variety of names prior to the arrival of the railroad, but the U.S. Postal Service formalized the name "Anchorage" in 1915 as a way to consistently direct mail to the government encampment.[16]

The first railroad in Alaska was a 50-mile span built north out of Seward by the Alaska Central Railway Company in 1903. In March 1914, Congress agreed to fund the construction and operation of a railroad from Seward to Fairbanks. A new federal agency—the Alaska Engineering Commission (AEC)—was created to plan the route and supervise construction.[17] Ship Creek, located at the northern edge of present-day downtown Anchorage, became the field headquarters of the AEC in 1914. The delta was a desirable location for a camp because it was conveniently located on the inlet, and rail yards and shops could easily be built on the mud flats. On April 9, 1915, President Woodrow Wilson announced the approval of the AEC's recommended route through Ship Creek, and ordered construction of the railroad to commence.[18]

As early as 1914, speculation that Ship Creek might be the base for the new government railroad was enough to attract hundreds of men hopeful for employment. Squatters arrived in droves, and by the time of the president's announcement, a temporary settlement had already developed on the north side of the creek. "Tent City," as the squatters' settlement was often called, was primarily comprised of canvas tents, although a few entrepreneurs built more solid wood buildings to house their businesses.[19] Many of the squatters were European immigrants who had immigrated to the West Coast but could not find work elsewhere. The AEC did eventually hire some of these men as laborers, but in general, Alaska Railroad jobs were not as readily available as the squatters had hoped.[20]

From 1915 to the end of World War II, the Alaska Engineering Commission (AEC) and the Alaska Railroad Corporation (ARRC) constructed housing on Government Hill for railroad managers, engineers, and skilled workers. The AEC built thirteen cottages on the bluff overlooking Knik Arm at the western end of Government Hill in 1915, along what are now West Harvard Avenue and Delaney Street. These were among the first frame houses constructed in Anchorage, and were initially occupied by railroad workers.

ANCHORAGE TOWNSITE & INCORPORATION

The land for the Anchorage townsite had already been set aside by the General Land Office during a cadastral survey of the region in 1914, but it was not until May 1915 that the townsite was platted. The original townsite plat established a street grid and approximately 1,400 lots on the plateau immediately south of Ship Creek. The engineers numbered the east-west streets and named the north-south streets with letters, to simplify the plan.[21]

The South Addition was the first expansion of the original townsite, laid out in August 1915 to address a shortage of homestead sites. The East Addition and Third Addition soon followed in late September 1915 and the summer of 1916.[22] Although Anchorage was quick to establish itself, it was not incorporated as a city until 1920. The original Anchorage city limits extended south to 11th Avenue and east to East G Street (now Gambell Street).[23] The farther reaches were largely agricultural in character, scattered with homesteads, dairy farms, and fur farms until the late 1930s.

WORLD WAR II

In the late 1930s, the U.S. military began to prepare for the possibility of involvement in another world war. A worldwide study was conducted by the U.S. Navy that investigated and reported on the need for additional naval bases. The report was submitted to Congress by Admiral Arthur J. Hepburn in December 1938, and signed into law in early 1939. The "Hepburn Report" recommended the appropriation of $19 million for the construction of air, submarine, and destroyer bases in Alaska and the Aleutian Islands. This marked the beginning of defense buildup in the Alaska Territory.[24]

After several failed attempts in the mid-1930s to gain Congressional support for an Alaska air base, President Franklin D. Roosevelt finally ordered the withdrawal of 43,490 acres of land on the outskirts of Anchorage for Elmendorf Field and Fort Richardson in April 1939. [25] This location was chosen for the air base due to favorable topography and weather conditions, access to the Alaska Railroad, and proximity to the Cook Inlet.[26] Fort Richardson and Elmendorf Field were officially occupied by the Army in August 1940, and operated as the Army's headquarters for the militarization of Alaska. The Army relocated its operations to the eastern edge of the reserve (present-day Fort Richardson) after World War II. The Air Force assumed control of the original base and renamed it Elmendorf Air Force Base in 1948.[27]

Wartime military construction brought Anchorage its second wave as a boomtown.[28] Thousands of civilian workers were employed to construct the new fort. In April 1940, just before construction of Fort Richardson began, Anchorage had a population of only 4,000, and by the summer of 1941 the town had grown to over 9,000. The war created a housing shortage in Anchorage, causing the neighborhoods surrounding Downtown to be built out.

ALASKA STATEHOOD

Alaskans had been considering statehood since the late nineteenth century. However, early attempts at seeking statehood failed because Alaska lacked the population and financial independence to effectively support itself. By 1945, Alaska's population had increased dramatically and it had become an integral part of the U.S. defense network, and the demand for statehood became more forceful. The discovery of oil on the Kenai Peninsula in 1957 further fueled the debate, and was the key to changing the national perception of Alaska. Congress passed the Alaska Statehood Bill on June 30, 1958. Alaska officially became the 49th state in the union when President Dwight D. Eisenhower signed the bill into law on January 3, 1959.[29]

THE 1964 EARTHQUAKE

Among the most significant events in Anchorage's history is the 1964 Good Friday Earthquake, which occurred at 5:36 p.m. on March 27, 1964. Originally recorded at about 8.6 on the Richter scale and later upgraded to 9.2, the quake was the second most powerful seismic event measured by graph ever recorded in North America.[30] The earthquake had a profound effect on the physical environment in Downtown, Government Hill, the South Addition, and Turnagain. These neighborhoods were especially hard-hit by the disaster.

The 1964 earthquake affected some of the UMED institutions that were formerly located downtown. This precipitated eventual moves to the current UMED district area.

OIL INDUSTRY

The largest oil field in North America was discovered in Prudhoe Bay on the Arctic Slope in 1968. A 1969 oil lease sale brought billions of dollars to the state. Alaska's gross product doubled within two years of the Prudhoe Bay oil field development. Oil companies needed to construct a pipeline to bring North Slope oil to market in order to capitalize on the Prudhoe Bay oil lease sale.[31] Construction began on the Trans-Alaska Pipeline System in 1974. The pipeline was completed in 1977

Figure 3. A cross-country skier at Goose Lake. Cross-country skiing and other forms of recreation attract tourism to Anchorage.

at a cost of more than $8 billion. The oil discovery and pipeline construction fueled an economic windfall when oil and construction companies set up headquarters in Anchorage.[32]

The tremendous outpourings of the oil fields led to the formation of the Alaska Permanent Fund, which mandated that a portion of the royalties earned by the oil companies be distributed equally among Alaskan residents.[33] The fund was voted as a constitutional amendment by Alaska's citizens in 1976, and the first Permanent Fund legislation was enacted in 1980.[34] The discovery of oil at Prudhoe Bay also increased the urgency of settling the outstanding land claims of the Alaska Native Peoples, leading to the passage of the Alaska Native Claims Settlement Act (ANCSA) in 1971. ANCSA established a system of regional and village corporations to hold the land titles and assets transferred to the tribes by the federal government; Alaska Native Peoples became shareholders in these corporations, which are run like traditional for-profit businesses.

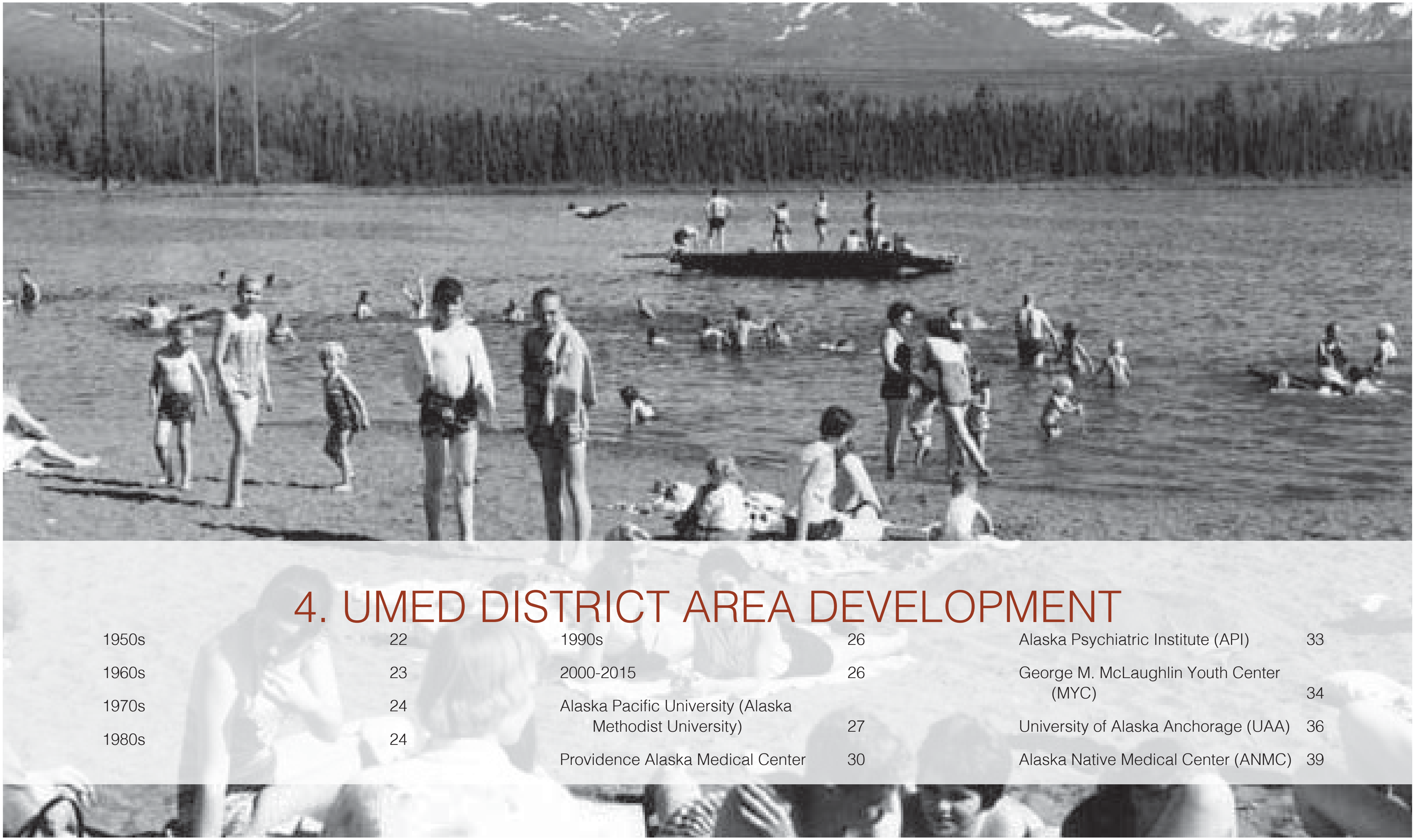
As the oil industry expanded, so did environmental conservation efforts. Many conservation groups were formed during the 1970s and 1980s. The Alaska National Interest Lands Conservation Act (ANILCA) was passed in 1980, which set aside over 100 million acres of public lands.[35]

MUNICIPALITY OF ANCHORAGE

The Municipality of Anchorage was formed in 1975 by a consolidation of the city and borough. Also included in this unification were Eagle River, Eklutna, Girdwood, Glen Alps, and several other communities. The unified area became officially known as the Municipality of Anchorage. The population of Anchorage had increased to 184,775 by 1980.

The decade of the 1980s was a time of growth, thanks to a flood of North Slope oil revenue into the state treasury. Capital improvement projects and an aggressive beautification program, combined with far-sighted community planning, greatly increased infrastructure and amenities for citizens. This effort was known as "Project 80s," and included major improvements such as a new library, civic center, sports center, and performing arts center.[36] The Project 80s building program rivaled the military construction of the 1940s.

During the 1980s and 1990s, outdoor recreation activities increased the role of tourism in the modern Anchorage economy, which has continued to the present day. In turn, the recreation and tourism industries have provided employment, attracted new residents to Anchorage, and provided individuals and the Municipality with money in their coffers to use in further residential and community development.



4. UMED DISTRICT AREA DEVELOPMENT

UMED DISTRICT AREA DEVELOPMENT

Figure 4. Goose Lake and Mosquito Lake amidst undeveloped land, 1950.

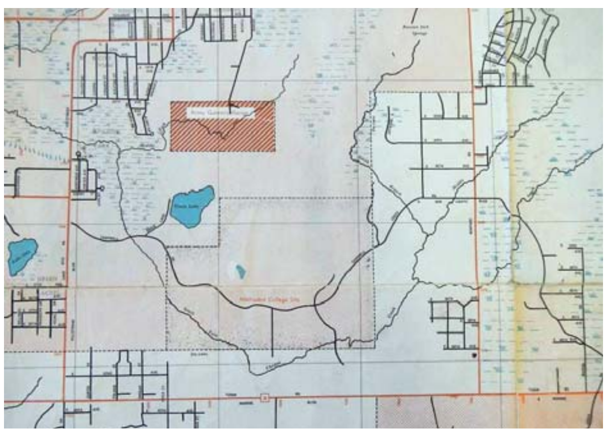


Figure 5. Future UMED District area as mapped by the National Bank of Alaska, 1956–58. The map is annotated with "Methodist College Site", and "Army Gunnery Range."

The historical narrative below is based on property type or specific institution and follows a general chronological order in which properties were originally constructed.

1950s

In the 1950s the UMED study area, formerly named the Goose Lake Plan Area, was outside the city limits. At least part of it, toward the east where Alaska Pacific University is now located, was owned by the U.S. Department of the Interior and administered by the Bureau of Land Management since it was public land outside the city's jurisdiction. The area included two natural lakes: Goose Lake (the larger lake to the northwest) and Mosquito Lake. They are kettle lakes, meaning they are shallow, sediment-filled bodies of water formed by retreating glaciers or draining floodwaters.[37] Chester Creek meandered southwest of the lakes. No paved roads led to Goose Lake. The land that is now occupied by Goose Lake Park originally belonged to the U.S. Army. The parkland was deeded to the city in 1956 by the Army Corps of Engineers and the National Park Service. The deed restricted use to recreational purposes.[38]

Lake Otis Parkway ran north-south at the west end of the area, and a road called Campbell Road or Campbell Airstrip Road meandered east-west through the site. The road led from Anchorage to Campbell Airstrip, which was a satellite facility to Elmendorf Field during World War II.[39] A large swath of wetlands occupied the area northwest of the lake, and an Army Gunnery Range was located directly north, north of what is today Northern Lights Boulevard.

During this timeframe, a road (Northern Lights Boulevard) was laid out from the west off Lake Otis Parkway. The road led to a parking lot and constructed beach at the north side of the Goose Lake. In addition, Wendler Junior High School and Lake Otis Elementary School had been constructed off Lake Otis Parkway to serve new residential subdivisions in the area, including Anchor Homes, which was developed in 1953 at the northeast corner of the Lake Otis Boulevard and Northern Lights Boulevard intersection. The subdivision included roughly 125 one- and two-bedroom homes with attached garages.[40]

An electrical substation associated with the Eklutna Hydroelectric Project, consisting of a small building, was erected in 1954 at the northeast corner of Career Center Drive. It has been identified on an AHRS form as significant in association with the electrification of the Anchorage area.


Figure 6. Goose Lake, n.d.


Figure 7. Goose Lake, n.d.

Additional residential development occurred in the southwest corner of the UMED area, bounded by East 40th Avenue to the north, Lake Otis Parkway to the west, East Tudor Road to the south, and Elmore Road to the east. No historical documents about this neighborhood in the southwestern portion of the study area were found during research.

Alaska Methodist University (AMU; renamed Alaska Pacific University [APU] in 1978) constructed its first two buildings on a hill east of Mosquito Lake, accessed from Lake Otis Parkway by what is now Providence Drive. The campus opened in 1960 (see later section for more information about the development of AMU/APU).

1960s

Gravel pits were indicated in a 1964 map immediately east of the elementary school, in the future site of University of Alaska-Anchorage.[41] Research did not reveal when the gravel pits in that location were initially created. The southeast corner of the study area, where University Lake is now located, was a gravel extraction zone.[42]

In the 1960s, the Goose Lake Recreation area and beach was open from late May to late August. During the 12-week period in 1964, an estimated 104,000 people came to sunbathe and swim. The picnic area at Goose Lake was also popular. In the winter months, Goose Lake was transformed into a supervised skating rink.[43]

By the end of the 1960s, several institutions had taken up residence in the delineated area surrounding Goose Lake, or were building campuses at the time. These included expansions to AMU (now APU), and the establishment of the Alaska Psychiatrist Institute, McLaughlin Youth Center, Providence Hospital, and University of Alaska-Anchorage (UAA). The development of these institutions is discussed in detail in the following sections.

The northern portion of the study area, containing forested land, was and continues to be owned by UAA, APU, and Anchorage MOA (Goose Lake Park). Numerous trails and ski paths developed in the area during the 1960s. According to retired faculty member and coach Jim Mahaffey, prior to this time there were “bits and pieces of old roads, power lines, and moose trails.”[44] APU established its first ski trail in 1967: a one-kilometer loop with short supporting loops, which was the first lighted ski trail in Anchorage. Four-kilometer and six-kilometer adjoining trail loops were built in 1969.[45] Also in 1969, Wendler Junior High School and Alaska Community College (now UAA) developed ski trails to the east and south of the junior high school campus.[46] The trail was

Figure 8. West side of UMED area, showing Northern Lights Boulevard routed north of Goose Lake, 1967.

Figure 9. General ownership map, 1972.

discontinued in 1973, and the west and south portions of this land were developed by UAA with buildings and parking lots and by the Anchorage School District for King Career Center. Northern Lights Boulevard was routed north of Goose Lake into its current configuration.

The College Gate residential neighborhood, located to the east, was also under development during the 1960s, with some streets laid out by 1970. No historical documents about the College Gate neighborhood were found during research.

1970s

The 1970s saw a great amount of development, particularly with regard to the UAA, Providence Hospital, and McLaughlin Youth Center campuses. By 1978, King Career Center was also constructed on a parcel of UAA property immediately east of Wendler Junior High as part of the Anchorage School District. It offers vocational and technical training for 11th and 12th grade students to explore career options. The building was constructed sometime between 1972 and 1978, though the parcel for a "Career Training Site" had been established on city engineer maps by 1966.

The College Gate residential subdivision continued to develop through the 1970s, with curving streets and cul-de-sacs on which two-story wood frame houses with integral two-car garages were constructed. College Gate Elementary School at 3101 Sunflower Street and the Church of Christ at 3124 Rose Street were also erected toward the northeast corner of the neighborhood.

Unlike Goose Lake and Mosquito Lake, which are natural lakes, University Lake was man-made. The gravel extraction pit created a ponding of water by 1972 (the south half of what is now University Lake). By 1978, the north and south portions of the pit were filled with water and the lake was created. Other gravel extraction appears to have occurred north of East Tudor Road, along with the creation of additional bodies of water. This occupied the Tudor Centre area, where the Alaska Native Medical Center (ANMC) exists today. The residential neighborhood at the southwest corner of the study area was built out further with houses, low-rise office buildings, and some commercial establishments.

1980s

During the 1980s, the Goose Lake Plan was conceived as a general use plan for the institution in the Goose Lake area. The various institutions continued their expansion. APU built three new buildings; UAA expanded northeast with construction of the Administrative/ Humanities Building, the Fine Arts Building, and surface parking lots, and southeast with construction of a cluster of student housing to the west off Elmore Road; McLaughlin Youth Center added new buildings to the northwest; and Providence Hospital added more buildings to its site. A cluster of single and multifamily housing was constructed in 1983 on Widgeon Lane off UAA Drive, immediately west of Goose Lake. According to a 1972 property ownership map, this development was on privately owned land that was zoned for residential development by 1969.

In 1978, the University Area Community Council asked the Anchorage Parks and Recreation Department to consider a lot where a house had been condemned in College Gate, east of University Lake, as a possible park. In 1981, the property was purchased with bonds and federal grant funds. Castle Heights Park was constructed in 1982 on six lots (1.38 acres) that were either condemned or deemed unsuitable for homes.[47] Meanwhile, more of the College Gate neighborhood and the area between Boniface Parkway and Baxter Road were developed. Two trailer parks were also developed. The larger of the two, Riviera Terrace Trailer Court, is located between Boniface Parkway and Baxter Road, and holds over 165 trailers adjacent to South Fork Chester Creek. Baxter Road Trailer Court, on Baxter Road near East Tudor Road, holds about six trailers. Like the surrounding residential neighborhoods, the trailer courts also feature curving streets and cul-de-sacs. Various subdivisions within the larger residential area east of the UMED area continued to be developed through the 1990s and 2000s.

In 1983, the APU and UAA Trail Systems, which had been combined, were redesigned and reconstructed. Two bridges were installed as part of this effort. The trail included the Lake Loop, which now belongs to MOA Parks and Rec. Also, a bike trail between East High School and the College Gate neighborhood, and the APU/UAA commuter path from APU to the Consortium Library were laid out.[48]

By 1984, University Lake had taken its current form through backfilling with soil in the east and west ends of the water-filled pit. It appears that between 1978 and 1988, Chester Creek was routed through the east and west ends of University Lake. Originally it passed the lake to the south. The Tudor Centre area at Elmore Drive and East Tudor Road contained small bodies of water to the east, an undeveloped dirt plot at center, and an office park with seven office buildings that now contain Southcentral Foundation facilities, other medical offices, and the Department of Corrections.

Figure 10. Development of institutional campuses and residential areas, 1978. Newly developed University Lake is visible.

Figure 11. Development of institutional campuses and Tudor Centre, 1988.

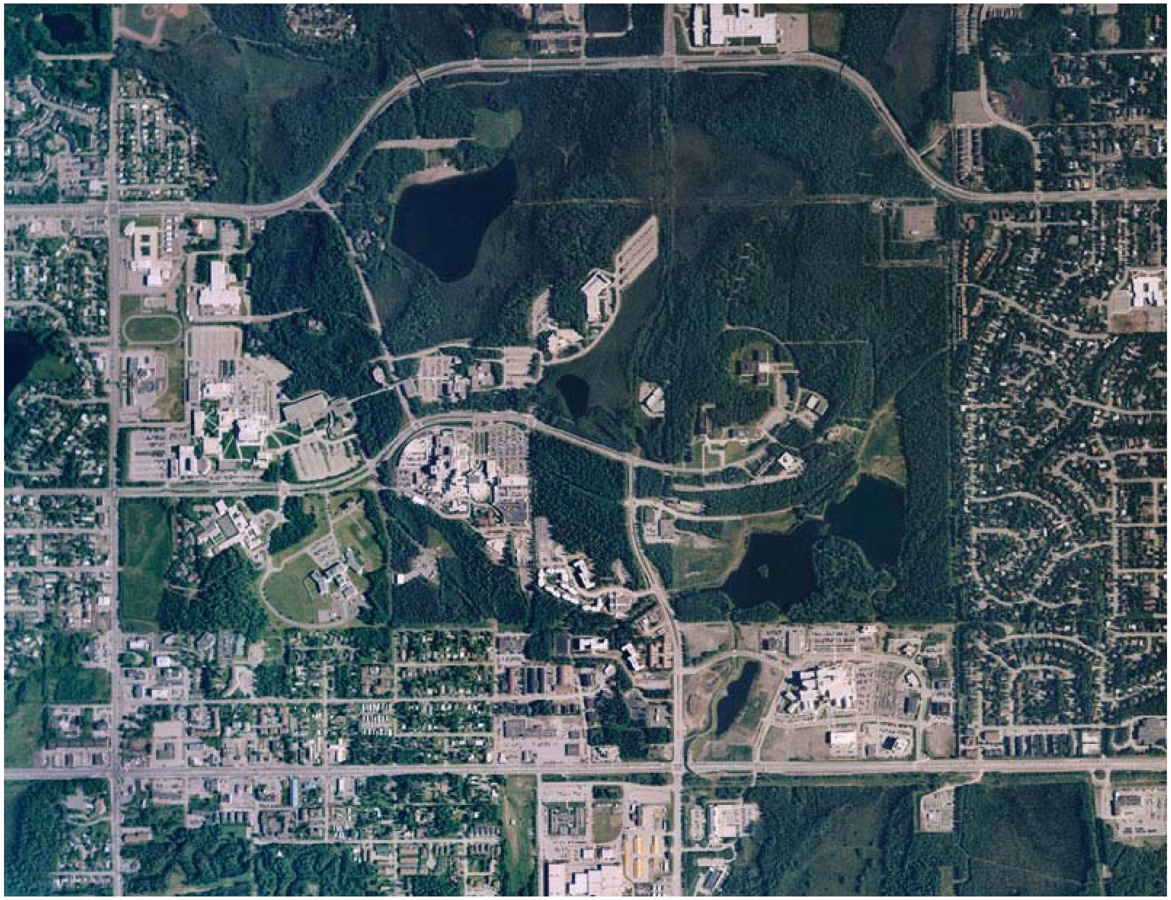


Figure 12. Further development, including construction of the Alaska Native Medical Center, 1998.

1990s

The 1990s continued the trend of expansion. APU constructed another building, and Alaska Public Telecommunications, Incorporated (APTI) built a radio and television studio facility on APU property between the APU campus and Mosquito Lake. UAA built more student housing (North Hall, West Hall, and East Hall) off Elmore Drive. In 1997, the ANMC opened on the center portion of the Tudor Centre site. The large hospital was surrounded by surface parking lots, and Southcentral Foundation built the Native Primary Care Center immediately to the south, between Diplomacy Drive and East Tudor Road.

2000 - 2015

In the 2000s, Piper Street was laid to the north and east of the Alaska Psychiatric Institute (API). Among the construction of new buildings for various institutions, API demolished one section at the rear of its complex and constructed another building at the south end of the parking lot. Providence Alaska Medical Center also built a large Health Park southwest of its main campus and east of API. UAA's construction included a major addition to the Consortium Library and four other academic buildings.

A multi-purpose arena is currently under construction on the UAA campus, adjacent to PAMC. Its planned opening is set for 2014. A new UAA School of Engineering building is also being constructed. The building will be situated on the site of the Wells Fargo Arena parking lot just north of Providence Drive. It is scheduled to open in 2015.

There were a number of buildings constructed between the Library Addition and the New Engineering & Industry Building—the Central Parking Garage, Engineering & Biomedical Labortory (EBL), ANSEP Building, Conoco Philips Integrated Sciences Building (HSB), and a few temporary support facilities all totalling over 500,000 GSF and adding over 25% additional space to the campus from 2002 to 2011. This was a tremendous period of growth for UAA.

ALASKA PACIFIC UNIVERSITY (ALASKA METHODIST UNIVERSITY)

Alaska Pacific University (APU), a Christian liberal arts school, opened near Goose Lake in September 1960. Originally known as Alaska Methodist University (AMU), the campus was the result of a 10-year plan to develop a Christian college in Alaska. In December 1954, the Anchorage Alaska Methodist College Committee received a proposition from the Department of the Interior, through the Bureau of Land Management in Anchorage, offering

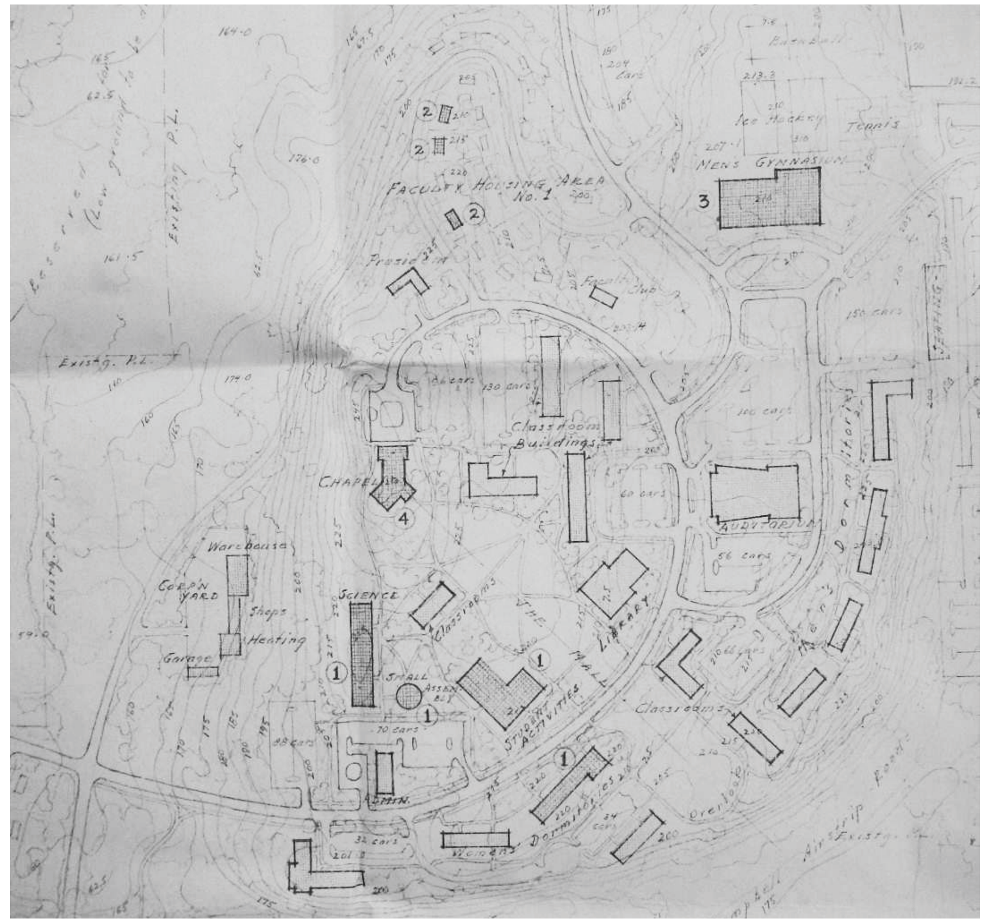


Figure 13. Portion of Alaska Methodist University Master Site Plan, 1957.

the committee the opportunity to purchase 200 acres of land for the site of the college. After negotiation, the committee secured an agreement from the Bureau of Land Management for the purchase of 242.5 acres.[49] In 1964, the campus had grown to 505 acres.[50] Today, the campus encompasses about 175 acres, of which approximately 40 acres are developed.[51]

A master plan for the grounds was drawn by Prentiss French-Fasla, a landscape architect from San Francisco, in March 1957. Edwin Crittenden of Anchorage worked as an architectural consultant. The plans called for a semicircular drive, now known as University Drive, which today stems to the east from an intersection with Providence Drive and Elmore Road. Women's dormitories were planned to the south of University Drive; men's dormitories and a large auditorium to the east; and a student activities center, library, administration building, and classrooms to the west. At the far west end of the campus was a facilities complex with warehouses, shops, heating facilities, garage, and corporation yard. At the north end of the drive was a chapel, a faculty housing area, a president's house, and a men's gymnasium.

Athletic fields were planned at the north and south ends of the campus. Mosquito Lake already existed to the west, and the master plan proposed enlarging the pond into a much bigger lake with a boathouse and dock. A second large faculty housing area with numerous single-family units, as well as a married student housing complex, were planned south of Providence Drive and west of Elmore Drive. Further afield, northwest of the main campus, a small nursing school complex was planned, as well as an atomic research complex. These complexes were relatively isolated. The site was planned with entrances from several points, including Tudor Road to the south, a road from the northwest, and another from the north.

Figure 14. Aerial view of Alaska Methodist University campus, ca. 1960

Figure 15. Grant Hall, Alaska Pacific University (then Alaska Methodist University), ca. 1960.

Though University Drive was laid out as drawn, the general locations of buildings did not closely follow the plan, and the breadth of development did not occur. A historic photograph post-construction (undated, but likely ca. 1960) shows that one main building, Grant Hall, was constructed in the location of the planned "Science" academic building and assembly hall in the early master plan. This building cost $1.5 million to construct. A men's dormitory with 100 units was located southeast of the academic building, and cost $700,000 to construct.[52] This building, known as Gould Hall at 4200 University Drive, currently houses the Alaska Science Center Geology Office. Aside from those two buildings, there was a Quonset hut located on University Lake Drive. The size of Mosquito Lake was never altered. Three years later, in 1963, a second dormitory, student union building, library, and gymnasium were in the planning stages but had not yet been built.[53]

The Campus Center (also known as the Atwood Center) was constructed in 1966 northeast of Grant Hall. The building is listed in the National Register of Historic Places for significance as the location of the 1971 ratification of the Alaska Native Claims Settlement Act. This was the largest settlement ever made to aboriginal claims. The two-story building was designed by world-renowned architect Edward Durrell Stone in 1966. The square building was constructed as a student union, flanked by a women's residence building and a married student-faculty apartment building. The composition framed a central courtyard. Exterior finishes were white stucco and precast concrete, and the buildings were designed atop podiums in the New Formalism sub-style of the Modernist Movement, with freestanding square columns along the facades.[54]

Figure 16. Gould Hall, Alaska Pacific University (then Alaska Methodist University), ca. 1963.

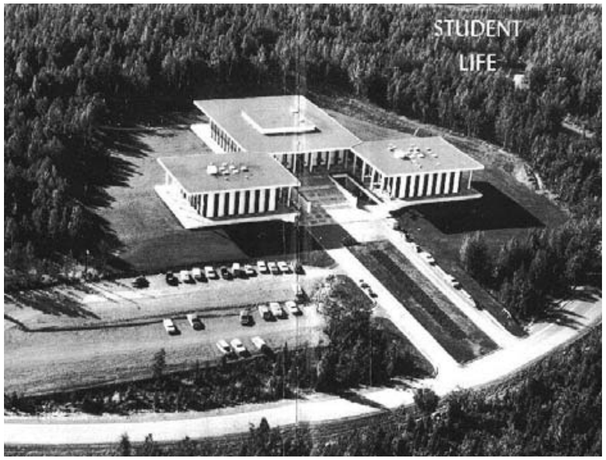


Figure 17. AMU Campus Center by Edward Durrell Stone, 1966.

By 1971, these three buildings were joined by 14 small residential units in the planned northern faculty housing area. The school was restructured into a nondenominational institution in 1978 and renamed Alaska Pacific University. During the 1980s, APU built Grace Hall next to Gould Hall, the President's residence, and the Moseley Sports Center. In the 1990s, the Carr Gottstein Academic Center opened. Glenn Olds Hall was built in the 2000s.

PROVIDENCE ALASKA MEDICAL CENTER

As early as 1934, Anchorage officials were looking to establish a hospital for its then-3,000 residents. At that time, the only hospital in town was a small government clinic operated by the Alaska Railroad. In 1935, the Sisters of Providence—a Catholic missionary group that arrived in Alaska from Montreal in 1902 to establish hospitals in Nome and Fairbanks—were approached about building a hospital in Anchorage. In 1937, the Sisters formally announced the construction of a $500,000 hospital with 50 beds adjacent to the Delaney Park Strip at West 9th Avenue and L Street. The cornerstone was laid in 1938 and the WPA Moderne-style Providence Hospital opened on June 29, 1939. Upon its completion the hospital was thought to be much more extravagant than the city needed, but as Anchorage boomed during and after World War II it was in high demand.[55]

By the 1950s, the facility was overcrowded and the equipment had become antiquated. In response, the Sisters made provisions for acquiring land outside downtown. The Alaska Methodist University controlled

Figure 18. Providence Hospital (no longer extant), circa 1944.

Figure 19. Providence Hospital and surrounding neighborhood, circa 1959.

Figure 20. Moving patients into the new Providence Hospital from the old hospital on L Street, 26 October 1962.

a tract of federal land adjacent to its campus south of Goose Lake. Early in 1957, the Sisters requested that the University's Board of Regents relinquish its claim to the tract of wilderness in favor of the hospital.[56] In June 1958, a land patent was issued for 45 acres in the Goose Lake plan area. The construction project was funded by a combination of $900,000 in federal money provided through the Hill-Burton Act, $450,000 in state funds, $2.5 million from the Sisters of Providence, and community fundraising efforts. When Alaska became a state in 1959 and the Borough of Anchorage was established, the Sisters' land in the future UMED District came under jurisdiction of the Borough. Because the Borough encouraged growth in the midtown area, the new location outside downtown proved to be better favored by the public. Construction of the new hospital became part of a trend toward decentralization of businesses and services in the downtown Anchorage area.[57]

Groundbreaking began in May 1960, and the new 97,000-square-foot Providence Hospital was completed in 1962.[58] By that time, the Alaska Psychiatric Institute and Alaska Methodist University were already located in the Goose Lake area. Construction was managed by Patti-McDonald Construction. The new hospital contained 175 beds.[59] The Sisters moved to the new convent in August, and moved patients from the old facility in October. The old hospital was repurposed as a nursing home and renamed St. Mary's Residence, but was demolished in the 1970s.[60]

Alaska's oil boom helped to accelerate the Sisters' plans to expand the new hospital facility. With an influx of people into Anchorage and the state of Alaska as a whole, Providence's emergency room visits doubled between 1964 and 1969, rising from roughly 4,100 to more than 8,200. The number of outpatients also doubled by 1969. In November 1969, the Sisters of Providence announced a large project for a professional

Figure 21. New Providence Hospital in the UMED District area, 1962.

Figure 22. Providence Hospital after expansions, 1980.

Figure 23. Model of Project 90 expansions, particularly behind the original building (upper portion of the image in pale blue).

office building, a diagnostic and treatment center, and a five-story, 125-bed nursing tower.[61] The Providence Professional Building was built in 1970. It was a three-story, 25-office complex adjacent to the hospital and connected by an enclosed first-floor walkway and subterranean basement passage. A 450-car parking lot was also under way.[62] In December 1971, the Sisters contracted with the nationally recognized architecture firm of Skidmore, Owings, and Merrill (SOM) to design another expansion for $17 million. The plan called for the construction of a six-floor diagnostic and treatment center with facilities for radiology, nuclear medicine, a laboratory, surgical suites, and 127 additional beds.[63] Several other additions, remodels, and new buildings have been constructed in the last 30 years. Project 90 was instituted with the goal of upgrading and expanding facilities by the 1990s. The project's phased development began in 1983 with a new one-story Maternity Center wing, located between the existing south tower and the professional building.[64] Also in 1983, Providence House was opened, which allowed patients' families from out of town to stay close to the hospital. The 15-bedroom home was built adjacent to Providence Hospital. In 1992, Hoffman Construction Co. of Anchorage was awarded a job to construct a five-story, 90,000-square-foot building near the hospital's two existing office buildings.[65] A new Children's Hospital was opened in 1999, which allowed parents and loved ones to stay with their children as they received treatment.

The original emergency room was designed to accommodate about 35,000 patient visits per year, but by 2000, the hospital saw over 50,000 visits. The hospital started construction in spring 2000 on a new emergency room and outpatient surgery center, which was estimated at $30 million.[66] The emergency room was completed in 2001 and expanded the hospital by 100,000 square feet.[67] Additional measures to modernize and expand PAMC include renovation of the Newborn Intensive Care Unit (NICU), cardiac surgery program, and of the surgical services area.

ALASKA PSYCHIATRIC INSTITUTE (API)

The same year Providence Hospital was established in the Goose Lake area, the Alaska Psychiatric Institute (API) also constructed a new facility across Providence Drive. The facility opened in October 1962 at 2900 Providence Drive as Alaska's only state-operated psychiatric hospital. Prior to establishment, patients sought treatment in a Portland, Oregon facility. With federal funding of $6.5 million, construction began in 1960 by the Leese Company of Anchorage with Stone, Marraccini & Patterson of San Francisco as architects.[68] The facility was constructed on an 80-acre, state-owned site bordered on the north by Providence Drive, west of Providence Hospital.[69]

The growth of API over the years was reflected in the development of specialized units for children and adolescents, forensics, and geriatric, acute, and chronically mentally ill patients. For example, a children's unit was built in 1965 and a closed intensive care unit was added in 1969. The hospital opened with 50 inpatient beds, but more were quickly added to bring the capacity to 225 beds by 1965. In 1972, there were 255 beds, and by 1985, there was critical overcrowding.[70] In 1988, a handbook for mental healthcare professionals explained that the patient population at that time consisted largely of young adults with a relatively small number of geriatric patients, and approximately 31% of the patient population was Alaskan Native.[71] Changing demographics rendered the original open-concept design inappropriate.[72] A late 1980s document listed the following API facilities on the site:

1. Alaska Psychiatric Institute is the main hospital facility containing all patient care, diagnostic and treatment, administrative, and support departments. It is comprised of a four-level center wing and two-level east and west wings, and totals approximately 133,196 building gross square feet (BGSF) of space.

2. Multiple housing unit is a freestanding building comprised of two one-bedroom apartments and four efficiency apartments on the first level and recreation, storage, and mechanical space on the basement level. It is used by students, out-of-town guests, and staff, and totals approximately 5,945 BGSF of floor area.

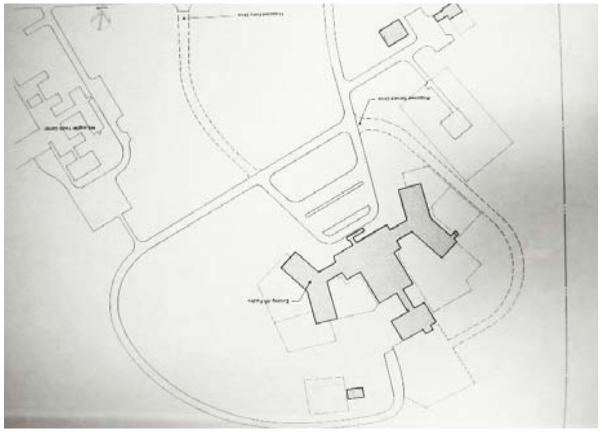


Figure 24. API site plan showing original building and proposed new driveways, 1986.

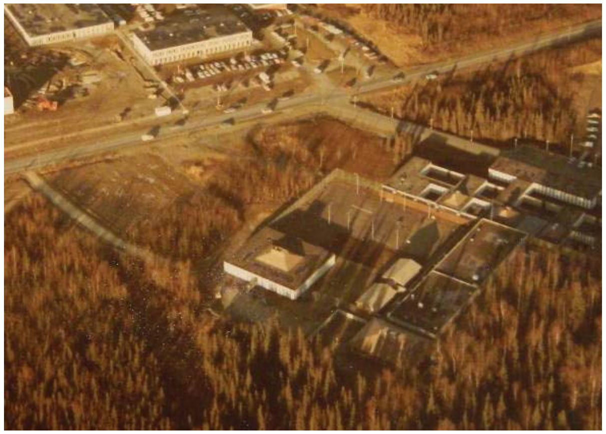


Figure 25. MYC campus, looking northeast, 1971.

Figure 26. MYC campus, looking northeast, 1976.

3. Superintendent's residence is contiguous to the multiple housing unit and is a three-bedroom single family residence with full basement and attached two-car garage. It is currently unoccupied and is comprised of approximately 2,867 BGSF (excluding the garage).[73]

In the early 2000s, API constructed a new facility immediately west of the original building. In 2004, the building was sold to Providence Health Systems. The building was extensively remodeled for use as the Providence Hospital Administration Building. Providence demolished the extended section at the rear of the complex, which had contained facilities management functions such as a garage, maintenance, and mechanical rooms. Other changes included replacing original windows and altering the façade. Another building was constructed at the south end of the parking lot.

In 2007, the U.S. Department of the Interior (DOI) found this building to be eligible for listing in the National Register of Historic Places under Criterion A for its association with the development of psychiatric care in the state, since API was the first publicly operated psychiatric facility in Alaska. It was considered eligible at the state level of significance with a period of significance of 1962. The property was incorporated at this time into the Alaska Heritage Resources Survey (AHRS).[74]

GEORGE M. MCLAUGHLIN YOUTH CENTER (MYC)

The George M. McLaughlin Youth Center was constructed in 1968 at 2600 Providence Drive, at the west end of the UMED district area. The center was named after George M. McLaughlin, a prominent Anchorage attorney who had been influential in establishing a rehabilitation center for youth prior to his death in 1958. Before the construction of MYC, juvenile detention facilities and rehabilitation centers were lacking in Alaska. In November 1957, a detention facility of concrete block with security windows had been completed in Anchorage. However, it did not provide rehabilitation services. A youth camp was established in 1960, which was the first institution created in Alaska for the rehabilitation of juveniles.[75] MYC was established as "a coeducational school for those whose deviant behavior has reached such a degree as to require twenty-four hour residential treatment and supervision. Administratively, the Center operates under the Division of Corrections, Department of Health and Welfare, State of Alaska."[76]

The State Division of Planning developed a six-year plan for capital improvements for the period of 1963–69. One of the proposals included $2.4 million for construction of a juvenile center complex to be erected in phases over a four-year period. The legislature authorized $1.08 million for construction of the first phase. A site was chosen on a 40-acre tract adjacent to Alaska Psychiatric Institute, where professional services would be readily available and community services and court requirements could also be served nearby. The proposal appeared on the November 3, 1964, ballot and was approved by voters.

Construction was awarded to Saunders, Inc., in March 1965, and the architectural firm of Curtis and Davis of New Orleans provided consultant services for the State Division of Buildings on the design. The improvements were originally conceived as one main building with a series of seven or eight surrounding buildings, but rising construction costs resulted in changes to the main building and construction of only one cottage. All resident housing, the shop, and the school from the original plan were postponed, which hindered the facility's mission to provide treatment rather than simply detention. Construction of the modern concrete and glass buildings began that summer.[77] When complete, the facility had a capacity for 150 youth of both sexes ranging in age from 8 to 18.[78]

Margaret E. Murton elaborated on the modern design in her 1970 University of Alaska master's thesis, T*he McLaughlin Youth Center: A Study of the Evolution of a Diagnostic and Treatment Facility for Juvenile Delinquents in Alaska*:

> The main building is constructed in the shape of a double cross (commonly referred to as a telephone pole design) with one long rectangle having four perpendicular extensions. The areas between these two extensions have been walled off with a concrete wall some twenty feet in height which serve as outdoor "patios" and two enclosed recreation areas. Although built along modern architectural lines, the exterior of the building is somewhat formidable in that the windows are deeply inset in the concrete in the form of long narrow slits, some six to eight inches in width and approximately eight feet high. They serve primarily as light sources, since no one from the outside can see in, and no one from the inside can see out. […] The dining hall, by contrast, has one wall that is all glass. The view is tremendous[…].[79]

The complex was designed with the understanding that it would take several years to build the needed facilities and complete the associated program development. In 1971, the McLaughlin Youth Center proposed expansion and construction of a juvenile detention facility. The purpose of the new facility was to accommodate youths who were awaiting court hearings and to provide physical and psychological diagnostic facilities. It would also serve as an outpatient diagnostic clinic for youths in the McLaughlin Youth Center, foster homes, and community-based halfway houses. The new construction was designed and planned by CCWC and HOK.[80] By 1976, the facility had also added four clusters of three cottages, which were connected by enclosed walkways to the main building.

The complex has continued to develop through the 1980s, 1990s, and 2000s with several new buildings and additions northwest of the original building.

Figure 27. UAA Campus, looking west during construction, October 1971. Lake Otis Elementary School at upper right.

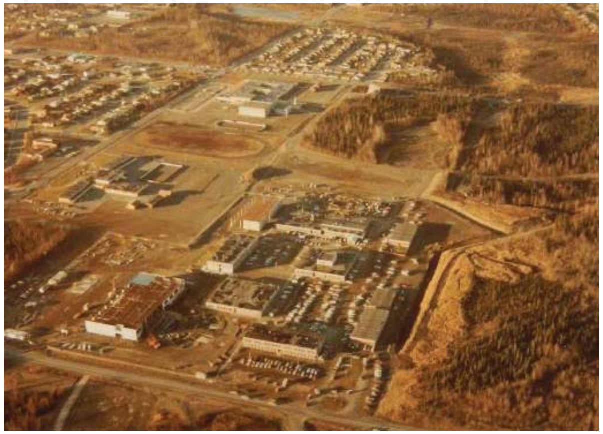


Figure 28. UAA Campus, looking north, 1971. Lake Otis Elementary School and Wendler Middle School at upper left.

Figure 29. UAA Campus, looking east, 1975.

Figure 30. UAA Campus, looking east, showing new Campus Center complex with enclosed walkway to Consortium Library at upper right, 1976.

UNIVERSITY OF ALASKA, ANCHORAGE (UAA)

Like the George McLaughlin Youth Center, the University of Alaska, Anchorage campus was under construction in 1968 in the Goose Lake area. Fourteen years earlier, in 1954, Anchorage Community College (ACC), a joint venture of the Anchorage Independent School District and the University of Alaska (then with a campus only in Fairbanks), operated evening classes on the second floor of what is now West High School (then known as Anchorage High School). ACC offered academic and business-related courses. The University of Alaska was also offering graduate courses in Anchorage and looking to expand with a new campus. In 1962, ACC was fully adopted as a unit of the University of Alaska, and plans for expansion began taking shape.

Construction for ACC began in 1968. In 1970, ACC dedicated a $3 million campus on Providence Avenue and moved from West High School into five new buildings that totaled 120,000 square feet. Four of the buildings contained similar massing and faced inwards towards an open green space to create a campus-like setting. The following year, the Anchorage Senior College was established as an upper-division and graduate level educational facility, and the Consortium Library was constructed to be shared by all three learning institutions in the vicinity: ACC, APU, and Alaska Senior College.

The same year saw the official creation of The University of Alaska, Anchorage to contain both ACC and the newly formed senior college, though both facilities continued to operate as individual institutions under the umbrella of UAA.

1972 also brought the construction of the Lucy Cuddy Center, which provided a place for students to eat, gather, and learn about the hospital industry. In 1974 the Social Sciences building (formerly the College and Arts and Sciences) was added to the Alaska Senior College as an addition to the Consortium Library. ACC also continued to add to their building stock, with an auto technology building in 1973 and an addition to the Professional Sciences building in 1975.[81] As enrollment grew and supporting buildings were continually constructed, the Junior and Senior colleges were soon linked in a linear campus. The combined campus was outlined in the UAA 1974-1976 master plan. In 1975, Anchorage Senior College was officially named the University of Alaska, Anchorage, though it still only provided an upper division, two-year program.

UAA and ACC finally consolidated in 1987, creating the four-year university that exists today. The linear layout of the campus, formalized in the mid-1970's, continues to act as an identifying feature of the campus and guides future development. UAA is currently developing plans for additional residential dormitories and student life facilities in an effort to establish a more traditional residential campus community. Many of the original ACC buildings are still in use.

Figure 31. A plan illustrating the linked Junior and Senior Colleges from the mid-1970's UAA Master Plan,1974-76.

Figure 32. Original UAA campus buildings, 1978.

The campus has expanded numerous times in the intervening years, particularly after North Slope oil money began to flow into Alaska's treasury in 1979. This funding allowed for expansion of higher education opportunities across the state. According to UAA's online historic timeline, construction projects have included the following:

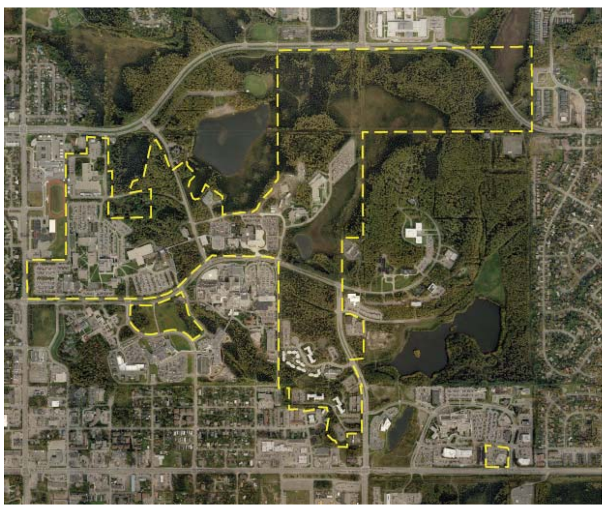


Figure 33. Aerial view of the UMED district showing boundaries of the UAA campus, 2009.

DATE	PROJECT
1972	Construction began on the Consortium Library, to be shared by Alaska Pacific University and the UAA (opened in 1973)
1973	Building K (now Professional Studies Building) and Building J (now the Auto/Diesel Technology Building) opened on West Campus
1974	Senior College Building (now Social Sciences Building) opened
1975	Information UAA Performing Arts Center (now Wendy Williamson Auditorium) opened
1977	Science Building opened
1978	The Campus Center complex (including the Student Union and Wells Fargo Sports Center) opened
1981	Engineering Building opened
1983	Allied Health Sciences Building and UAA Administration Building opened
1986	First on-campus student apartments opened
1986	UAA Fine Arts Building opened
1992	University space crunch was temporarily relieved by the purchase of the Diplomacy Building at Tudor Center. That year, the Business Education Building (now Rasmuson Hall) also opened
1998	The Commons and three four-story residence halls opened
2002	Central Parking Garage built
2003	Expansion of the School of Nursing, funded by a partnership with the largest health care providers in Alaska, began.
2004	A major addition to the Consortium Library was dedicated, and the Environmental and Biomedical Laboratory Building opened
2006	ANSEP Building built
2009	UAA opened the Conoco Phillips Integrated Science Building, home to the UAA Planetarium and Visualization Theater
2009	East Garage and Fireside Cafe also opened
2011	UAA opened new Health Sciences Building and broke ground on the new Alaska Airlines Center 2014 - The Alaska Airlines Center sports and recreation facility will open
2011	Health Sciences Building (HSB) opened
2013	Broke ground on the Engineering & Industry Building (to be completed in 2015)

ALASKA NATIVE MEDICAL CENTER (ANMC)

In 1997, the Alaska Native Medical Center opened a new hospital in the UMED district. This new facility replaced the aging Native hospital formerly located on Third Avenue, which was opened in 1953 as a tuberculosis sanitarium. The original hospital was located in an earthquake danger zone, immediately adjacent to a bluff that slid away in the 1964 Good Friday earthquake. Though it sustained relatively minor damage during the earthquake, the hospital remained on unstable ground.[84] The ANMC did not have money for land acquisition; consequently, a land trade was agreed upon, which involved city land, federal land, and land in the Tudor Centre. Guaranteed health care for Natives originated through treaties in the Lower 48 wherein the U.S. Government promised Native Americans health services and education as a way to make amends for the loss of land and culture. Congress guaranteed health care for Natives in a 1921 law. The 1973 Annual Report for the ANMC explains how the original hospital in downtown Anchorage was established:

> The Alaska Native Medical Center traces its origins to the early period following World War II, when the people of Alaska and the Federal Government once again began to take stock of the human situation in the Territory. Anchorage was then a boom town, due in large part to the rapid growth of its two major military bases, both of which were important staging areas during the war. Many Alaska Natives had moved to the urban area to take advantage of the job market and stayed on. The vast majority, however, still lived in outlying villages.
>
> Health conditions among the Native people were appalling at the time. […] Of all the epidemics, tuberculosis was the greatest burden. […] The death rate from this disease in the post-war period was one of the highest known anywhere in the world.
>
> […] In 1946, the Territorial Legislature was called into a special session to consider, among other matters, the ways of coping with the problem of tuberculosis. An appropriation equal to 1/10th of the annual Territorial budget resulted from this unique event.
>
> In 1947, an American Medical Association team came to Alaska to survey medical conditions. […] Among their recommendations was immediate construction of 1,000 beds for tuberculosis in the Territory, 400 of them in Anchorage. In 1948, Congress appropriated funds for a 400 bed hospital. […] The design contract was awarded June 26, 1948, and construction began in 1949. […] The first patients were not admitted until December 1, 1953.[82]

Figure 34. Original ANMC hospital facility on Third Street, ca. late 1950s.

Figure 35. Damage to ANMC campus on Third Avenue from Good Friday Earthquake, 1964.

The “Anchorage Hospital: Alaska Native Service,” as it was originally known, began as a staging area for diagnosis and the initial treatment of tuberculosis, while also providing care for general medical and surgical conditions.[83] It was the largest civilian building in the Territory, with 127,574 square feet of floor space. It became a full-service hospital in the mid-1960s. 30 years later, its expanded facilities of 185,000 square feet were considered cramped and outdated for the varied uses of the hospital. Congress allocated $2 million to begin planning for a new facility in 1984. While 17 Indian Health Service hospitals have been built across the country since 1980, most were smaller regional hospitals. Thus, more than a quarter of the agency’s hospital construction money went to the much larger Anchorage project.[85] The new building cost $168 million to construct and occupied 370,000 square feet.[86] Construction began in 1993 on 15 acres of reclaimed gravel pit in what was then known as the Tudor Centre development, at Tudor Road and Bragaw Street.

By the 1990s, Native Alaskans used the ANMC for primary care and basic services such as checkups, dental exams, and nonprescription medications; minor surgeries; and advanced surgeries and treatments. The federally funded health service used the Tudor Centre site, while the municipality received about 20 acres of federally owned property between Goose Lake and the University of Alaska-Anchorage Consortium Library. This land is wetlands without high market value, however. The owners of Tudor Centre received property on the north side of O’Malley Road, between the Seward Highway and the Old Seward Highway.[87]

When the ANMC opened, it was the U.S. Indian Health Service’s biggest and most medically advanced hospital.

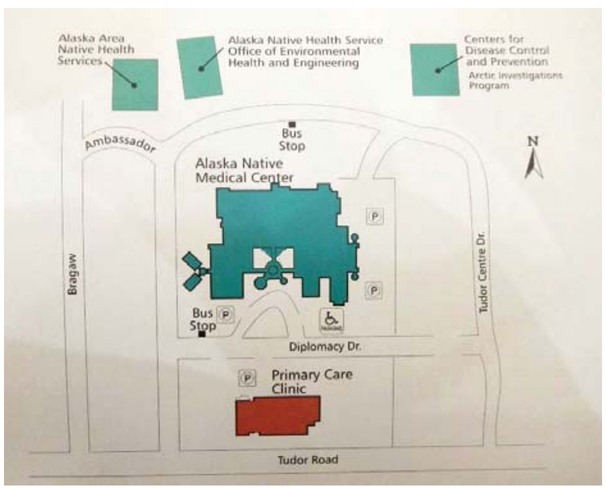


Figure 36. Alaska Native Medical Center campus map, showing location in relation to associated buildings such as the Primary Care Clinic, n.d. (ca. 1995-2000).

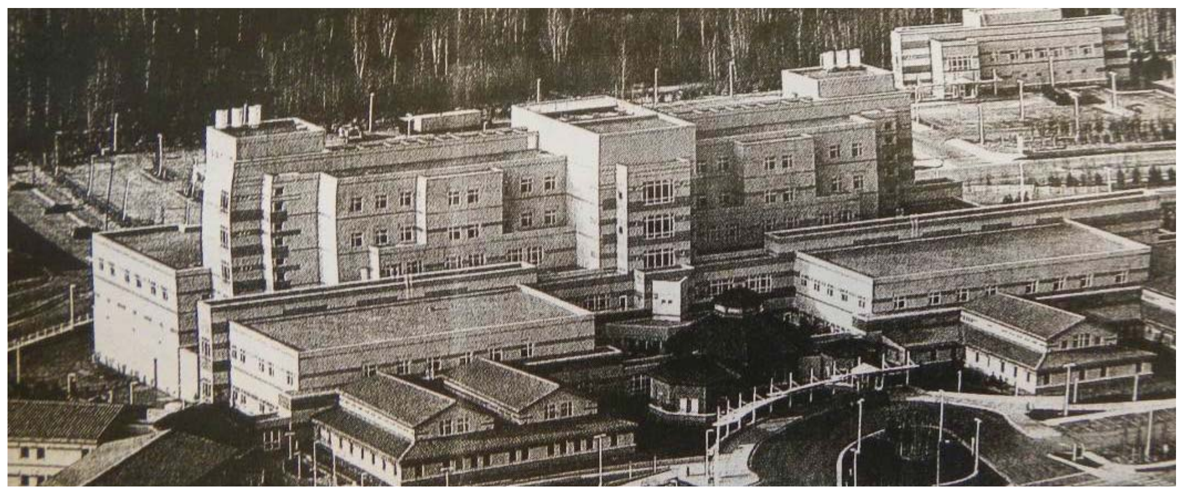


Figure 37. New Alaska Native Medical Center in the UMED District, 1997.

Designed by the Seattle architecture firm of NBBJ and constructed by general contractor Ellis-Don Construction Inc. of Ontario, Canada, the five-story hospital had a flexible steel skeleton designed to withstand collapse in a 9.6 earthquake. It was also constructed on steel piles, rather than concrete footings, due to the underground stream discovered during construction of the northwest corner of the building. The hospital design included arctic entries, a circular lobby topped with a high octagonal dome, and Native art throughout.

In response to the desires of the Native population, it was purposely designed to be lower in height and sprawling so that it would feel less intimidating to visitors from smaller villages.[88] The building also featured state-of-the-art emergency backup systems, including numerous emergency generators and four water tanks located in the basement that holds 100,000 gallons of water for three days' use. When the hospital was constructed, it had 688 parking spaces, including 34 for handicapped parking. It staffed about 1,000 employees, half of whom were Native, in 1997.[89]

Coinciding with construction of the building, Native leaders decided to use the Indian Self-Determination Act to take over management of the hospital from the federal government. In 1998, after two years of discussions between Native tribes regarding facility operations, a new 15-member tribal board called the Alaska Native Tribal Health Consortium was created. The management structure was ultimately mandated through Congressional legislation written by Senator Ted Stevens.[90] Ultimately, it was agreed that the Consortium would run the hospital emergency room, pharmacy, radiology, and all in-patient services, while the Southcentral Foundation, the nonprofit health care arm of Cook Inlet Region Inc. (CIRI), would operate the clinics for dentistry, audiology, and optometry.[91]

Despite the size and scope of the new Native hospital, Providence Alaska Medical Center remains the state's largest medical facility and the place where Natives go for certain special procedures, including open-heart surgery. Furthermore, additional outpatient services are provided by a two-story clinic constructed in 1995 on Diplomacy Drive off Tudor Road, across the street from the Native hospital, financed by CIRI and operated by the Southcentral Foundation.[92] This 40,000-square-foot Primary Care Center includes women's health, family medicine, pediatrics, and mental health. Southcentral went on to expand the Primary Care Center, which reopened in 2002 with 100,000 square feet of space. The expansion was designed by NBBJ Architects with Neeser Construction of Anchorage.

Figure 38. Interior of the ANMC.

DISTRICT PROFILE

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9. TRANSPORTATION & CIRCULATION

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APPENDICES

1. PROJECT OVERVIEW

PROJECT OVERVIEW

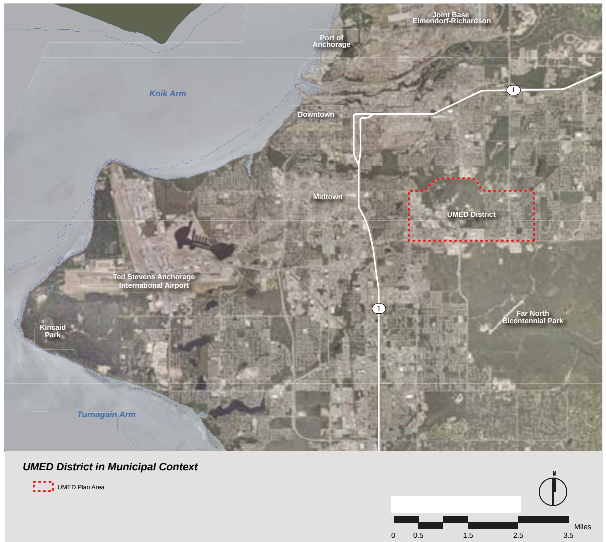


Figure 1. UMED Muni Context

INTENT OF PROFILE REPORT

This Profile Report serves as the background document for the updated Universities and Medical (UMED) District Plan. The purpose of the UMED District Plan is to provide a framework for the continued development of educational, health, housing, commercial, and public infrastructure and programs for this unique natural area and major employment center within Anchorage. This plan will update the UMED District Plan adopted in 2003, so that it continues to guide growth and development within the district. Through stakeholder participation and public outreach, the plan will ensure that neighborhoods and organizations within the district are given the opportunity to fulfill their individual missions. The planning process will engage those who live, work, and use resources within the UMED District. In addition to this Profile Report, A Historic Context Statement: Development of the UMED District and a Co-gen Feasibility Study were produced in support of the plan.

The Profile Report introduces and provides an overview of existing conditions within the district, including a physical description of the district, an overview of the groups that use it, the natural and recreational resources that shape it, the economic drivers located within it, and the transportation systems that support the district. The final chapter of the Profile Report also summarizes general regulations that guide and encourage growth and change within the district and that to some degree may restrict development. This Profile Report will be referenced in the UMED District Plan, and allows that document to focus on visions, goals, and implementation strategies that will ensure an integrated, cohesive, and holistic UMED District that meets the needs of the neighborhoods and organizations located within and adjacent to it.

PROJECT AREA

The Municipality of Anchorage (MOA) is uniquely situated within a natural landscape composed of national forest, state parklands, and tidelands. Only 10 percent of the 1,995 square mile MOA is inhabited, primarily in the Anchorage Bowl area.

ORGANIZATIONAL COLLABORATION

One of the most fundamental goals of the UMED District Plan is to encourage and facilitate collaboration among those who use the district. The UMED District is composed of two primary user groups: neighborhoods and organizations. Residential neighborhoods within the UMED are concentrated in the east and southwest portions of the district. The neighborhoods include parks, residential developments, and schools.

Organizations within the district, which include universities, medical centers, state facilities, schools, medical offices, and other commercial support businesses, are largely grouped in the western portion of the UMED District. Organizations represent groups that own a significant portion of land, are major employers, and/or provide services that are unique within the Municipality of Anchorage (MOA). These major contributors are typically private or non-profit institutions and are influential in the development of the district, the growth of the MOA, and the state of Alaska as its second largest employment center. The MOA also owns and manages municipal properties within the district, including parks and schools.

NEIGHBORHOODS, COMMUNITY DESIGN AND BUILT FORM

- Residential Neighborhoods
- Neighborhood Services
  - University Area Community Council (UACC)
  - Municipality of Anchorage
  - Anchorage School District (ASD)
  - Community Institutions and Organizations
- Community Design and the Built Environment
  - Commercial and Retail Development

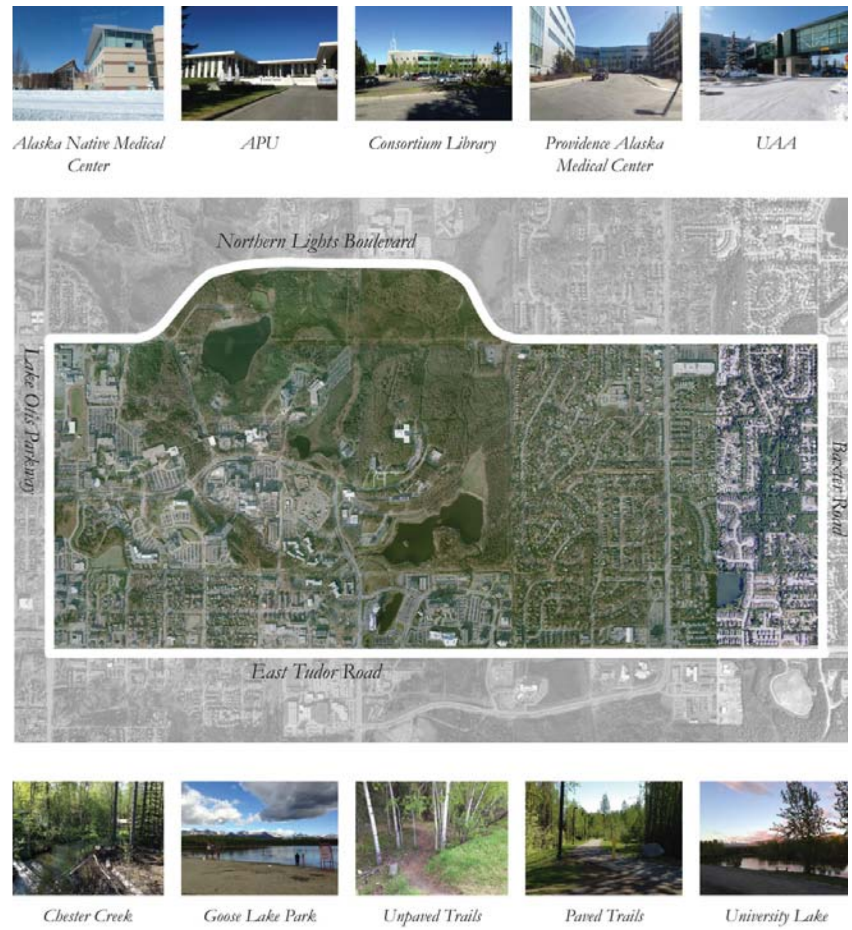


Figure 2. UMED Character-defining Features Map

ORGANIZATIONS

- Alaska Mental Health Land Trust (the Trust)
- Alaska Native Medical Center (ANMC)
- Alaska Pacific University (APU)
- Alaska Psychiatric Institute (API)
- McLaughlin Youth Center (MYC)
- Providence Alaska Medical Center (PAMC)
- University of Alaska Anchorage (UAA)

GENERAL CHARACTERISTICS

The UMED District is located approximately two and a half miles southeast of downtown Anchorage. The district is bounded by Northern Lights Boulevard to the north, Lake Otis Parkway to the west, Tudor Road to the south, and Baxter Road to the east. The district, which includes the College Gate and Castle Heights neighborhoods, is home to about 6,300 people, or 2.2 percent of the residential population of the MOA. This population includes about 1,100 students or individuals living in group quarters in dormitories at the University of Alaska Anchorage (UAA) and Alaska Pacific University (APU). The Anchorage Bowl 2020 Comprehensive Plan designated this area a major employment center, with the expectation of continued growth and development.

The natural setting is an important feature of the UMED District. The varied topography includes forest, wetlands, a creek, several lakes, and views of the Chugach Mountain Range. These natural systems serve important biological and ecological functions and contribute to the unique character and quality of life of the UMED District.

PROJECT INITIATION & TIMELINE

The MOA began working with Page & Turnbull, Kittleson & Associates, RSA Engineering, Strategic Economics (the project team), and HMS to prepare the UMED District Plan Update in the spring of 2013. Pending approval from the Planning and Zoning Commission, the MOA will release the Draft UMED District Plan Update in December 2014.

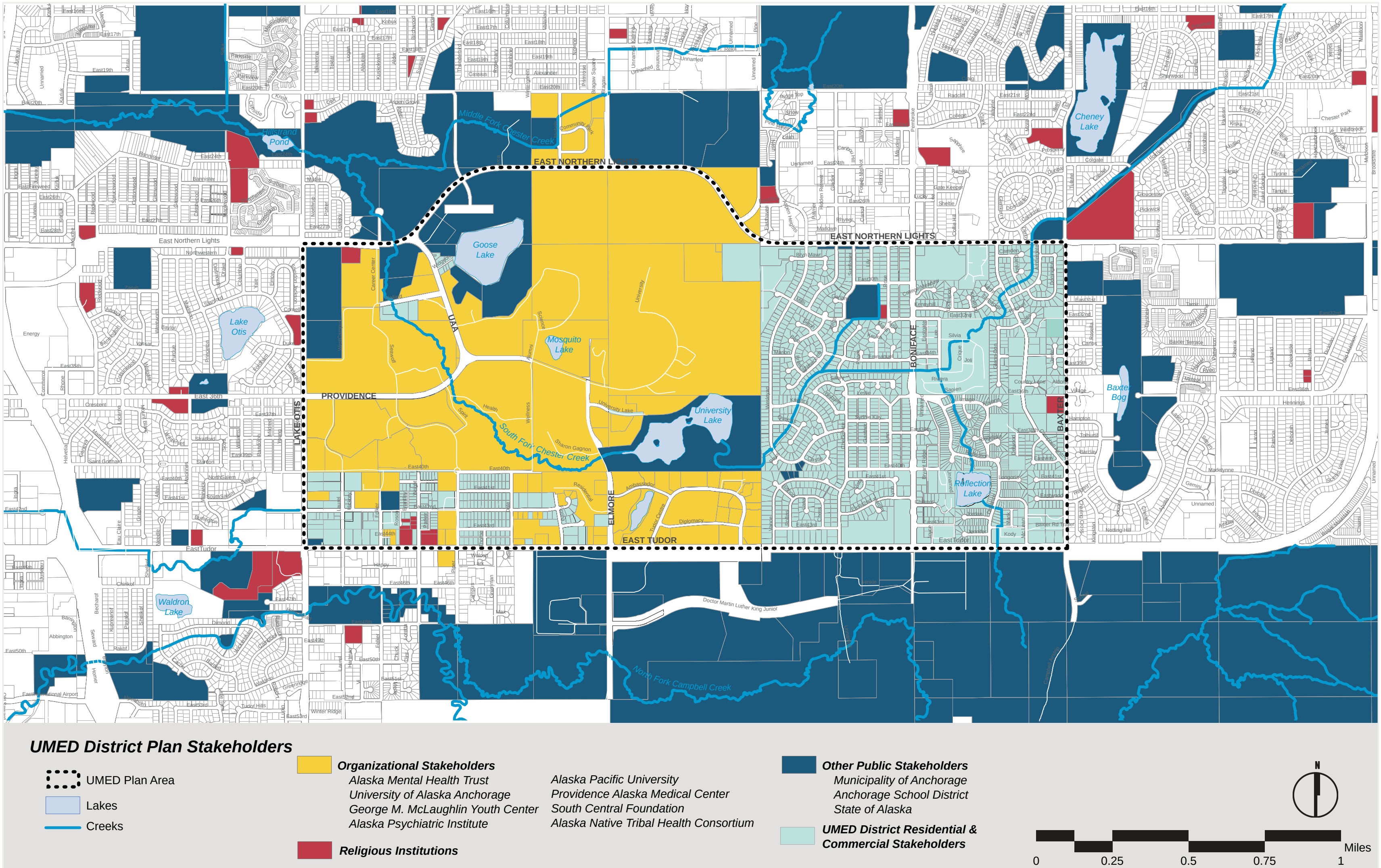


Figure 3 District Stakeholders Map

2. NEIGHBORHOODS, COMMUNITY DESIGN & BUILT FORM

NEIGHBORHOODS, COMMUNITY DESIGN & BUILT FORM

Figure 4a. House in College Gate Development

Figure 4b. Greenbriar Multiunit Housing

This Neighborhoods, Community Design and Built Form Chapter focuses on the role of residences within the UMED District and how these single- and multifamily developments fit into and influence the physical context of the district. Although neighborhood services, such as schools, churches, and parks, do not exclusively serve these neighborhoods, these community facilities are described in this section, as residents most directly interface with and benefit from these services. The UMED District neighborhoods are active, thriving places that serve both the immediate and the greater Anchorage communities.

RESIDENTIAL NEIGHBORHOODS

The earliest residences in the district were in the southwest portion of the UMED, bounded by 40th Street on the north, Dale Street on the east, Tudor on the south, and Otis Parkway on the west, and organized on a grid. Single family houses range from one to two stories with one multiunit apartment complex just beyond Dale Street. By the 1970s, the neighborhood included low-rise office buildings and some commercial establishments at its southwest corner.

The South Fork of Chester Creek runs east to west through these residential neighborhoods. The Municipality of Anchorage owns land around the creek between Wesleyan Drive and College Gate Elementary School.

The Castle Heights neighborhood, which comprises six lots developed in 1982, includes a small 1.38 acre pocket park created by the University Area community that includes ADA-Accessible play equipment.
Located in the eastern part of the district, the College Gate neighborhood was developed in the 1960s and 1970s. The suburb is characterized by curving streets and cul-de-sacs, on which primarily two-story wood frame houses with integral two-car garages were constructed. The neighborhood is vehicle oriented, with a fairly cohesive architecture of consistent scale. Most homes have yards, contributing to the area's having adequate open space. There are a comparatively small number of town homes and duplexes among the primarily single family neighborhood.

Two mobile home parks, the Riviera Terrace Trailer Court and the Baxter Road Trailer Court, are also located in the eastern portion of the district. Located between Boniface Parkway and Baxter Road, the Riviera Terrace Trailer Court contains over 165 mobile homes and is bisected by the South Fork of Chester Creek. Baxter Road Trailer Court is located along Baxter Road near East Tudor Road and holds half a dozen mobile homes as well as single-family and multifamily buildings and units.

Within the central portion of the UMED, a cluster of single- and multifamily housing was constructed on Widgeon Lane off UAA Drive, immediately west of Goose Lake, in 1983. According to a 1972 property ownership map, this development occurred on privately owned land zoned for residential development.

NEIGHBORHOOD SERVICES

A number of public and private entities serve the neighborhoods located within the UMED District. Although organizations within the district also benefit from these services, they most directly aid residents within the UMED District.

UNIVERSITY AREA COMMUNITY COUNCIL

The University Area Community Council (UACC) is an independent community council recognized by the Anchorage Municipal Assembly, which works closely with the Federation of Community Councils to provide technical and support services to the UMED District. Residents are an important voice within the UACC, which meets monthly and includes a board of officers and committees. The UACC monitors, comments on, and actively participates in projects within the district, particularly those related to: parks and recreation; the Northern Access Road Project; the Checkmate Drive Sidewalk project; and the University Lake Drive extension project. The UACC has been an active stakeholder in the UMED District Plan update process since the completion and adoption of the Goose Lake Plan in 1983.

MUNICIPALITY OF ANCHORAGE

Departments within the MOA oversee the management of public health and safety, public infrastructure, land use and development, and parks within the UMED District. Anchorage Water and Wastewater Utility provides water and wastewater services, lighting and electricity are provided by Municipal Light and Power (ML&P), and Public Works manages traffic, sidewalks, curbs and gutters, storm water drainage, snow removal, street lighting, signage, and general infrastructure maintenance. The Department of Community Development implements land use codes, facilitates land development, and manages planning projects for residential, environmental, and commercial initiatives. Within the UMED District, the Department of Parks & Recreation manages Goose Lake Recreational Area, University Lake, Folker Park, and Castle Heights Park, which are owned by the MOA. There are four Anchorage Fire Department stations located within a mile and a half of the UMED District: Station 3 at 1100 Airport Heights Road; Station 4 at 4359 Maclinnes Street; Station 6 at 1301 Patterson Street; and Station 14 at 4501 Campbell Airstrip Road. The Anchorage Police Department is located at 4501 Elmore Road, just south of the UMED District.

OPPORTUNITIES AND CHALLENGES

FOR RESIDENTS OF THE UMED:

- Potential for increased density
- Continued maintenance of public infrastructure
- Conservation and use of natural features within the neighborhoods
- Improved vehicular circulation
- Safe pedestrian circulation throughout the UMED
- Continued maintenance of homes and private properties

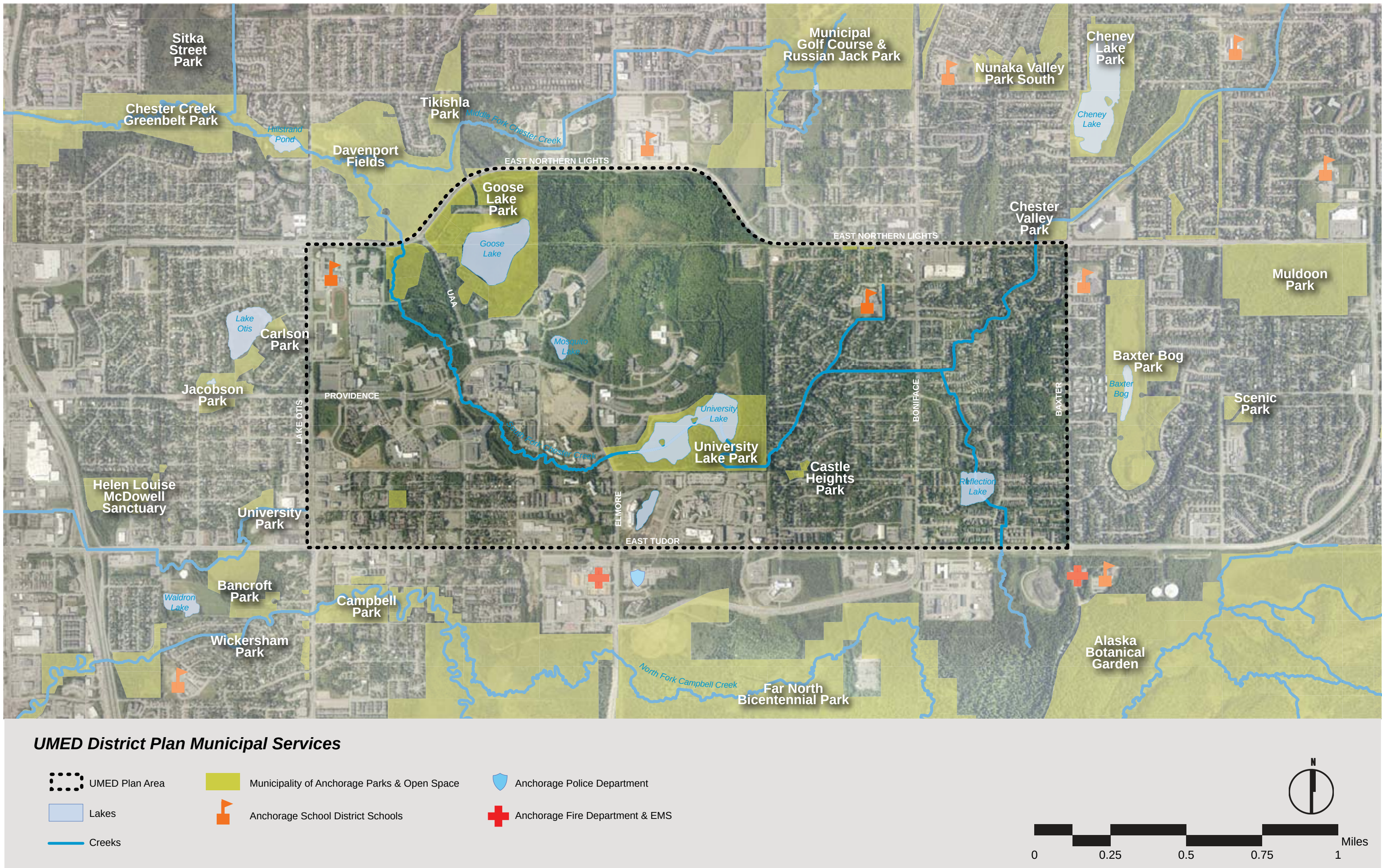


Figure 5. UMED Muni Services

ANCHORAGE SCHOOL DISTRICT (ASD)

The Anchorage School District (ASD) includes approximately 103 schools located in the Municipality of Anchorage. The ASD operates four schools and a career center within the UMED District:

- College Gate Elementary School;
- King Career Center;
- Lake Otis Elementary School;
- McLaughlin School; and
- Wendler Middle School.

The SAVE High School, located at 410 E. 56th Avenue (outside the UMED), works closely with the King Career Center. The ASD describes SAVE as "an accredited comprehensive alternative high school that provides the opportunity for credit recovery." SAVE students attend high school classes, and have a job or receive vocational training.

Public schools adjacent to the UMED District are: Baxter Elementary School, Russian Jack Elementary School, East High School, and the Whaley School. Baxter Elementary features a Multi-Sensory Instruction (MSI) program, an approach to teaching language arts and reading to students with language disabilities and reading problems. The Whaley School is an alternative school that serves children with physical and developmental disabilities.

Independent schools located within the UMED include the Aurora Waldorf School (which serves pre-K through 8th grade students), the Winterberry Charter School at 4802 Bryn Mawr Court, and the Highland Tech Charter School (grades 9-12). The Midnight Sun Montessori and Birchwood Montessori schools are located in the residential neighborhoods in the eastern portion of the UMED, as is the Starbright Early Learning Center, which offers classes for preschool children through 3rd grade.

ASD school facilities, which include athletic fields, space for community meetings, and specialized facilities such as swimming centers, are utilized by the greater UMED District community. Turf sports and flexible play fields are limited in the UMED District: a track and field and one ball field are located at Wendler Middle School, while Goose Lake Park contains a multipurpose play field. College Gate Elementary School includes a multipurpose athletic field; a soccer field; and hard surface play areas. In addition to its swimming pool, East High School has a track and football field, flexible play fields, and 12 hard surface tennis courts. Baxter Elementary School has a hard surface play area and flexible play fields.

NAME	ADDRESS	TYPE
College Gate Elementary School	3101 Sunflower Street	Grades K-6
King Career Center*	2650 E. Northern Lights Boulevard	Provides the connection between school and work where students can explore careers and apply academics in a vocational setting
Lake Otis Elementary School	3331 Lake Otis Parkway	Grades K-6
McLaughlin School	2600 Providence Drive	Serves students who have been incarcerated at the McLaughlin Youth Center, a state detention center for juveniles
Wendler Middle School	2905 Lake Otis Parkway	Grades 7-8

Table 1. ASD-operated schools within the UMED district. *King Career Center is located and operates on UAA property under a long term lease agreement.

COMMUNITY INSTITUTIONS AND ORGANIZATIONS

In addition to the neighborhood services provided by the UACC and the ASD, the UMED District neighborhoods are supported by churches located within the district and also by affiliated associations that work within the neighborhoods. Churches in the district include: the Anchorage Gospel Rescue Mission, Baxter Road Bible Church, the Church of Christ, the First Congregational Church, and the University Baptist Church. Although membership in these religious institutions expands beyond the UMED District, the church facilities are often used for neighborhood gatherings and meetings. Non-profit community organizations, such as the Friends of Castle Heights and Friends of Folker Park, in addition to other neighborhood groups, also work within the UMED District neighborhoods.

COMMUNITY DESIGN & THE BUILT ENVIRONMENT

In many ways, the design of built form and its relationship to its surrounding environment shapes the character of a place. While some features, such as a neighborhood development, large building complex, or public art installation, clearly contributes to the character of a place, other less-obvious design qualities may equally influence the feeling and quality of place-making.

Character-defining features are generally organized under five categories: location, setting, infrastructure, natural and built environment, and branding. The following attributes identify components that contribute to the uniqueness of the UMED; they provide a framework by which to explore features within the district and the balance between residential neighborhoods and institutional organizations.

LOCATION

- Located approximately 2.5 miles from Downtown Anchorage.
- Generally bound by Lake Otis Parkway on the west, East Tudor Road on the south, Baxter Road on the east, and East Northern Lights Road on the north.
- Trail bridges are located within the district at Northern Lights Boulevard and Tudor Road.
- Located at a key juncture for MOA-wide systems: trails, wildlife and habitat corridors.

SETTING

- Urban complexes located within a natural setting.
- Varied topography composed of wetlands, lakes, creeks, meadows, and forested hills; ecosystem is home to wildlife including bears, moose, and raptors.
- Includes Chester Creek and Goose, Mosquito, Reflection, and University Lakes as well as the lake at the ANMC.
- Provides views of the Chugach Mountain Range.
- Associated uses that contribute to setting: institutional, commercial, residential, recreational, and natrual areas.

INFRASTRUCTURE

- Elmore Road and Providence Drive serve as major roads between institutions within the district.
- Includes regional trail system that is used for walking, biking, skiing and special events.
- Road systems generally serve individual institutions; no universal circulation system within the district.
- Roads vary in design: APU and UAA campus includes some “country lane” roads without curbs and gutters.
- District contains street furniture and amenities of varied designs that reflect independent organizations.
- Sidewalks finishes: unpaved, naturalistic, asphalt, concrete.
- Private trails for skiing, hiking, and training.

BUILT ENVIRONMENT

- Composed of institutional complexes, commercial strips, and residential neighborhoods.
- Institutional and commercial architecture is generally modern in design; apartments and student housing is typically two to three stories; residential neighborhoods contain primarily ranch-style houses and mobile homes, and are one to two stories.
- Generally institutional buildings are two to five stories; commercial buildings are one to two stories.
- Density throughout the district is generally low to medium.
- Overall, development within the district is sensitive to natural and recreational open space.
- Built form is generally developed by independent organizations and stakeholders; therefore does not necessarily relate to adjacent complexes, etc.

BRANDING

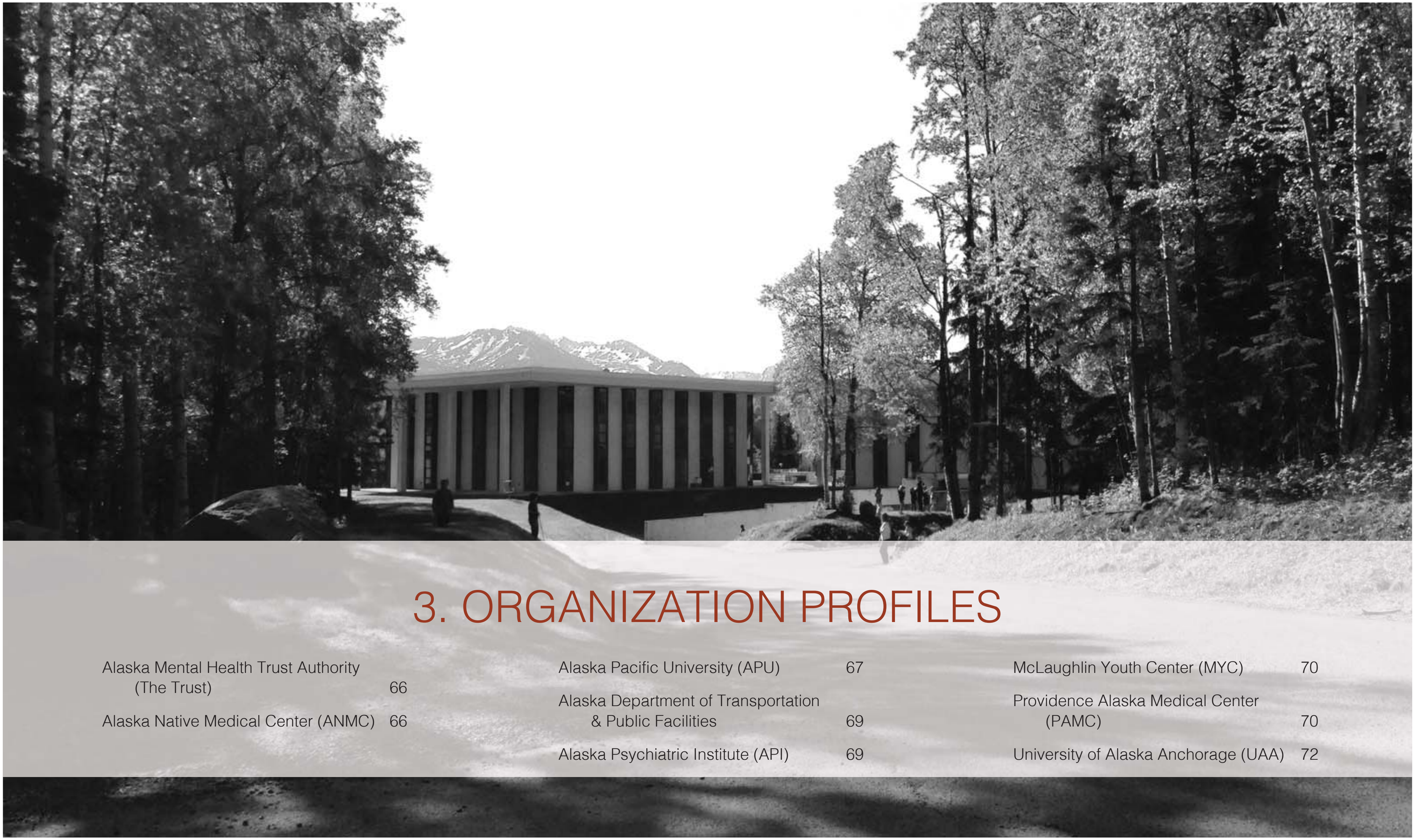
- Recognized primarily by institutions. Natural features contribute to the identification of the district.
- The following planning documents include design guidelines that pertain to the district: Anchorage 2020, UMED Framework Master Plan (2003), UAA, and APU.
- District branding has been implemented on Piper Street and 40th Avenue, and 36th Avenue at Lake Otis.

The UMED is shaped by design guidelines provided within Anchorage 2020, in the UMED Framework Master Plan (2003), and in capital plans for the UAA, APU, and Alaska Native Tribal Health Consortium (ANTHC) campuses. Anchorage 2020 includes the most general design guidelines, the UMED Framework Master Plan (2003) provides a district-wide framework and design guidelines, and the master plans completed by each institution include the most specific guidance. These Guidelines are fully outlined in Appendix A.

OPPORTUNITIES AND CHALLENGES

FOR COMMUNITY DESIGN:

- Implementation of district-wide design guidelines that include/recognize/celebrate UMED District organizations
- Collaboration on signage and wayfinding systems
- Unified/coordinated color and materials palette in the public realm (pathways, paving, lighting, etc.)
- Management of the natural environment as a unifying and defining feature of district
- Peripheral development that reinforces the character within the UMED District through branding, design guidelines, and community support



3. ORGANIZATION PROFILES

ORGANIZATION PROFILES

The following section serves to further describe or introduce each of the organizations, or the public and private institutions, that operate within the UMED District. Although the profiles do not provide comprehensive information about each organization, they include the mission statement and general services the organization provides, as well as identify opportunities and challenges faced by each:

- *Alaska Mental Health Land Trust (the Trust)*
- *Alaska Native Medical Center (ANMC)*
- *Alaska Pacific University (APU)*
- *Alaska Department of Transportation and Public Facilities*
- *McLaughlin Youth Center (MYC)*
- *Providence Alaska Medical Center (PAMC)*
- *University of Alaska Anchorage (UAA).*

ALASKA MENTAL HEALTH TRUST AUTHORITY (THE TRUST)

The Alaska Mental Health Trust Authority (the Trust), a state corporation, administers the Alaska Mental Health Trust, a perpetual trust managed on behalf of Trust beneficiaries. Trust beneficiaries include: people with mental illnesses; people with developmental disabilities; people with chronic alcoholism and other substance-related disorders; and people with Alzheimer's and related dementia. The Trust uses its resources to provide an integrated mental health program for its beneficiaries.

The Trust Land Office (TLO), a unit within the State Department of Natural Resources, manages the Alaska Mental Health Trust Authority land and assets. The TLO generates income from the land through: land leasing and sales; real estate investment and development; commercial timber sales; mineral exploration and production; coal, oil, and gas exploration and development; and sand, gravel, and rock sales.

Trust Lands are not managed as state public land and therefore do not follow the Alaska State Statutes for state lands. However, AS 47.30.660 states that the Alaska Mental Health Trust Authority shall coordinate with federal, state, regional, local, and private entities involved in mental health services as the Trust plans for integrated and comprehensive mental health care. Within the UMED, the Trust owns five properties situated on 40th Ave between Otis and Piper.

ALASKA NATIVE MEDICAL CENTER (ANMC)

Founded in 1997, the Alaska Native Tribal Health Consortium (ANTHC) is a non-profit health organization owned by and for Alaska Native Peoples. To support its mission to improve the health of Alaska Native Peoples, the ANTHC provides medical care and leads construction of water, sanitation, and health facilities throughout the state. The largest division of the ANTHC is the Alaska Native Medical Center (ANMC), which, since 1999, has been jointly managed by the ANTHC and the non-profit Southcentral Foundation (SCF). Alaska Native Peoples from all over the state come to ANMC for health services.

The medical center includes: the only trauma-rated hospital emergency room in Alaska; radiology, in-patient services, dentistry, audiology, and optometry services; and a pharmacy. The Providence Alaska Medical Center (PAMC) provides specialized services to ANMC patients, such as open heart surgery. Within the ANTHC site, the SCF operates a Primary Care Center and a clinic that provides women's health, family medicine, pediatrics, and mental health services on Diplomacy Drive. The ANTHC has been implementing master plans by the Seattle office of NBBJ and has developed an architectural vocabulary for its campus that is distinctive.

ALASKA PACIFIC UNIVERSITY (APU)

APU, founded as the Alaska Methodist University (AMU) in 1954, was the first institution to locate and develop a campus within the UMED District. In 1978, the school was restructured as a nondenominational institution and renamed Alaska Pacific University. Established as a private, four-year, liberal arts college, today Alaska Pacific University is a nondenominational institution that also offers graduate and doctoral degrees. APU strives to promote the fullest development of its students through liberal arts and professional programs while emphasizing individual attention to students, the development of leadership abilities, and the nurturing of spiritual and moral values consistent with its Christian heritage while respecting the religious convictions of all.

APU's mission as a small private liberal arts and sciences university is to provide personalized, experiential hands-on instruction "in the field" with Alaska as its primary classrooms. APU is best known for its outdoor studies programs and its environmental science and psychology departments. The university, which has an enrollment capacity of 650, had 550 full-time students in September 2013. To encourage increased enrollment, APU recently reduced its tuition.

In 1964, the original 240-acre campus expanded to 505 acres, and in 1966 the Atwood Center building was constructed. Over time, APU has sold some of its land holdings and, as of 2013, encompasses about 175 aces, of which approximately 40 are developed.

Figure 6a. ANTHC Pond

Figure 6b. ANTHC Primary Care Facility

OPPORTUNITIES AND CHALLENGES

FOR THE TRUST:

- Collaborations with organizations and stakeholders
- Potential for commercial development
- Ability to support missions and goals of other organizations

FOR THE ALASKA NATIVE MEDICAL CENTER:

- Plans to build a parking garage
- Potential for collaboration with neighboring organizations and stakeholders
- Adjacent to APU endowment lands
- Borders University Lake and off-leash dog park
- Cultural contributions to UMED, Anchorage, Alaska
- Potential for growth
- Becoming landlocked with potential loss of open space
- Federal funding cuts to Native health programs

OPPORTUNITIES AND CHALLENGES

FOR THE APU:

- Future planning and potential development of endowment lands
- Increasing student enrollment to capacity
- Proximity of the APU trails and soccer fields to the off-leash dog park at University Lake
- Maintenance of the campus infrastructure and buildings
- Management of private trails/use of APU lands by stakeholders
- Collaboration with neighboring organizations and stakeholders
- Proposed Northern Access Road Project
- Those outside the campus community utilizing campus parking

As a financial strategy that supports its educational mission, APU leases some of its land to the following entities:

- U.S. Geological Survey (three buildings)
- Alaska Spine Institute
- Marriot SpringHill Suites Anchorage - University Lake
- Alaska Public Media

Most of these groups occupy APU buildings and hold ground leases of 50 years. These leases provide approximately 30 percent of APU's annual revenue. APU has recently established a Hospitality Management program, based on its relationship with the University Marriot Springhill Suites.

In the late 1960s, APU staff and students collaboratively developed trails on the APU campus to meet the needs of the school's recreational programs. By the early 1980s, APU had collaborated with UAA to redesign and reconstruct a combined trail system. This effort included the Lake Loop, which is now managed by the MOA. Today APU's trail system is used by its ski team in winter and by miscellaneous training programs during the rest of the year. APU's trails are often used by the general public, whose use impedes how APU has access to and manages its own trails.

Figure 7a. APU Atwood Center

Figure 7b. APU Grant Hall

ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES

The Alaska Department of Transportation and Public Facilities (DOT&PF) designs and manages transportation services and infrastructure throughout the state of Alaska. In partnership with the MOA, the DOT&PF is currently leading a planning effort on a northern access road through the UMED that may connect Elmore Road with major arterials to the north and east.

The Division of Statewide Maintenance and Operations manages the design, construction, and maintenance of Alaska state buildings. Within the UMED District, the McLaughlin Youth Center and Alaska Psychiatric Institute are managed by Public Facilities.

Figure 8. Perimeter treatment at McLaughlin as seen from Providence Drive

ALASKA PSYCHIATRIC INSTITUTE (API)

Prior to congressional approval of the construction of a mental health hospital in Alaska, mentally ill Alaskans were sent to the Morningside Hospital in Portland, Oregon. In 1956, Congress approved construction of a mental health facility in Anchorage, and the state began managing the Alaska Psychiatric Institute (API) in Anchorage in 1959. The mission of API is to provide an array of quality inpatient psychiatric services to Alaskans with psychiatric disorders who meet admission criteria. The API facility is a beneficiary of the Mental Health Land Trust.

In partnership with individuals, their families, and the community, API's Recovery Center provides therapeutic services that assist individuals to achieve healing and recovery.

OPPORTUNITIES AND CHALLENGES

FOR THE DOT&PF:

- Funding
- Environmental considerations
- Access to trails network
- Limited right-of-way
- Community support

FOR THE API:

- Limited property for expansion
- Retaining competent, local staff
- Funding

OPPORTUNITIES AND CHALLENGES

FOR THE MYC:

- Maintenance and preservation of the privacy and natural setting of the facility
- Affiliation with API
- Collaboration with organizations and stakeholders
- Potential for expansion and/or relocation
- Becoming landlocked with potential loss of open space
- Funding
- Community-wide understanding or its program successes and needs

FOR THE PAMC:

- Adapting to changing medical systems and technology
- Potential for expansion
- Development of commercial properties
- Use of nonmedical land holdings south and east of the medical campus
- Reliance on financial partnerships
- Ownership of Tudor Square, the commercial strip on Tudor Road
- Nonpatient users occupying hospital parking lots
- Increased costs for utilities
- Attracting and retaining qualified, professional staff

GEORGE M. MCLAUGHLIN YOUTH CENTER (MYC)

McLaughlin Youth Center (MYC) is a rehabilitation and detention center run by the Alaska Department of Health and Social Services. MYC provides care for youth who are detained pending court action, those who have been institutionalized by the Court for purposes of receiving long-term treatment, and youth who need community-based detention and transition/reentry services. The mission of the Division of Juvenile Justice is to hold juvenile offenders accountable for their behavior, promote the safety and restoration of victims and communities, and assist offenders and their families in developing skills to prevent crime.

Construction of the MYC in 1968 at 2006 Providence Drive was funded by Alaska State legislation. A facility was built at the west end of the UMED District area in the vicinity of the API, which could provide professional services.

The 22-acre MYC complex was designed with the understanding that it would take several years to build the needed facilities and develop associated programs. In 1971, the MYC proposed construction of an outpatient diagnostic clinic, foster homes, and community-based halfway houses. By 1976, the complex had added four clusters of three cottages, which were connected by enclosed walkways to the main building. The complex continued to develop through the 1980s, 1990s, and 2000s, with several new buildings and additions northwest of the original building. Today, MYC has completed a remodel of the Intensive Treatment Unit and of the Medical Suite and Training areas. The Division of Juvenile Justice does not anticipate further expansion of the MYC within the UMED District in the near future.

PROVIDENCE ALASKA MEDICAL CENTER (PAMC)

Providence Alaska Medical Center (PAMC) is the largest hospital in Alaska. The medical complex, located at 3200 Providence Drive, includes an emergency department, family practitioners, imaging and laboratory services and a pharmacy, a specialized cancer center, a children's hospital, a heart and vascular center, and a maternity center. Guest housing is available for families of out-of-town patients at the 43-room Hickel House located at 3967 Piper Street. The mission of PAMC is to serve "those in need with compassion and respect, consistently adhering to a high standard of excellence."

In 1958, the Sisters of Providence, a Catholic missionary group, purchased 45 acres from the Board of Regents of the Alaska Methodist University (now called APU) to build a new hospital complex to replace an overcrowded and antiquated facility it managed in Downtown Anchorage. A new 97,000-square-foot Providence Hospital was

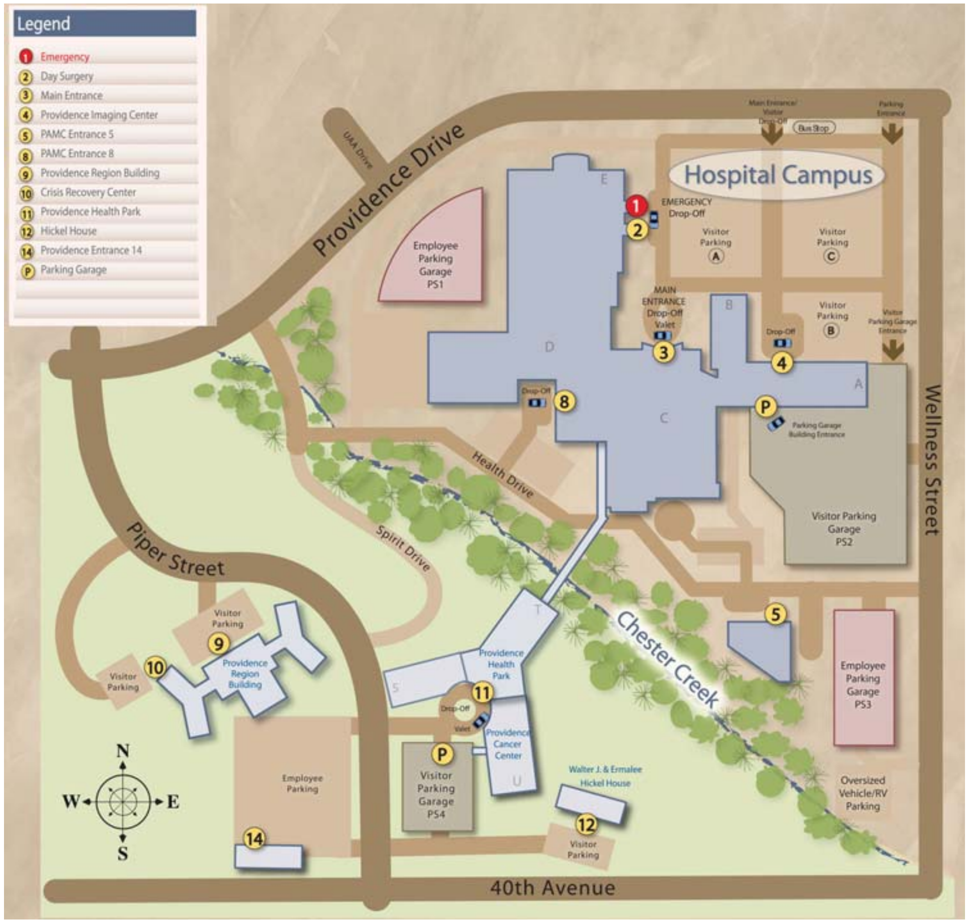


Figure 9. PAMC Campus Map

completed in 1962. In 1970, the Providence complex expanded to include a new professional office building, a diagnostic and treatment center, and a five-story, 125-bed nursing tower. The hospital complex expanded again in December 1971, when the Sisters contracted with the architecture firm Skidmore, Owings, and Merrill (SOM) to design a six-floor diagnostic and treatment center. Several other additions, remodels, and new buildings have been constructed over the last 30 years. A new Children's Hospital was incorporated into the Providence complex in 1998. In 2001, the hospital completed construction of a new emergency room and an outpatient surgery center. The new Mother-Baby Unit of the Providence Maternity Center was completed in 2013.

The PAMC continues to grow and expand. However, due to the changing nature of health care, PAMC expects that much of its growth will be within existing building footprints. In addition to the parcels that comprise the main campus, the PAMC owns a parcel at the southwest corner of the intersection of East Tudor Road and Piper Street, several residential parcels and the Tudor Road strip mall.

OPPORTUNITIES AND CHALLENGES

FOR THE UAA:

- Adapting to changing educational systems and technologies
- Evolution of curriculum and programs to a research university
- Wetland areas within the campus
- Potential for development at Northern Lights
- Proposed Northern Access Road Project
- Transition from low- to high-density development
- Replacement of obsolete facilities
- Improvements to transit and parking
- Collaboration with other institutions
- Developing an enhanced campus core zone focusing on student services, student life, and core academics
- Development and funding of additional student housing and related facilities
- Reinforcement of a design (architecture and landscape) vocabulary
- Consideration of private/public partnerships and alliances
- Arena traffic impacts to neighboring UMED roadway systems

UNIVERSITY OF ALASKA ANCHORAGE (UAA)

Initially founded as a joint venture of the University of Alaska and Anchorage Independent School District, the University of Alaska Anchorage (UAA) has been located in the UMED District since the 1960s. Originally called the Anchorage Community College (ACC) and Anchorage Senior College (ASC), the school became the University of Alaska Anchorage in 1987 and since then has steadily grown in enrollment, size, and stature. UAA's mission is to discover and disseminate knowledge through teaching, research, engagement, and creative expression. The campus occupies a unique natural setting that includes creeks, lakes, wetlands, subarctic flora and fauna and offers views of the Chugach peaks to the east and the Alaska Range to the west.

The state-run, public university offers associate, baccalaureate, and graduate degrees as well as cooperative/collaborate master's and doctoral programs with the University of Alaska Fairbanks, the University of Washington Medical School, Creighton University, and East Carolina University. The University of Alaska Anchorage participates in the WWAMI program, a medical school program that is collaborative among universities in five states: Alaska, Idaho, Montana, Washington, and Wyoming. In addition to medicine and nursing, popular programs include accounting, aviation technology, biology, civil engineering, elementary education, history, human services, journalism, justice, psychology, and social work. The university is also developing online programs in health, engineering, business, teacher education, and vocational and technical fields.

Figure 10a. Rasmusson Hall (College of Business and Public Policy) and West Spine to Wells Fargo Sports Center: Appendix E

Figure 10b. ANSEP Building, UAA: Appendix E

The 2013 fall enrollment at UAA was 15,640, of which 26% or 4,050 students had a non-degree seeking status. The University Board of Regents approved an updated UAA Master Plan on September 27, 2013. The University anticipates that enrollment numbers will remain steady; annual growth for the next 20 years is projected to be 0.0 to 0.5 percent. However, in response to UAA Administration and student demands for a larger traditional residential campus community, the university has been planning capital improvements that include housing and student life facilities.

UAA, which owns a large portion of land within the UMED District, has outlined a robust plan for capital projects in its recent Master Plan update to help the University meet its vision for a more traditional residential campus.

UAA/APU CONSORTIUM LIBRARY

Founded in 1970 by the Alaska State Legislature, which called for the construction of a library that now serves both the University of Alaska Anchorage and Alaska Pacific University, the UAA/APU Consortium Library was built at 3211 Providence Drive in the UMED. Due to the Consortium Library's location on the UAA campus, it will generally be discussed under the UAA sections, though the library partners with the following groups:

- Alaska Moving Image Preservation Association – AMIPA
- Alaska Resources Library and Information Services – ARLIS
- Anchorage Public Library
- Archives and Special Collections
- Center for Advancing Faculty Excellence
- Center for Community Engagement & Learning
- Faculty Technology Center (FTC)
- Justice Center
- Learning Resources Center (LRC)
- LitSite Alaska

The institutions that the library serves have grown dramatically, both in students enrolled and in academic programs offered.

Figure 11. Consortium Library

OPPORTUNITIES AND CHALLENGES

FOR THE CONSORTIUM LIBRARY:

- Student employment through work-study programs
- Collaborative programs between neighboring organizations and stakeholders
- Technology advances
- Storage space for Archives and Special Collection donations
- Digital preservation of Alaska's unique historic beginnings
- Development of north entrance
- Use of parking in distictwide parking management system

4. PREVIOUS UMED DISTRICT PLANS

PREVIOUS UMED DISTRICT PLANS

Figure 12a. 1983 Goose Lake Plan

The UMED District Plan Update will build upon previously adopted plans for the UMED District: the 1983 Goose Lake Plan, and the Universities and Medical District Framework Master Plan, adopted in 2003. Both plans focused primarily on the organizations located within the district. This chapter will summarize the purpose and planning tools that resulted from these previous plans.

1983 GOOSE LAKE PLAN

Adopted in 1983, the Goose Lake Plan had as its chief purpose to create collaboration among institutions in the UMED District to accomplish common goals and objectives. A Development Suitability Map was generated through the planning process to guide land use and development in the district through 2000. Although it was successful in protecting natural reserves, circulation within the district remained disjointed and ownership patterns made development difficult for some district users. The Map identified six land uses:

- Unsuitable for development
- Open/undeveloped open space
- Institutional
- Commercial
- Residential
- Resource extraction

2003 UNIVERSITY MEDICAL DISTRICT FRAMEWORK MASTER PLAN

The 2003 University Medical District Framework Master Plan (2003 UMED Plan) was created "…to identify and reconcile the objectives and priorities of institutional, residential, commercial, and natural environmental interests in and adjacent to the Universities and Medical Campus District." A fundamental recommendation of the Plan is that educational and medical institutions within the district be able to grow and compete effectively. Other development in the district should support these primary uses, and do so in a way that reduces reliance on automobile trips. Some recommendations for the district were also summarized in a land use map, which was amended by the Anchorage Assembly in 2009 and 2012.

PRESERVATION OPEN SPACE

Preservation Open Space includes land adjacent to lakes and streams, and land with primary Class "A" wetlands. It was recommended that these lands be permanently protected from development through a conservation easement or similar instrument. Natural open-space buffers and some recreational trail corridors may also share this classification. New vehicular access to serve the district is not barred by this classification.

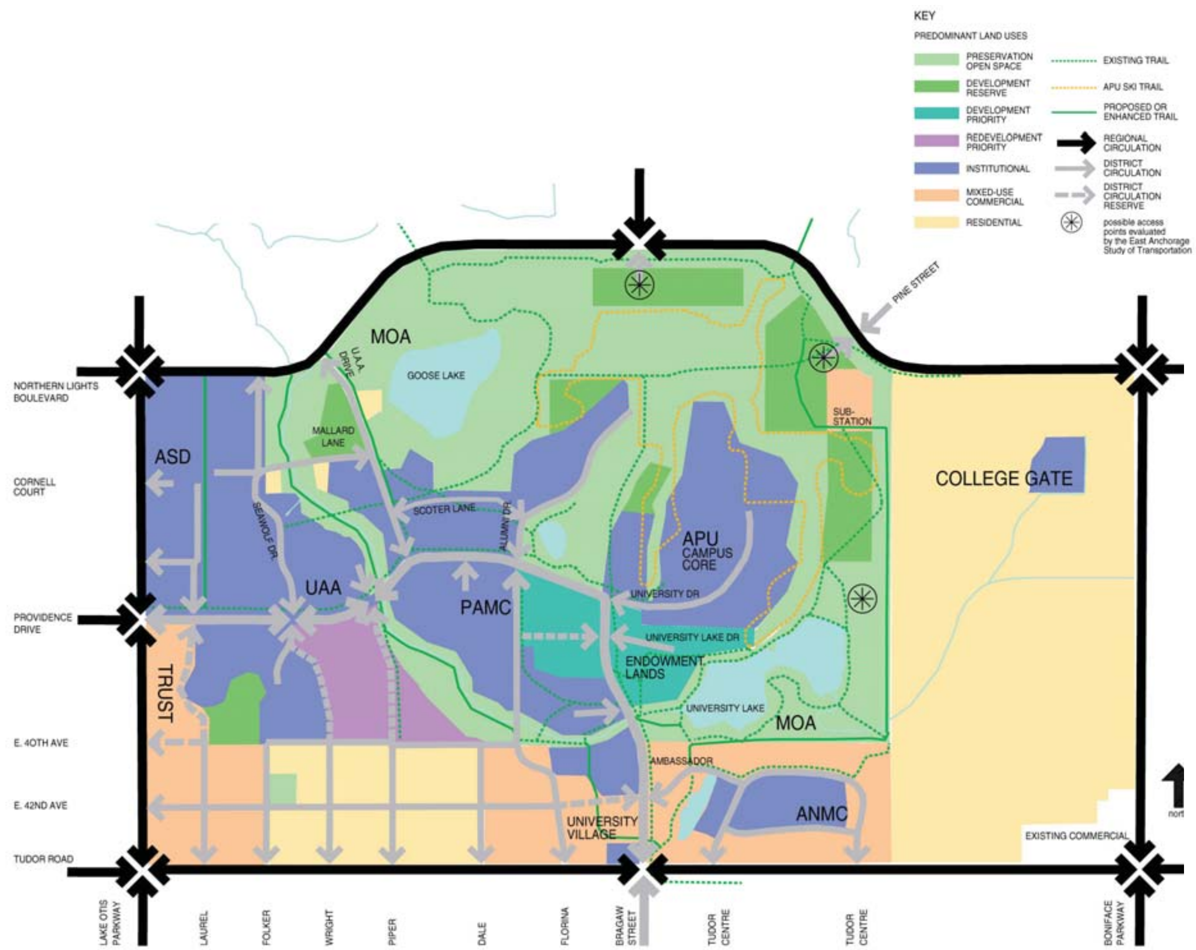


Figure 12b. UMED District Plan for Integrated Campuses, 2003

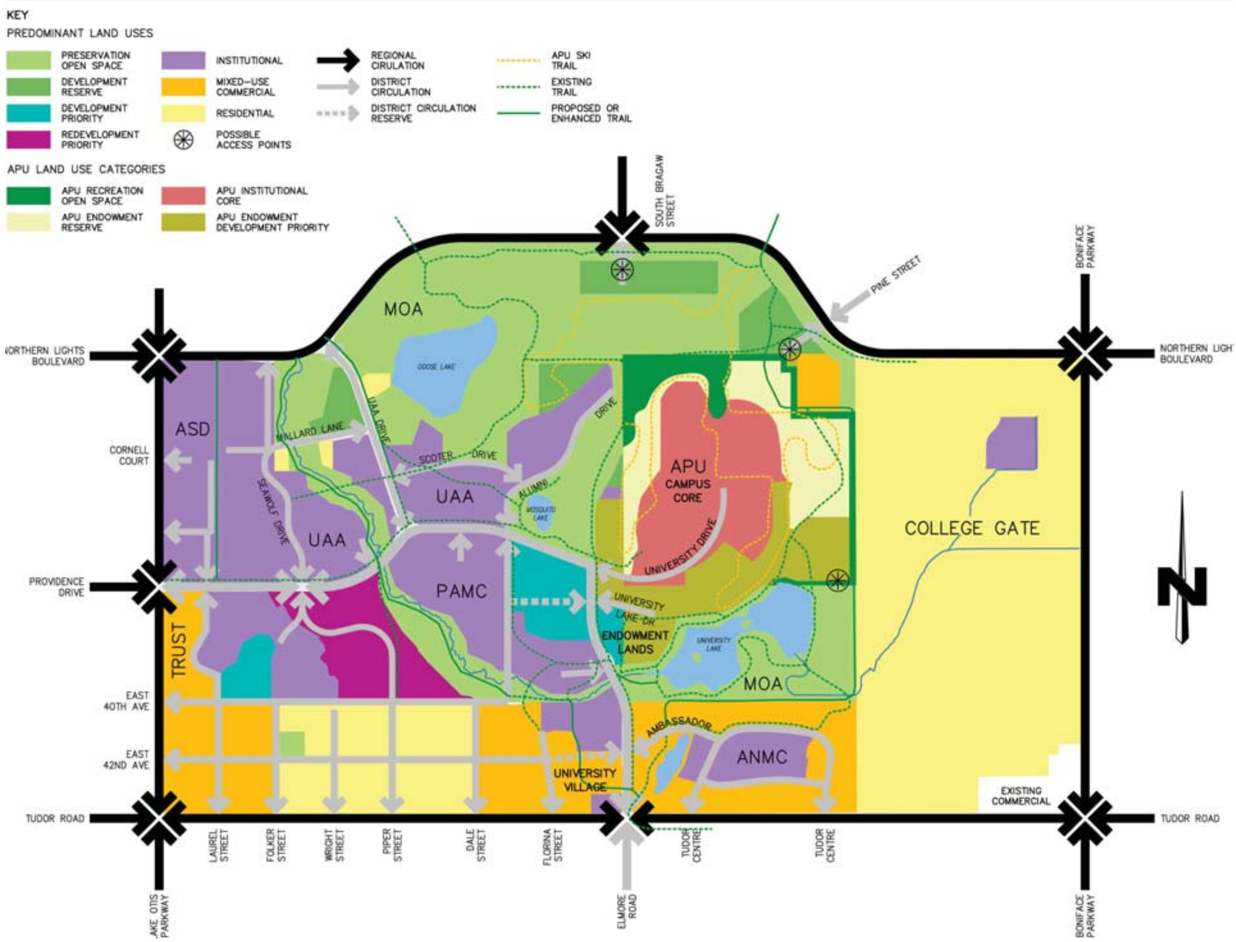


Figure 13. UMED Amendment Assembly Ordinance 2012-79

DEVELOPMENTAL RESERVE

The Development Reserve classification indicates a conditional right to develop. Uses in this classification may be public, institutional, or residential. Generally, land that has some valuable natural features but is not integral to Preservation Open Space may be developed, provided that natural features are not damaged or displaced.

REDEVELOPMENT AND DEVELOPMENT PRIORITY

Redevelopment and Development Priority indicates lands that have already been developed, or are ready to receive development without compromising the surrounding natural environment. These lands typically have infrastructure available for access and utilities. This classification includes all previously developed institutional lands. Infill is recommended before using Development Reserve lands.

INSTITUTIONAL

The Institutional classification includes all lands controlled by institutions in the area. Where institutional lands are mapped with another classification, limitations of that classification on development shall apply.

RESIDENTIAL

The Residential classification is for land that is predominantly occupied by housing in good repair, but does not exclude other compatible uses from being developed within it.

MIXED-USE COMMERCIAL

The Mixed-Use Commercial classification includes all lands that are not classified as Preservation Open Space, Institutional, or Residential. The intent is for these lands to be developed with a compact mix of uses that support the needs of institutions and those who inhabit them.

In 2009 and 2012, the Anchorage Assembly approved amended land use plan maps for the UMED District. The 2009 plan map changed the area located north of 40th Avenue between Laurel and Folker Streets from Development Reserve to Development Priority; thus, the area was identified as one that is ready for development without compromising the natural environment. Additionally, the 2009 amendment closed Wright Street, which the 2003 UMED Plan had showed may be extended to Providence Drive, at the south side of 40th Avenue. The Florina Street connection between 42nd and 40th Avenues was removed, and Piper Street between 40th Avenue and Providence Drive was realigned.

The 2012 plan map amendment (Figure 13) added land use classifications specific to Alaska Pacific University (APU), as follows:

APU RECREATION/OPEN SPACE

This land use category includes land intended for open space and recreation purposes. The intent for this land is to retain this area in its natural state, recognizing that utilities, road corridors and other improvements necessary to university expansion may be necessary within these areas. A buffer area of 25 feet measured from the western edge of the current trail on the eastern boundary of the site shall be provided. Site plan reviews in the future shall utilize this definition as part of the review.

APU INSTITUTIONAL CORE

This land use category includes all of the educational and support facilities serving APU's mission. This includes classrooms, administrative and recreation facilities, and residential facilities for students, faculty, and staff.

APU ENDOWMENT DEVELOPMENT PRIORITY

This is land that has already been developed, is adjacent to developed areas, or has access, utilities, and other infrastructure to support development. These lands are developed to support APU's institutional mission.

Designation as endowment land is not intended to limit the potential future use of this land for academic or other accessory uses to the overall university operations.

APU ENDOWMENT RESERVE

This includes lands that are generally suitable for development, but do not currently have access, utilities, or other infrastructure and are not expected to be developed in the near future. Sections of these areas may have some environmental constraints, and additional buffer areas may be considered or incorporated into future developments. Designation as endowment land is not intended to limit the potential future use of this land for academic or other accessory uses to the overall university operations.

5. ORGANIZATIONAL MASTER PLANS

ORGANIZATIONAL MASTER PLANS

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM - 2013 Facility Master Plan (2013-2025)

Alaska Native Health Campus - Parcel Ownership Diagram

Parcels on the Alaska Native Health Campus by ownership.

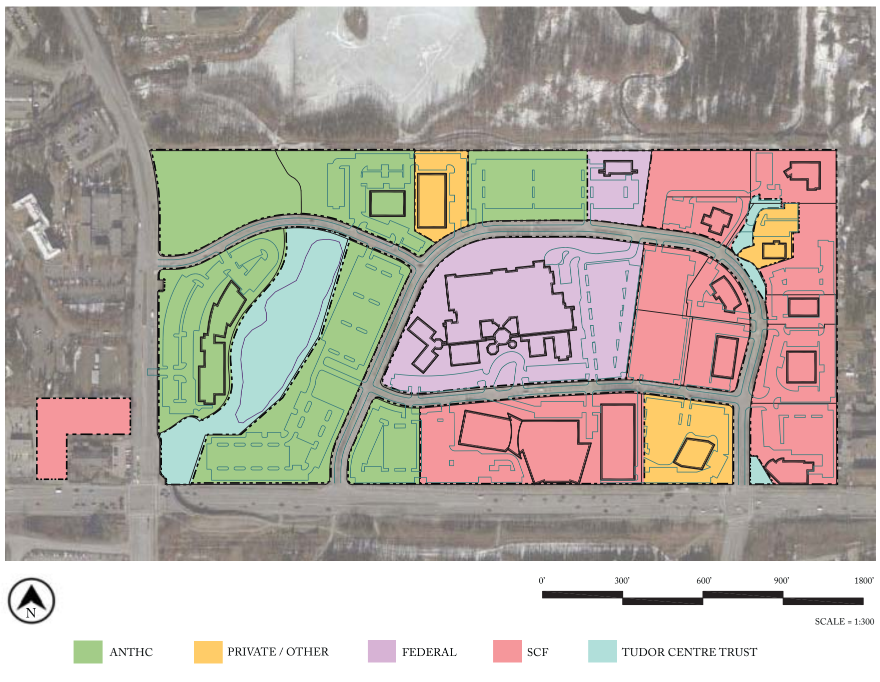


Figure 14. Alaska Native Health Campus Existing Parcel Ownership Map

One of the goals of the UMED District Plan update is to coordinate the capital planning projects of organizations within the district. The purpose of this section of the Profile Report will provide an overview of current and proposed projects led by organizations and stakeholders in the UMED District. Only those organizations that have prepared and shared their master planning documents with the UMED District update planning team were reviewed. These organizations include:

- *Alaska Native Medical Center (ANMC)*
- *Providence Anchorage Medical Center (PAMC)*
- *Alaska Pacific University (APU)*
- *University of Alaska Anchorage (UAA)*

ALASKA NATIVE MEDICAL CENTER (ANMC)

The Alaska Native Tribal Health Consortium released an updated Facility Master Plan in June 2013 that guides projects proposed for all ANTHC Divisions at the Alaska Native Medical Center (ANMC) site. The plan specifies that the ANMC will remain open throughout the implementation of these capital improvements, which includes construction of a physical connection between the ANMC hospital and Southcentral Foundation (SCF) Primary Care Clinics, acquisition of a portion of the public right-of-way and a portion of federal land to construct a Specialty Clinic Building at the northern portion of the medical campus, and traffic circulation improvements that will create a pedestrian-friendly campus. The Long Range Development Plan also describes efforts to expand the Emergency, ICU, Surgery, Maternal Child Health, Pharmacy, Physical Therapy, and Rehab Departments. To support expansion of services within the campus, the plan outlines a concept to relocate infrastructure support services to an adjacent or nearby satellite campus (location to be identified). Figure 14 contrasts the current ownership of parcels within the ANMC with those proposed in the 2013 Master Plan.

ALASKA PACIFIC UNIVERSITY (APU)

The 2011 Alaska Pacific University Master Plan outlines major goals for the university as well as projected uses and expansion of endowment lands. The University would like to increase enrollment from 550 students to approximately 750, while retaining the school's character as a wooded, hilltop campus. Among other capital improvements, APU plans to extend University Lake Drive to allow for future development and to promote pedestrian-oriented compact medium- to high-density development. In part, the 2011 Master Plan was generated to address inconsistencies between the university's endowment lands and the 2003 UMED District Plan (as amended June 23, 2009), including usage, maintenance, and modification of "public" and "private" trails that traverse the campus. Some clarification

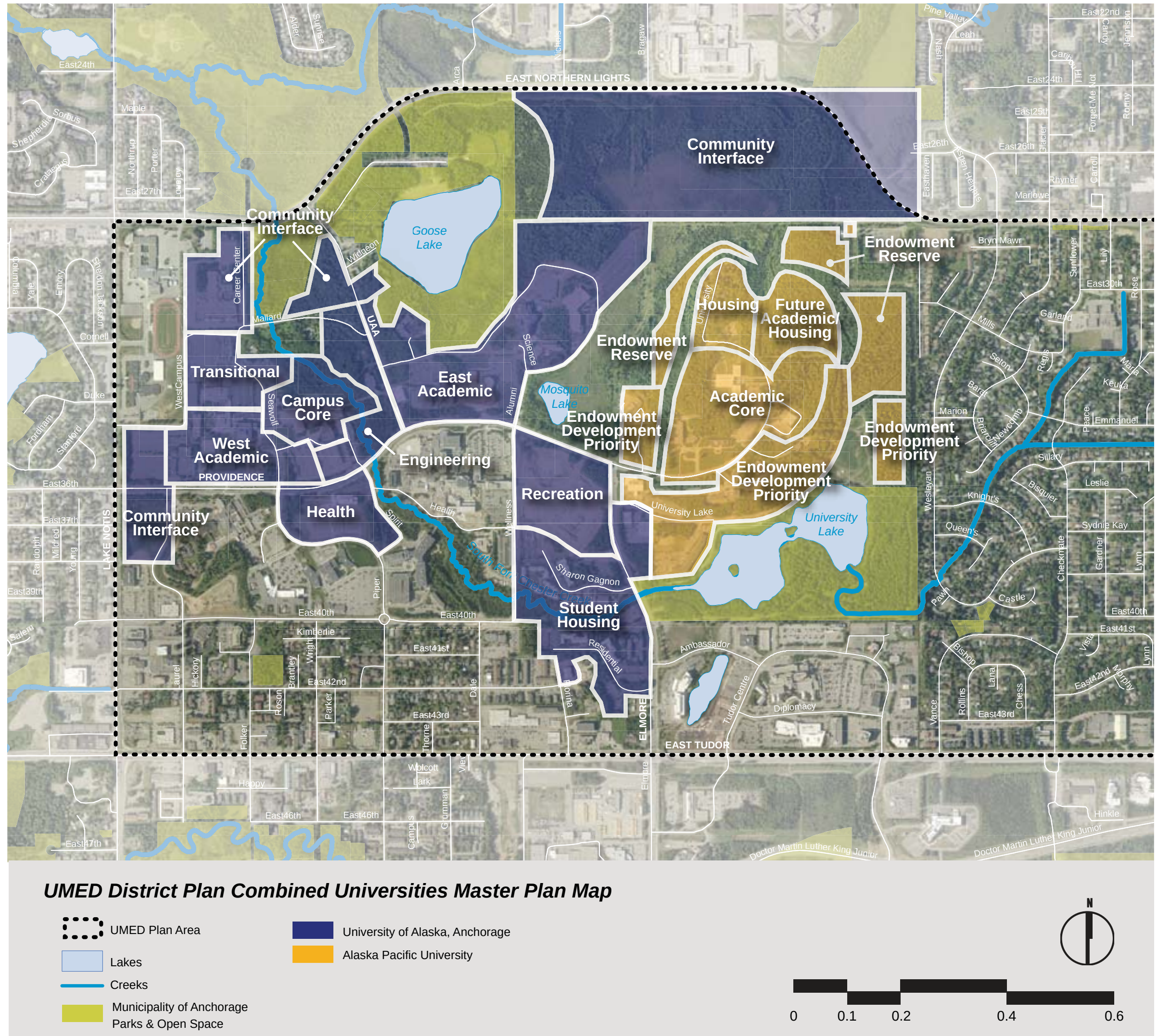


Figure 15a. University Master Planning Zones

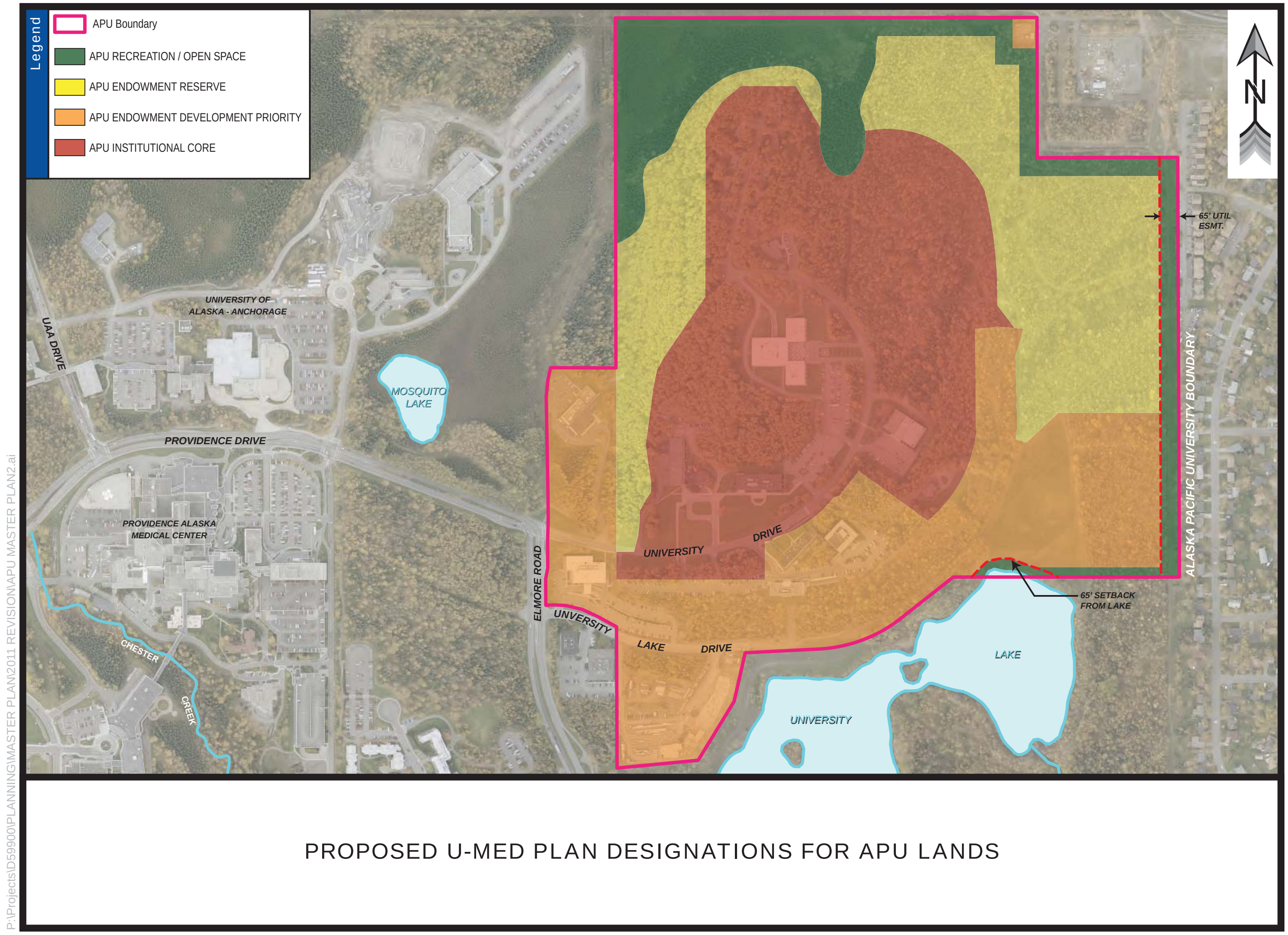


Figure 15b. Proposed UMED Plan Designations for APU Lands

regarding APU endowment lands was incorporated into the amended 2012 UMED Land Use Map, which was approved in August 2012. Additionally, the plan called for an inspection of campus-owned infrastructure such as sewer lines, and an evaluation of snow removal practices that are shared between the Municipality of Anchorage and APU. Lastly, the plan also included design guidelines for future development that would preserve the wooded "country lane" character of the campus.

The following land use definitions are excerpted from the 2011 APU Master Plan:

ACADEMIC CORE

The Academic Core contains the existing academic, administrative, student services, core residential and support areas of the APU campus, all positioned along University Drive. These lands are relatively flat, have reasonably good soil conditions, and are served by existing utilities and roads. The Academic Core is considered prime land for future academic, administrative, and student services building expansion, with the goal of locating such buildings in close walking distance to each other. It also includes existing vegetated areas between Atwood Center and Grant Hall and the adjacent hill above the campus. This vegetated area is recognized for its important aesthetic and recreation value, and development for academic purposes may be considered in the long-term with careful consideration of the natural environment.

HOUSING

The Housing area contains student and faculty housing to supplement the core housing provided in the Atwood Center. This area includes the existing University Village Housing, which has recently undergone major remodeling. It also includes Segelhorst Hall, the most recent housing development, just north of the Atwood Center and east of University Village. This site offers a quiet, vegetated environment with easy access to the Atwood Center, APU's trail system, and the recreation facilities at Moseley Center.

FUTURE ACADEMIC/HOUSING DEVELOPMENT

This land is reserved for longer-term expansion of academic, administrative, and support areas. This area is suitable for long-term academic expansion because it is large and relatively flat, providing suitable space for large buildings. While somewhat distant from the center of the Academic Core, it is close to the center of student housing, services, and recreation facilities, at the Atwood Center and Moseley Center, making it a good location for short and long-term residential development. Areas along the east side of University Drive may be developed first for automobile parking to support development within the Academic Core.

ENDOWMENT PRIORITY LANDS

Endowment lands are lands allocated for uses compatible with, and related to, university uses. Endowment lands may be developed by APU, with both land and facilities leased, or developed by others, with only the land leased. Lease revenues from Endowment lands or buildings generate revenues to support APU's operating and capital cost needs. Endowment lands in this land use classification are proposed for development in the short to medium term because they are more easily developed and are desirable due to proximity to existing roads and utilities, flat slopes and good soils, and desirable location relative to existing facilities and University Lake. It is important to note that not only do the endowment developments pay a lease fee, they routinely incorporate classroom, conference room, or other spaces for use by APU programs, which helps meet the net square footage needs of APU without requiring additional capital expenditures by the University. These lands should be considered similar to the Mixed Use/Commercial land use category in the U-Med District Plan and used to support a compact mix of uses that supports the needs of the institutions and the public. Designation as endowment land is not intended to preclude the ability for these lands to be used for academic uses, supporting residential uses, or accessory uses including snow disposal or other administrative support infrastructure.

ENDOWMENT RESERVE LANDS

The Long-Term Endowment Lands, located on the north, northeast, and northwest portion of the campus, are Endowment lands that are not likely to be developed in the short-term due to wetlands, poorer soils, topography, and the lack of access and utilities. The current Long-Range Transportation Plan for Anchorage proposed a new access to the U-Med District from Northern Lights Boulevard to Elmore Road. Construction of this access could result in some of the northern Endowment lands becoming more accessible for development. If these lands are developed, site planning would be designed to carefully integrate existing natural features and trails. As mentioned previously, the private trails on APU are not located in trail easements and can be relocated as appropriate, as development occurs on campus. These lands should be considered similar to the Mixed Use/ Commercial land use category in the U-Med District Plan and used to support a compact mix of uses that supports the needs of the institutions and the public. Designation as endowment land is not intended to preclude the ability for these lands to be used for academic uses, supporting residential uses, or accessory uses including snow disposal or other administrative support infrastructure.

RECREATION/OPEN SPACE

This area is proposed to remain mostly undeveloped and in a natural state due to topographic challenges, a desire to maintain a buffer between land uses, and to retain the opportunity for a permanent trail system around and through the campus. While the existing campus trails are not in trail easements (other than the Chester Creek Trail along the eastern boundary of the campus), trail connectivity will be maintained to the greatest extent when campus lands are developed. The buffer area along the eastern boundary of campus will be at least 65 feet in width from the property line, measured 25 feet from the west edge of pavement of the existing Chester Creek Trail. Limited development of the greenbelt areas may be necessary, particularly for trails, recreational uses, vehicle access, and utility extensions. This designation also allows for existing and future athletic and recreation uses for APU students and, to some extent, the broader community. For example, the Russ Olds soccer field's proximity to University Lake and its southern exposure make it a desirable recreation space and a useful buffer area between the park and the developed areas of the campus. The fields already located here are used by APU and local sports teams on a permit basis.

ACCESSORY USES

Accessory uses, including maintenance facilities and snow storage, may be located within any of the land use districts on campus. Accessory uses include any and all operations, activities, and uses needed to maintain and operate the university.

PROVIDENCE ANCHORAGE MEDICAL CENTER (PAMC)

The Providence Anchorage Medical Center (PAMC) is currently completing its "Generations Project" at the Medical Center, which will modernize and expand the current campus. The project includes renovation and expansion of the Newborn Intensive Care Unit (NICU) and cardiac surgery program, expansion of the Maternity Center, and remodeling of the surgical services area. Costs for the project are expected to be about $150.3 million and the project is slated for completion by January 2014.

UNIVERSITY OF ALASKA ANCHORAGE (UAA)

The University of Alaska Anchorage (UAA) recently updated its Master Plan to guide capital projects on campus and establish development expectations for stakeholders, the University, and the community. The 2013 Campus Master Plan identifies several long-range development goals, which include development of additional student housing units, strengthening the campus core by increasing student life facilities, and improving pedestrian, vehicular, and mass transit circulation and safety. It was approved by the University of Alaska Board of Regents on September 27, 2013.

3.1 :: ZONE OVERVIEW

This revision to the Master Plan has been developed utilizing a network of campus zones, each with a distinctive identity and role in support of UAA's mission, both academic and strategic. The zones provide a framework and guideline to allow each zone to evolve and develop distinct characteristics while still maintaining a holistic campuswide vision. This section of the Master Plan identifies the intent, opportunities, and key elements of the campus zones and their application as a tool to guide future development.

The outlined zones establish the baseline criteria, with the goal of enabling long range visioning and coordination across current and future projects to improve operational effectiveness. They are integral to any planning, design, and construction process at UAA. To ensure this campuswide approach is integrated, a detailed process including zone analysis, infrastructure integration, and design guidelines are outlined in Section 4 - Implementation of the Master Plan.

LEGEND:

- Community Interface Zone
- West Academic Zone
- Campus Core Zone
- Engineering Zone
- Transitional Zone
- Health Zone
- East Academic Zone
- Recreation Zone
- Student Housing Zone

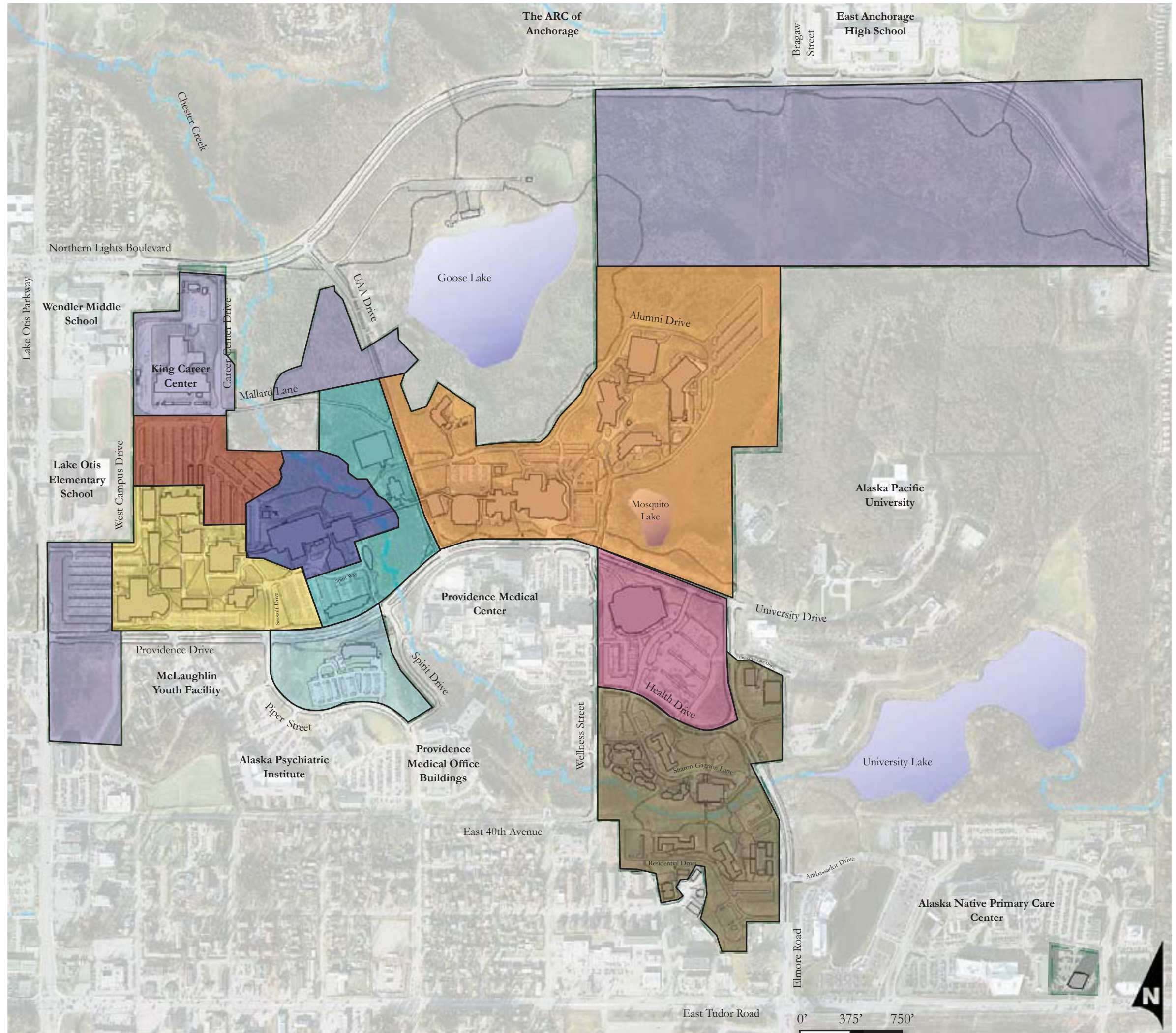


Figure 16. University of Alaska Anchorage 2013 Thematic Development Map

The University plans to develop science and medical research facilities that foster collaboration with Providence Medical Center, and to increase development in zones in which students and the community may interact. The UAA would like to increase the density of the campus through construction of new, mid-rise development in the West Academic Zone. A new Ice Arena and Recreational Facility is also slated for development. Optimal locations will be identified based on the Master Plan's Zone and Site Selection process. One option includes the corner of Providence Drive and Elmore Road; others are adjacent to the new Alaska Airlines Sports Center development or just south of East High School. The 2013 Master Plan supports the concept of a mixed-use development.

The UAA is currently constructing the new Alaska Airlines Sports Center at the corner of Providence Drive and Elmore Road. Projected for completion in August 2014, the facility will provide a competitive arena for the basketball, volleyball, and gymnastics teams as well as training facilities for all the school's athletic programs. The sports center is also expected to be a venue for high school and college events. The UAA and PAMC have a parking agreement in place to meet parking needs to accomodate maximum attendance at events in the new Alaska Airlines Center.

The UAA 2013 Master Plan includes a plan and design guidelines for development within the thematic zones of the campus. The purpose of the thematic development map below is to organize facilities within the campus by use. Definitions of the themes identified in the map, excerpted from the September 2013 UAA Master Plan, follow the figure on the following page.

COMMUNITY INTERFACE ZONE

The surrounding landscape and adjacencies to the Anchorage community allow for development that focuses on bringing UAA and community partners together for educational partnerships and public service. This zone becomes a visible bridge between academics and the community. Key characteristics and design elements include community access and services, collaboration, and recreation.

WEST ACADEMIC ZONE

Development in this zone should support academic foundations for the entire UAA community with a focus on advanced technical and occupational skills, and professional development in the business, public policy, education, and vocational fields. New and replacement facilities should increase density and height while retaining the traditional quad characteristic of the zone.

CAMPUS CORE ZONE

This zone serves as the heart of UAA. It is a place of gathering and the primary interface between academics, student life and the visitors. In addition to this core zone, student amenities are dispersed throughout UAA to develop an integrated and cohesive student life experience.

ENGINEERING ZONE

The common goal of this zone is to inspire learning and research through the discipline of engineering, and to spark research collaboration with adjacent Health and East Campus zones. Key zone characteristics are a collaborative, multidisciplinary approach to education, research, professional development, and community partnerships.

TRANSITIONAL ZONE

The key characteristic of this zone is a place in transition. The long-term vision is a bridge between the community through technical and applied academics.

HEALTH ZONE

The common goal of this zone is to inspire learning through the disciplines of health and social welfare. It has direct adjacency to the surrounding medical community and key zone characteristics are a collaborative, multidisciplinary approach to education, research, service, and community partnerships.

EAST ACADEMIC ZONE

Development in this zone should center primarily on education in the liberal arts and sciences as well as academic institutions for the entire UAA community.

RECREATION ZONE

The vision of the recreation zone is the promotion of the health and welfare for UAA and the surrounding community.

STUDENT HOUSING ZONE

Development in this zone should focus on housing and mixed-use facilities with the intent of creating a strong sense of place for all resident UAA students. The UAA currently has capacity to house 1,000 students and seeks to double housing from 1,000 to 2,000 beds in the next ten years.

UAA/APU CONSORTIUM LIBRARY

The recently adopted UAA Master Plan update lists mechanical upgrades at the Consortium Library as part of its Capital Improvement Plan.

6. NATURAL RESOURCES

NATURAL RESOURCES

As with much of the Anchorage metropolitan area, the topography of the UMED District is that of a glacial plain generally less than 400 feet in elevation with very low topographic relief. Two hills within the district are notable topographic features. APU Hill rises 100' above the surrounding landscape, while a lower hill, located on Trust Land south of McLaughlin Youth Center, is 60' above the average elevation of the area. The Chugach Mountains that rim the Anchorage Bowl to the east are visible from many locations in the UMED District, particularly from upper floors of larger buildings and from the main roadways.

The area's surficial geology is described in the Goose Lake Land Use Plan of 1983. Three general soil types were identified: are coarse-grained surficial deposits, mixed coarse and fine-grained surficial deposits, and fine-grained surficial deposits. Areas characterized by coarse-grained surficial deposits, and mixed course and fine-grained surficial deposits, are where most urban development has occurred in the UMED District.

Fine-grained surficial deposits usually describe wetlands, due to the poor drainage and percolation. Most of the area within this soil classification remains unbuilt owed to challenging soil conditions and a desire to protect wetlands. As available land with better soil conditions is developed, additional pressure may be placed on areas with poorer soils for conversion to urban land uses.

The UMED District is in the Chester Creek watershed, which originates 10 miles to the east in the Chugach Mountains and flows into the Knik Arm of Cook Inlet at Westchester Lagoon. The South Fork of Chester Creek runs through the center of the UAA and PAMC campuses. It flows east through University Lake and through the eastern neighborhoods. The creek provides a green space trail and wildlife corridor extending from the Knik Arm to the UMED District and continues northeast to the mountains.

Chester Creek has extensive and regular flooding problems. Development along the stream course can alter hydrology through reduction of pervious and ponding areas. This tends to accelerate runoff and contribute to flooding. A Chester Creek Stream Conditional Evaluation in 2001 revealed that sedimentation, channelization, bank damage, loss of riparian areas, and a disconnection between the stream and riparian areas degrades the water quality in Chester Creek. The MOA requires a minimum 25-foot development setback along with drainage protection easement along the stream and its tributaries when possible.

The district contains five lakes: three artificial (University Lake, Boniface Lake, and the unnamed pond near ANTHC) and two natural (Goose Lake and Mosquito Lake: both are kettle ponds). Goose Lake and University Lake are located on MOA parklands. Mosquito Lake is on UAA property northeast of the intersection of Alumni and Providence Drives. An unnamed pond owned by the Tudor Centre Trust is located on ANTHC property west of Alaska Native Medical Center; this former gravel pit that was filled with water is visible from Tudor Road and is a focal water feature on the medical center campus. The fifth lake, Reflection Lake, is located in a predominantly residential neighborhood northeast of the intersection of Boniface Parkway and Tudor Road. This lake is connected to the south fork of Chester Creek and is privately owned.

Chester Creek has been identified as an anadromous stream for coho salmon. Dolly Varden char is also present in the creek, primarily above the UAA campus. Urbanization and land uses along the stream can have a detrimental impact on the health of the fish. The Alaska Department of Environmental Conservation (DEC) has listed the stream and University Lake as impaired water. High levels of fecal bacteria (E. coli) have been observed in both Chester Creek and University Lake. The DEC has identified the source of pathogens as urban runoff and industrial pollutants. E. coli contamination in humans commonly results from untreated or partially treated effluent finding its way into a stream. Testing for the presence of other markers (such as caffeine) can help to better isolate pathogen sources, and is proposed with the UMED District Plan update.

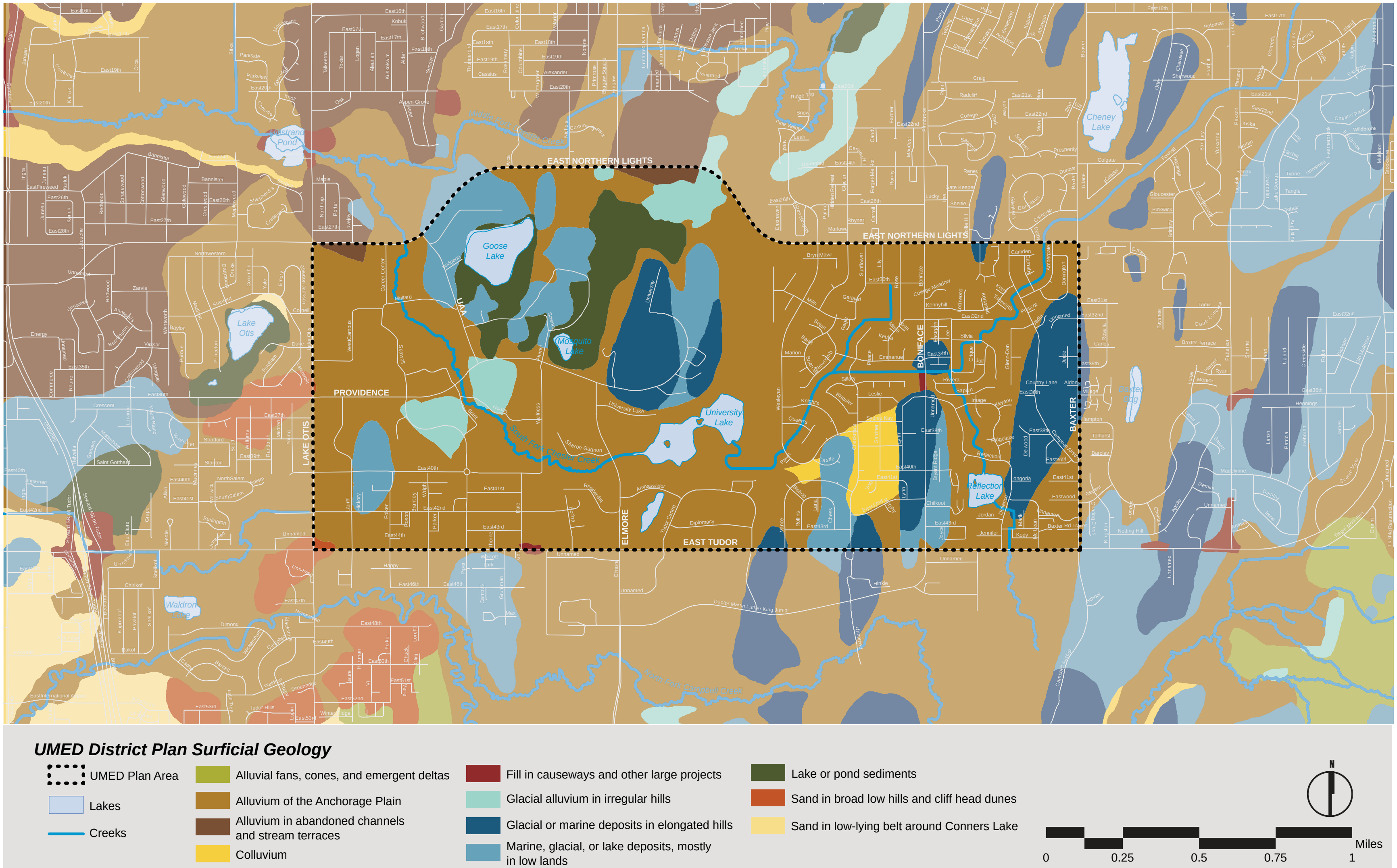


Figure 17. Surficial Geology Map

ANCHORAGE WETLANDS MANAGEMENT PLAN

Anchorage is one of the first communities in the nation to create a wetlands management plan, the Anchorage Wetlands Management Plan was initiated in 1982 per Alaska Statutes ACC 11.114, which also directed completion of the Anchorage Coastal Management Program (ACMP) to address freshwater wetlands that have an influence on coastal resources. Although a sunset clause terminated participation in the ACMP on June 30, 2011, the MOA Long Range Planning section of the Community Development Department is tasked with an update to the Anchorage Wetlands Management Plan (AWMP). In March 2012, a draft of the AWMP was presented to the community at a public hearing. On April 8, 2013, the Planning and Zoning Commission (PZC) recommended approval of the plan to the Anchorage Assembly. Pending approval from the Anchorage Assembly, the plan will be adopted in 2014.

Three wetlands classifications, A, B, and C, have been identified within the district. "A" wetlands have the highest resource value and are not to be altered or disturbed except for actions that can enhance or restore a site's functions and values. Roadways, trails, utilities, and demonstrated park needs may be allowed in these wetlands if no practical, less-damaging alternative exists and if values and functions are maintained to the maximum extent. "B" wetlands typically have a mixture of higher and lower values and functions. They possess some significant resources but could possibly be developed. "C" wetlands are the lowest value wetlands, generally exhibiting reduced or minimal functions and/or ecological values. Development of "C" wetlands is considered to have minimal cumulative impact.

Large portions of wetlands are located on UAA property in the vicinity of the South Fork of Chester Creek in the core campus area and east of Elmore Road adjacent to student housing and extending from Mosquito Lake to Northern Lights Boulevard. The MOA has wetlands holdings around Goose Lake. APU has wetlands at the northeast corner of its lands, and PAMC owns a portion of the wetlands along the South Fork of Chester Creek. Wetlands located along the creek are predominately classified as "A" due to their high cumulative values and presence of anadromous fish. Wetlands adjacent to Mosquito and Goose Lakes are similarly classified as "A" due to high values for habitat and to water quality. An area linking both lakes is classified as both "B" and "C" wetlands. The U.S. Army Corps of Engineers (USACE) is responsible for processing fill applications of Class "A" and "B" wetlands. Wetlands delineation is required for each instance, and applicants are required to secure permits under section 404 of the Federal Clean Water Act following delineation. The USACE has delegated its permitting authority under a General Permit to the MOA for Class "C" wetlands. Unauthorized fill of wetlands is a violation of federal statutes. Wetland management best practices are outlined in Appendix B.

CHESTER CREEK WATERSHED PLAN

UMED is located within portions of the South and Middle Fork watersheds of Chester Creek. According to the draft Watershed Plan, urbanization has substantially altered large portions of the watershed, but it continues to provide recreational opportunities and animal habitat in Anchorage.

Chester Creek is listed on the Alaska Section 303(d) List of Impaired Waterbodies. In 2001, Section 206 of the Water Resources Development Act (WRDA) authorized funding to address water quality concerns in Chester Creek. The Municipality of Anchorage and the U.S. Army Corps of Engineers cooperated to identify priority projects for restoring the habitat and water quality in Chester Creek. The draft watershed plan was a follow up action to this effort; the first draft was initiated in 2003 and included substantial public involvement. A public review draft was published in 2005, but has not been formally adopted by the city of Anchorage. Findings included:

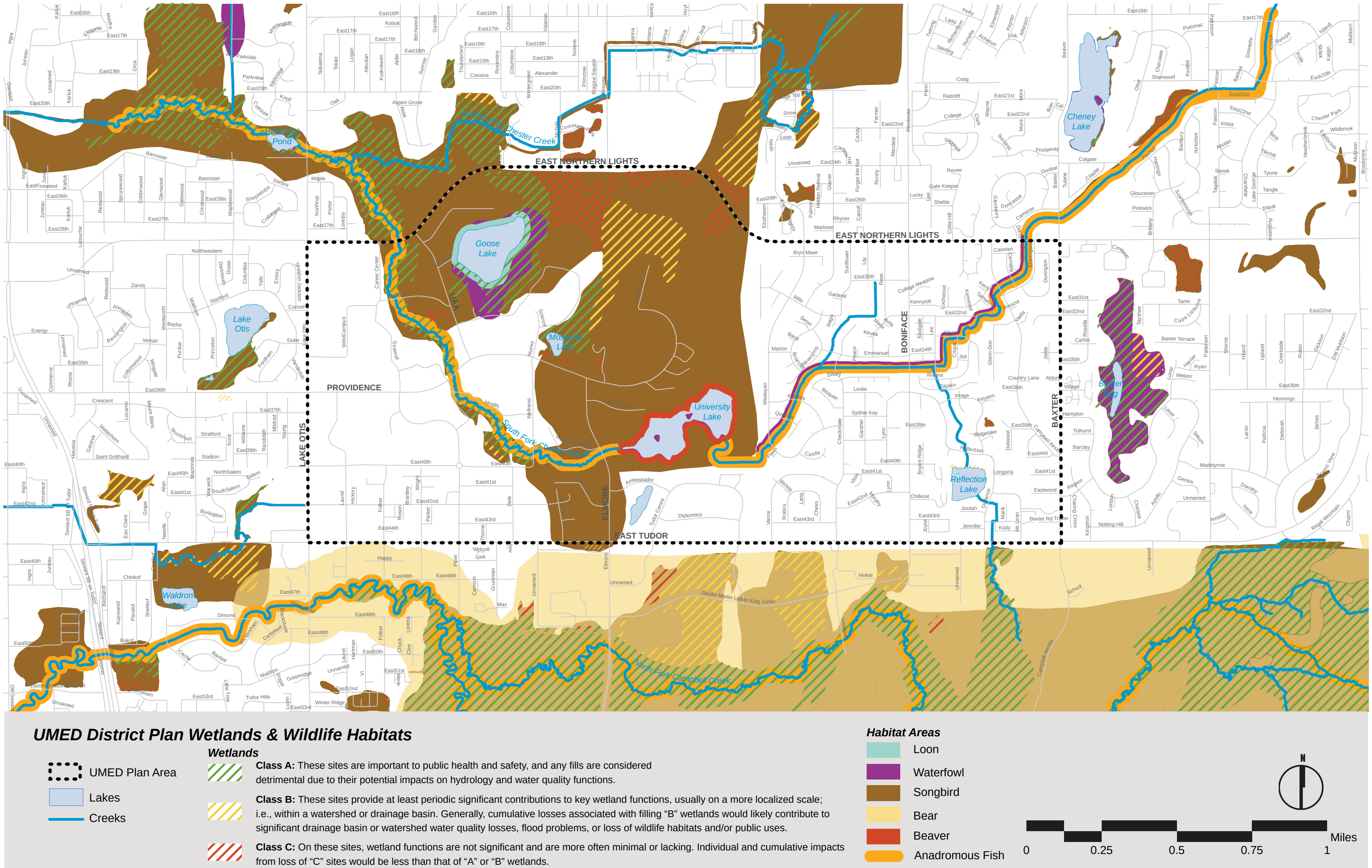


Figure 18. Wetland Designations and Habitats

- Urban pollutant runoff into the creek has resulted in unreliable water quality. A lot of chloride and sodium are transported through the Chester Creek basin. Sources for these chemicals include street de-icers used in the winter for street and private driveway maintenance. In addition, trace metals and increased conductivity may be limiting sensitive populations of invertebrates in the downstream portions of the creek. Iron levels have also been high in past studies.
- Channelization, reductions in riparian habitat, increases in impervious surfaces, high flows, and street maintenance activities within the Chester Creek Watershed have increased the amount of sediment entering the creek. Sediment discharges in the urbanized portion of Chester Creek have been estimated to be two to three times higher than in the undeveloped upstream portion of the creek.
- University Lake feeds into the Chester Creek Watershed.

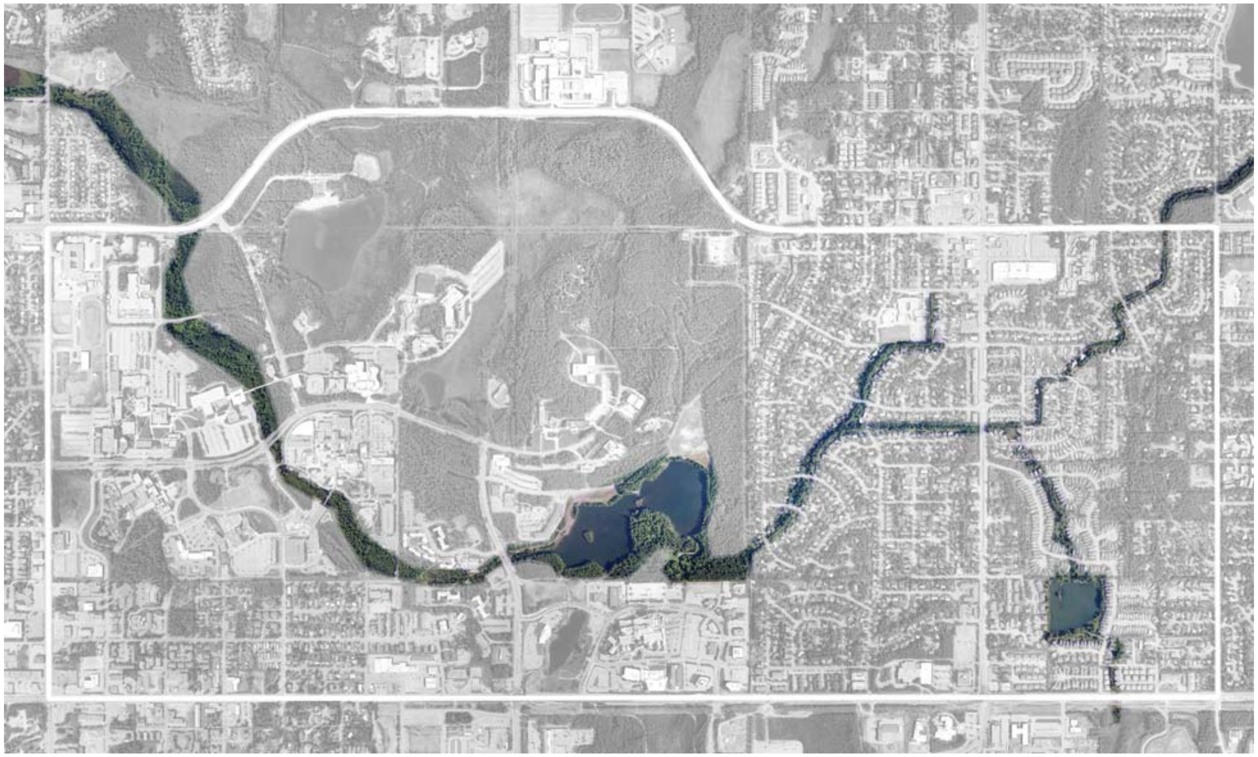


Figure 18b. South Fork of Chester Creek in the UMED District

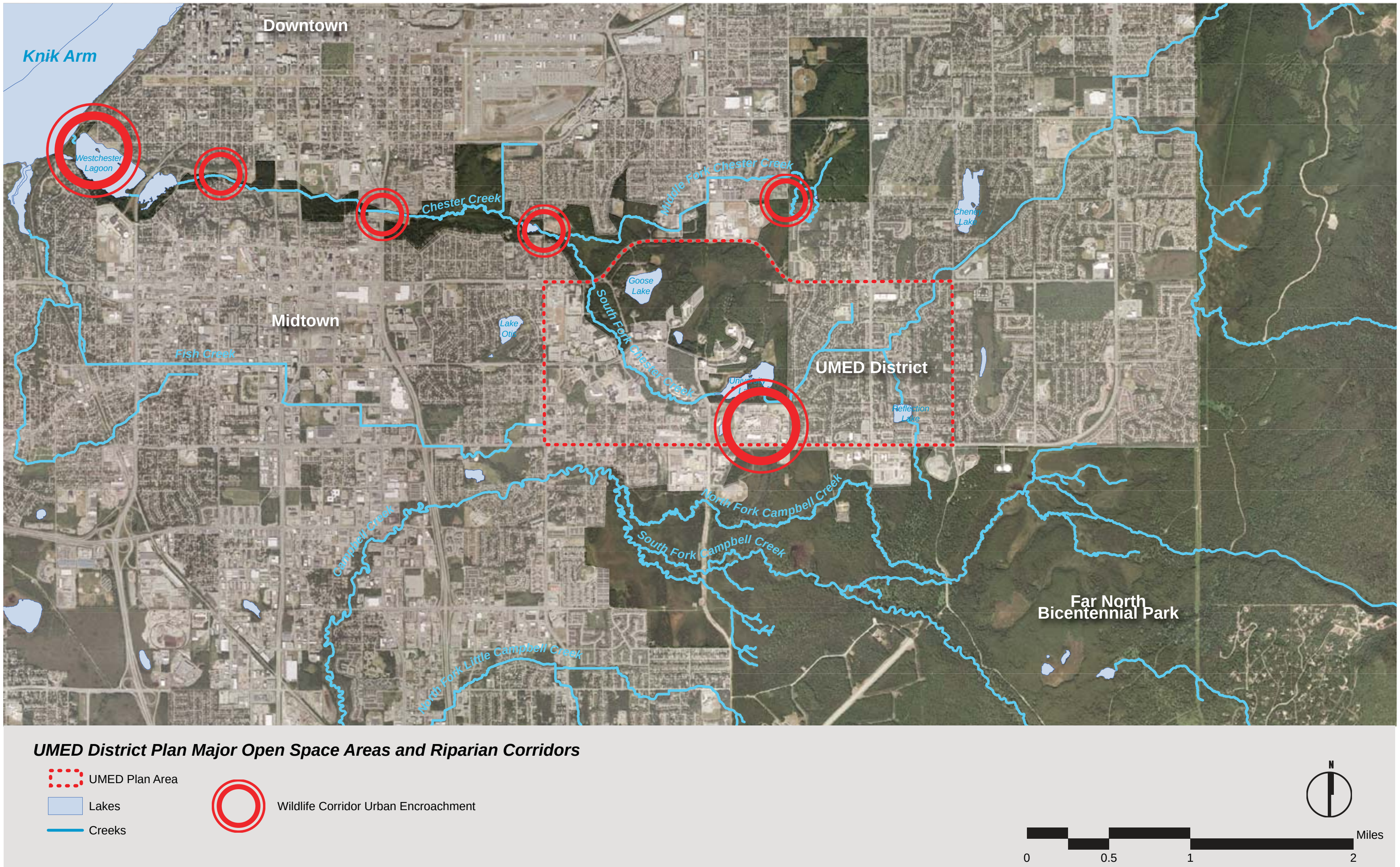


Figure 19. Pinch Points

PRINCIPAL FLORA & FAUNA

Virtually all of the unbuilt land in the UMED District is either wooded or wetlands. In 1990, nine areas were shown to have 50- to 100-year-old stands of trees. Some of these have been developed since, including the new Alaska Airlines Sports Center at Providence Drive and Elmore Road. Currently, 50- to 100-year-old stands of trees exist in seven areas; the native trees are primarily spruce and birch.

The landscape character in the UMED District is either natural or designed (meaning introduced, actively maintained landscaping). Undeveloped areas are composed of woodlands and wetlands. The district has both formal (introduced) and native landscapes, depending on adjacent development or circulation. Formal introduced landscapes define most building entries along roadways and the space between buildings as the natural landscapes are removed for development.

WILDLIFE

The district's wetlands and wooded areas host a variety of wildlife. Moose are present year round, especially in the broad wetland areas northeast of Goose and Mosquito Lakes. During the calving season, people can pose a threat to moose, when they find themselves too close to the calves. The Chester Creek riparian corridor provides for movement of moose and other wildlife species such as fox, coyote, and black bear. There are resident beavers found at University Lake.

The lakes provide valuable habitat for birdlife. Goose Lake serves as a nesting area for loons; an area around Mosquito Lake serves as a nesting area for Northern goshawks and great horned owls. Geese and a variety of shorebirds nest on University Lake islands that also host a year-round beaver population. Other birds that nest in the UMED District lakes include merlins and hawk owls.

In the district, there are no developed wildlife corridors under or over major arterial roadways. Wildlife crossings at Northern Lights Boulevard from Russian Jack Springs Park and the lower Chester Creek Greenbelt result in some risk to animals and motorists. Movement to and from the Campbell Creek watershed requires crossing Tudor Road and developed lands along Martin Luther King Boulevard. Similar migration probably occurs east and west through the College Gate Neighborhood and across Lake Otis Road into the Tudor and Rogers Park neighborhoods.

OPPORTUNITIES AND CHALLENGES

FOR THE NATURAL RESOURCES IN THE UMED DISTRICT:

- Loss of wildlife habitat
- Facilitating wildlife movement
- Human-wildlife interaction (vehicle collisions, human safety issues, off-leash or uncontrolled dogs)
- Seasonal restrictions on land use during the nesting season for songbirds, raptors, and other migratory birds
- Water quality in Chester Creek, University Lake, and Goose Lake
- The proposed UMED District northern access road
- Provision of safe wildlife crossings on major arterials
- Public outreach and education

7. RECREATION & OPEN SPACE

RECREATION & OPEN SPACE

Anchorage is a classic winter city with winter conditions for six months of the year. This offers significant opportunities and impacts to the use and character of parks and open space. Winter recreational activities range widely: Nordic skiing, dog sled mushing and ice-skating are supported by the climate and parkland amenities. Facilities for traditional outdoor team sports such as soccer, baseball, rugby or football are inaccessible for half of the year and require recovery time following the spring thaw. Conversely lakes, bogs and wetland areas are available for winter recreation.

Anchorage residents and visitors have access to a remarkable variety of parks, trails and open space. In 2006 over 10,000 acres of municipal park land, and over 250 miles of trails and greenbelts connect neighborhoods, schools, parks, natural resource use areas and wildlife habitats. The city is surrounded by the 781 square mile Chugach State Park and the 50 square mile Anchorage Coastal Wildlife Refuge. The extent and variety of these resources are what makes Anchorage a special place to live and a true outdoor city. They contribute to an exceptional outdoor-oriented quality of life.

PARK PLAN

The MOA adopted the Anchorage Bowl Park, Natural Resource and Recreation Facility Plan (commonly known as "The Park Plan") in April of 2006. Its stated purpose says: "To provide a model for applying a systematic approach to the planning of parks, recreation and natural use areas." Consequently, the Park Plan "focuses on the basic need of parks within the Anchorage Bowl, to provide for and reserve space for a range of leisure activities, and to retain a dimension of the natural environment as part of the overall design of the community." The Park Plan was guided, in part, by the Anchorage 2020 Comprehensive Plan. The UMED District shares the Anchorage parkland legacy with an additional unique characteristic: institutional lands that are perceived by many as part of the public park inventory. UAA and APU natural areas are not distinguishable from Goose Lake and University Lake municipal parks and are easily accessed from the Chester Creek and Campbell Creek Trail systems. Users cannot easily discern boundaries between private and public cross-country ski trails, which are maintained on APU and UAA lands, as well as municipal parklands.

While Anchorage has a respectable 52.90 acres of parkland per 1,000 residents, there are deficiencies of certain parks and facility types. Some areas lack access to neighborhood parks and there is unmet need for a variety of recreational facilities. The UMED neighborhoods, including residences south of 40th Avenue, College Heights and the one half section of University Park east of Boniface Parkway, have a deficiency of neighborhood parks and enjoy the use of APU and UAA lands. The Park Plan assessed park needs using a Park Classification System and Levels of Service (LOS) Model, which are described below.

PARK PLAN CLASSIFICATION SYSTEM

The Park Plan uses a classification system to identify park facility and natural resource area types:

- NEIGHBORHOOD USE (NU) AREAS: These are close-to-home recreation areas that serve one neighborhood as a focal point for residents and include areas for informal play and family and community building.
- COMMUNITY USE (CU) AREAS: Community parks are larger in size and serve a broader purpose than neighborhood parks. The focus is on meeting the recreational needs of several neighborhoods or a large section of the community.
- SPECIAL USE (SU) AREAS: This classification covers a broad range of parks and recreation facilities that provide a single specialized use such as an equestrian center, a golf course, a sports park, an indoor recreation center, or a botanical garden. Special uses generally

fall into three categories: Outdoor Recreation Facilities, Historic/Cultural/Social Sites, and Indoor Recreation Facilities

- NATURAL RESOURCE USE AREAS: These areas are lands set aside for preservation of significant natural resources, remnant landscapes, natural or wildlife habitats, open space, and visual aesthetics and buffering. Natural Resource Use areas are divided into three categories: Preservation, Conservation, and Reserve for future use.
- TRAILS AND CONNECTORS: These provide non-motorized links between residential areas, employment, services, parks and schools. This classification consists of trails, greenbelts, and linear parks and includes a mix of hard and soft surface trails. Maintenance of these areas is dependent on the type of trail and design standard. Trails and connector administration is implemented through Anchorage's Areawide Trails Plan

Levels of Service Model standards for parks were developed by the National Recreation and Park Association and adopted by the MOA in the 1980s. Typically, LOS are expressed in number of acres of park type per 1,000 residents, or in number of facilities for 10,000 residents. According to the Park Plan, the application of LOS standards does not carry municipal regulatory status. Rather, the standards should be considered dynamic guidelines to be used as a starting point to help the MOA determine a fair and equitable distribution of facilities throughout the community.

SUB PARK DISTRICTS

The Park Plan divides Anchorage into five park districts. These districts have different characteristics, population densities, and development patterns, and, as a result, have widely varying access to recreational opportunities.

NORTHEAST PARK DISTRICT

The UMED District is located in the geographic center of the Northeast District. With approximately 70,000 people, the Northeast Park District has the greatest population of all five districts. The district has 2,578 acres of parkland, the largest concentration in the MOA, and includes 30 athletic fields, 25 playgrounds, and 13 picnic shelters. Parks and natural areas located adjacent to the UMED District include:

- Tikishla Park, northwest of Northern Lights Boulevard near Goose Lake Park
- Russian Jack Springs Park, approximately one half mile north of Northern Lights Boulevard and linked to UMED by a multiuse paved path and wetlands complex
- Chester Valley Park, northeast from the intersection of Baxter Road and Northern Lights Boulevard

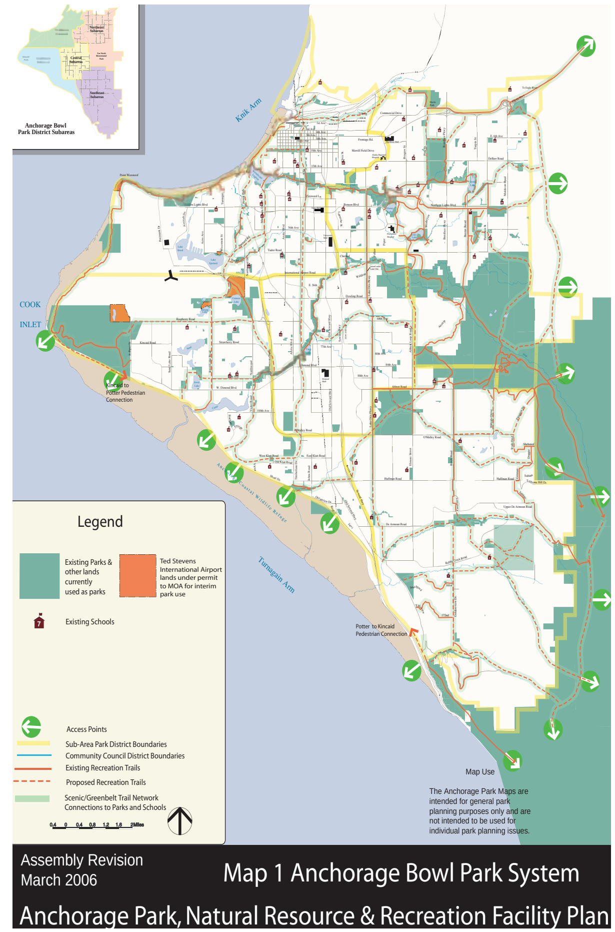


Figure 20. Anchorage Bowl Park Districts Map

- Baxter Bog Park, approximately one eighth mile east of Baxter Road
- Waldron Lake, southwest of Tudor Road and Lake Otis Parkway with open playing fields that are used by the Boys and Girls Clubs
- Campbell Park, the Chuck Albrecht Sports Complex, and Far North Bicentennial parks, approximately one half mile south of Tudor Road near the intersection of Dr. Martin Luther King Jr. Avenue and Elmore Road

Both Campbell and Far North Bicentennial parks are linked to the UMED District by a paved multiuse trail that connects to University Lake over Tudor Road and through the ANMC. Far North Bicentennial Park is the largest park in the MOA; much of the park is undeveloped.

According to the Park Plan, the Northeast Park District has deficiencies in various aspects of the park system and will have a shortage of Neighborhood Use (NU) and Community Use (CU) areas by 2020. Based on the projected population growth for the next 20 years, the district will require eight to ten new NU parks (each between 5 and 10 acres in size), and one to two CU parks. Specifically, Neighborhood Use parks are needed in the vicinity of University Park, Scenic Foothills, Russian Jack Park, Northeast, and Tudor. Community Use parks are needed near Muldoon and DeBarr, and University.

MOA PARKS WITHIN THE UMED DISTRICT

Key parks within the UMED District include Goose Lake and University Lake, which are managed by the MOA. The MOA is also responsible for Castle Heights Park, Folker Park, and portions of the South Fork Chester Creek wetlands.

GOOSE LAKE PARK

Goose Lake Park is located on the east side of UAA Drive and north of the UAA Campus. The 57.81 acre park opened in 1988 and functions primarily as a Community Use (CU) and Special Use (SU) park. Apart from a small residential development along Widgeon Lane, the closest residential neighborhoods are approximately one half mile or more away. The park includes Goose Lake, wetlands, and wooded areas.

Goose Lake, with its bathhouse and concessions building, is the dominant feature of the park. The beach is heavily used in summer and staffed with lifeguards. The bathhouse changing rooms are described as unpleasant by Parks and Recreation staff and are in need of remodeling or replacement. In past winters, the lake has been cleared of snow for ice skating; however, this practice was discontinued in the winter of 2012-2013. In addition to the recreational activities provided by the lake, an approximately 10-acre flexible play field with a covered picnic area is located near the northeast end of the lake. The field sees significant use in the summer but is underutilized and could be programmed to achieve wider use. There are one basketball court and a playground with equipment designed to serve children ages 5 to 12.

Figure 21a. Bike trail in the UMED District

Figure 21b. Swimming in Goose Lake

Special programs at Goose Lake include "The Lunch Box," a non-profit organization that provides free lunches to children when the beach is open, and a Polar Plunge event, held annually to raise funds for the Special Olympics Alaska.

The Park and Recreation 2008 park user report card identified a need for general maintenance improvements and upgrades such as a new bathhouse, repair of the parking lot and basketball court, and other maintenance tasks. Most improvements are near the end of their useful life. Park and Recreation staff describe the park as a jewel in the Anchorage park system but greatly in need of an overhaul and update. Vehicular access to the park is constrained due to the entrance drive's proximity to the intersection of UAA and Northern Lights Boulevard; however, according to Parks and Recreation staff, parking is adequate for most events.

UNIVERSITY LAKE PARK

The 64-acre University Lake Park is located north of the ANMC and directly adjacent to the College Park Neighborhood. Formerly called Behm Lake, University Lake is an artificial water feature formed from the aggregate pit used to construct the APU and ANMC campuses. Chester Creek was rerouted through the lake following the closure of gravel mining operations, and APU sold the property to the MOA. The park serves as a major trailhead for the MOA multiuse trail system. Elmore Road and University Lake Drive provide vehicular access to the park. Improvements are limited to a small parking lot at Elmore Road and earth or gravel surfaced trails. The multiuse Chester/Campbell Creek Link runs along the eastern and southern edges of the park. Its proximity to ANMC, the College Park Neighborhood, UAA student housing, APU, and the Marriot SpringHill Suites, Anchorage University Lake make University Lake a popular Neighborhood Use (NU) facility for walkers, joggers, and cyclists.

A portion of University Lake is one of five designated off-leash dog parks in Anchorage established in 2005. Adjacent UMED organizations complain of frequent conflicts with off-leash dog park users. Water quality in the lake is a possible concern. The source of its contamination is under study. Cleaning up of dog droppings is a constant issue. Anchorage Unleashed, a dog owner advocacy group, and the Anchorage Waterways Council Scoop the Poop committee have worked together to clean up pet waste in the park. The MOA constructed a fence adjacent to the APU soccer field to prevent dogs from accessing the field from the lakeshore trail.

According to Park and Recreation staff, improvements are needed so that University Lake Park can better serve the UMED District. Currently, vehicular access is inadequate,

Figure 22a. Image of Off-Leash Dog Area Sign

Figure 22b. Image of University Lake

and additional parking is needed both to meet MOA requirements and to serve a growing population of recreational users.

CASTLE HEIGHTS PARK

Castle Heights, a small 1.38-acre Neighborhood Use (NU) park, is located in the southeastern part of the College Park neighborhood. It was established in 1981 from six undeveloped residential lots and includes a playground with equipment for children from 2 to 12 years of age, and an open play field. It provides College Park Neighborhood a gateway trail link to University Lake Park and the Chester/Campbell Creek multiuse trail system to the west. All parking is accommodated on streets adjacent to the park. No changes or improvements are anticipated other than periodic maintenance of the park.

FOLKER PARK

This 2-acre Neighborhood Use (NU) area is a wooded area with trails and benches located at the northeast corner of 42nd Avenue and Folker Street. Parking is on the street. This passive-use park serves adjacent employment and residential areas. Other than periodic maintenance, no additional improvements are anticipated.

ANCHORAGE PEDESTRIAN PLAN

The Areawide Trails Plan (ATP), published in 1978 and revised in 1997, has guided pedestrian, bicycle, and multipurpose trail use within Anchorage for over 20 years. The MOA, however, has begun efforts to update the ATP with a new, Non-motorized Transportation Plan (NTP). In 2007, the MOA Traffic Department published *Anchorage Pedestrian Plan: Making Anchorage a Better, Safer Place to Walk* (Pedestrian Plan) in support of the new NTP. The purpose of the Pedestrian Plan is to “establish a framework for the next twenty years for improvements that will enhance the pedestrian environment and increase opportunities to choose walking as a mode of transportation.” The excerpted section below addressed pedestrian facilities within the UMED District:

> This community council area is comprised of approximately 50% of institutional campus area, the UMed area, which includes UAA, APU, Providence Hospital and Alaska Native Medical Center, and McLaughlin Youth Center, the other half is residential neighborhoods both single and multifamily. The UMed area features sidewalks along the main roads as well as several recreational trail systems including the Chester Creek Trail and ski trails in the APU campus area. There are several distinct residential neighborhoods none of which include sidewalks. These include the Collegegate/College Heights/Castle Heights neighborhood, Chester Terrace, Eastlake and Eastwood Terrace Subdivisions. The neighborhood north and east of Lake Otis and Tudor Road is also emerging as a neighborhood that would benefit from improvements such as pedestrian facilities.

The UMED District serves as an important focal point for the multiuse trail connections between the Campbell Creek and Chester Creek watersheds. Trails are also discussed in Chapter 9: Transportation and Circulation.

AREAWIDE TRAILS PLAN

Although dated, the 1997 Areawide Trails Plan contains data relevant to the use of trails. Trails within the UMED District include the Chester Creek Trail and the Chester/Campbell Creek Trail Link; trails along arterial and collector level street rights-of-way; and trails within University Lake and Goose Lake Parks.

The MOA Department of Public Works Maintenance and Operations maintains sections of trails within the UMED that are located within the public right-of-way. This includes trail sections that are separated from the street by the natural landscape, designed landscape, hardscape, and street furniture such as benches and bus shelters. The most frequently used public right-of-way trail sections are typically paved with asphaltic concrete and are located along roadways.

Winter clearing and grooming is particularly important to promote mobility, use of public transportation, and use by winter sport user groups. Maintenance and Operations removes snow from streets, sidewalks, and trails within the public right-of-way, typically by plowing snow from the outside edge of the roadway to snow storage zones beyond the curb. These zones are required to be a minimum of 7 feet in width. The majority of sidewalks and trails fall outside the snow storage zone.

One common concern is the presence of landscaping, utility pedestals, and street furniture in the snow storage area. These features are easily damaged by snow removal equipment and make the task more difficult. The weight of the snow and length of time between thaws is tough on plant material. Raised planters in the snow storage zone have proven more successful but are a maintenance challenge.

The MOA Department of Parks and Recreation manages trails located in parks, greenbelts, and natural areas within the UMED. Seasonal cross-country ski trails are groomed by nongovernmental entities such the Nordic Ski Association of Anchorage.

The 2006 Park Plan provides the following recommendations regarding the UMED District:

- Upgrade Existing NU Park facilities:
  - University Lake Park: Improve off-leash area, develop play area, picnic area, athletic fields, and parking
  - Goose Lake Park: Provide upgrades to picnic area, playground, and athletic field
- School Park Partnership:
  - Baxter Elementary School: Develop school-park joint facilities
  - Expand and develop recreation facilities
  - East High School: Upgrade swimming pool
- Protect and Improve Natural Resources:
  - Chester Creek: The water quality should be monitored and drainages into the area should be acquired and protected

8. COMMERCIAL, HOUSING, & MARKET CONDITIONS

COMMERCIAL, HOUSING, & MARKET CONDITIONS

This chapter presents an overview of the commercial and residential real estate markets in the UMED District. The goals of this analysis are to assess the district's strengths and challenges in attracting new development, identify the kinds of development that the district is most likely to attract, and determine the likely phasing of market demand in the short, medium, and long term. These market findings will help to inform the development of Vision, Goals, and Objectives in the next phase of the UMED District Plan Update. Given the largely institutional nature of the core of the district, it is important to note that much development in the UMED District will be driven by institutional needs rather than by market forces alone.

METHODS

In order to understand the factors that influence future development potential in the UMED District, Strategic Economics analyzed demographic and employment data for the Plan Area and for Anchorage as a whole. Strategic Economics then evaluated the existing supply of office, housing, and retail development in the district, and compared district market performance indicators with the broader Anchorage metro area. A site visit and series of interviews with stakeholders and local real estate professionals further refined Strategic Economics' understanding of market demand and development feasibility.

ORGANIZATION OF CHAPTER

This chapter contains the following sections:

- The Key Findings section synthesizes the major insights to emerge from this analysis.
- The Demographics and Employment section provides an overview of household and employment characteristics that define the UMED District's role within the Municipality of Anchorage
- The Challenges to Development section provides an overview of factors that impact development feasibility in Anchorage and in the UMED District.
- The Office Market Analysis describes the existing office supply and current office market conditions in the UMED District.
- The Residential Market Analysis provides an overview of the existing housing stock, followed by an examination of current housing market conditions, and a discussion of demand for new housing in the UMED District. This analysis focuses on attached (townhouse) and multifamily housing.
- The Retail Market Analysis describes the existing retail supply in the UMED District, evaluates current retail market conditions, and discusses the potential for new retail development in the district.

KEY FINDINGS

The UMED District is one of the largest employment centers in the region and has significant growth potential. With multiple hospitals and two university campuses, the UMED District is home to a high concentration of the region's employment in the "Eds and Meds" industries.

The major challenges to new development in the UMED District are lack of developable land and high construction costs. Over half of the UMED District is designated for institutional or public use, and the remaining land is largely developed. New development will depend upon the decisions of major landowners and likely require the redevelopment of existing properties. Other challenges include the high cost of construction in Alaska, which requires a much higher rent threshold before new development is feasible, and the lack of available financing from commercial banks.

The UMED District medical office market is very strong; demand is likely to remain strong in the near term. Demand for medical office space is driven by tenants' desire to be near the district's hospitals. Recent construction in the district has been for medical office uses. In the short term, medical office development is likely to continue to be the "highest and best use" of developable land.

The UMED District has seen minimal residential growth over the previous decade. The lack of recent residential development is due to a combination of factors, particularly the lack of land available for new development and the dominance of the medical office market. The core of the district is dominated by institutional uses and contains no residential development other than approximately 1,100 units of student housing.

The major strengths of the UMED District as a residential location are its central location, proximity to employment, and outdoor recreational amenities. Although there has been no recent residential development in the area, local brokers and developers were convinced of the viability of the location for new development, if land were available. Strategic Economics estimates demand for between 750 and 1,125 residential units in the UMED District over the next 20 years. The high concentration of workers and young adults in the UMED District, as well as the growing population of seniors in Anchorage, are important facets of housing demand. Additional high-quality retail development has the potential to improve the quality of life in the area under study, and thereby strengthen its potential to attract new residential development.

Despite strong demand, most types of compact housing (townhomes and apartments) are not yet financially feasible for private developers. As noted previously, high land costs and high construction costs make compact housing particularly challenging in the UMED District and its context in Anchorage. Student housing could provide a means to grow the district's residential population in the near term, through a public-private partnership that minimizes both risk to developers and capital costs to the university.

As residential market pressure grows, townhomes will become feasible first, followed by higher density apartments and mixed-use development in the mid-to-long term. Anchorage's growing population, land scarcity, and projected lack of real income growth are expected to increase demand for compact housing. As rents and sales prices rise, residential development may become feasible for private developers in the mid-to-long term.

Existing retail businesses are dispersed on the outskirts of the UMED District. Although there are an estimated 154,000 square feet of retail in the study area, most of it is not in a location that is easily accessible by the district's large student and employee population. In addition, the existing retail supply is relatively outdated, with most centers built in the 1970s and 1980s. Institutional stakeholders, university students, and some residents have indicated a desire for more restaurants, retail stores, and services targeted at the district population.

The UMED District could potentially support a small increment of new, local-serving retail. Retail demand in the district is driven primarily by the large daytime population of students and workers, and is limited by a relatively small evening and weekend population. Strategic Economics' analysis suggests that the existing supply of retail is fairly well-matched to current demand within the district, with unmet demand translating into an additional 35,000 square feet of retail. This is a relatively small increment of retail, roughly equivalent to a medium-sized supermarket, or a few restaurants and specialty shops.

New retail development should focus on the creation of a concentrated node of activity in one strategic location. Although the supply analysis indicates that there are over 150,000 square feet of retail within the district, much of this retail is oriented to serve drive-by traffic rather than the UMED District itself. The workers, students, and households within the district currently lack access to a significant concentration of retail within walking distance, with the nearest grocery store being over 2 miles away from the center of the district. Creating a convenient retail cluster in the core of the district could fill this need for local retail and services, while creating a desirable hub of activity that enhances the quality of life. There are several possible locations for this "retail village," including along Tudor Road in the south as well as at locations within the core. The appropriate sizes and types of businesses for a new retail center will depend, in part, on the chosen location.

The addition of new households to the UMED District would increase the viability of new retail development. Although the district has a large daytime population, the small residential population affects the district's ability to support a lively, 24/7 retail activity node with restaurants and entertainment. New residential development, including student housing, would support additional retail businesses in the district, contribute to pedestrian activity, and help to form a neighborhood identity

DEMOGRAPHICS & EMPLOYMENT

This section describes the key demographic and employment characteristics that influence the potential for development in the UMED District. Unless otherwise noted, current demographic statistics are from the 2007-2011 American Community Survey.

DEMOGRAPHIC OVERVIEW

The UMED District is home to approximately 9,900 residents, or 3.5 percent of the Anchorage population (Table 2). These residents comprise 3,400 households as well as some 900 individuals living in group quarters such as dormitories at University of Alaska Anchorage (UAA)

	YEAR	UMED DISTRICT	ANCHORAGE	UMED DISTRICT SHARE
TOTAL POPULATION	1990	8,661	226,338	3.8%
	2000	10,221	260,283	3.9%
	2007-2011	9,933	287,390	3.5%
POPULATION IN GROUP QUARTERS	1990	323	5,074	6.4%
	2000	953	7,014	13.6%
	2007-2011	879	7,572	11.6%
HOUSEHOLDS	1990	3,320	82,702	4.0%
	2000	3,618	94,822	3.8%
	2007-2011	3,361	105,123	3.5%
AVERAGE HOUSEHOLD SIZE	1990	2.5	2.7	
	2000	2.5	2.7	
	2007-2011	2.4	2.7	

Table 2. Population and Household Trends, 1990-2011

and at Alaska Pacific University (APU). Residential uses occupy approximately 650 acres of the total 1,750-acre district, compared to over 900 acres that are designated for institutional uses and public space.

The UMED District's residential population has not grown at the same pace as Anchorage as a whole. The number of households in Anchorage grew by 11 percent over the past decade, whereas the number of households in the UMED District grew by only 1 percent during the same time period. In the previous decade, from 1990 to 2000, the district's population grew by approximately 300 households and 630 individuals in group housing. The increase in the group quarter's population is primarily due to three residence halls that opened on the UAA campus in 1998, each housing 200 students. Areas zoned for residential uses are largely built out, while the remaining developable parcels are owned by the major organizations.

Average household size in the UMED District is also smaller than in Anchorage as a whole. The most recent data from the American Community Survey indicates that the average household size in Anchorage as a whole is 2.7, compared to 2.4 in the UMED District. The smaller household size in the district does not include the population in group quarters, but it is likely related to the significant presence of multifamily apartments in the southern portion. The households that reside in these one- and two-bedroom apartments, whether students or longer-term residents, are likely to be smaller than average. Anchorage household size has been stable over the past two decades, but is expected to decrease slightly over the next two decades.[1]

The UMED District has a high concentration of young adults and seniors. Figure 23 compares the distribution of population by age group in the District and in Anchorage. As would be expected, given the presence of two university campuses in the district, a large share of the population is between the ages of 18 and 34. Some 27 percent of the district's population falls into this age category, compared to 21 percent in Anchorage as a whole. Interestingly, the district also has a larger share of adults over the age of 65 than Anchorage itself. Meanwhile, children and adults between the ages of 35 and 64 are underrepresented in the district.

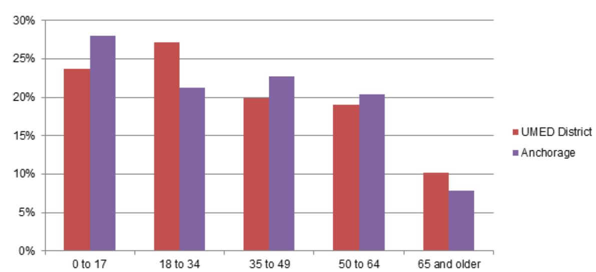


Figure 23. Distribution of Population by Age Group, 2010

Median household income in the UMED District is very similar to that in Anchorage as a whole. Adjusting for inflation, the Anchorage median household income decreased by 5 percent over the past two decades, from $79,700 to $75,500 (Table 3). The current median household income in the UMED District is $75,100, a 3 percent decrease relative to 1990.[2] Overall, household income trends in Anchorage and the district are consistent with national trends, which show flat or declining real incomes over the past two decades.

Over the next two decades, the share of Anchorage's population over the age of 65 will increase dramatically. Figure 24 shows population growth by age group from 2010 to 2035, as projected by the Alaska Department of Labor and Workforce Development. According to these estimates, the population over the age of 65 will increase by 37,250 between 2010 and 2030, equivalent to 59 percent of total population growth over that period.

YEAR	UMED DISTRICT	ANCHORAGE
1990	$77,650	$79,719
2000	$68,966	$74,996
2007-2011	$75,135	$75,485

Table 3. Median Household Income (2011 dollars)

The share of the population over the age of 65 will more than double between 2010 and 2030, from 7 to 16 percent. According to local brokers and developers, the increasing number of seniors in Anchorage is due not only to the aging of the "Baby Boomers" but also to a shift in older households' decision to stay in Alaska as they age, rather than relocate to warmer climates.

EMPLOYMENT OVERVIEW

The high concentration of education and medical jobs in the UMED District makes it one of Anchorage's largest employment centers. The district is currently home to over 13,700 jobs, accounting for 9 percent of all jobs in Anchorage.[3] Almost 80 percent of jobs in the district are in the education and health sectors. The three largest employers in the district are Providence Alaska Medical Center (PAMC), University of Alaska Anchorage (UAA), and Alaska Native Medical Center (ANMC), with approximately 9,000 employees at these organizations combined.

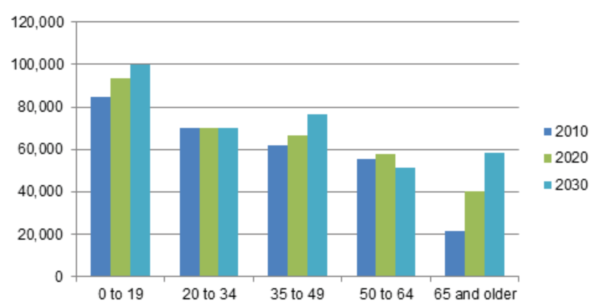


Figure 24. Projected Change in Age Distribution, Municipality of Anchorage, 2010-2030

Anchorage's economy is growing. As shown in Figure 25, Anchorage has been steadily adding jobs over the past decade, with the exception of a slight dip in employment between 2008 and 2010. The average annual growth rate over the past decade is 1.0 percent. This growth is expected to continue in the near term despite uncertainties in the oil and gas industries and in federal government spending, which are key drivers of the Anchorage economy. Reflecting the strength of Anchorage's economy, the 2012 average unemployment rate of 5.6 percent was well below the national average of 8.1 percent.[4]

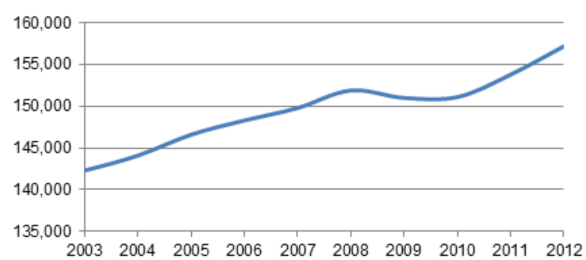


Figure 25. Historical Employment, Municipality of Anchorage, 2003-2012

Health care is one of the largest and fast-growing sectors of the Anchorage economy. Since 2009, Anchorage employment in health care has grown by 2,400 jobs, accounting for 39 percent of total employment growth in Anchorage during this time period. Current Anchorage employment in health care is 18,000, representing 11 percent of total employment. Over 40 percent of these health care jobs are located in the UMED District. In Alaska as in the rest of the United States, demand for health care services is expected to continue to grow as the population ages. These trends suggest that the UMED District will experience sustained employment growth over the coming decades.

UMED District workers commute from all over Anchorage. Figure 26, a "heat map" of UMED District workers' home locations, shows that employees of district organizations live in neighborhoods throughout Anchorage. Significant concentrations of workers live in neighborhoods in close proximity to the district, to the north, east, and southwest. This suggests that new residential development within the district could be attractive to local workers.

CHALLENGES TO DEVELOPMENT

Lack of developable land is a major constraint on development potential in the UMED District. A significant majority of the district is designated for institutional or public use, while the remaining land is largely developed or has environmentally sensitive characteristics. All brokers and developers interviewed for this study highlighted this as the major impediment to private development in the district. There is a perception that major organizations control the market for land there. New development will depend upon the decisions and cooperation of major landowners and likely require the redevelopment of existing properties. The addition of a Northern Access Road could also open up new development opportunities in the district.

Construction costs are higher in Anchorage. Anchorage's isolated, northern location leads to a shorter construction season, high material shipping costs, challenging soil conditions, and higher labor costs. These development costs impact the overall feasibility of a project, raising the rent or price threshold at which a project becomes profitable.

Commercial financing options in Anchorage are limited. Developers report that most commercial banks active in the lower 48 states will simply not finance new development in the Anchorage market. Therefore, developers must work with local banks to finance commercial development and have less leverage in negotiating favorable financing terms and conditions.

Infrastructure costs can be significant. New development in Anchorage often requires new water, sewer, and sidewalk construction. These costs are often borne by the developer, further increasing development costs and impacting project feasibility.

OFFICE MARKET ANALYSIS

Anchorage office rents and vacancy rates are stable. At the end of the fourth quarter of 2012, average asking rent in the metro Anchorage area was $2.17 per square feet per month (full-service), unchanged from the previous year (Table 4).[5] The average vacancy rate of 10.8 percent had decreased slightly from 11.1 percent in the fourth quarter of 2011.

	UMED DISTRICT	ANCHORAGE
AVERAGE FULL-SERVICE RENT (SQ. FT./MONTH)	$2.24*	$2.17
AVERAGE VACANCY RATE	No Data	10.8%

Table 4. Office Market Indicators *Note: UMED District average monthly rent is based on a sample of seven listings

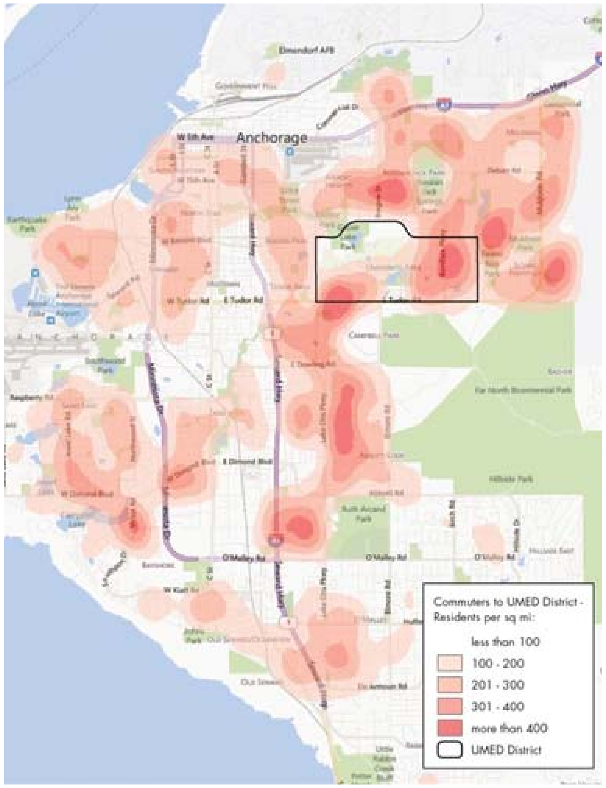


Figure 26. Commute Shed for Workers in the UMED District

The office market in the UMED District is overwhelmingly targeted toward medical users, with new Class A construction supplementing existing Class B and C office buildings.[6] Between 2007 and 2011, PAMC added 230,000 square feet of medical office space in the T, U, and S Towers. According to area brokers, office space in these towers leased quickly upon completion. Recent construction also includes a 60,000-square-foot, three-story facility for the Orthopedic Physicians of Anchorage (OPA) at the corner of East 40th Avenue and Lake Otis Parkway.

UMED District asking rents are comparable to those elsewhere in Anchorage. Table 5 lists sample rents for recent listings in or near the district. Local brokers confirmed that these lease rates are typical for the district and similar to other employment centers in Anchorage.

RESIDENTIAL MARKET ANALYSIS

Although the existing residential neighborhoods in the UMED District contain a large share of single-family detached homes, future development is likely to be higher density, particularly attached townhomes and multifamily apartments. Unless otherwise noted, data presented in this section is obtained from the U.S. Census Bureau's 1990 and 2000 Decennial Censuses and its 2007-2011 American Community Survey.

EXISTING HOUSING STOCK

The supply of housing in the UMED District has grown at a slower rate than in Anchorage as a whole. The District currently contains 4,070 housing units, accounting for 3.6 percent of the Municipality's total supply of 112,800 housing units. In the past decade, housing stock in the Municipality of Anchorage grew by 12 percent, adding 12,440 new units. During the same period, the UMED District grew by 5 percent, adding just 200 housing units. Almost all of this residential growth occurred in the neighborhood between Boniface Parkway and Baxter Road.

The UMED District has a high share of multifamily housing, compared to Anchorage as a whole. In the UMED District, multifamily housing accounts for 51 percent of housing stock, compared to 35 percent in the Municipality of Anchorage (Figure 27). Multifamily apartments are primarily located in the southwest corner of the district, south of the PAMC campus. Although these apartments serve residents who range across the spectrum in age and household type, they also serve as de facto "student housing" for the two universities in the district. The approximately 1,400 single-family detached units in the study area are primarily located in the neighborhoods in the eastern portion of the district.

LOCATION	MONTHLY RENT/SQ. FT.	LEASE TYPE	SIZE (SQ. FT.)	TYPE	CLASS
Just east of Lake Otis Pkwy & E. 40th Ave.	$2.65	Full Service	3,100	Medical Office	B
SW Corner of Lake Otis Pkwy & E. 40th Ave.	$2.20	Modified Gross	700-1,400	Medical Office	B
Bragaw St. at E. 18th Ave.	$2.00	Modified Gross	18,216	Office	B

Table 5. Sample Asking Rents in the UMED District

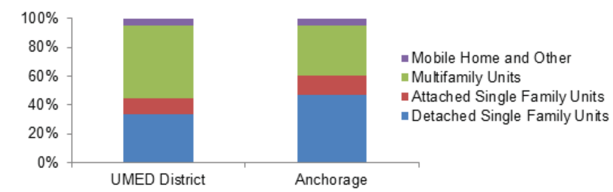


Figure 27. Housing Stock by Type

The UMED District contains a small but significant number of mobile home units. Census data suggests that the district contains approximately 200 mobile homes, located primarily in Riviera Terrace Mobile Home Park and Baxter Road Trailer Court. Given the size of the parcels, these trailer parks may be considered as among the few noninstitutional opportunity sites for redevelopment within the district. At the same time, these mobile homes represent an important source of affordable housing for Anchorage, and any plans for redevelopment should be considered within that context.

The UMED District has a high share of renters compared to Anchorage as a whole. Consistent with the high share of multifamily units and young people in the UMED District, 49 percent of households are renters, compared to 39 percent in Anchorage as a whole. The predominance of rental housing is likely a result of the area's suitability as a location for students. However, interviews with local brokers and developers have suggested that there would be demand for more ownership housing in the area as well.

Existing University housing serves a small percentage of the study area's student population. UAA currently provides on-campus housing for approximately 1,000 students, which is less than 16 percent of the full-time student population. UAA student housing currently consists of three Residence Halls and two apartment communities, MAC and Templewood, located west of Elmore Road and south of Providence Road. By contrast, Alaska Pacific University (APU) provides on-campus housing for approximately 100 students (just under 20 percent of the estimated 550 full-time equivalent student population) in a combination of suites, apartments, and townhouse units located on University Drive.

RENTAL MARKET CONDITIONS

The Anchorage rental market is strong. As shown in Figure 28, apartment rents have been increasing steadily over the past five years, growing by 9 percent in inflation-adjusted dollars from 2007 to 2012. High demand for rental housing is also indicated by low vacancy rates, which declined sharply between 2007 and 2011. In 2012, Anchorage's average apartment vacancy rate was 2.6 percent, well below the national average of 4.4 percent.[7]

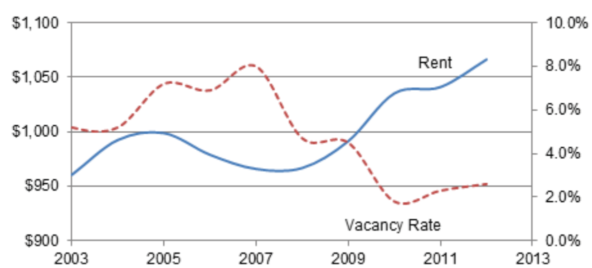


Figure 28. Historical Average Apartment Rent in Anchorage (2012 Dollars)

Apartment rents in the UMED District are comparable to those elsewhere in Anchorage. Strategic Economics reviewed rental listings for units of various sizes at six apartment properties located in the District. Rents ranged from $840 for a 213-square foot studio to $1,480 for an 850-square-foot two-bedroom unit, averaging $1.90 per square foot. Table 6 compares average apartment rents and vacancy rates in the District and Anchorage.

Despite low vacancies and strong demand for rental housing, rents are not yet high enough for new multifamily apartment construction to be feasible. Local developers noted that most apartment buildings in the UMED District and elsewhere in Anchorage were built in the 1970s and 1980s, and that almost no new construction has occurred since then. It is currently more viable for property owners to renovate old buildings than to build new ones. Given the high construction costs in Anchorage, rents will need to be significantly higher than they currently are in order for new apartment construction to occur.

	UMED DISTRICT	ANCHORAGE
AVERAGE MONTHLY RENT	$1,078	$1,057
VACANCY RATE	No data	2.5%

Table 6. Comparison of Average Apartment Rents

FOR-SALE MARKET CONDITIONS

The Anchorage housing market has fared much better in the past five years than that in the rest of the United States. Figure 29 shows the inflation-adjusted historical trend for average sales prices in Anchorage. Although sales prices have declined in the five years following the housing market crisis and ensuing recession, the effects of the foreclosure crisis were much less severe than elsewhere in the nation due to more conservative mortgage lending practices and less speculative building during the preceding housing bubble.[8] In 2012, the Anchorage housing market began to recover ahead of the housing market recovery in the rest of the continental United States, led by a growing economy and a low unemployment rate. Last year, the average single-family home sales price was 2.6 percent higher than the previous year and 15 percent higher than in 2003, in inflation-adjusted dollars. The 2012 average condominium sales price was 3.7 percent lower than the previous year, but 11 percent higher than a decade earlier, in 2003. According to local developers, the lower condominium sales prices in 2012 likely reflect the age of units on the market and the lack of newer construction, rather than a weakening market.

New residential construction is continuing in Anchorage at a steady rate. Figure 30 shows the new units constructed in Anchorage since 2008. Although new construction activity is considerably less than during the frenzy of activity between 2001 and 2005, some 400 to 600 units have been added each year, despite the housing crisis and recession. Building activity has been evenly split between single-family and multifamily homes. In 2008 and 2009, more multifamily units were constructed than single-family homes, but in the past three years single-family construction activity has been stronger.

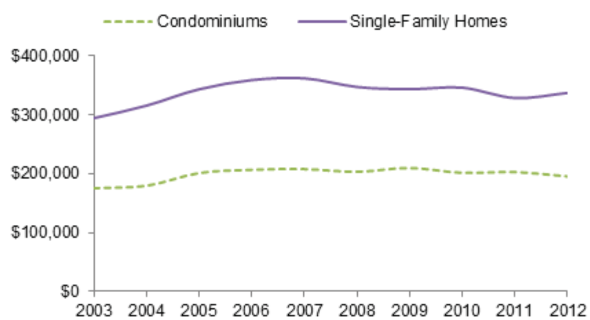


Figure 29. Municipality of Anchorage Average Sales Price (2012 Dollars)

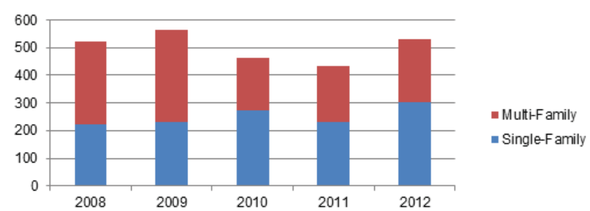


Figure 30. New Housing Units by Type of Structure, Municipality of Anchorage *Note: Single-Family include attached dwellings; Multi-Family properties have 2 or more dwellings

Condominium sales prices in the UMED District are approximately $50,000 lower than the Anchorage average, but this effect is likely related to the age of the housing stock. According to statistics compiled by Alaska Multiple Listing Service (Alaska MLS), the 2012 average condominium sales price in the UMED District and surrounding area was $153,572, compared to an average of $195,364 in Anchorage as a whole. Recent listings for condo units in the study area range from $135,000 for a one-bedroom unit to $174,000 for a two-bedroom unit. In the fourth quarter of 2012, the average sales price for new condominium construction was over $75,000 higher than the average sales price for existing construction.[9]

POTENTIAL FOR COMPACT HOUSING IN THE UMED DISTRICT

The UMED District has the potential for compact housing in a range of types.

SMALL LOT SINGLE-FAMILY DETACHED HOME: The 2012 Anchorage Housing Market Analysis found that a single-family detached home on a 3,000-square-foot lot was the closest to being financially feasible of all the housing building types tested in their analysis. However, given the low availability and high price of land in the UMED District, this building type is unlikely to have significant potential there.

TOWNHOUSES: The 2012 Anchorage Housing Market Analysis found that townhouses are approaching the feasibility threshold, and therefore are most likely to be developed in the short-to-mid term. These units typically range from 1,300 to 1,800 square feet, and provide a separate entrance, garage, and driveway for each household. Because of the preference of Anchorage homeowners for exterior front doors and private vehicle and recreational equipment storage, townhouses are a more acceptable form of compact housing for the ownership market than vertically stacked condominiums.[10] To increase densities, units have become increasingly narrow and can be as high as three stories. In Anchorage, the development code allows for "horizontal condominiums," which support a similar built-form as townhomes, but with the land held in common ownership.

APARTMENTS: Interviews with developers indicate that four-story residential buildings are not currently financially feasible for a developer to construct, and are unlikely to be so in the short-to-mid term. This finding corroborates the results of the 2012 Anchorage Housing Market Analysis conducted by ECONorthwest. By contrast, certain types of subsidized construction, such as senior or student housing, may become feasible in the short term. Apartments are typically rental units ranging in size from 400 to 1,000 square feet. In Anchorage, apartment buildings generally range from three to four stories.

MIXED-USE RESIDENTIAL: This building type is similar to residential apartments but with retail uses on the ground floor. Interviews with developers indicate that mixed-use residential buildings are more challenging from a financial feasibility perspective than apartments, because of financing restrictions, limited retail viability, and lower residential revenues due to the lower unit count. A few developers suggested that the UMED District might be a feasible location for a mixed-use development in the longer term, because of the potential for a pedestrian-oriented environment in the core of the district. To ensure the success of the retail component, a mixed-use project should be located in a cluster of other retail uses within the core.

STUDENT HOUSING: Student housing can typically be built to higher densities than other forms of compact housing, due to smaller unit sizes. New student housing construction in the UMED District could possibly be provided in a public-private partnership between a private developer and either UAA or APU, or both. According to interviews with administrators, UAA currently plans to double the amount of student housing from 1,000 to 2,000 beds within the next 10 years, depending on funding availability. New housing would likely be developed by increasing density within the existing student housing footprint, following the sequential demolition of the MAC and Templewood buildings.

Demand for Compact Housing:

In general, demand for compact housing in Anchorage is likely to increase over time. As explained in detail in the 2012 Anchorage Housing Market Analysis prepared for the Municipality of Anchorage, demand for attached and compact housing types is projected to grow over the next two decades. Decreasing land availability, increasing housing prices, and changing lifestyles are key drivers of this trend.

Cost is the most important driver of demand for compact housing. According to projections by the Institute of Social and Economic Research (ISER) at UAA, real household income in Anchorage is expected to remain relatively flat over the next two decades. Concurrently, the population is projected to grow significantly, and available land is becoming increasingly scarce. As wages remain stable but the cost of housing increases, a growing number of households will choose smaller dwellings.

The aging of the Anchorage population is an important demographic trend shaping residential demand. Although some Baby Boomers will stay in the large single-family homes in which they raised their families, others may decide to downsize to reduce costs and increase proximity to amenities. For retired individuals who plan to travel, condominiums and apartments offer the advantage of having property maintenance, such as snowplowing, taken care of in their absence.

Despite significant demand for compact housing in the UMED District, rents and sales prices are not high enough to justify new development. In general, higher-density building types are associated with higher construction costs and greater development risk. Although several townhome and apartment projects have been built in Anchorage recently, interviews with residential developers suggest that these projects have struggled financially.

Demand Projections:
According to projections developed for the 2012 Housing Market Analysis, Anchorage will add 21,500 housing units over the 20-year period from 2010 to 2030. Strategic Economics estimated future housing demand in the UMED District under moderate and high-growth scenarios by assuming that the district would capture a certain percentage of total housing demand. These estimates are summarized in Table 7.

Moderate Growth:
If the UMED District were to maintain its current share of Anchorage housing stock, it would capture 3.5 percent of Anchorage housing demand from 2010 to 2030. This amounts to an absorption rate of approximately 38 units per year, or 750 new housing units over a 20-year period.

High Growth:
If the UMED District were to capture 50 percent more residential development than in the Moderate Growth scenario, it would capture 5.25 percent of future housing demand, adding 1,125 units over the next 20 years.

	UMED DISTRICT CAPTURE RATE	UMED DISTRICT NEW HOUSING UNITS		
		ANNUAL	10-YEAR DEMAND	20-YEAR DEMAND
MODERATE GROWTH	3.5%	38	375	750
HIGH GROWTH	5.25%	56	563	1,125

Table 7. UMED District Housing Demand Estimates

RETAIL MARKET ANALYSIS

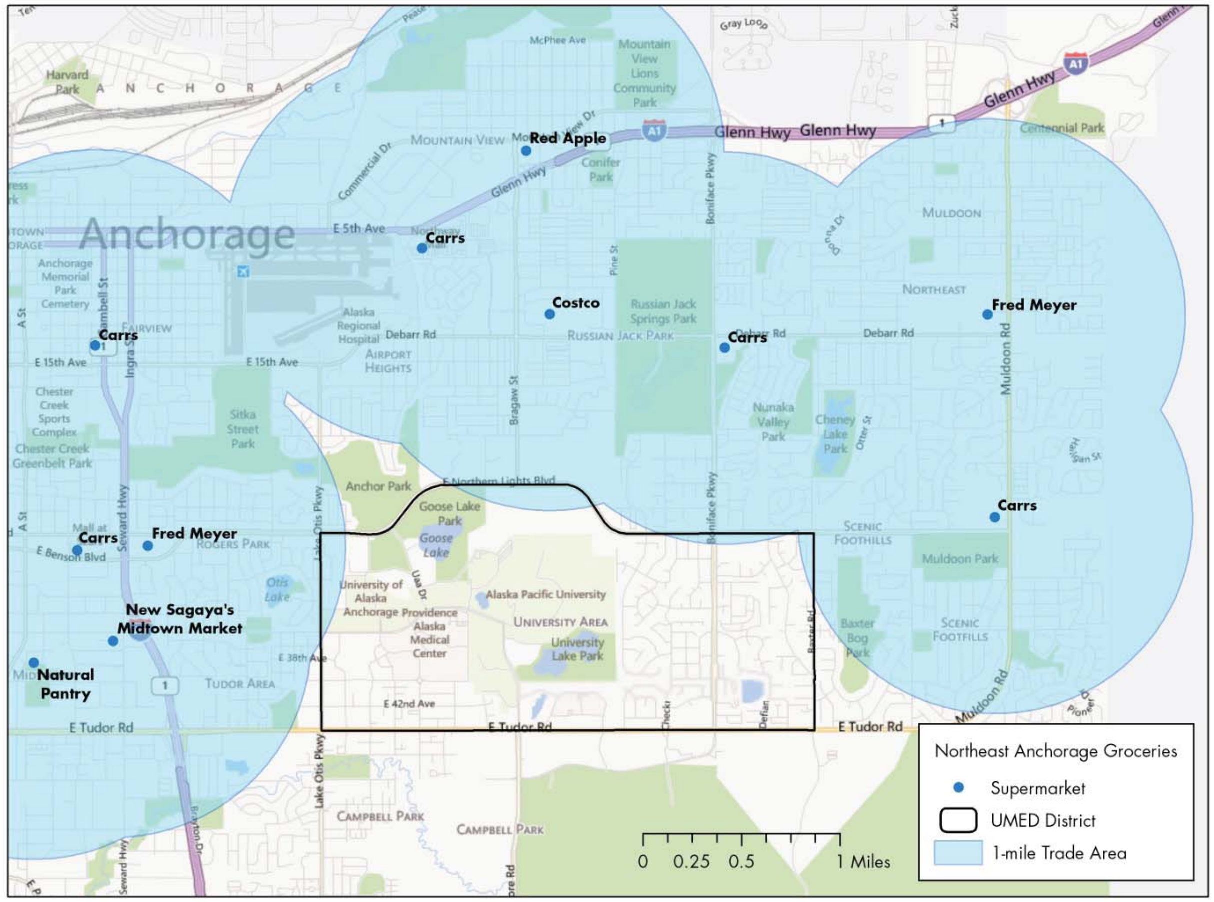
Existing retail in the UMED District is primarily located along East Tudor Road, dispersed among small strip centers and freestanding buildings. Strategic Economics estimates that there are approximately 154,000 square feet of retail within the district. The largest concentration of retail is Tudor Square, a strip center with 64,000 square feet of gross leasable area. Built in 1982, the strip mall is currently owned by PAMC. Two other smaller strip centers along East Tudor Road—Sunrise Plaza and TudorMED Plaza—are both less than 20,000 square feet. In addition to these shopping centers, there are freestanding fast-food restaurants and gas stations along East Tudor Road. A small concentration of retail exists in the southwest corner of the intersection of East Northern Lights Boulevard and Boniface Parkway. Additional strip retail is located just outside the district boundary on the south side of East Tudor Road and at the southwest corner of Lake Otis Parkway and Northern Lights Boulevard.

Approximately 22,000 square feet of retail space is located on the UAA campus. The largest retail business is the campus bookstore, which is 12,000 square feet. The remaining retail uses are small eateries, coffee shops, and convenience stores ranging from 200 to 2,000 square feet.

Existing UMED District retail businesses are local-serving. Typical businesses include restaurants, convenience goods, personal services, and medical offices. Some of the quick-service restaurants, such as Starbucks and Quiznos, are national chains, but most are local "mom and pop" businesses.

The UMED District lacks a grocery store. Figure 30 shows the supermarkets nearest to the district and indicates the typical one-mile trade area for each store. As can be seen from the map, some of these trade areas extend to the outskirts of the district, but residents, students, and workers in the center of the district are still over 2 miles from the nearest supermarket. This suggests a possible opportunity for some type of grocery store closer to the district core.

The retail development pattern is strongly auto-oriented. Existing retail development is located along high traffic thoroughfares and designed to maximize convenience for customers arriving by car. Both strip malls and stand-alone retail parcels are dominated by large surface parking lots. This reflects the reality of the Anchorage climate and built environment, which means that most customers will be driving, due to cold temperatures and the low density of development.



Strategic Economics 2013

Figure 31. Supermarkets near the UMED District

RETAIL MARKET CONDITIONS

The current retail market in Anchorage is characterized by stable rents and relatively low vacancy rates. In the fourth quarter of 2012, average asking rent was $1.62 per square foot per month on a triple-net basis (NNN), essentially the same as one year ago.[11] The average vacancy rate across all shopping center types was 8.0 percent, 0.2 percent higher than in the fourth quarter of 2011.

Asking rents in the UMED District are similar to elsewhere in Anchorage. Local brokers noted that existing retail in the district is in a good location with high visibility, and appears to be performing well. Table 8 compares average asking rents and vacancy rates in the district and in Anchorage. Although vacancy rate data is not available for the district, local brokers reported low vacancies.

	UMED DISTRICT	ANCHORAGE
AVERAGE RENT (SQ. FT./MONTH)	$1.83*	$1.62
AVERAGE VACANCY RATE	No data	8.0%

Table 8. Retail Market Indicators

Although the retail market is performing well, current rents are likely too low to justify new construction. Local real estate developers suggested that new retail development would require monthly rents of $2.75 to $3.00 per square foot (NNN) to cover construction costs, approximately $1.00 higher per square foot than current averages.

LOCAL-SERVING RETAIL DEMAND ANALYSIS

To determine the approximate scale of new retail development that would be viable in the UMED District, Strategic Economics estimated retail demand from the district's students, workers, and residents, and then compared it to existing retail supply. It is important to note that this estimate does not consider either retail demand generated outside of the district or the competitive supply of retail space located outside it. This analysis is intended to provide insight into the scale of new retail that could potentially be supported at the local level, by residents, workers, and students within the UMED District.

Using regional and national data sources, Strategic Economics estimated per capita annual spending for each consumer group across different retail categories, and applied assumptions about what percentage of spending would be captured by the UMED District.[12] Supportable retail area was then calculated using data on average sales per square foot for each retail category. Further methodological details are provided in the Appendix.

Results:

The analysis indicates that the existing daytime and evening population of the UMED District can support 188,500 square feet of retail space. Table 9 lists estimated per capita retail spending, existing population, and supportable retail area for each consumer group. As the district grows its student, worker, and household population over the coming decades, supportable retail area will also increase. The column on the far right indicates how many more square feet of retail area would be supported by an additional 100 units of each consumer group.

Demand vs. Supply:

As stated earlier in this report, the UMED District is estimated to contain 154,000 square feet of retail. Subtracting this amount from the estimated supportable retail area of 188,500 square feet suggests that the district could support 35,000 square feet of net new retail. This is a relatively small increment of retail. For comparison, a typical grocery-anchored neighborhood shopping center, by itself, contains approximately 100,000 square feet of retail.

While this analysis provides a general indication of unmet and future retail demand, the size of any new retail development will depend strongly upon the visibility and accessibility of a given location. The implications of various factors on the potential for new retail are discussed in the following section.

RETAIL DEVELOPMENT POTENTIAL

As mentioned in the previous analysis: Concentrating retail in a central location could better serve the needs of UMED District workers, students, and households; the district could potentially support a small increment of new, local-serving retail, though Strategic Economics' analysis suggests that the existing supply of retail is fairly well-matched to current demand within the district, with unmet demand translating into an additional 35,000 square feet of retail; and the addition of new households, students, and workers to the district would increase the viability of new retail development. In particular, new residential development, including student housing, would increase the evening and weekend population, potentially increasing pedestrian activity in the core and helping to form a neighborhood identity.

Additionally, organizations may play a key role in fostering the development of a new retail center. Institutional goals are a major determinant of new development in the UMED District. Several organizational stakeholders within the district, particularly UAA, have expressed an interest in creating a "retail village" that serves the needs of students, employees, patients, and other visitors and creates an appealing destination in the district's center.

The motivations of these organizations may enable new retail development to take place before the market would support private development.

Mixed-use development is challenging in Anchorage, but may be possible in the UMED District due to the unique context. The Alaskan climate poses particular challenges to creating a walkable shopping environment. Snow accumulation on sidewalks is a major impediment to pedestrian activity in the winter, and potential solutions, such as additional snow clearance or covered sidewalks, are costly. Melting snow in the spring and icy surfaces in the fall also limit the appeal of walking at other times of year. However, several brokers suggested that the campus environment and high concentration of students and workers could make pedestrian-oriented retail more viable in the UMED District than elsewhere in Anchorage.

Location and access will be critical in determining the scale and format of new retail. New retail development on a major thoroughfare at the outer edges of the district will be able to draw on customers from adjacent neighborhoods, and thus may be able to support more retail square footage than the demand analysis presented in this report. However, this retail would likely take on a traditional, auto-oriented form in order to be convenient to drive-by traffic. Conversely, a location within the core of the district may be more amenable to a mixed-use format, with an emphasis on walkability, yet the scale is likely to be smaller, supported primarily by students, workers, and residents in the district. Retail within the core may also benefit from synergies with the existing Marriot SpringHill Suites Anchorage and the new Alaska Airlines Sports Center currently under construction.

CONSUMER GROUP	ANNUAL PER CAPITA RETAIL SPENDING	EXISTING POPULATION	SUPPORTABLE RETAIL AREA (SQ. FT.)	SUPPORTABLE RETAIL AREA (SQ. FT.)
Students (Full-Time Equivalent)	$1,500	8,900	42,600	4,800
Workers	$2,200	13,700	95,000	6,900
Households	$4,500	4,000	50,900	12,800
Total		26,600	188,500	

Table 9. UMED District Supportable Retail Area

9. TRANSPORTATION & CIRCULATION

TRANSPORTATION & CIRCULATION

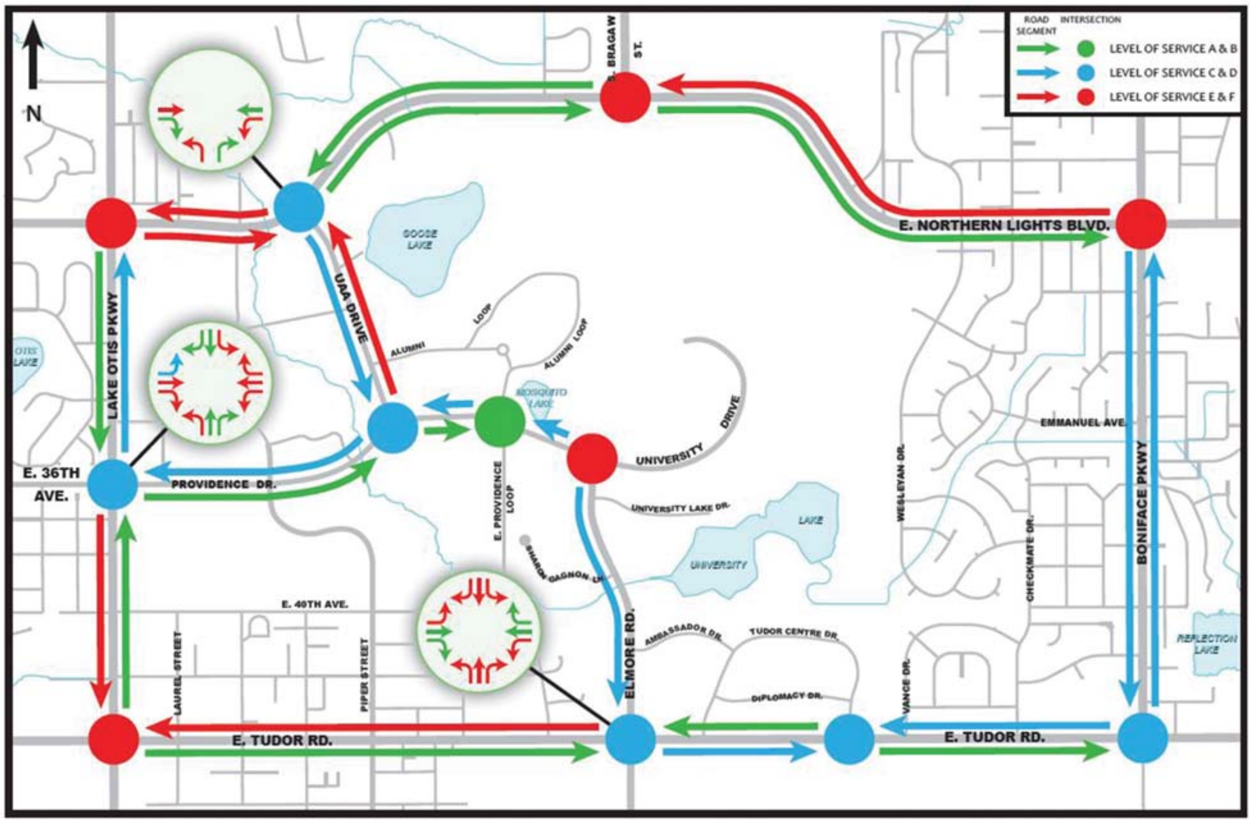


Figure 32. 2011 Weekday A.M. Vehicle Level of Service

INTRODUCTION

This chapter addresses the existing conditions and the future planned projects for roadway, transit, nonmotorized users, and parking. The ongoing growth in the major organizations in the UMED District has driven an increasing need for transportation access and circulation. Motor vehicular access remains the primary mode of access to the district. Efforts have been made to increase the use of transit, shuttles, cycling, and walking.

This growth trend will continue with further expansions throughout the district. Growth management strategies, as well as projects soon to be completed, have been laid out in various organizational Master Plans. The transportation impacts of the Alaska Airlines Sports Center (AASC) and the new College of Engineering Building on the UAA campus have been analyzed, and the need for several circulation enhancements has been determined. In addition, the events held at the AASC will be governed by a traffic management plan to ease ingress and egress by all modes.

DISTRICT MOTOR VEHICLE ACCESS AND CIRCULATION

District residents, employees, students, and users access the district in motor vehicles via major arterials on the periphery: Northern Lights Boulevard, Lake Otis Parkway, Tudor Road, and Boniface Parkway. Vehicular access inside the district is primarily accomplished via minor arterials, such as Providence Drive and Elmore Road, but also by "collector" roadways including UAA Drive, Piper Street, and 40th Avenue. These complementary roadways allow for traffic demand to spread and balance across several access points. Secondary roadways and campus driveways allow for vehicular circulation and access to parking areas and other destinations.

The vehicle access and circulation for the district has been recently and comprehensively analyzed as part of the "Northern Access to the University and Medical District – Reconnaissance Study Report." This study showed that several intersections providing access to the district are operating with poor levels of service. These intersections include:

- Lake Otis Parkway/Northern Lights Boulevard
- Bragaw Street/Northern Lights Boulevard
- Boniface Parkway/Northern Lights Boulevard

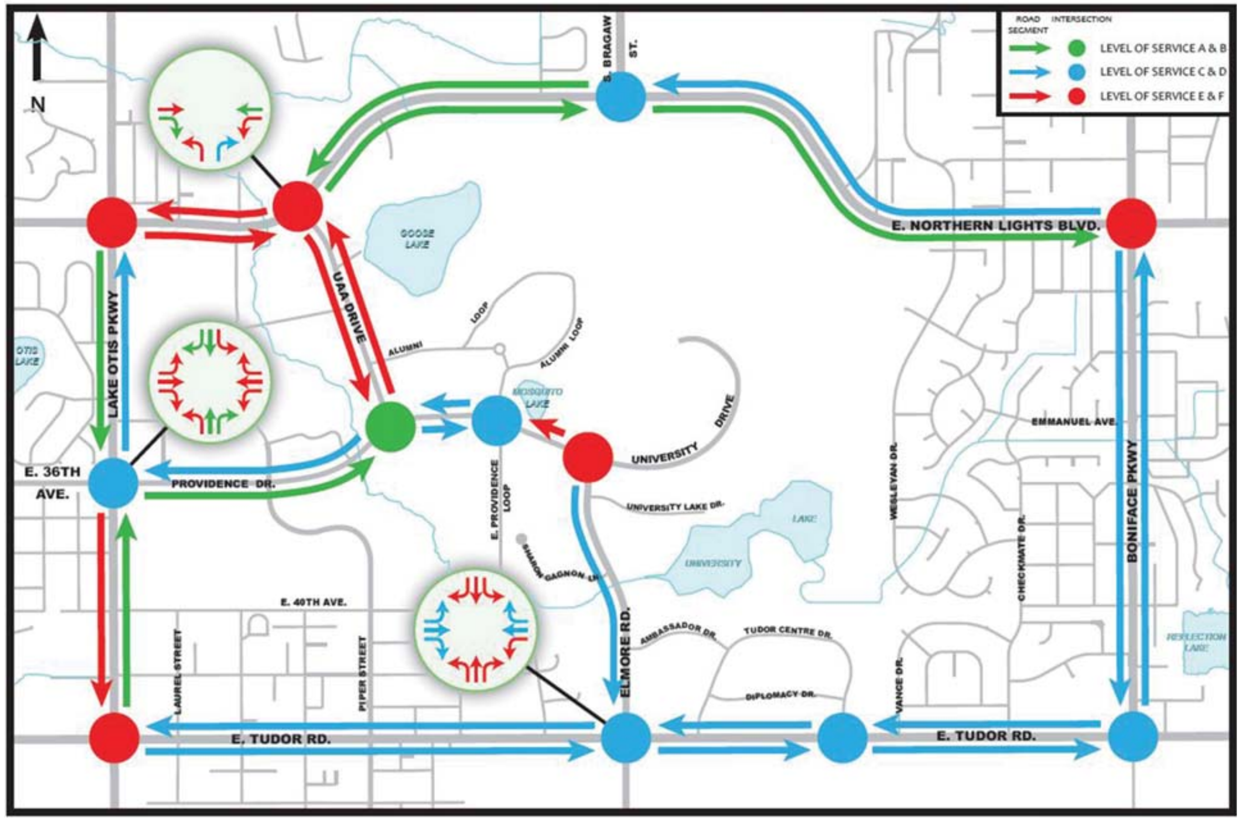


Figure 33. 2011 Weekday P.M. Vehicle Level of Service

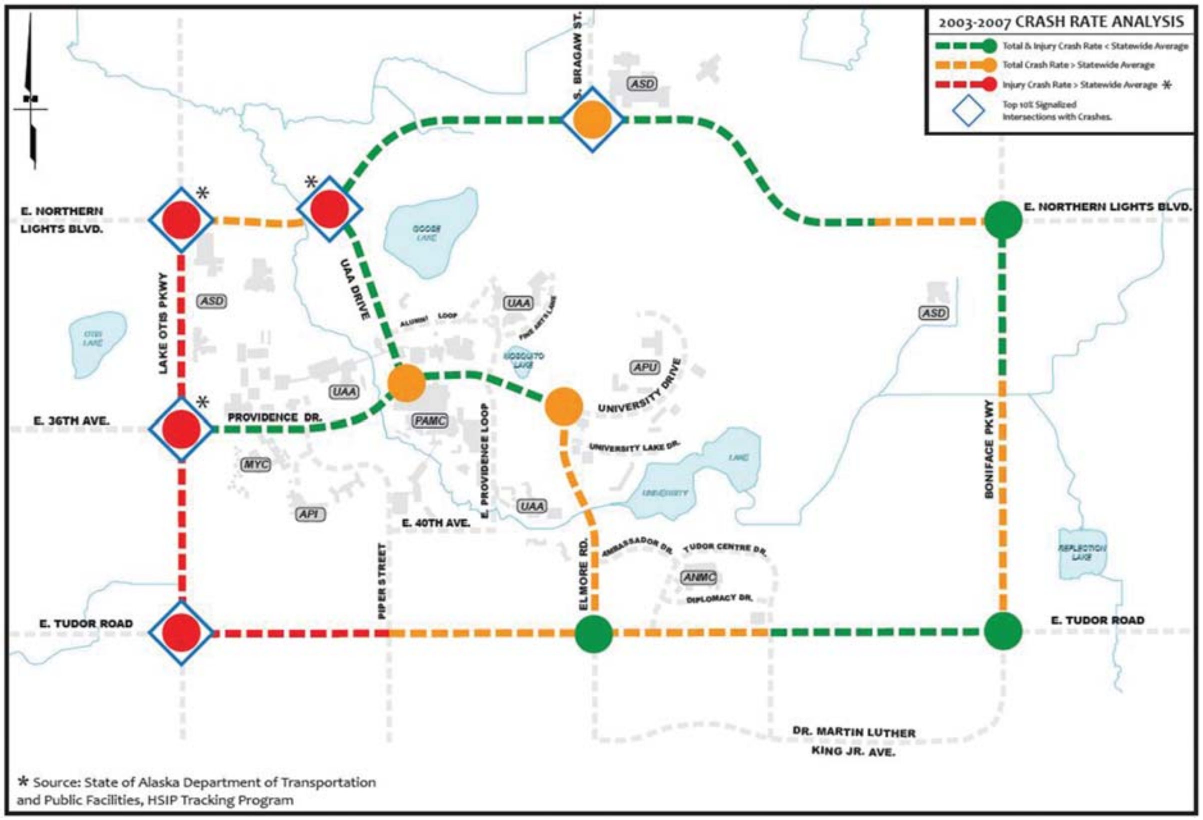


Figure 34. 2003-2007 Crash Rate Analysis

- Lake Otis Parkway/Tudor Road
- Elmore Road/Providence Drive

The Reconnaissance Study Report also reported that the Lake Otis Parkway segments and intersections adjacent to the district, as well as the UAA Drive/Northern Lights Boulevard intersection, exceed the statewide average crash rate.

The internal and adjacent roadway system has expanded with growth in the district through numerous intersection improvements projects and new roadway connections. Key projects completed since the 2003 UMED District Plan was written include: additions to the road network; improving district access from the south and west; and enhancing connectivity between the district organizations and Tudor Road, residential neighborhoods, and the medical office complexes in the southwestern section.

In addition, numerous roadway projects are planned in the district via Alaska Department of Transportation & Public Works (DOT&PF) projects, conditions of approved developments, and long-range plans. The DOT&PF is finalizing construction documents for safety-related improvement at the Northern Lights Boulevard/UAA Drive intersection. The Alaska Airlines Sports Center will include enhancements to adjacent circulation by extending Health Drive to Elmore Road. The UAA

School of Engineering Building garage and the Tudor Center expansion include improvements to the adjacent roadway system. The MOA is working with APU to extend University Lake Drive to provide additional access to the APU campus.

The recent 2035 Metropolitan Transportation Plan (MTP) included three major short-term projects area, including improvement to Northern Lights Boulevard and Lake Otis Drive. The most substantial of these funded projects is the Northern Access Road Project to the UMED District, which would provide a connection between Northern Lights Boulevard and Providence Drive. The Reconnaissance Study Report indicates that the roadway is forecast to reduce vehicle delay, travel time, and vehicle volumes on the major arterials in the district. The Reconnaissance Study states that the roadway would shorten travel distances for those accessing the district from the north and northeast, reducing out-of-direction travel on roadways such as Lake Otis Parkway, UAA Drive, and Boniface Parkway. This connection would also lessen turning movements at intersections, which reduce capacity and safety.

ROADWAY IMPROVEMENTS AND PROJECTS IN THE UMED DISTRICT

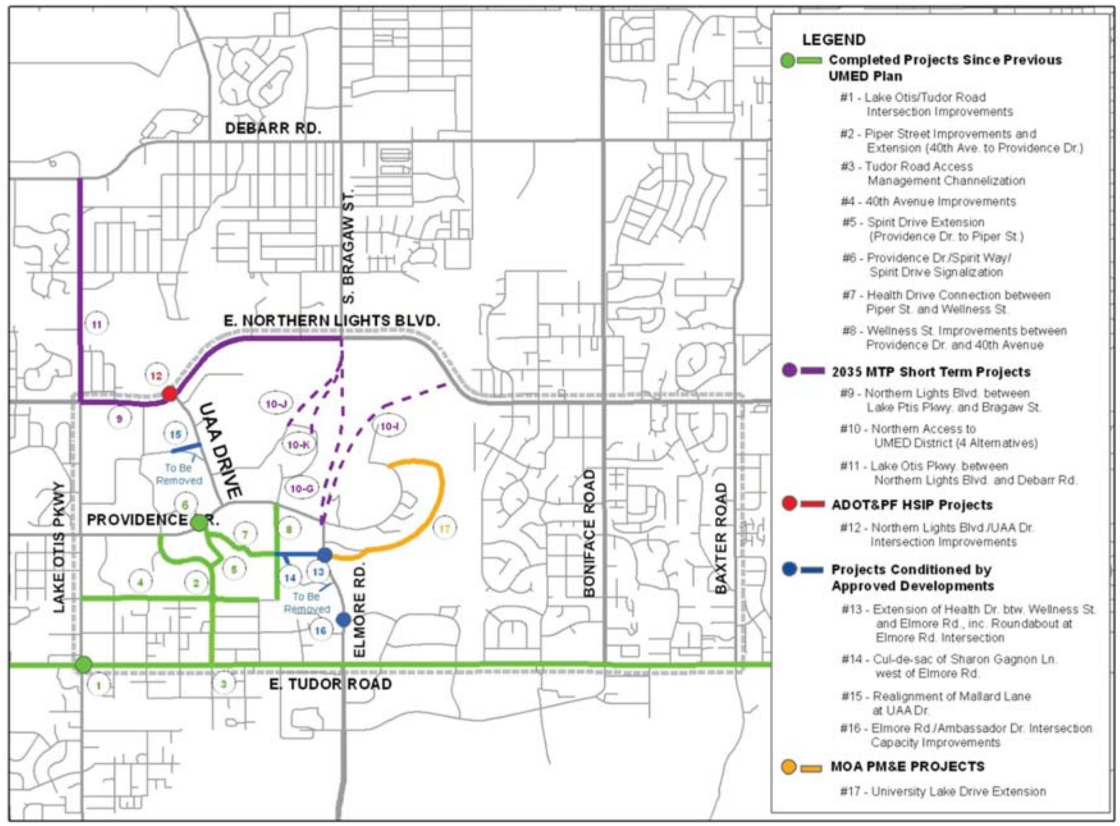


Figure 35. Roadway Improvements and Projects in the UMED District

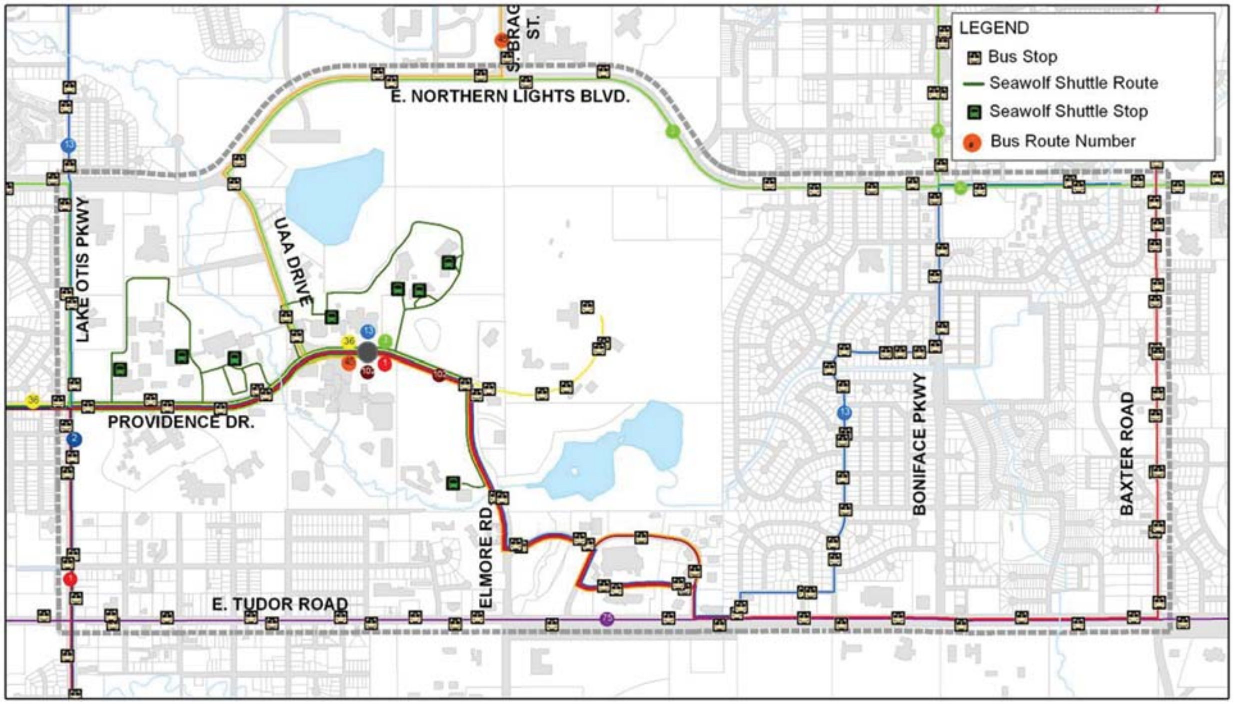


Figure 36. Public Transportation within the UMED District

PUBLIC TRANSPORTATION

The District is moderately well served by a variety of public transit, most notably by eight People Mover fixed bus routes, six of them serving a transit center located at PAMC. UAA and APU participate in the U-Pass program, which provides students with free bus passes. UAA alone has distributed 22,800 passes, which has resulted in nearly 1,000 average weekday rides, thus reducing the need for parking and reducing congestion both on campus and on the surrounding roadway network. UAA operates the Seawolf Shuttle, providing connections across campus and to Anchorage area satellite locations, improving campus circulation. A culture shift to reduce personal cars, new parking management strategies, and other incentives could increase public transit use and reduce parking demand. Additionally, on-demand public transportation options include:

- ANMC shuttle service
- Taxis
- AnchorRides paratransit service
- Zimride car-sharing
- Anchorage Share-a-Ride
- Hertz On-Demand car rentals

NONMOTORIZED TRANSPORTATION

The UMED District contains an extensive network of sidewalks, trails, and multiuse pathways serving nonmotorized uses. The sidewalk system provides connections across the various campuses and links each use to transit and adjacent uses. The trail and multiuse path system, shown in Figure 37, serves a variety of year-round uses. Key paths used for transportation, such as commuting by bicycle, include the Chester Creek Trail to the northwest and the Campbell Creek Trail to the south. These trails, along with a network of paved and unpaved trails, provide recreation opportunities for pedestrians, runners, cyclists, and skiers. The 2035 MTP includes a range of sidewalk and multiuse pathway projects, identified for the district.

FUTURE NON-MOTORIZED PROJECTS AFFECTING UMED DISTRICT

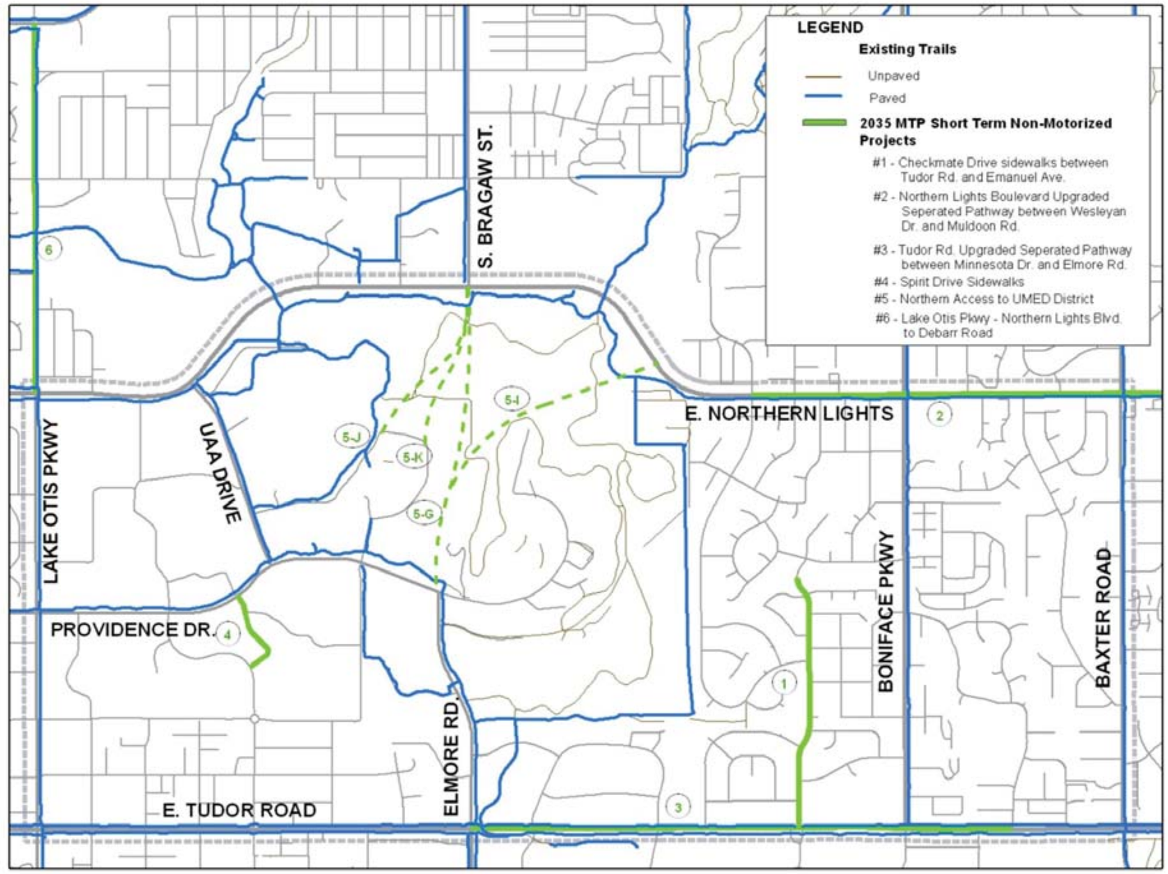


Figure 37. Future Non-motorized Projects Affecting UMED District

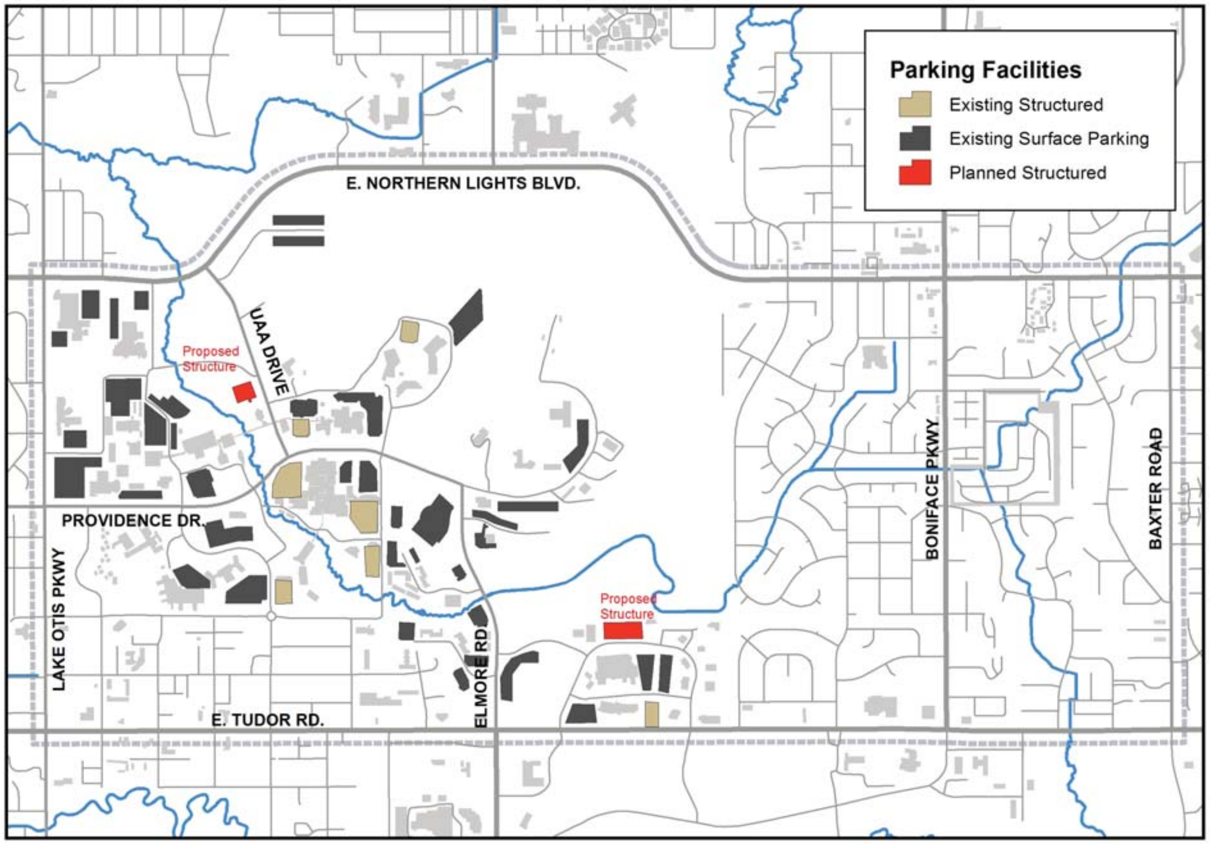


Figure 38. Major Institutional Parking Facilities in the UMED District

PARKING FACILITIES

A substantial portion of the developable land in the UMED District is devoted to surface parking, as shown in Figure 38. However, as the district grows and densifies, the major organizations will transition to structured parking. UAA, PAMC, and ANMC have existing structured parking; UAA and ANMC have planned parking structures to serve approved developments.

Parking is controlled via permits at APU, semester permits, and paid hourly parking at UAA, while the remaining parking in the district is free. Parking lots are enforced by University staff. A shared parking agreement has been established between PAMC and UAA to allow evening and weekend events at the Alaska Airlines Sports Center to use approximately 500 spaces in the adjacent PAMC parking facilities.

In addition to institutional parking, the district also contains surface parking lots serving commercial and office uses, including elevated structures with parking at ground level. The residential portions of the district are served via both off- and on-street parking. No permit or time restrictions govern the on-street parking in the district. Initiatives such as shared parking, intradistrict shuttles, parking management, and transportation-demand-management measures can increase the efficiency of a District parking system.

OPPORTUNITIES AND CHALLENGES

FOR TRANSPORTATION:

- Congestion on UAA Drive
- Access and safety at Wendler Middle School and Lake Otis Elementary School
- Congestion and out-of-direction travel may require additional roadway development
- Concern over northern access impacts to natural areas and trails
- Lack of direct bus/transit to the District
- Parking management program
- Transportation-demand-management program
- Funding
- Content sensitive solutions for design of roadway and trail projects

10. REGULATORY FRAMEWORK

REGULATORY FRAMEWORK

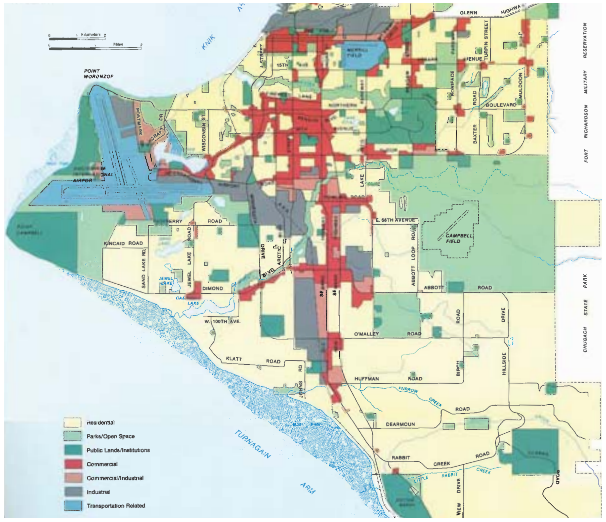


Figure 39. Generalized Land Use Map, 1986

This chapter provides an overview of the planning documents that that have guided development in the UMED District over the years. The Anchorage Generalized Land Use Plan, the Anchorage 2020: Anchorage Bowl Comprehensive Plan, the 2035 Metropolitan Transportation Plan, and the 2012 Anchorage Wetlands Management Plan (outlined in the Natural Resources Chapter of this report on page 94) serve as the umbrella documents under which the 2003 UMED District Plan was created. Title 21, the municipal code that governs land use and zoning in Anchorage, was recently updated to include modern land uses reflected in the Anchorage 2020 Land Use Policy and Plan maps.

GENERALIZED LAND USE MAP, 1986

Anchorage adopted an official Generalized Land Use Map in 1986. Since that time the map has been updated parcel by parcel, resulting in the UMED Land Use: Existing Conditions map included in this report (Figure 41). The updates were incorporated over the years with district planning or organizational master planning updates.

The 1986 Generalized Land Use Map is amended with the adoption of district or neighborhood plans and will be amended with this UMED District Plan update as directed by the 2020 Comprehensive Plan. It is important for it to be represented in the UMED Profile Report because it is the most recently adopted Land Use map for Anchorage. The map has informed Land Use planning efforts throughout Anchorage for almost three decades, and continues to be the foundation for land use and zoning decisions throughout Anchorage.

ANCHORAGE 2020: ANCHORAGE BOWL COMPREHENSIVE PLAN

The Anchorage 2020: Anchorage Bowl Comprehensive Plan (Anchorage 2020) was adopted on February 20, 2001 to “create a framework for decisions about land use and transportation, as well as public facilities, economic development, housing, and other public issues.” The purpose of the plan was to guide development, particularly in the Anchorage Bowl, through the year 2020. Growth within the Anchorage Bowl is physically constricted by mountains and water; therefore, the plan focused specifically on the relationship between growth in Anchorage and the protection of natural areas and open space in relation to this development. Through the Anchorage 2020 plan, a Land Use Concept Plan was developed to identify major employment centers, redevelopment/mixed-use areas, town centers, neighborhood commercial centers, industrial reserves, and transit-supportive development corridors throughout the Anchorage Bowl.

The Anchorage 2020 Land Use Policy Map (Figure 40) identifies the UMED District as a major employment center that incorporates or borders a redevelopment and mixed-use area. Major employment centers are promoted as high-density areas within the Anchorage Bowl, with greater than 50 employees an acre, and have been created next to Redevelopment and Mixed-Use Areas, so-called “urban villages,” which provide medium- to high-density residential development and encourage residents to live close to their places of work. The plan recommends walking as the transportation mode of choice for short trips within major employment centers and makes the development of pedestrian networks a priority. Policy 23 of Anchorage 2020 and Title 21, specifically B-2 and B-3 zoning district regulations, support the Major Employment Center concept. Additionally Anchorage 2020 policies 10, 14, 17, and 20 support the Redevelopment and Mixed-Use Areas concept.

Lake Otis Parkway is identified as a transit-supported development corridor on the Land Use Policy Map. Transit corridors are designed to accommodate residential development within ¼ of a mile from the designated corridor. Town Centers on Lake Otis Parkway are identified at Dowling and Abbott Roads. Transportation Policies 30, 34, and 37 and Residential Policy 9 of the Anchorage 2020 Implementation Plan support the transit-supported development corridor concept.

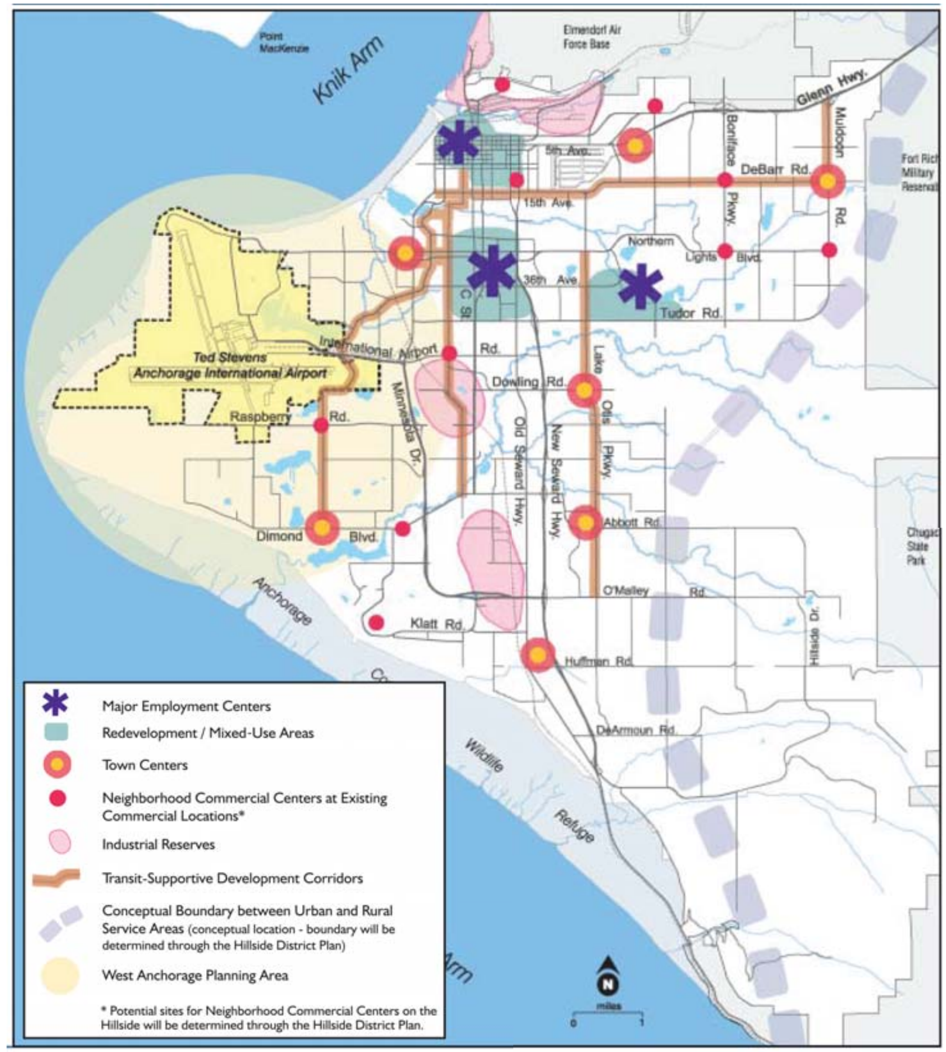


Figure 40. Anchorage 2020 Land Use Policy Map

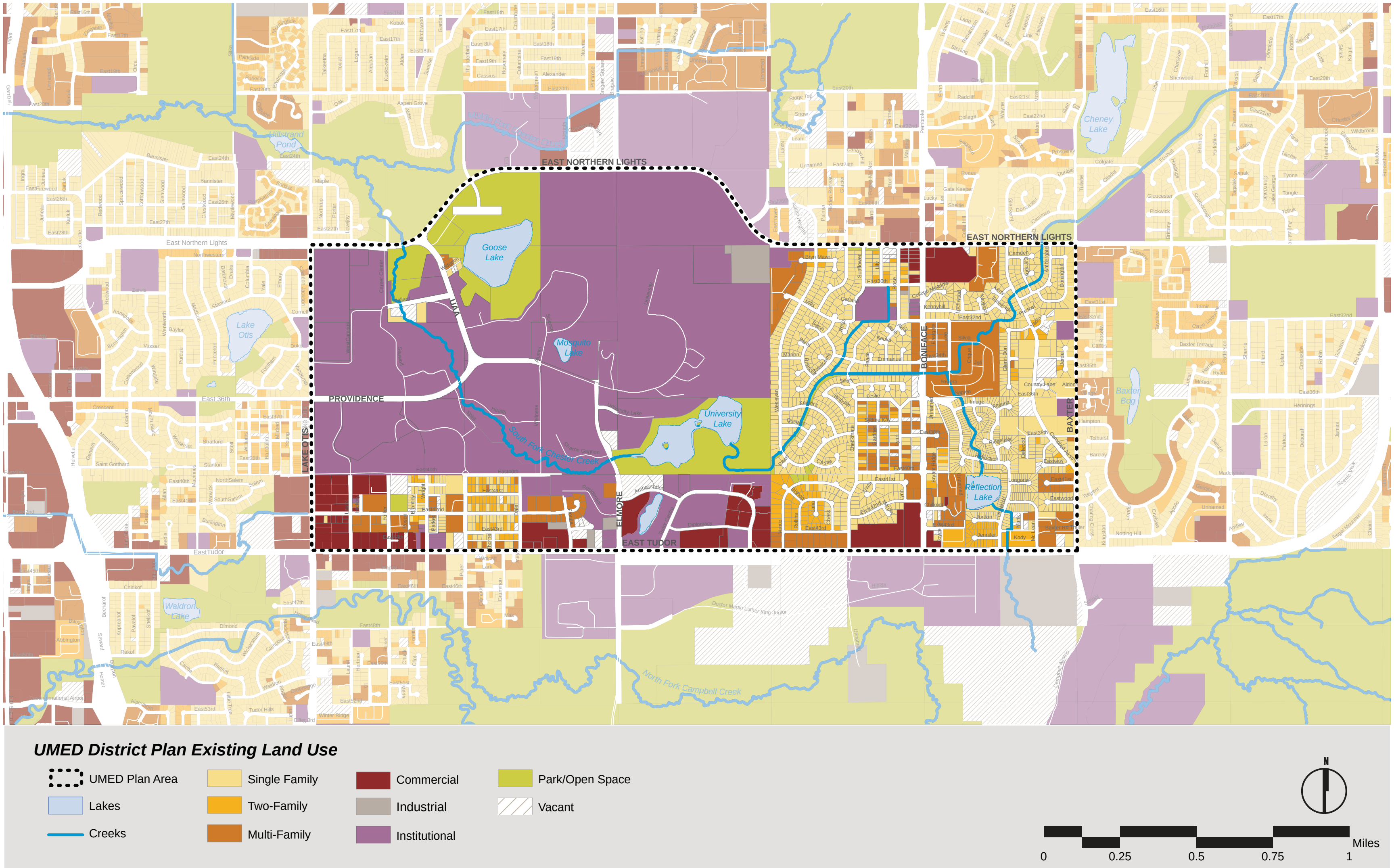


Figure 41. UMED Existing Land Use Map

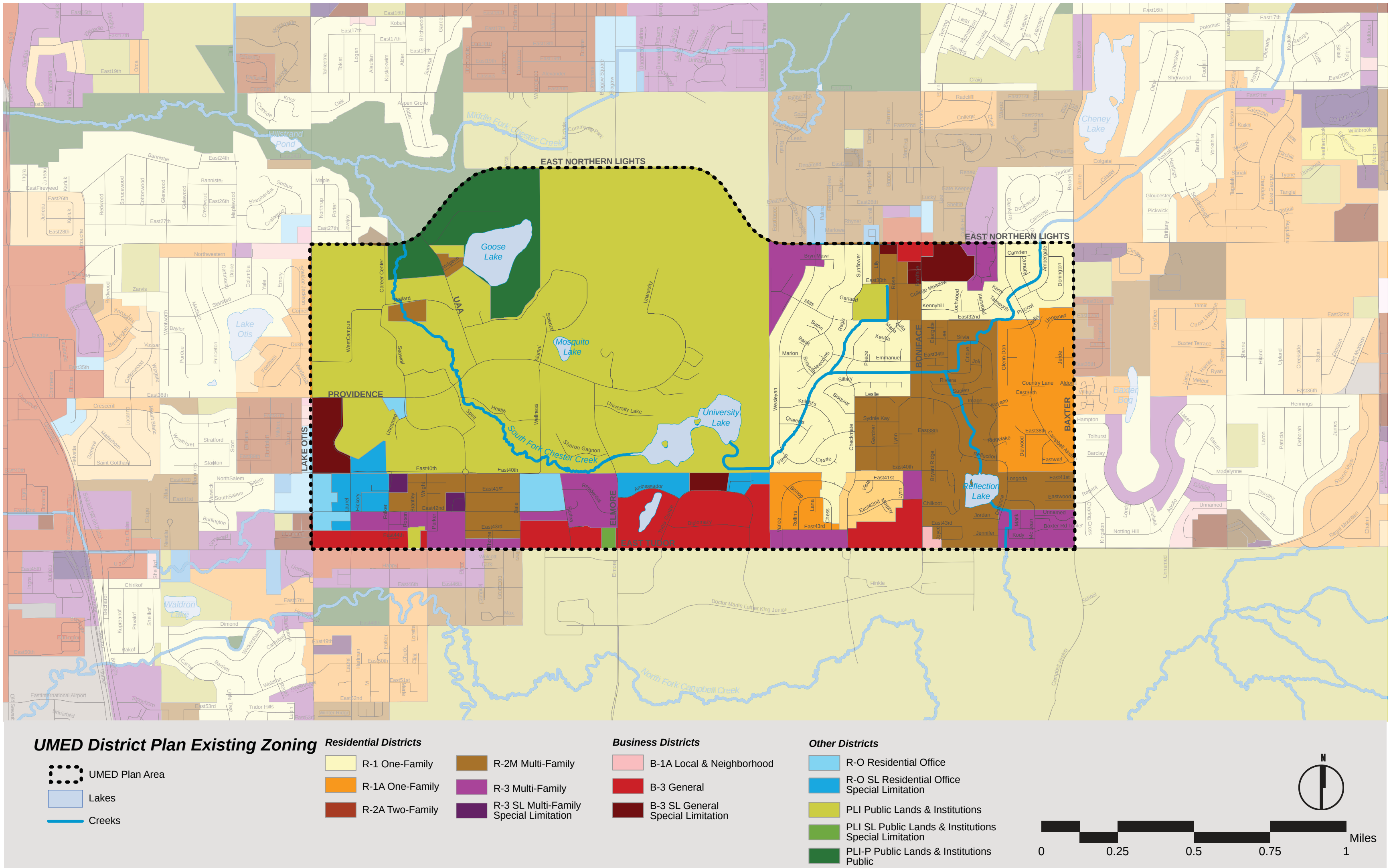


Figure 42. UMED Existing Zoning

TITLE 21

The section of the Municipality of Anchorage municipal code that regulates land use and development is Title 21. This title is intended to protect and enhance the public health, safety, and general welfare of the MOA. To implement Anchorage 2020, the MOA's Community Development Planning Division initiated a rewrite of Title 21 to modernize land use regulations to include development techniques and design standards; to make the code more useable and easier to understand; and to implement recently adopted plans and policies. Assembly Committee Draft Title 21 Chapters were introduced to the Anchorage Assembly on December 18, 2012. The Assembly adopted Title 21 on February 26, 2013, with an effective date of January 1, 2014.

For a detailed breakdown of the zoning classifications as pertains to the UMED District, please see Appendix F.

2035 METROPOLITAN TRANSPORTATION PLAN (MTP)

The Anchorage Metro Area Transportation Solutions (AMATS) is a federally recognized Metropolitan Planning Organization (MPO) created to plan and fund transportation systems in the Anchorage Bowl and the Chugiak-Eagle River areas when federal funds are used. The Federal Highway Administration (FHWA) requires the MPO to have an adopted Metropolitan Transportation Plan (MTP), which must be updated every four years. To comply with FHWA MTP requirements, the AMATS developed the 2035 Metropolitan Transportation Plan (MTP) for the Anchorage Bowl and Chugiak-Eagle River areas in 2012. The Transportation Improvement Program (TIP), is the four-year, financially constrained capital program of transportation projects, funded primarily from gasoline taxes and Federal funding.

The purpose of the 2035 Metropolitan Transportation Plan is to outline goals for the Anchorage Bowl and Chugiak-Eagle River transportation systems and provide a framework by which to guide the TIP. Development of the MTP is guided by land uses outlined in Anchorage 2020 and subsequently adopted District and Neighborhoods plans. The MTP includes recommendations for vehicular, public transportation, and bicycle circulation.

ANCHORAGE BICYCLE PLAN

The Anchorage Bicycle Plan was created to include bicycle travel into the overall transportation planning process and promote the bicycle as a legitimate mode of transportation. The plan aims to expand the existing infrastructure, including parking and wayfinding for bicycling; encourage bicycle usage as a transportation mode; and promote bicycle education and safety. The plan, which was adopted by the Anchorage Assembly in March 2010, identifies a 508-mile, comprehensive network of bicycle paths throughout the MOA. The greenbelt trails that follow major stream corridors, such as the Chester Creek trail located within the UMED District, constitute the majority of this comprehensive trail system. The American Community Survey reported that 1.02 percent of work trips are made by bicycle in Anchorage, which is far greater than the national average of 0.4 percent. Within Anchorage, the most common bicycle destinations coincide with those areas of highest employment or business concentrations: Downtown (32 percent), Midtown (24 percent), and the UMED District (18 percent).

The following recommended action items included in the plan specifically identify the UMED District as an area for improvement. These action items support Goal 5 of the Anchorage Bicycle Plan, to "provide support facilities and amenities designed to enhance the bicycle network and encourage the use of bicycling as a practical transportation system."

POLICY 5.1:

Review zoning codes for bicycle parking to include requirements for bicycle parking well-monitored, lit, secure areas that are protected from the elements and are convenient to the entrances of buildings.

- 5. Work with MOA Planning Department to incorporate a bonus point system that would be adopted for zoning districts to provide consideration of long-term bicycle parking as part of site plan reviews for development within major employment centers—Downtown, Midtown, the UMED District, and town center.

POLICY 5.2:

Include short- and long-term bicycle parking that is covered and protected at public facilities.

- 1. Work with Project Management & Engineering, Transit, and the Anchorage Parking Authority to provide and install secure bicycle storage lockers at park-and-ride locations and Downtown, Midtown, and UMED District Parking facilities.

EAST ANCHORAGE DISTRICT PLAN

Like other areas of Anchorage, East Anchorage will benefit from a district planning effort. A tailored plan that looks at the area's unique residential/commercial mix and transportation issues is being developed, together with implementation strategies that suit the area's character.

The district planning area is located to the northeast of the UMED District, and overlaps into the residential neighborhoods along Boniface Parkway.

This plan is built around six Guiding Principles meant to capture the values and priorities of East Anchorage: Economy, Community and Housing, Equity and Opportunity, Environment, Transportation, and Process Implementation. Recommendations for new trails, "activity centers" locations, road/intersection improvements, residential growth, and design guidelines are outlined in the plan's vision and would directly impact the neighborhoods within the UMED District. A public Review Draft of the plan was released in October 2013.

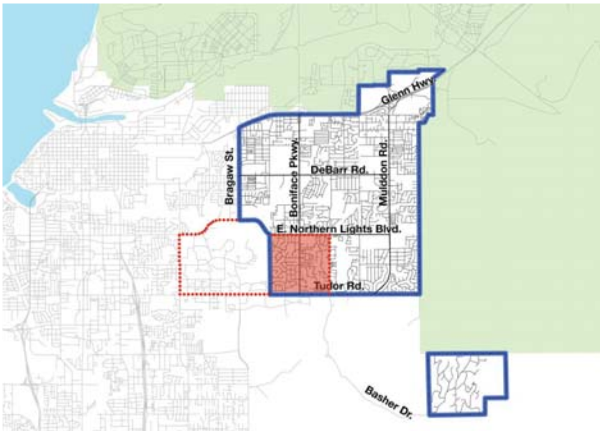


Figure 43. The area in red illustrates the overlap between the UMED District Plan boundary and the East Anchorage District Plan boundary and is not meant to indicate or propose any changes to the current University Area Community Council boundary currently adopted by the Anchorage Assembly.

UMED DISTRICT PLAN UPDATE

These Supporting Documents are one element of the District Plan Update. The Profile Report provides an overview of the key players in the UMED District and summarizes the existing regulatory framework for each. Although not exhaustive, the Profile Report also establishes a baseline of information on which the UMED District Plan Update has been built. The District Plan Update also relies on data gathered from further research and the public outreach process. These various sources of information have identified challenges and opportunities within the District and have subsequently informed the Visions chapter of the District Plan Update.

Through continued public outreach, case studies, and research, recommendations have been developed to meet the goals and objectives of each Vision. Finally, the recommendations have been organized into a matrix that identifies how easily each may be accomplished, what type of funding may be necessary, and who are the responsible parties.

Figure 44. Cover of the UMED District Plan Update

APPENDICES

APPENDIX A: UMED DISTRICT DESIGN GUIDELINES

ANCHORAGE 2020 DESIGN & ENVIRONMENTAL POLICIES

POLICY NO.	POLICY
41	Land use regulations shall include new design requirements that are responsive to Anchorage's climate and natural setting.
42	2650 E. Northern Lights Boulevard
43	Plans for major commercial, institutional, and industrial developments, including large retail establishments, are subject to site plan review.
44	Design and build public improvements for long-term use.
45	Connect local activity centers, such as neighborhood schools and community centers with parks, sports fields, greenbelts, and trails, where feasible.
46	The unique appeal of individual residential neighborhoods shall be protects and enhanced in accordance with applicable goals, policies, and strategies.
47	Provide distinctive public landmarks and other public places in neighborhoods.
48	Subdivision plats and site development plans shall be designed to enhance or preserve scenic views and other significant natural features in accordance with applicable goals, policies, and strategies.
49	Site plan layout and building design for new development shall consider the character of adjacent development. The Municipality may require layouts and designs to incorporate the functional and aesthetic character of adjacent development.
50	Healthy, mature trees and forested areas shall be retained as much as possible.
51	The Municipality shall define Anchorage's historic buildings and sites and develop a conservation strategy.
52	Site and design residential development to enhance the residential streetscape and diminish the prominence of garages and paved parking areas.
53	Design, construct, and maintain roads to retain or enhance scenic views and improve the general appearance of the road corridor.
54	Design and construct neighborhood roads and walkways to ensure safe pedestrian movement and neighborhood connectivity, and to discourage high-speed, cut-through traffic.
55	Provide pedestrian and trail connections within and between residential subdivisions in new plats, including replats.

Table A. Design policies are excerpted from the Anchorage 2020: Anchorage Bowl Comprehensive Plan.

POLICY NO.	POLICY
56	Anchorage 2020 goals, policies, and strategies shall guide development of the Housing & Community Development Consolidated Plan in terms of the location and density of housing development.
57	Encourage the maintenance and upkeep of existing housing in order to extend its useful life and neighborhood stability.
58	Encourage more affordable housing, including home ownership opportunities for low-income residents.
59	Recognize mobile home parks, co-ops, and common ownership interests as viable, affordable housing choices and neighborhood lifestyle options.
60	Design attractive affordable housing that is suited to its environs.
61	Promote the availability of supportive housing opportunities for the homeless and for persons with special needs.
62	Distribute throughout the Municipality residential facilities that are supported by governmental agencies and operated for health, social services, or correctional purposes.
63	Amend land use regulations and relevant plans to incorporate policies and procedures, management plans, and standards for natural open space. Encourage public/private collaboration methods for natural open space protection.
64	The Municipality shall provide orderly development within Anchorage's coastal zone, protect and enhance its unique natural features and resources, and sustain and enhance coastal access.
65	Promote and encourage the identification and conservation of open spaces, including access to greenbelts, Chugach State Park, Anchorage Coastal Wildlife Refuge, and Far North Bicentennial Park.
66	Fish, wildlife, and habitat protection methods shall be addressed in land use planning, design, and development processes.
67	Critical fish and wildlife habitats, high-value wetlands, and riparian corridors shall be protected as natural open spaces, wherever possible.
68	Water resources and land use planning shall be integrated through the development of watershed plans for Anchorage streams.
69	The Municipality shall preserve the functions and values of important wetlands, and manage the proper use of low-value wetlands with General Permits, as delineated in the Anchorage Wetlands Management Plan.
70	The ecological and drainage functions of Anchorage's aquatic resources shall be protected and, where appropriate, restored.
71	Utilize wetlands to manage drainage and improve water quality, where appropriate.
72	The Municipality shall minimize the incidence of new developments for human occupancy in high natural hazard areas.

U-MED FRAMEWORK MASTER PLAN (2003) DESIGN GUIDELINES

The following design guidelines are excerpted from the Universities and Medical District Framework Master Plan published in 2003 (pg. 40).

PUBLIC INFRASTRUCTURE

Ensure thoughtful direction and timing of public investments in infrastructure to leverage private investments in ways that will benefit the District as a whole.

- Sequence implementation of District public improvements to:
  - stimulate reciprocal private development,
  - enhance the existing open space and trail system, and
  - address immediate and long-range circulation needs.
- Maximize opportunities for shared use and funding of infrastructure projects throughout the District.

INSTITUTIONAL AND PRIVATE DEVELOPMENT

Provide owners and developers with a policy framework that will ensure proper coordination of all improvements with one another and with the plans for adjacent properties. Place a high value on irreplaceable natural features.

- Design and sequence development so that the natural qualities of the district are protected. All development should be consistent with the Plan's identified land classifications:

- Redevelopment Priority
- Development Priority
- Development Reserve
- Preservation Open Space
- Institutional
- Residential
- Mixed-Use Commercial

GATEWAYS

Acknowledge, through design and signage, the points of entry to the District and to institutions within it.

- Treat Bragaw Street, UAA Drive and Providence Drive as principal gateways into the District.
- Treat Tudor Centre, Providence East, Seawolf Drive, Dale Street, Piper Street, Florina Street, Wright Street, Cornell Court, E. 40thAvenue, E. 42nd Avenue, and MLK Learning Center Drive as entrances to campuses and other properties.

ENTRANCE AND ORIENTATION

Simplify way-finding by clearly identifying major destinations throughout the District.

- Provide each campus entry with a permanent monument and landscape treatment appropriate to its context.
- Coordinate standards for lighting, street furnishings and signage throughout the District to create a consistent and understandable circulation system.
- Extend direction-finding signage to trails where appropriate.

MIX AND ARRANGEMENT OF USES

Reduce the need for vehicular trips by encouraging service, retail and other support functions close to places of work, residence and study in the District.

- Encourage a mix of uses within blocks and, where feasible, within buildings.
- Public attractions should be located so that public access and activity do not disrupt every day users of the District.
- Attractions should be designed to complement the natural setting of the District and should be compatible with adjacent uses.

- Expand the local street and pedestrian circulation systems throughout the District to accommodate direct access between facilities

BUILDING MASS

Configure each building to be compatible in scale with adjacent natural and built features.

- Design buildings so that their apparent bulk does not overwhelm the size and character of nearby buildings, woodlands and other open spaces, and trails.
- Protect solar access to significant public open spaces by limiting the height of buildings to the south.
- Avoid features such as large blank walls that increase the apparent bulk of a building.

BUILDING ORIENTATION

Orient buildings to face streets and other public spaces and to conserve energy.

- Encourage active ground floor uses along pedestrian routes.
- Orient buildings and related structures to maximize shared views.
- Provide balconies, terraces, lobbies and entrances facing parks, plazas and special streets.
- Provide links from plazas and courtyards to major open spaces.
- Face doors and windows towards public open spaces. Avoid turning the back of any development on public open space.
- Configure windows to capitalize on natural light and avoid solar gain in summer.
- Coordinate building design with existing trees and other natural features to provide shelter from prevailing winds.
- Orient buildings to create favorable micro-climates for new and existing landscape, and to protect building entrances and usable outdoor spaces.

BUILDING ARTICULATION

Reconcile the need for improved local access between campuses and support facilities with the established character of District development.

- Site and articulate new campus buildings to reinforce the center of each campus as a walkable environment.
- In residential portions of the District, maintain a sense of traditional blocks, street walls and intersections within the established street system.
- Avoid development of remote facilities that would subdivide natural areas.

PUBLIC ART

Enrich the maturing urban environment by integration of art in its public spaces.

- Integrate public art into the development projects.
- Use regional and local themes in selecting public art.
- Scrutinize the suitability of art objects, especially memorials, introduced to public spaces for their possible influence on future improvements.

MATERIALS AND SIGNAGE

Set a precedent for future development with the quality of signage and of conspicuous building materials. It is important that consistent, high quality be maintained.

- Use building materials that suggest permanence and dignity and that are appropriate for Alaska.
- Develop specific guidelines for each institution and the neighborhood development (commercial and residential). For non-

institutional development, these may take the form of Covenants, Conditions and Restrictions [CC&Rs].

HIERARCHY OF OPEN SPACES

Provide for a full range of open space needs in the District. The primary value of some natural space is as undisturbed habitat. At the other extreme are open spaces designed for active recreation. The District is capable of meeting both of these needs and many less clearly defined and shared uses.

- Provide passive and active public open space in the District.
- Consider the relationships between primary and secondary open spaces in the senses of public access, size, habitat uses, and other specialized uses such as nordic skiing and snowshoeing.
- Connect all public open spaces with a network of pedestrian pathways as components of an open space system that extends beyond the individual institutions to the adjacent neighborhood.
- Integrate private open spaces with the public access system to the extent that compatibility with other private uses permits.

LANDSCAPE BUFFERS

Protect natural areas from inappropriate access, from 'visual pollution' such as an open view of a parking lot, and from untreated runoff from developed areas. Natural areas, especially those designated as Preservation Open Space, merit special protection, which can be provided in part by planted buffers.

- Favor use of native plant materials, but ensure that view corridors will not be obstructed when trees and shrubs approach maturity.
- Conserve and integrate established native plants in the disturbed areas near development.

NATIVE LANDSCAPES

Reinforce the natural landscape and ecology of the District by use of appropriate materials and techniques.

- Emphasize native plantings in naturalistic patterns.
- Coordinate native plantings adjacent to habitat corridors with mixed plantings in associated streets and open spaces.
- Protect steep slopes from erosion.
- Protect and restore existing wetlands.
- Maintain campus safety and security through selective trimming or removal of trees and shrubs. Avoid use of tall, dense plantings that obstruct sight lines.
- Use native plantings to protect nesting areas and other sensitive habitat from human access.

HABITAT PROTECTION

Protect surviving native flora and fauna in the District and encourage their continued presence.

- Maintain existing wildlife corridors linkage among habitat areas.
- Restrict pedestrian access to sensitive areas.
- Minimize the widths of disturbance zones when constructing trails.
- Identify and protect especially vulnerable plant and animal habitats.

RECREATIONAL FACILITIES (TRAILS, BEACHES AND SPORTS FIELDS)

Integrate recreational facilities with the circulation system to provide access for all who live or work in the District.

- Complete the system of local streets and trails to interconnect the other primary public open spaces.
- Vary the spatial experience along trails in response to orientation and to natural and built features.
- Configure and landscape the trails and contiguous private open spaces to create a

series of connected yet discrete open spaces, each related to buildings and capitalizing on views.

- Provide public access to the trails.
- Celebrate significant points of connection of the trails.
- Maintain the integrity of ski trails over or under vehicular streets.
- Connect campus local trails to the regional trail system.

ROADWAYS

Design the circulation system to serve all users. In the past, some streets have been built to meet only vehicular needs, conflicting directly with the principles of the current plan.

- Design every street to accommodate automobiles, transit, bicycles and pedestrians equitably.
- Design streets to encourage driving at appropriate speeds, making appropriate use of traffic calming measures.
- Design roads and driveways to conform with the existing topography, minimizing cutting and filling, yet adhering as closely as possible to transit gradient and turning parameters.
- Provide direct connections to the trail system.
- Accommodate the needs of transit to serve major destinations in the District effectively.

TRANSPORTATION MANAGEMENT

Manage vehicular movements in the District to meet access needs without compromising uses or environmental quality.

- Promote the use of transit, walking, bicycling and skiing for circulation to and within the District.
- Maintain equity between modes within streets and intersections throughout the District.
- Manage parking on campuses to encourage carpooling.
- Control street intersections to regulate vehicular flows to acceptable levels.
- Minimize conflicts between vehicles and pedestrians by introducing controls at busy crossing points.

PUBLIC TRANSIT

Promote public transit as a viable mode of travel within and beyond the District.

- Provide transit routes and stops that give public transit priority over other vehicles.
- Provide convenient transit stops that are close to destinations and include adequate seating, shelter and other furnishings as appropriate.

PEDESTRIAN AND BICYCLE ACCESS

Expand the circulation system to provide safe and convenient access on foot and bicycle between all major destinations within and adjacent to the District.

- Seek opportunities to establish pedestrian connections between the campus and the adjacent neighborhoods.
- Design streets in the adjacent neighborhood that encourage pedestrian use.
- Direct pedestrian and bicycle traffic to street crossings with adequate sight distances and appropriate traffic controls.
- Provide sidewalks on both sides of every street.
- Identify and respond to the needs on each sidewalk for pedestrian through-zone width, building frontage zone, furnishing zone, curb and loading zone dimensions.
- Connect all streets to others at both ends to create a flexible grid. Similarly, connect all sidewalks, trails and walkways to one another or to building entrances
- Provide safe off-street, short-cut pedestrian connections where possible.

SERVICE ACCESS

Provide access for service vehicles that is discrete yet efficient.

- Locate service, drop-off and pick-up areas away from corners and major building entries, so that they minimize disruption to vehicular and pedestrian traffic patterns.
- Discourage loading, service and parking access from primary pedestrian streets and trails.
- Ensure adequate sight lines for maneuvering service vehicles.

PARKING FACILITIES

Locate and configure parking facilities for convenience without undue visibility. They should be less dominant in the landscape than occupied buildings or major landscape features.

- Provide convenient but inconspicuous parking.
- Minimize frontage areas used for surface parking.
- Provide landscape buffers between roadways and parking lots.
- Limit parking areas so they are not immediately visible from the municipal trails.
- Provide adequate but not excessive parking at designated access points to trail system.
- Lay out surface parking with clear and direct pedestrian access routes.
- To the extent practicable, use shared parking facilities.
- Discourage parking entrances and exits on pedestrian-oriented streets or close to corners.
- Buffer structured parking at street level with active, pedestrian-oriented uses or landscaping.
- Wherever practicable, locate parking facilities out of public view on the perimeter of campuses to reduce conflicts with pedestrians.

APPENDIX B: WETLAND MANAGEMENT BEST PRACTICES

The following Wetland Management Best Practices are excerpted from the Draft Anchorage Wetlands Management Plan Revision, dated March 2012.

DRAINAGE IMPACT ANALYSIS

When required as a specific permit condition or as deemed necessary for municipal reviews, a Drainage Impact Analysis (i.e., hydrogeologic analysis) shall be supplied by the applicant to the Municipality of Anchorage's Community Development Department with consultation by MOA-Watershed Management Section. Information for this analysis includes, but is not limited to:

- Estimates of surface and subsurface water movement within and into the subject property;
- Delineation of estimated on-site and off-site drainage impacts of the fill;
- Outline of mitigating factors to offset adverse impacts;
- Soil types, depth to groundwater, and seasonal water table information;
- Existing topographic delineation and general surface drainage patterns;
- Location of permanent and ephemeral watercourses and water bodies greater than 100 sq ft;
- How development within and adjacent to the subject wetland may be affected by groundwater intrusion as a result of the proposal.
- *Note: The Drainage Impact Analysis provided by the applicant should include information, which conforms, at a minimum, to municipal policies in the most current municipal Design Criteria Manual.

SITE DRAINAGE PLAN

To evaluate and reduce the potential for groundwater intrusion and impacts to existing local hydrology, the following information shall be required when indicated in Table 4, or otherwise as a condition of a General Permit. This information may be applicable concerning both construction and full build-out of the project:

- Identification of final surface drainage directions for a finished development;
- Location and types of existing and proposed constructed and natural drainage facilities/ features, including sub-drains, culvert size and catch basins, and location of connections and elevations where new drainage features tie into existing storm drains. Also, location and measurements of retained natural drainage features;
- Identification and location of water quality treatment measures and facilities and levels/ standards of water quality intended to be achieved with treatment;
- Location and types of necessary dewatering controls (ditches, ditch blocks, etc.) to be used in construction and as part of finished design, to ensure maintenance of remaining wetland hydrology.

WATER QUALITY CONTROL PLAN

A water quality control plan shall be submitted for all wetland construction projects and shall indicate, as necessary:

- Measures that will be taken during construction for water quality maintenance. These measures must include, but are not limited to:
    - Placement of perimeter silt fence or other sediment control devices at the toe of any exposed fills;
    - Identification of the location, size, and depth, of stormwater and construction site runoff treatment settling ponds;
    - Identification of the location and type(s) of outlet features of water treatment for settling ponds, e.g., filtering swales; and
    - Identification of temporary construction and fill slope stabilization measures.

- Measures that will be taken (by the applicant) for long-term site stabilization, including:
  - Minimum 2.5:1 slopes of fill which face or abut unfilled wetlands;
  - Slope blankets; and
  - Revegetation plans for exposed fills and slopes, including maintenance, as necessary.

SITE RESTORATION AND STABILIZATION

The following measures shall be included in any restoration plan submitted by an applicant, where the original wetland is being restored or enhanced:

- Final grading plan of disturbed and restored wetlands shall match remaining natural grades, or original grades as closely as practicable;
- Include revegetation plan for disturbed fills and wetlands. Shall utilize native species per original condition to maximum extent practicable, and/or match guidelines of the Municipality of Anchorage Standard Specifications (M.A.S.S.).
- Shall include topsoil placement, as necessary, on poorer soil areas, e.g., peat or silt, to insure revegetation.
- Proposed coverage of revegetation plans: recommend 90 percent coverage after one season, plus appropriate maintenance and replacement scenarios. Consult with the current M.A.S.S. for the latest applicable guidelines. Site specific guidelines may be required.

MINIMIZATION AND HABITAT AVOIDANCE

The following measures shall be included in design plans for General and Individual Section 404 Permits in order to minimize or avoid disturbance to wetlands and to wildlife use of an area:

- Cluster housing design [or Conservation Subdivision per Provisionally Adopted Code (May, 2010) 21.08.070] and transition buffer standards, following the Anchorage Municipal Code (Section 21.45), shall be used wherever feasible and prudent to modify residential densities in order to avoid fills in key wetland areas.
- Whenever practicable, commercial or residential subdivision design shall incorporate key wetland areas in separate tracts as open space or under other nondevelopment designations.
- In larger wetlands, subdivision development and fills shall be phased, where possible, to minimize impacts. Phasing shall begin at the portion of a wetland furthest from known sections of higher value wetlands.
- General Permit and Individual Permit authorizations shall contain timing restrictions for fills, during the period from April 15 to July 15 in an effort to minimize impacts on nesting and migrant waterbirds.

ADDITIONAL INFORMATION

Unless otherwise specified, when additional information or site analysis (e.g., drainage analysis, wetland delineation, avoidance measures) is required in Table 4, such information shall be provided by the applicant at the time of permit application.

MITIGATION TECHNIQUES

The process outlined in this section and identified Enforceable Policies shall be used as the Municipality's key mitigation techniques. Where additional mitigation, beyond these key techniques, is considered during a Section 404 Review, then the mitigation shall be considered in the following order of preference according to EPA's standard for mitigation sequencing. The costs and engineering feasibility, relative to the benefit to the resource, shall be considered in the implementation of this policy. Additional information on mitigation can be found in Chapter 6 of this plan. The standard mitigation sequence is:

- AVOID: Avoiding the adverse impacts altogether by not taking a certain action;
- MINIMIZE: Minimizing impacts by limiting the degree or magnitude of the action;
- COMPENSATION: Compensating for the impact by replacing or providing substitute resources or environments through:
    - Rectifying the impact by repairing, rehabilitating or restoring the affected environment;
    - Create or establish new wetlands where they did not exist before;
    - Enhancement of existing degraded wetlands improving one or more of their functions.
    - Preservation of wetlands in perpetuity using a conservation easement or other mechanism.
    - Mitigation Banking allows developers who will incur wetland impacts to compensate by purchasing credits from a wetland mitigation bank prior to filling wetlands. Mitigation Banks basically preserve wetlands and sell the credits for a fee established by the bank.
    - In-lieu-fee mitigation allows payment of a set fee to compensate for wetland impacts assessed by the Anchorage Debit-Credit Methodology or other method accepted by the Corps of Engineers. Fees are used to purchase wetlands to be preserved or to enhance or restore existing wetlands;

APPENDIX C: RETAIL DEMAND METHODOLOGY

RETAIL DEMAND METHODOLOGY

Retail demand was calculated separately for workers, students and households. In all cases, the methodology followed the same basic steps outlined below.

- Estimate existing worker, student and household populations in the planning area.
- Use existing data sources to estimate average annual spending patterns for a single worker, student or household.
- Apply a local capture rate by retail category to estimate the amount of spending that will take place in the UMED district.
- Multiply UMED district spending per worker/student/household by the total worker/student/household population to arrive at total UMED district annual retail sales.
- Translate UMED district annual retail sales into supportable retail area by dividing the total sales by sales category by typical sales per square foot for each retail category.

The following pages describe the data sources and assumptions used for each stage of the calculations.

EMPLOYEE RETAIL SPENDING

The current number of workers in the UMED district was obtained from 2010 employment data from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) Program.

Worker spending patterns were obtained from a national survey conducted in 2011 by the International Council of Shopping Centers (ICSC).[13] The survey asked 4,000 U.S. office workers across a range of incomes and occupations to report on one week's worth of expenditures near their workplace. Workers were assumed to have two weeks of vacation each year during which no retail spending takes place near the workplace.

To account for the fact that the UMED district will not contain all types of retail included in the ICSC survey, a capture rate was applied to spending pattern data. For example, employee spending at quick-service restaurants and coffee shops is likely to take place almost entirely within the neighborhood. On the other hand, because the area is not a strong location for regional-serving retail, it is unlikely that employees will have the opportunity to make significant expenditures on electronics and apparel in the UMED District area.

Applying the capture rate assumptions to employee and worker spending patterns, the average worker or student is expected to spend approximately $2,200 per year on neighborhood retail and services. See Figures C1.

STUDENT RETAIL SPENDING

The number of full-time equivalent students at UAA and APU was obtained from information provided by the respective institutions.

Because UAA and APU are primarily commuter campuses, students were assumed to have the same spending patterns as workers, but with 19 weeks of vacation instead of two.

Capture rates were the same as those assumed for workers. Applying the capture rate assumptions to student spending patterns, the average student is expected to spend approximately $1,500 per year on neighborhood retail and services. See Figure C2.

HOUSEHOLD RETAIL SPENDING

The existing households in the UMED district are based on U.S. Census data from the 2007-2011 American Community Survey. In addition to these households, Strategic Economics counted the residential population living in group quarters and divided this number by the average size of the households used to determine household spending patterns.

Average annual retail spending for UMED residents was derived from 2010-2011 Consumer Expenditure Survey, West Region, conducted by the U.S. Bureau of Labor Statistics.

To account for the fact that only a portion of household spending will take place in the UMED district, a capture rate was applied to spending pattern data. The capture rates reflect the anticipated local-serving nature of retail in the neighborhood.

Applying the capture rate assumptions to household spending patterns, the average UMED district household is expected to spend approximately $4,500 per year on neighborhood retail and services. See Figure C3.

TRANSLATING RETAIL SALES INTO SUPPORTABLE RETAIL AREA

Assumptions regarding sales per square foot by type of retail establishment are based on information from the Dollars and Cents of Shopping Centers 2008, published by the Urban Land Institute. Dollar amounts were inflation adjusted to match spending pattern data. See Figure C4.

Figure C1. UMED District Worker Spending Patterns

CATEGORY	AVERAGE WEEKLY EXPENDITURES PER WORKER	AVERAGE ANNUAL EXPENDITURES	UMED AREA CAPTURE RATE	ESTIMATED UMED ANNUAL RETAIL SALES PER WORKER
Full-Service Restaurants	$13.06	$627	35%	$219
Fast Food/Lunch Eateries	$15.80	$758	75%	$569
Department Stores	$9.03	$433	0%	$0
Discount Stores	$9.03	$544	25%	$136
Drug Stores	$7.60	$365	50%	$182
Grocery Stores	$21.58	$1,036	50%	$518
Clothing Stores	$4.43	$213	10%	$21
Shoe Stores	$3.40	$163	10%	$16
Sporting Goods Stores	$3.49	$168	10%	$17
Electronics	$8.93	$429	10%	$43
Jewelry Stores	$3.75	$180	0%	$0
Office Supplies/Stationery	$7.41	$356	50%	$178
Warehouse Clubs	$12.32	$591	0%	$0
Other Goods (florist, etc.)	$3.75	$180	15%	$27
Personal Care Shops	$5.76	$276	30%	$83
Personal Services	$4.97	$239	30%	$72
Other Services	$4.90	$235	30%	$71
Entertainment	$5.01	$240	25%	$60
Total Retail and Food Services	$146.52	$7,033		$2,212

Figure C2. UMED District Student Spending Patterns

CATEGORY	AVERAGE WEEKLY EXPENDITURES PER STUDENT	AVERAGE ANNUAL EXPENDITURES	UMED AREA CAPTURE RATE	ESTIMATED UMED ANNUAL RETAIL SALES PER STUDENT
Full-Service Restaurants	$13.06	$431	35%	$151
Fast Food/Lunch Eateries	$15.80	$521	75%	$391
Department Stores	$9.03	$298	0%	$0
Discount Stores	$11.30	$374	25%	$93
Drug Stores	$7.60	$251	50%	$125
Grocery Stores	$21.58	$712	50%	$356
Clothing Stores	$4.43	$146	10%	$15
Shoe Stores	$3.40	$112	10%	$11
Sporting Goods Stores	$3.49	$115	10%	$12
Electronics	$8.93	$295	10%	$29
Jewelry Stores	$3.75	$124	0%	$0
Office Supplies/Stationery	$7.41	$245	50%	$122
Warehouse Clubs	$12.32	$407	0%	$0
Other Goods (florist, etc.)	$3.75	$124	15%	$19
Personal Care Shops	$5.76	$190	30%	$57
Personal Services	$4.97	$164	30%	$49
Other Services	$4.90	$162	30%	$49
Entertainment	$5.01	$165	25%	$41
Total Retail and Food Services	$146.52	$4,835		$1,521

Figure C3. UMED District Household Spending Patterns

CATEGORY	AVERAGE WEEKLY EXPENDITURES PER HOUSEHOLD	UMED AREA CAPTURE RATE	ESTIMATED UMED ANNUAL RETAIL SALES PER HOUSEHOLD
Full-Service Restaurants	$1,576	20%	$315
Fast Food/Lunch Eateries	$1,811	20%	$362
Department Stores	$896	0%	$0
Discount Stores	$0	0%	$0
Drug Stores	$897	50%	$448
Grocery Stores	$4,736	50%	$2,368
Clothing Stores	$1,563	10%	$156
Shoe Stores	$363	10%	$36
Sporting Goods Stores	$1,234	10%	$123
Electronics	$1,627	10%	$163
Jewelry Stores	$0	0%	$0
Office Supplies/Stationery	$0	0%	$0
Warehouse Clubs	$0	0%	$0
Other Goods (florist, etc.)	$0	0%	$0
Personal Care Shops	$739	30%	$222
Personal Services	$568	30%	$170
Other Services	$870	0%	$0
Entertainment	$757	20%	$151
Total Retail and Food Services	$17,637		$4,516

Figure C4. Sales per Square Foot Assumptions

CATEGORY	SALES PER SQUARE FOOT (2011 DOLLARS)
Full-Service Restaurants	378
Fast Food/Lunch Eateries	431
Department Stores	125
Discount Stores	263
Drug Stores	464
Grocery Stores	525
Clothing Stores	252
Shoe Stores	208
Sporting Goods Stores	239
Electronics	327
Jewelry Stores	328
Office Supplies/Stationery	191
Warehouse Clubs	263
Other Goods (florist, etc.)	268
Personal Care Shops	191
Personal Services	191
Other Services	319
Entertainment	83

APPENDIX D: ZONING CLASSIFICATIONS TABLE

ZONING CLASSIFICATION	DISTRICT REQUIREMENTS
B-1A LOCAL AND NEIGHBORHOOD BUSINESS DISTRICT Minimum area of district is 11,500 sq ft Maximum area is 2.0 Acres	Permissible Uses: Business, food service kiosk, farmers market, several retail uses, health services, dwelling mixed use Density DU/AC: Lot Coverage: 6,000sqft FAR: 0.5 Setbacks: F= Min 0', Max 20' a minimum of 30% of the street facing building elevation shall be within the maximum set back, S= 10' if adjacent to residential district, 0' or 5' min, R=15' if abutting a residential district, otherwise 10" Height Limit: 30' +5' for ground level retail additional first story height, not to exceed two stories Max lot coverage: 50% Parking Requirements: See B-3 for general parking requirements summary by use Up to 5% reduction allowed
B-1A SL 1A LOCAL AND NEIGHBORHOOD BUSINESS DISTRICT (appears to be outside of UMED) Minimum area of district is 11,500 sq ft Maximum area is 2.0 Acres	Permissible Uses: Business, restaurants, food service kiosk, farmers market, several retail uses, dwelling mixed use, health services, Density DU/AC: Lot Coverage: 6,000sqft FAR: 0.5 Setbacks: F= Min 0', Max 20' a minimum of 30% of the street facing building elevation shall be within the maximum set back, S= 10' if adjacent to residential district, 0' or 5' min, R=15' if abutting a residential district, otherwise 10" Height Limit: 30' +5' for ground level retail additional first story height, not to exceed two stories Max lot coverage: 50% Parking Requirements: See B-3 for general parking requirements summary by use Up to 5% reduction allowed

ZONING CLASSIFICATION	DISTRICT REQUIREMENTS
B-3 GENERAL BUSINESS DISTRICT (priority classification)	Permissible Uses: Business and R-4 Residential (subject to FAR provisions in 21.04.0201.2c), Assisted Living 9+ residents, nursing facility, movie theater, night club, general outdoor recreation, fitness recreation and sport center, major entertainment facility, amusement establishment, bar, farmers market, all named retail uses, research laboratory, hospital, health services, commercial food production, college or university, transit center, Density DU/AC: 35+ 110 Lot Coverage: 6,000sqft FAR: 0.5 or unrestricted for mixed use and non residential uses Setbacks: F=10' for residential, Min 0', Max 20' a minimum of 50% of the street facing building elevation shall be within the maximum set back, S= 5' + 1' for each 5' in height exceeding 35' for residential, 10' if adjacent to residential district, 0' or 5' min, R= 10' if residential, 15' if abutting a residential district, otherwise 10' Height Limit: 45' +5' for ground level retail additional first story height Parking Requirements: Health Services1per250sfgfa, Restaurant, bar 1per100sfgfa,Office 1per 350sfgfa, nursing facility 1per 4 beds, hospitals 1per 2 beds= 1 per 350sfgfa office and admin., general retail, 1per 350sfgfa, Grocery store 1per 250sfgfa, Hotel .9 per guest room +1 per 4 persons in meeting rooms, extended stay 1 per one bedroom unit, 1.25 per 2 bedroom unit, 1.5 per three bedroom unit +1 per 4 persons in meeting rooms, theater company, dinner theater and movie theater 1 per 4 persons Per section 21.07.090: Credits given for various uses, site planning consistent with MOA certain urban design and planning objectives. Shared parking studies and credits are also allowed under certain circumstances. Up to 5% reduction allowed

ZONING CLASSIFICATION	DISTRICT REQUIREMENTS
B-3 SL(?)GENERAL BUSINESS DISTRICT (priority classification)	Permissible Uses: Business and R-4 Residential (subject to FAR provisions in 21.04.0201.2c), Assisted Living 9+ residents, movie theater, night club, general outdoor recreation, fitness recreation and sport center, major entertainment facility, amusement establishment, bar, farmers market, all named retail uses, research laboratory, health services, commercial food production, college or university, transit center, Density DU/AC: 35+ 110 Lot Coverage: 6,000sqft FAR: 0.5 or unrestricted for mixed use and non residential uses Setbacks: F=10' for residential, Min 0', Max 20' a minimum of 50% of the street facing building elevation shall be within the maximum set back, S= 5' + 1' for each 5' in height exceeding 35' for residential, 10' if adjacent to residential district, 0' or 5' min, R= 10' if residential, 15' if abutting a residential district, otherwise 10" Height Limit: 45' +5' for ground level retail additional first story height Max lot coverage: 50% for residential (unrestricted for mixed use and other uses) Parking Requirements: See B-3 for general parking requirements summary by use Up to 5% reduction allowed
PLI PUBLIC LANDS AND INSTITUTIONS (priority classification)	Permissible Uses: Business or professional office, commercial food production, farmers market, dormitories as accessory use, assisted living 9+ residents, general outdoor recreation, major entertainment facility, restaurant, research laboratory, snow disposal site, college or university, nursing facility, hospital/health care facility, health services, transit center, Density DU/AC: Lot coverage: 45% Setbacks: F, S, R = 25' when abutting district is DR, PR, PLI or residential or = min setback of abutting district Height Limit: 75' in UMED greater heights may be approved by major site plan review or through an institutional master plan Parking Requirements: See B-3 for general parking requirements summary by use

ZONING CLASSIFICATION	DISTRICT REQUIREMENTS
PLI SL PUBLIC LANDS AND INSTITUTIONS	Permissible Uses: Business or professional office, commercial food production, farmers market, assisted living 9+ resident, general outdoor recreation, major entertainment facility, restaurant, research laboratory, snow disposal site, college or university, nursing facility, health services, hospital/health care facility, transit center, Density DU/AC: Lot Coverage: 45% FAR: Setbacks: F, S, R = 25' when abutting district is DR, PR, PLI or residential or = min setback of abutting district Height Limit: 75' in UMED greater heights may be approved by major site plan review or through an institutional master plan Parking Requirements: See B-3 for general parking requirements summary by use
PLI-P PUBLIC LANDS AND INSTITUTIONS	Permissible Uses: Business or professional office, commercial food production, farmers market, assisted living 9+ resident, general outdoor recreation, major entertainment facility, restaurant, research laboratory, snow disposal site, college or university, nursing facility, hospital/health care facility, health services, transit center, Density DU/AC: Lot Coverage: 45% FAR: Setbacks: F, S, R = 25' when abutting district is DR, PR, PLI or residential or = min setback of abutting district Height Limit: 75' in UMED greater heights may be approved by major site plan review or through an institutional master plan Parking Requirements: See B-3 for general parking requirements summary by use

ZONING CLASSIFICATION	DISTRICT REQUIREMENTS
R-1 SINGLE-FAMILY RESIDENTIAL DISTRICT	Permissible Uses: Single family homes, snow disposal site, Density DU/AC: 1-5 8 Minimum lot area: 6,000sqft Maximum lot coverage: 30% Setbacks: F= 20, S=5 R=10 Height Limit: 30' +5 Parking Requirements: 2 per DU up to 2.400Sqft, 3 per DU over 2,400sqft
R-1A SINGLE-FAMILY RESIDENTIAL DISTRICT (LARGER LOT)	Permissible Uses: Single family homes, snow disposal site, Density DU/AC: 1-4 6 Minimum lot area: 8,400sqft Maximum lot coverage: 30% Setbacks: F= 20, S=5 R=10 Height Limit: 30' +5 Parking Requirements: 2 per DU up to 2.400Sqft, 3 per DU over 2,400sqft
R-2A TWO-FAMILY RESIDENTIAL DISTRICT (LARGER LOT) (priority classification) Inconsistencies with Campbell Airstrip Road neighborhood)	Permissible Uses: Single and duplex residences, snow disposal site, Density DU/AC: 5-7 10 if clustered 12 Minimum lot area: 6,000sqft (3,500 sqft for single family residence) Maximum lot coverage: 40% Setbacks: F= 20, S=5 R=10 Side not applicable on common lot line Height Limit: 30' +5 Parking Requirements: Single family detached 2 per DU up to 2.400Sqft, 3 per DU over 2,400sqft, 1 per studio or efficiency or one bedroom +,5 for each additional bedroom + guest parking

ZONING CLASSIFICATION	DISTRICT REQUIREMENTS
R-2A TWO-FAMILY RESIDENTIAL DISTRICT (appears to be outside of UMED)	Permissible Uses: Single family and duplex residences, assisted living 9+ residents, snow disposal site, Density DU/AC: 5-8 16 if clustered 15 Minimum lot area: 6,000sqft (3,500 sqft for single family residence) Maximum lot coverage: 40% Setbacks: F= 20, S=5 R=10 Side not applicable on common lot line Height Limit: 30' +5 Parking Requirements: Single family detached 2 per DU up to 2.400Sqft, 3 per DU over 2,400sqft, 1 per studio or efficiency or one bedroom +,5 for each additional bedroom + guest parking
R-2M MIXED RESIDENTIAL DISTRICT	Permissible Uses: Single family and duplex residences, assisted living 9+ residents, snow disposal site, Density DU/AC: 5-15 19 if clustered 22 Minimum lot area: 6,000sqft (3,500 sqft for single family residence, 2,500 sqft for townhouse) Maximum lot coverage: 40% Setbacks: F= 20, S=5 R=10 Side not applicable on common lot line, additional standards apply for different building types Height Limit: 30' +5 Parking Requirements: Single family detached 2 per DU up to 2.400Sqft, 3 per DU over 2,400sqft, 1 per studio or efficiency or one bedroom +,5 for each additional bedroom + guest parking, See B-3 for general parking requirements summary by use

ZONING CLASSIFICATION	DISTRICT REQUIREMENTS
R-2M SL MIXED RESIDENTIAL DISTRICT	Permissible Uses: Single Family and duplex residences, assisted living 9+ residents, snow disposal site, Density DU/AC: 5-15 19 if clustered 22 Minimum lot area: 6,000sqft (3,500 sqft for single family residence, 2,500 sqft for townhouse) Maximum lot coverage: 40% Setbacks: F= 20, S=5 R=10 Side not applicable on common lot line, additional standards apply for different building types Height Limit: 30' +5
R-3 MIXED RESIDENTIAL DISTRICT (priority classification) Intended for low-rise multistory townhouse and multifamily dwellings Housing in R-1, R-1A, R-2, R-2A, and R-2D are permitted	Permissible Uses: Multifamily housing, Assisted Living 9+ residents, snow disposal site, nursing facility, Density DU/AC: 15-40 20 if clustered 55 Minimum lot area: 6,000sqft for single family detached 3,500 sqft for single family attached, 6,000sqft for two family dwelling, 2,000 sqft for townhouse, 9,000sqft + 1,000 for every unit over 7 units multifamily seven or more units (other standards apply for additional building types) Maximum lot coverage: 40% Setbacks: F= 20, S=10 R=20 Side not applicable on common lot line, other standards apply for additional building types Height Limit: 35' Parking Requirements: Single family detached 2 per DU up to 2.400Sqft, 3 per DU over 2,400sqft, 1 per studio or efficiency or one bedroom +,5 for each additional bedroom + guest parking, See B-3 for general parking requirements summary by use

ZONING CLASSIFICATION	DISTRICT REQUIREMENTS
R-3SL MIXED RESIDENTIAL DISTRICT Intended for low-rise multistory townhouse and multifamily dwellings Housing permitted in R-1, R-1A, R-2, R-2A, and R-2D are permitted	Permissible Uses: Multifamily housing, assisted living 9+ residents, snow disposal site, nursing facility, Density DU/AC: 15-40 20 if clustered 55 Minimum lot area: 6,000sqft for single family detached 3,500 sqft for single family attached, 6,000sqft for two family dwelling, 2,000 sqft for townhouse, 9,000sqft + 1,000 for every unit over 7 units multifamily seven or more units (other standards apply for additional building types) Maximum lot coverage: 40% Setbacks: F= 20, S=10 R=20 Side not applicable on common lot line, other standards apply for additional building types Height Limit: 35' Parking Requirements: Single family detached 2 per DU up to 2.400Sqft, 3 per DU over 2,400sqft, 1 per studio or efficiency or one bedroom +,5 for each additional bedroom + guest parking
R-O RESIDENTIAL OFFICE	Permissible Uses: Business, office, out patient medical and R-4 Residential (subject to FAR provisions in 21.04.0201.2c), assisted living 9+ residents, restaurant, food kiosk, hospital/health care facility, health services, Retail limited to 25% gross floor area of building, college or university, nursing facility, Density DU/AC: 35+ 110 Minimum lot area: 6,000sqft Maximum lot coverage: 50% Setbacks: F= 10, S= Residential 5' +1' for each 5' exceeding 35' height, 5' or 10' if adjacent to a residential district, R=10' or 15' if adjacent to a residential district Height Limit: 45' not to exceed three stories of non residential use +5 Parking Requirements: Single family detached 2 per DU up to 2.400Sqft, 3 per DU over 2,400sqft, 1 per studio or efficiency or one bedroom +,5 for each additional bedroom + guest parking, See B-3 for general parking requirements summary by use

ZONING CLASSIFICATION	DISTRICT REQUIREMENTS
R-O SL RESIDENTIAL OFFICE	Permissible Uses: Business, office, out patient medical and R-4 Residential (subject to FAR provisions in 21.04.0201.2c), assisted living 9+ residents, restaurant, food kiosk, hospital/health care facility, health services, Retail limited to 25% gross floor area of building, college or university, nursing facility, Density DU/AC: 35+ 110 Minimum lot area: 6,000sqft Maximum lot coverage: 50% Setbacks: F= 10, S= Residential 5' +1' for each 5' exceeding 35' height, 5' or 10' if adjacent to a residential district, R=10' or 15' if adjacent to a residential district Height Limit: 45' not to exceed three stories of non residential use +5 Parking Requirements: Single family detached 2 per DU up to 2.400Sqft, 3 per DU over 2,400sqft, 1 per studio or efficiency or one bedroom +,5 for each additional bedroom + guest parking, See B-3 for general parking requirements summary by use

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All cover page photos Page & Turnbull and Jeffrey Rhoads.

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Community Development Department
Long-Range Planning Section
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Exhibit D

UMED Steering Team Membership

UMED District Plan Update

October 2015

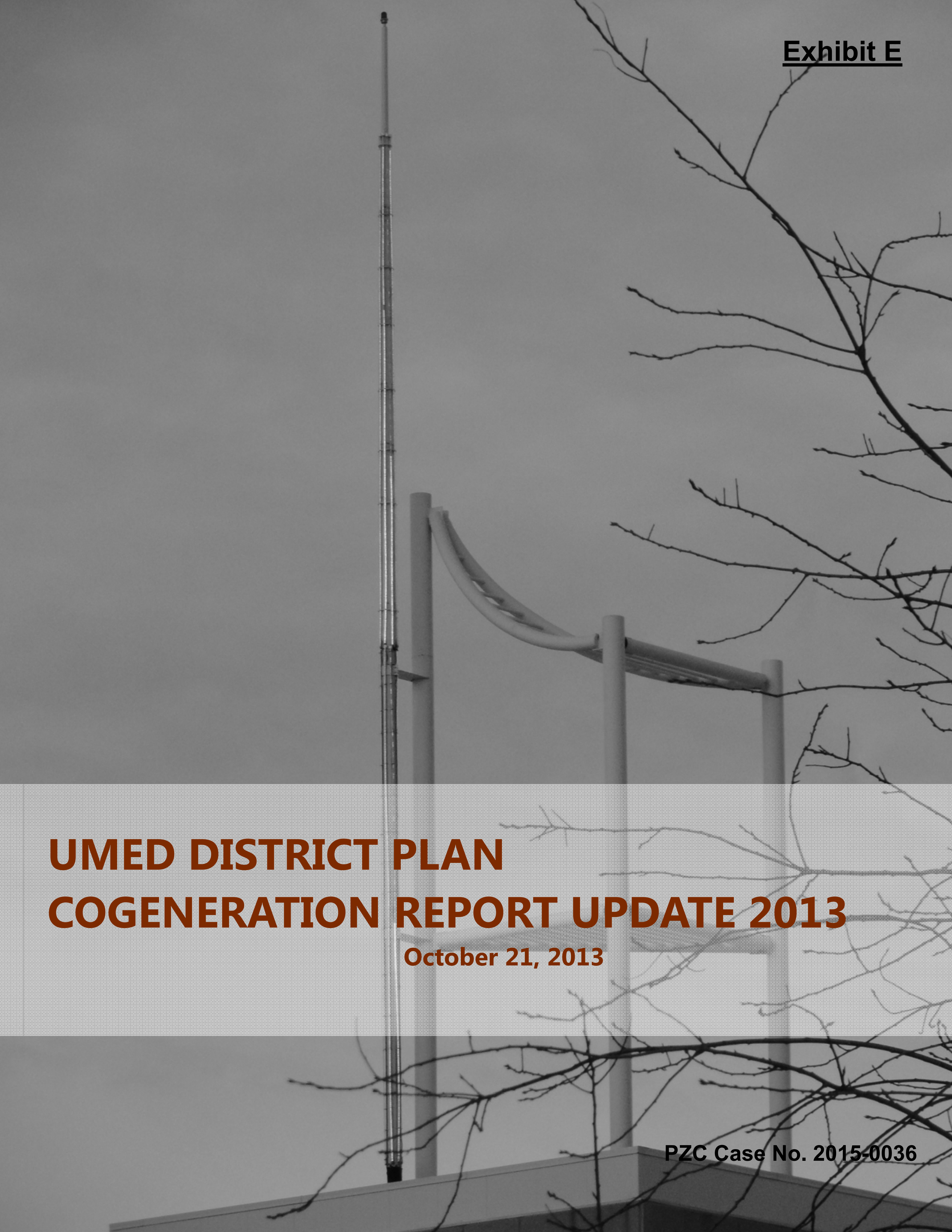
PZC Case No. 2015-0036

Exhibit D

UMED DISTRICT PLAN UPDATE
STEERING TEAM

	Name		*Organization*
1	BANTZ	DON	ALASKA PACIFIC UNIVERSITY
2	BIDWELL	JANET	UNIVERSITY AREA COMMUNITY COUNCIL
3	BUNNELL	KRISTINE	MOA COMMUNITY DEVELOPMENT—PLANNING
4	EBY	DOUG	ALASKA NATIVE TRIBAL HEALTH CONSORTIUM
5	FAUNCE	JOHN	UNIVERSITY OF ALASKA ANCHORAGE
6	GONDEK	JACOB	UNIVERSITY AREA COMMUNITY COUNCIL
7	HAHN	BEN	ALASKA PACIFIC UNIVERSITY
8	HONEYCUTT	ROBERT	PROVIDENCE ALASKA MEDICAL CENTER
9	JOSEPHSON	ANDY	ALASKA STATE LEGISLATURE—HOUSE
10	LINDBECK	STEVE	ALASKA PUBLIC MEDIA—APTI
11	MANSELL	LONNIE	UNIVERSITY OF ALASKA ANCHORAGE
12	MORMILO	STEPHANIE	MOA PUBLIC WORKS—TRAFFIC
13	RAFUSE	STEPHEN	MOA PARKS AND RECREATION
14	ROMERDAHL	ANDREW	PROVIDENCE ALASKA MEDICAL CENTER
15	SEARS	JAMES	ALASKA NATIVE TRIBAL HEALTH CONSORTIUM
16	STANG	PAUL	UNIVERSITY AREA COMMUNITY COUNCIL
17	TARR	GERAN	ALASKA STATE LEGISLATURE—HOUSE
18	TURLETES	CHRIS	UNIVERSITY OF ALASKA ANCHORAGE
19	WEAVER	JERRY	MOA COMMUNITY DEVELOPMENT
20	WESTON	DENNIS	MCLAUGHLIN YOUTH CENTER
21	WILSON	ROBERT	ALASKA NATIVE TRIBAL HEALTH CONSORTIUM
22	WONG	CAROL	MOA COMMUNITY DEVELOPMENT—PLANNING
23	YACKEL	BRYAN	TRUST LAND OFFICE

Exhibit E



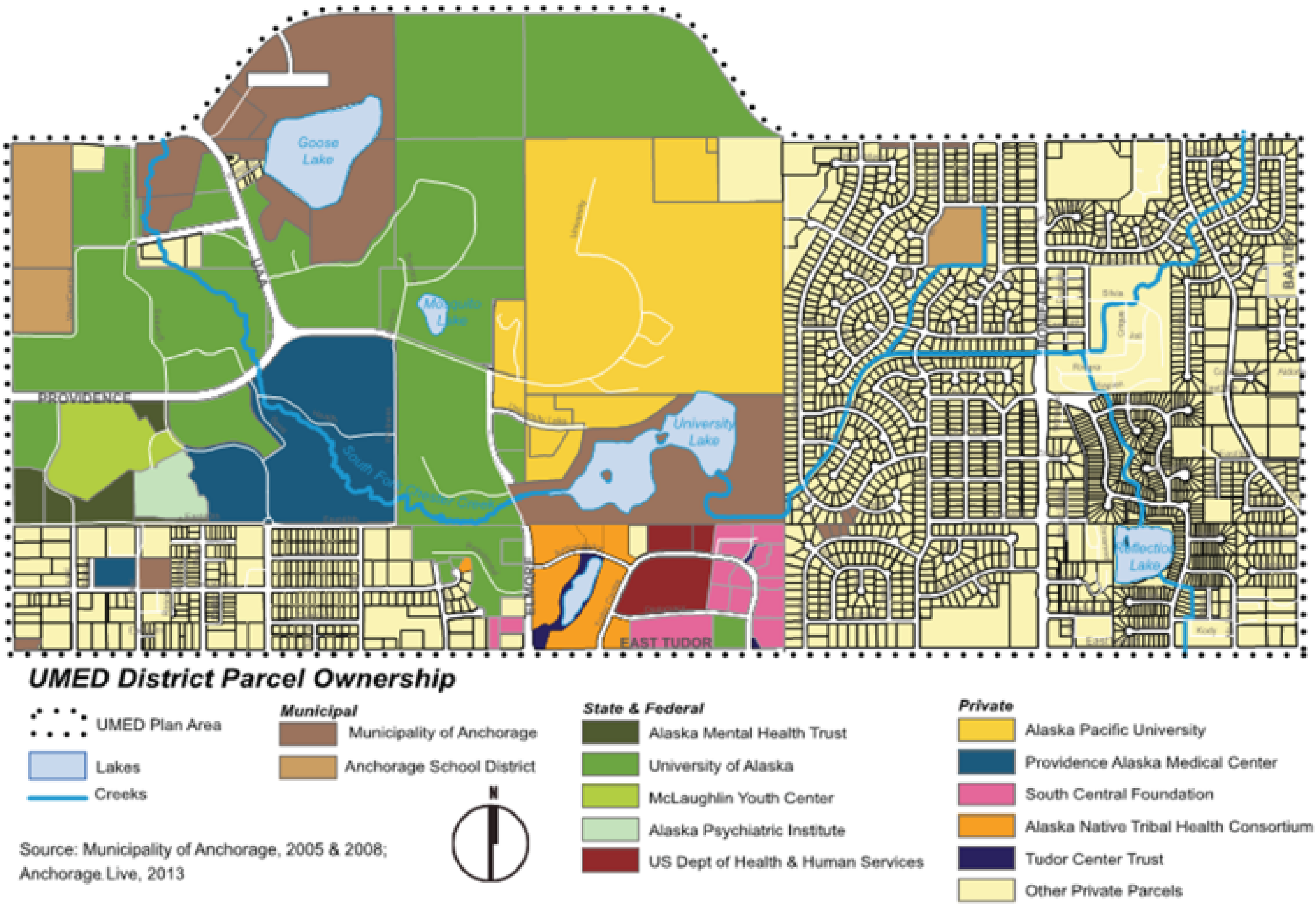
UMED DISTRICT PLAN
COGENERATION REPORT UPDATE 2013

October 21, 2013

PZC Case No. 2015-0036

UMED District Plan Cogeneration Report Update

2013



RSA Engineering, Inc.

for

Page & Turnbull and
Municipality of Anchorage

Community Development Department

October 21, 2013

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EXECUTIVE SUMMARY

This report is an update to the 2009 UAA/ML&P Combined Heat and Power (CHP) Study which is a part of the overall UMED District Plan Update. The project is a stakeholder desired plan funded by the State of Alaska through a grant, and administered by the Municipality of Anchorage. The original CHP study envisioned a 10 megawatt (mW) power generation station using natural gas fired turbines that would produce both heat and power. The heat was to be used by Providence Alaska Medical Center (PAMC) and the University of Alaska Anchorage (UAA) for their facilities. The plant, to be located on UAA property, was going to connect the PAMC and UAA with a series of buried enclosed pipes and pumps (utilidors) that would distribute the waste heat (hot glycol or steam) to the appropriate facilities. The cost of the utilidors alone was almost half of the total capital cost of the project, which made the project infeasible after all of the overhead and operational costs were included.

Changes in Technology

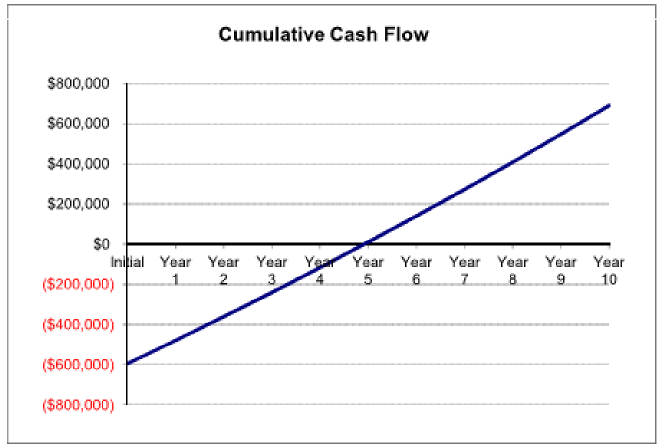
In the last few years, micro turbines have entered the picture. “Micro turbine” is the terminology generally used for small, high speed gas turbines in the size range of 15 kW to 300 kW. Since the 2009 study, micro turbine technology has made it now possible to locate a small micro turbine (or several micro turbines to match loads) in many of the buildings within the UMED district where there is a significant demand for both heat and power. This arrangement is called “distributed cogeneration”. These micro turbines are referred to in this report as combined heat and power (CHP) units, since they make both heat and power simultaneously for use within the building where they are located. With the use of micro turbines in buildings, the original centralized project capital cost could be virtually cut in half because utilidors are no longer needed to distribute heat to the entire district, and no administrative interagency overhead would be required since there would be no need for a central plant. The buildings would still be connected to the Anchorage Municipal Light and Power (ML&P) grid for most of their power. It is noted that CHP units can also be manufactured using natural gas fired reciprocating engines as their power source - instead of high speed turbines, but the noise, maintenance, operating costs and emissions are all higher. For this reason the reciprocating engine technology was not given further consideration in this study.

Study Process

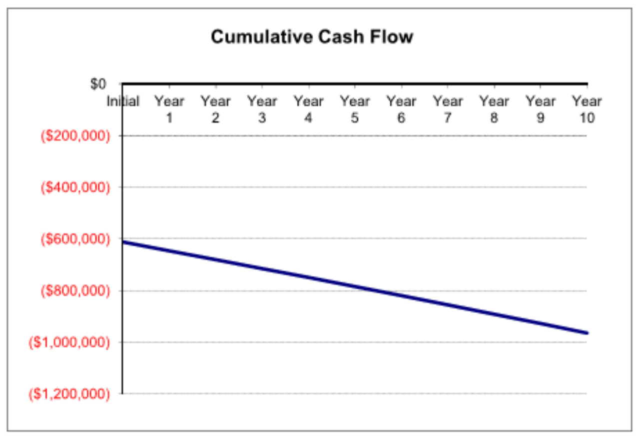
Interviews were conducted with representatives from each of the UMED stakeholders to determine their current needs, desires and plans, and to see if they were interested in installing a proof of concept (POC) CHP unit in one or more of their buildings. All stakeholders would consider such a project. The POC CHP units could range in size from 30kW to 1,000 kW, depending on the thermal load to be served.

Cost Analysis

A cost analysis was performed to determine the potential payback for two generic installations, one producing 65 kW (C-65) and one producing 200 kW (C-200). If a C-200 unit were installed in the ML&P service area but connected to the customer's load side of the meter (contrary to ML&P's tariff requirements but in compliance with the CEA interconnection guidelines – more on this in section I), the payback period would be less than five years, and the 10-year Net Present Value (NPV) would be $339,481 dollars using existing tariff rates. See cumulative cash flow graph to the right.



If the same C-200 unit were installed using the ML&P restrictions which require the customer to first sell all power generated back to ML&P for half of what they then pay to buy it back, the payback period would be infinity, and a 10 year NPV would be a loss of $870,752, making it financially infeasible. See the cumulative cash flow for this scenario to the right.



Evaluation of smaller, less expensive 65 kW CHP unit reveals a similar result. If the stakeholder installs a C-65 and connects it directly to the grid to sell the power back to ML&P, rather than on the load side of their meter, they lose $330,697 over 10 years, with a payback period of infinity. However, if they are allowed to connect a 65 kW CHP to the load side of the meter, (using the CEA guidelines) thus reducing demand and power costs, they have a 10 year NPV of $28,870, with a 6.82 year payback. These paybacks were all prepared using conservative installation and maintenance cost estimates.

Tariff Restrictions

Since the ML&P interconnection requirements prohibit a customer from installing a CHP unit on load side of their electrical meter, they cannot reduce their demand charges or the overall amount of power they purchase from ML&P. Chugach Electric Association (CEA) which serves customers across Tudor Road, which forms the south boundary of the UMED district, does not have this requirement, so a CEA customer could install a CHP unit and expect to see excellent payback periods through demand charge, power use, and heating cost reductions. Whereas an ML&P customer will never realize a breakeven return on their investment. Therefore CHP units installed in the ML&P service area (north of Tudor Road) are financially infeasible under any circumstance. Larger stakeholders in the UMED district pay approximately one million dollars ($1,000,000) each, annually, for demand charges alone. ML&P defines demand charges in their tariff as follows: *"Demand charges are determined by using the maximum average rate of energy use for any 15-minute interval. The billing demand shall be greater of the following: the recorded maximum demand for the month, or 80 percent of the maximum demand recorded during the preceding 11 months, or the customer demand, under a special contract for a customer with on-site generation."*

The UMED users are very interested in finding ways to redirect the cash used to pay high demand costs toward enhancement of their core mission, which is to provide increased patient care and better education services. These stakeholders employ a large number of Alaskans. As an example, PAMC is the #2 employer in the State of Alaska.

This report describes the characteristics of CHP units in more detail, payback periods, tariff requirements, interconnection requirements, and interview results.

Recommendations

This report recommends that relief be sought from ML&P to allow customers to connect their CHP units on the load side of their electrical meter in order to reduce their annual power and demand payments to ML&P. This concept was discussed and rejected out of hand during a meeting with ML&P on August 27, 2013. If the request for relief is denied after a stakeholder application, relief could be sought through a Public Utilities Regulatory Poling Act (PURPA) case presented to the Regulatory Commission of Alaska (RCA). It may also be addressed through executive action by the Mayor and the Anchorage Assembly.

If relief is obtained from ML&P's interconnection restrictions, this report further recommends that POC CHP installations be made and closely monitored, in select facilities on the UMED campus.

If these interconnection requirements cannot be changed, there is only one option left for distributed cogeneration. Stakeholders can completely disconnect selected facilities or parts of facilities from ML&P and generate all of their own power, including emergency power. This is possible but not desirable for several of the larger stakeholders who already have on-site back-up power generation. This scenario has another down-side in that a complete disconnection of these larger facilities from the ML&P grid would preclude emergency power back-feed to the utility grid (or the other way around) in the event of an earthquake, major fire, or other catastrophic event.

Important note: The power and demand costs in Anchorage are not going down. At present there is a proposed tariff change by ML&P before the RCA (Issued 9-13-2013) that seeks approval of a 24.3% across-the-board interim and refundable rate increase to the currently effective energy and demand charges, effective for billings on or after October 24, 2013. The 24.32% increase is the first phase of a proposed 31.52% across-the-board rate increase to current demand and energy charges, over a two-year period. This information is in RCA Public Notice TA332-121 ML&P.

BACKGROUND

This UMED District Plan Cogeneration Update is a stakeholder-desired update to prior cogeneration studies in the UMED district. Past efforts include the 2006 Combined Heat and Power Plan for the Providence Alaska Medical Center (PAMC) and the 2009 UAA/ML&P Combined Heat and Power Study performed by RSA Engineering, Inc. for UAA. The current UMED district plan update is led by prime consultant Page & Turnbull, Inc., with RSA Engineering, Inc. as a sub-consultant responsible for updating the cogeneration element of the overall plan. The purpose of the updated cogeneration element is to analyze the original cogeneration efforts in light of newer technology and/or engineering concepts, and update the financial analysis.

From March 2004 through July 2009, Providence Alaska Medical Center (PAMC), the University of Alaska Anchorage (UAA), and Municipal Light and Power (ML&P) worked together to perform reviews, studies, audits, and assessments. The information derived from this research culminated in a grant application which was prepared for an Energy Conservation Project. The project would replace existing boilers with heat recovery equipment while utilizing more efficient power generation turbines. The grant application, dated November 10, 2008 stated that “combined heat and power offers the possibility of improving the fuel efficiency of an electric generating process by more than 100% when compared to conventional electric plants and by more than 70% when compared to combined-cycle electric generating plants”. This study showed that the proposed 10 mW ML&P operated plant would use the benefit of heat generation, therefore a new heat power generation and recovery system adjacent to PAMC and UAA was proposed to utilize otherwise wasted heat.

As previously mentioned, the concept was to develop a new, 10 mW, Combined Heat and Power (CHP) facility on UAA property, near the PAMC, and to furnish electricity and heat to both PAMC and UAA using state of the art natural gas powered turbine engines. These engines are designed to drive generators; their waste heat would also be captured for facility use. The original plan included two new 5 mW gas turbine generators, each with heat recovery boilers (64 million BTU capacity at full load) and a thermal distribution system that would connect PAMC and UAA buildings to the plant. The project estimated that the engines could generate 77,000 mWh of electricity and 51,000 mWh of thermal energy for export as a result of operating the CHP plant in a bottom cycle mode. This meant that 86% of the time, all available waste heat from the turbines would be recovered for use in the UMED district. The project also envisioned generating an additional 34,000 mWh of heat energy from duct burners by combusting natural gas in the oxygen rich and hot flue gas leaving the gas turbines. The grant application stated that "The UMED campuses consume 385,000 MCF of natural gas to heat the campus and ML&P consumes approximately 363,000 MCF of natural gas on behalf of the UMED campuses for the total consumption of 747,000 MCF." The grant application went on to state that, "This project will reduce the consumption of natural gas for the UMED campuses to approximately 400,000 MCF or by approximately 45%."

When the grant application was prepared, it stated that "ML&P meets the 13 mW demand for electricity of the UMED District using generating assets across the metropolitan area." ML&P planned to replace its current fleet of generators with a combined cycle plant that would improve efficiency by 15-20% and the generating assets of the facility would be about 10% more efficient than assets in place at that time. The proposed project would have improved energy efficiency by nearly 40% according to the application.

The cost of the project was estimated to be $55 million (if the UAA housing was not included) in 2008 dollars. Of that estimate, $24 million was dedicated to the distribution system, representing 43.6% of the total project cost. If UAA housing was included, the total cost increased to $63 million. "*<u>$31 million would be allocated to thermal distribution, which represents 49.2% of the total costs."</u>* The project was proposed to be funded with a $35 million grant, plus $20 million in matching funds in the form of a loan. No in-kind investment was planned.

The revenue would be generated by selling wholesale electricity to ML&P for $3.8 million, thermal energy to UAA for $1 million, and thermal energy to PAMC for $2 million as well as backup services to PAMC for $.75 million. This would create $7.5 million in revenue, while the estimated operating cost for natural gas, labor, O&M, space lease, and debt service was forecasted at $7.2 million. The plant would be staffed with an ML&P manager and PAMC staff. The plant would be operated using gas from ML&P.

According to the grant application, "The proposed rate of return from the grant-funded project has been measured in net present value (NPV) after debt service and a discount rate to ML&P's rate of 8.3 percent. The NPV, given the assumptions we have made, is approximately $4 million."

A subsequent study was performed by RSA Engineering, Inc. titled "UAA/ML&P Combined Heat and Power Study" for the University of Alaska – Anchorage, dated July 13, 2009. This study focused on a more detailed analysis of costs and provided schematic design concepts to heat selected facilities within the UAA system by utilizing the waste heat generated from the proposed CHP plant. The buildings selected for more detailed analysis and cost estimations included:

- Allied Health Center
- Energy Module EM-1
- Energy Module EM-2
- Gordon Hartlieb Building
- Integrated Science Building
- Lucy Cuddy Hall
- New Library Addition
- Old Library
- Performing Arts Building
- Prof. Studies /Wendy Williamson Auditorium
- Social Science Building

The resulting cost estimate assumed that the waste heat would be brought to the building using a district heat loop, although the district heat loop costs were not included. The cost estimated for district heat upgrades within the selected 11 buildings was $1,951,304.

PAMC had commissioned an "Investment Grade Energy Study for a Stand Alone Cogeneration System" in April 2006, as well as a business plan for a CHP plant, dated October 4, 2006. That study concluded in a request for approval of a business plan to complete construction of a CHP plant at an estimated construction cost of $12,150,000. The purpose of this study was to "clearly demonstrate the economical and functional viability of an on-site combined electrical power generation". At the time of the study, demand rates paid to ML&P by PAMC were among the highest in the nation and cost PAMC nearly $700,000 in 2005; their costs were estimated to exceed $1,000,000 annually within a few years. These extremely high demand charges contribute to the economic viability of a CHP plant according to their study. Prior studies by PAMC in 1996 and 1998 indicated a savings of nearly $1,000,000 per year in electrical utility costs, although the project was never funded.

Subsequent, additional growth on the PAMC campus suggests that even higher savings are available with the use of CHP, even if serving only their Main Campus buildings. At that time, PAMC had not yet upgraded their old emergency generation system. They have now completed construction of a new 6 mW capacity diesel generation plant to provide electrical power to the campus in the event of an electrical interruption from the grid provided by ML&P. This new 6 mW emergency generation plant at PAMC significantly reduces the need for a centralized CHP plant as originally envisioned, and also eliminates the $750,000/year backup power revenue previously envisioned in the centralized CHP study, making the centralized CHP plant even less viable today. In addition, ML&P (in partnership with CEA) has completed construction of a new South Central Power Generation Plant in Anchorage that further reduces the need for the originally envisioned 10 mW CHP plant at the UAA. ML&P now has 382 mW of capacity, including the South Central Plant, which adequately meets all of their generation requirements at this time.

Scope of Report

The purpose of this report is to review the 2004-2008 studies and verify them using current technology and conditions. It is also to determine if the original concept is still viable, and identify other approaches that should be considered. This report specifically evaluates the original central plant concept using thermal energy distributed through piping in utilidors as compared to a distributed CHP generation system. The distributed CHP generation system would use much smaller micro turbine generators sized to meet the base thermal load of the building served, and eliminates the use of extensive utilidors. Thermal energy would typically be distributed only to the building where the CHP system is located, although there is the possibility of distribution to other closely located buildings.

Additionally, this report will review potential roadblocks to implementation of a CHP system, including Utility Interconnection Requirements and restrictions, tariffs, codes, and other related issues.

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b. Ruth Todd, Page-Turnbull, Inc.

c. Greg Porter & Paul Rieland – Chenega Energy

d. Chris Turletes, Lonnie Mansell, John Faunce, PE, & Staff – UAA Facilities

e. James Sears – Southcentral Foundation

f. Robert Wilson – Alaska Native Medical Center / ANTHC

g. Robert Honeycutt & Don Long – Providence Alaska Medical Center (PAMC)

h. Deb Johnston – Alaska Pacific University

i. Jim Fowler - Energy Audits of Alaska

j. Mark Frischkorn & Mack Bergstedt– RSA Engineering, Inc.

k. Jim Posey, Marty Smith, Bob Reagan & Staff – ML&P

l. Tina Williams & Staff – API

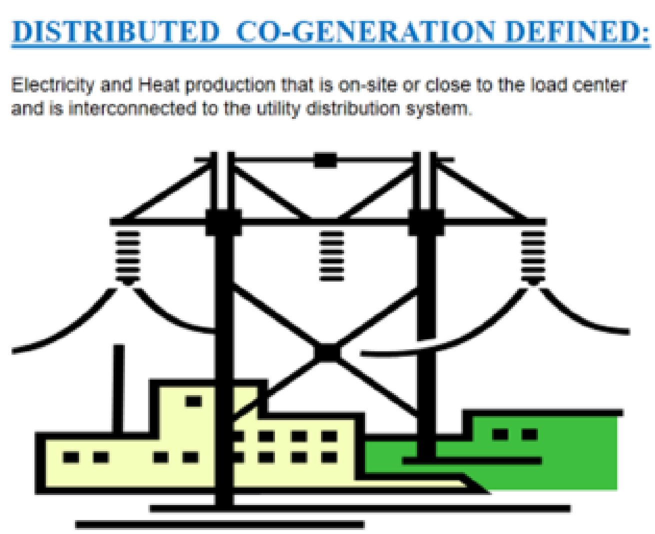
m. Dennis Weston, Rob Ruddy, & Staff – McLaughlin Youth Center

n. Doug Ault – DOT/PF Facilities

Key Changes from the 2008 Study

a. Centralized vs. Distributed Generation

In the context of this report, centralized generation refers to the 2008 plan to locate two 5 MW CHP turbine generators in the UAA parking garage or elsewhere on the UAA campus. Distributed cogeneration refers to smaller, localized micro turbine generators located outside or inside the building they serve, with little or no waste heat being piped away from the building. The distributed cogeneration concept makes a lot of sense considering that almost half of the investment costs for the centralized generation were for utilidor distribution systems to create a district heating system serving only a few of the other UMED facilities. This study will



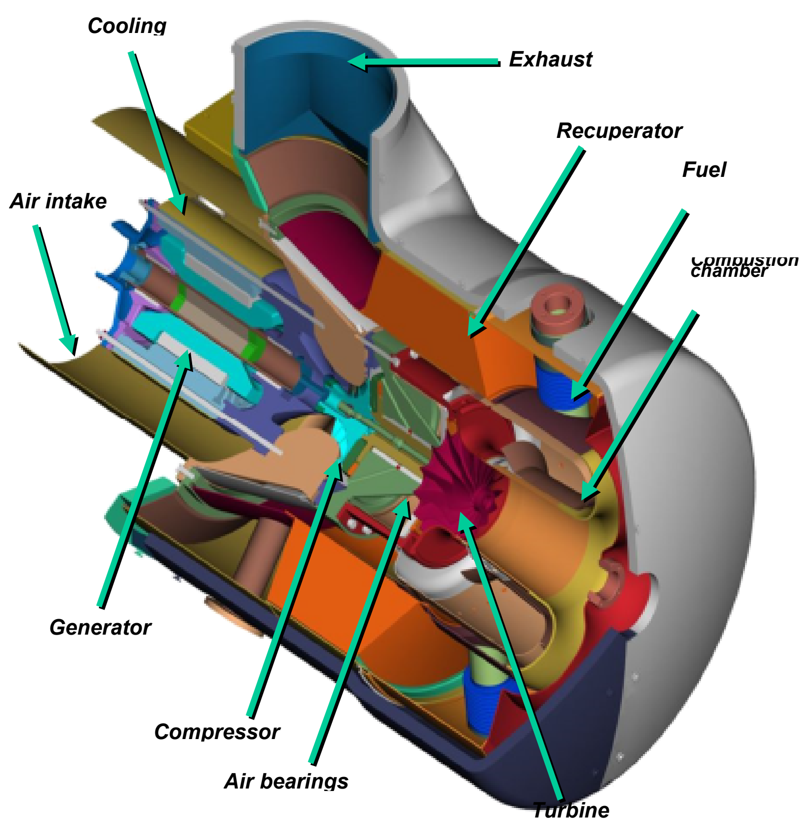
therefore focus on the issues related to implementation of a distributed cogeneration system as opposed to the original concept of centralized generation with extensive utilidors.

b. Utilidors & district heating distribution systems

Utilidors are enclosed spaces, usually buried, carrying utilities. For district heating, it is not uncommon to use accessible utilidors to permit access and maintenance to the piping systems. Utilidors, as well as direct buried piping systems, create additional energy loss as heat is lost through the insulated pipes. Pumping energy is also required to pump the glycol from the centralized station to the buildings served. Finally, the network of utilidors require maintenance, and subjects the piping system to significant maintenance and reliability issues such as seismic damage from an earthquake, pump failures, pipe leaks, pipe corrosion, or potential flooding of the utilidor. Additionally, a district heating system utilizing utilidors will require administrative overhead to account for and invoice users for waste heat which is consumed. The high, non-recoverable capital expenditure for equipment, design and construction of a waste heat system creates a significant financial penalty for a user who wishes to disconnect from the system. Conversely, a distributed generation system producing waste heat and electrical power does not need utilidors, so many of these risks and costs are eliminated. For these reasons, a utilidor system of waste heat distribution is impractical when compared to micro turbine cogeneration systems located within the building that is utilizing the waste heat.

c. Micro turbines Defined

A micro turbine is best defined as a miniature jet engine rotating at speeds up to 96,000 rpm which generates electricity and heat. Commercially sized micro turbines come in sizes including 30 kW, 65 kW, 200 kW, and 250 kW units which can be cascaded to produce up to 100 mW. They are highly reliable units producing ultralow emissions, they have very simple yet cost effective designs, and have very low maintenance requirements. When used to make both heat and power simultaneously, they can be



significantly more efficient than the comparable utility-based generation system that consists of a power plant, step-up and step-down transformers, and miles of transmission and distribution wiring.

d. Micro turbine Basis of Design

For the purpose of this study, two types of micro turbines were examined: Direct Drive "Capstone" technology systems and FlexEnergy CHP units. The FlexEnergy units have a gearbox whereas the Capstone units do not. These two systems appear to be the most commonly available micro turbine CHP systems; moreover, both brands have recent installations in Alaska. The Capstone system has local representation and repair facilities through Chenega Energy, so many of the examples illustrate their system due to their responsiveness and the availability of a local manufacturer's representative. This does not preclude the ultimate design specification and purchase of either brand of system if a building owner chooses to move forward with the installation of CHP units at their facility. It is pointed out that CHP units can also be made with natural gas or diesel fired reciprocating engines, but they were not considered for this report due to their increased noise, maintenance intervals, emissions, and space requirements.

- Unit sizing options

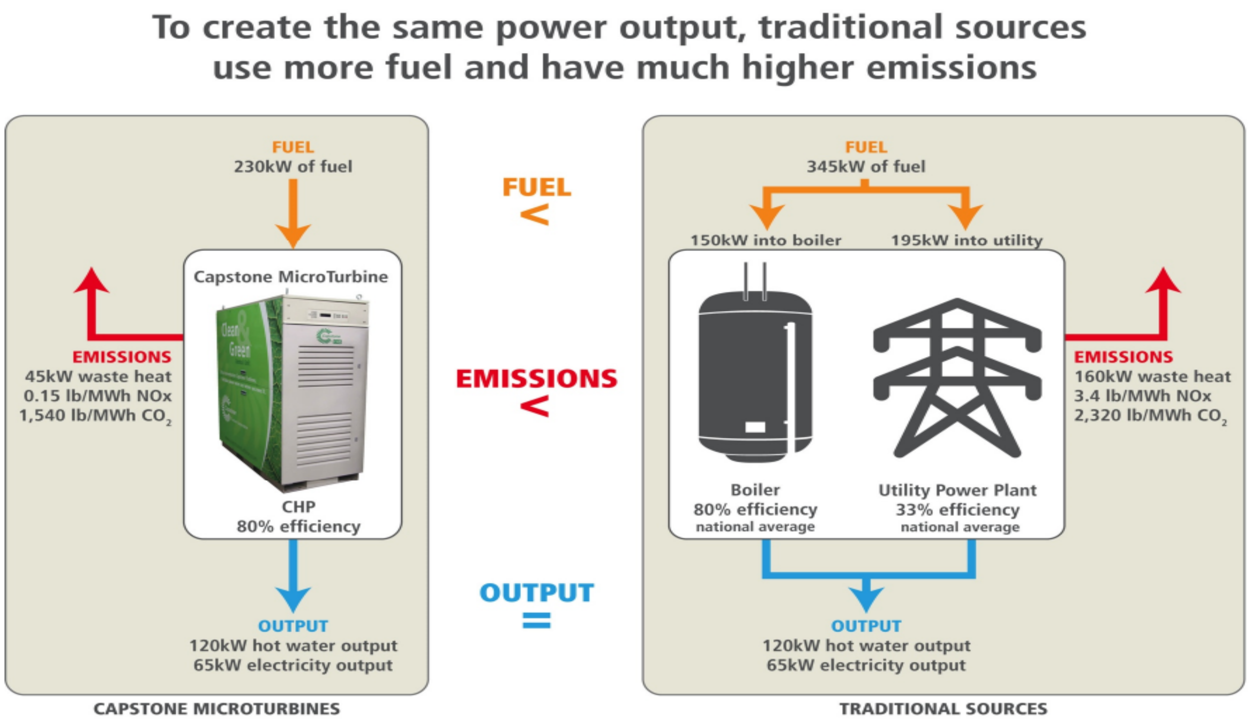
Capstone micro turbines can be purchased in 30 kW, 65 kW and 200 kW sizes, then combined or cascaded to match the loads up to 1,000 kW. FlexEnergy offers a single 250 kW size, which can then also be cascaded with additional units to generate over 1,000 kW. Both manufacturers' units can "turn down" to produce less power as needed, although their efficiency is reduced in "turn down" mode. For this reason, it is better to match the minimum and maximum expected loads as closely as possible to the micro turbine's capacity in order to attain maximum efficiency.

- Noise Generation

Micro turbine generators make much less noise than a traditional diesel or natural gas reciprocating engine generator set. OSHA requires hearing protection when noise levels exceed 85 dBA per 29 CFR 1910.95. Both micro turbine manufacturers have measured acoustic emissions at full power (noise levels) at levels of around 65 dBA, within 10 meters (33 feet) of the device. Hearing protection is always required when working around a reciprocating generator engine set, whereas it appears to be unnecessary when working around a micro turbine. FlexEnergy literature claims that their 250kW unit is about 2 dB quieter than the Capstone unit when measured 1 meter and 10 meters from the device.

- Efficiency

When the overall efficiency of a reciprocating engine is compared to a micro turbine, exhaust gas as well as jacket water heat recovery from the reciprocating engine must be included. Micro turbines do not use jacket water cooling. Their exhaust gas is passed through a heat exchanger to salvage heat. A CHP unit is at its maximum efficiency when operating at 100% of its rated electrical output, is in cold air (0-20 degrees F), and when all or most of its thermal capacity is utilized. Diesel reciprocating engines with both jacket water and exhaust gas heat recovery appear to be slightly more efficient than CHP units using high efficiency packaged exhaust gas heat recovery systems. However, the slightly higher efficiency of diesel reciprocating generator systems compared to CHP systems is offset by the former's complexity, many moving parts, numerous components and higher maintenance requirements



- **Maintenance and Reliability**

Both CHP manufacturers claim that they have over a million hours of micro turbine operating time with extremely low downtime. They both claim 99.999% uptime. This is primarily due to the fact that micro turbines have very few moving parts. The Capstone turbine engines have only one moving part, and it rotates on an air bearing. The two micro turbines reviewed have similar engines, but the FlexEnergy has a transmission which increases the number of moving parts that can require maintenance. FlexEnergy claims a product design life of 80,000 hours with one overhaul, and both manufacturers recommend engine overhauls after 40,000 hours of operation. It should be noted that a unit operating 24/7, 365 days per year, runs for 8,760 hours/year. According to the Capstone representative, the annual cost for maintenance, if performed under a service contract by the manufacturer's authorized representative, is about $.012/kWh for NG fired units, and about $.015/kWh to $ .017/kWh for liquid fuel units.

See maintenance intervals in the chart below:

Maintenance Task	**Capstone C200-Frequency-Hrs**	**FlexEnergy MT250-Frequency-Hrs**
Inspect unit	4000	8000
Clean/replace filters	8000	2000
Replace igniter	8000	8000
Replace 2nd stage separator	8000	Not defined
Replace fuel injectors	20000	Not listed
Lube generator bearings	Not required	8000
Replace coolants & filters	Not required	8000
Engine & generator overhaul	40000	40000
Total scheduled maint/year	6 hours/year	8 hours/year

- EMISSIONS

Because their emissions are so low when burning Natural Gas, neither Capstone nor FlexEnergy requires the use of exhaust scrubbing to reduce Nitrous Oxide (NOx). Both companies use a leaner mix of fuel to air ratio to achieve the low NOx. The main problem associated with the use of a leaner mix of fuel to air, is higher production of Carbon Monoxide (CO). Capstone uses an Oxidation Catalyst to reduce the CO levels, very similar to the process used in automobile exhaust systems. Emissions, expressed in NOx pounds per Megawatt hour, are 0.22 to 0.25 lbs. /mWh for the FlexEnergy MT250, and 0.40 to 0.46 lbs. /mWh for the Capstone C200.

Manufacturer	**Standard Emissions NOx/mWh**	**CA Low Emission Option NOx/mWh**
FlexEnergy MT250	0.22 to 0.25	0.09 to 0.10
Capstone Turbine (all sizes)	0.40 to 0.46	0.14 to 0.17
Reciprocating Engine	1.5 to 6	0.3 to 1.2

- ENCLOSURE REQUIREMENTS

A total system capacity of 1,000 kW (one megawatt) would require four FlexEnergy MT250 units, or one Capstone C1000 unit (which has 5 C200 units packaged together). If the heat recovery module were installed above the C1000, the enclosure dimensions for both units would be about 38’ x 30’. Since the units operate more efficiently in colder ambient temperatures, installations in Alaska typically include a roof and are open to ambient air on one or more sides. An environmental enclosure is preferred to better control ambient temperatures, to provide a better working environment for service and repairs and to reduce the potential for corrosion. When comparing the weight of the MT250 versus the C200, the MT250 is significantly heavier at 14,500 lbs., while the Capstone CHP C200 weighs in at 7,500 lbs.

- ALTITUDE RESTRICTIONS

The Capstone units are not listed or tested to operate above a 10,000’ elevation, and at that altitude the manufacturer recommends an altitude de-rating of about 30%. As a rule of thumb, altitude de-ration is 1 kW per 1,000 feet above sea level. This de-ration has to be tempered for the temperature of the air at altitude by using density altitude for the corrections.

- AMBIENT AIR TEMPERATURE REQUIREMENTS

Both manufacturers’ units operate as low as -10 degrees F. Both units exceed their nametag output electrical rating when operating in ambient air colder than +20F, and both units start to reduce their outputs when the ambient air is warmer than +20F. Both units claim a high limit ambient air temperature of +120 degrees F. Units examined in Anchorage at the H2Oasis facility and the ATT Portage cell tower facility were installed outdoors, under a roof, but otherwise open to the ambient air. The FlexEnergy units at the Alyeska ski resort hotel (2 of the M250 units) were placed in a concrete enclosure that had one wall open to the air via louvers.

- NATURAL GAS REQUIREMENTS

The amount of natural gas needed for the micro turbine CHPs is approximately 33-50% more than that used for boilers in a building, but the benefit is that electricity is also produced thus providing an overall energy reduction when the production of both heat and power is considered. The NG micro turbines do, however, require a gas booster to increase delivery pressure to the device if high pressure gas is not available in the area. In the case of the FlexEnergy unit, this is a screw compressor. In the case of the Capstone unit, this is a scroll compressor. The FlexEnergy unit requires a gas inlet pressure (to the compressor) of 4” WC while the Capstone unit requires a gas inlet pressure of 7”WC. Standard gas regulators at most installations provide 7”WC, and most very large installations with high gas consumption have higher delivery pressures of 2 PSI to 5 PSI or higher, depending on the load served, so existing gas inlet pressures should be adequate for both units. Enstar can provide the higher pressure gas for installations at the UAA, PAMC, or the Native Hospital/SCF facilities if needed, which would eliminate the need for a natural gas booster compressor at those locations.

- **Fuel Oil Requirements**

The CHP units discussed in this report are fired using natural gas (NG). If intended for emergency backup, alternate fuel sources can be used. Capstone units have the ability to be fired with NG, propane or methane (such as landfill gas). Capstone also makes a line of CHP units (similar size lineup as NG) that burn various grades of fuel oil or Kerosene (Jet Fuel). Their performance, including emissions, is still excellent but slightly lower than NG units. Additionally, the cost of alternate fuels is higher than the cost of natural gas, making payback periods longer. CHP units could be designed to burn fuel oil in these facilities if there were a requirement for a liquid fuel generation system, but those essential facilities within UMED that require independent liquid fueled power backup have already met this requirement using diesel fired reciprocating engine generator sets.

- **Controls**

Both manufacturers provide remote monitoring capability, including remote diagnostics for factory-based troubleshooting. Both units have integrated utility synchronization and protection. The units can be set up for maximum heat output, or maximum power output, base loading, peak shaving, or load following. Both units can be operated independent of the utility, although there are restrictions with the Capstone unit on the ability to start a micro turbine and generate power without a utility grid reference. These issues are addressed with an on-board battery.

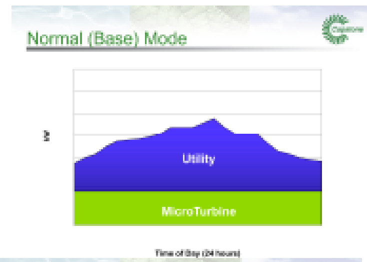
- **Sizing Options**

1. Turndown Ratios: This term refers to the ability of the micro turbine to reduce its power output to follow a decreasing load. Both manufacturers' units can do this. Capstone can turn down the power output by slowing the engine to operate within the speed range of 96,000 RPM to 50,000 RPM. Operation of the units under a lower load than the peak design output reduces the efficiency of the unit slightly, and also reduces the amount of heat output.

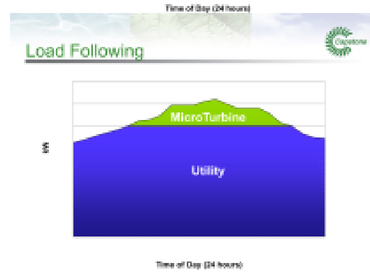
2. Size Based on Thermal Load: The micro turbines can be selected to match the minimum or maximum thermal load or anywhere in between, without wasting heat. When the unit size is based on thermal load, the electricity generated will be used to simply reduce the amount of total electricity purchased, thus reducing power costs. The thermal energy produced is about twice that of the electrical energy produced. It is possible to entirely replace the existing boilers in any given building with micro turbines, assuming there is sufficient electrical load to consume the electrical energy produced - unless the surplus power is sold back to the utility. This can be an attractive option if boilers are at the end of their useful life and sufficient redundancy exists.

3. Size Based on Electrical Load:

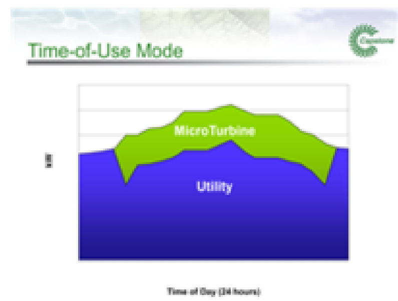
   a. Base Loading: The base loading concept will typically be used when the units are sized for a specific thermal output. The amount of power generated is simply subtracted from the total electricity purchased from the utility.



   b. Load Following aka Peak Shaving: The peak shaving concept will have the micro turbine controlled to only generate sufficient power to keep the peak demand load from exceeding some maximum, pre-determined amount.



   c. Time-of-use mode: This mode can be used if the utility has time-of-use based tariff rates. Time-of-use tariffs are used to penalize and discourage high power consumption during periods of high overall demand on the entire utility system. Utilities in Anchorage are not currently using time of use billing. Another possible scenario that might result in a time-of-use mode would exist if a building operator only wanted the micro turbine to operate during certain hours, possibly hours of peak thermal demand.



e. Cost & Paybacks

Due to the variable electrical and thermal load requirements for each of the UMED stakeholders, and limited report funding, only generic cost models were prepared. They are intended to provide some insight into the potential for cost savings within the UMED district if the ML&P tariff restrictions are removed. The cost estimates prepared were for a 200 kW Capstone CHP dual mode unit as well as for a 65 kW Capstone dual mode unit, both with generic accessories and connection requirements. For each model of CHP unit, two scenarios were run. The first is with the CHP connected on the load side of the electrical meter, which allows the customer to use his generated power to reduce demand costs and to offset his purchase price of power. This is the scenario that CEA would use if a CHP were to be connected. The second scenario assumes that the unit is connected per the ML&P interconnection requirements, wherein all power is sold back to the utility, and then repurchased at a rate almost double the sell back rate. This model does not permit any demand reduction on the consumer's bill, so the paybacks go to infinity, meaning there is never a positive payback to this installation. Neither RSA Engineering nor Capstone can guarantee that these projected savings will occur or that the calculations made by the Economic Calculator software are accurate or error-free. The output from the Economic Calculator used for this analysis in no way constitutes a commitment by Capstone or RSA Engineering that the forecasted savings or performance will be achieved.

The results of these cost analysis are presented below:

Item	**200 kW CEA** *Connection* **Load side**	**200 kW ML&P** *Connection* **Sell power back**	**65 kW CEA** *Connection* **Load side**	**65 kW ML&P** *Connection* **Sell power back**
Installed cost for unit	$594,597	$612,097	$271,670	$289,170
10 Year IRR	16.4%	N/A	8.1%	N/A
10 Year NPV	$339,481	($870,572)	$28,870	($330,697)
Payback in years	4.92	Never	6.82	Never
Tax Depreciation used?	No	No	No	No
Tax Credits assumed?	No	No	No	No
Cooling assumed?	No	No	No	No
Average OSA Temp	37.4 F	37.4 F	37.4 F	37.4 F
Operation times	24/7	24/7	24/7	24/7
Annual inflation	2%	2%	2%	2%
Annual maintenance	$.012/kWh	$.012/kWh	$.012/kWh	$.012/kWh
Discount rate	6%	6%	6%	6%
Nat Gas Cost ($/MMBTU)	$6.30	$6.30	$6.30	$6.30
Electricity Cost/kWh	$0.06916	$0.03548	$0.06916	$0.03548
Demand Cost/kW	$13.64	No Reduction	$13.64	No Reduction

f. Financing Options

Several financing options are available for installation of micro turbine CHP. Some examples are:

- *Performance Contracting*: There are a number of energy service companies, Siemens Controls, Johnson Controls and Ameresco, to name three, who offer financing and performance contracting options for projects like this. A performance contract forecasts the savings, which is then used to pay off the loan made by the contractor, for the installed equipment. Siemens presently provides the HVAC and/or energy management controls for almost every building in the UMED district, so they are familiar with the existing controls, systems and equipment. The micro turbine installation contractor and/or distributor may also offer a performance contract financing option.

- *Cash*: Building owners could simply purchase the equipment using cash and then return the savings back to their cash on hand as the savings occur.

- *Alaska Housing Finance Corporation* (*AHFC) Revolving Energy Loan:* Buildings within the UAA system as well as state or municipal owned buildings are eligible to finance energy saving upgrades like this using the AHFC Revolving Energy Loan. See link http://www.ahfc.us/efficiency/energy-programs/energy-efficiency-revolving-loan-fund-aeerlp/. This program has a 15 year maximum term, and the interest rate is as published on the date of the preliminary loan application.

- *Grant*: It may be possible to acquire a grant from the State or Federal Government for the acquisition of the desired equipment and installation. The US Department of Energy, for example, has issued an intent to provide a grant opportunity titled "Assisting Federal Facilities with Energy Conservation Technologies" (AFFECT), NOI DE-FOA-0000898 dated July 9, 2013. Combined heat and power is their topic area #1 according to the NOI (what is NOI?). Note that this grant is limited to federal facilities. Other energy grant opportunities may exist as well. See link below for more information: http://www1.eere.energy.gov/femp/technologies/renewable_assistance.html

g. Building Code Requirements

Electric utilities require a dedicated, lockable disconnect on the exterior of buildings that have cogeneration systems installed. These disconnects allow lineman to lock out the micro turbines to prevent back feeding electricity to the grid when they are working on it. Numerous other building codes are applicable to a CHP application - some examples are below:

- NFPA 37: Std for Installation & Use of Gas Turbines
  - Adopted by reference in 2012 IFGC 616
  - Adopted by reference in 2012 IMC 915
- IEEE 1547: Interconnection of Distributed Resources w/grid
  - Adopted provisions by serving utility
  - Includes protective relays, utility manual disconnects
- Key Provisions (not all inclusive)
  - Locate where accessible for fire fighters – NFPA 37, 4.1.1.1
  - No combustible materials stored in room – NFPA 37, 4.1.1.3
  - Interior walls, floors, ceilings must be 1-hour construction, except top floor – NFPA 37, 4.1.2.1.1
  - Ventilation adequate to prevent buildup of gasses – NFPA 37, 4.1.2.1.3
  - Attached engine rooms need 1-hr wall where attached to structures – NFPA 37, 4.1.2.1.4
  - Noncombustible construction on detached structure – NFPA 37,4.1.2.2.1
  - Keep detached structures 5’ from main building – NFPA 37, 4.1.4
  - Natural gas supplies, piping, gas trains, regulators – NFPA37, 5.1
  - Exhaust systems – NFPA 37, Chapter 8
  - Controls & Instrumentation of turbines – NFPA, Chapter 9.3
  - Fire protection – NFPA Chapter 11

h. Safety Devices

Utility providers have interconnection requirements which specify numerous protective devices and protocols intended to prevent the CHP unit from reducing the quality of the utility’s power, to protect the load equipment and to prevent back-feeding of CHP generated power to the grid. Examples of safety devices that are specified by the utility interconnection requirements include:

- Synchronizing function device
- Under voltage relay
- Directional power relay
- Field over/under excitation relay
- Reverse phase relay

- Phase sequence/balance relay
- Instantaneous time overcurrent relay with voltage restraint
- Neutral overcurrent relay
- Overvoltage relay
- Under/over frequency relay

i. Utility Interconnection Requirements

Both Municipal Light and Power (ML&P) and Chugach Electric (CEA) have published utility interconnection requirements documents that define all of the restrictions each utility has established regarding use of cogeneration units connected to their gird. Some of these restrictions and requirements are shown for comparison below. Note that ML&P, unlike CEA, forbids any customer using an electrical generation device from connecting the power generation device on the customer's load side of the meter, so ML&P customers cannot enjoy the demand cost and power cost reductions that are available to the CEA customers. ***This is a significant difference between the two utility providers' policies. ML&P's policy essentially creates an environment in which distributed CHP units will never recoup costs through savings.***

According to the Schedule 22 and 23 tariff requirements at ML&P, *"Demand charges are determined by using the maximum average rate of energy use for any 15-minute interval. The billing demand shall be greater of the following: the recorded maximum demand for the month, or 80 percent of the maximum demand recorded during the preceding 11 months, or the customer demand, under a special contract for a customer with on-site generation."* This implies that a special contract is needed for a customer with on-site generation to further define his demand charges. The tariff charges are repeated below for reference.

j. ML&P Interconnection Guidelines

- **113 Class C Facilities**

Non-utility generator installations from 100 kVA to 1,000 kVA, where the stiffness ratio is at least 30, are Class C installations. The larger capacity of Class C facilities (relative to Classes A and B), and the consequent potential to island large sections of the ML&P electric system is of much greater concern. In addition, Class C installations can significantly influence primary feeder devices and operations.

Class C installations shall have the producer's non-utility generation equipment connected directly to the ML&P electric power system. Class C installations shall not serve any of the producer's load(s) normally served by ML&P.

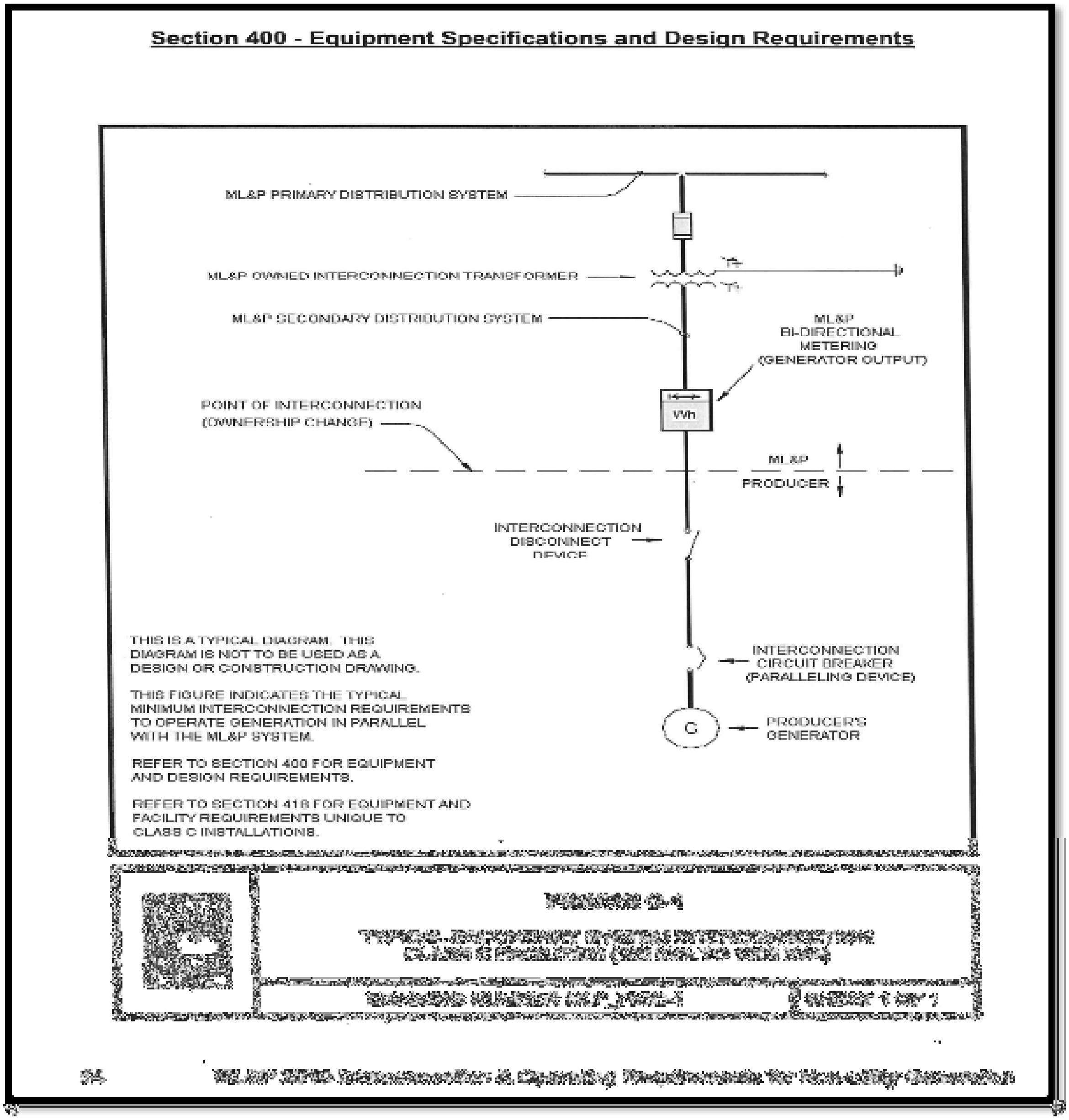
k. CEA Interconnection Guidelines

163 Class C Facilities Non-utility generator installations of 100 kVA to 1,000 kVA, where the stiffness ratio is at least 30, are identified as Class C installations.

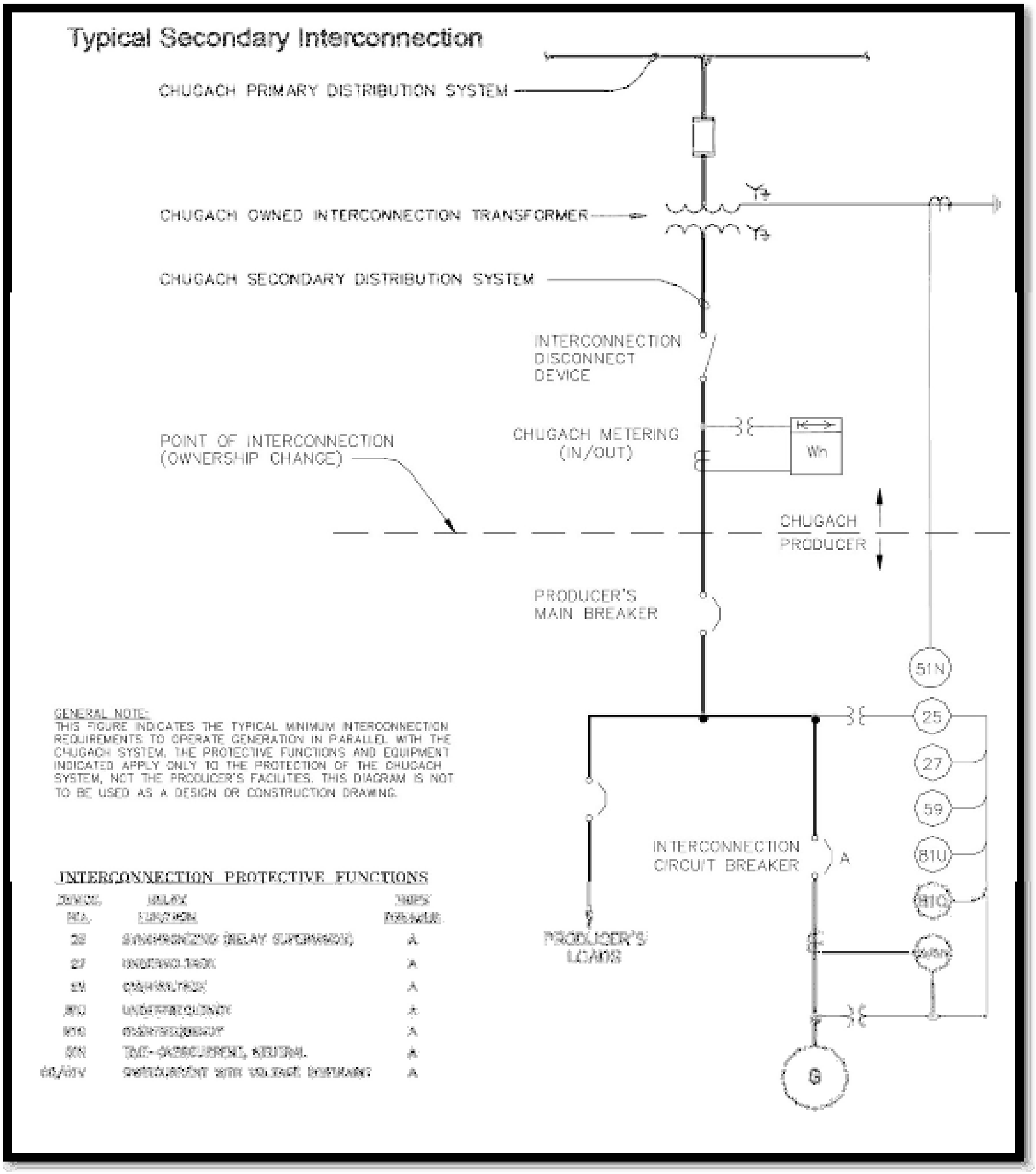
Given the larger capacity of Class C facilities (relative to Classes A and B), the potential to island large sections of the Chugach electric system is of much greater concern. In addition, Class C installations can significantly influence primary feeder devices and operations. Accordingly, the probability of interference with Chugach consumers and system equipment is high enough to necessitate more stringent interconnection requirements.

The interconnection requirements are further clarified by the interconnection sketches provided by both utilities, on the following pages:

ML&P Interconnection Requirement Sketch



CEA Interconnection Requirement Sketch



UTILITY TARIFF COST ANALYSIS

A calculation of potential savings was performed to identify only the demand charge savings if a customer could install a CHP on the load side of his meter, which, as previously mentioned, is prohibited by ML&P but not CEA. Based on ML&P's published demand and energy charges, a generic 200 kW CHP unit operating in a ML&P customer's facility could reduce the demand charge on a Class C service at primary voltage by $36,816/year. This does not include the cost of energy reduction, which is a savings on top of the demand reduction. A primary service takes power from the utility on the upstream (high voltage) side of the distribution transformer, whereas the secondary service takes power at the secondary side (low voltage) of the distribution transformer. If the customer is metered at secondary voltage, his potential demand charge reduction would be $32,736/year.

THESE FIGURES ARE BASED ON THE SCHEDULES BELOW:

General Service: Large at Secondary Voltage - ML&P Tariff

*Any service with a demand exceeding 20 kW for three consecutive months and metered at secondary voltage.**

Schedule 22

(Monthly Charge)

Customer Charge **$ 44.15**			
Demand Charge **$ 13.64 /kW**			
	Energy Charge	**3.8840**	**¢ /kWh**
	Cost of Power Adjustment	**2.974**	**¢ /kWh**
	Regulatory Cost Charge	**0.0578**	**¢ /kWh**
	Total Per kWh	**6.9158**	**¢**
MOA Underground Surcharge **2% on all charges/rates except RCC**			
	Minimum Monthly Charge	*$44.15*	

General Service: Large At Primary Voltage – ML&P Tariff

Any service with a demand exceeding 20 kW for three consecutive months and metered at Primary Voltage. The following monthly rates are subject to adjustment each quarter and are based on the total kWh usage.*

Schedule 23

(Monthly Charge)

Customer Charge **$ 159.55**			
Demand Charge **$ 15.34 /kW**			
	Energy Charge	**3.6580**	**¢ /kWh**
	Cost of Power Adjustment	**2.974**	**¢ /kWh**
	Regulatory Cost Charge	**0.0578**	**¢ /kWh**
	Total Per kWh	**6.6898**	**¢**
MOA Underground Surcharge **2% on all charges/rates except RCC**			

Minimum Monthly Charge $159.55

EXISTING MICRO TURBINE INSTALLATIONS IN ALASKA

Capstone Turbine Company has advised that there are over 7,000 micro turbines sold around the world, with over 35 million operating hours. There are a number of CHP micro turbine installations in Alaska including FlexEnergy units. Several existing locations are listed below:

- Remote cell towers off the grid
  - Portage
  - Homer
  - Tazlina
- Military:
  - Shemya 7-C65s
  - Eielson 3 C30s
  - Eielson 5 C65s
  - Ft Greely 5 C65s
- Oliktok Point-4 C-30s (Diesel) – US DOE
  - 14 C65s
  - 4 C60s
  - 4 C200s
  - 2 C1000 (pending)
- Montana Creek Highway Camp
- Fairbanks – 1 C65
- H2Oasis Water Park – 1 C65 and 3 C60s
- Alyeska Prince Hotel
  - Girdwood-2- Flexenergy MT250

INTERVIEW NOTES WITH STAKEHOLDERS IN THE UMED DISTRICT

Interviews were conducted with various representatives from each of the UMED stakeholders. The purpose of the interviews was to determine interest and feasibility given the changes that have occurred in the industry since 2009. For a full summary of the interviews, see Appendix A.

STAKEHOLDER FEEDBACK SUMMARY

- Most Want to Try a Proof of Concept (POC) CHP Unit
- Examples of Potential POC Locations:
  - Native Hospital mechanical room using steam micro turbine
  - SCF data room
  - UAA Integrated Science building
  - UAA Sports Complex
  - UAA Energy Modules
  - APU Mosley Pool Building
  - API boiler room
  - MYC boiler room
  - PAMC boiler room
- Most Prefer to use the Base Load CHP scenario, with the CHP unit sized to Pick up Thermal Load
- <u>All</u> Would Prefer to Continue Service with ML&P
- <u>All</u> Want to See Relief on Interconnection Requirement to allow Reduction in Demand costs
- Some Would Like to Use a Smart Grid Behind Primary Metered Grid

Options Available to Stakeholders

Based on our analysis and information obtained from a series of interviews with UMED stakeholders (see Appendix A for interview notes), the following options are available:

1. Do nothing
2. Install distributed CHPs to feed heat & power to selected buildings, which would reduce demand, energy and heating costs, but would require regulatory relief. This is therefore not an option without regulatory relief.
3. Install distributed CHPs to sell all power to the ML&P grid as required in the ML&P interconnection requirements which results in no demand or energy charge reduction. This is not really an option since there is no financial payback for either the 65 kW unit or the 200 kW unit.
4. Install CHPs in buildings that can be totally off the ML&P grid.
5. Pick 1-2 buildings to test a proof of concept CHP installation to determine how well CHP will integrate into existing systems, if they function as desired and if savings meet forecasts. This option would also require relief from the ML&P interconnection requirements.
6. Carry the entire facility campus using CHP generators which are interconnected using smart grid technology to meet all thermal loads, and maximize efficiency by turning down lightly loaded CHP units. Provide backup using diesel micro- turbine or existing reciprocating generators. Completely sever all connections to ML&P, or work out a mutual backup agreement. This option should not be implemented until at least a proof of concept installation is installed somewhere on the UMED district to verify costs and savings.

Recommendations

The cost of electricity and heat for the commercial facilities in the UMED District is substantial, so Stakeholders are very interested in finding ways to reduce these costs. Many have instituted energy conservation measures, but more must be done in order to contain ever-growing utility energy costs. As an example of this increasing utility cost environment, the Regulatory Commission of Alaska has posted a notice of a tariff filing by the ML&P utility (TA332-121) on September 13, 2013. The tariff filing is *"seeking approval of a 24.32% across-the-board interim and refundable rate increase to the currently effective energy and demand charges, effective for billings on or after October 24, 2013. The 24.32% increase is the first phase of a proposed 31.52% across-the-board rate increase to the currently effective demand and energy charges, over a two-year period."* Some of the Stakeholders in the UMED district pay in excess of $1 million per year in demand charges alone, so this is a huge increase. If the Stakeholders can institute a cost reduction CHP system, they can help offset these rate increases. This can only be done if the ML&P provides relief from their interconnection requirements. With ML&P's existing interconnection requirements for a CHP system, our financial models indicate that any sell back agreement has a 10 year negative cash flow, and a payback period of infinity.

Our recommendation is to obtain relief from ML&P's interconnection requirements and install POC CHP systems in selected UMED buildings. If the Stakeholders cannot get regulatory relief from ML&P and/or the RCA, they may want to consider completely isolating selected facilities or parts of facilities from the ML&P grid, and provide all of their power using CHP and their existing backup generators, or redundant CHP units. This option is not attractive to either the Stakeholder or the Utility, since it precludes the mutual aid that could be provided if ML&P's service or the Stakeholder's service were interrupted. This option would also reduce revenue to ML&P by much more than the energy and demand revenue reduction that would occur if CHP units are installed for nominal base loading on the load side of the meter.

GLOSSARY OF TERMS

British thermal unit (BTU) – The amount of heat required to raise the temperature of one pound of water one degree Fahrenheit. One watt-hour equals 3.314 BTUs.

CEA – Chugach Electric Association

CHP – Combined heat and power

CHP Guide by HUD: See the link below for the "New Guide on CHP's Role in Promoting Reliability and Resiliency" for additional information.
http://portal.hud.gov/hudportal/HUD?src=/program_offices/sustainable_housing_communities,

Cogeneration – The use of a heat engine or power station to simultaneously generate electricity and useful heat.

Combined Heat & Power (CHP) – The generation of electricity and usable heat simultaneously from a single facility. This is also referred to as cogeneration.

Demand Charge – This is the cost of having a required capacity of power available at all times. The demand charge is determined by the maximum demand required of a user during a defined period. According to ML&P, demand is determined by using the maximum average rate of energy use for any 15-minute interval. The billing demand shall be the greater of the following: The recorded maximum demand for the month, or 80% of the maximum demand recorded during the preceding 11 months, or the customer demand, under a special contract for a customer with on-site generation.

Disconnect – A device that can shut off the current in a device by removing its connection with the power supply.

Grid – An interconnected system of electric cables and power stations that distributes electricity over a large area.

IEEE – An abbreviation for the Institute of Electrical and Electronics Engineers, Inc., a non-profit technical professional organization with members in 150 countries, responsible for technical publishing, conferences, and consensus-based standards activities.

Interconnection – The physical connection of a generating facility in accordance with interconnection requirements so that operation in parallel with the utility's local distribution system can occur for the purpose of electrical power transfers.

Internal Rate of Return (IRR) – The discount rate often used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. An investment is generally considered acceptable if its internal rate of return is greater than the cost of capital.

Island – Circumstances in which part of an electrical power system is operating while being electrically isolated from the rest of the electrical power system.

Kilowatt (kW) – The basic unit of electricity and electrical demand, equal to 1,000 watts.

Kilowatt-hour (kWh) – A unit of energy equal to 1,000 watt-hours. This is the basic measure of electric energy generated for use. For example, a 100-watt light bulb burning for 10 hours uses one kilowatt-hour of energy.

Lbs. – pounds mass

Load – The amount of electric power drawn at a specific time from an electric power system, or the total power drawn from the system.

Mcf – 1,000 cubic feet of natural gas

Megawatt (mW) – A unit of electricity equal to 1,000 kilowatts or 1 million watts.

mWh – Megawatt hours

ML&P – Municipal Light and Power

NG – Natural gas

NOx – Nitrous Oxide gas found in emissions of engines.

10 Year Net Present Value (NPV) - This is the sum of all future cash flows over ten years minus the cost of the investment, or the "difference amount" between the sums of discounted cash inflows and cash outflows.

One-line diagram – A diagram that shows, by means of lines and graphic symbols, the connection between a proposed installation of a Distributed Resource and the electrical power system.

PAMC – Providence Alaska Medical Center

Parallel operation – All electrical connections between distributed generation facilities and the electric distribution utility's system that are capable of operating in conjunction with each other.

POC – Proof of concept

RCA – Regulatory Commission of Alaska

UAA – University of Alaska Anchorage

UMED – University-Medical District

WC – A unit of pressure, normally expressed as inches of water column. 27.7" WC = 1 psi

APPENDIX A: STAKEHOLDER INTERVIEW NOTES

a. University of Alaska Anchorage

Facility Owner	University of Alaska, Anchorage
Date	8/14/13
Attendees	➢ Dick Armstrong, PE, RSA Engineering, Principal Engineer ➢ Jim Fowler, PE, Energy Audits of Alaska, Principal ➢ Chris Turletes, CFM, Associate Chancellor, ➢ John Faunce, P.E., Director Facility Planning and Construction ➢ Ryan Buchholdt, Business Manager ➢ Tom Sternberg, Director Facilities Management and Operations ➢ Joe Howell, Data & Fiscal Manager (Utilities Manager) ➢ Lonnie Mansell, Facilities Planner
Building Inventory	66 buildings
Annual Energy Spend	$10 million, approx. 50% natural gas, 50% electric
Total Electric Load	Approximately 3-4 MW
Key Strategic Reasons for interest	Risk management – insufficient back-up generation capacity. Cost savings.
How metered	Electric - Primary

Additional Notes:

- Each building is sub-metered for gas and electric through their energy management system; Siemens implemented sub-metering approximately 1 year ago, first 2-3 months not necessarily reliable data as meters were being calibrated. UAA will provide access to their dashboard where data can be downloaded and manipulated for various outputs
- They will provide a digital photo of campus
- UAA probably does not have enough back-up generating capacity to supply entire campus
- 24-36 month cycle to implement CHP project
- Will provide 24 months of utility data
- There are 2 "energy modules" that serve a number of buildings
- Formerly had 1 MW Solar Turbine generator in place, de-commissioned 5-10 years ago
- Discussion about current electrical distribution on campus, 2 energy modules
- Discussion about ML&P requirements for non-utility power generation and "island" option
- Payback criteria: must be <15 years

Response to Questions:

1. Can you provide 2 years electric and gas billings for your buildings? Can it be published in our report? *YES*
2. Do you have stand-by or emergency generators? Where, how big? *SEVERAL, DISTRIBUTED AROUND THE CAMPUS, NOT ENOUGH TO MEET ENTIRE CAMPUS LOAD*
3. Could you use these generators as a backup to CHP to avoid demand spikes? *POSSIBLY, EMMISSIONS AND AIR QUALITY PERMITS WOULD BE REQUIRED*
4. Do you presently have waste heat at any buildings? *NO*
5. Is heating glycol separate for each building? *YES* Which buildings have district heat serving multiples? *NONE*
6. Would you want to try a proof of concept CHP? *VERY INTERESTED*
7. How big would you make your CHP in a POC building? *BASE LOAD UNLESS ML&P REQUIREMENTS CANNOT BE CHANGED*
8. Given ML&P restriction on cogeneration use for demand reduction, would you want to totally energize a building with CHP? Do you want to be completely independent from ML&P on selected buildings? *NO*
9. Any idea how much energy goes to heating buildings? Cooling? *$5 MILLION IN NATURAL GAS FOR HEATING AND DHW; DON'T KNOW HOW MUCH COOLING*
10. Is there still any interest in further evaluation a centralized CHP system? *NO*
11. Are any boilers nearing their end of life – use CHP as replacement boiler? *YES, SEVERAL OF OUR OLDER BUILDING BOILERS ARE NEAR THE END OF THEIR USEFUL LIFE.*
12. What is the assumed cost of money? *DID NOT ASK*
13. Is there an ROI goal for investments like this? *15 YEAR PAYBACK*
14. Is your building primary or secondary metered with >20 kW load for > 3 months? *PRIMARY METERED*
15. Can we get a digital photo of your campus/facility for our report *YES*


NORTHERN LIGHTS BOULEVARD
GOOSE LAKE
CAREER CENTER DRIVE
SEAWOLF DRIVE
MALLARD LANE
WEST CAMPUS DRIVE
UAA DRIVE
ALUMNI LOOP
EAST LOT
MOSQUITO LAKE
PROVIDENCE DRIVE
PROVIDENCE HOSPITAL
LAKE OTIS PARKWAY
36TH AVENUE
HEALTH DRIVE
PIPER ST
SPIRIT DRIVE
WELLNESS ST
STUDENT HOUSING
UNIVERSITY LAKE DRIVE
ELMORE RD
RESIDENTIAL DRIVE
UAA
UNIVERSITY of ALASKA ANCHORAGE
Glenn Hwy
Merrill Field
Aviation Complex
15th Ave
Tudor Rd
University Center
3901 Old Seward Hwy
Aviation Complex
2811 Merrill Field Dr
Diplomacy Building
4500 Diplomacy Dr
Photos provided by:
University of Alaska Anchorage


UAA LEGEND
Information
Coffee Kiosk
Parking Services
Dining
Parking
Housing Parking
Seawolf Shuttle Stops
People Mover Stops
Pay N Park
WOLFcard Kiosk
Metered/ Visitor Parking
ATM
Emergency Phone
Student Health Center
Bike Route
Multi Use Trail

UAA Campus Map – Building Legend

UAA Buildings

ESH - Eugene Short Hall- 2601 Providence Drive - AS101

SMH - Sally Monserud Hall - 2545 Providence Drive - AS102

BMH - Beatrice McDonald Hall - 2400 West Campus Drive - AS103

GHH - Gordon Hartlieb Hall - 3300 Seawolf Drive - AS104

RH - Rasmuson Hall - 3416 Seawolf Drive - AS105

CUDY - Lucy Cuddy Hall - 2533 Providence Drive - AS106

WB - West Bridge - 3416 Seawolf Drive - AS107

GRN - Greenhouse - 3344 Seawolf Drive - AS108

GRS - Greenhouse Storage - 3344 Seawolf Drive - AS109

ADT - Auto/Diesel Technology Building - 2460 West Campus Drive - AS110

PSB - Professional Studies Building - 2533 Providence Drive - AS111

WWA - Wendy Williamson Auditorium - 2533 Providence Drive - AS112

AHS - Allied Health Science Building - 3500 Seawolf Drive - AS114

EM1 - Energy Module #1 - 3351 Seawolf Drive - AS115

EM2 - Energy Module #2 - 3196 Alumni Drive - AS116

WFSC - Wells Fargo Sports Center - 2801 Spirit Way - AS117

BKS - Bookstore - 2901 Spirit Way - AS118

SU - Student Union - 2921 Spirit Way - AS119

ABL - Arcade and Bridge Lounge - 3211 Providence Drive - AS120

ENGR - Engineering Building - 3310 UAA Drive - AS121

SCI - Natural Sciences Building - 3150 Alumni Drive - AS122

SSB - Social Sciences Building - 3190 Alumni Drive - AS123

LIB - Consortium Library - 3211 Providence Drive - AS124

ADM - Administration/Humanities Building - 3680 Alumni Drive - AS125

ADU - Administration Utility Building - 3121 Science Circle - AS126

ART - Fine Arts Building - 3640 Alumni Drive - AS127

Student Housing 1-6, aka MAC Housing

SH1 - Student Housing #1 - 3550 Sharon Gagnon Lane - AS128

SH2 - Student Housing #2 - 3530 Sharon Gagnon Lane - AS129

SH3 - Student Housing #3 - 3540 Sharon Gagnon Lane - AS130

SH4 - Student Housing #4 - 3620 Sharon Gagnon Lane - AS131

SH5 - Student Housing #5 - 3610 Sharon Gagnon Lane - AS132

SH6 - Student Housing #6 - 3640 Sharon Gagnon Lane - AS133

TWA - Temple Wood Building A - 4000 Elmore Road - AS135

TWB - Temple Wood Building B - 4000 Elmore Road - AS136

TWC - Temple Wood Building C - 4000 Elmore Road - AS137

TWD - Temple Wood Building D - 4000 Elmore Road - AS138

TWE - Temple Wood Building E - 4000 Elmore Road - AS139

TWF - Temple Wood Building F - 4000 Elmore Road - AS140

CMMNS - Commons - 3700 Sharon Gagnon Lane - AS141

EASTH - East Hall Student Housing - 3701 Residential Drive - AS142

WESTH - West Hall Student Housing - 3601 Residential Drive - AS143

NORTHH - North Hall Student Housing - 3550 Sharon Gagnon Lane - AS144

GAO - Grounds Admin Office - 3322 Seawolf Drive - AS145

GSO - Grounds Staff Office - 3322 Seawolf Drive - AS146

GES - Grounds Equip Shed - 3310 Seawolf Drive - AS147

GIE - Grounds Irrigation Equip Shed - 3310 Seawolf Drive - AS148

CSS - Custodial Storage Shed - 3318 Seawolf Drive - AS149

CPG - Central Parking Garage - 3170 Alumni Drive - AS150

EBL - Ecosystem-Biomedical Health Laboratory - 3151 Alumni Drive - AS151

EGH - Engineering Greenhouse - 3310 UAA Drive - AS152

ANSEP - Alaska Native Science and Engineering Programs - 2929 Spirit Way - AS153

CPISB - ConocoPhillips Integrated Science Building - 3101 Science Circle - AS154

ECP - East Campus Parking Garage - 3600 Alumni Drive - AS155

HSB - Health Sciences Building - 3170 Alumni Drive - AS156

AAC - Alaska Airlines Center - 3550 Providence Drive - AS157

FSC - Fireside Cafe - 3550 Alumni Drive - AS158

HMB - EBL Hazardous Material Storage - 3155 Alumni Drive - AS159

EBT1 - Engineering Temporary Building 1 - 3202 UAA Drive - AS160

EBT2 - Engineering Temporary Building 2 - 3200 UAA Drive - AS161

EIB - Engineering Industry Building - 2900 Spirit Way - AS162

DPL - Diplomacy Building - 4500 Diplomacy Drive - AO105

ULB - University Lake Building - 3890 University Lake Drive - AO106

ULA - University Lake Annex - 3800 University Lake Drive - AO107

BHRS - Behavioral Health Research & Services - 3401 East 42nd Ave - AL122

b. ALASKA PACIFIC UNIVERSITY

Facility Owner	Alaska Pacific University
Date	8/15/13
Attendees	➢ Deborah Johnston, CFO, Director of Facilities and Risk Management ➢ Dick Armstrong, PE, RSA Engineering, Inc., Principal Engineer ➢ Jim Fowler, PE, Energy Audits of Alaska, Principal
Building Inventory	●10 buildings and 2 housing villages on campus ●2 academic buildings, 25k SF and 42k SF ●9 duplex residences ●6-unit apartment style student housing ●President's house, 3900 SF ●Atwood Center, 60k SF ●Grace Hall and Glen Olds Hall are leased to USGS (net lease – APU pays utilities), includes large server room ●Gould Hall was also leased to USGS, but 50% vacant since May 2012 ●APT Building leased to public radio/TV, triple net lease - tenant pays all costs ●2 academic buildings, 25k SF and 42k SF ●9 duplex residences ●6-unit apartment style student housing ●President's house, 3900 SF ● Atwood Center, 60k SF ●Grace Hall and Glen Olds Hall are leased to USGS (net lease – APU pays utilities), includes large server room
Annual Energy Spend	$500k, approx. $300k natural gas, $210k electric
Total Electric Load	Unknown
Key Strategic Reasons for interest	1. Risk management – no back-up generation capacity except 9kW in President's house 2. Cost savings 3. Desire for energy efficiency
How metered	Electric – Secondary, each building is metered Natural Gas – single meter serves entire campus (special tariff), APU owns gas lines on campus. Atwood, Carr Gottstein, Grant and Mosely halls may be individually metered or sub-metered.

Additional Notes:

- 2 buildings have DDC controls, but are currently running "manually"
- Will provide 24 months of utility data and building inventory SF of each building
- Discussion about ML&P requirements for non-utility power generation and "island" option
- Mosely Sport Center boiler is at or near end of life; recollection of $85k replacement quote received 2 years ago
- Dr. Bantz (President) interested in energy efficiency, but does not want to be beta site
- Best times for retrofit work is during Christmas and Spring breaks and last half of August
- APU is a private, non-profit organization
- Risk Management committee has desire for backup generator which could be moved from building to building as necessary
- Housing capacity is 140 students and 15-20 staff, up to 200 total in emergency
- An investment grade audit may have been performed on Mosely and Atwood buildings

- First day of class is August 26
- Atwood would be the critical facility in time of emergency

Response to Questions:

1. Can you provide 2 years electric and gas billings for your buildings? Can it be published in our report? *YES*

2. Do you have stand-by or emergency generators? Where, how big? *A SINGLE 9KW GENERATOR SERVING THE PRESIDENTS RESIDENCE*

3. Could you use these generators as a backup to CHP to avoid demand spikes? *YES*

4. Do you presently have waste heat at any buildings? *NO*

5. Is heating glycol separate for each building? Which buildings have district heat serving multiples? *N/A*

6. Would you want to try a proof of concept CHP? *THERE IS INTEREST, HAVE TO DISCUSS WITH DR. BANTZ*

7. How big would you make your CHP in a POC building? *BASE LOAD*

8. Given ML&P restriction on cogeneration, would you want to totally energize a building with CHP? Do you want to be completely independent from ML&P on selected buildings? *PROBABLY NOT*

9. Any idea how much energy goes to heating buildings? Cooling? *$300K NATURAL GAS FOR HEATING, DHW AND POOL HEAT; ALMOST NO COOLING EXCEPT SMALL SERVER ROOMS*

10. Is there still any interest in a centralized CHP system? *PERHAPS, IF THE COST WAS REDUCED*

11. Are any boilers nearing their end of life – use CHP as replacement boiler? *ATWOOD CENTER BOILER AND CARR GOTTSTEIN RTU'S (1974)*

12. What is the assumed cost of money? *8%*

13. Is there an ROI goal for investments like this? *NO*

14. Is your building primary or secondary metered with >20 kW load for > 3 months? *SECONDARY*

15. Can we get a digital photo of your campus/facility for our report *WILL LOOK FOR ONE?*

c. Providence Alaska Medical Center - PAMC

Facility Owner	Providence Alaska Medical Center
Date	8/30/13
Attendees	➢ Dick Armstrong, PE, RSA Engineering, Principal Engineer ➢ Robert Honeycutt, Chief Operations Officer, PAMC ➢ Don Long, Facilities Chief, PAMC
Building Inventory	Unknown
Annual Energy Spend	Unknown
Total Electric Load	Approximately 4.3 to 4.5 MW
Key Strategic Reasons for interest	Reduce operating costs
How metered	Electric - Primary

Additional Notes:

- Demand charges are about $ 1 million/year
- Primary metered distribution within campus is at 4160 volts
- During previous talks regarding cogen, PAMC was not allowed to use closed transition transfer switches per ML&P requirements

Response to Questions:

1. Can you provide 2 years electric and gas billings for your buildings? Can it be published in our report? *YES*

2. Do you have stand-by or emergency generators? Where, how big? *8 megawatts of new diesel generators. They can pick up full load within 35 seconds.*

3. Could you use these generators as a backup to CHP to avoid demand spikes? *YES*

4. Do you presently have waste heat at any buildings? *NO*

5. Is heating glycol separate for each building? Which buildings have district heat serving multiples? *Depends on building. Main building is on one loop*

6. Would you want to try a proof of concept CHP? *Yes*

7. How big would you make your CHP in a POC building? 1 Megawatt

8. Given ML&P restriction on cogeneration, would you want to totally energize a building with CHP? Do you want to be completely independent from ML&P on selected buildings? *Would consider a distinct load or loads that could go completely off grid, such as all the heavy equipment and cooling*

9. Any idea how much energy goes to heating buildings? Cooling? *No readily*

10. Is there still any interest in a UMED centralized CHP system? *No*

11. Are any boilers nearing their end of life – use CHP as replacement boiler? *No*

12. What is the assumed cost of money? *Not asked*

13. Is there an ROI goal for investments like this? *NO*

14. Is your building primary or secondary metered with >20 kW load for > 3 months? *Primary metered*

15. Can we get a digital photo of your campus/facility for our report *WILL LOOK FOR ONE?*

d. Alaska Native Tribal Health Center - ANTHC

Facility Owner	ANTHC
Date	8/13/13
Attendees	➢ Robert Wilson, PE, Director of Facilities ➢ Dick Armstrong, PE, RSA Engineering, Inc – Principal Engineer ➢ Jim Fowler, PE, Energy Audits of Alaska - Principal
Building Inventory	*5 owned buildings and 2 managed (which are owned by federal government)* <u>Owned buildings:</u> ●HCB, 3900 Ambassador ●Cobb, 4000 Ambassador ●Inuit, 4141 Ambassador ●Providence Building, 3925 Tudor ●Key Bank Building, 4500 Diplomacy <u>Managed buildings:</u> ● Alaska Native Medical Center (ANMC), 4315 Diplomacy, CDC building ●South Central Foundation owns all other buildings (12) on campus
Annual Energy Spend	Unknown
Total Electric Load	3-4 MW
Key Strategic Reasons for interest	Cost savings
How metered	Electric – Secondary, each building is metered Natural Gas – each building is metered

Additional Notes:

- ANTHC strategy has 3 possible directions:
    - Central plant to serve entire campus
    - SCF and ANTHC create own capacity to serve their 3-4 MW
    - Hospital only
- Options 1 and 2 above seem to be least feasible, now looking at option 3 – Hospital only
- James Sears is contact at SCF
- Hospital requires 27,000# steam @ 125 psi and 11,000# @ 15 psi
- They are in process of proposing a steam micro turbine to generate 260 kW of "free" power from the 125 psi to 15 psi pressure reduction now accomplished by pressure reducing valve (will do this regardless of CHP co-generation program status)
- Tudor Center Trust is property manager (all property now owned by ANTHC and SCF)
- Lots of snow melt heat used for sidewalks
- Offices operate 8:00am -5:00pm
- Hospital operates 24/7/365
- Clinics operate 8:00am -7:00pm
- Future growth includes building parking garage in north parking lot and 170 units of student housing

Response to Questions:

1. Can you provide 2 years electric and gas billings for your buildings? Can it be published in our report? *YES*
2. Do you have stand-by or emergency generators? Where, how big? *(3) 1250 kW GENERATORS ON CAMPUS (N+1) PLUS SOME DUAL FIRED (DIESEL FUEL) BOILERS*
3. Could you use these generators as a backup to CHP to avoid demand spikes? *YES, BUT LEARY OF AIR QUALITY ISSUES AND EMMISSIONS (THEY HAVE PERMITS) SO MAY NOT USE AS BACKUP FOR CHP*
4. Do you presently have waste heat at any buildings? *NO, BUT USE RUN-AROUND LOOP FOR HEAT RECOVERY FROM EXHAUST AIR IN HOSPITAL*
5. Is heating glycol separate for each building? *YES* Which buildings have district heat serving multiples? *N/A*
6. Would you want to try a proof of concept CHP? *YES*
7. How big would you make your CHP in a POC building? *BASE LOAD*
8. Given ML&P restriction on cogeneration, would you want to totally energize a building with CHP? Do you want to be completely independent from ML&P on selected buildings? *PROBABLY NOT*
9. Any idea how much energy goes to heating buildings? Cooling? *$5 MILLION NATURAL GAS FOR HEAT, DHW AND PROCESS STEAM; (3) 335 Ton ELECTRIC CHILLERS ON PREMESIS, BUT CHILLED WATER LOOP IS COOLED BY GROUND WATER*
10. Is there still any interest in a centralized CHP system? *PROBABLY NOT*
11. Are any boilers nearing their end of life – use CHP as replacement boiler? *DIDN'T ASK*
12. What is the assumed cost of money? *DIDN'T ASK*
13. Is there an ROI goal for investments like this? *6% NOI*
14. Is your building primary or secondary metered with >20 kW load for > 3 months? *SECONDARY*
15. Can we get a digital photo of your campus/facility for our report? *DIDN'T ASK*

e. South Central Foundation Buildings

Facility Owner	South Central Foundation - SCF
Date	8/30/13
Attendees	➢ James Sears ➢ Dick Armstrong. PE, RSA Engineering, Inc. – Principal Engineer
Building Inventory	Owned Buildings at Tudor Center Complex: • 4501 Diplomacy Drive • 4315 Diplomacy Drive • 4320 Diplomacy Drive • 4155 Tudor Center Drive, Units 101-104; 203-207 • 4175 Tudor Center Drive • 4341 Tudor Center Drive • 4160 Tudor Center Drive • 4201 Tudor Center Drive • 4145 Tudor Center Drive • 4105 Tudor Center Drive • 4450 Diplomacy Drive
Annual Energy Spend	Unknown
Total Electric Load	Unknown
Key Strategic Reasons for interest	Cost Savings
How metered	Electric – Secondary, each building is metered Natural Gas – each is separately metered

Additional Notes:

- SCF would consider the options
- Primary Care Clinic open 8 AM – 7 PM
- Offices open 8 AM – 5 PM

Response to Questions:

1. Can you provide 2 years electric and gas billings for your buildings? Can it be published in our report? *Can contact MLP*

2. Do you have stand-by or emergency generators? Where, how big? *1 generator at 4341 Tudor Centre*

3. Could you use these generators as a backup to CHP to avoid demand spikes? *No*

4. Do you presently have waste heat at any buildings? *NO*

5. Is heating glycol separate for each building? *Yes*

6. Would you want to try a proof of concept CHP? *Yes*

7. How big would you make your CHP in a POC building? *Please explain*

8. Given ML&P restriction on cogeneration, would you want to totally energize a building with CHP? Do you want to be completely independent from ML&P on selected buildings? *No*

9. Any idea how much energy goes to heating buildings? Cooling? *Would need to review by billing*

10. Is there still any interest in a centralized CHP system? *I'd say it largely depends on capital investment.*
11. Are any boilers nearing their end of life - use CHP as replacement boiler? *4175 Tudor Centre possibly*
12. What is the assumed cost of money? *Don't know*
13. Is there an ROI goal for investments like this? *Unknown*
14. Is your building primary or secondary metered with >20 kW load for > 3 months? *SECONDARY*
15. Can we get a digital photo of your campus/facility for our report? *DIDN'T ASK*

f. Enstar Natural Gas

Facility Owner	Enstar Natural Gas
Date	9/25/2013
Attendees	➢ John Lau, PE, Director of Transmission Operations ➢ Travis D. Price, Building Maintenance ➢ Matt Vandis, Electrical Engineer ➢ Marc Rouse, Capstone Marketing ➢ Greg Porter, President, Chenega Energy ➢ Paul Rieland, Chenega Energy ➢ Dick Armstrong, PE, RSA Engineering
Building Inventory	2 buildings on International Airport Road
Annual Energy Spend	Unknown
Total Electric Load	Unknown
Key Strategic Reasons for interest	Offset electrical energy costs to Enstar through use of CHP Providing natural gas to UMED District
How metered	Electric - Secondary

Additional Notes:

- Enstar feels confident that they have adequate natural gas capacity in the UMED district to serve all Stakeholders in the district if they add CHP
- Gas pressures in the UMED area are 40-60 PSIG, but CHP units need 70-80 PSIG to operate without an accessory gas compressor, which can be provided
- Enstar could increase gas pressure to 100 PSIG by running a spur pipeline to those facilities needing higher pressure both at ANMC and at UAA
- Enstar may be interested in installing one or more CHP units at their International Airport Road facility, and would like to see pricing and economic analysis, which Chenega Energy will provide.
- If CHP systems are placed in buildings, a rule of thumb is that the natural gas usage would increase by about half again due to the power generation.

g. ALASKA PSYCHIATRIC INSTITUTE - API

Facility Owner	API
Date	8/20/13
Attendees	➢ Tina Williams ➢ Annalysa Haynie ➢ Durbin Hobbs ➢ Doug Ault – DOT Facilities Project Manager ➢ Jim Long – MYC Maintenance ➢ Dick Armstrong, PE, RSA Engineering, Inc – Principal Engineer ➢ Brenda Alvarado ➢ Ron Hale
Building Inventory	1 owned building
Annual Energy Spend	2012 Electric: $ 182,300, Demand Approximate: $56,398 2012 Gas: $ 141,583
Total Electric Load	Unknown
Key Strategic Reasons for interest	Cost savings
How metered	Electric – Secondary Main building metered

Additional Notes:

- No waste heat at facility
- Do not want to operate a standalone generation system at API
- Uses 2 each, 2 million BTU boilers, one carries 80% of total load
- 70% of the time, one 2 million BTU boiler carries entire building
- Doug Ault, DOT/PF handles Facilities Upgrades, procurements
- Hospital operates 24/7/365

Response to Questions:

1. Can you provide 2 years electric and gas billings for your buildings? Can it be published in our report? *YES, 1.5 YEARS PROVIDED*

2. Do you have stand-by or emergency generators? Where, how big? *2 EMERGENCY DIESEL GENERATORS AT 400 KW EACH. THE TOTAL BUILDING DEMAND IS <400 KW, BUT BUILDING IS WIRED SUCH THAT EMERGENCY GENSET ONLY ENERGIZES CRITICAL LOADS*

3. Could you use these generators as a backup to CHP to avoid demand spikes? *YES, BUT WIRING ON EMERGENCY GENSETS ONLY TO CRITICAL LOADS*

4. Do you presently have waste heat at any buildings? *NO*

5. Is heating glycol separate for each building? *ONLY ONE BUILDING*

6. Would you want to try a proof of concept CHP? *WOULD CONSIDER, BUT BASED ON DOUG AULT RECOMMENATION*

7. How big would you make your CHP in a POC building? *TBD*

8. Given ML&P restriction on cogeneration, would you want to totally energize a building with CHP? Do you want to be completely independent from ML&P on selected buildings? *NO*

9. Any idea how much energy goes to heating buildings? Cooling? *NATURAL GAS FOR BUILDING HEAT, LAUNDRY, COOKING IS $ 141,583 FOR 2012.*

10. Is there still any interest in a centralized CHP system? *PROBABLY NOT*

11. Are any boilers nearing their end of life – use CHP as replacement boiler? *NO, RELATIVELY NEW BUILDING*

12. What is the assumed cost of money? *ESITMATED AT 5%*

13. Is there an ROI goal for investments like this? *DID NOT ASK*

14. Is your building primary or secondary metered with >20 kW load for > 3 months? *SECONDARY*

15. Can we get a digital photo of your campus/facility for our report? *YES, MYC/API CAMPUS*

h. MUNICIPAL LIGHT AND POWER (ML&P)

Facility Owner	Municipality of Anchorage
Date	8/27/13
Attendees	➢ Jim Posey, General Manager ➢ Bob Reagan, Manager Regulatory Affairs ➢ Joe Steele, Technical Services Superintendent ➢ Ronnie Dent, ML&P ➢ Steve McElroy, ML&P ➢ Alex Martin, Alaska Dispatch ➢ Nicole Jones-Vogel, MOA Planning ➢ Marty Smith, ML&P ➢ Carol Wong, Manager MOA long range planning ➢ Anna Henderson, ML&P ➢ Kristine Bunnell, MOA Project Manager (by phone) ➢ Dick Armstrong, PE, Principal, RSA Engineering, Inc. ➢ Tim Hall, Principal, RSA Engineering, Inc. ➢ Jim Fowler, PE, Principal, Energy Audits of Alaska
Total Electric Capacity	382 mW estimated total capacity including South Central Plant (joint ML&P/CEA venture) which came on line February 2013. Plant 2A will add approximately 100 to 120 mW additional capacity, and is in process. 7 gas turbines 1 steam turbine 2 hydro facilities Bradley Lake rights

Meeting Notes (Initials from list above are used to indicate speaker – these are paraphrased meeting notes, not direct quotes - unless indicated with quotation marks):

After reviewing the PowerPoint presentation by Dick Armstrong which summarized the following points, a discussion ensued. The main points covered in the PowerPoint presentation follow:

- The prior study findings (i.e. a central 10 MW plant and utilidors to distribute heat) including the fact that nearly 50% of the capital cost was to distribute the heat
- The current program direction (i.e. distributed CHP's sized for base load case, serving customer's load on or near heat consuming site)
- The MPL tariff section 113 disallowing a customer's generated power to feed their own load or reduce demand charges
- CEA's regulations which do allow a customer's generated power to feed their own load and does allow reduction in demand charges

- The UMED constituent's desires to remain connected to ML&P and for relief from section 113

Additional Notes:

JP - indicated that he had only 20 minutes and "get to whatever you're trying to sell"
DA - clarified that nothing is being sold, this is an engineering activity to update a feasibility study, and part of the process was to provide UMED feedback to ML&P and to obtain ML&P's inputs.
JP – there was a proposal put on the table resulting from the last study (the centralized 10 MW CHP plant), and UMED rejected it. It required that the State or some other entity make up the difference in lost revenues to ML&P. Any revenue we lose from a reduction in demand charges to UMED has to be made up from the rest of our customer base. (Ronnie Dent is point of contact for additional historical information about the last study and this proposal)
DA – Why is CEA's rate structure different from ML&P?
JP – only 12% of our revenue is from residential customers. Demand charges cover when a large customer "flips the switch" at his facility, we have to be able to meet that demand. UMED was among the largest 3 of our customers. CEA does not have as many big users.
BR – you're essentially asking for net metering, we won't do that
BR – although there is one exception, and that is less than 25 kW systems, and we only have 2 customers taking advantage of that
JF – that exception accommodated photo voltaic systems, right?
BR - yes
JS – I disagree with the statement that a CHP micro-turbine will only be down for 6 hours a year, so ML&P still has to have the capacity to "turn the switch back on", so we're not saving anything. What you're essentially proposing is that ML&P be required to follow the load if the base load is provided by CHP.
BR – I see this falling under PURPA. In 1978 the federal government passed the Public Utilities Regulatory Policies Act which requires utilities to purchase power back from qualifying generation facilities at a rate that "includes all of the benefits of their receipt of the same power from the utility". Our default rate is the 3.5 cents you mentioned. We have never gone through the PURPA process with any customers.
Unknown speaker – thinking back to the deal that was on the table that JP mentioned, the environment at UMED has changed, as has ML&P's. Back then, I recall that Providence's backup generators were approaching their end of life, so the central plant met more than one need, and ML&P did not have the South Central Plant, or Plant 2A, so we needed capacity.
JF – how many years into the future will the current capacity you have on line, plus plant 2A's capacity last for your customer base?
BR – hard to say, maybe 10-20 years, probably 15 is as good a number as any, depends too on how fast the city grows.

Technical questions:

DA – what's the efficiency of your generators?

JS/BR – right around 12,000 BTU/kWh or 33%, but most of our generators are running on a combined cycle which probably pushes it to 9,000-10,000 BTU/kWh. The South Central plant is running around 8,000 BTU/kWh.

DA – what are your transmission losses?

BR – not too high, as our lines are pretty local, maybe 5% maximum

DA – can we get the total UMED consumption and demand?

JS – I can probably provide that, although there are a whole lot of meters…

i. McLaughlin Youth Center

Facility Owner	McLaughlin Youth Center
Date	8/21/13
Attendees	➢ Dennis Weston, Superintendent ➢ Anita Smythe – Administrator ➢ Rob Ruddy ➢ Dick Armstrong, PE, RSA Engineering, Inc – Principal Engineer ➢ Jim Wan
Building Inventory	●Administration ●Cottages 1-5 ● Building C ●School ●Boy's Detention ●New Detention
Annual Energy Spend	2013 Electric: Energy Av. Estimate = $ 169,144 Elect Demand Av Est. = $ 53,935/yr. 2013 Gas: 93785 (Jan/Jun 2013); Estimate $ 187,570/year
Total Electric Load	Unknown
Key Strategic Reasons for interest	Cost savings
How metered	Electric – Secondary Main building metered
Potential Building(s) for Pilot Installation	API Main Building

Additional Notes:

- No waste heat at facility
- Do not want to operate a standalone generation system at API
- Uses 2 each, 2 million BTU boilers, one carries 80% of total load
- 70% of the time, one 2 million BTU boiler carries entire building
- Doug Ault, DOT/PF handles Facilities Upgrades, procurements
- Hospital operates 24/7/365

Response to Questions:

1. Can you provide 2 years electric and gas billings for your buildings? Can it be published in our report? *YES, 1.5 YEARS PROVIDED*

2. Do you have stand-by or emergency generators? Where, how big? *2 EMERGENCY DIESEL GENERATORS AT 400 KW EACH. THE TOTAL BUILDING DEMAND IS <400 KW, BUT BUILDING IS WIRED SUCH THAT EMERGENCY GENSET ONLY ENERGIZES CRITICAL LOADS*

3. Could you use these generators as a backup to CHP to avoid demand spikes? *YES, BUT WIRING ON EMERGENCY GENSETS ONLY TO CRITICAL LOADS*

4. Do you presently have waste heat at any buildings? *NO*

5. Is heating glycol separate for each building? *ONLY ONE BUILDING*

6. Would you want to try a proof of concept CHP? *WOULD CONSIDER, BUT BASED ON DOUG AULT RECOMMENDATION*

7. How big would you make your CHP in a POC building? *TBD*

8. Given ML&P restriction on cogeneration, would you want to totally energize a building with CHP? Do you want to be completely independent from ML&P on selected buildings? *NO*

9. Any idea how much energy goes to heating buildings? Cooling? *NATURAL GAS FOR BUILDING HEAT, LAUNDRY, COOKING IS $ 141,583 FOR 2012.*

10. Is there still any interest in a centralized CHP system? *PROBABLY NOT*

11. Are any boilers nearing their end of life – use CHP as replacement boiler? *NO, RELATIVELY NEW BUILDING*

12. What is the assumed cost of money? *ESITMATED AT 5%*

13. Is there an ROI goal for investments like this? *DID NOT ASK*

14. Is your building primary or secondary metered with >20 kW load for > 3 months? *SECONDARY*

15. Can we get a digital photo of your campus/facility for our report? *YES, MYC/API CAMPUS*

Appendix B: FlexEnergy

FLEXENERGY

FLEX TURBINE™ MT250

Ultra-clean electricity and useful thermal energy from a rugged and efficient gas turbine

250 kW Continuous Onsite Electrical Power with Integrated Heat Recovery

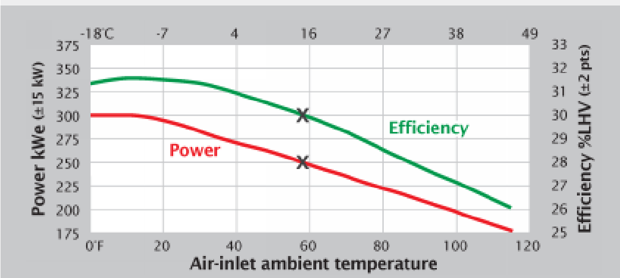
KEY FEATURES

- High system efficiency
- Grid-parallel, grid-isolated, or dual-mode
- Low emissions exceed stringent environmental standards
- Product design life of 80,000 hours with overhaul
- Integrated, variable-output, waste-heat recovery unit available
- Over one million hours of fleet operating experience

ELECTRICAL PERFORMANCE*

CHARACTERISTIC	SPECIFICATION
Electrical efficiency (±2)	30% LHV without gas booster
Electrical power** (±15)	250 kW nominal

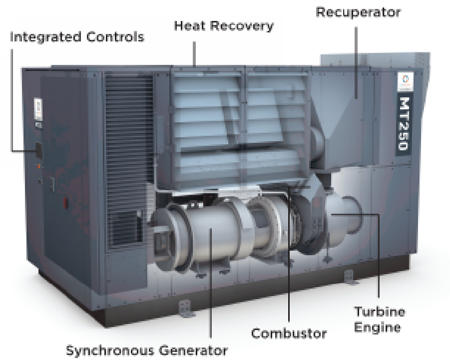
ELECTRICAL OUTPUT GRAPH SHOWS CHANGE IN POWER AND EFFICIENCY WITH TEMPERATURE



Note- X represents output at ISO Conditions
- kWe is electrical output at terminals corrected for parasitics, but not including gas booster power

Nominal heat rate (HHV)	12,645 Btu/kWh (13,341 kJ/kWh) without gas booster 13,080 Btu/kWh (13,800 kJ/kWh) with gas booster
Nominal heat rate (LHV)	11,380 Btu/kWh (12,007 kJ/kWh) without gas booster 11,770 Btu/kWh (12,418 kJ/kWh) with gas booster
Voltage	480 VAC/400 VAC
Frequency	60 Hz/50 Hz
Type of service	3 phase, wye, 4 wire
Grid-isolated regulation (steady state)	±0.50% nominal voltage ±0.30 Hz nominal frequency
Transient handling (linear loads) (recovery within 5 seconds)	±10% nominal voltage max ±5 Hz frequency max

* at ISO Conditions (59°F [15°C] @ sea level, 60% RH) unless otherwise noted, pipeline natural gas only. Data shown without gas booster.
** elevation derate of approximately 8.80 kW per 1000 ft (305 m)



CARB CERTIFICATION
- The MT250 is the first microturbine to be certified to the California Air Resource Board's 2007 emissions standards

RUGGED GAS TURBINE
- Back-to-back rotating components
- Proven oil-lubricated bearings
- High H_2S tolerance up to 6500 ppmv

SYNCHRONOUS GENERATOR
- Same technology utilities use to power the grid
- High load starting capability up to 100 hp DOL

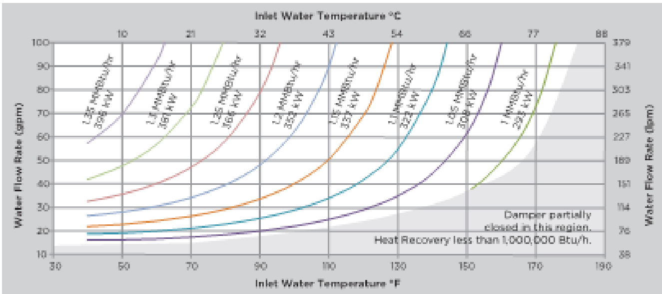
PATENTED RECUPERATOR
- Critical to high system efficiency
- Compact design

PATENTED COMBUSTOR
- Dry low NOx
- Easily meets stringent environmental regulations

SOPHISTICATED CONTROLS
- Closed transition dual-mode functionality
- Remote monitoring capability

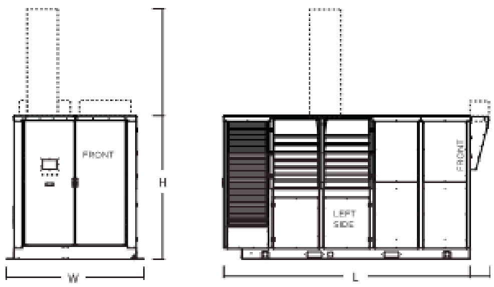
COMBINED HEAT AND POWER
- Controllable output level
- Integral heat recovery unit enclosed within turbine enclosure
- No ducting
- Suitable for potable applications

HEAT OUTPUT RECOVERABLE TO WATER



Note- Heat Recovery Unit (HRU) at ISO conditions, damper fully open, ±15%

PHYSICAL SPECIFICATIONS

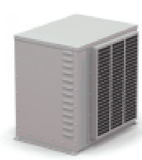


DIMENSIONS		WIDTH	LENGTH	HEIGHT	WEIGHT Est
Indoor Unit	(in)	77.2	167.6	91.9	14,500 lb
	(cm)	196.0	425.8	229.9	6,577 kg
Outdoor Unit	(in)	77.2	167.6	158.1	14,500 lb
	(cm)	196.0	425.8	401.5	6,577 kg

Weatherproof Outdoor Enclosure

MINIMUM CLEARANCE REQUIREMENTS

CHARACTERISTIC	SPECIFICATION
Vertical clearance	
- Indoor Unit	102 in (259 cm)
- Outdoor Unit	no overhead obstruction
Horizontal front, rear and left side	48 in (122 cm)
Horizontal right side	72 in (183 cm)



Generator Braking Resistor

GENERATOR BRAKING RESISTOR

CHARACTERISTIC	SPECIFICATION
Dimensions (LxWxH)	37x39x30 in (94x99x76 cm)
Weight	240 lb (109 kg)

SOUND LEVELS

CHARACTERISTIC	SPECIFICATION
Standard	80 dB(A) @ 1m
Low sound option	77 dB(A) @ 1m

FLEXENERGY.COM
INFO@FLEXENERGY.COM

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Irvine, CA 92618
United States

Europe:
+44 (0)7710 827141

33 St. James' Square
London, SW1Y 4JS
United Kingdom

HEAT RECOVERY*

CHARACTERISTIC	SPECIFICATION
Recuperator exhaust temp. w/o HRU	493°F (256°C)
Engine air flow	4.7 lb/s (2.13 kg/s)
Max water flow	100 gpm (22.7 m³/hr)
Max inlet water pressure	125 psig (862 kPa)
Max inlet water temp.	194°F (90°C)

* at ISO Conditions (59°F [15°C] @ sea level, 60% RH) unless otherwise noted.

FUEL REQUIREMENTS

CHARACTERISTIC	SPECIFICATION
Inlet pressure	
-with gas booster	4" (100mm) WC to 1 psig (6.9 kPa)
-without gas booster	80 to 140 psig (551 to 965 kPa)
Min temperature*	33°F (1°C)
Max temp. -with gas booster	115°F (46°C)
-without gas booster	175°F (79°C)
250SV Model**	245 to 350 WI Btu/scf
very low caloric value gas	9,130 to 13,040 WI kJ/m³
250SW Model**	325 to 600 WI Btu/scf
low caloric value gas, level 1	12,100 to 22,340 WI kJ/m³
250ST Model**	500 to 970 WI Btu/scf
low caloric value gas, level 2	18,600 to 36,100 WI kJ/m³
250SM Model**	800 to 1440 WI Btu/scf
medium caloric value gas	29,800 to 53,600 WI kJ/m³
250SH Model**	1380 to 1900 WI Btu/scf
high caloric value gas	51,400 to 70,700 WI kJ/m³

* Or 18°F dewpoint suppression, whichever is greater
** Wobbe Index. Lower heating value (LHV), dry basis, at 14.7 psi (101 kPa) and 59°F (15°C)

EMISSIONS AT 100% LOAD*

CHARACTERISTIC	SPECIFICATION
NOx	<5 ppmv @ 15% O_2
CO	<5 ppmv @ 15% O_2
VOC	<5 ppmv @ 15% O_2

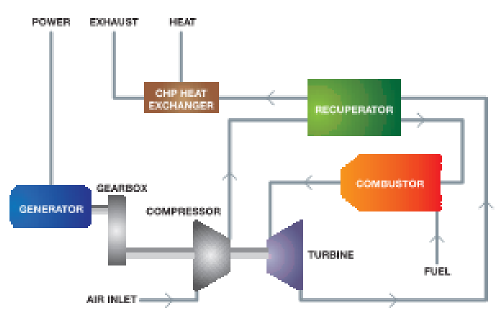
* Pipeline natural gas only at ISO conditions

AMBIENT TEMPERATURE LIMIT

CHARACTERISTIC	SPECIFICATION
Outdoor*	-10° to 115°F (-23° to 46°C)

* some configurations may require additional cold-weather options

MT250 GAS TURBINE CYCLE



APPENDIX C: CAPSTONE C65 & C65 ICHP MICROTURBINE

C65 & C65 ICHP MicroTurbine Natural Gas

Capstone

Achieve ultra-low emissions and reliable electrical/thermal generation from natural gas.

- Ultra-low emissions
- One moving part – minimal maintenance and downtime
- Patented air bearing – no lubricating oil or coolant
- 5 and 9 year Factory Protection Plans available
- Remote monitoring and diagnostic capabilities
- Integrated utility synchronization and protection[1]
- Small, modular design allows for easy, low-cost installation
- Reliable – tens of millions of run hours and counting

C65 MicroTurbine

Electrical Performance[2]

Electrical Power Output	65kW
Voltage	400–480 VAC
Electrical Service	3-Phase, 4 wire
Frequency	50/60 Hz, grid connect operation
	10–60 Hz, stand alone operation
Maximum Output Current	100A, grid connect operation
	100A, stand alone operation[3]
Electrical Efficiency LHV	29%

C65 ICHP MicroTurbine

Fuel/Engine Characteristics[2]

Natural Gas HHV	30.7–47.5 MJ/m³ (825–1,275 BTU/scf)
Inlet Pressure[4]	517–552 kPa gauge (75–80 psig)
Fuel Flow HHV	888 MJ/hr (842,000 BTU/hr)
Net Heat Rate LHV	12.4 MJ/kWh (11,800 BTU/kWh)

Exhaust Characteristics[2]

NOx Emissions at 15% O_2[5]	< 9 ppmvd (19 mg/m³)
NOx / Electrical Output[5]	0.16 g/bhp-hr (0.46 lb/MWhe)
Exhaust Gas Flow	0.49 kg/s (1.08 lbm/s)
Exhaust Gas Temperature	309°C (588°F)

Reliable power when and where you need it. Clean and simple.

C65 ICHP Heat Recovery(6)

Integrated Heat Recovery Module Type	Copper Core	Stainless Steel Core
Hot Water Heat Recovery	120 kW (408,000 BTU/hr)	74 kW (251,000 BTU/hr)
Total System Efficiency LHV	82%	62%

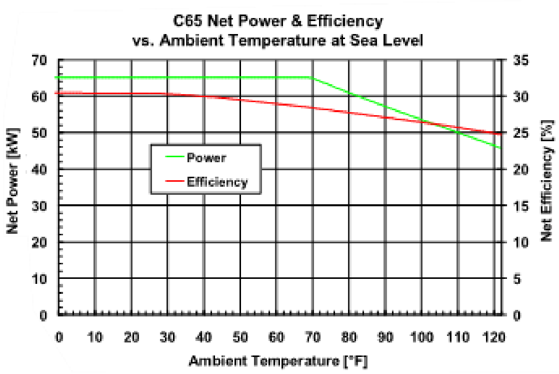
Dimensions & Weight(7)	C65	C65 ICHP
Width x Depth(8) x Height(9)	0.76 x 1.9 x 1.9 m (30 x 77 x 76 in)	0.76 x 2.2 x 2.4 m (30 x 87 x 93 in)
Weight - Grid Connect Model	758 kg (1,671 lb)	1000 kg (2,200 lb)
Weight - Dual Mode Model	1121 kg (2,471 lb)	1364 kg (3,000 lb)

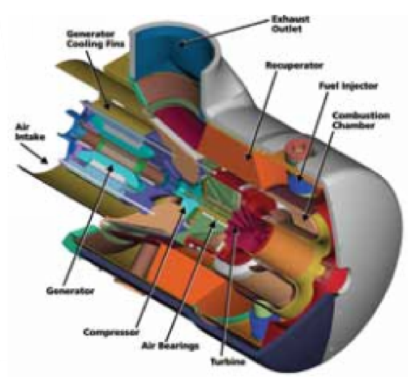
Minimum Clearance Requirements(10)	C65	C65 ICHP
Vertical Clearance	0.61 m (24 in)	0.61 m (24 in)
Horizontal Clearance		
Left & Right	0.76 m (30 in)	0.76 m (30 in)
Front(11)	1.7 m (65 in)	1.7 m (65 in)
Rear	0.91 m (36 in)	0.76 m (30 in)

Sound Levels	C65	C65 ICHP
Acoustic Emissions at Full Load Power(12)		
Nominal at 10 m (33 ft)	70 dBA	65 dBA

Certifications

- Certified to UL 2200 and UL 1741 for natural gas operation (UL files AU2687, E209370)
- Complies with IEEE 1547 and meets statewide utility interconnection requirements for California Rule 21 and the New York State Public Service Commission
- Materials Equipment Acceptance (MEA) approval for New York City
- Models available with optional equipment for CE Marking





(1) Some utilities may require additional equipment for grid interconnectivity
(2) Nominal full power performance at ISO conditions: 59°F, 14.696 psia, 60% RH
(3) With linear load
(4) Inlet pressure for standard natural gas at 39.4 MJ/Nm³ (1,000 BUT/scf) (HHV)
(5) Exhaust emissions for standard natural gas at 39.4 MJ/Nm³ (1,000 BTU/scf) (HHV)
(6) Heat recovery for water inlet temperature of 38°C (100°F) and flow rate of 2.5 l/s (40 GPM)
(7) Approximate dimensions and weights
(8) Depth includes 10 inch extension for the heat recovery module rain hood on ICHP versions
(9) Height dimensions are to the roof line. Exhaust outlet extends at least 7 inches above the roof line
(10) Clearance requirements may increase due to local code considerations
(11) Dual Mode MicroTurbine configuration for Battery Removal clearance
(12) The optional acoustic inlet hood kit can reduce acoustic emissions at the front of the MicroTurbine by up to 5 dBA
Specifications are not warranted and are subject to change without notice.

21211 Nordhoff Street • Chatsworth • CA • 91311 • 866.422.7786 • 818.734.5300 • www.capstoneturbine.com
 P0911 C65 & C65 ICHP Data Sheet CAP139 | Capstone P/N 331035E

APPENDIX D: CAPSTONE C200 MICROTURBINE HIGH-PRESSURE

C200 MicroTurbine High-pressure Natural Gas

World's largest air-bearing microturbine produces 200kW of clean, green, and reliable power.

- Ultra-low emissions
- One moving part – minimal maintenance and downtime
- Patented air bearing – no lubricating oil or coolant
- 5 and 9 year Factory Protection Plans available
- Remote monitoring and diagnostic capabilities
- Integrated utility synchronization and protection
- Small, modular design allows for easy, low-cost installation
- Proven technology with tens of millions of run hours and counting
- Internal fuel gas compressor available for low fuel pressure natural gas applications

C200 MicroTurbine

Electrical Performance(1)

Electrical Power Output	200kW
Voltage	400–480 VAC
Electrical Service	3-Phase, 4 wire
Frequency	50/60 Hz, grid connect operation 10–60 Hz, stand alone operation
Maximum Output Current	290A RMS @ 400V, grid connect operation 240A RMS @ 480V, grid connect operation 310A RMS, stand alone operation(2)
Electrical Efficiency LHV	33%

Fuel/Engine Characteristics(1)

Natural Gas HHV	30.7–47.5 MJ/m³ (825–1,275 BTU/scf)
Inlet Pressure(3)	517–552 kPa gauge (75–80 psig)
Fuel Flow HHV	2,400 MJ/hr (2,280,000 BTU/hr)
Net Heat Rate LHV	10.9 MJ/kWh (10,300 BTU/kWh)

Exhaust Characteristics(1)

NOx Emissions @ 15% O_2(4)	< 9 ppmvd (18 mg/m³)
NOx / Electrical Output(4)	0.14 g/bhp-hr (0.4 lb/MWhe)
Exhaust Gas Flow	1.3 kg/s (2.9 lbm/s)
Exhaust Gas Temperature	280°C (535°F)
Exhaust Energy	1,420 MJ/hr (1,350,000 BTU/hr)

Reliable power when and where you need it. Clean and simple.

Dimensions & Weight[5]

Width x Depth x Height[6]	1.7 x 3.8 x 2.5 m (67 x 150 x 98 in)
Weight – Grid Connect Model	2776 kg (6,120 lb)
Weight – Dual Mode Model	3413 kg (7,525 lb)

Minimum Clearance Requirements[7]

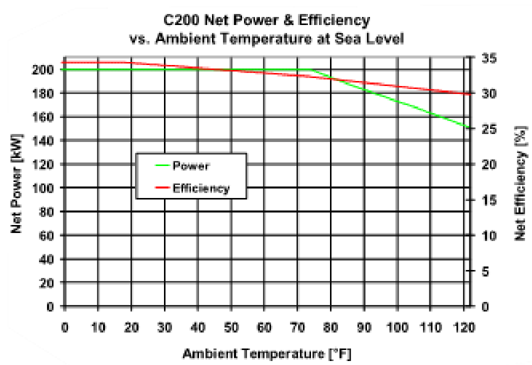
Vertical Clearance	0.6 m (24 in)
Horizontal Clearance	
Left & Right	1.1 m (42 in)
Front	1.1 m (42 in)
Rear	1.8 m (70 in)

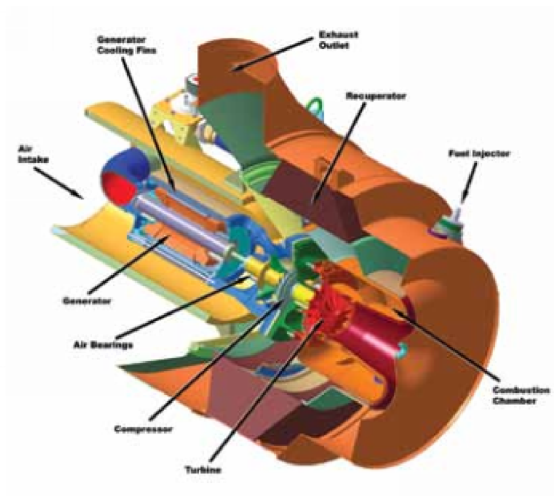
Sound Levels

Acoustic Emissions at Full Load Power	
Nominal at 10 m (33 ft)	65 dBA

Certifications

- UL 2200 and UL 1741 natural gas operation[8]
- Complies with IEEE 1547 and meets statewide utility interconnection requirements for California Rule 21 and the New York State Public Service Commission
- CE certified





(1) Nominal full power performance at ISO conditions: 59°F, 14.696 psia, 60% RH
(2) With linear load
(3) Inlet pressure for standard natural gas at 39.4 MJ/Nm³ (1,000 BTU/scf) (HHV)
(4) Emissions for standard natural gas at 39.4 MJ/Nm³ (1,000 BTU/scf) (HHV)
(5) Approximate dimensions and weight
(6) Height dimensions are to the roof line. Exhaust outlet extends at least 8 inches above the roof line
(7) Clearance requirements may increase due to local code considerations
(8) All natural gas models are planned to be UL Listed

Specifications are not warranted and are subject to change without notice.

Capstone

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 P0911 C200 HP Natural Gas Data Sheet CAP146 | Capstone P/N 331042E

APPENDIX E: ECONOMIC CALCULATOR 65KW MICRO TURBINE-WITH ALL POWER SOLD TO ML&P

Project Summary

Project Information

Company Name	Generic Building at UMED with a C65 Microturbine - Assumes CHP unit sells all power to ML&P		
Facility Description	Generic facility at UMED to use waste heat but sell all power to ML&P per their tariff		
Facility Location	UMED District		
Date of Analysis	17-Sep-13	Prepared By	

Benefits Summary

10 yr IRR	#NUM!
10 yr NPV	($330,697)
Payback Period [Years]	>10 Years
Discount Rate	6.0%

Calculations include benefits from:
Electricity Production; Heat Cogeneration;

5 Year Cash Flow Analysis

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
Net Investment	($289,170)					
Total Annual Benefits		$31,747	$32,382	$33,029	$33,690	$34,364
Fuel & O&M Costs		($37,306)	($37,961)	($38,628)	($39,309)	($40,004)
Net Cash Flow	($289,170)	($5,560)	($5,579)	($5,599)	($5,619)	($5,640)
Discounted Cash Flow	($289,170)	($5,245)	($4,965)	($4,701)	($4,451)	($4,215)

Equipment, Investment, and Operating Summary

Capstone MicroTurbines	1 x 65
Configuration	65C-HD4-DU00
Fuel Source	LP Natural Gas

Total System Power Rating	65	kW
Avg Monthly Generated Power	31,842	kWh per Month
Avg Price of Offset Utility Power	$0.035	$/kWh
Equivalent Cars Removed	25	using EPA data

Total Installed Cost	($289,170)
Installation/Equipment Rebates	$0
Avoided Equipment Costs	$0
Financing/Tax Credits	$0
Net Investment	($289,170)

Operating Hours/Year		Efficiency [LHV]	
Microturbine	6,264	72.1%	Overall Total
~~Heat~~	~~6,264~~	~~72.1%~~	~~during Heat~~
~~Cooling~~	~~0~~	~~N/A~~	~~during Cooling*~~
* using thermal input, not cooling output		49.9%	FERC

Disclaimer: The software used to create this Economic Calculator is provided as a tool for estimation of the potential value of installing and operating a Capstone microturbine system. The calculated results are based on Capstone's published specifications and certain performance assumptions by Capstone when there is a range of performance possibilities for the Capstone microturbine (which performance is subject to change without notice). The Economic Calculator requires the user to input certain additional assumptions regarding conditions of operation, as well as certain location specific information. The Economic Calculator results will change depending on changes to the assumptions, including lower or higher assumptions where there is a range of possible performance criteria, changes in operation, and changes in location. Neither Capstone, nor any of its representatives, can guarantee that these projected savings will occur or that the calculations made by the Economic Calculator are accurate or error-free. The output from the Economic Calculator in no way constitutes a commitment by Capstone that the forecasted savings or performance will be achieved.

Economic Calculator UMED C65 All power sells back to ML&P 091713.xlsx

65KW MICRO TURBINE-WITH ALL POWER SOLD TO ML&P

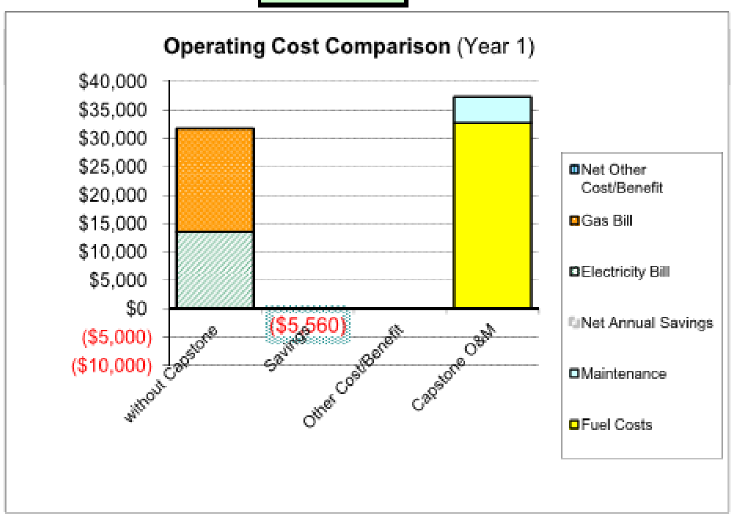
Payback Analysis

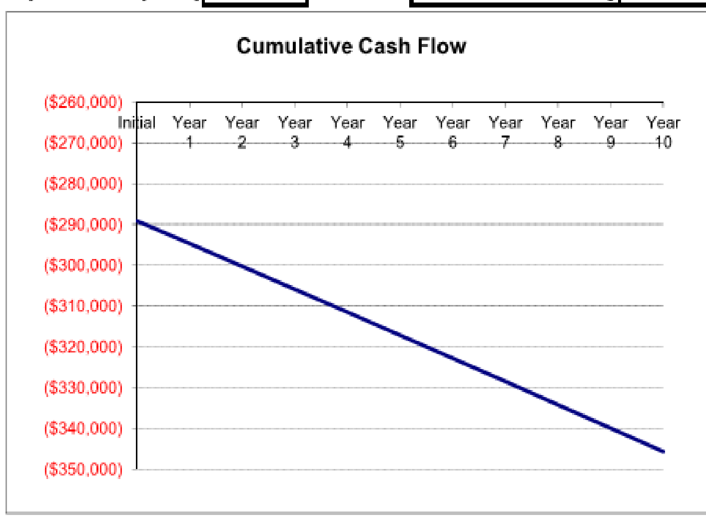
	Include in Analysis?	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Installed Cost		$289,170										
Fuel, O&M, and Other Costs			$37,306	$37,961	$38,628	$39,309	$40,004	$40,712	$41,435	$42,172	$42,923	$43,690
Savings/Avoided Costs												
Electricity Production	☑		$13,557	$13,828	$14,105	$14,387	$14,675	$14,968	$15,267	$15,573	$15,884	$16,202
Heat Cogeneration	☑	$0	$18,190	$18,554	$18,925	$19,303	$19,689	$20,083	$20,485	$20,894	$21,312	$21,738
Cooling	☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Power Quality/ Reliability	☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Financing/ Inv. Tax Credits	☐	~~$13,000~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Emissions Credits	☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Depreciation Tax Benefit	☐		~~$23,712~~	~~$37,939~~	~~$22,763~~	~~$13,658~~	~~$13,658~~	~~$6,829~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Total		$0	$31,747	$32,382	$33,029	$33,690	$34,364	$35,051	$35,752	$36,467	$37,196	$37,940
Net Cash Flow		($289,170)	($5,560)	($5,579)	($5,599)	($5,619)	($5,640)	($5,661)	($5,683)	($5,705)	($5,727)	($5,750)
Cumulative Cash Flow		($289,170)	($294,730)	($300,309)	($305,908)	($311,527)	($317,167)	($322,828)	($328,511)	($334,215)	($339,942)	($345,692)

Depreciation Method	MACRS 5 YR (half-yr convetion)
Depreciation Timeline	5 years
Tax Rate	41%
Discount Rate	6.0%

Annual Savings (Year 1)	($5,560)
10 yr IRR	#NUM!
10 yr NPV	($330,697)
Payback Period [Years]	>10 Years

Operating Hours/year	
Microturbine	6,264
Heat	6,264
Cooling	~~0~~





Economic Calculator UMED C65 All power sells back to ML&P 091713.xlsx

65KW MICRO TURBINE-WITH ALL POWER SOLD TO ML&P

Performance Calculator

Microturbine Information

Capstone Product	C65	
Catalog Number	65C-HD4-DU00	
kW Nominal Rating	65	
Fuel Type	LP Natural Gas	Requires Gas Pack
Configuration	Dual Mode	
Heat Recovery Module	Yes	
Certification/Emissions	UL	

Units

English

Site Information

Site Elevation	140	Feet

Parasitic Loads

Fuel Gas Booster	4.0	kW (from selection above)
Customer Load	0.0	kW (if any)
Total Parasitic Load	4.0	kW

Inlet & Exhaust Restrictions

Inlet Pressure Drop	2	inches WC
Exhaust Backpressure	3	inches WC

Cogeneration (Heating)

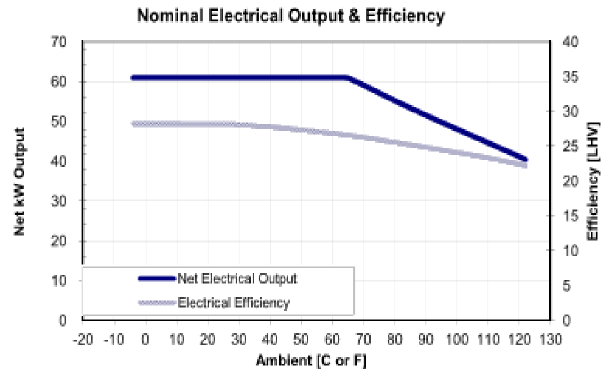
HRM or Direct Exhaust?	HRM	
Inlet Water Temperature to HX	160	°F
Water Flow	40.0	gallons/min
Process Control Temperature	200	°F

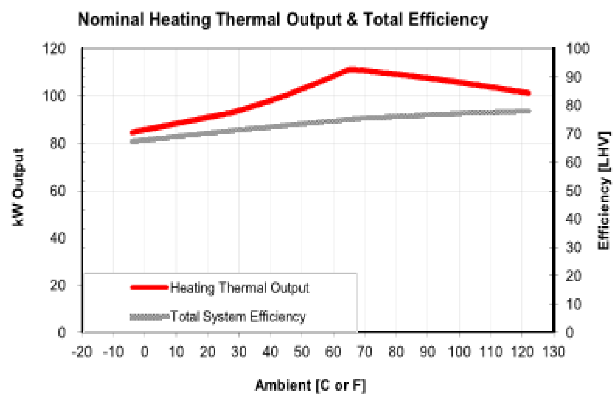
Cogeneration (Cooling)

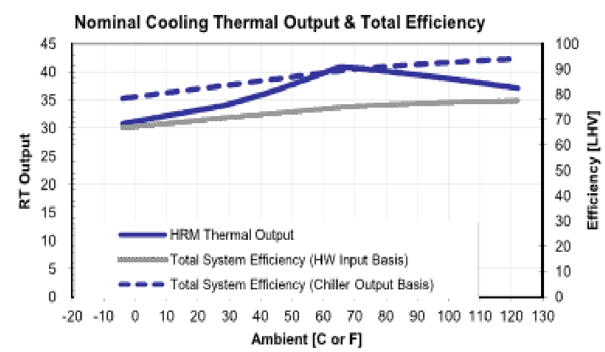
HRM or Direct Exhaust?	HRM	
Coefficient of Performance	1.30	
Inlet Water Temp to Chiller	180	°F
Water Flow	40.0	gallons/min

Nominal Performance for Selected Ambient Temperature

	Ambient	36.0	°F
Electrical Output	Power	61.0	kW
	Efficiency	27.9	% [LHV]
Heating Output	Power	96.3	kW
		329,000	BTU/hr
	Water Out	176.6	°F
	Efficiency	72.0	% [LHV]
Cooling Output	Power	35.2	RT
		124.0	kW
	Efficiency	71.5	% [LHV] based on Heat Input
		84.6	% [LHV] based on Chiller Output







Economic Calculator UMED C65 All power sells back to ML&P 091713.xlsx

65KW MICRO TURBINE-WITH ALL POWER SOLD TO ML&P

Equipment and Installation

Equipment Costs	Units	Price	Total
Microturbines	1	$ 114,400	$ 114,400
DC Gas Pack	1	$ 32,870	$ 32,870
Elec Equipment	1	$ 19,900	$ 19,900
			$ -
			$ -
			$ -
			$ -
			$ -
			$ -
			$ -
Sales Tax @ 8%	0	$ -	$ -
		Subtotal	$ 167,170
		Equipment Rebate Percent	0%
		Equipment Rebate Amount	$ -

Microturbine Information	
Capstone Product	65C-HD4-DU00
kW Nominal Rating	65
Quantity	1
Total kW Nominal Rating	65

$2,572	Dollars per kW Nominal Rating
$0	

Installation Costs	Units	Price	Total
Shipping	1	$ 1,000	$ 1,000
Site Prep			$ 10,000
Piping included in mechanical			$ -
Mechanical Works (Ducting and Insulation)			$ 30,000
Electrical Works			$ 35,000
Engineering/Permitting/Admin			$ 20,000
Commissioning/Start Up			$ 5,000
Interconnection Agreement			$ 1,000
Air Permit			$ -
Other			$ 20,000
		Subtotal	$ 122,000
		Installation Rebate Percent	0%
		Installation Rebate Amount	$ -

$1,877	Dollars per kW Nominal Rating
$0	

TOTAL INSTALLED COST - WITHOUT REBATE	$ 289,170
TOTAL INSTALLATION / EQUIPMENT REBATE	$ -
TOTAL INSTALLED COST - AFTER REBATE	$ 289,170

$4,449	Dollars per kW Nominal Rating
$0	
$4,449	

Economic Calculator UMED C65 All power sells back to ML&P 091713.xlsx

65KW MICRO TURBINE-WITH ALL POWER SOLD TO ML&P

Monthly Operating Profile

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Avg. Ambient Temp ˚F	15	19	26	37	54	56	59	59	49	34	21	18	37.4
Net Electrical Output [kW]	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0
Net kW Demand Reduction	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0

Cogeneration Mode

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉
Cooling	○	○	○	○	○	○	○	○	○	○	○	○
Power Only	○	○	○	○	○	○	○	○	○	○	○	○

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Weekdays/Month	22	20	22	22	22	22	22	22	22	22	21	22	261
Weekend Days/Month	9	8	9	8	9	8	9	9	8	9	9	9	104
Total Days/Month	31	28	31	30	31	30	31	31	30	31	30	31	365

	Weekday Operation			Weekend Operation		
	Power	Heat	Cooling	Power	Heat	Cooling
Midnight	x	x				
	x	x				
2:00 AM	x	x				
	x	x				
4:00 AM	x	x				
	x	x				
6:00 AM	x	x				
	x	x				
8:00 AM	x	x				
	x	x				
10:00 AM	x	x				
	x	x				
Noon	x	x				
	x	x				
2:00 PM	x	x				
	x	x				
4:00 PM	x	x				
	x	x				
6:00 PM	x	x				
	x	x				
8:00 PM	x	x				
	x	x				
10:00 PM	x	x				
	x	x				
Midnight						
Hours	24	24	0	0	0	0

Total Annual Operation (includes Availability)	Power	Heat	Cooling
Weekday	6,264	6,264	0
Week End	0	0	0
Total Hours/Yr	6,264	6,264	0
Efficiency (LHV)	72.1%	72.1%	N/A
	Overall Total	during Heat	during Cooling*
FERC Efficiency	49.9%		

* using thermal input, not cooling output

Reference: Year 1 Variable O&M Cost	Power	Heat	Cooling
Jan	$0.096	$0.053	$0.064
Feb	$0.096	$0.052	$0.063
Mar	$0.096	$0.051	$0.063
Apr	$0.097	$0.050	$0.063
May	$0.099	$0.048	$0.062
Jun	$0.100	$0.048	$0.062
Jul	$0.100	$0.048	$0.062
Aug	$0.100	$0.048	$0.062
Sep	$0.098	$0.049	$0.062
Oct	$0.097	$0.050	$0.063
Nov	$0.096	$0.052	$0.063
Dec	$0.096	$0.052	$0.063
Annual Avg	$0.098	$0.050	$0.063

Economic Calculator UMED C65 All power sells back to ML&P 091713.xlsx

65KW MICRO TURBINE-WITH ALL POWER SOLD TO ML&P

Equipment Operating Assumptions

Costs of Operation

100% Availability
2% Annual Inflation (Electric & Fuel)
Average Maintenance Cost $0.0120 $/kWh

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Fuel Costs		$32,721	$33,376	$34,043	$34,724	$35,419	$36,127	$36,849	$37,586	$38,338	$39,105
Average Maintenance Cost		$4,585	$4,585	$4,585	$4,585	$4,585	$4,585	$4,585	$4,585	$4,585	$4,585
Annual Scheduled Maintenance Cost											
Capstone Factory Protection Plan											
Other Ongoing Costs											
Total Fuel, O&M and Other Costs	$0	$37,306	$37,961	$38,628	$39,309	$40,004	$40,712	$41,435	$42,172	$42,923	$43,690

Electricity Production

61.0 Average Net kW Output
61.0 Average Net kW Demand Reduction
Average Net Heat Rate: 12,337 BTU/kWh (LHV); 3.61 kWt/kW (LHV)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided kWh Costs		$13,557	$13,828	$14,105	$14,387	$14,675	$14,968	$15,267	$15,573	$15,884	$16,202
Avoided kW Demand Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Electricity Cost Savings	$0	$13,557	$13,828	$14,105	$14,387	$14,675	$14,968	$15,267	$15,573	$15,884	$16,202

Cogeneration (Heating)

Efficiency of Alternative Heating 80% (LHV)
Avg. Heating Output Energy: 0.33 MMBTU/hr; 98.0 kW (when operating)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided Fuel Costs		$18,190	$18,554	$18,925	$19,303	$19,689	$20,083	$20,485	$20,894	$21,312	$21,738
Avoided Equipment Cost	$0										

Cogeneration (Cooling)

COP of Alternative Electric Chiller 3.0
Avg. kW displaced N/A
Avg.Cooling: RT NOT; kW OPERATING (when operating)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided kWh Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided kW Demand Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided Equipment Cost											

Power Quality and Reliability

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided Downtime / Power Interruption Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided Equipment Cost	$0										

Financing/ Investment Tax Credits

10% ITC %
200 Max ITC $/kW
0% % Financed
8% Interest

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Investment Tax Credits	$13,000										
Financing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$13,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Emissions Credits

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Economic Calculator UMED C65 All power sells back to ML&P 091713.xlsx

65KW MICRO TURBINE-WITH ALL POWER SOLD TO ML&P

Utility Tariffs

Microturbine Fuel	$/MMBTU (HHV)						
Fuel Rate Reference	Enstar G-4 Rates						
Effective Date	1-Jul-13						
Summer Months	Months	from	thru				
$6.31	8	Apr	Nov				
Winter Months	Months	from	thru		from	thru	
$6.31	4	Jan	Mar	and	Dec	Dec	

Alternative Heating Fuel	Same as MT					
Fuel Rate Reference						
Effective Date						
Summer Months	Months	from	thru			
	0	May	Apr			
Winter Months	Months	from	thru		from	thru
	12	Jan	Apr	and	May	Dec

Electric Rates

Utility Tariff	ML&P Schedule 22
Effective Date	01-Jul-13

Summer Months

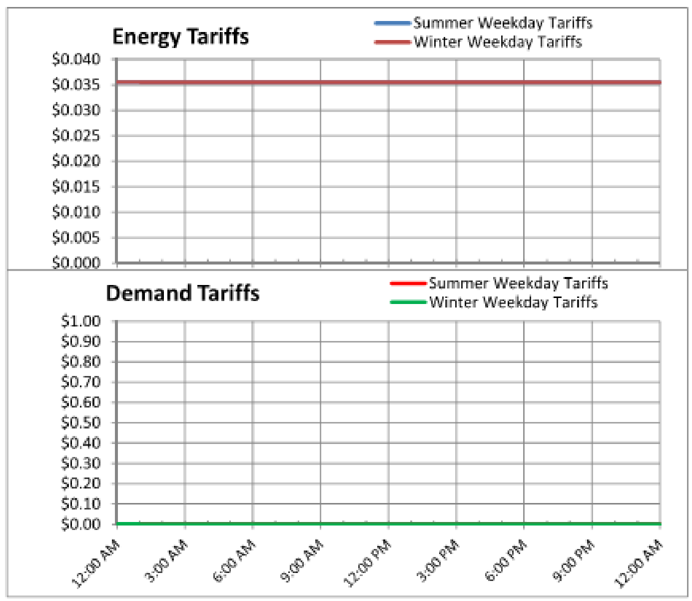
Months	from	thru
4	Jun	Sep

	Tariffs		Time				
Time	$/kWh	$/kW Demand	from	to		from	to
Peak	$0.03548	$0.00	1:00 PM	5:00 PM			
MidPeak	$0.03548	$0.00	8:00 AM	1:00 PM	and	5:00 PM	8:00 PM
OffPeak	$0.03548	$0.00	all other times, and all day weekends				

Winter Months

Months	from	thru		from	thru
8	Jan	May	and	Oct	Dec

	Tariffs		Time				
Time	$/kWh	$/kW Demand	from	to		from	to
Peak	$0.03548	$0.00	None	None			
MidPeak	$0.03548	$0.00	8:00 AM				8:00 PM
OffPeak	$0.03548	$0.00	all other times, and all day weekends				



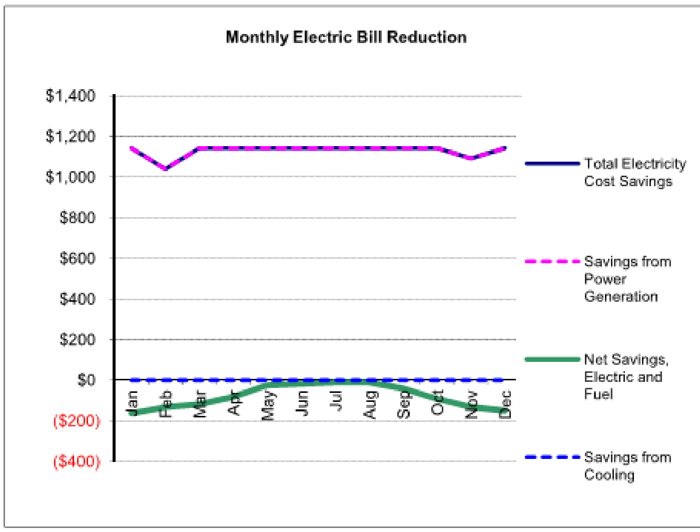
Economic Calculator UMED C65 All power sells back to ML&P 091713.xlsx

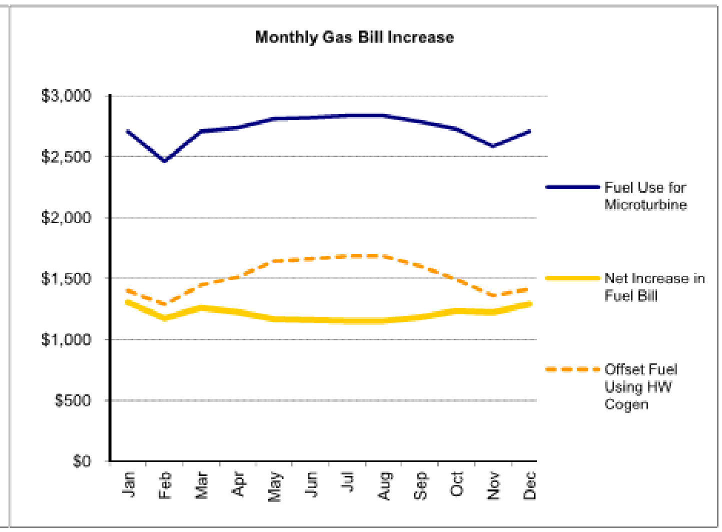
65KW MICRO TURBINE-WITH ALL POWER SOLD TO ML&P

Monthly Bill Comparison

Electric	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Total
Avoided kWh Costs	$1,143	$1,039	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,091	$1,143	$13,557
Avoided kW Demand Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Savings from Power Generation	$1,143	$1,039	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,091	$1,143	$13,557
with Absorption Cooling													
Avoided kWh Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided kW Demand Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Savings from Cooling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Electricity Cost Savings	$1,143	$1,039	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,091	$1,143	$13,557

Fuel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Fuel Use for Microturbine	$2,706	$2,461	$2,708	$2,737	$2,811	$2,821	$2,837	$2,837	$2,786	$2,727	$2,584	$2,707	$32,721
Offset Fuel Using HW Cogen	$1,401	$1,288	$1,447	$1,512	$1,643	$1,660	$1,684	$1,684	$1,603	$1,493	$1,361	$1,414	$18,190
Net Increase in Fuel Bill	$1,306	$1,173	$1,261	$1,225	$1,167	$1,161	$1,153	$1,153	$1,183	$1,234	$1,223	$1,293	$14,531
Net Savings, Electric and Fuel	($163)	($134)	($118)	($82)	($25)	($18)	($10)	($10)	($40)	($92)	($132)	($150)	($974)





Economic Calculator UMED C65 All power sells back to ML&P 091713.xlsx

Appendix F: Economic Calculator 65Kw Micro Turbine on Load Side of Meter

Project Summary

Project Information

Company Name	Generic Building at UMED with a C65 Microturbine - Assumes CHP unit on customer side of meter
Facility Description	Generic at UMED, with CMP used to reduce demand and internally use power-no sell back
Facility Location	UMED District
Date of Analysis	17-Sep-13
Prepared By	

Benefits Summary

10 yr IRR	8.1%
10 yr NPV	$28,870
Payback Period [Years]	6.82
Discount Rate	6.0%

Calculations include benefits from:

Electricity Production; Heat Cogeneration;

5 Year Cash Flow Analysis

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
Net Investment	($271,670)					
Total Annual Benefits		$74,544	$76,035	$77,556	$79,107	$80,689
Fuel & O&M Costs		($37,255)	($37,908)	($38,574)	($39,254)	($39,948)
Net Cash Flow	($271,670)	$37,290	$38,127	$38,981	$39,853	$40,742
Discounted Cash Flow	($271,670)	$35,179	$33,933	$32,730	$31,567	$30,444

Equipment, Investment, and Operating Summary

Capstone MicroTurbines	1 x 65
Configuration	65C-HD4-DU00
Fuel Source	LP Natural Gas

Total System Power Rating	65	kW
Avg Monthly Generated Power	31,842	kWh per Month
Avg Price of Offset Utility Power	$0.148	$/kWh
Equivalent Cars Removed	25	using EPA data

Total Installed Cost	($271,670)
Installation/Equipment Rebates	$0
Avoided Equipment Costs	$0
Financing/Tax Credits	$0
Net Investment	($271,670)

Operating Hours/Year		Efficiency [LHV]	
Microturbine	6,264	72.1%	Overall Total
~~Heat~~	~~6,264~~	~~72.1%~~	~~during Heat~~
~~Cooling~~	~~0~~	~~N/A~~	~~during Cooling*~~
* using thermal input, not cooling output		49.9%	FERC

Disclaimer: The software used to create this Economic Calculator is provided as a tool for estimation of the potential value of installing and operating a Capstone microturbine system. The calculated results are based on Capstone's published specifications and certain performance assumptions by Capstone when there is a range of performance possibilities for the Capstone microturbine (which performance is subject to change without notice). The Economic Calculator requires the user to input certain additional assumptions regarding conditions of operation, as well as certain location specific information. The Economic Calculator results will change depending on changes to the assumptions, including lower or higher assumptions where there is a range of possible performance criteria, changes in operation, and changes in location. Neither Capstone, nor any of its representatives, can guarantee that these projected savings will occur or that the calculations made by the Economic Calculator are accurate or error-free. The output from the Economic Calculator in no way constitutes a commitment by Capstone that the forecasted savings or performance will be achieved.

Economic Calculator UMED C65 on Load Side of Meter 091713.xlsx

65KW MICRO TURBINE ON LOAD SIDE OF METER

Payback Analysis

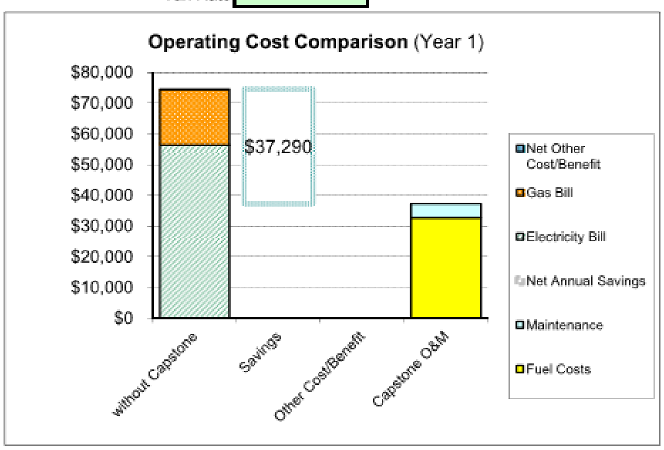
	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Installed Cost	$271,670										
Fuel, O&M, and Other Costs		$37,255	$37,908	$38,574	$39,254	$39,948	$40,655	$41,376	$42,112	$42,863	$43,628

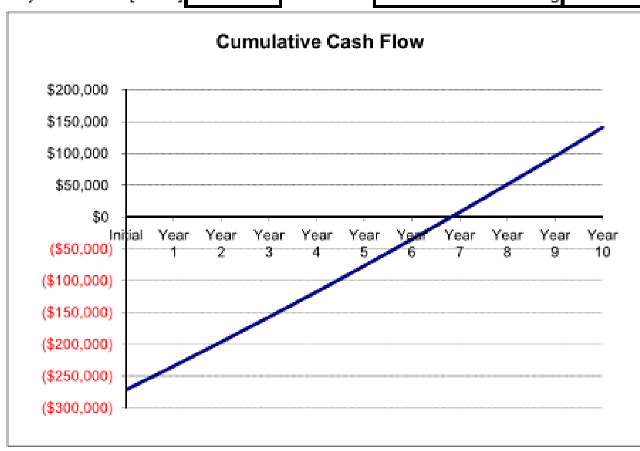
Savings/Avoided Costs	Include in Analysis?	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Electricity Production	✓		$56,380	$57,507	$58,657	$59,831	$61,027	$62,248	$63,493	$64,763	$66,058	$67,379
Heat Cogeneration	✓	$0	$18,165	$18,528	$18,898	$19,276	$19,662	$20,055	$20,456	$20,865	$21,283	$21,708
Cooling	☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Power Quality/ Reliability	☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Financing/ Inv. Tax Credits	☐	~~$13,000~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Emissions Credits	☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Depreciation Tax Benefit	☐		~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Total		$0	$74,544	$76,035	$77,556	$79,107	$80,689	$82,303	$83,949	$85,628	$87,341	$89,087

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Net Cash Flow	($271,670)	$37,290	$38,127	$38,981	$39,853	$40,742	$41,648	$42,573	$43,516	$44,478	$45,459
Cumulative Cash Flow	($271,670)	($234,380)	($196,253)	($157,272)	($117,419)	($76,677)	($35,029)	$7,544	$51,059	$95,537	$140,997

Depreciation Method		Annual Savings (Year 1)	$37,290
		10 yr IRR	8.1%
Depreciation Timeline	5 years	Discount Rate 6.0% — 10 yr NPV	$28,870
Tax Rate	0%	Payback Period [Years]	6.82

Operating Hours/year	
Microturbine	6,264
Heat	6,264
Cooling	~~0~~





Economic Calculator UMED C65 on Load Side of Meter 091713.xlsx

65KW MICRO TURBINE ON LOAD SIDE OF METER

Performance Calculator

Microturbine Information

Capstone Product		
Catalog Number	65C-HD4-DU00	
kW Nominal Rating	65	
Fuel Type		Requires Gas Pack
Configuration		
Heat Recovery Module		
Certification/Emissions		

Units

Site Information

Site Elevation	100	Feet

Parasitic Loads

Fuel Gas Booster	4.0	kW (from selection above)
Customer Load	0.0	kW (if any)
Total Parasitic Load	4.0	kW

Inlet & Exhaust Restrictions

Inlet Pressure Drop	2	inches WC
Exhaust Backpressure	3	inches WC

Cogeneration (Heating)

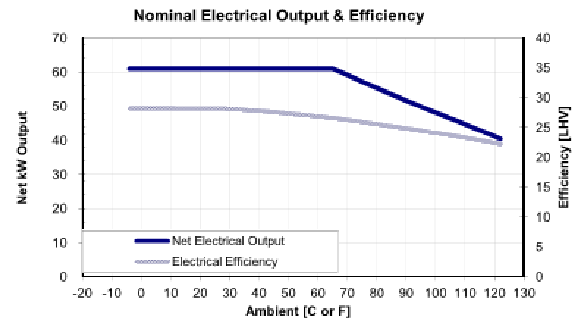
HRM or Direct Exhaust?		
Inlet Water Temperature to HX	160	°F
Water Flow	40.0	gallons/min
Process Control Temperature	200	°F

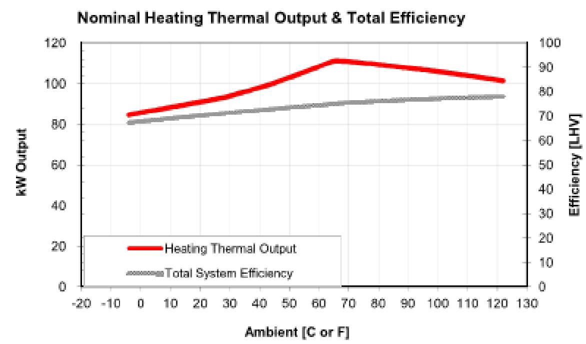
Cogeneration (Cooling)

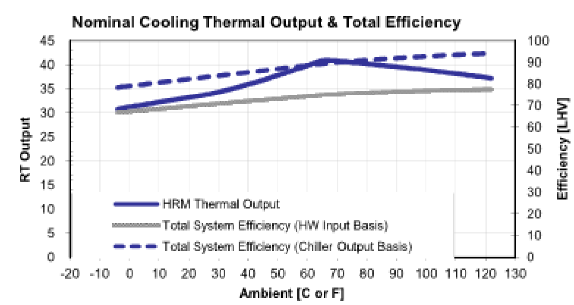
HRM or Direct Exhaust?		
Coefficient of Performance	1.30	
Inlet Water Temp to Chiller	180	°F
Water Flow	40.0	gallons/min

Nominal Performance for Selected Ambient Temperature

	Ambient	36.0	°F
Electrical Output	Power	61.0	kW
	Efficiency	27.9	% [LHV]
Heating Output	Power	96.3	kW
		329,000	BTU/hr
	Water Out	176.6	°F
	Efficiency	72.0	% [LHV]
Cooling Output	Power	35.2	RT
		124.0	kW
	Efficiency	71.6	% [LHV] based on Heat Input
		84.7	% [LHV] based on Chiller Output







Economic Calculator UMED C65 on Load Side of Meter 091713.xlsx

65KW MICRO TURBINE ON LOAD SIDE OF METER

Equipment and Installation

Equipment Costs	Units	Price	Total
Microturbines	1	$ 114,400	$ 114,400
DC Gas Pack	1	$ 32,870	$ 32,870
Elec Equipment	1	$ 7,400	$ 7,400
			$ -
			$ -
			$ -
			$ -
			$ -
			$ -
			$ -
	0	$ -	$ -
		Subtotal	$ 154,670
		Equipment Rebate Percent	0%
		Equipment Rebate Amount	$ -

Microturbine Information	
Capstone Product	65C-HD4-DU00
kW Nominal Rating	65
Quantity	1
Total kW Nominal Rating	65

$2,380	
	Dollars per kW Nominal Rating
$0	

Installation Costs	Units	Price	Total
Shipping	1	$ 1,000	$ 1,000
Site Prep			$ 10,000
Plumbing - included in mechanical			$ -
Mechanical Works (Ducting and Insulation)			$ 30,000
Electrical Works			$ 30,000
Engineering/Permitting/Admin			$ 20,000
Commissioning/Start Up			$ 5,000
Interconnection Agreement			$ 1,000
Air Permit			$ -
Other			$ 20,000
		Subtotal	$ 117,000
		Installation Rebate Percent	0%
		Installation Rebate Amount	$ -

$1,800	
	Dollars per kW Nominal Rating
$0	

TOTAL INSTALLED COST - WITHOUT REBATE	$ 271,670
TOTAL INSTALLATION / EQUIPMENT REBATE	$ -
TOTAL INSTALLED COST - AFTER REBATE	$ 271,670

$4,180	
$0	Dollars per kW Nominal Rating
$4,180	

Economic Calculator UMED C65 on Load Side of Meter 091713.xlsx

65KW MICRO TURBINE ON LOAD SIDE OF METER

Monthly Operating Profile

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Avg. Ambient Temp ˚F	15	19	26	37	54	56	59	59	49	34	21	18	37.4
Net Electrical Output [kW]	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0
Net kW Demand Reduction	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0
Cogeneration Mode													
Heat	●	●	●	●	●	●	●	●	●	●	●	●	
Cooling	○	○	○	○	○	○	○	○	○	○	○	○	
Power Only	○	○	○	○	○	○	○	○	○	○	○	○	
Weekdays/Month	22	20	22	22	22	22	22	22	22	22	21	22	261
Weekend Days/Month	9	8	9	8	9	8	9	9	8	9	9	9	104
Total Days/Month	31	28	31	30	31	30	31	31	30	31	30	31	365

	Weekday Operation			Weekend Operation		
	Power	Heat	Cooling	Power	Heat	Cooling
Midnight	x	x				
	x	x				
2:00 AM	x	x				
	x	x				
4:00 AM	x	x				
	x	x				
6:00 AM	x	x				
	x	x				
8:00 AM	x	x				
	x	x				
10:00 AM	x	x				
	x	x				
Noon	x	x				
	x	x				
2:00 PM	x	x				
	x	x				
4:00 PM	x	x				
	x	x				
6:00 PM	x	x				
	x	x				
8:00 PM	x	x				
	x	x				
10:00 PM	x	x				
	x	x				
Midnight Hours	24	24	0	0	0	0

Total Annual Operation (includes Availability)	Power	Heat	Cooling
Weekday	6,264	6,264	0
Week End	0	0	0
Total Hours/Yr	6,264	6,264	0
Efficiency (LHV)	72.1%	72.1%	N/A
	Overall Total	during Heat	during Cooling*
FERC Efficiency	49.9%		

* using thermal input, not cooling output

Reference: Year 1 Variable O&M Cost	Power	Heat	Cooling
Jan	$0.096	$0.052	$0.064
Feb	$0.096	$0.052	$0.063
Mar	$0.096	$0.051	$0.063
Apr	$0.097	$0.050	$0.062
May	$0.099	$0.048	$0.062
Jun	$0.099	$0.048	$0.062
Jul	$0.100	$0.048	$0.062
Aug	$0.100	$0.048	$0.062
Sep	$0.098	$0.049	$0.062
Oct	$0.097	$0.050	$0.063
Nov	$0.096	$0.052	$0.063
Dec	$0.096	$0.052	$0.063
Annual Avg	$0.097	$0.050	$0.063

Economic Calculator UMED C65 on Load Side of Meter 091713.xlsx

65KW MICRO TURBINE ON LOAD SIDE OF METER

Equipment Operating Assumptions

Costs of Operation

100%	Availability
2%	Annual Inflation (Electric & Fuel)
Average Maintenance Cost $0.0120	$/kWh

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Fuel Costs		$32,669	$33,323	$33,989	$34,669	$35,362	$36,070	$36,791	$37,527	$38,277	$39,043
Average Maintenance Cost		$4,585	$4,585	$4,585	$4,585	$4,585	$4,585	$4,585	$4,585	$4,585	$4,585
Annual Scheduled Maintenance Cost											
Capstone Factory Protection Plan											
Other Ongoing Costs											
Total Fuel, O&M and Other Costs	$0	$37,255	$37,908	$38,574	$39,254	$39,948	$40,655	$41,376	$42,112	$42,863	$43,628

Electricity Production

61.0	Average Net kW Output	Average Net	12,337	BTU/kWh (LHV)
61.0	Average Net kW Demand Reduction	Heat Rate	3.61	kWt/kW (LHV)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided kWh Costs		$26,426	$26,955	$27,494	$28,044	$28,605	$29,177	$29,760	$30,356	$30,963	$31,582
Avoided kW Demand Costs		$29,953	$30,553	$31,164	$31,787	$32,423	$33,071	$33,732	$34,407	$35,095	$35,797
Total Electricity Cost Savings	$0	$56,380	$57,507	$58,657	$59,831	$61,027	$62,248	$63,493	$64,763	$66,058	$67,379

Cogeneration (Heating)

			MMBTU/hr	kW	
Efficiency of Alternative Heating	80% (LHV)	Avg. Heating Output Energy	0.33	98.0	(when operating)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided Fuel Costs		$18,165	$18,528	$18,898	$19,276	$19,662	$20,055	$20,456	$20,865	$21,283	$21,708
Avoided Equipment Cost	$0										

Cogeneration (Cooling)

					RT	kW	
COP of Alternative Electric Chiller	3.0	Avg. kW displaced	N/A	Avg.Cooling	NOT	OPERATING	(when operating)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided kWh Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided kW Demand Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided Equipment Cost											

Power Quality and Reliability

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided Downtime / Power Interruption Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided Equipment Cost	$0										

Financing/ Investment Tax Credits

10%	ITC %	200	Max ITC $/kW	0%	% Financed	8%	Interest

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Investment Tax Credits	$13,000										
Financing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$13,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Emissions Credits

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Economic Calculator UMED C65 on Load Side of Meter 091713.xlsx

65KW MICRO TURBINE ON LOAD SIDE OF METER

Utility Tariffs

Microturbine Fuel: $/MMBTU (HHV)

Fuel Rate Reference: Enstar G-4 Rates
Effective Date: 1-Jul-13

		Months	from	thru		from	thru
Summer Months	$6.30	8	Apr	Nov			
Winter Months	$6.30	4	Jan	Mar	and	Dec	Dec

Alternative Heating Fuel: Same as MT

Fuel Rate Reference:
Effective Date:

		Months	from	thru		from	thru
Summer Months		0	May	Apr			
Winter Months		12	Jan	Apr	and	May	Dec

Electric Rates

Utility Tariff: ML&P Schedule 22
Effective Date: 01-Jul-13

Summer Months

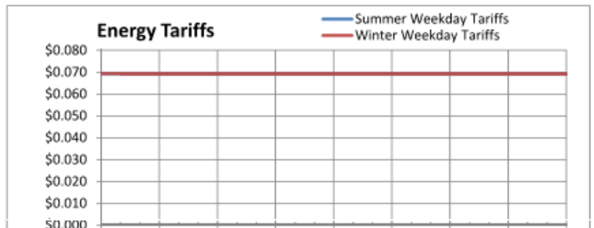
Months	from	thru
4	Jun	Sep

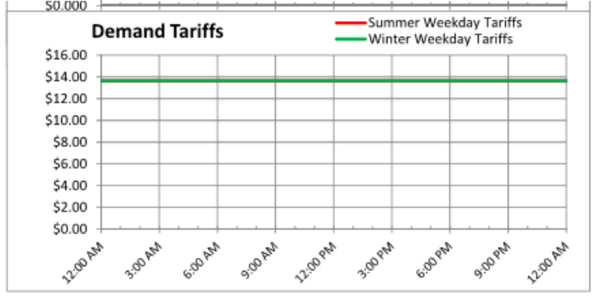
	Tariffs		Time				
Time	$/kWh	$/kW Demand	from	to		from	to
Peak	$0.06916	$13.64	1:00 PM	5:00 PM			
MidPeak	$0.06916	$13.64	8:00 AM	1:00 PM	and	5:00 PM	8:00 PM
OffPeak	$0.06916	$13.64	all other times, and all day weekends				

Winter Months

Months	from	thru		from	thru
8	Jan	May	and	Oct	Dec

	Tariffs		Time				
Time	$/kWh	$/kW Demand	from	to		from	to
Peak	$0.06916	$13.64	None	None			
MidPeak	$0.06916	$13.64	8:00 AM				8:00 PM
OffPeak	$0.06916	$13.64	all other times, and all day weekends				



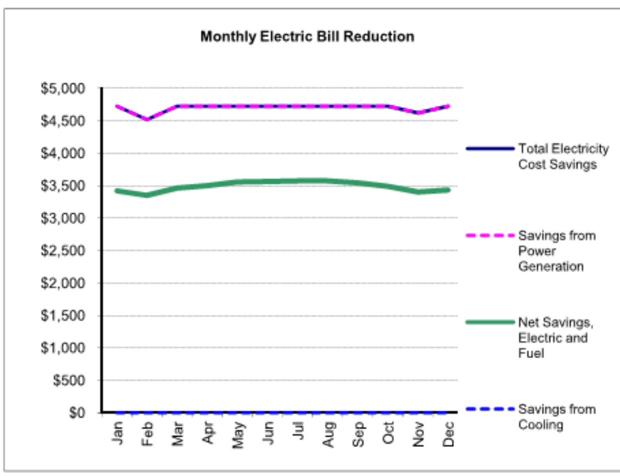


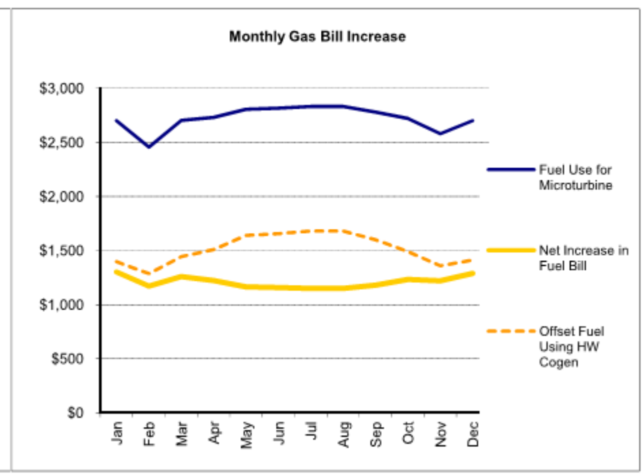
Economic Calculator UMED C65 on Load Side of Meter 091713.xlsx

65KW MICRO TURBINE ON LOAD SIDE OF METER

Monthly Bill Comparison

Electric	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Total
Avoided kWh Costs	$2,228	$2,025	$2,228	$2,228	$2,228	$2,228	$2,228	$2,228	$2,228	$2,228	$2,126	$2,228	$26,426
Avoided kW Demand Costs	$2,496	$2,496	$2,496	$2,496	$2,496	$2,496	$2,496	$2,496	$2,496	$2,496	$2,496	$2,496	$29,953
Savings from Power Generation	$4,724	$4,521	$4,724	$4,724	$4,724	$4,724	$4,724	$4,724	$4,724	$4,724	$4,622	$4,724	$56,380
with Absorption Cooling													
Avoided kWh Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided kW Demand Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Savings from Cooling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Electricity Cost Savings	$4,724	$4,521	$4,724	$4,724	$4,724	$4,724	$4,724	$4,724	$4,724	$4,724	$4,622	$4,724	$56,380
Fuel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Fuel Use for Microturbine	$2,702	$2,457	$2,704	$2,732	$2,806	$2,817	$2,832	$2,832	$2,781	$2,723	$2,580	$2,703	$32,669
Offset Fuel Using HW Cogen	$1,399	$1,287	$1,445	$1,510	$1,641	$1,658	$1,682	$1,682	$1,600	$1,490	$1,359	$1,412	$18,165
Net Increase in Fuel Bill	$1,303	$1,170	$1,259	$1,222	$1,165	$1,159	$1,151	$1,151	$1,181	$1,232	$1,221	$1,290	$14,505
Net Savings, Electric and Fuel	$3,420	$3,351	$3,465	$3,501	$3,558	$3,565	$3,573	$3,573	$3,543	$3,491	$3,402	$3,433	$41,875





Economic Calculator UMED C65 on Load Side of Meter 091713.xlsx

APPENDIX G: ECONOMIC CALCULATOR – 200 KW MICRO TURBINE WITH ALL POWER SOLD BACK TO ML&P

Project Summary

Project Information

Company Name	UMED
Facility Description	Generic Building in UMED with C200 Micro Turbine - All power sold back to ML&P
Facility Location	Anchorage AK
Date of Analysis	16-Sep-13
Prepared By	Richard S. Armstrong

Benefits Summary

10 yr IRR	#NUM!
10 yr NPV	($870,752)
Payback Period [Years]	>10 Years
Discount Rate	6.0%

Calculations include benefits from:
Electricity Production; Heat Cogeneration;

5 Year Cash Flow Analysis

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
Net Investment	($612,097)					
Total Annual Benefits		$110,978	$113,198	$115,462	$117,771	$120,127
Fuel & O&M Costs		($144,938)	($147,437)	($149,986)	($152,586)	($155,239)
Net Cash Flow	($612,097)	($33,959)	($34,239)	($34,524)	($34,815)	($35,112)
Discounted Cash Flow	($612,097)	($32,037)	($30,473)	($28,987)	($27,577)	($26,238)

Equipment, Investment, and Operating Summary

Capstone MicroTurbines	1 x 200
Configuration	200R-FD4-BU00
Fuel Source	LP Natural Gas

Total System Power Rating	200	kW
Avg Monthly Generated Power	138,700	kWh per Month
Avg Price of Offset Utility Power	$0.035	$/kWh
Equivalent Cars Removed	91	using EPA data

Total Installed Cost	($612,097)
Installation/Equipment Rebates	$0
Avoided Equipment Costs	$0
Financing/Tax Credits	$0
Net Investment	($612,097)

Operating Hours/Year		Efficiency [LHV]	
Microturbine	8,760	64.8%	Overall Total
~~Heat~~	~~8,760~~	~~64.8%~~	~~during Heat~~
~~Cooling~~	~~0~~	~~N/A~~	~~during Cooling*~~
* using thermal input, not cooling output		48.1%	FERC

Disclaimer: The software used to create this Economic Calculator is provided as a tool for estimation of the potential value of installing and operating a Capstone microturbine system. The calculated results are based on Capstone's published specifications and certain performance assumptions by Capstone when there is a range of performance possibilities for the Capstone microturbine (which performance is subject to change without notice). The Economic Calculator requires the user to input certain additional assumptions regarding conditions of operation, as well as certain location specific information. The Economic Calculator results will change depending on changes to the assumptions, including lower or higher assumptions where there is a range of possible performance criteria, changes in operation, and changes in location. Neither Capstone, nor any of its representatives, can guarantee that these projected savings will occur or that the calculations made by the Economic Calculator are accurate or error-free. The output from the Economic Calculator in no way constitutes a commitment by Capstone that the forecasted savings or performance will be achieved.

Economic Calculator - UMED MLP SEII BAck C-200 RSA 091613a.xlsx

200 KW MICRO TURBINE WITH ALL POWER SOLD BACK TO ML&P

Payback Analysis

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Installed Cost	$612,097										
Fuel, O&M, and Other Costs		$144,938	$147,437	$149,986	$152,586	$155,239	$157,944	$160,704	$163,518	$166,389	$169,317

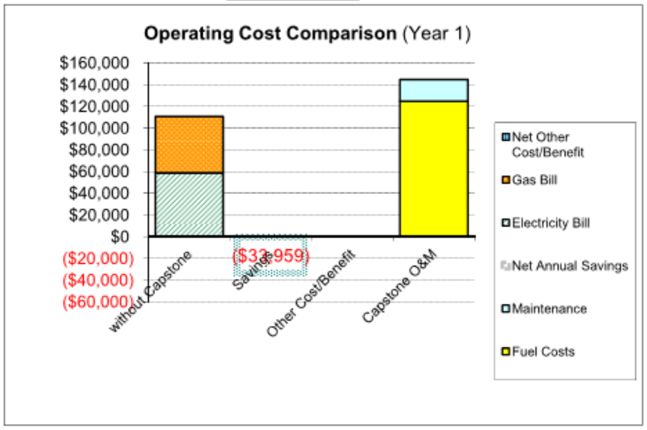
Savings/Avoided Costs — Include in Analysis?	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Electricity Production ☑		$59,053	$60,234	$61,439	$62,667	$63,921	$65,199	$66,503	$67,833	$69,190	$70,574
Heat Cogeneration ☑	$0	$51,925	$52,964	$54,023	$55,104	$56,206	$57,330	$58,477	$59,646	$60,839	$62,056
Cooling ☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Power Quality/ Reliability ☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Financing/ Inv. Tax Credits ☐	~~$40,000~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Emissions Credits ☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Depreciation Tax Benefit ☐		~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Total	$0	$110,978	$113,198	$115,462	$117,771	$120,127	$122,529	$124,980	$127,479	$130,029	$132,629

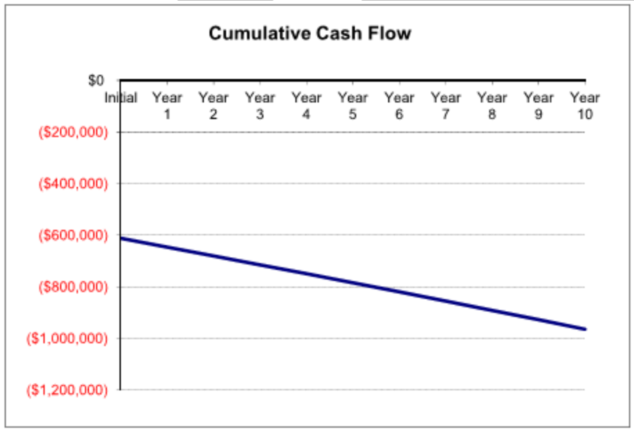
	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Net Cash Flow	($612,097)	($33,959)	($34,239)	($34,524)	($34,815)	($35,112)	($35,415)	($35,724)	($36,039)	($36,360)	($36,688)
Cumulative Cash Flow	($612,097)	($646,056)	($680,295)	($714,820)	($749,635)	($784,747)	($820,162)	($855,886)	($891,925)	($928,285)	($964,973)

Depreciation Method	MACRS 5 YR (half-yr convetion)
Depreciation Timeline	5 years
Tax Rate	0%
Discount Rate	6.0%

Annual Savings (Year 1)	($33,959)
10 yr IRR	#NUM!
10 yr NPV	($870,752)
Payback Period [Years]	>10 Years

Operating Hours/year	
Microturbine	8,760
Heat	8,760
Cooling	0





Economic Calculator - UMED MLP SEll BAck C-200 RSA 091613a.xlsx

200 KW MICRO TURBINE WITH ALL POWER SOLD BACK TO ML&P

Performance Calculator

Units: English

Microturbine Information

Capstone Product	C200	
Catalog Number	200R-FD4-BU00	
kW Nominal Rating	200	
Fuel Type	LP Natural Gas	
Configuration	Dual Mode	
Heat Recovery Module	Yes	Use External HRM
Certification/Emissions	UL	

Site Information

Site Elevation	140	Feet

Parasitic Loads

Fuel Gas Booster	10.0	kW (from selection above)
Customer Load	0.0	kW (if any)
Total Parasitic Load	10.0	kW

Inlet & Exhaust Restrictions

Inlet Pressure Drop	2	inches WC
Exhaust Backpressure	3	inches WC

Cogeneration (Heating)

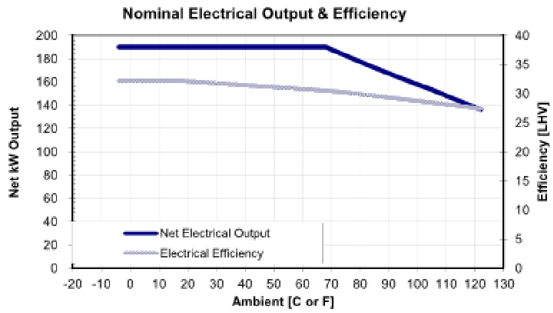
HRM or Direct Exhaust?	HRM	
Inlet Water Temperature to HX	160	°F
Water Flow	80.0	gallons/min
Process Control Temperature	200	°F

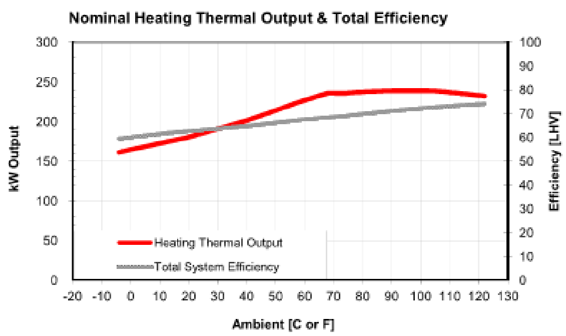
Cogeneration (Cooling)

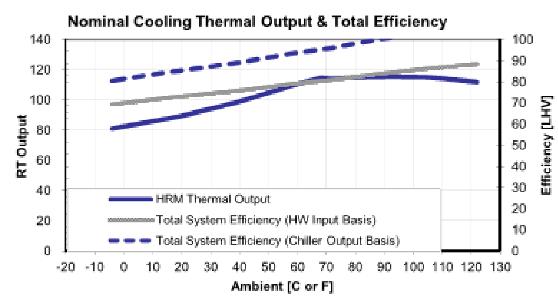
HRM or Direct Exhaust?	Direct Exhaust	
Coefficient of Performance	1.30	
Chiller Exhaust Outlet Temp	180	°F
Water Flow	80.0	gallons/min

Nominal Performance for Selected Ambient Temperature

	Ambient	36.0	°F
Electrical Output	Power	190.0	kW
	Efficiency	31.6	% [LHV]
Heating Output	Power	197.1	kW
		673,000	BTU/hr
	Water Out	177.0	°F
	Efficiency	64.4	% [LHV]
Cooling Output	Power	96.9	RT
		341.2	kW
	Efficiency	75.2	% [LHV] based on Heat Input
		88.3	% [LHV] based on Chiller Output







Economic Calculator - UMED MLP SEll BAck C-200 RSA 091613a.xlsx

200 KW MICRO TURBINE WITH ALL POWER SOLD BACK TO ML&P

Equipment and Installation

Equipment Costs	Units	Price	Total
Microturbines	1	$ 353,000	$ 353,000
Electrical Equipment	1	$ 19,900	$ 19,900
Heat Exchanger	1	$ 47,197	$ 47,197
Electrical Installation	1	$ 35,000	$ 35,000
Mechanical Install	1	$ 70,000	$ 70,000
12 x 20' Building with slab	1	$ 30,000	$ 30,000
			$ -
			$ -
			$ -
			$ -
Sales Tax @ 8%	0	$ -	$ -
		Subtotal	$ 555,097
		Equipment Rebate Percent	0%
		Equipment Rebate Amount	$ -

Microturbine Information	
Capstone Product	200R-FD4-BU00
kW Nominal Rating	200
Quantity	1
Total kW Nominal Rating	200

$2,775	
	Dollars per kW Nominal Rating
$0	

Installation Costs	Units	Price	Total
Shipping	1	$ 1,000	$ 1,000
Site Prep			$ 10,000
Engineering/Permitting/Admin			$ 20,000
Commissioning/Start Up			$ 5,000
Interconnection Agreement			$ 1,000
Air Permit			$ -
Other			$ 20,000
		Subtotal	$ 57,000
		Installation Rebate Percent	0%
		Installation Rebate Amount	$ -

$285	
	Dollars per kW Nominal Rating
$0	

TOTAL INSTALLED COST - WITHOUT REBATE	$ 612,097
TOTAL INSTALLATION / EQUIPMENT REBATE	$ -
TOTAL INSTALLED COST - AFTER REBATE	$ 612,097

$3,060	
$0	Dollars per kW Nominal Rating
$3,060	

Economic Calculator - UMED MLP SEII BAck C-200 RSA 091613a.xlsx

200 KW MICRO TURBINE WITH ALL POWER SOLD BACK TO ML&P

Monthly Operating Profile

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Avg. Ambient Temp °F	15	19	26	37	54	56	59	59	49	34	21	18	37.4
Net Electrical Output [kW]	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0
Net kW Demand Reduction													0.0
Cogeneration Mode													
Heat	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	
Cooling	○	○	○	○	○	○	○	○	○	○	○	○	
Power Only	○	○	○	○	○	○	○	○	○	○	○	○	
Weekdays/Month	22	20	22	22	22	22	22	22	22	22	21	22	261
Weekend Days/Month	9	8	9	8	9	8	9	9	8	9	9	9	104
Total Days/Month	31	28	31	30	31	30	31	31	30	31	30	31	365

	Weekday Operation			Weekend Operation		
	Power	Heat	Cooling	Power	Heat	Cooling
Midnight	x	x		x	x	
	x	x		x	x	
2:00 AM	x	x		x	x	
	x	x		x	x	
4:00 AM	x	x		x	x	
	x	x		x	x	
6:00 AM	x	x		x	x	
	x	x		x	x	
8:00 AM	x	x		x	x	
	x	x		x	x	
10:00 AM	x	x		x	x	
	x	x		x	x	
Noon	x	x		x	x	
	x	x		x	x	
2:00 PM	x	x		x	x	
	x	x		x	x	
4:00 PM	x	x		x	x	
	x	x		x	x	
6:00 PM	x	x		x	x	
	x	x		x	x	
8:00 PM	x	x		x	x	
	x	x		x	x	
10:00 PM	x	x		x	x	
	x	x		x	x	
Midnight						
Hours	24	24	0	24	24	0

Total Annual Operation (includes Availability)	Power	Heat	Cooling
Weekday	6,264	6,264	0
Week End	2,496	2,496	0
Total Hours/Yr	8,760	8,760	0
Efficiency (LHV)	64.8%	64.8%	N/A
	Overall Total	during Heat	during Cooling*
FERC Efficiency	48.1%		

* using thermal input, not cooling output

Reference: Year 1 Variable O&M Cost	Power	Heat	Cooling
Jan	$0.086	$0.058	$0.060
Feb	$0.086	$0.058	$0.060
Mar	$0.086	$0.057	$0.059
Apr	$0.087	$0.056	$0.059
May	$0.088	$0.054	$0.058
Jun	$0.089	$0.054	$0.058
Jul	$0.089	$0.054	$0.058
Aug	$0.089	$0.054	$0.058
Sep	$0.088	$0.055	$0.058
Oct	$0.087	$0.056	$0.059
Nov	$0.086	$0.057	$0.059
Dec	$0.086	$0.058	$0.060
Annual Avg	$0.087	$0.056	$0.059

Economic Calculator - UMED MLP SEII BAck C-200 RSA 091613a.xlsx

200 KW MICRO TURBINE WITH ALL POWER SOLD BACK TO ML&P

Equipment Operating Assumptions

Costs of Operation

	100%	Availability
	2%	Annual Inflation (Electric & Fuel)
Average Maintenance Cost	$0.0120	$/kWh

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Fuel Costs		$124,965	$127,464	$130,013	$132,614	$135,266	$137,971	$140,731	$143,545	$146,416	$149,345
Average Maintenance Cost		$19,973	$19,973	$19,973	$19,973	$19,973	$19,973	$19,973	$19,973	$19,973	$19,973
Annual Scheduled Maintenance Cost											
Capstone Factory Protection Plan											
Other Ongoing Costs											
Total Fuel, O&M and Other Costs	$0	$144,938	$147,437	$149,986	$152,586	$155,239	$157,944	$160,704	$163,518	$166,389	$169,317

Electricity Production

190.0	Average Net kW Output	Average Net	10,826	BTU/kWh (LHV)
0.0	Average Net kW Demand Reduction	Heat Rate	3.17	kWt/kW (LHV)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided kWh Costs		$59,053	$60,234	$61,439	$62,667	$63,921	$65,199	$66,503	$67,833	$69,190	$70,574
Avoided kW Demand Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Electricity Cost Savings	$0	$59,053	$60,234	$61,439	$62,667	$63,921	$65,199	$66,503	$67,833	$69,190	$70,574

Cogeneration (Heating)

				MMBTU/hr	kW	
Efficiency of Alternative Heating	80%	(LHV)	Avg. Heating Output Energy	0.68	200.2	(when operating)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided Fuel Costs		$51,925	$52,964	$54,023	$55,104	$56,206	$57,330	$58,477	$59,646	$60,839	$62,056
Avoided Equipment Cost	$0										

Cogeneration (Cooling)

					RT	kW	
COP of Alternative Electric Chiller	3.0	Avg. kW displaced	N/A	Avg.Cooling	NOT	OPERATING	(when operating)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided kWh Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided kW Demand Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided Equipment Cost											

Power Quality and Reliability

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided Downtime / Power Interruption Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided Equipment Cost	$0										

Financing/ Investment Tax Credits

10%	ITC %	200	Max ITC $/kW	0%	% Financed	8%	Interest

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Investment Tax Credits	$40,000										
Financing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$40,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Emissions Credits

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Economic Calculator - UMED MLP SEII BAck C-200 RSA 091613a.xlsx

200 KW MICRO TURBINE WITH ALL POWER SOLD BACK TO ML&P

Utility Tariffs

Microturbine Fuel	$/MMBTU (HHV)					
Fuel Rate Reference	Enstar G4					
Effective Date	1-Jul-13					
Summer Months	Months	from	thru			
$6.31	6	May	Oct			
Winter Months	Months	from	thru		from	thru
$6.31	6	Jan	Apr	and	Nov	Dec

Alternative Heating Fuel	Same as MT					
Fuel Rate Reference						
Effective Date						
Summer Months	Months	from	thru			
	0	May	Apr			
Winter Months	Months	from	thru		from	thru
	12	Jan	Apr	and	May	Dec

Electric Rates

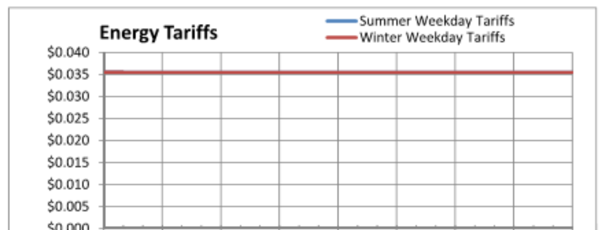
Utility Tariff	MLP Schedule 22
Effective Date	10-Aug-13

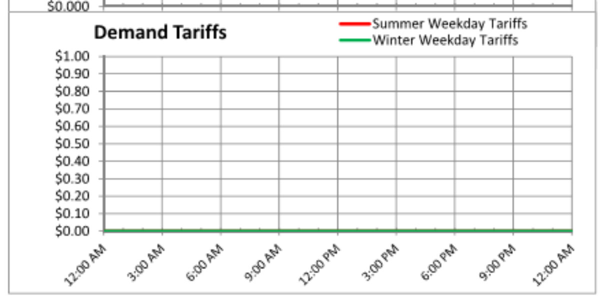
Summer Months	Months	from	thru
	6	May	Oct

	Tariffs		Time			
Time	$/kWh	$/kW Demand	from	to	from	to
Peak	$0.03548	$0.00	None	None		
MidPeak	$0.03548	$0.00	None			None
OffPeak	$0.03548	$0.00	all other times, and all day weekends			

Winter Months	Months	from	thru		from	thru
	6	Jan	Apr	and	Nov	Dec

	Tariffs		Time			
Time	$/kWh	$/kW Demand	from	to	from	to
Peak	$0.03548	$0.00	None	None		
MidPeak	$0.03548	$0.00	None			None
OffPeak	$0.03548	$0.00	all other times, and all day weekends			



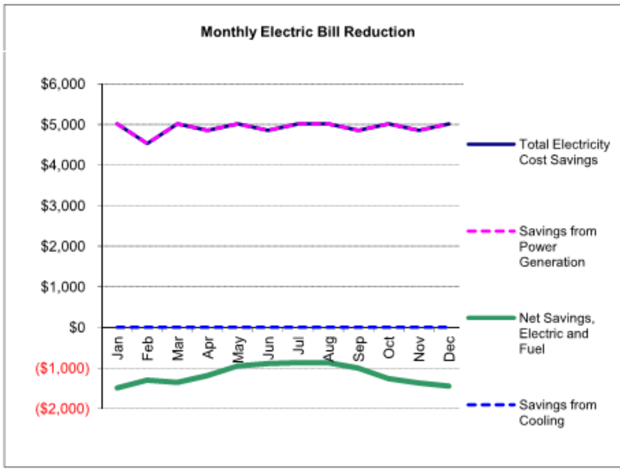


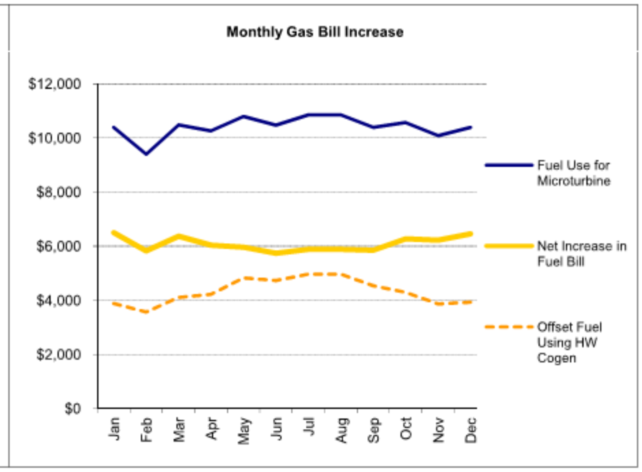
Economic Calculator - UMED MLP SEll BAck C-200 RSA 091613a.xlsx

200 KW MICRO TURBINE WITH ALL POWER SOLD BACK TO ML&P

Monthly Bill Comparison

Electric	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Total
Avoided kWh Costs	$5,015	$4,530	$5,015	$4,854	$5,015	$4,854	$5,015	$5,015	$4,854	$5,015	$4,854	$5,015	$59,053
Avoided kW Demand Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Savings from Power Generation	$5,015	$4,530	$5,015	$4,854	$5,015	$4,854	$5,015	$5,015	$4,854	$5,015	$4,854	$5,015	$59,053
with Absorption Cooling													
Avoided kWh Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided kW Demand Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Savings from Cooling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Electricity Cost Savings	$5,015	$4,530	$5,015	$4,854	$5,015	$4,854	$5,015	$5,015	$4,854	$5,015	$4,854	$5,015	$59,053
Fuel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Fuel Use for Microturbine	$10,394	$9,398	$10,481	$10,261	$10,798	$10,472	$10,856	$10,856	$10,393	$10,570	$10,090	$10,394	$124,965
Offset Fuel Using HW Cogen	$3,885	$3,570	$4,111	$4,222	$4,831	$4,731	$4,971	$4,971	$4,536	$4,294	$3,868	$3,936	$51,925
Net Increase in Fuel Bill	$6,509	$5,828	$6,370	$6,039	$5,967	$5,741	$5,886	$5,886	$5,857	$6,276	$6,223	$6,458	$73,039
Net Savings, Electric and Fuel	($1,493)	($1,298)	($1,355)	($1,186)	($952)	($887)	($870)	($870)	($1,004)	($1,260)	($1,369)	($1,443)	($13,986)





Economic Calculator - UMED MLP SEII BAck C-200 RSA 091613a.xlsx

APPENDIX H: ECONOMIC CALCULATOR – 200 KW MICRO TURBINE ON LOAD SIDE OF METER

Project Summary

Project Information

Company Name	Generic Building at UMED with a C200 Microturbine - Assumes CHP unit on customer side of meter
Facility Description	Generic at UMED, with CMP used to reduce demand and internally use power - no sell back
Facility Location	UMED District
Date of Analysis	16-Sep-13
Prepared By	

Benefits Summary

10 yr IRR	16.4%
10 yr NPV	$339,481
Payback Period [Years]	4.92
Discount Rate	6.0%

Calculations include benefits from:
Electricity Production; Heat Cogeneration;

5 Year Cash Flow Analysis

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
Net Investment	($594,597)					
Total Annual Benefits		$260,288	$265,494	$270,804	$276,220	$281,745
Fuel & O&M Costs		($144,839)	($147,336)	($149,883)	($152,481)	($155,131)
Net Cash Flow	($594,597)	$115,450	$118,158	$120,921	$123,739	$126,613
Discounted Cash Flow	($594,597)	$108,915	$105,161	$101,528	$98,013	$94,613

Equipment, Investment, and Operating Summary

Capstone MicroTurbines	1 x 200
Configuration	200R-FD4-BU00
Fuel Source	LP Natural Gas

Total System Power Rating	200	kW
Avg Monthly Generated Power	138,700	kWh per Month
Avg Price of Offset Utility Power	$0.125	$/kWh
Equivalent Cars Removed	91	using EPA data

Total Installed Cost	($594,597)
Installation/Equipment Rebates	$0
Avoided Equipment Costs	$0
Financing/Tax Credits	$0
Net Investment	($594,597)

Operating Hours/Year		Efficiency [LHV]	
Microturbine	8,760	64.8%	Overall Total
~~Heat~~	~~8,760~~	~~64.8%~~	~~during Heat~~
~~Cooling~~	~~0~~	~~N/A~~	~~during Cooling*~~
* using thermal input, not cooling output		48.1%	FERC

Disclaimer: The software used to create this Economic Calculator is provided as a tool for estimation of the potential value of installing and operating a Capstone microturbine system. The calculated results are based on Capstone's published specifications and certain performance assumptions by Capstone when there is a range of performance possibilities for the Capstone microturbine (which performance is subject to change without notice). The Economic Calculator requires the user to input certain additional assumptions regarding conditions of operation, as well as certain location specific information. The Economic Calculator results will change depending on changes to the assumptions, including lower or higher assumptions where there is a range of possible performance criteria, changes in operation, and changes in location. Neither Capstone, nor any of its representatives, can guarantee that these projected savings will occur or that the calculations made by the Economic Calculator are accurate or error-free. The output from the Economic Calculator in no way constitutes a commitment by Capstone that the forecasted savings or performance will be achieved.

Economic Calculator on Load Side of Meter per CEA 091713.xlsx

200 KW MICRO TURBINE ON LOAD SIDE OF METER

Payback Analysis

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Installed Cost	$594,597										
Fuel, O&M, and Other Costs		$144,839	$147,336	$149,883	$152,481	$155,131	$157,835	$160,592	$163,404	$166,273	$169,199

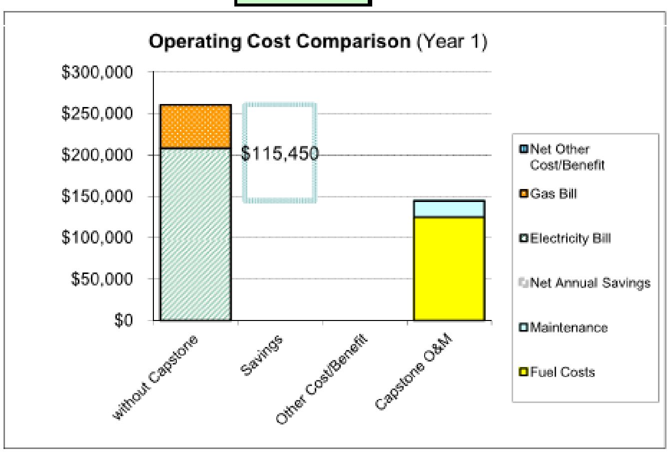
Savings/Avoided Costs — Include in Analysis?

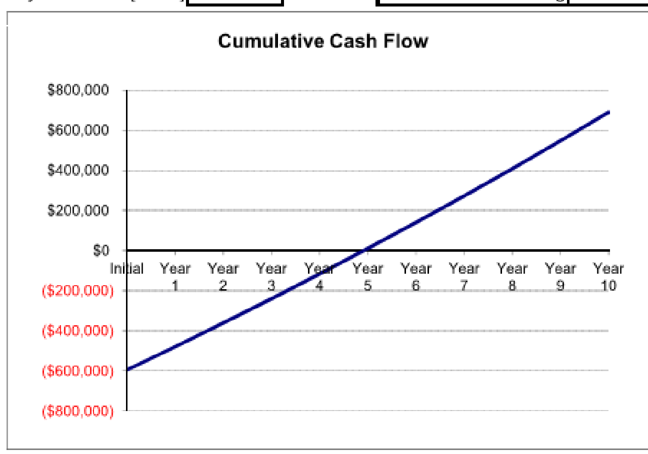
	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Electricity Production ☑		$208,404	$212,572	$216,824	$221,160	$225,583	$230,095	$234,697	$239,391	$244,179	$249,062
Heat Cogeneration ☑	$0	$51,884	$52,922	$53,980	$55,060	$56,161	$57,284	$58,430	$59,599	$60,791	$62,007
Cooling ☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Power Quality/ Reliability ☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Financing/ Inv. Tax Credits ☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Emissions Credits ☐	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Depreciation Tax Benefit ☐		~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
Total	$0	$260,288	$265,494	$270,804	$276,220	$281,745	$287,379	$293,127	$298,990	$304,969	$311,069

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Net Cash Flow	($594,597)	$115,450	$118,158	$120,921	$123,739	$126,613	$129,545	$132,535	$135,585	$138,697	$141,870
Cumulative Cash Flow	($594,597)	($479,147)	($360,989)	($240,068)	($116,329)	$10,284	$139,829	$272,364	$407,950	$546,646	$688,516

Depreciation Method	MACRS 5 YR (half-yr convetion)		Annual Savings (Year 1)	$115,450	
			10 yr IRR	16.4%	
Depreciation Timeline	5 years	Discount Rate 6.0%	10 yr NPV	$339,481	
Tax Rate	0%		Payback Period [Years]	4.92	

Operating Hours/year	
Microturbine	8,760
Heat	8,760
Cooling	~~0~~





Economic Calculator on Load Side of Meter per CEA 091713.xlsx

200 KW MICRO TURBINE ON LOAD SIDE OF METER

Performance Calculator

Microturbine Information

Capstone Product	C200	
Catalog Number	200R-FD4-BU00	
kW Nominal Rating	200	
Fuel Type	LP Natural Gas	
Configuration	Dual Mode	
Heat Recovery Module	Yes	Use External HRM
Certification/Emissions	UL	

Units: English

Site Information

Site Elevation	140	Feet

Parasitic Loads

Fuel Gas Booster	10.0	kW (from selection above)
Customer Load	0.0	kW (if any)
Total Parasitic Load	10.0	kW

Inlet & Exhaust Restrictions

Inlet Pressure Drop	2	inches WC
Exhaust Backpressure	3	inches WC

Cogeneration (Heating)

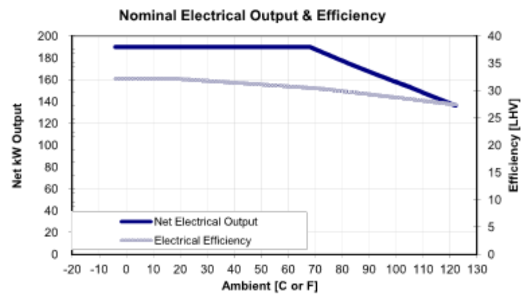
HRM or Direct Exhaust?	HRM	
Inlet Water Temperature to HX	160	°F
Water Flow	80.0	gallons/min
Process Control Temperature	200	°F

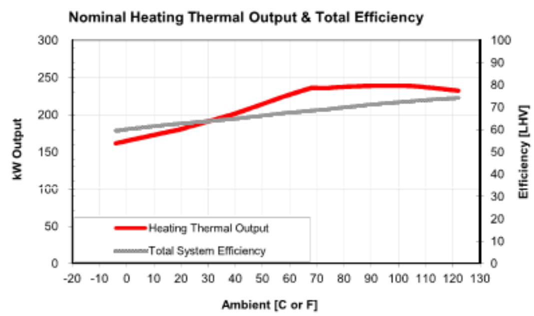
Cogeneration (Cooling)

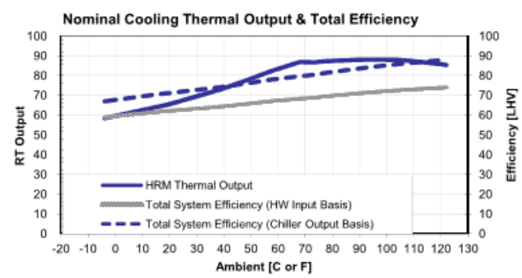
HRM or Direct Exhaust?	HRM	
Coefficient of Performance	1.30	
Inlet Water Temp to Chiller	180	°F
Water Flow	80.0	gallons/min

Nominal Performance for Selected Ambient Temperature

	Ambient	36.0	°F
Electrical Output	Power	190.0	kW
	Efficiency	31.6	% [LHV]
Heating Output	Power	197.1	kW
		673,000	BTU/hr
	Water Out	177.0	°F
	Efficiency	64.4	% [LHV]
Cooling Output	Power	71.9	RT
		253.0	kW
	Efficiency	64.0	% [LHV] based on Heat Input
		73.7	% [LHV] based on Chiller Output







Economic Calculator on Load Side of Meter per CEA 091713.xlsx

200 KW MICRO TURBINE ON LOAD SIDE OF METER

Equipment and Installation

Equipment Costs	Units	Price	Total
Microturbines	1	$ 353,000	$ 353,000
Cain heat recovery	1	$ 47,197	$ 47,197
Electrical Equipment	1	$ 7,400	$ 7,400
12' x 20' building with slab	1	$ 30,000	$ 30,000
			$ -
			$ -
			$ -
			$ -
			$ -
			$ -
Sales Tax @ 8%	0	$ -	$ -
		Subtotal	$ 437,597
		Equipment Rebate Percent	0%
		Equipment Rebate Amount	$ -

Microturbine Information

Capstone Product	200R-FD4-BU00
kW Nominal Rating	200
Quantity	1
Total kW Nominal Rating	200

$2,188	
	Dollars per kW Nominal Rating
$0	

Installation Costs	Units	Price	Total
Shipping	1	$ 1,000	$ 1,000
Site Prep			$ 10,000
Plumbing - included in mechanical			$ -
Mechanical Works (Ducting and Insulation)			$ 70,000
Electrical Works			$ 30,000
Engineering/Permitting/Admin			$ 20,000
Commissioning/Start Up			$ 5,000
Interconnection Agreement			$ 1,000
Air Permit			$ -
Other			$ 20,000
		Subtotal	$ 157,000
		Installation Rebate Percent	0%
		Installation Rebate Amount	$ -

$785	
	Dollars per kW Nominal Rating
$0	

TOTAL INSTALLED COST - WITHOUT REBATE	$ 594,597	$2,973	
TOTAL INSTALLATION / EQUIPMENT REBATE	$ -	$0	Dollars per kW Nominal Rating
TOTAL INSTALLED COST - AFTER REBATE	$ 594,597	$2,973	

Economic Calculator on Load Side of Meter per CEA 091713.xlsx

200 KW MICRO TURBINE ON LOAD SIDE OF METER

Monthly Operating Profile

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Avg. Ambient Temp °F	15	19	26	37	54	56	59	59	49	34	21	18	37.4
Net Electrical Output [kW]	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0
Net kW Demand Reduction	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0

Cogeneration Mode

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉
Cooling	○	○	○	○	○	○	○	○	○	○	○	○
Power Only	○	○	○	○	○	○	○	○	○	○	○	○

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Weekdays/Month	22	20	22	22	22	22	22	22	22	22	21	22	261
Weekend Days/Month	9	8	9	8	9	8	9	9	8	9	9	9	104
Total Days/Month	31	28	31	30	31	30	31	31	30	31	30	31	365

	Weekday Operation			Weekend Operation		
	Power	Heat	Cooling	Power	Heat	Cooling
Midnight	x	x		x	x	
	x	x		x	x	
2:00 AM	x	x		x	x	
	x	x		x	x	
4:00 AM	x	x		x	x	
	x	x		x	x	
6:00 AM	x	x		x	x	
	x	x		x	x	
8:00 AM	x	x		x	x	
	x	x		x	x	
10:00 AM	x	x		x	x	
	x	x		x	x	
Noon	x	x		x	x	
	x	x		x	x	
2:00 PM	x	x		x	x	
	x	x		x	x	
4:00 PM	x	x		x	x	
	x	x		x	x	
6:00 PM	x	x		x	x	
	x	x		x	x	
8:00 PM	x	x		x	x	
	x	x		x	x	
10:00 PM	x	x		x	x	
	x	x		x	x	
Midnight						
Hours	24	24	0	24	24	0

Total Annual Operation (includes Availability)			
	Power	Heat	Cooling
Weekday	6,264	6,264	0
Week End	2,496	2,496	0
Total Hours/Yr	8,760	8,760	0
Efficiency (LHV)	64.8%	64.8%	N/A
	Overall Total	during Heat	during Cooling*
FERC Efficiency	48.1%		

* using thermal input, not cooling output

Reference: Year 1 Variable O&M Cost			
	Power	Heat	Cooling
Jan	$0.085	$0.058	$0.065
Feb	$0.086	$0.058	$0.064
Mar	$0.086	$0.057	$0.064
Apr	$0.087	$0.056	$0.064
May	$0.088	$0.054	$0.063
Jun	$0.088	$0.054	$0.063
Jul	$0.089	$0.054	$0.063
Aug	$0.089	$0.054	$0.063
Sep	$0.088	$0.055	$0.063
Oct	$0.087	$0.056	$0.064
Nov	$0.086	$0.057	$0.064
Dec	$0.085	$0.058	$0.064
Annual Avg	$0.087	$0.056	$0.064

Economic Calculator on Load Side of Meter per CEA 091713.xlsx

200 KW MICRO TURBINE ON LOAD SIDE OF METER

Equipment Operating Assumptions

Costs of Operation

	100%	Availability
	2%	Annual Inflation (Electric & Fuel)
Average Maintenance Cost	$0.0120	$/kWh

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Fuel Costs		$124,866	$127,363	$129,910	$132,509	$135,159	$137,862	$140,619	$143,431	$146,300	$149,226
Average Maintenance Cost		$19,973	$19,973	$19,973	$19,973	$19,973	$19,973	$19,973	$19,973	$19,973	$19,973
Annual Scheduled Maintenance Cost											
Capstone Factory Protection Plan											
Other Ongoing Costs											
Total Fuel, O&M and Other Costs	$0	$144,839	$147,336	$149,883	$152,481	$155,131	$157,835	$160,592	$163,404	$166,273	$169,199

Electricity Production

190.0	Average Net kW Output	Average Net	10,826	BTU/kWh (LHV)
190.0	Average Net kW Demand Reduction	Heat Rate	3.17	kWt/kW (LHV)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided kWh Costs		$115,107	$117,409	$119,757	$122,152	$124,595	$127,087	$129,629	$132,221	$134,866	$137,563
Avoided kW Demand Costs		$93,298	$95,164	$97,067	$99,008	$100,988	$103,008	$105,068	$107,170	$109,313	$111,499
Total Electricity Cost Savings	$0	$208,404	$212,572	$216,824	$221,160	$225,583	$230,095	$234,697	$239,391	$244,179	$249,062

Cogeneration (Heating)

				MMBTU/hr	kW	
Efficiency of Alternative Heating	80%	(LHV)	Avg. Heating Output Energy	0.68	200.2	(when operating)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided Fuel Costs		$51,884	$52,922	$53,980	$55,060	$56,161	$57,284	$58,430	$59,599	$60,791	$62,007
Avoided Equipment Cost	$0										

Cogeneration (Cooling)

					RT	kW	
COP of Alternative Electric Chiller	3.0	Avg. kW displaced	N/A	Avg.Cooling	NOT	OPERATING	(when operating)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided kWh Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided kW Demand Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided Equipment Cost											

Power Quality and Reliability

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Avoided Downtime / Power Interruption Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided Equipment Cost	$0										

Financing/ Investment Tax Credits

10%	ITC %	200	Max ITC $/kW	0%	% Financed	8%	Interest

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Investment Tax Credits	$0										
Financing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Emissions Credits

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Economic Calculator on Load Side of Meter per CEA 091713.xlsx

200 KW MICRO TURBINE ON LOAD SIDE OF METER

Utility Tariffs

Microturbine Fuel: $/MMBTU (HHV)

Fuel Rate Reference: Enstar G-4 Rates
Effective Date: 1-Jul-13

	Months	from	thru		from	thru
Summer Months $6.30	8	Apr	Nov			
Winter Months $6.30	4	Jan	Mar	and	Dec	Dec

Alternative Heating Fuel: Same as MT

Fuel Rate Reference:
Effective Date:

	Months	from	thru		from	thru
Summer Months	0	May	Apr			
Winter Months	12	Jan	Apr	and	May	Dec

Electric Rates

Utility Tariff: ML&P Schedule 22
Effective Date: 04-Jul-05

Summer Months

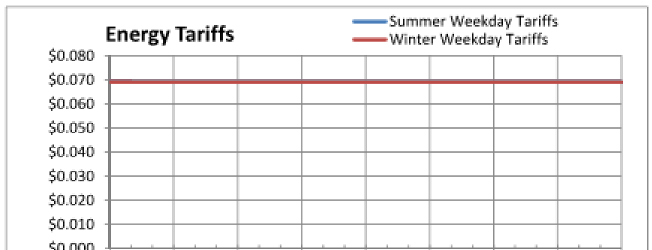
Months	from	thru
4	Jun	Sep

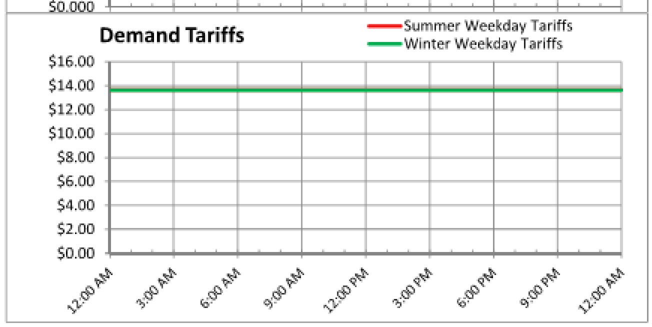
	Tariffs		Time				
Time	$/kWh	$/kW Demand	from	to		from	to
Peak	$0.06916	$13.64	1:00 PM	5:00 PM			
MidPeak	$0.06916	$13.64	8:00 AM	1:00 PM	and	5:00 PM	8:00 PM
OffPeak	$0.06916	$13.64	all other times, and all day weekends				

Winter Months

Months	from	thru		from	thru
8	Jan	May	and	Oct	Dec

	Tariffs		Time				
Time	$/kWh	$/kW Demand	from	to		from	to
Peak	$0.06916	$13.64	None	None			
MidPeak	$0.06916	$13.64	8:00 AM				8:00 PM
OffPeak	$0.06916	$13.64	all other times, and all day weekends				





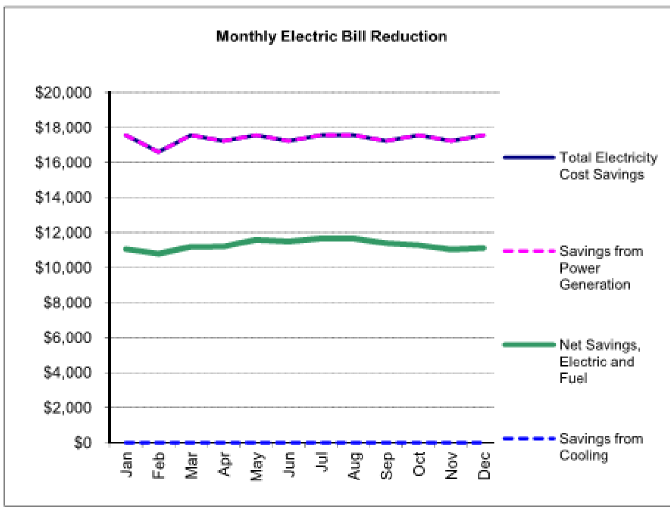
Economic Calculator on Load Side of Meter per CEA 091713.xlsx

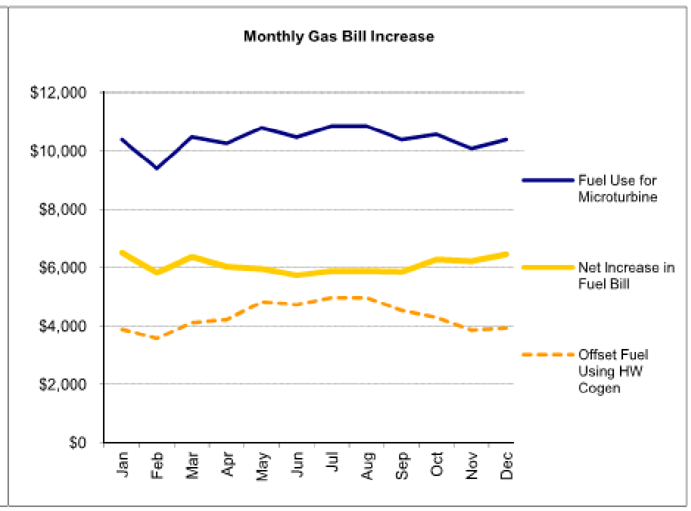
200 KW MICRO TURBINE ON LOAD SIDE OF METER

Monthly Bill Comparison

Electric	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Total
Avoided kWh Costs	$9,776	$8,830	$9,776	$9,461	$9,776	$9,461	$9,776	$9,776	$9,461	$9,776	$9,461	$9,776	$115,107
Avoided kW Demand Costs	$7,775	$7,775	$7,775	$7,775	$7,775	$7,775	$7,775	$7,775	$7,775	$7,775	$7,775	$7,775	$93,298
Savings from Power Generation	$17,551	$16,605	$17,551	$17,236	$17,551	$17,236	$17,551	$17,551	$17,236	$17,551	$17,236	$17,551	$208,404
with Absorption Cooling													
Avoided kWh Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Avoided kW Demand Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Savings from Cooling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Electricity Cost Savings	$17,551	$16,605	$17,551	$17,236	$17,551	$17,236	$17,551	$17,551	$17,236	$17,551	$17,236	$17,551	$208,404

Fuel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Fuel Use for Microturbine	$10,386	$9,390	$10,473	$10,253	$10,789	$10,464	$10,848	$10,848	$10,385	$10,561	$10,082	$10,386	$124,866
Offset Fuel Using HW Cogen	$3,882	$3,567	$4,108	$4,218	$4,827	$4,727	$4,967	$4,967	$4,533	$4,291	$3,864	$3,933	$51,884
Net Increase in Fuel Bill	$6,504	$5,823	$6,365	$6,035	$5,962	$5,737	$5,881	$5,881	$5,853	$6,271	$6,218	$6,453	$72,981
Net Savings, Electric and Fuel	$11,047	$10,782	$11,186	$11,201	$11,589	$11,499	$11,670	$11,670	$11,383	$11,280	$11,018	$11,098	$135,423





Economic Calculator on Load Side of Meter per CEA 091713.xlsx

200 KW MICRO TURBINE ON LOAD SIDE OF METER