Downtown Streets Engineering Study

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Engineering Report

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Prepared For:
Municipality of Anchorage

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Abbreviations

ADA	Americans with Disabilities Act
AMATS	Anchorage Municipal Area Transportation Solution
CBD	Central Business District
DCM	Design Criteria Manual
DOT&PF	Alaska Department of Transportation and Public Facilities
LOS	Level of Service
LTS	Level of Traffic Stress
MOA	Municipality of Anchorage
mph	Miles per Hour
ROW	Right of Way
TMC	Turning Movement Count
TMV	Turning Movement Volume
vph	Vehicles per Hour
vphpl	Vehicles per Hour per Lane

Definition of Terms

Level of Service (LOS): Performance measure concept used to quantify the operational performance of a facility and present the information to users and operating agencies. The actual performance measure used varies by the type of facility; however, all use a scale of A (best conditions for individual users) to F (worst conditions). Often, LOS C or D in the most congested hours of the day will provide the optimal societal benefits for the required construction and maintenance costs.

Level of Traffic Stress (LTS): A measure of the perceived comfort a person biking experiences on a facility based on roadway design, traffic volumes, and motor vehicle speeds. LTS 1, the most comfortable level, has very little traffic stress for cyclists of all age ranges. LTS 4, the least comfortable level, is very stressful for all and few cyclists will use these facilities. LTS levels are determined based on how separated the bicycle facility is from vehicle traffic, as well as vehicle volumes and speeds.

Executive Summary

This study evaluates impacts and benefits of engineering treatments recommended by Our Downtown: Anchorage Downtown District Plan 2021.

The existing downtown network consists of a closely spaced grid of one-way and two-way streets with 60-foot to 80-foot right-of-way (ROW). The pedestrian network of sidewalks and crosswalks is nearly continuous with only a few crosswalks missing from intersections for movements conflicting with dual turn lanes. The bicycle network is much more fragmented with very little dedicated infrastructure for cyclists. The arterial couplets present barriers to non-motorist users when accessing much of downtown.

A range of engineering treatments were evaluated for their feasibility at improving transportation in the downtown core for all users. Most treatments incorporate converting some of the existing ROW to new uses that better suit the context of the adjacent development by reducing the number of vehicle lanes.

Speed Limit Reductions. A network-wide speed limit reduction to 25 mph on major roads and 20 mph on minor roads could be completed following a comprehensive speed study and would increase non-motorist safety and comfort. Speed limit reductions in other municipalities show vehicle speeds were not necessarily reduced by lowering posted limits alone; many required additional traffic calming steps that could include treatments such as signal coordination, narrower vehicle lanes, curb bulbouts, on-street parking, and raised intersections.

Conversion of D Street and F Street to Two-way. Two-way street conversions were suggested to reduce vehicle speeds and reduce out-of-direction travel. Converting lower-volume streets to two-way (D Street and F Street) would provide additional low-stress routes for cyclists to navigate through downtown. Unfortunately, these roads are currently only one lane wide. Converting these to two-way streets would require complete reconstruction of the roadways to widen portions of the road that can only accommodate one vehicle at a time.

Conversion of 5th and 6th Avenue to Two-Lane, Two-Way Roads. This conversion was examined in two steps: 1) a lane reduction on both streets from three one-way lanes to two one-way lanes and 2) conversion of both streets from one-way to two-way. Because vehicle volumes are much lower west of the A Street/C Street couplet than they are east of the A Street/C Street couplet, these treatments were analyzed separately for only occurring on the west side of downtown and for occurring the entire width of downtown. Reducing lanes increases pedestrian safety by reducing vehicle-pedestrian conflicts at crossings and potentially reducing vehicle speeds along the corridor. The right of way currently used for the third lane could be used for a variety of uses, such as parking, bicycle infrastructure, wider sidewalks, parklets, or other amenities.

Analysis of lane reductions on 5th Avenue and 6th Avenue indicate minimal impacts to vehicle operations if a lane were removed west of the A Street/C Street couplet. Travel times on 5th and 6th Avenues increase by only a minute or two in the peak periods.

Lane reductions east of the A Street/C Street couplet do impact vehicle operations. Travel time during the most congested period of the day (westbound on 5th Avenue in the morning peak) doubles (from 5 minutes to 10 minutes). With the two-way conversion, travel time on 5th Avenue in the morning peak increases even more (up to 25 minutes).

Rebuild Intersection of 6th Avenue and E Street. The pedestrian crossing on the south leg of this intersection is complicated by the entrance to the JC Penney parking garage. Our Downtown Plan proposed redesigning the intersection to improve pedestrian safety. Improvements for this intersection should be included in any redesign of either 6th Avenue or E Street.

Rebuild G Street between 3rd Avenue and 5th Avenue. With numerous art galleries and boutique shops, the Our Downtown Plan envisions G Street being rebuilt as a one-lane, one-way road with wider sidewalks and shorter crossing distances. As a destination street, G Street does not carry high volumes of traffic, so rebuilding the road to focus on pedestrians could benefit pedestrians and bicyclists without major impacts to drivers. G Street could be rebuilt as a pedestrian-focused street, with delivery vehicles allowed only during certain hours of the day.

Enhance E Street Corridor. Our Downtown Plan envisions E Street as a transit or pedestrian focused corridor. Currently, E Street is two-lane, one-way between 3rd and 9th Avenues. Conversion to two-way traffic could be beneficial, as E Street connects to two-way streets carrying traffic in and out of downtown to both the north and the south. A new Downtown Transit Center is planned next to E Street just north of 3rd Avenue. Operations with two-way traffic and additional transit vehicles serving the new Transit Center show E Street can comfortably accommodate the change. One option would be to convert E Street to a Transit Mall, with shared bus/bike lanes and enhanced pedestrian amenities.

Amenities. Some engineering treatments do not require additional ROW to improve conditions for users. Additional seating and trash receptacles can be installed in existing curb bulbouts near intersections. Bicycle racks have additional space requirements for access which limits the number of suitable locations; reallocating in-street parking spaces to bicycle parking is one option to limit costs. Consistent pedestrian scale lighting is important for pedestrian safety. Lighting upgrade priorities found in the 2018 Downtown Light and Signals Upgrade Reconnaissance Study should be continued. Winter maintenance should be considered when analyzing any engineering treatments.

Planning-level costs for treatments are provided where possible. Low-cost estimates assume reconfiguration can be completed without repaving or reconfiguring curbs (i.e. striping, signal head adjustments, and flex-post installation). The high-cost estimates for full-reconstruction assume curb-to-curb reconstruction and the installation of any additional streetscape enhancements.

1 Introduction

The Downtown Streets Engineering Study will result in a series of recommendations for projects and lay the groundwork to establish a Downtown Streets Capital Improvement Program (DTCIP). The Downtown Streets Engineering Study will analyze existing conditions in downtown Anchorage bounded by N Street on the west, Ingra Street on the east, 10th Avenue on the south, and Ship Creek to the north. Analyzed treatments are identified in Our Downtown: Anchorage Downtown District Plan 2021, hereafter referred to as Our Downtown Plan.

Figure 1. Study Area for Downtown Streets Engineering Study

The Municipality of Anchorage Long-Range Transportation Strategy (2025), adopted during this study, coordinates previously adopted transportation plans in Chugiak-Eagle River, Anchorage Bowl, and Girdwood communities. Strategy goals identified for the Anchorage Bowl area align with treatments recommended by Our Downtown Plan.

2 Existing and No Build Conditions

Downtown Anchorage is built on a grid network of one-way and two-way streets. Five couplets serve drivers traveling to downtown, from downtown, or through downtown. Speed limits on couplets are 30 mph or 35 mph while the posted speed limit is 25 mph on the remainder of the network.

The couplets serving downtown Anchorage are below:

- L Street and I Street are extensions of Minnesota Drive. L Street serves southbound drivers. I Street serves northbound drivers.
- C Street and A Street are extensions of C Street. C Street serves southbound drivers. A Street serves northbound drivers.
- Gambell Street and Ingra Street are extensions of New Seward Highway. Gambell Street serves southbound drivers. Ingra serves northbound traffic.
- 5th Avenue and 6th Avenue are extensions of Glenn Highway. 5th Avenue serves westbound drivers. 6th Avenue serves eastbound drivers.
- 3rd Avenue and 4th Avenue are extensions of Mountain View Drive. 3rd Avenue is a one-way westbound road east of C Street. 4th Avenue is a one-way eastbound road east of A Street.

All couplets, except the 3rd Avenue and 4th Avenue couplet, connect to a principal arterial or interstate. Within the study area, couplets are typically three lanes in one direction with an occasional turning lane, except for Gambell Street and Ingra Street which are four lanes.

Almost all the downtown network has sidewalk. However, there is almost no dedicated bicycle infrastructure, and infrastructure connecting bicycles to downtown is limited. Alaska Administrative Code (13 AAC 02.400) and Anchorage Municipal Code (Section 9.38.070) state bicycles should not be ridden on sidewalks in business districts. As a result, bicycles must be ridden on shoulders, typically with on-street parking, or in travel lanes with vehicles. Just south of the study area, 10th Avenue is a bicycle boulevard providing some east-west connectivity.

For the purposes of this study, Existing refers to existing traffic volumes on the current downtown network and No Build refers to forecasted 2050 volumes on the existing network. Existing and forecast volumes used in this study are provided in Appendix C Turning Movements and Traffic Volumes. Generally, forecasted growth is minimal or flat in the study area. No Build is used as the baseline for comparison for the proposed treatments analyzed in this study.

2.1 Bicycle Operations

Bicycle Level of Traffic Stress (LTS) describes how comfortable a facility is for a person bicycling on it. Four levels of LTS, presented in Table 1 account for the characteristics of the facility including the speed and volume of adjacent vehicles, roadway classification, and presence of exclusive bicycle facilities.

Table 1: Levels of Traffic Stress

Levels of Traffic Stress (LTS)	
LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS3.

Source: NACTO Report 11-19: Low-Stress Bicycling and Network Connectivity (May 2012)

Figure 2 shows bicycle LTS in downtown Anchorage. Overall, downtown Anchorage has gaps within its bicycle network for bicycle riders who are uncomfortable riding next to motorized traffic without at least a buffer. Within the study area, there are no continuous LTS 1 or LTS 2 roads extending east of Cordova Street. North-south access to and from downtown is also limited to LTS 4 roads except for A Street which transitions from LTS 4 to LTS 1 south of 13th Avenue.

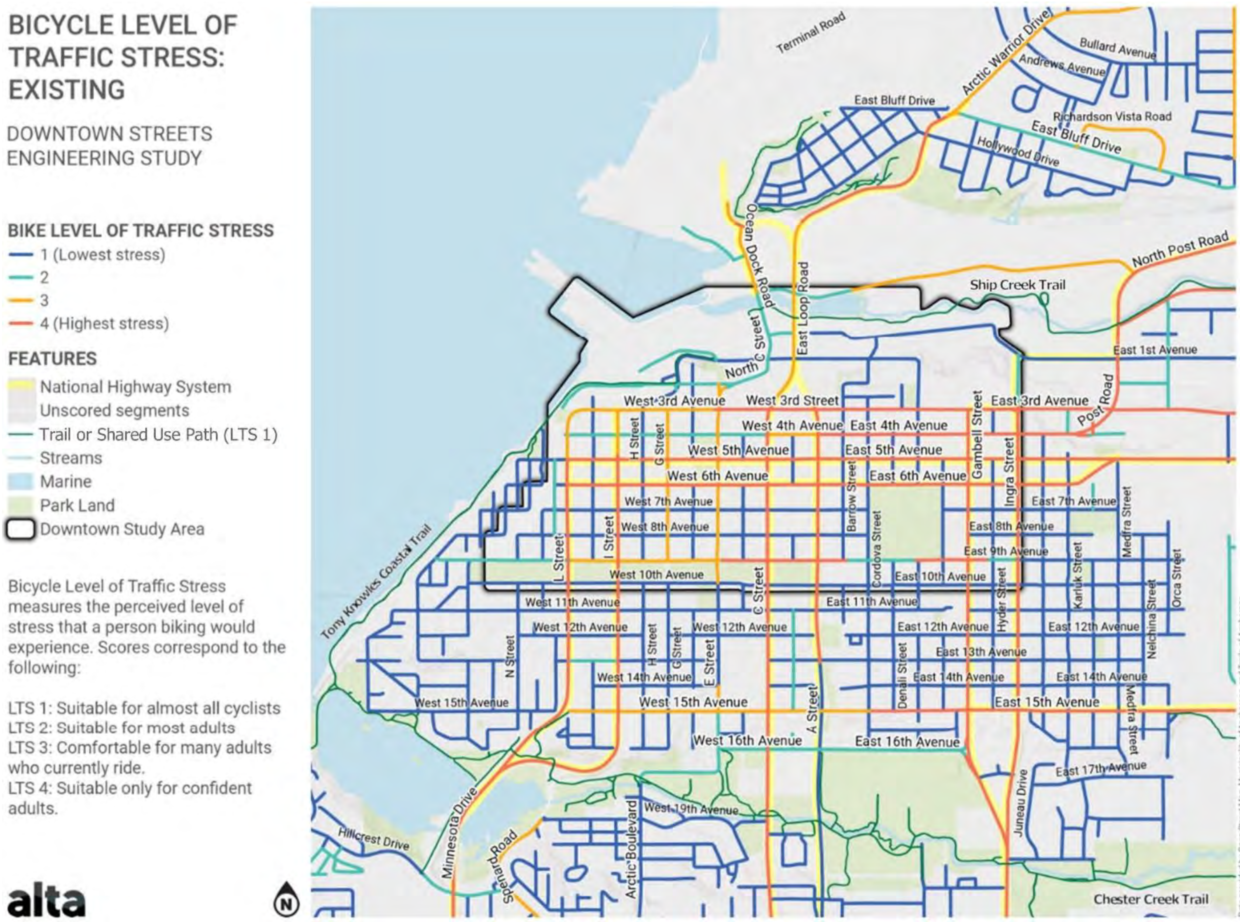

Figure 2. Downtown Bicycle Level of Stress

Low stress islands are a visual representation of the continuity of bicycle routes with LTS 1 or LTS2 that most riders would find acceptable. Smaller islands indicate a smaller continuous area of low-stress access where higher stress crossings are required to continue a trip. Larger islands indicate cyclists can go longer distances on low-stress routes before needing to interact with a high-stress route. Larger low-stress islands are desirable and indicate a well-connected bicycle network that accommodates most cyclists.

Figure 3 shows the low-stress bicycle islands in the study area. Currently, most of the downtown core consists of small low-stress islands bisected by the arterial couplets. The trail system running along the north and west borders of the study area provides low-stress access to the extents of downtown but cyclists traveling into downtown must then interact with many high-stress routes to reach their destinations. The 10th Avenue bicycle boulevard provides lower-stress access, with some discontinuities, to cyclists entering the study area from the south but these riders must also interact with high-stress routes to reach their destinations downtown. Overall, the downtown network between L Street and Ingra Street is fragmented and only suitable for highly experienced cyclists willing to interact with high-stress routes.

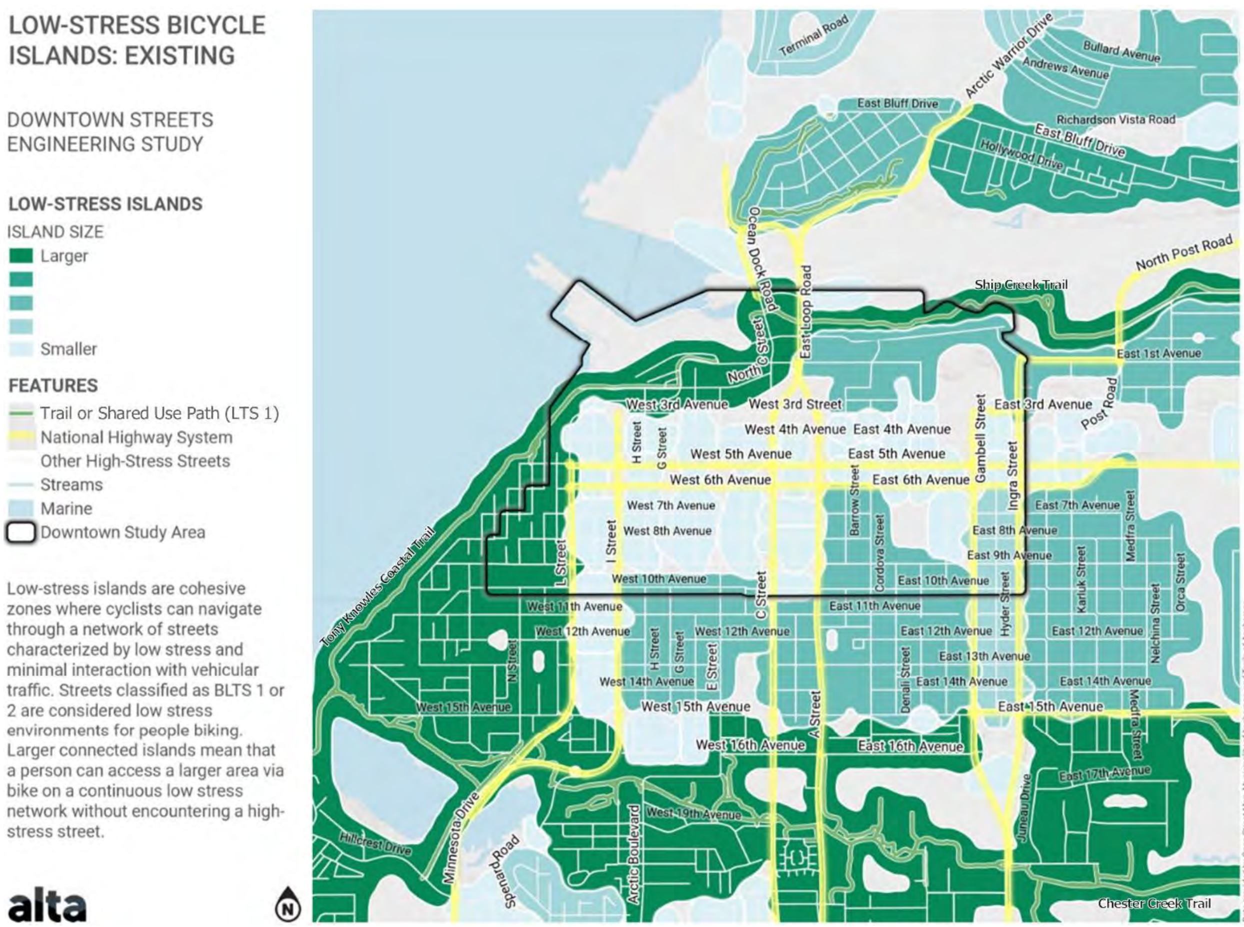

Figure 3. Bicycle Islands Under Existing Conditions

Figure 4 highlights high stress intersections in and surrounding the study area. High stress intersections in this figure are intersections where low stress roads (LTS 1 or LTS 2) intersect with high stress roads (bicycle LTS 3 or bicycle LTS 4). The study area is almost surrounded by high stress intersections, adding to the difficulty for bicyclists to travel to or from downtown. Additionally, high stress intersections divide downtown into sections making it difficult to travel between different areas downtown.

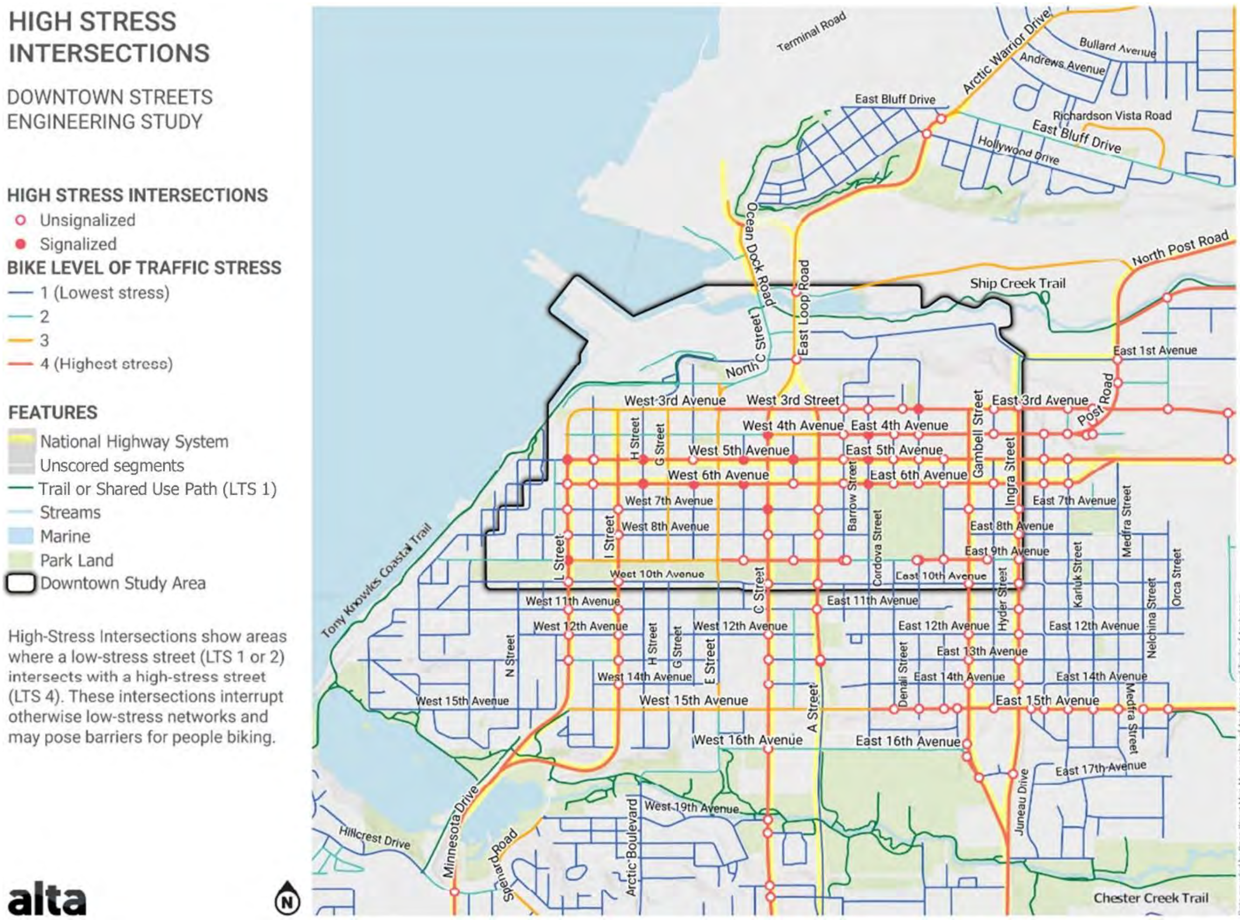

Figure 4. High Stress Intersections (Bicycle)

2.2 Pedestrian Operations

The walkability of a city depends on a combination of pedestrian safety and comfort, connectedness of the network, and the general attractiveness of the area for users. Design elements and facility maintenance factor into pedestrian's perceptions on whether an area is walkable. Design elements such as sidewalk widths and pedestrian-scale lighting directly influence the comfort and safety of pedestrians. Facility maintenance also influences safety and usability of sidewalks.

The existing pedestrian experience in Downtown Anchorage is mixed. Corridors such as 4th Avenue provide users with a comfortable environment with street-level store fronts, wide sidewalks, pedestrian-scale lighting, street trees, and other amenities. Pedestrians must only cross two lanes of traffic and most intersections and crossings are further shortened with curb bulb-outs. On the other hand, the pedestrian experience is poor along C Street: many blocks have parking garages with narrow sidewalks and few street-level store fronts, as well as lack of adequate lighting and many other amenities. Pedestrians must cross three or more lanes of traffic plus parking lanes or shoulders.

The AMATS Safety Plan identified several intersections in the study area, shown in Figure 5, as high severity crash locations. Specifically, the 5th Avenue, C Street, and Gambell Street corridors have higher occurrences of bicycle and pedestrian crashes. The intersection of 6th Avenue and E Street was identified in the Our Downtown Plan as a safety concern for non-motorists due to the configuration of the JC Penney parking garage entrance ramp.

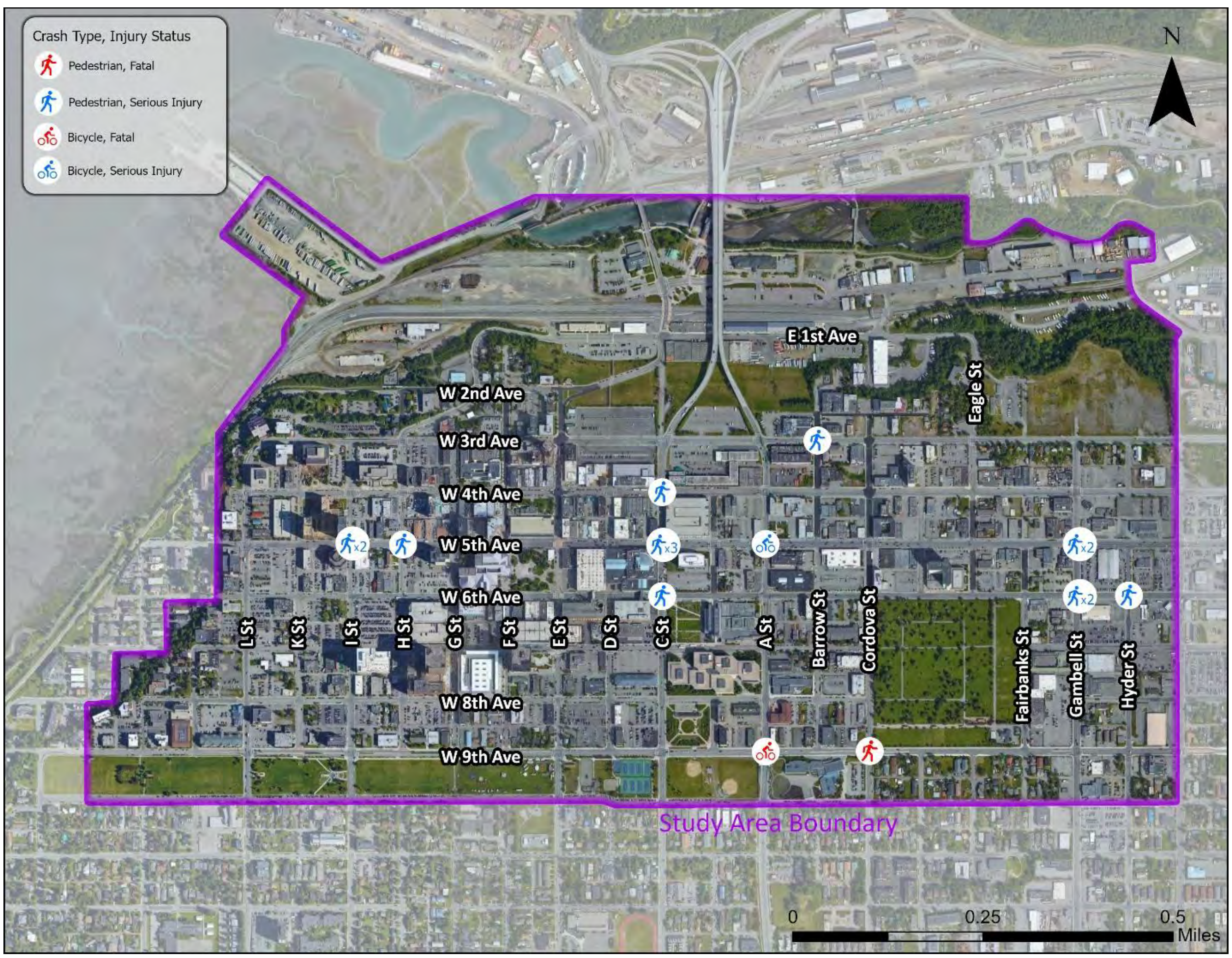

Figure 5: Fatal and Major Injury Non-Motorized Crashes (Source: AMATS Safety Plan, 2024)

2.3 Intersection Operations

Intersection level of service (LOS) is a qualitative measure representing vehicle delay and estimating how much of the capacity of an intersection is being used during peak hours. An intersection operating at LOS A thru C indicates delay that is comfortable for vehicle drivers and, for the purposes of this study, that there is enough capacity in the peak hours to consider lane reduction treatments. Intersections operating at LOS D are near capacity and lane reductions may increase delay beyond what is normally accepted. The Design Criteria Manual (DCM) states that, in the design year, intersections should have an LOS of D or better. LOS E thru F indicates intersections operate poorly with uncomfortable delay and more vehicle demand than capacity in the peak hour. While vehicle LOS should not be the only measure for the design of urban streets, vehicle LOS can be useful for understanding the experience of vehicle traffic.

Intersection operations were analyzed in Synchro 11 software using peak hour traffic volumes. A detailed discussion of the count data and methodology used in determining peak hour vehicle turning movement volumes can be found in Appendix C.

A summary of the existing LOS at signalized intersections during the morning and evening peak hours is presented in Figure 6. The figure represents the downtown grid network. Blocks representing intersections that are not signalized are left blank. Blocks representing signalized intersections are colored to represent the LOS for that intersection. No intersections currently experience worse than LOS D.

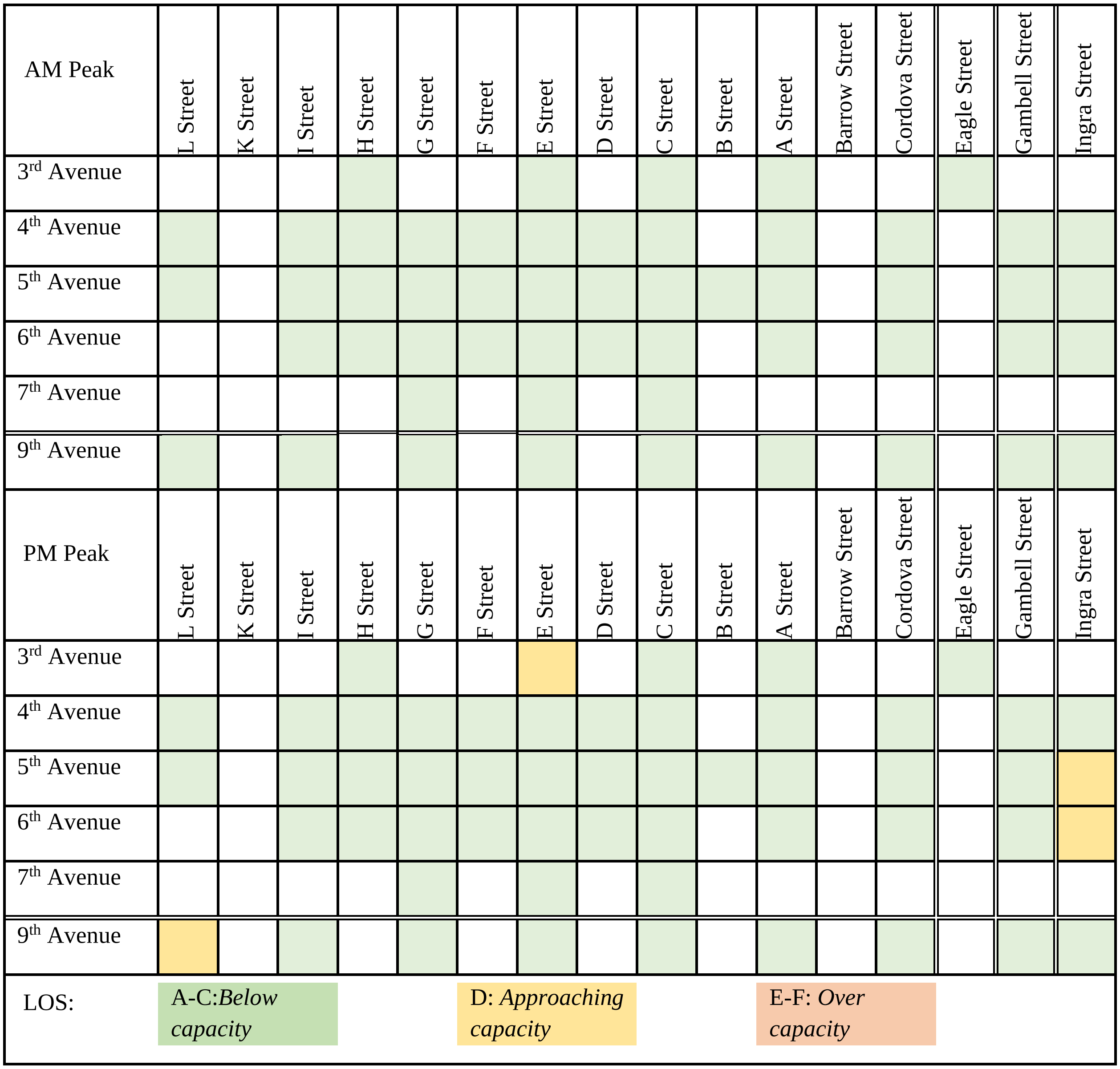

Figure 6: Existing Level of Service at Signalized Intersections

Signalized intersection operations for peak periods using the forecasted 2050 volumes are presented in Figure 7. Signal timings were optimized using Synchro's timing optimization feature to ensure coordination maintains suitable vehicle progression through downtown. During the morning peak, all intersections operate better than LOS D, similar to existing conditions. Two intersections experience worse than LOS D during the evening peak. The improved operations at 3rd and E Street in the PM peak are the result of the optimized signal timings.

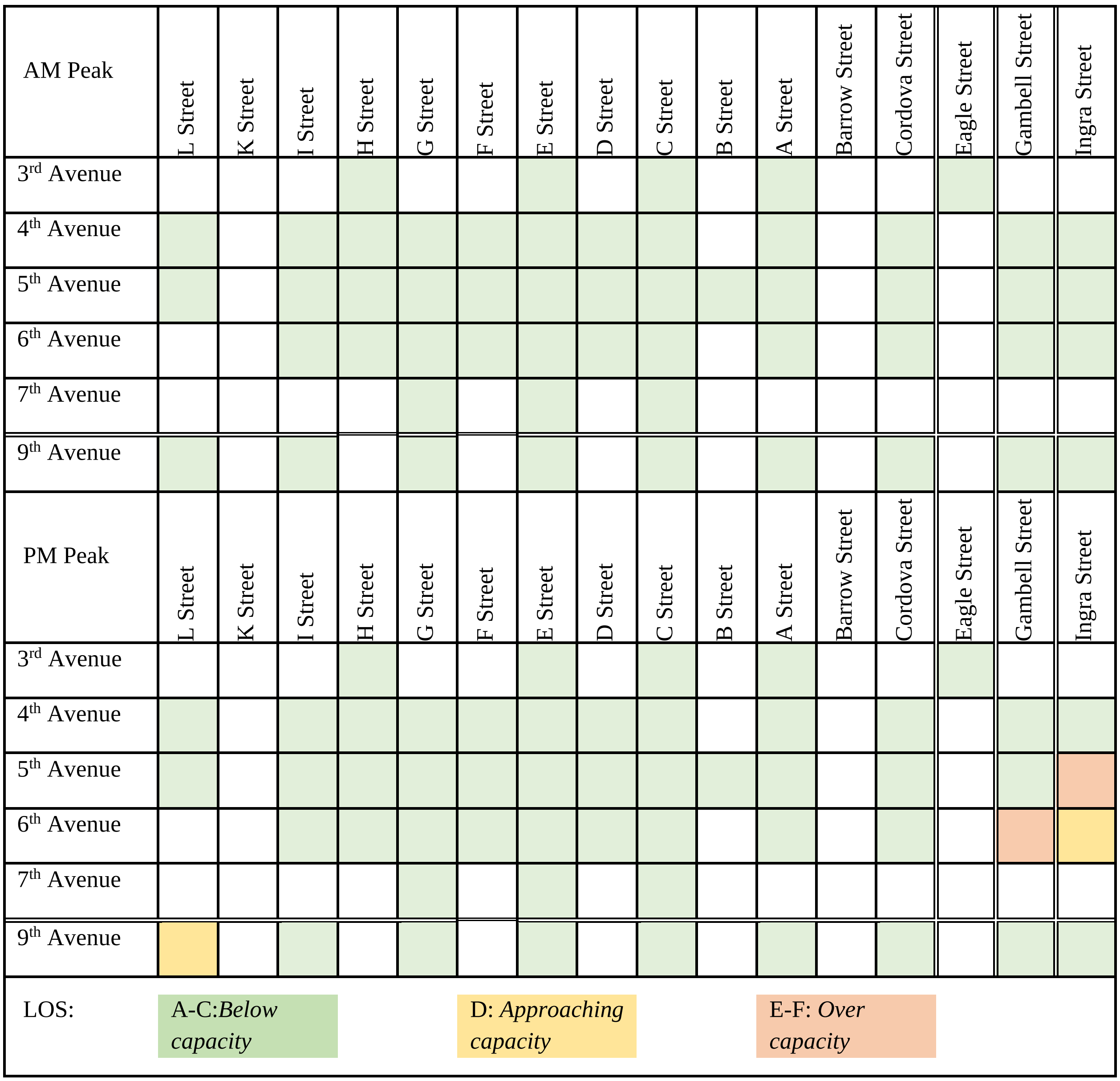

Figure 7: 2050 No Build Level of Service at Signalized Intersections

2.4 Summary

The existing Downtown area has limited bicycle infrastructure that leads to a discontinuous network and stressful user experience for all but the most experienced riders. Intersections operate at LOS D or better during peak periods. Vehicle speeds create safety concerns and a generally uncomfortable experience for non-motorists.

The No Build conditions for all users are similar to existing conditions. Most intersections still operate at LOS D or better; only Ingra Street/5th Avenue and Gambell Street/6th Avenue operate worse than LOS D. Non-motorists continue to experience safety and comfort issues due to vehicle speeds. A summary of impacts on user groups and operations for the No Build treatment is presented in Table 2.

Table 2: Summary of Treatment Impacts: No Build

Treatment: No Build	
Cost	No change
Bicyclists	No change
Pedestrians	No change
Vehicles	No change
Freight	No change
Transit	No change
Snow Storage	No change

3 Opportunities for Alternative Uses of the Right of Way

Many of the treatments presented in the Our Downtown Plan create opportunities to reallocate the right of way (ROW) to prioritize uses other than vehicle travel. Illustrations presenting a range of possible ROW use conversions are included in the following section and are also compiled together in Appendix A Visualizations of Alternative Right-Of-Way Uses.

The illustrations show "usage zones" within the ROW, identify street components that could be used within each zone, and set primary and secondary users for each zone. Alternative uses during winter months are also presented, to illustrate how snow will be stored.

Figure 8 thru Figure 11 are keys to understanding the illustrations. Figure 8 is a legend, explaining the meaning of the symbols used. Figure 9 presents an overview of the municipal code requirements for walkway width. Figure 10 shows requirements for parallel accessible parking. Figure 11 provides guidance on lane widths, depending on roadway class and expected vehicle use.

Any dimensions included in these visualizations are for planning purposes; municipal code and any relevant design manuals should be referenced to determine actual dimensions required in specific configurations.

These visualizations could be used as guidance for many downtown roadways. Specific examples are included in the following section, which describes the evaluation of engineering treatments from the Our Downtown Plan.

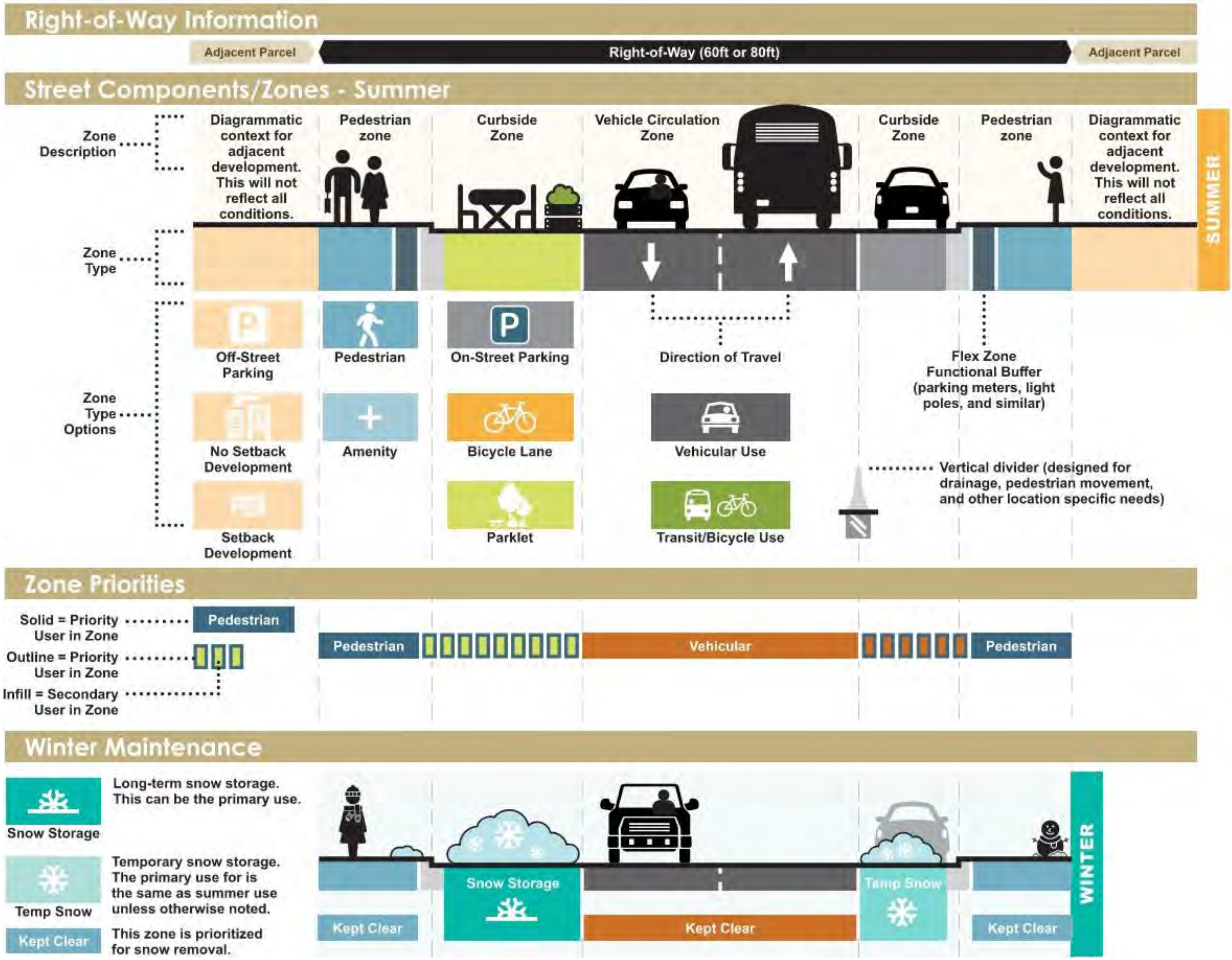

Figure 8: Visualization Legend

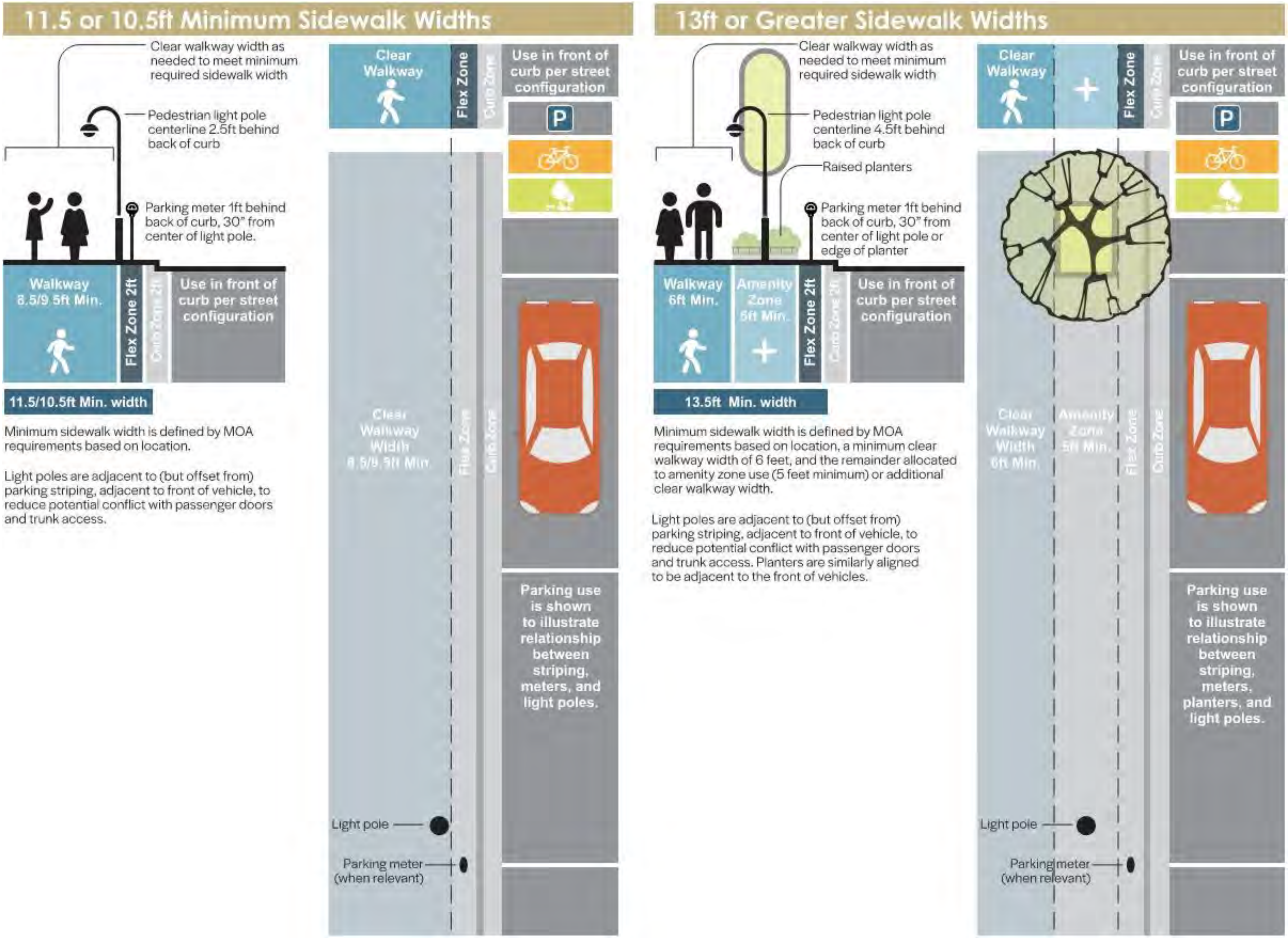

Figure 9: Sidewalk Widths

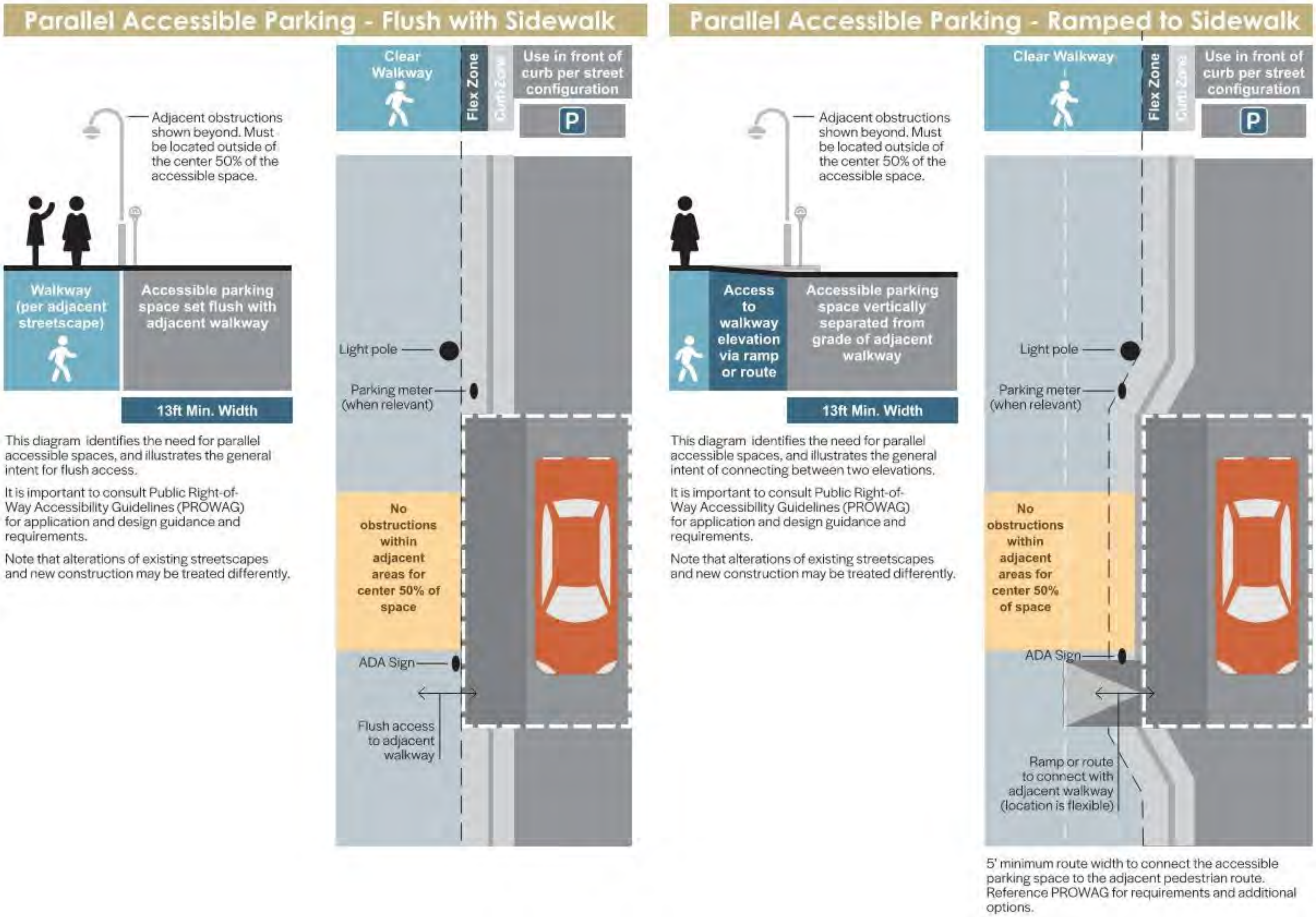

Figure 10: Parallel Accessible Parking

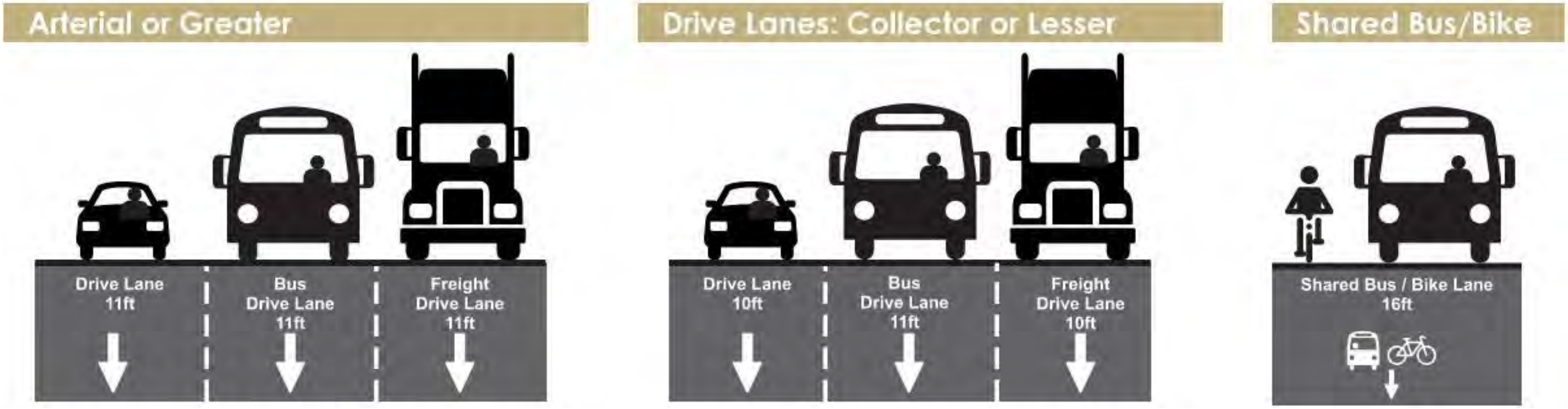

Figure 11: Drive Lanes

4 Evaluation of Engineering Treatments

Several treatments were recommended in the Our Downtown Plan. This report evaluates their feasibility from an engineering perspective, including considering impacts and benefits.

4.1 Ownership of 5th Avenue and 6th Avenue

For the four pairs of one-way couplets in downtown Anchorage (5th/6th Avenue, L/I Street, A/C Street, and Gambell/Ingra Street), there is not a document vesting ownership to the Alaska Department of Transportation and Public Facilities (DOT&PF); however, DOT&PF and the Federal Highway Administration (FHWA) have invested resources for maintenance and construction over time. As a result, regardless of ownership, both DOT&PF and FHWA have an interest in these corridors.

The Municipality of Anchorage (MOA) is interested in having more control over the design and management of these corridors; as it relates to this study, the focus is on 5th and 6th Avenues. This study identified three pathways the MOA could pursue:

- MOA can use the existing metropolitan transportation planning process through AMATS to implement the community vision for downtown.
- MOA can use shorter-term planning and funding opportunities and work with DOT&PF and FHWA to implement the community vision for downtown.
- MOA can request to remove the NHS designation from these streets (or portions of these streets) and can ask DOT&PF to relinquish ownership and convey it to MOA. Note that no high classification routes have been successfully conveyed to date in Alaska, and that this process is likely to take a significant amount of time.

4.2 Reduce Speed Limit in Downtown to 20 mph and 25 mph

Our Downtown Plan supports reducing speed limits to 25 mph on high volume roads and 20 mph on low volume roads and adjusting traffic signal timing to match. Suggested reductions are changing speed limits to 20 mph on 2nd Avenue, 3rd Avenue, 4th Avenue, 7th Avenue, 8th Avenue, and 9th Avenue, reducing speed limits to 25 mph on 5th Avenue and 6th Avenue, and reducing speeds limits to 20 mph or 25 mph on A Street through L Street.

Alaska Administrative Code 13 AAC 02.400 sets the maximum speed for business districts at 20 mph unless otherwise posted. The reduction of speed limits on MOA streets is regulated by municipal code and requires a comprehensive speed study before any changes are made. A comprehensive speed study is not defined within municipal code, but could include analysis of current driver speeds, crash history, bicycle LTS, pedestrian experience, and land use.

Other agencies throughout the county have implemented area-wide speed limit changes by various methods and have achieved different levels of success. Findings are summarized in Appendix D Speed Limit Reduction Studies.

4.2.1 Pedestrian Safety

Vehicle impact speed is a critical factor in vehicle-pedestrian crashes in determining the severity of injuries to the pedestrian. The risk of death for pedestrians struck by vehicles traveling at increasing speeds is shown in Figure 12. Reducing speeds from 30 mph to 25 mph reduces the chance of fatal injury by about 50%.

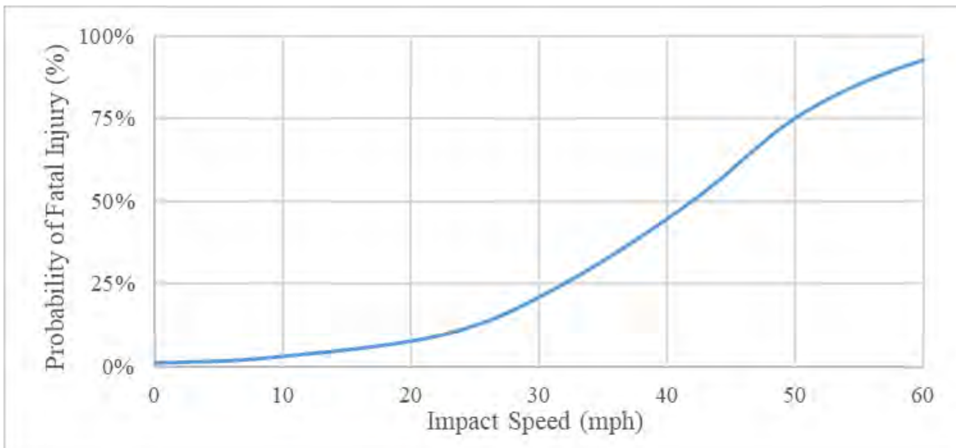

Figure 12: Impact Speed and Pedestrian's Risk of Death (Source: Tefft, 2011)

Additionally, drivers have a wider field of vision when driving at a lower rate of speed. They are more able to identify pedestrians in or entering the roadway and react accordingly.

A desire for improved pedestrian safety supports the proposed speed limit reductions.

4.2.2 Arterial Travel Time

Arterial travel time is the amount of time it takes drivers to progress along an arterial corridor, including control delay from signals. Generally, adding signals to an arterial or reducing speed limits may increase travel time. Removing signals or increasing speed limits may reduce travel times. Small differences in reported travel times are expected when compared to actual travel times due to fluctuations in real-world conditions.

The speed limit reduction treatment was analyzed using Synchro’s Arterial LOS feature with speeds on L Street, I Street, C Street, A Street, Gambell Street, Ingra Street, 5th Avenue, and 6th Avenue reduced to 25 mph. Speeds on all other downtown streets were reduced to 20 mph. Signal timing was optimized using Synchro’s optimization to maintain signal progression at the new speed limits.

Figure 13 summarizes AM and PM peak travel times along several downtown streets under no-build conditions and with reduced speed limits. During both the AM and PM peaks, the largest travel time increase occurs along the A Street corridor, with an increase of about 50 seconds. The remaining downtown corridors see travel time increases of 35 seconds or less. For through traffic, these travel time increases are a small portion of the total trip time and are unlikely to result in drivers choosing to take a different route.

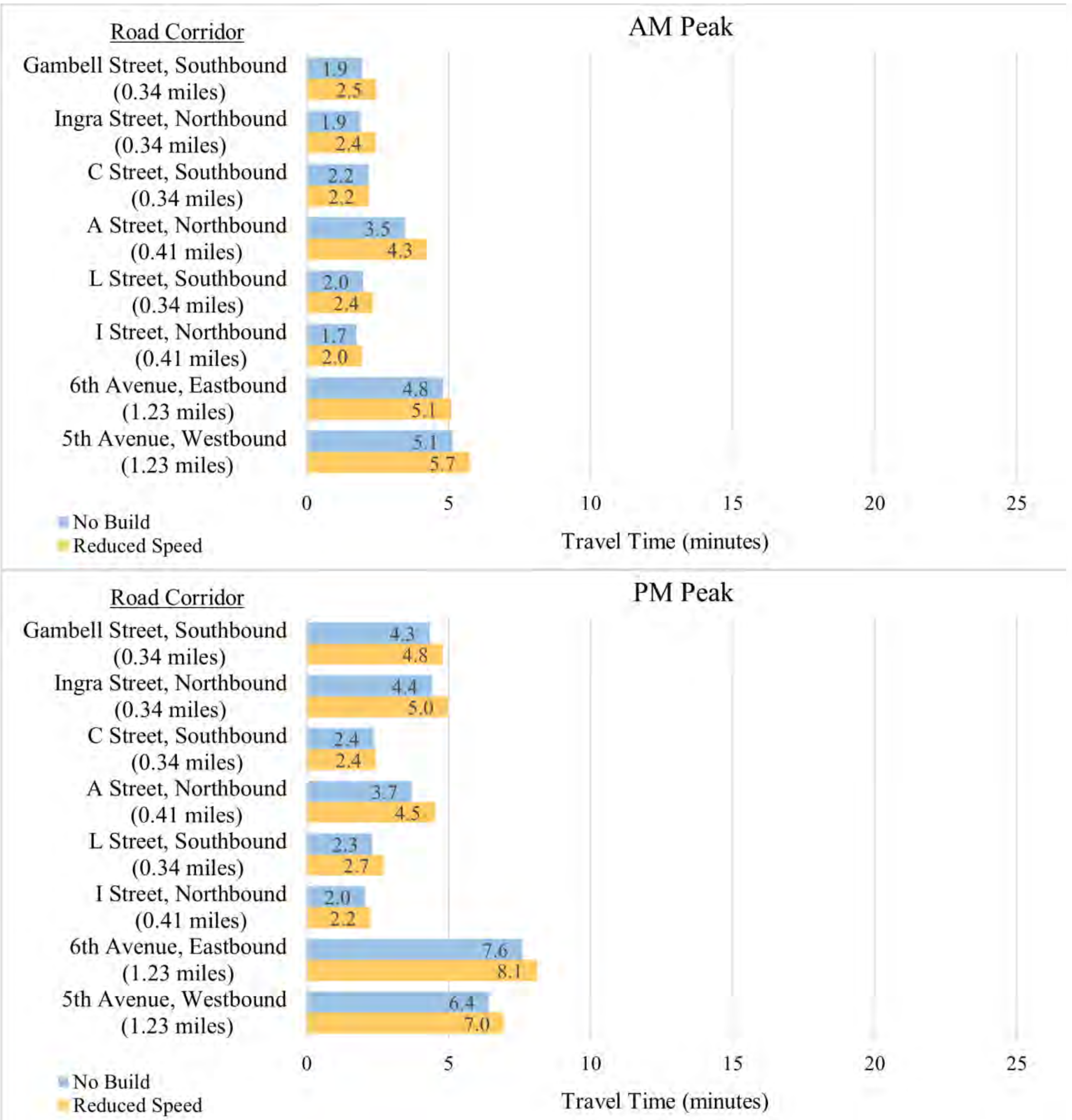

Figure 13: 2050 Peak Hour Travel Time Comparison for Reduced Speed Limit Alternative

4.2.3 Expansion of Low Stress Bicycle Islands with Speed Limit Reduction

Vehicle speeds are a major factor in how stressful a facility is for cyclists. Reducing vehicle speeds is a low-cost method to improve LTS on existing roads that also benefits other non-motorists by improving safety and user comfort. Figure 14 presents bicycle LTS in the study area when speed limits are reduced on all roads. LTS on lower classification roads north and south of the downtown core improve when compared to existing. However, continuous north-south low-stress routes are limited and the arterial couplets still present major barriers to cyclists desiring these less stressful routes.

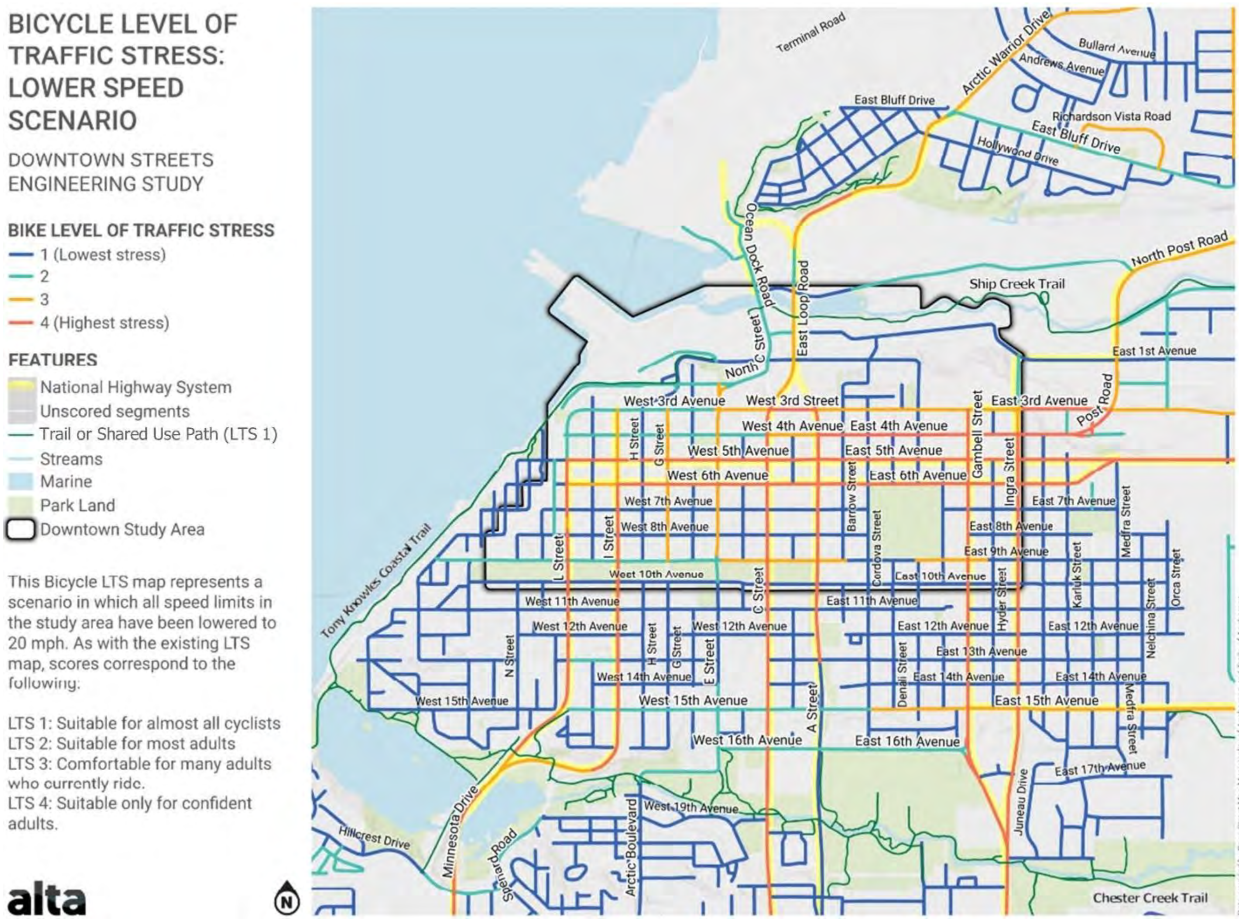

Figure 14: Downtown Bicycle Level of Stress with Speed Limit Reduction

Low-stress islands when speed limits are reduced, presented in Figure 15, expand to much of downtown northwest of 5th Avenue and C Street. The medium-sized island south of 6th Avenue bounded by A Street and Gambell Street becomes part of a larger low-stress island. The F Street corridor is shown as a low-stress connection providing an important north-south connection through downtown but it should be noted F Street is discontinuous for bicyclists who do not dismount to travel through the Performing Arts Center and Town Square Park. Many small low-stress islands are still present between the arterial couplets that bisect the study area.

The expansion of low stress bicycle islands in the study area would be a desirable outcome of the proposed reduced speed limits.

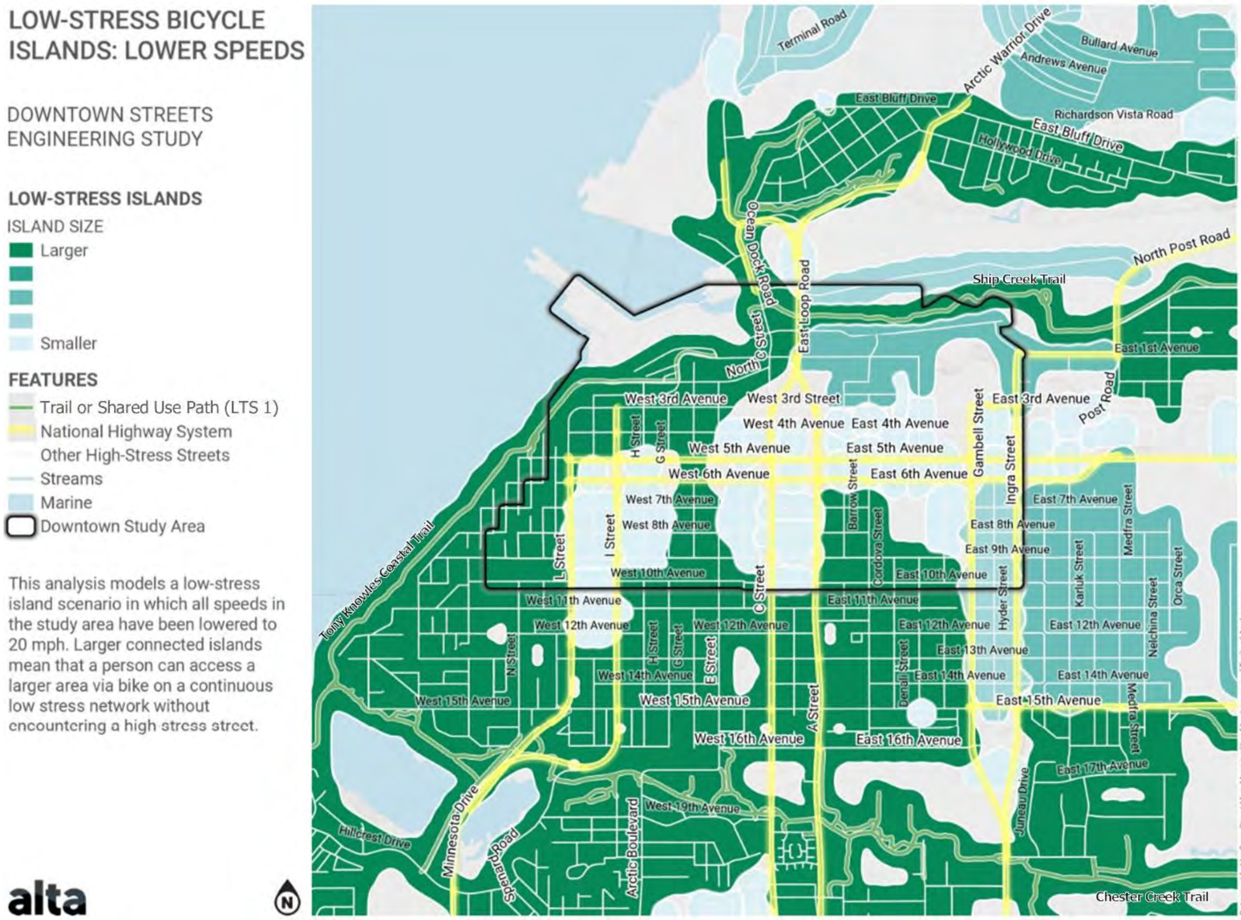

Figure 15. Bicycle Islands with Speed Limit Reduction

4.2.4 6th Avenue and A Street Cycle Track (Anchorage Protected Bike Lane Pilot Study)

During the summer of 2024, a temporary bi-directional cycle track was installed in downtown Anchorage on 6th Avenue between L Street and A Street and on A Street between 10th Avenue and 6th Avenue, reducing the street width for vehicles from three to two lanes. The bike lane was installed in the original third vehicle lane and was protected from vehicle traffic using flex-posts, temporary striping, and rubber curbs. Due to these changes during the pilot project, LTS was improved from level 4 to level 2 and a valuable east-west connection to the LTS 1 trail system was made through the study area. Pedestrians also benefited from the installation of the bike lanes which created a buffer between vehicle traffic and users on the adjacent sidewalks.

Vehicle speed data was collected during the pilot project to determine if reducing travel lanes had an impact on driver behavior and vehicle speeds. The report concluded that vehicle speeds were not significantly impacted by the installation of the protected bike lane.

Except for the afternoon peak hour, travel times throughout the day during the lane reductions on A Street and 6th Avenue remained broadly similar to travel times measured after the bike lane was removed. Travel times on the two-lane 6th Avenue segment only increased by up to 50 seconds during the afternoon rush hour, an amount of time that did not cause vehicles to miss multiple signal cycles.

Surveys during and after the project found users were generally supportive of the bike lane. Cyclists found the visual separation created with flex-posts and temporary curbs improved their feeling of comfort while acknowledging these treatments would not physically stop an errant vehicle. Traffic noise exceeding the level above which noise interferes with communication and diminishes non-motorist comfort (70 decibels) also decreased with the bike lane.

4.2.5 Summary

This report only considers the impact of signal timing changes due to reduced speed limits in Downtown Anchorage. A more comprehensive study of the feasibility of reduced speed limits is likely needed before the change can be implemented.

Many other jurisdictions have reduced speed limits in their downtown areas; their experience suggests that changing the speed limit may not be enough to actually reduce vehicle speeds. Changing the coordinated signal timing may help, as well as other treatments to encourage drivers to slow down such as narrower lanes, curb bulb-outs, on-street parking, and raised intersections.

Based on travel times along the main arterials, drivers are unlikely to choose to take a different route if speeds are reduced downtown. Furthermore, the LTS analysis indicates that riding a bicycle downtown would become significantly more comfortable if speeds are reduced.

The data from the Anchorage Protected Bike Lane Pilot Study did not conclude a lane reduction alone would encourage a reduction in vehicle speeds, although it should be noted that speed limits were not reduced during the project.

A summary of impacts on user groups and operations for the treatment reducing speed limits on all downtown roads is presented in Table 3.

Table 3: Summary of Impacts: Speed Limit Reduction in Downtown

Cost	Low-cost option
Bicyclists	Improves safety and comfort
Pedestrians	Improves safety and comfort
Vehicles	Minor increase in travel time
Freight	Minor increase in travel time
Transit	Minor increase in travel time
Snow Storage	No change

4.3 D Street and F Street Conversions from One-way Streets to Two-way Streets

Our Downtown Plan supports converting D Street and F Street to two-way streets. D Street between 4th Avenue and 5th Avenue and F Street between 3rd Avenue and 5th Avenue are northbound one-way segments. Currently, D Street is a one-lane street with on-street parking on both sides. At 4th Avenue, curb bulbs have been installed, reducing the pavement width to allow only one vehicle to pass.

F Street is also a single lane wide with on-street parking and vertical concrete treatments that reduce the pavement width.

Existing sidewalks on both sides of D Street and F Street allow pedestrians to travel north and south. However, bicyclists should follow the rules of the road and must travel to C Street or G Street to travel south. One-way segments of D Street and F Street are low volume local roads.

4.3.1 Summary

Because both D and F Street are only one-lane wide, converting them to two-way would require complete reconstruction of the roads to provide enough width for two lanes. Two-way conversion would have little benefit for vehicle travel but might benefit bicyclists. Alternatively, bicycle-only infrastructure could be built to add contraflow bicycle travel. A summary of impacts on user groups and operations for the treatment converting D Street and F Street to two-way is presented in Table 4.

Table 4: Summary of Impacts: D Street and F Street 2-Way Conversion

Cost	High-cost; complete reconstruction required
Bicyclists	Would improve network
Pedestrians	No change
Vehicles	Minimal benefits
Freight	No change
Transit	No change
Snow Storage	No change

4.4 5th and 6th Avenue Conversion to Two-way Streets

Our Downtown Plan supports converting 5th and 6th Avenues to two-way streets. Stakeholder interviews indicated that the primary reason for this conversion is to reduce vehicle speeds downtown. These two-way conversions also remove the turning restrictions present on one-way roads allowing for more direct routes and access to downtown destinations such as the Performing Arts Center and Town Square Park.

The 5th and 6th Avenue couplet is the primary east/west arterial serving the Downtown area. To convert this one-way couplet to two-way streets, the number of travel lanes would likely also need to be reduced from three lanes to two lanes. As such, the conversion is considered in two steps: first, reallocating a travel lane to other uses (lane reduction) and second, converting to two-way. The effects of each of these steps were analyzed on two corridor segments: west side only (between the A/C Streets couplet and the I/L Streets couplet), and entire width of downtown (between the Ingra/Gambell Streets couplet and the I/L Streets couplet). A full evaluation of this analysis is found in the *Evaluation of Engineering Treatments on 5th Avenue and 6th Avenue Memo* (October 2025).

The analysis assumed a lane reduction on 4th Avenue from three to two lanes, due to stakeholder interest.

4.4.1 General Considerations

4.4.1.1 Non-motorized Impacts

Lane reduction treatments offer many improvements to non-motorists. When including turn and parking lanes, pedestrians must currently cross up to five lanes at some intersections on 5th and 6th Avenues. Intersections with dual turn lanes do not provide pedestrian signal phases on the conflicting movements, prohibiting crossings and forcing pedestrians to travel further or take additional risks to cross.

Reducing the number of lanes and minimizing the number of turn lanes reduces pedestrian-vehicle conflicts and improves overall pedestrian comfort when navigating the corridor.

4.4.1.2 Vehicle Considerations

Lane reduction treatments change how vehicles operate within the existing downtown network. On three-lane, one-way roads, a driver can minimize their delay in the outside lanes caused by turning and parking vehicles by changing lanes. Vehicles occupying the center lane are rarely delayed by these conflicts.

On two-lane, one-way roads, drivers still change can lanes to avoid conflicts from turning and parking vehicles but all lanes can be delayed by these conflicts, slowing travel speeds.

On two-lane, two-way roads (with one lane in each direction), drivers cannot change lanes behind turning and parking vehicles to avoid delay. At intersections with shared through and turn lanes, queues are likely to build behind turning vehicles that cannot find gaps in oncoming traffic.

4.4.1.3 Heavy Vehicles

Lane reduction treatments narrow the travel way making it more difficult for larger vehicles to turn on downtown streets. 5th and 6th Avenues are used by freight and transit vehicles and turns from the couplet to the north south couplets are frequent. The turning maneuvers between 6th Avenue and A and C Streets were tested using a tractor-trailer combination as part of the Anchorage Protected Bike Lane Pilot Study while lanes were reduced. The two-way conversion treatments would likely require large vehicles to use the opposing lane to complete turns with existing curb geometries.

4.4.2 Reduction of 4th, 5th, and 6th Avenues from Three Lanes to Two Lanes (Remain One-way)

Removing a travel lane from 4th Avenue, 5th Avenue, and 6th Avenue would allow space to be reallocated to sidewalks, bike lanes, bike parking, parklets, improved bus stops, etc., working towards the Our Downtown Plan priorities of optimizing multi-modal access to and within downtown and creating a place that is enjoyable and safe for walking, biking, and using public transit. Figure 16 and Figure 17 illustrate low-cost options for this conversion, for 6th Avenue (60-foot ROW width) and 5th Avenue (80-foot ROW width), respectively. Under these options, the street is restriped to convert one travel lane to another use, without full reconstruction of the roadway. Sidewalk widths remain as-is, and are therefore narrower than minimums in municipal code.

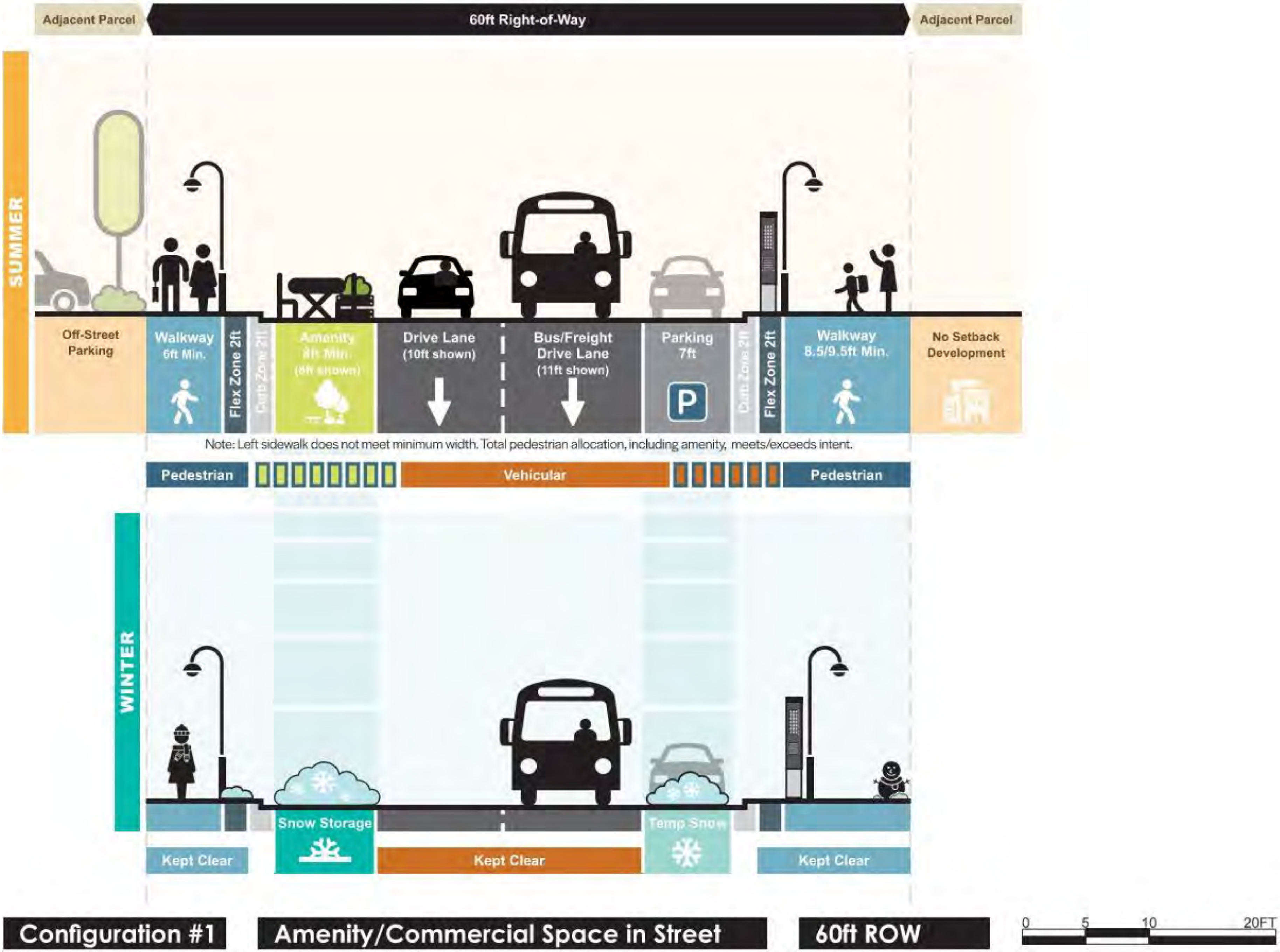

Figure 16: Visualization 1 – Amenity/Commercial Space in Street with 60-foot ROW

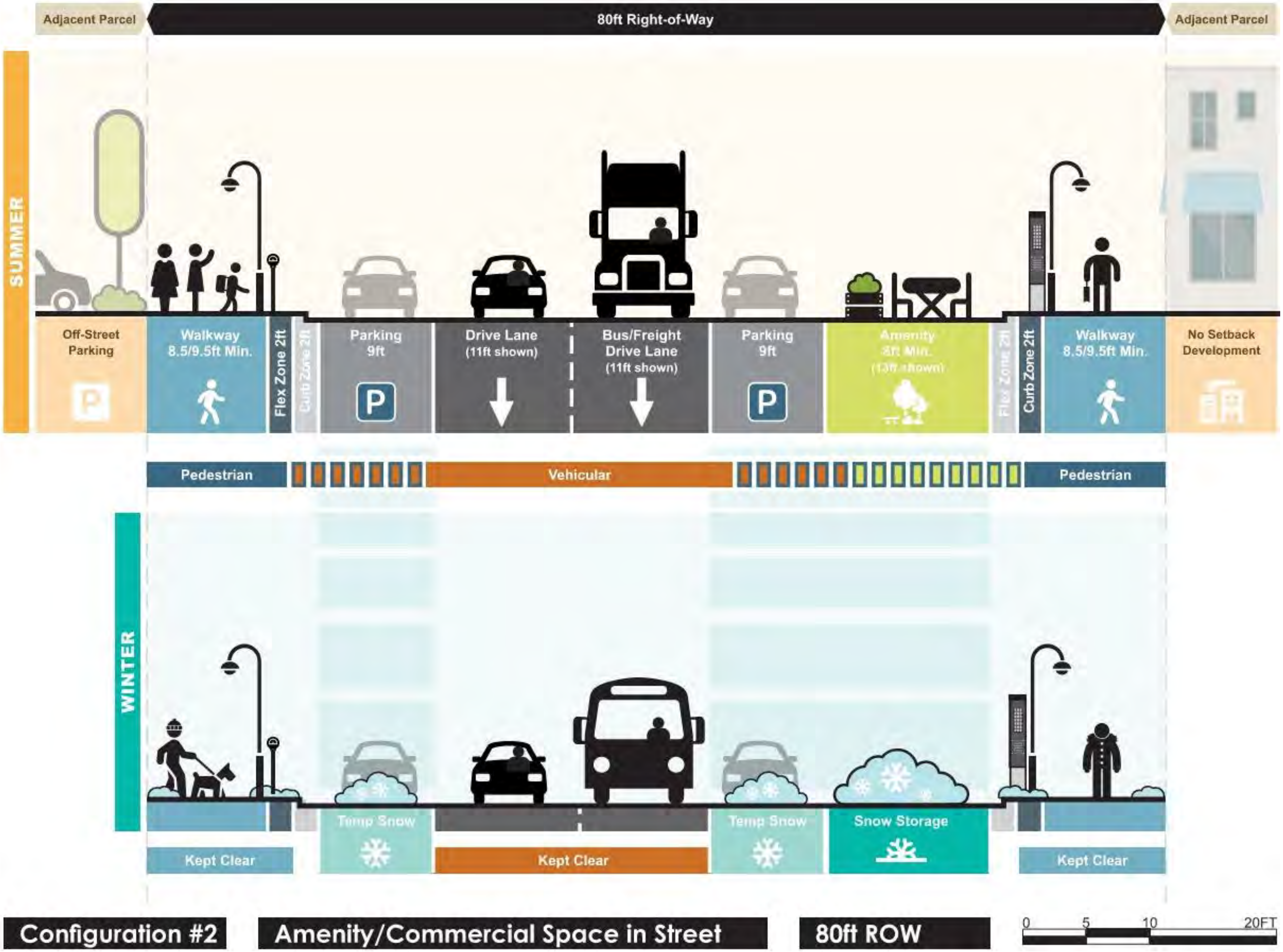

Figure 17: Visualization 2 – Amenity/Commercial Space in Street with 80-foot ROW

4.4.2.1 Intersection Operations

Peak hour operations at signalized intersections in 2050 are summarized in Figure 18 for lane reductions on the west side (west of A and C Streets). Operations do not fall below LOS D when lanes are reduced on the west side during the morning peak. High volumes of turning vehicles at the Ingra and Gambell Street intersections decrease operations during the evening peak. Queuing at intersections is similar to No Build conditions; the second travel lane limits queue formation throughout the day.

AM Peak	L Street	K Street	I Street	H Street	G Street	F Street	E Street	D Street	C Street	B Street	A Street	Barrow Street	Cordova Street	Eagle Street	Gambell Street	Ingra Street
3rd Avenue																
4th Avenue																
5th Avenue																
6th Avenue																
7th Avenue																
9th Avenue																

PM Peak	L Street	K Street	I Street	H Street	G Street	F Street	E Street	D Street	C Street	B Street	A Street	Barrow Street	Cordova Street	Eagle Street	Gambell Street	Ingra Street
3rd Avenue																
4th Avenue																
5th Avenue																
6th Avenue																
7th Avenue																
9th Avenue																

LOS: A-C: *Below Capacity* D: *Approaching Capacity* E-F: *Over Capacity*

Figure 18: 2050 Level of Service at Signalized Intersections for Lane Reduction between I/L and A/C Couplets

Figure 19 summarizes peak hour operations at signalized intersections in 2050 for lane reductions the entire width of downtown (west of Ingra and Gambell Streets). Lane reductions west of Ingra and Gambell Streets decrease signal operations below LOS D east of C Street during the morning peak. Westbound volumes exceed two-lane capacity on these 5th Avenue intersections. During the evening peak, Ingra and Gambell Street intersections with 6th Avenue operate worse than LOS D. Queueing throughout the day is similar to No Build conditions.

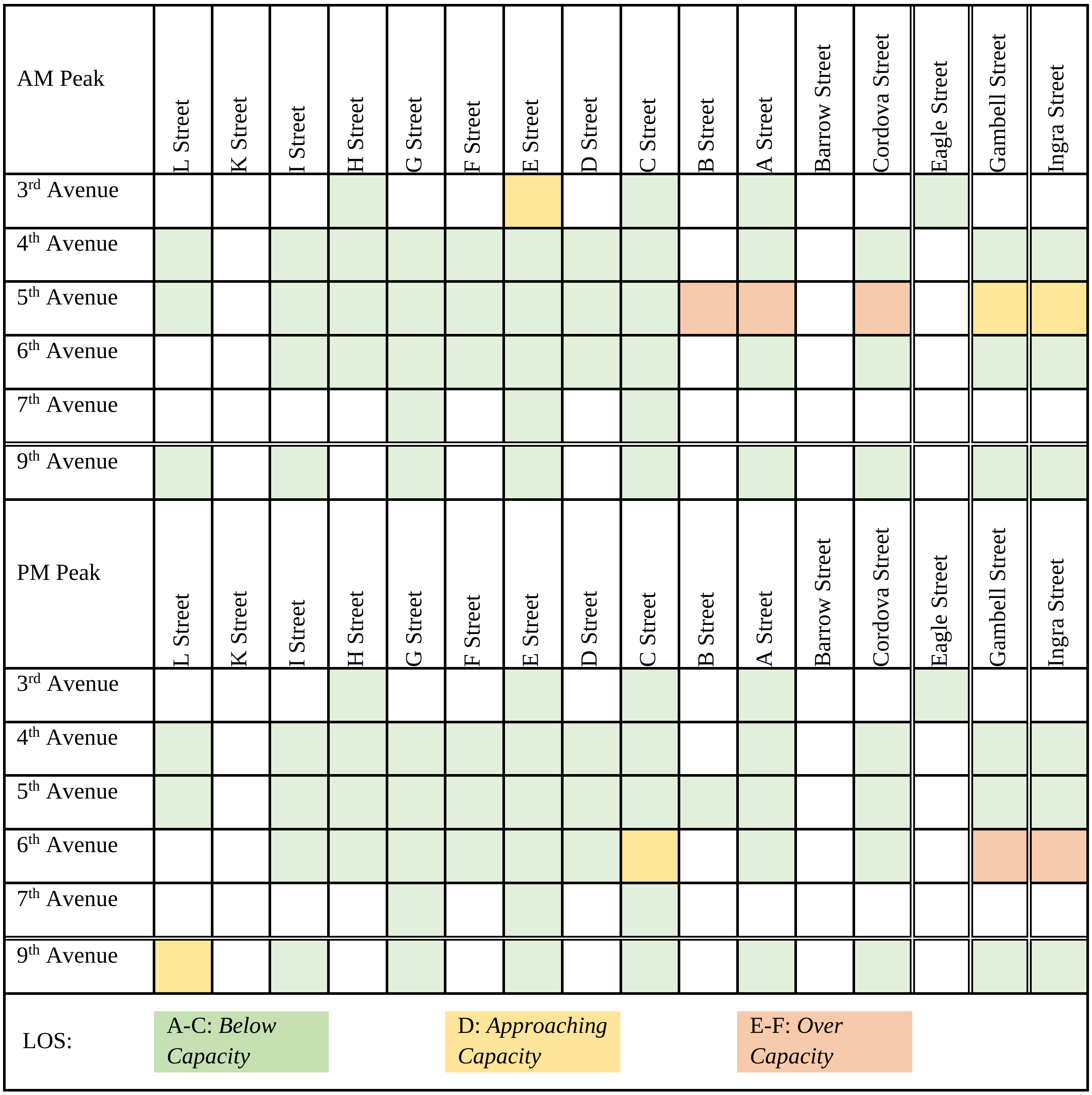

Figure 19: 2050 Level of Service at Signalized Intersections for Lane Reduction between I/L and Ingra/Gambell Couplets

4.4.2.2 Arterial Travel Time

Travel times along downtown arterials with travel lane reductions were compared to no build conditions using Synchro software. Comparisons for lane reductions on the west side of downtown (west of A and C Streets) are shown in Figure 20. Travel times are similar with small increases due to control delay building at some intersections. Traffic volumes east of downtown are not expected to change as a result of these changes in travel time.

Figure 20: 2050 Peak Hour Travel Time Comparison for Lane Reduction between I/L and A/C Couplets

Figure 21 shows changes in travel times when lane reductions are applied the entire width of downtown (west of Ingra and Gambell Streets). The effects of added control delay follow peak commute travel patterns with increased travel time in the westbound direction during the morning peak and in the eastbound direction during the evening peak. Traffic demand models show that east of downtown, traffic volumes are expected to change by less than 1%, indicating the increases in travel time are not great enough to change travel patterns.

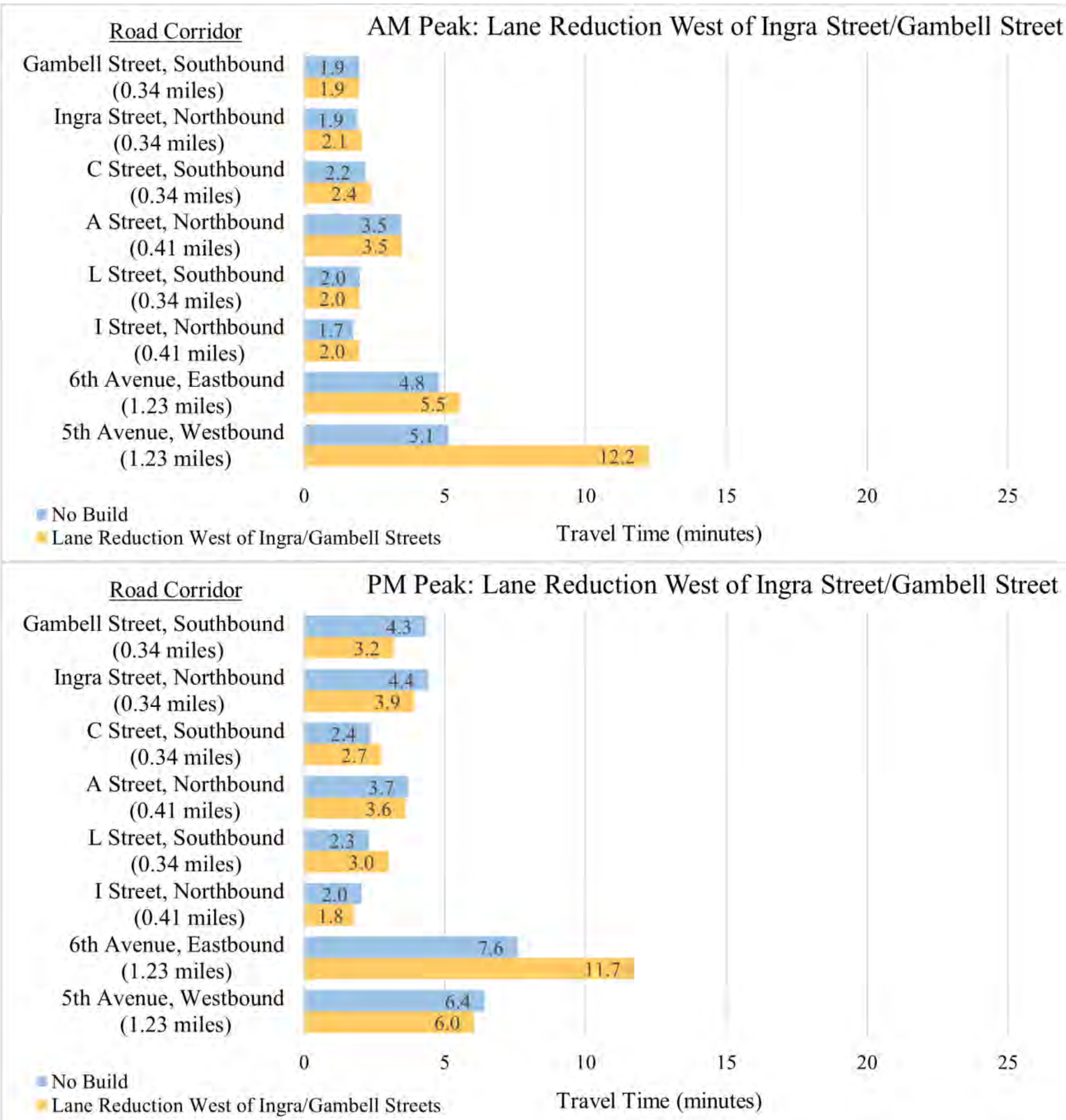

Figure 21: 2050 Peak Hour Travel Time Comparison for Lane Reduction between I/L and Ingra/Gambell Couplets

4.4.2.3 Estimated Costs

Table 5 summarizes estimated costs of converting 5th Avenue and 6th Avenue into two-lane streets. 6th Avenue ROW is narrower than 5th Avenue ROW resulting in lower full reconstruction costs. Converting 5th Avenue and 6th Avenue into two-lane roads will require signal heads to be adjusted to meet standards.

Table 5. Estimated Costs to Convert 5th Avenue and 6th Avenue into Two-Lane Streets

Lane Reduction Conversion	5th Avenue (80-foot ROW)		6th Avenue (60-foot ROW)	
	per Block	per Signal	per Block	per Signal
Low Cost Option Block: Signing and striping without repaving Signal: Adjust existing signal heads	$30,000	$6,000	$30,000	$6,000
Full Reconstruction Cost Option Block: Rebuild full ROW Signal: Install accessible pedestrian signals and lighting compliant with Downtown plans	$1,560,000	$400,000	$1,150,000	$400,000

4.4.3 5th and 6th Avenue Lane Reduction with Conversion to Two-way Streets

Removing a travel lane on 4th, 5th and 6th Avenues and a conversion of 5th Avenue and 6th Avenue to two-way streets provides improved access to downtown destinations and creates a more comfortable environment for multi-modal users. Left turns utilize shared lanes where possible to minimize non-motorized crossing distance at intersections. Friction between turning and parking vehicles is further magnified when compared to the lane reduction in the one-way alternatives. Figure 22 and Figure 23 illustrate full-cost options for this conversion, for 6th Avenue (60-foot ROW width) and 5th Avenue (80-foot ROW width), respectively. Under these options, the street is completely rebuilt. Other opportunities for completely rebuilding the streets are presented in Appendix A: Visualizations of Alternative Right-Of-Way Uses.

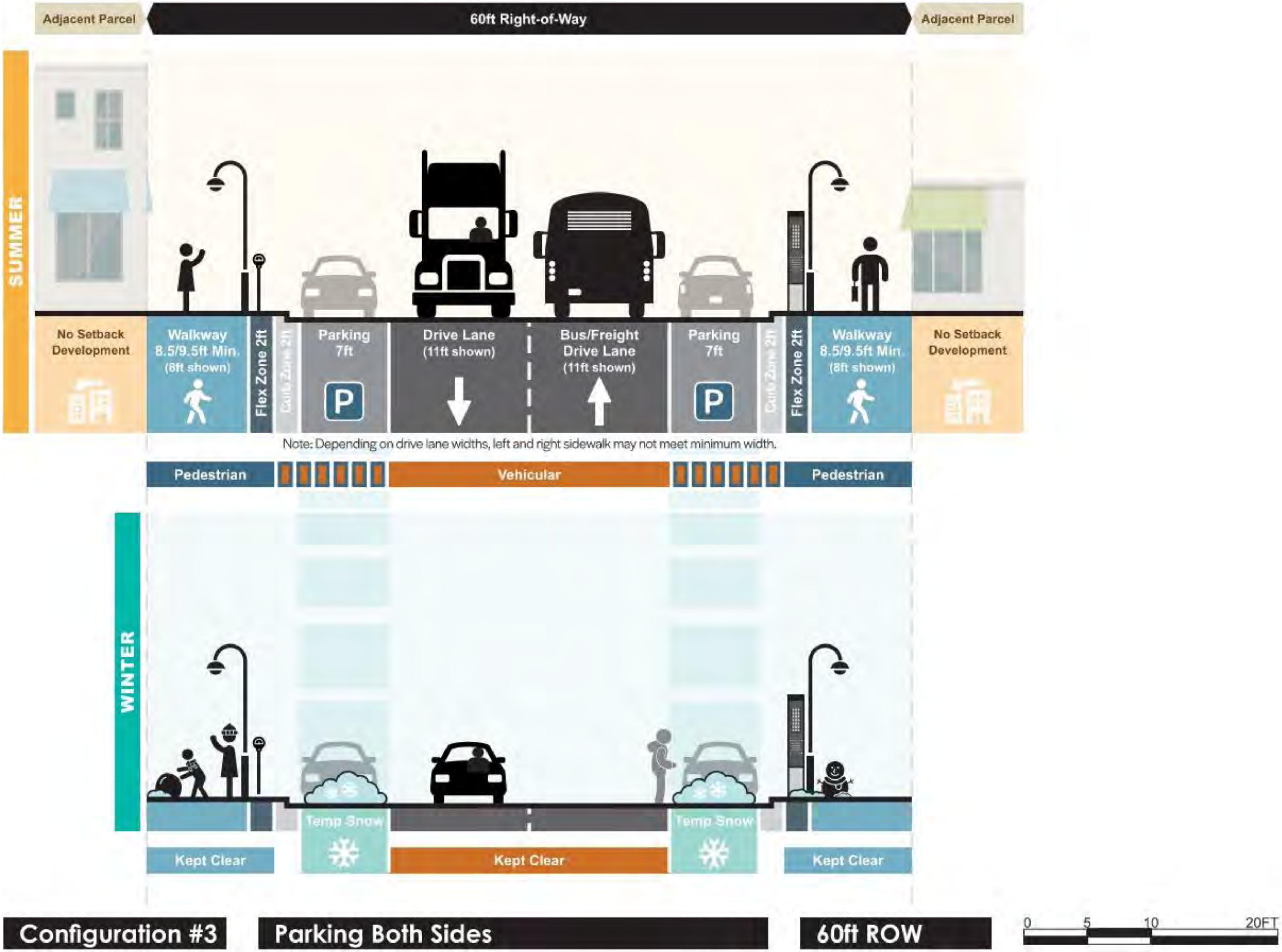

Figure 22: Visualization 3 – Parking on Both Sides with 60-foot ROW

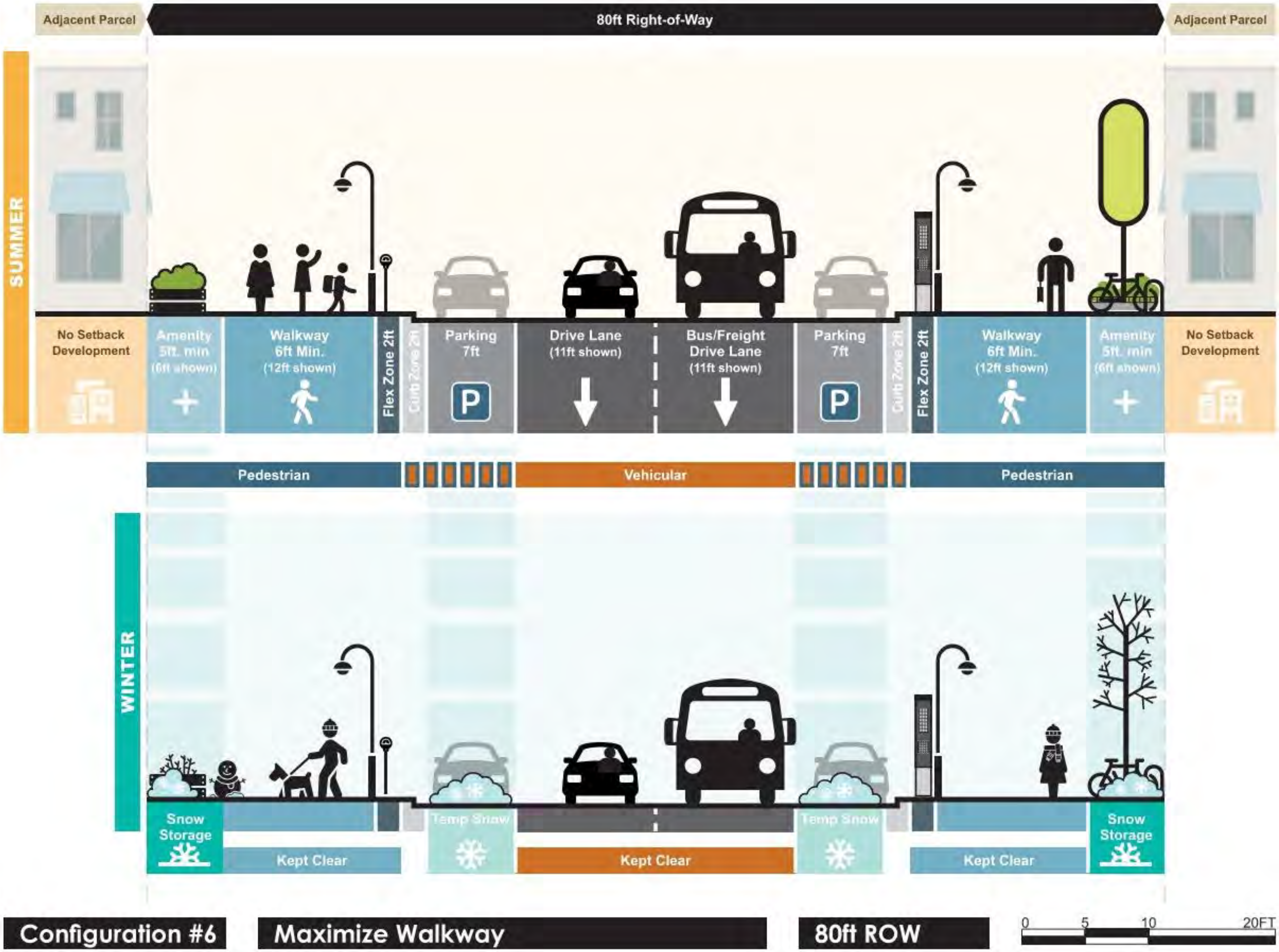

Figure 23: Visualization 6 – Maximize Walkway with 80-foot ROW

4.4.3.1 Intersection Operations

Existing one-way signal timing coordination promotes progression through intersections with minimal delay. The positive effect of this coordination is reduced in existing directions of travel when converting streets to two way and is nearly unachievable in the new travel directions with closely spaced signals. Two-way signal timing used in analysis was optimized in Synchro Optimizer without changing cycle lengths. Additional analysis of the downtown network signal timing with two-way conversions could improve coordination and reduce delay.

A planning level analysis of traffic volumes was conducted to determine how traffic would utilize the new directions of travel on two-way streets. TMVs for the two-way streets were updated using 2050 Travel Demand Model AADTs, existing turning movements, and NCHRP 765 Analytical Travel Forecasting Approaches for Project Level Planning and Design methodology. Volumes for new movements were determined assuming overall east and west volumes on 5th Avenue and 6th Avenue couplet remained consistent with existing patterns.

Peak hour operations at signalized intersections in 2050 are summarized in Figure 24 for two-way conversions west of A and C Streets. Intersection operations do not decrease below LOS D during the morning peak. During the evening peak, only the intersection of 6th Avenue and Ingra Street operates worse than LOS D due to the high number of turning vehicles. Single shared lanes at any intersection create the opportunity for queueing behind turning vehicles that are unable to find a gap in opposing traffic. Northbound queues also build where turning vehicles are blocked by queued vehicles on the converted streets.

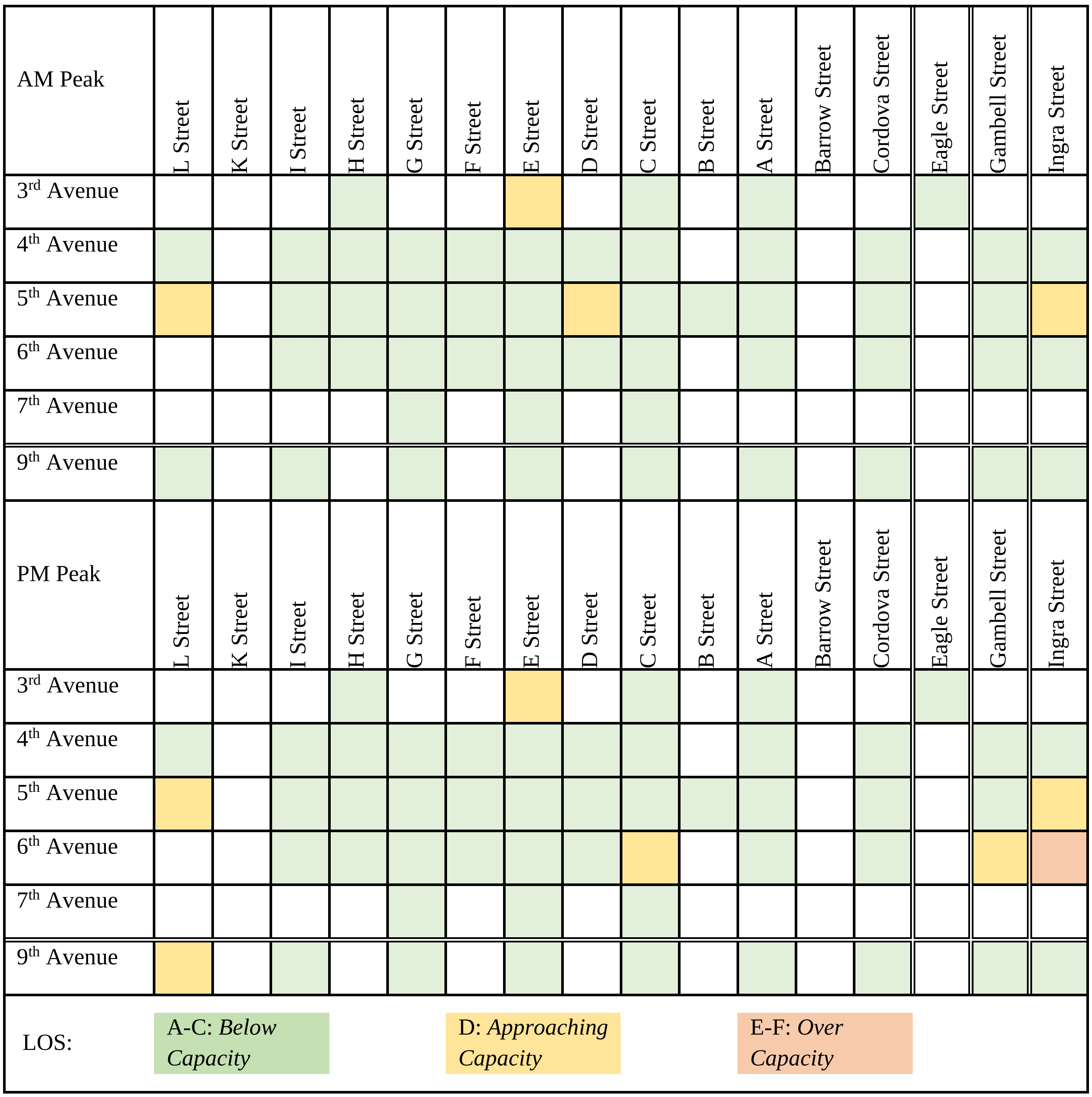

Figure 24: 2050 Level of Service at Signalized Intersections for Two-way Conversion between I/L and A/C Couplets

Figure 25 presents the results for two-way conversions the entire width of downtown. Two-way conversions degrade operations to below LOS D at intersections from C Street to the east. During the morning peak, westbound 5th Avenue volumes exceed the capacity provided by a single lane. During the evening peak, eastbound volumes on 6th Avenue exceed the single-lane capacity. Single-shared lanes create the opportunity for queuing at any converted intersection if turning vehicles are unable to find gaps in opposing traffic. Queuing is likely in both directions any time volumes exceed single-lane capacities and should be expected on northbound arterials when vehicles are blocked from completing turns.

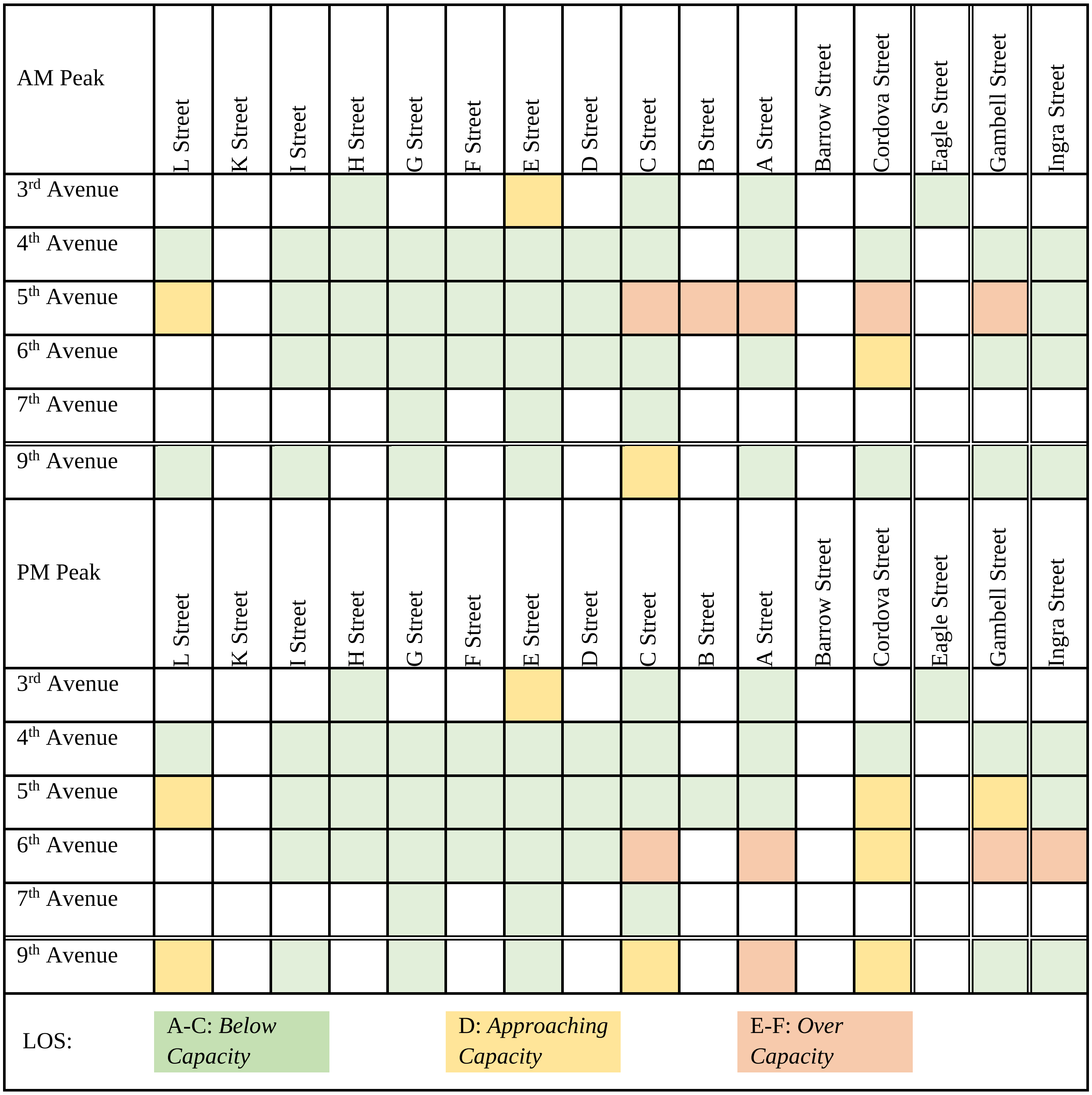

Figure 25: 2050 Level of Service at Signalized Intersections for Two-way Conversion between I/L and Ingra/Gambell Couplets

4.4.3.2 Arterial Travel Time

Travel times along downtown arterials with two-way conversions on 5th and 6th Avenues were compared to no build conditions using Synchro software. Comparisons for existing directions of travel with two-way conversions west of A and C Streets are shown in Figure 26. Morning peak travel time on 5th Avenue doubles as a result of control delay at the converted two-way intersections and remains similar to no build conditions on the other arterials. Evening peak hour travel times are similar to No Build conditions. Traffic volumes on arterials east of downtown are largely unaffected by this two-way conversion. Daily traffic on Glenn Highway east of Ingra and Gambell Streets is forecasted to decrease 1% with only Airport Heights Road projected to increase 1% from No Build projections.

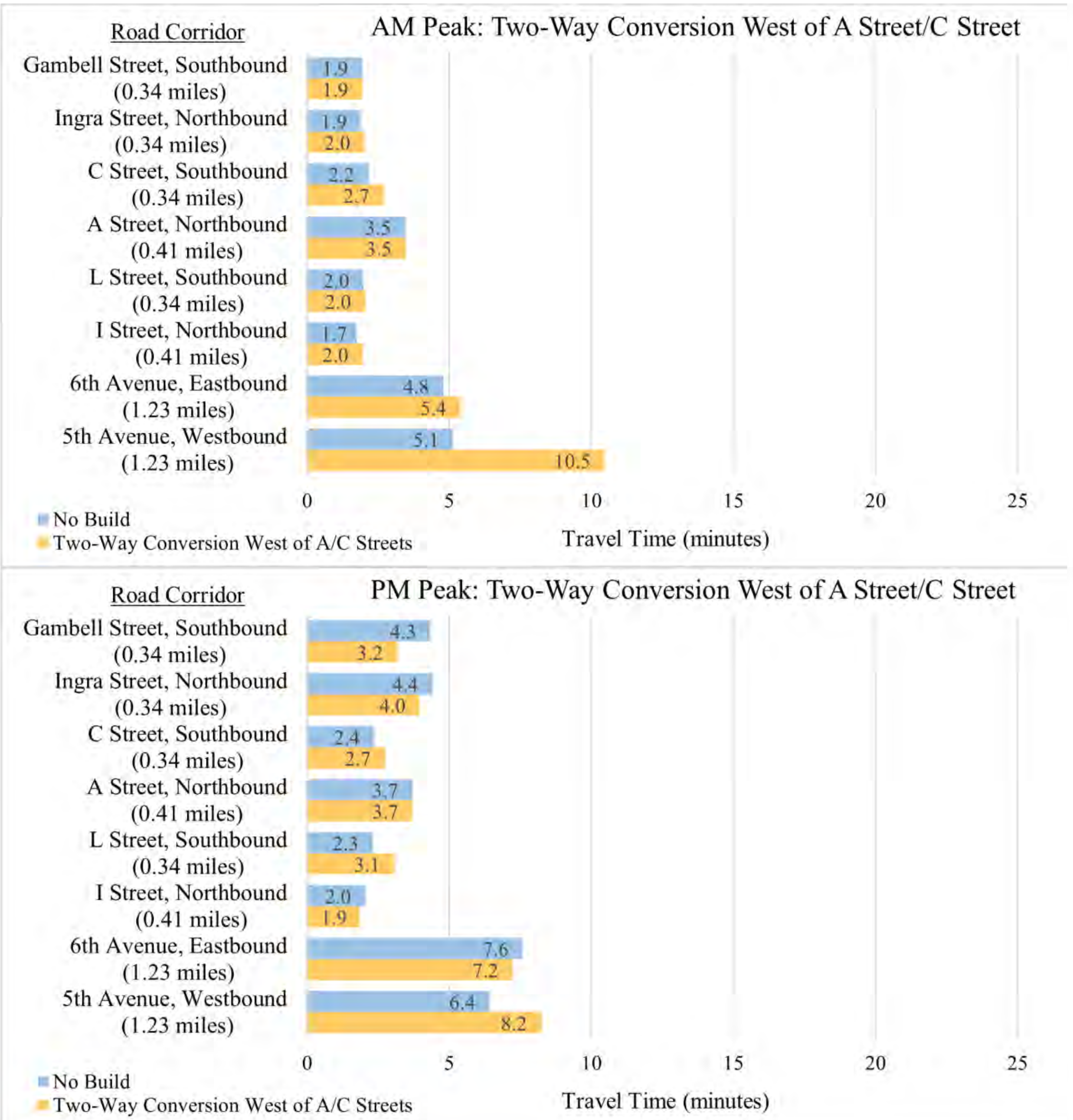

Figure 26: 2050 Peak Hour Travel Time Comparison for Two-way Conversion between I/L and A/C Couplets

Figure 27 compares travel time with two-way conversions the entire width of downtown (west of Ingra and Gambell Streets) to No Build conditions. Travel times on 5th and 6th Avenues increase significantly during peak hours. Travel times on other arterials are similar to No Build conditions. Volumes exceeding single-lane capacities cause progression through coordinated signals to break down, greatly increasing control delay at intersections. As a result, daily traffic volumes change by up to 5% on arterials east of downtown.

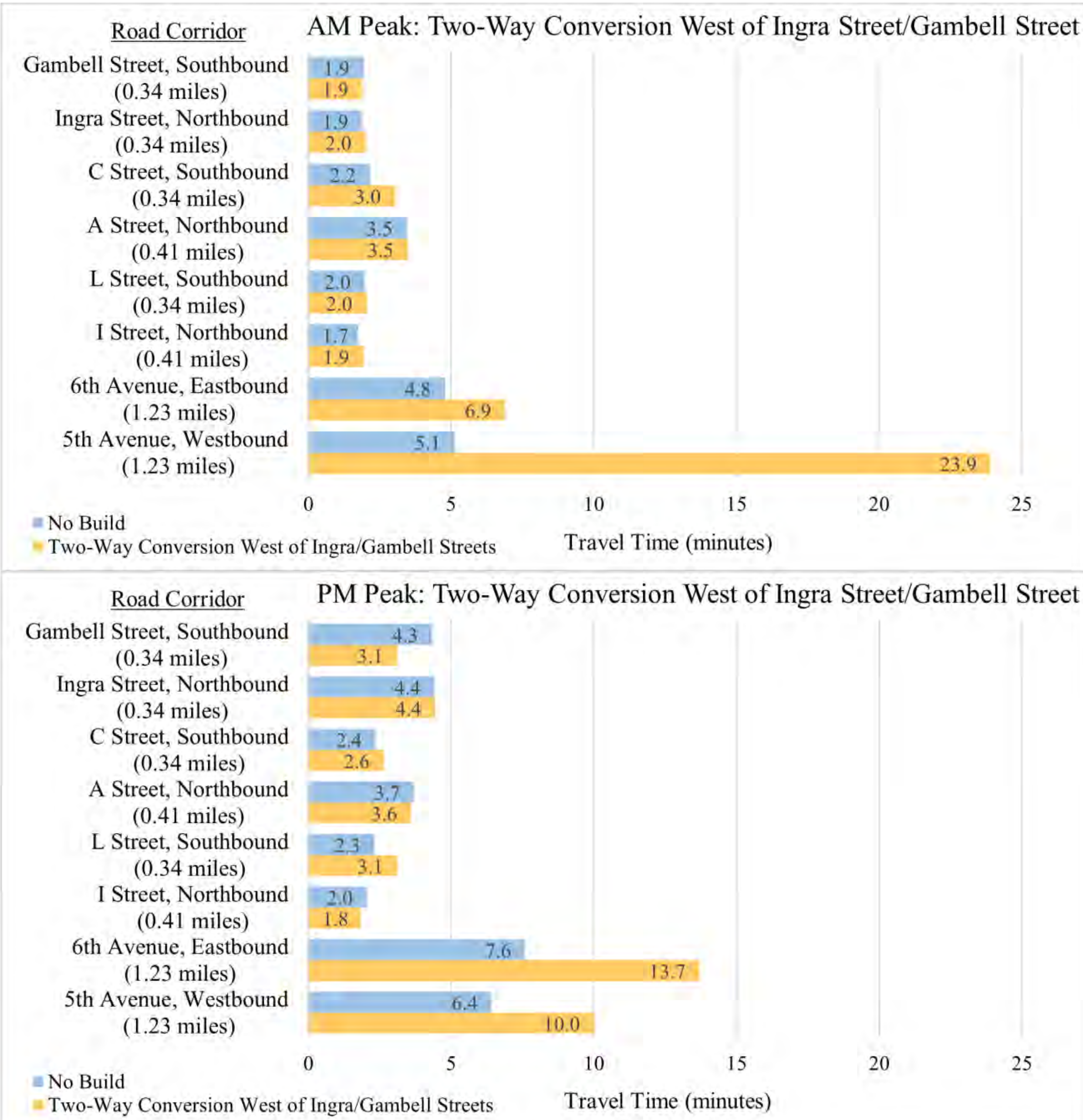

Figure 27: 2050 Peak Hour Travel Time Comparison for Two-way Conversion between I/L and Ingra/Gambell Couplets

4.4.3.3 Estimated Costs

Table 6 summarizes estimated costs for converting 5th Avenue and 6th Avenue into two-lane two-way streets. Final design elements will influence the final amount.

Table 6. Estimated Costs to Convert 5th Avenue and 6th Avenue into Two-Way Streets

Two-Way Street Conversion (includes lane reduction)	5th Avenue (80-foot ROW)		6th Avenue (60-foot ROW)	
	per Block	per Signal	per Block	per Signal
Low Cost Block: Signing and striping without repaving Signal: Add signal arms and adjust signal heads	\$50,000	\$85,000	\$50,000	\$85,000
Full Reconstruction Cost Block: Rebuild full ROW Signal: Install accessible pedestrian signals and lighting compliant with Downtown plans	\$1,580,000	\$400,000	\$1,170,000	\$400,000

4.4.4 Summary

Reducing travel lanes on 4th, 5th, and 6th Avenues provides benefits to non-motorized users and project stakeholders with minimal impact to motorists. Two-way conversions with lane reductions need additional consideration to signal timing to be feasible. Smaller intersections with shared turn lanes improve non-motorist comfort and network continuity but without improved progression through coordinated signals, motorists experience excessive delay and queueing.

Because reducing vehicle speeds is a primary focus for the changes to 5th and 6th Avenues, the recommendation of this report is to begin by reducing the travel lanes and implementing traffic calming and speed reduction strategies. This low-cost alternative would be the quickest way to achieve the desired outcomes.

A summary of impacts on user groups and operations for the 5th Avenue and 6th Avenue lane reduction treatments is presented in Table 7 and the two-way conversion in Table 8.

Table 7: Summary of Impacts: 5th Avenue and 6th Avenue Lane Reduction (Three to Two Lanes)

	West of A Street/C Street	**West of Ingra Street/Gambell Street**
Cost	Low- and high-cost options	Low- and high-cost options
Bicyclists	Improved connectivity if bike lanes are installed	Improved connectivity if bike lanes are installed
Pedestrians	Shorter crossing distances improve safety and comfort	Shorter crossing distances improve safety and comfort
Vehicles	Minimal impacts	Moderate impacts
Freight	Minimal impacts with compatible intersection design	Moderate impacts with compatible intersection design
Transit	Minimal impacts	Moderate impacts
Snow Storage	Depends on ROW configuration	Depends on ROW configuration

Table 8: Summary of Impacts: 5th Avenue and 6th Avenue Conversion to Two-Way

	West of A Street/C Street	**West of Ingra Street/Gambell Street**
Cost	Low- and high-cost options	Low- and high-cost options
Bicyclists	Improved connectivity if bike lanes are installed	Improved connectivity if bike lanes are installed
Pedestrians	Shorter crossing distances improve safety and comfort	Shorter crossing distances improve safety and comfort
Vehicles	Minimal impacts	Major Impacts
Freight	Impacted by intersection configurations	Major Impacts, plus impacted by intersection configurations
Transit	Minimal impacts	Major impacts
Snow Storage	Depends on ROW configuration	Depends on ROW configuration

4.5 Rebuild 6th Avenue and E Street Intersection

The Downtown Core Streets Streetscape Master Plan identified reconstructing 6th Avenue between E Street and D Street as a safety need. The JC Penney parking garage entrance on the southeast corner of the intersection is cited as an unsafe pedestrian crossing. Our Downtown Plan shows there is still public support for improvements to the area to increase safety and user experience. Possible improvements include bulb-outs and a raised intersection at 6th Avenue and E Street. A summary of impacts on user groups and operations for the treatment rebuilding the 6th Avenue and E Street intersection is presented in Table 9.

Table 9: Summary of Impacts: Rebuild 6th Avenue and E Street Intersection

Cost	*Design-level cost*
Bicyclists	No change
Pedestrians	Safer and more direct crossings
Vehicles	No change
Freight	Raised intersection may impact
Transit	Raised intersection may impact
Snow Storage	No change

4.6 Rebuild G Street between 3rd Avenue and 5th Avenue

In the Our Downtown Plan, G Street between 3rd Avenue and 5th Avenue, or G Street Art Central, is described as a unique district with an eclectic mix of art galleries and showrooms that attracts pedestrian activity. The plan promotes reducing G Street from southbound two lanes to one lane to allow more space for pedestrian and bicycle activity, enable more parking stalls, and calm traffic. Our Downtown Plan presents one possible option for reconfiguring the right of way; however, multiple stakeholders have suggested other potential concepts. Figure 28 presents an example of a pedestrian-focused street, where vehicles only use the street for deliveries.

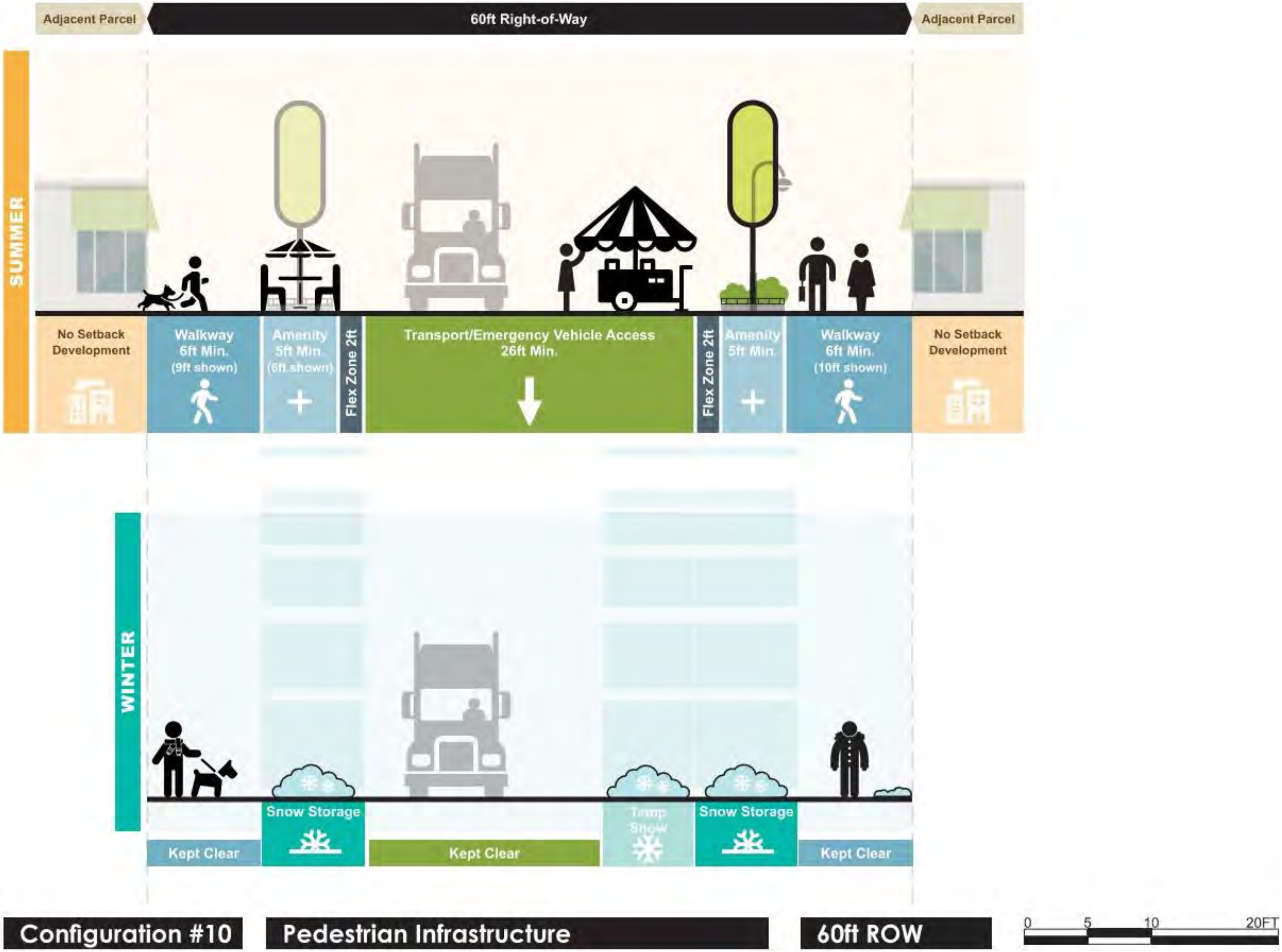

Figure 28: Visualization 10 – Pedestrian Street

In terms of accommodating traffic volumes, reducing G Street to one lane between 3rd and 5th Avenues is expected to have minimal impacts. G Street is currently identified by Bike Anchorage as a bicycle-friendly street; however, the LTS analysis designates G Street as LTS 3.

The reconstruction project should further identify opportunities and constraints for this corridor in selecting a preferred alternative to design. Note that reducing lanes on G Street may create a lane shift at 5th Avenue and G Street which may require signal heads to be adjusted. Three versions of high-level (planning) cost estimates were developed for reconfiguring G Street between 3rd Avenue and 5th Avenue and are presented in Table 10.

Table 10: Estimated Costs to Rebuild G Street Between 3rd Avenue and 5th Avenue

Rebuild G Street	3rd Ave to 5th Ave
Quick Build Cost Blocks: Signing, striping, and flex-posts or similar (for curb bulbouts) without repaving Signals: Signal head adjustments at 5th Ave	$90,000
Half-Width Construction Cost Blocks: Rebuild west half of ROW with new curb/streetscape to accommodate parking Signals: Signal head adjustments at 5th Ave	$650,000
Full Reconstruction Cost Blocks: Rebuild full ROW with curb bulbouts and street trees (similar to 4th Ave corridor) Signals: Install accessible pedestrian signals and lighting compliant with Downtown plans	$1,200,000

Note that the intersection of 4th Avenue and G Street is being modified as part of the 4th Avenue Signal and Lighting Upgrade project. Changes to the roadway include new curb bulbouts that are designed for the one-way traffic on G Street. A summary of impacts on user groups and operations for the treatment rebuilding G Street from 3rd Avenue to 5th Avenue is presented in Table 11.

Table 11: Summary of Impacts: Rebuild G Street Between 3rd Avenue and 5th Avenue

Cost	Low-, mid- and high-cost options
Bicyclists	No change
Pedestrians	More comfortable walking along G Street, shorter crossing distances
Vehicles	Minimal impacts
Freight	Minimal impacts
Transit	No change
Snow Storage	Depends on ROW configuration

4.7 E Street Corridor Enhancements

Our Downtown Plan supports making E Street more pedestrian-friendly with the potential to convert to two-way. The existing E Street corridor is a northbound one-way, two-lane road between 3rd Avenue and 9th Avenue. Pedestrian-friendly improvements are already present at many intersections. Parking is provided on both sides of the road along most of the corridor. Between 5th Avenue and 6th Avenue, E Street is built resembling a transit mall with reduced parking, wider sidewalks, rolled curbs, and a textured surface. Bulbouts are provided at intersections to limit pedestrian exposure while crossing. Existing bicycle infrastructure is limited to a bike lane south of 9th Avenue. The Built Environment Research Report (KE, 2024) identifies E Street as a top quarter pedestrian safety concern and a bike-friendly street with a high-priority need for bicycle facilities.

The Chinook Parking Lot on 3rd Avenue between C Street and E Street was selected as the site for the relocated Downtown Transit Center (Transit Center Study-Final Recommendations, October 2025). Converting E Street, currently a one-way road between 3rd Avenue and 9th Avenue, to two ways would allow for improved People Mover route connections to the new transit center and improve non-motorist access to the facility. Cyclists riding in the roadway would no longer need to travel to C Street or G Street to head southbound.

Figure 29 presents a visualization of a possible E Street configuration that could support planned transit improvements and the Our Downtown Plan goals to improve the corridor for non-motorized users.

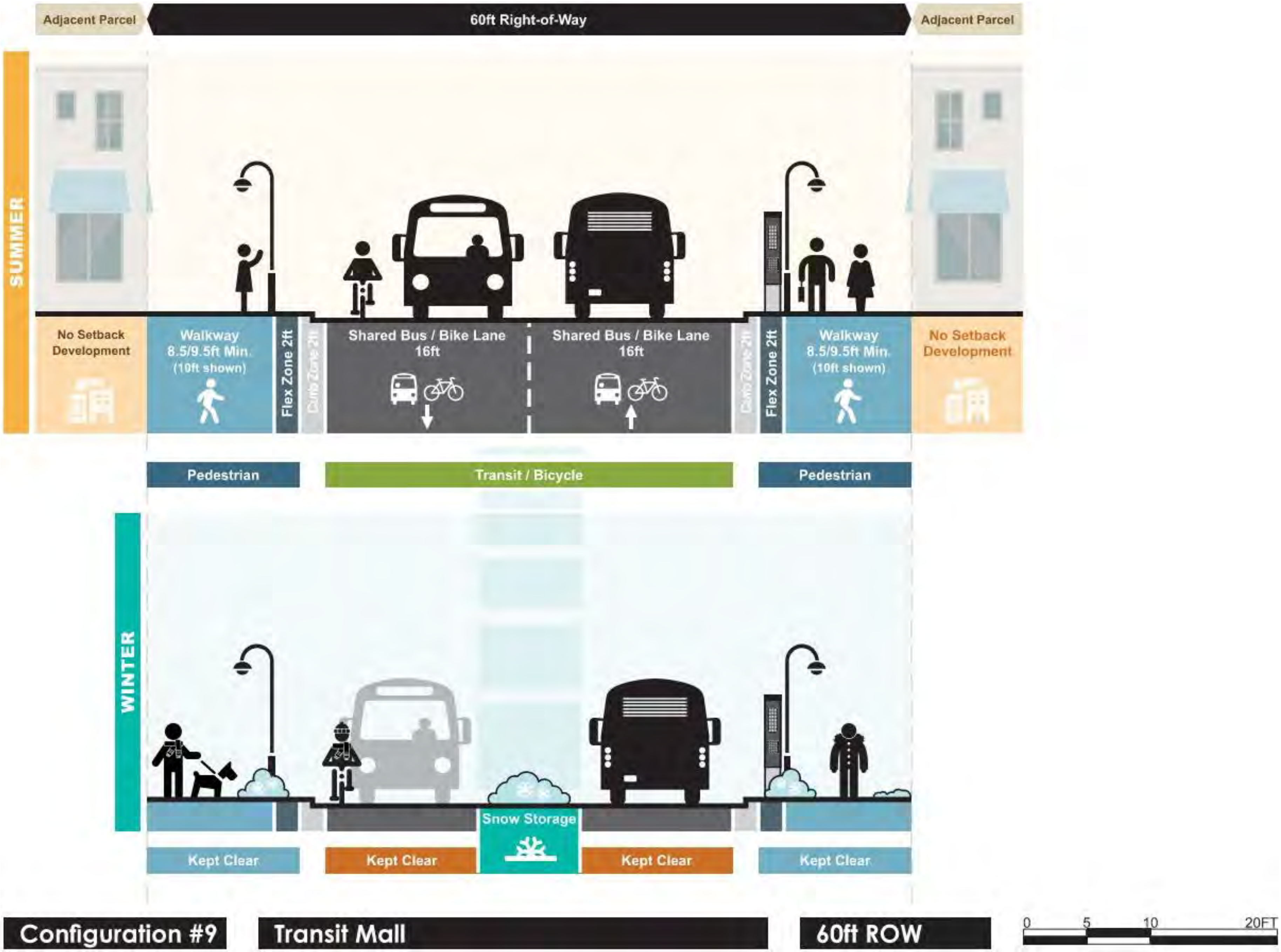

Figure 29: Visualization 9 -- Transit Mall with 60-foot ROW

Traffic volumes for the two-way conversion and increased transit volumes (to serve the new transit center location) were estimated by balancing north-south volumes and adding transit vehicles per the routes shown in the Transit Center Study. Intersection operations with transit buses operating on the two-way corridor are shown in Figure 30. Two-way E Street intersections operate similar to No Build conditions; better than LOS D during peak periods.

AM Peak	E Street	PM Peak	E Street
3rd Avenue	A-C	3rd Avenue	A-C
4th Avenue	A-C	4th Avenue	A-C
5th Avenue	A-C	5th Avenue	A-C
6th Avenue	A-C	6th Avenue	A-C
7th Avenue	A-C	7th Avenue	A-C
9th Avenue	A-C	9th Avenue	A-C

LOS: A-C: *Below Capacity* | D: *Approaching Capacity* | E-F: *Over Capacity*

Figure 30: 2050 Two-Way E Street Level of Service at Signalized Intersections

Because E Street is currently two lanes, the two-way conversion could be completed with just striping changes and additional signal heads to minimize costs. Significant additional costs would be incurred if curb-to-curb widths are adjusted. High-level planning cost estimates were developed for this conversion and are presented in Table 12.

Table 12: Estimated Cost to Rebuild E Street Between 3rd Avenue and 9th Avenue

Rebuild E Street	3rd Ave to 9th Ave
<u>Quick Build Cost</u> Blocks: Signing and striping without repaving Signals: Install accessible pedestrian signals	$650,000
<u>Full Reconstruction Cost</u> Blocks: Rebuild full ROW Signals: Install accessible pedestrian signals and lighting compliant with Downtown plans	$6,300,000

The 6th Avenue and E Street treatment introduced in Section 4.5 would be included with the full E Street corridor reconstruction option. With bike-friendly ROW configurations, this option would also provide improvements in LTS along the full length of the corridor, creating a much needed low-stress north-south connection through downtown for cyclists.

A summary of impacts on user groups and operations for the treatment converting the E Street corridor to two-way traffic is presented in Table 13.

Table 13: Summary of Impacts: E Street Corridor Two-Way Conversion

Cost	Low- and high-cost options
Bicyclists	Provides new lower LTS north-south connection in downtown
Pedestrians	Improves non-motorist access to transit center
Vehicles	Minimal benefits
Freight	No change
Transit	Improves connectivity for transit vehicles
Snow Storage	Depends on ROW configuration

4.8 Amenities

Our Downtown Plan suggests bicycle racks, seating, lighting, trash receptacles, and street trees are needed downtown. This section provides guidance on the design and installation of street furniture as part of any of these projects.

The MOA’s Title 21 Land Use Code provides the following guidance when installing furnishings such as bicycle racks, seating, and trash receptacles in the right of way:

- Furnishings should be installed in curb bulbouts or the “furniture zone.”
- At least one foot of clearance should be maintained behind the back of curb.
- The furniture zone extends to four feet behind the curb.
- Eight feet of unobstructed sidewalk space is required. Sidewalk space may be narrowed to five feet for temporary features with a waiver.

4.8.1 Bicycle Racks

Bicycle parking downtown is not always obvious or convenient. Bike Anchorage developed a user-driven database of bicycle parking locations in the Municipality; Figure 31 presents these locations in the study area. Additional information such as type of bike rack and whether the location is covered is also included in the database.

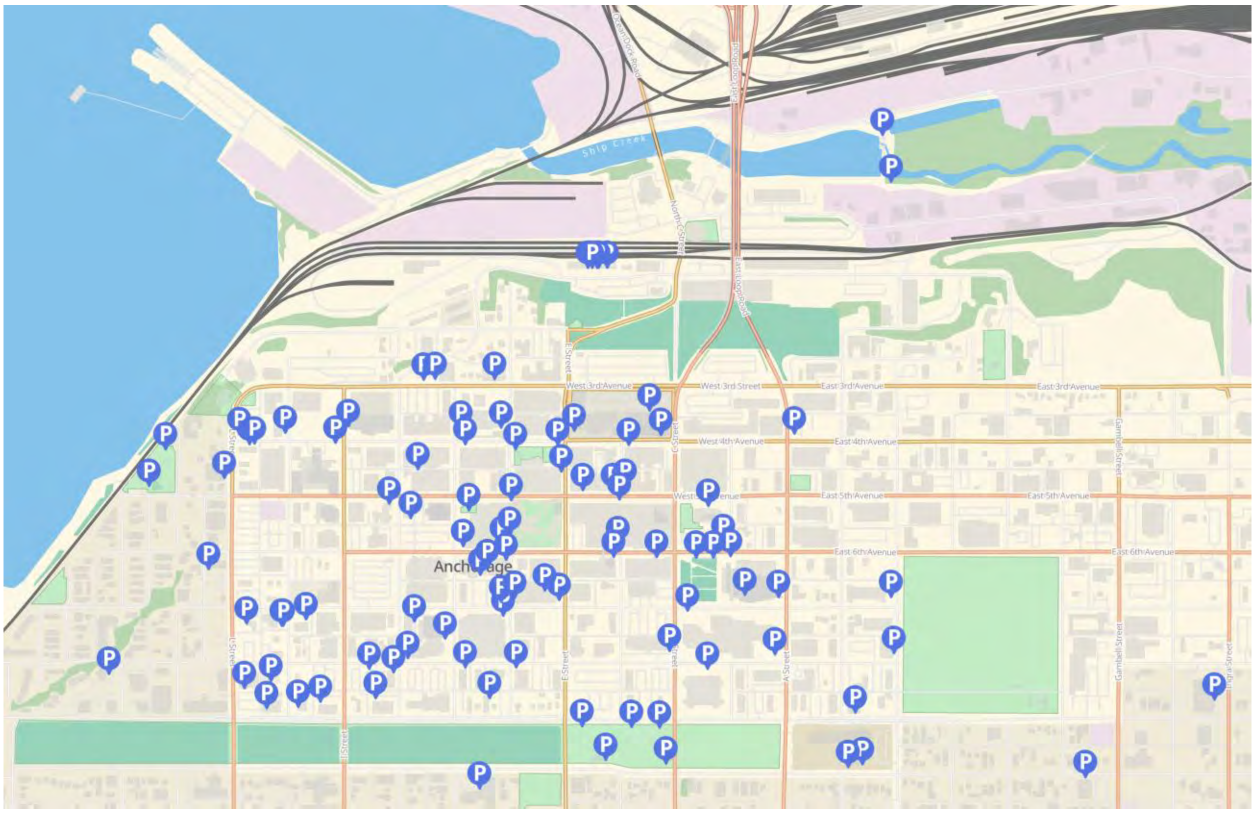

Figure 31. Bike Parking Locations (Source: Bike Anchorage)

Bicycle rack standards are published in MOA's Title 21 Land Use Code. Standards include required bicycle rack features, installation location, and the minimum number of bicycle racks to be installed per land use type. A minimum of two bicycle parking spaces must be provided for each principal usage, with specific requirements based on the type of use.

Bicycle racks must be securely anchored, tamper-resistant, and support the bicycle frame and one wheel to be locked with a standard U-type lock. Horizontal racks must support the bicycle at two or more points. The required dimensions for a bicycle parking space are six feet long and two feet wide. There are specific dimensions for vertical and stacked bike racks. Standards ensure the practical usability of these spaces. There must be a minimum of five feet of clear space behind each parking space to allow for maneuvering, and a clearance of two feet six inches from walls and other obstructions, except for horizontal racks attached to walls, which require at least one-foot clearance. Furthermore, all bicycle parking areas must be illuminated, hardsurfaced, and kept clear of obstructions, mud, and snow to maintain accessibility and usability throughout the year.

Re-allocating in-street parking to in-street bike parking may be one strategy to increase bicycle parking. Snow removal should be considered when determining the shape and placement of a bike parking area in the public right of way.

4.8.2 Seating

The U.S Access Board provides standards that benches must meet to comply with the Americans with Disabilities Act (ADA) guidelines. A single bench should have the right height, back support, and at least one armrest. When there are multiple benches, at least half should meet these ADA standards, and half of those should have an armrest. Offering different bench styles can meet various user needs. For easy maintenance, it's best to mount benches on a concrete pad or have paving around and under them, including a paved area in front of the bench.

Benches must be at least 43 inches long and 20-24 inches wide, with seats positioned 17-19 inches above ground level to ensure accessibility (ADAAG §903). Design considerations include preventing water accumulation and avoiding materials that retain heat in hot climates.

4.8.3 Lighting

The DCM outlines the standards and practices for pedestrian scale lighting, emphasizing the need for well-illuminated pedestrian pathways to ensure safety and visibility. Consistent and adequate illumination for pedestrian pathways running parallel to roadways enhances pedestrian visibility and reduces conflicts with vehicular traffic. The 2018 Downtown Lighting and Signals Upgrade Reconnaissance Study prioritizes lighting and signal upgrades for downtown street corridors based on the number of poor and fair infrastructure elements on a block.

Luminaires that provide white light, such as metal halide, induction, and enhanced color high-pressure sodium lamps, all with a CRI of 65 or greater, are required. LEDs also offer a reliable source of white light, which enhances perception-reaction time, peripheral vision, and object identification. For pedestrian facilities adjacent to roadways, maintained illuminance values must meet specific standards, with a minimum average horizontal illuminance of 20.0 lux and a vertical illuminance of 10.0 lux. Uniformity in lighting is essential, and the average-to-minimum ratio should not exceed the recommended values. The optimal placement for lighting poles is 3 feet behind the edge of pedestrian facilities to ease winter maintenance and reduce the risk of vehicle collisions. Intersection illumination is critical due to the high number of pedestrian and vehicular conflict points. Lights should be placed on the far right of intersections to silhouette pedestrians, improving visibility. Proper spacing and positioning of lighting are essential to ensure effective lighting and pedestrian safety.

4.8.4 Trash Receptacles

Supplying and maintaining trash receptacles in public areas can create a healthier and more pleasant environment.

The Anchorage Downtown Partnership is responsible for trash pick-up and disposal within the public right of way within the Downtown Improvement District. Other than the information found in Title 21, there is little MOA guidance about desirable features or placement of trash receptacles.

San Francisco Better Streets provides recommendations for general trash receptacle placement within high pedestrian activity areas, such as civic centers, commercial areas, and transit stops. That publication recommends trash receptacles at the corners of intersections and placed at a maximum of one every 200 feet in commercial areas. The publication recommends seeking private sponsorship if more trash receptacles are required.

4.8.5 Street Trees

Streets within and adjacent to street rights-of-way contribute greatly to aesthetics, pedestrian enjoyment and comfort, and environmental benefits. Street trees should be provided only when they are considered a long-term investment in green infrastructure, and with the conditions they need for longevity and health. These conditions include access to significant amounts of planting soil for tree health, soil extents that allow significant horizontal root growth for structural benefit, protection from physical and chemical damage, and a long-term maintenance commitment. These spatial and protection requirements make tree placement appropriate only within wider sidewalks, due to the other spatial needs for free pedestrian movement adjacent to the tree infrastructure. Opportunities to add tree infrastructure are still present on narrower sidewalks if vehicle parking is reduced, which also supports installation of other amenities described above. If the criteria for tree installation are not met, emphasis should be placed on other methods to shape aesthetics, pedestrian comfort, and environmental benefits.

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Appendix A Visualizations of Alternative Right-Of-Way Uses

Appendix B Built Environment Research Report

Appendix C Turning Movements and Traffic Volumes

Turning movement volumes (TMV) during the AM and PM peaks were used to analyze intersection operations. TMVs were estimated using turning movement counts (TMC), average annual daily traffic (AADT), and the iterative directional method outlined in NCHRP 765 Analytical Travel Forecasting Approaches for Project-Level Planning and Design.

TMCs at signalized intersections and all-way stop-controlled intersections were provided by the Municipality of Anchorage (MOA). TMCs were collected between July 2013 and August 2022, and were collected by manually counting or with pneumatic tubes. Table C-1 summarizes the collection dates and collection methods for the TMCs.

Table C-1. Summary of Turning Movement Counts and Collection Technique

	L Street	K Street	I Street	H Street	G Street	F Street	E Street	D Street	C Street	B Street	A Street	Barrow Street	Cordova Street	Eagle Street	Gambell Street	Ingra Street
3rd Avenue				9/18			8/20		3/22		4/21			8/22		
4th Avenue	3/18		8/20	5/21	6/16	10/18	8/22	8/20	8/22		3/22		5/22		10/18	9/21
5th Avenue	8/22		6/16	5/21	5/21		6/16	6/22	6/16	5/21	7/18		8/18		7/13	6/16
6th Avenue			3/22	5/22	8/18	5/21	6/22	5/21	7/18		6/16		5/22		7/18	5/17
7th Avenue		6/19		6/19	9/18	6/18	8/18	5/19	10/18			6/22				
8th Avenue		8/19		7/21		2/21		8/19				6/19				
9th Avenue	3/22		3/22		8/20		5/21		6/22		6/14		6/22		6/14	5/16

Manual Pneumatic Induction

Traffic volumes and TMCs change with time and are affected by season, with volumes typically increasing during the summer months. AADTs collected by DOT&PF in 2019 were used to estimate existing conditions. While 2022 AADTs are the most recent data available, volumes in 2022 have generally not returned to 2019 volumes. Figure C-1 shows AADTS for several downtown routes between 2014 and 2022.

Traffic volumes are not available on every street segment within the study area. Where AADTs were not collected, they were estimated. At intersections of two one-way streets, AADTs were estimated comparing vehicle trips into the intersection and vehicle trips out of the intersection; on local roads, AADTs were estimated using interpolation; at other locations, AADTs were estimated by applying hourly and monthly factors to TMCs. Design year AADTs were then forecasted by applying growth factors calculated by comparing the 2019 base model and the 2050 future travel demand model.

Applying the iterative directional method to the collected TMCs and estimated AADTs, existing TMCs were estimated. The iterative direction method produces planning level TMVs suitable for intersection analysis, intersection design, and traffic signal timing. TMVs between intersections were adjusted proportionally where determined appropriate to do so.

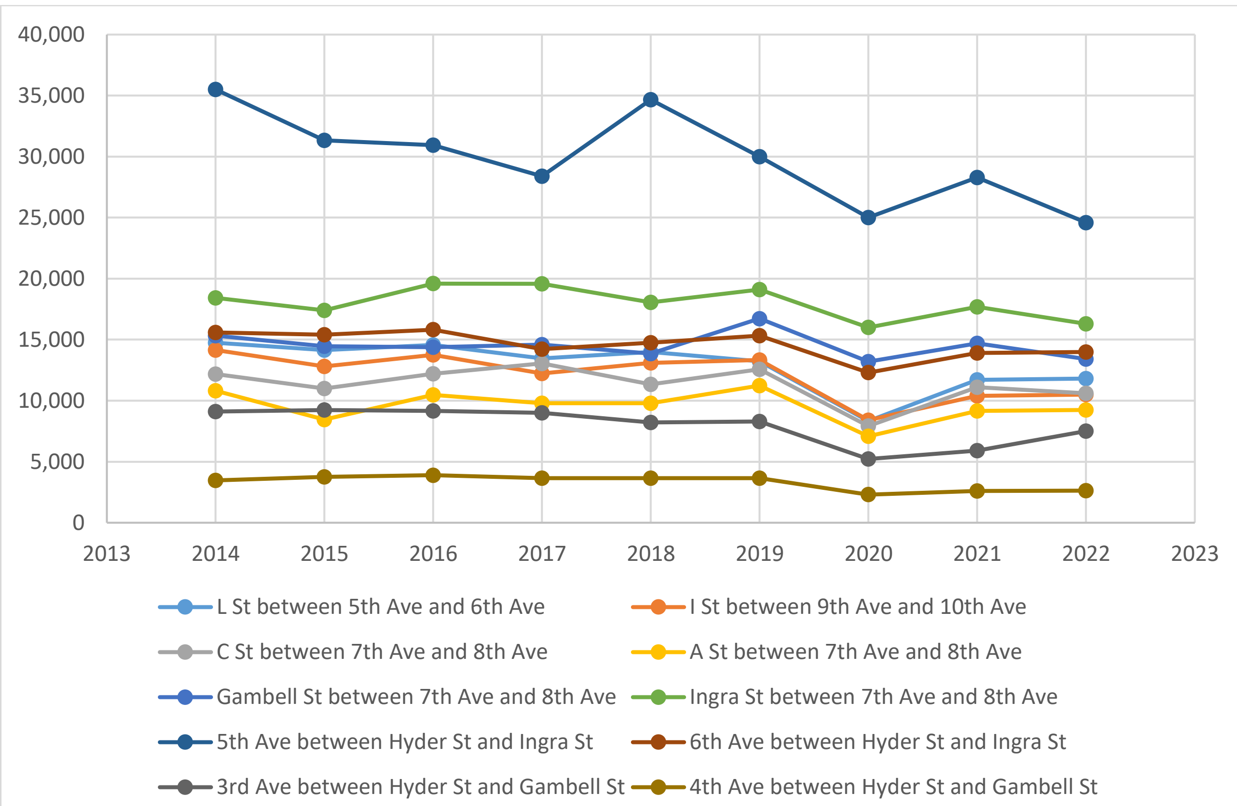


Figure C-1: Summary of Traffic Volumes on Couplet Roads in Downtown Anchorage

Freight vehicles and buses are a feature of Anchorage's fleet. Vehicle classification data is not available at most DOT&PF data collection points in downtown Anchorage; the classification percentage of 6% heavy vehicles used for this study come from the continuous count stations on A Street and on Minnesota Drive.

The following figures present TMVs used in this study.

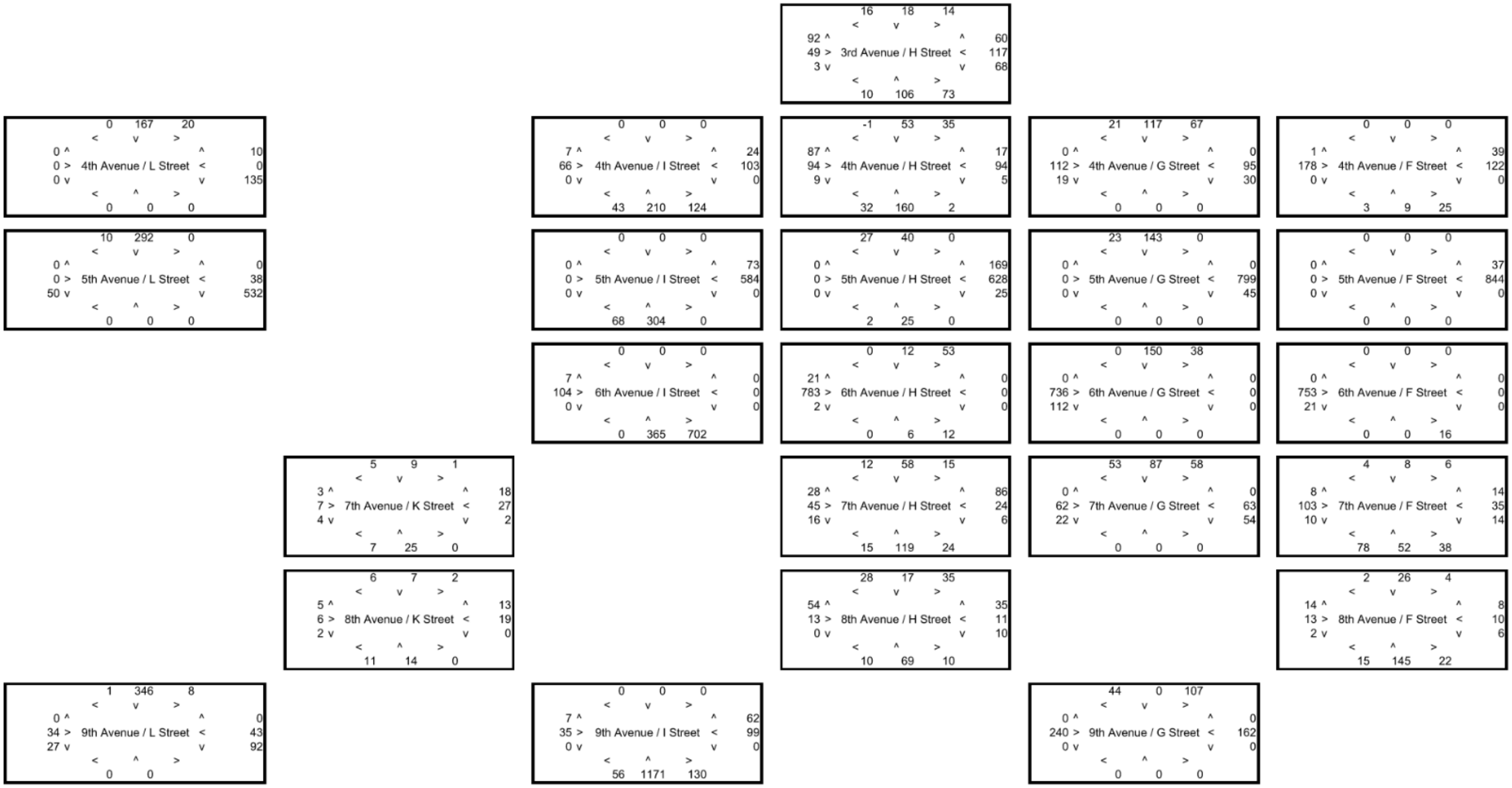


Figure C-2: Existing AM TMVs L Street Through F Street

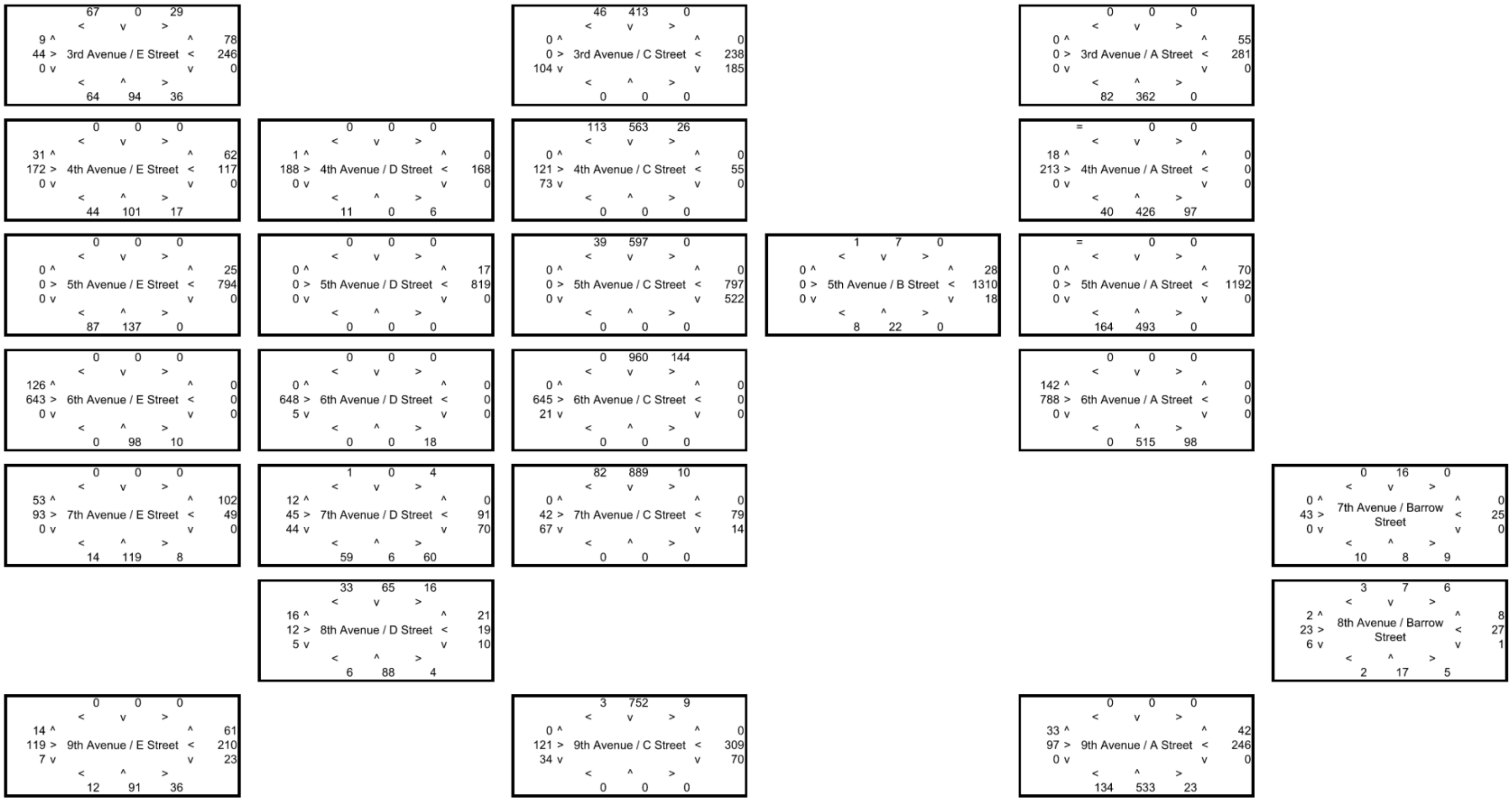


Figure C-3: Existing AM TMVs E Street Through Barrow Street

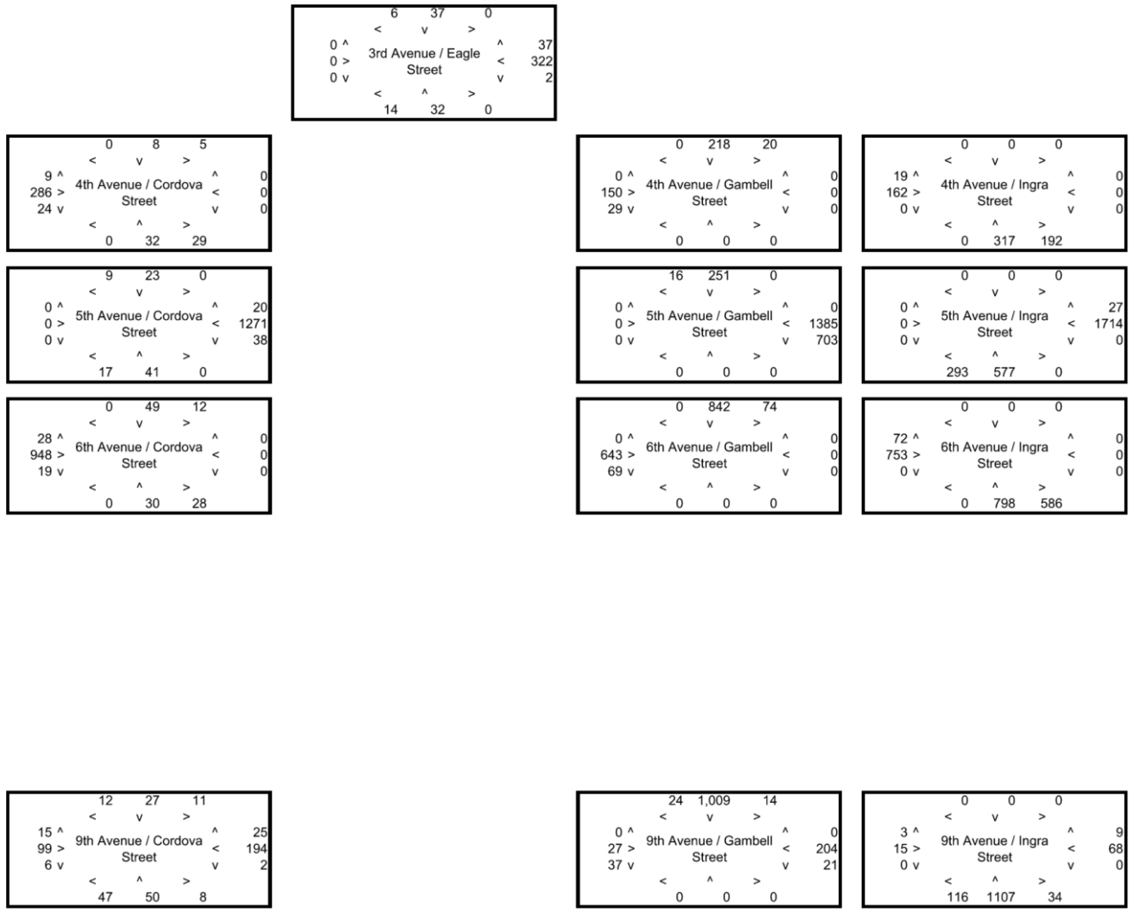


Figure C-4: Existing AM TMVs Cordova Street Through Ingra Street

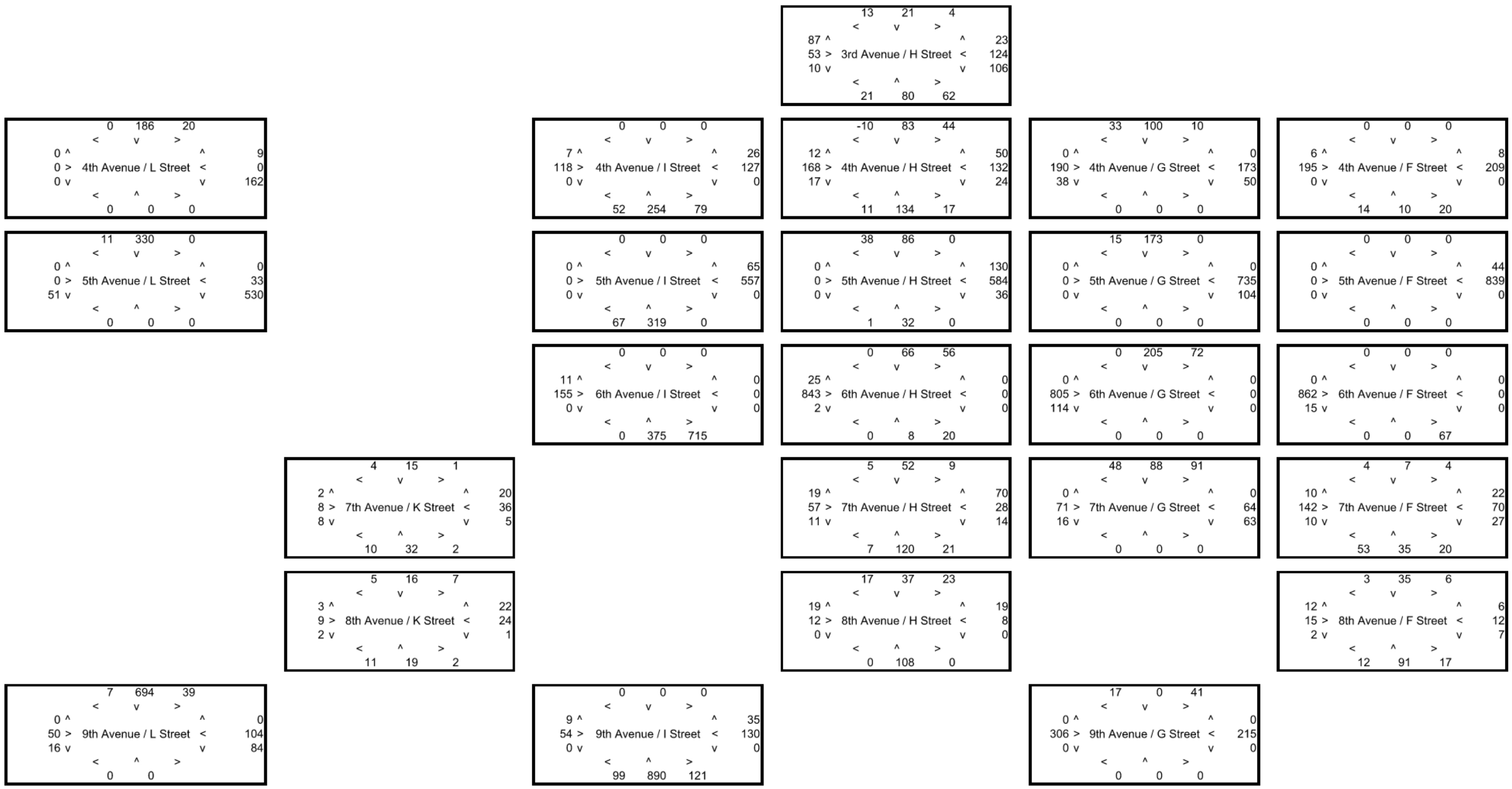


Figure C-5: Future AM TMVs L Street Through F Street

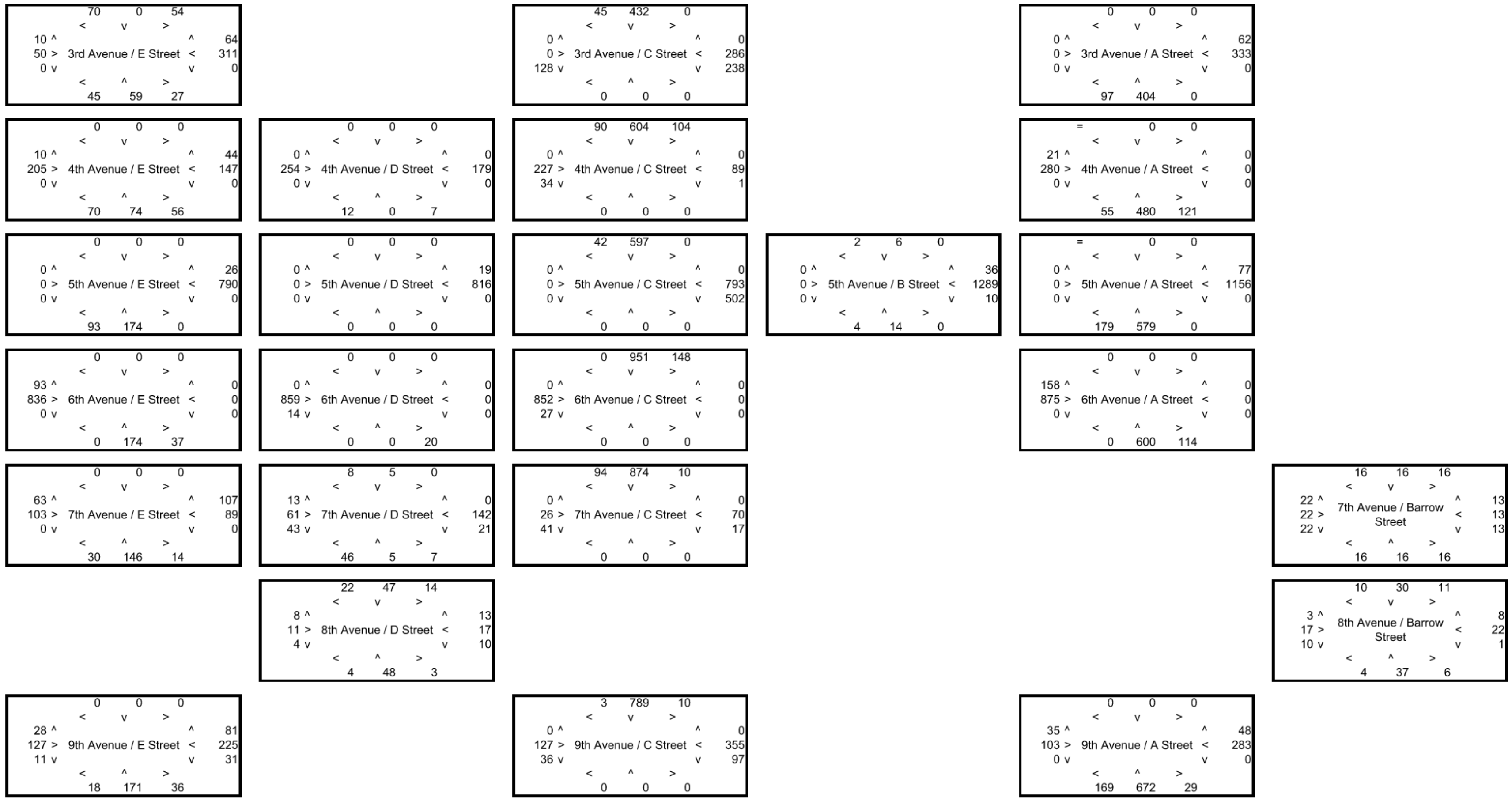


Figure C-6: Future AM TMVs E Street Through Barrow Street

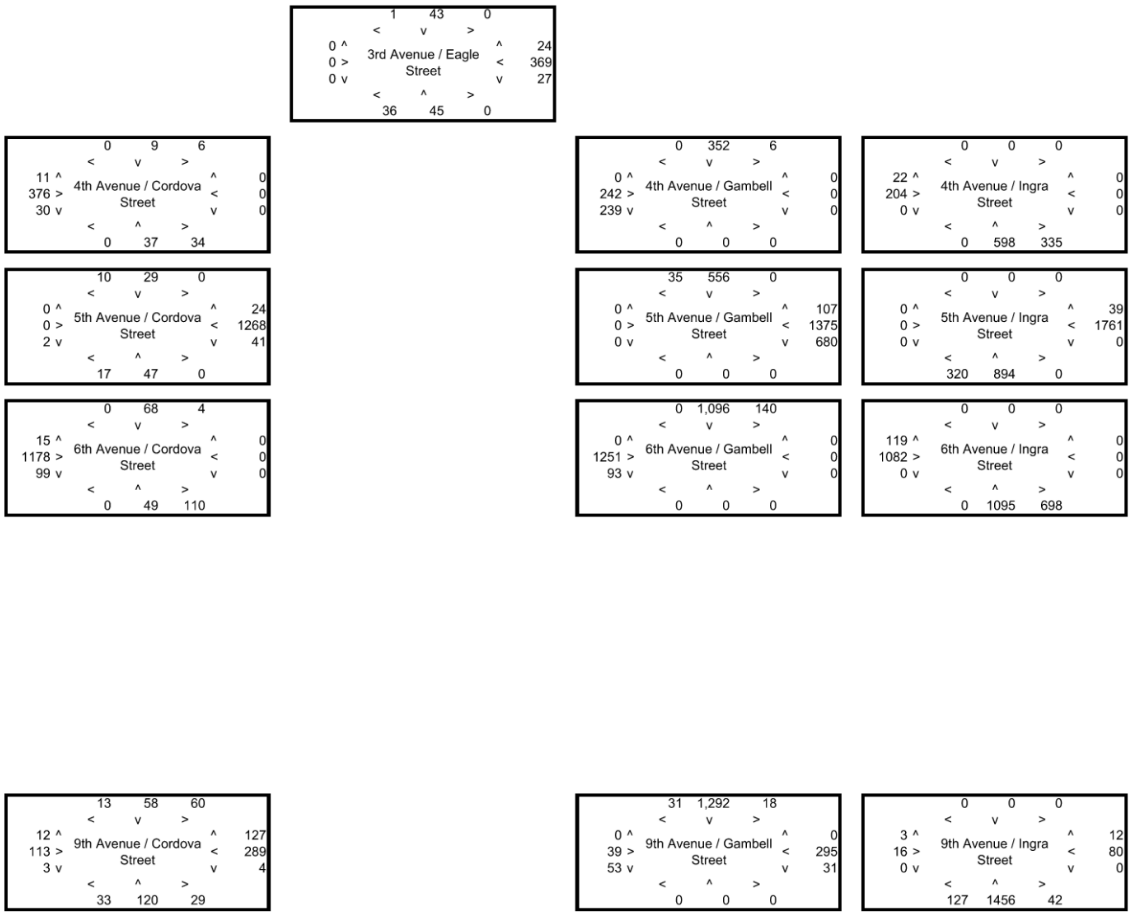


Figure C-7: Future AM TMVs Cordova Street Through Ingra Street

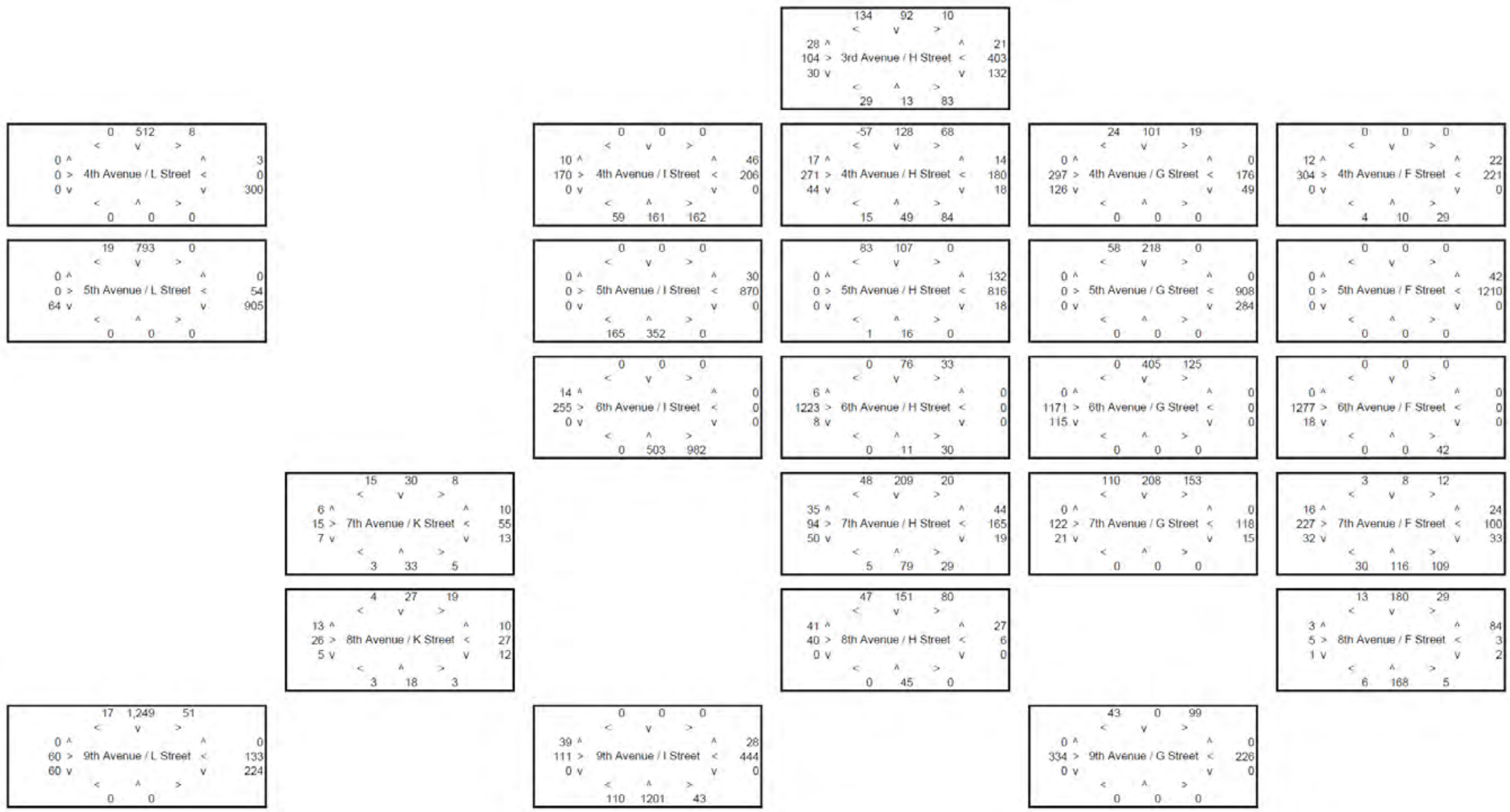


Figure C-8: Existing PM TMVs L Street Through F Street

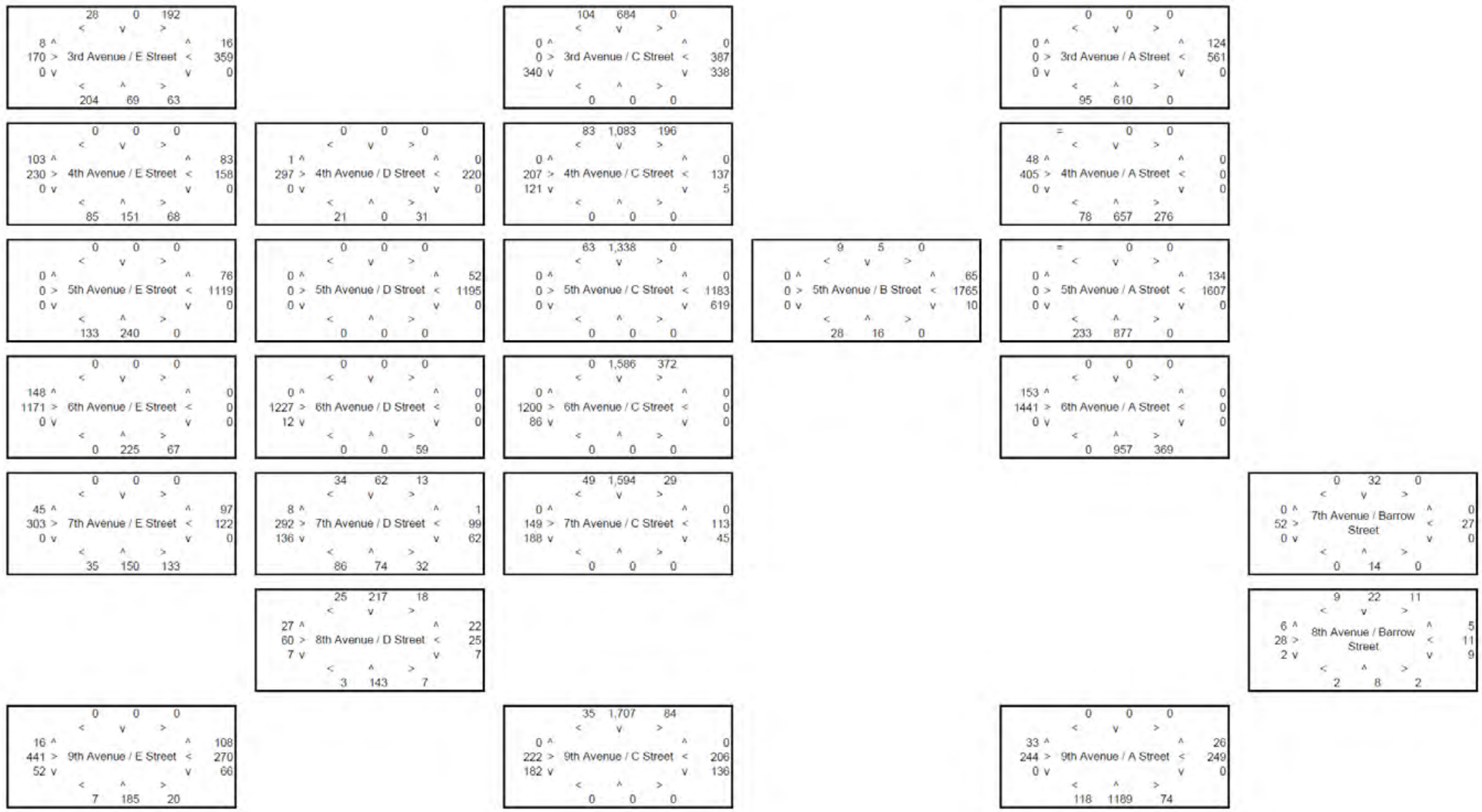


Figure C-9: Existing PM TMVs E Street Through Barrow Street

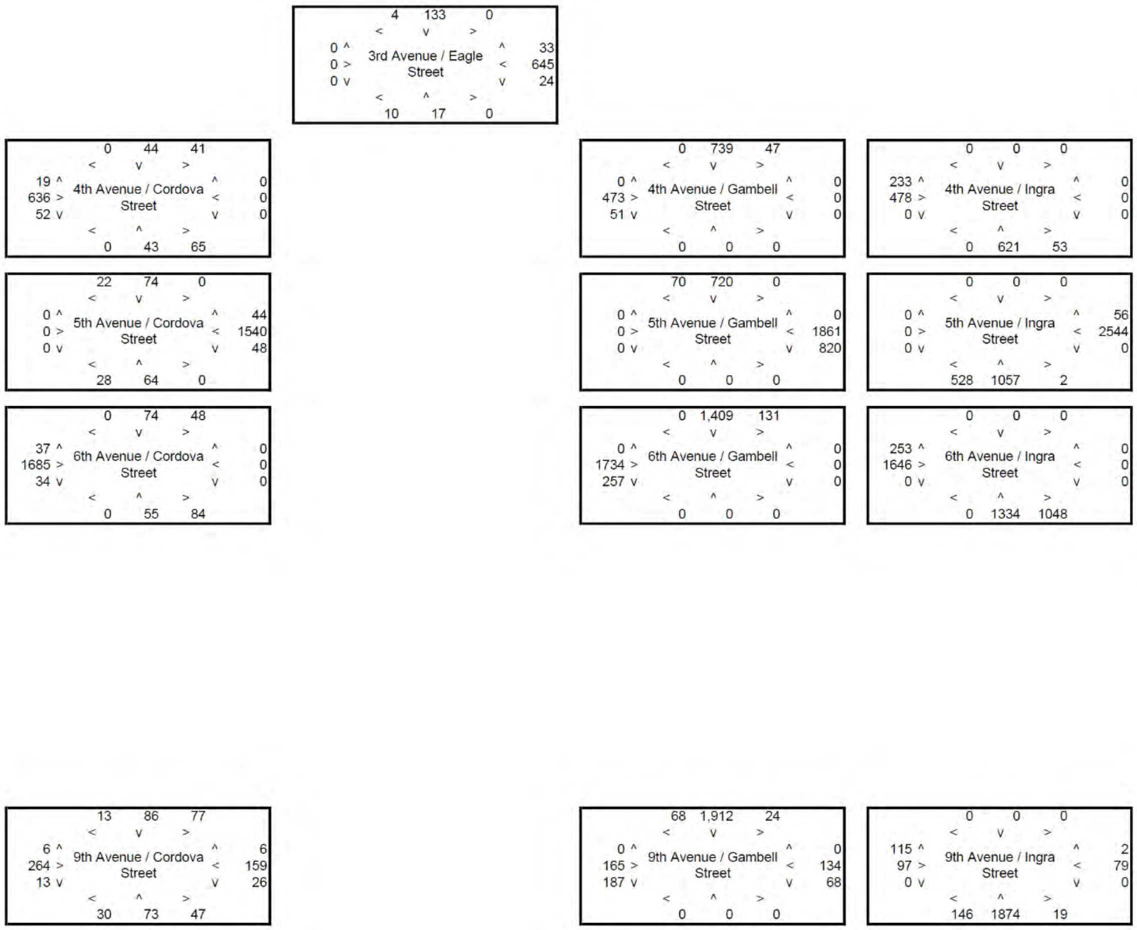


Figure C-10: Existing PM TMVs Cordova Street through Ingra Street

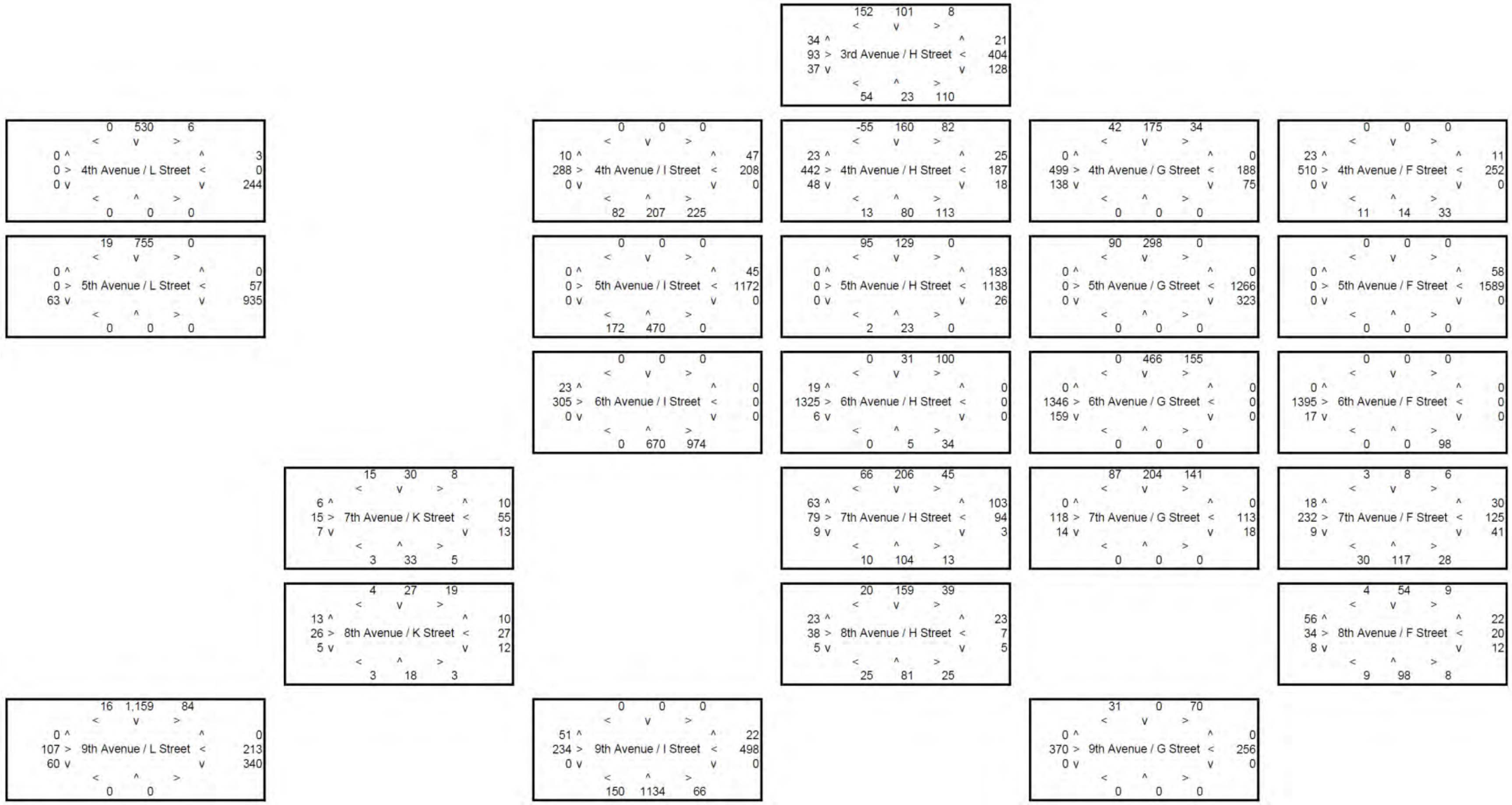


Figure C-11: Future PM TMVs L Street Through F Street

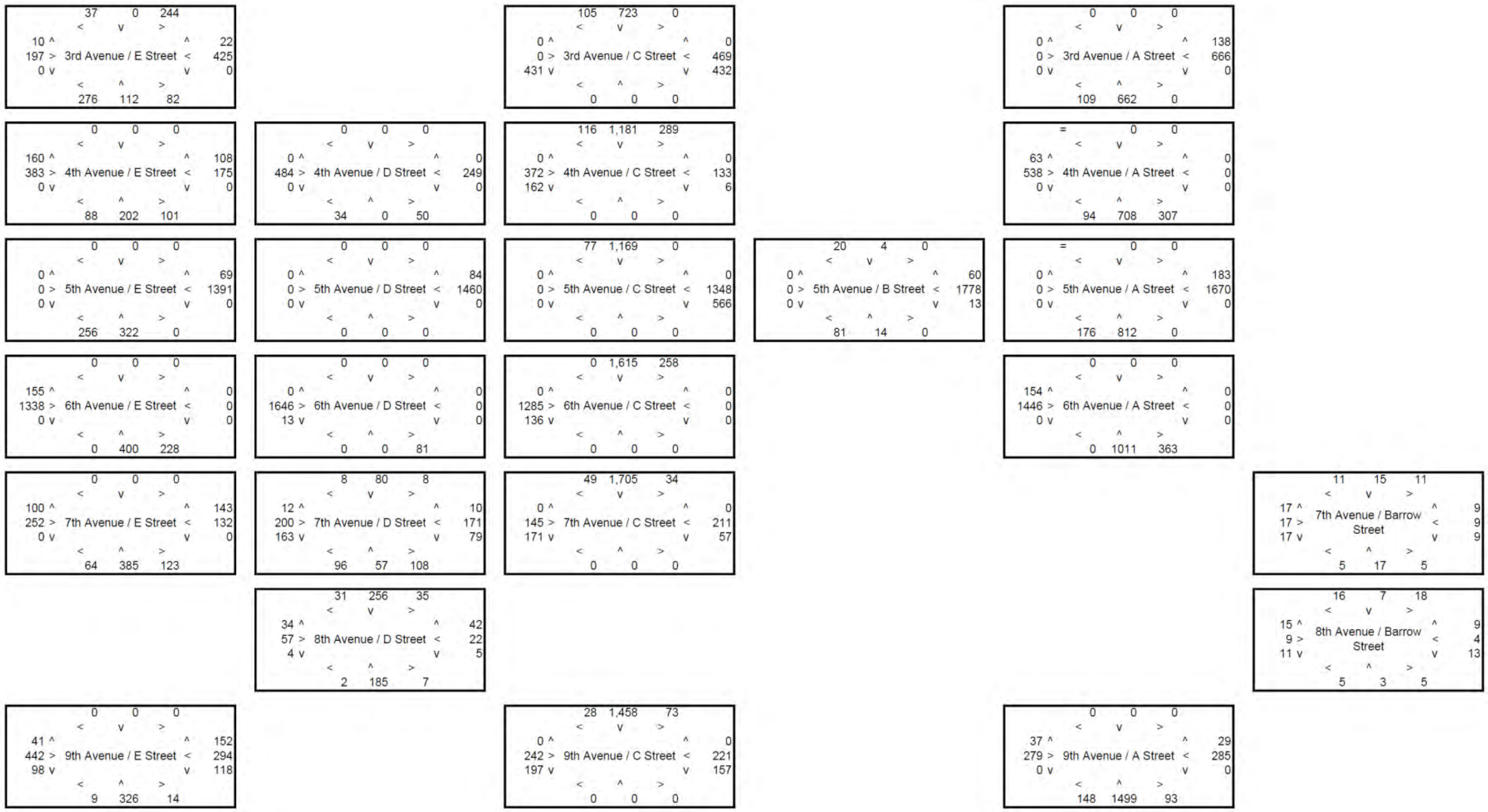


Figure C-12: Future PM TMVs E Street Through Barrow Street

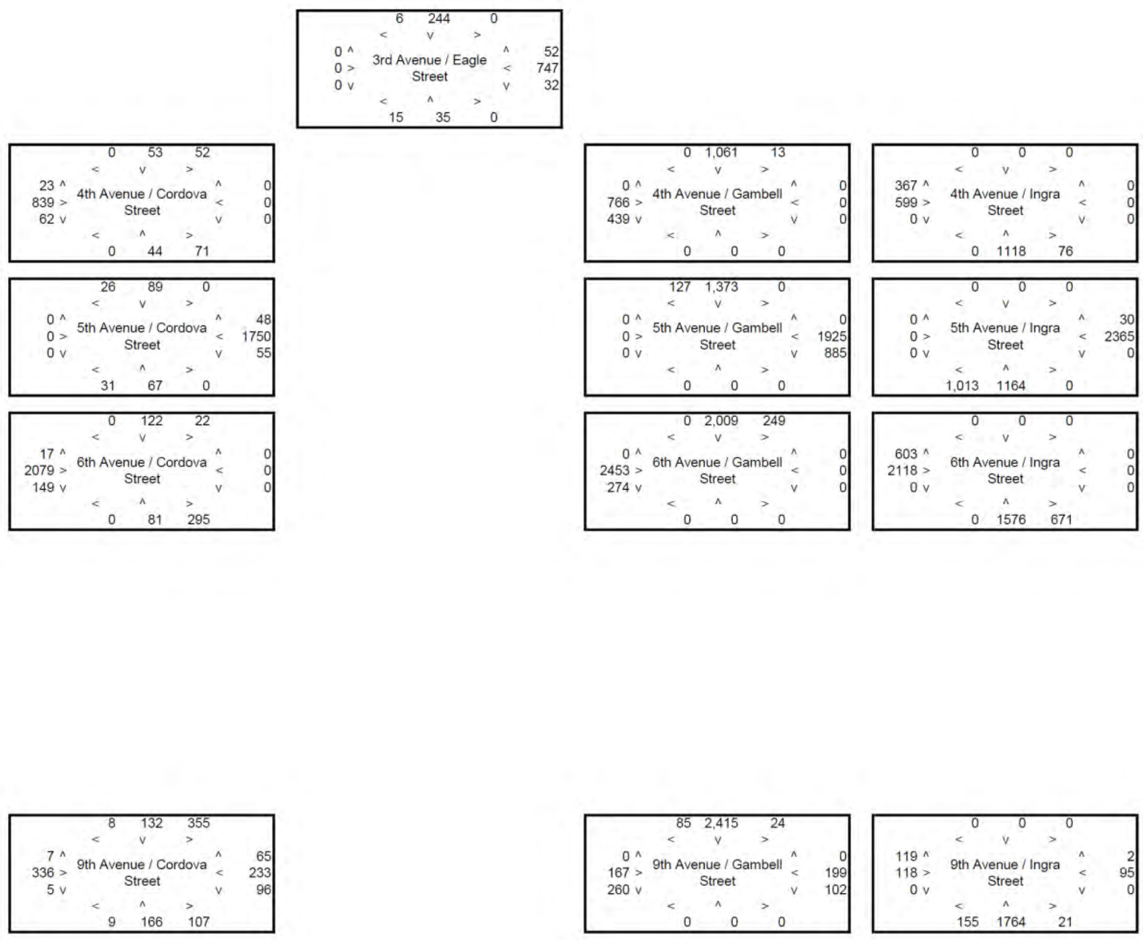


Figure C-13: Future PM TMVs Cordova Street through Ingra Street

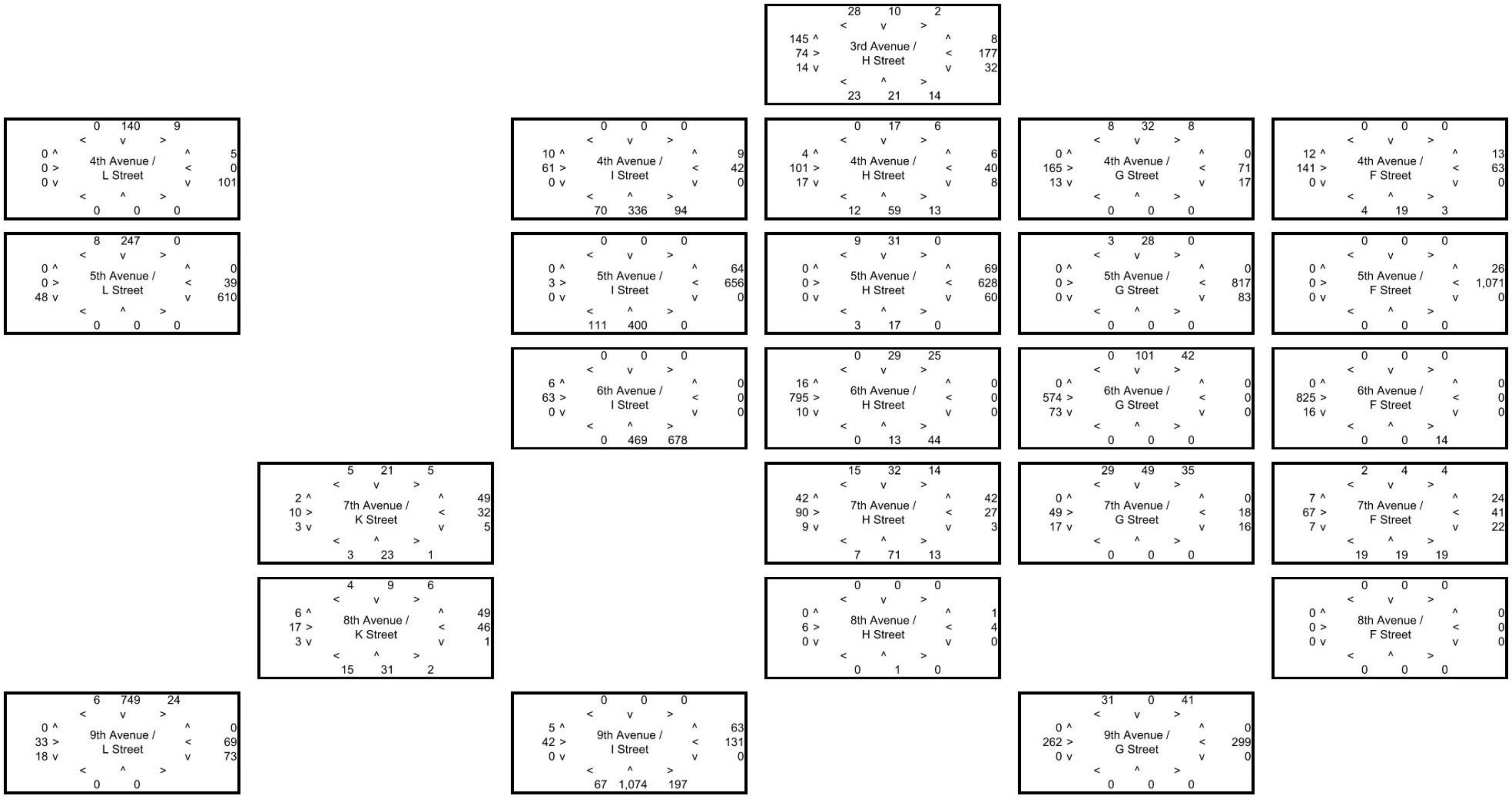


Figure C-14: Lane Reduction Between I/L Streets and A/C Streets AM TMVs – L Street to F Street

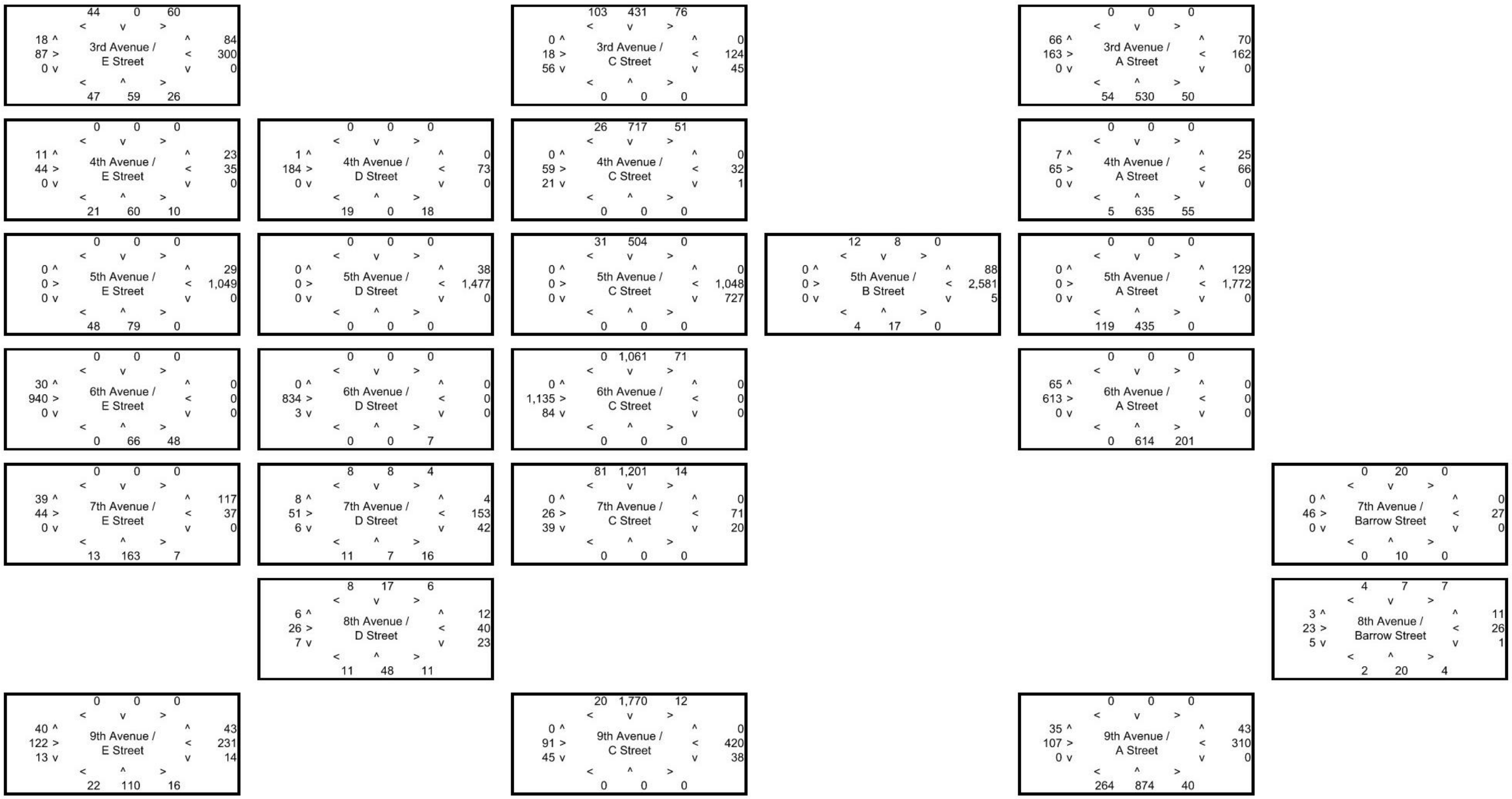


Figure C-15: Lane Reduction Between I/L Streets and A/C Streets AM TMVs – E Street to Barrow Street

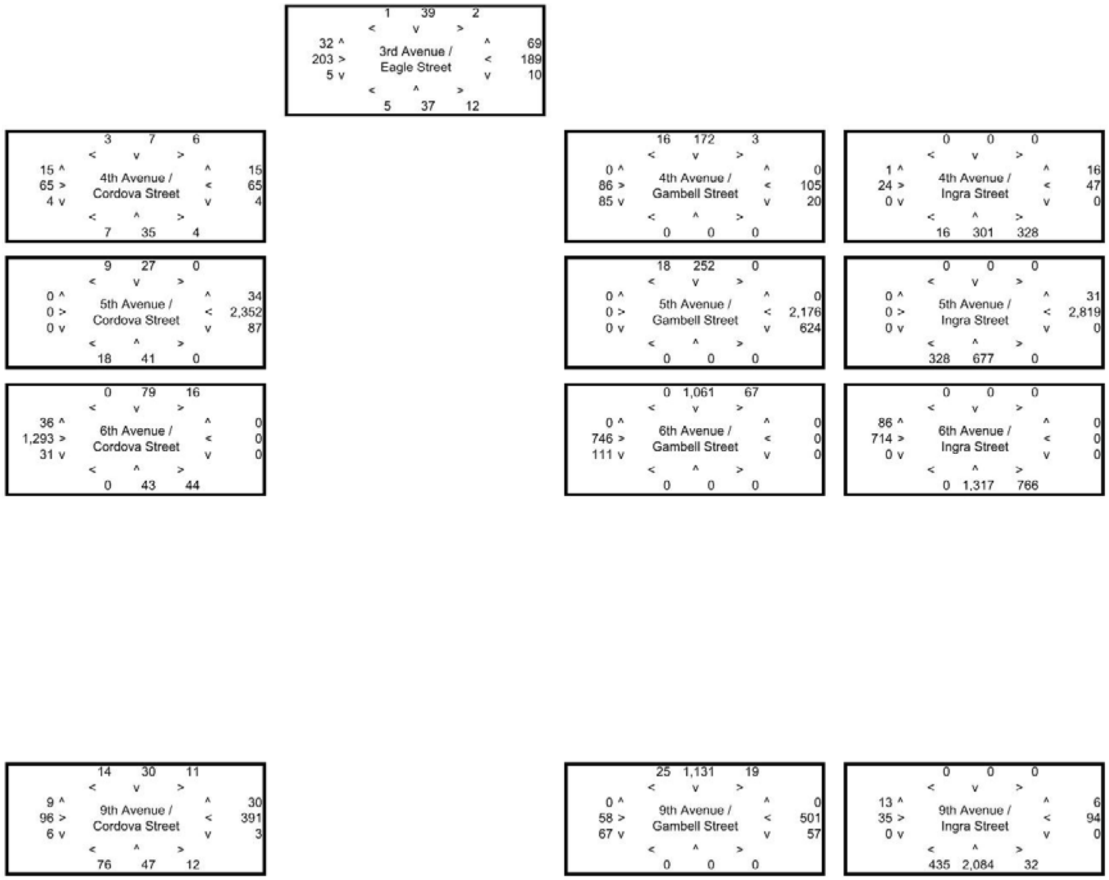


Figure C-16: Lane Reduction Between I/L Streets and A/C Streets AM TMVs – Cordova Street to Ingra Street

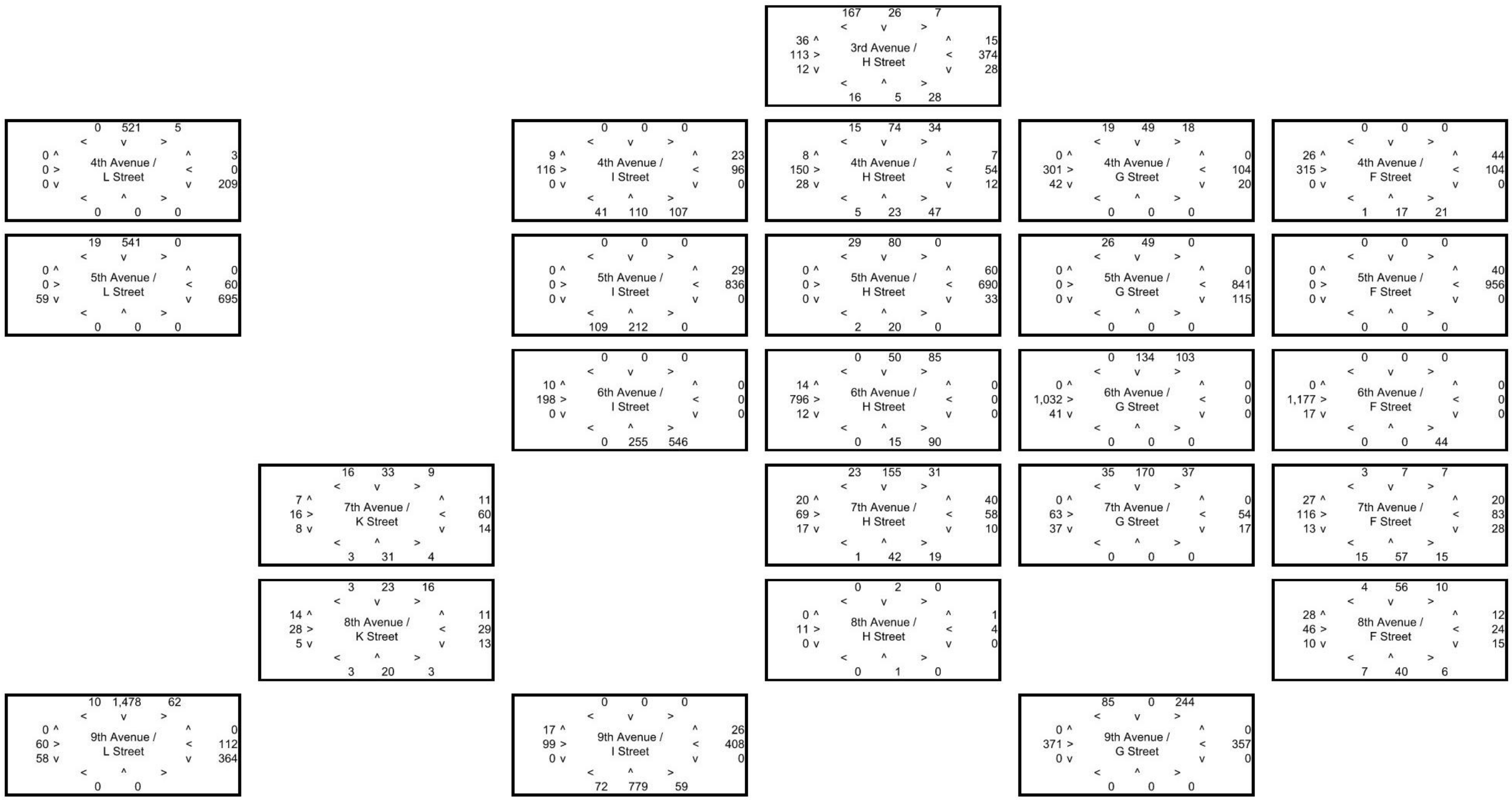


Figure C-17: Lane Reduction Between I/L Streets and A/C Streets PM TMVs – L Street to F Street

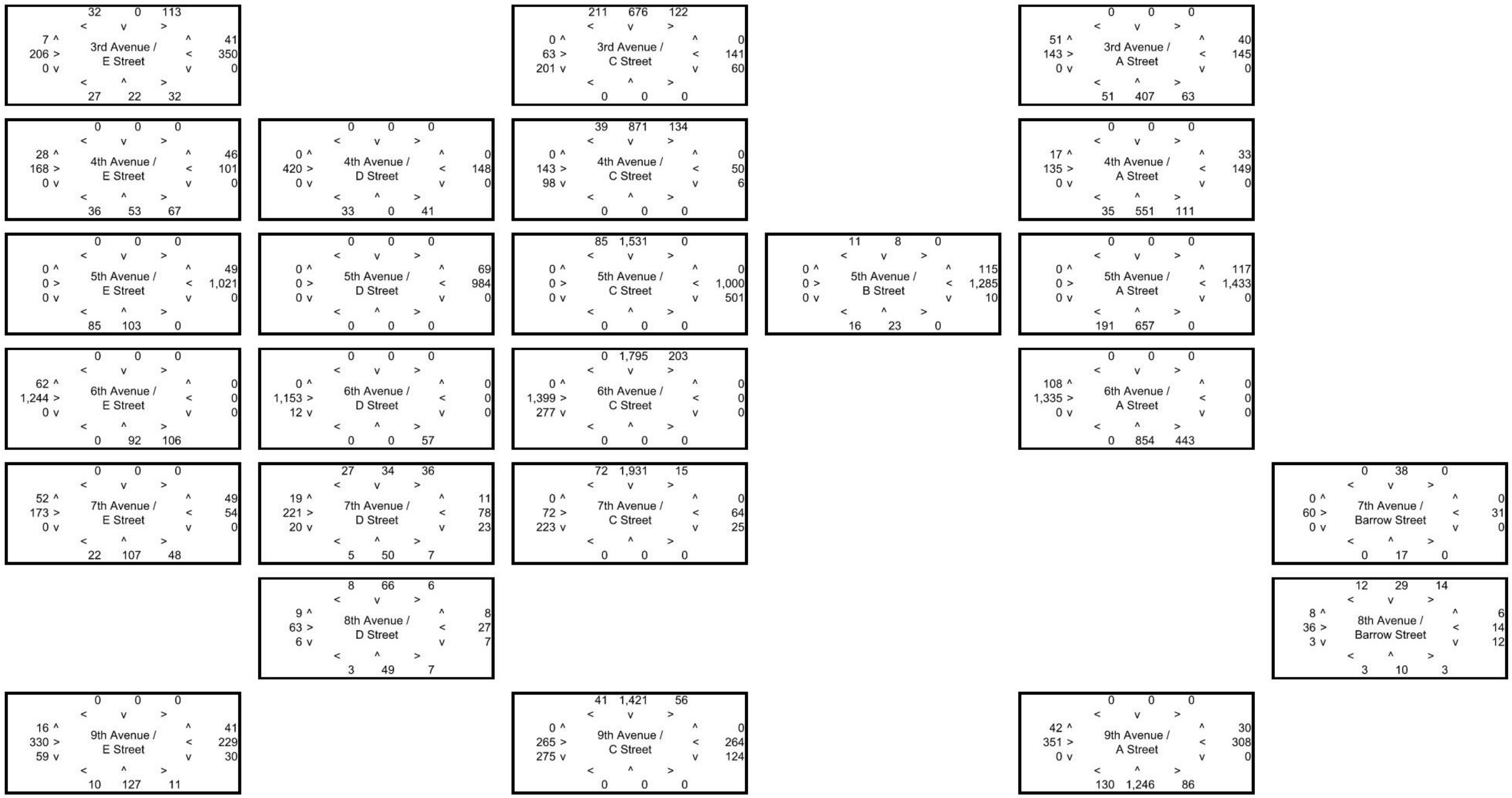


Figure C-18: Lane Reduction Between I/L Streets and A/C Streets PM TMVs – E Street to Barrow Street

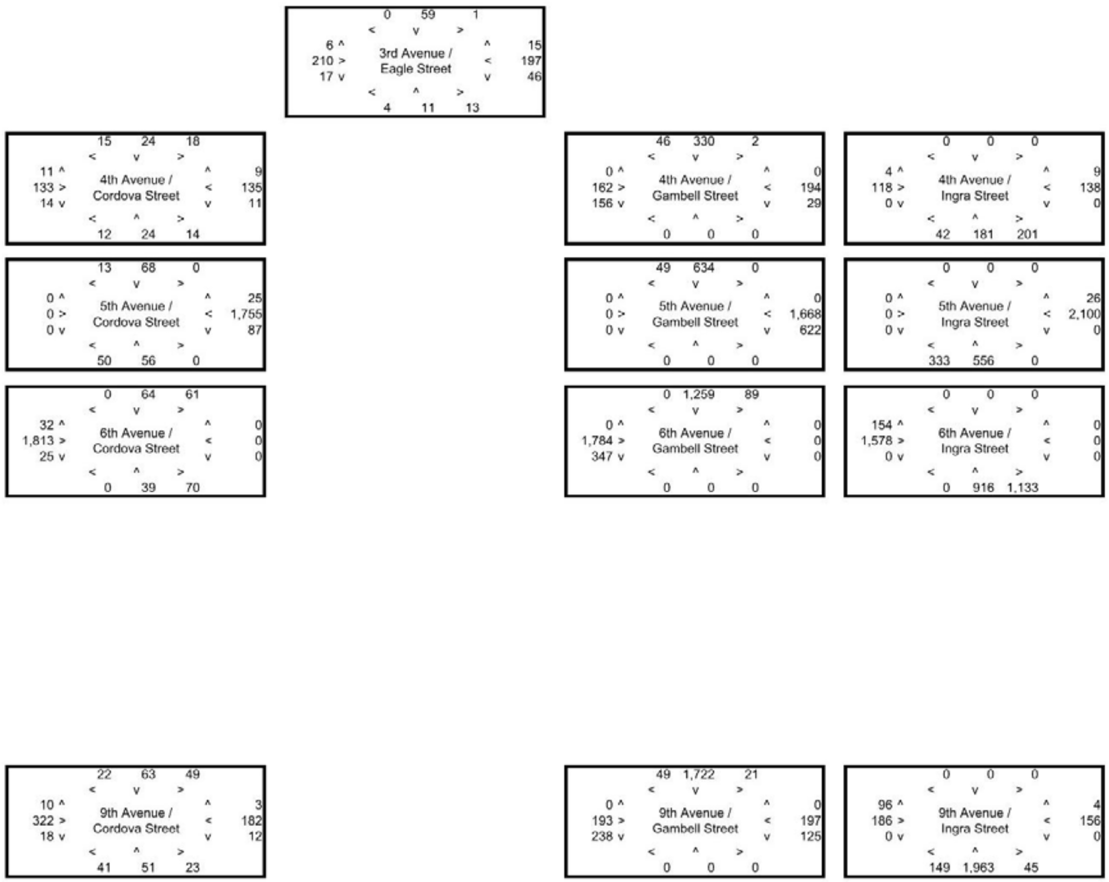


Figure C-19: Lane Reduction Between I/L Streets and A/C Streets PM TMVs – Cordova Street to Ingra Street

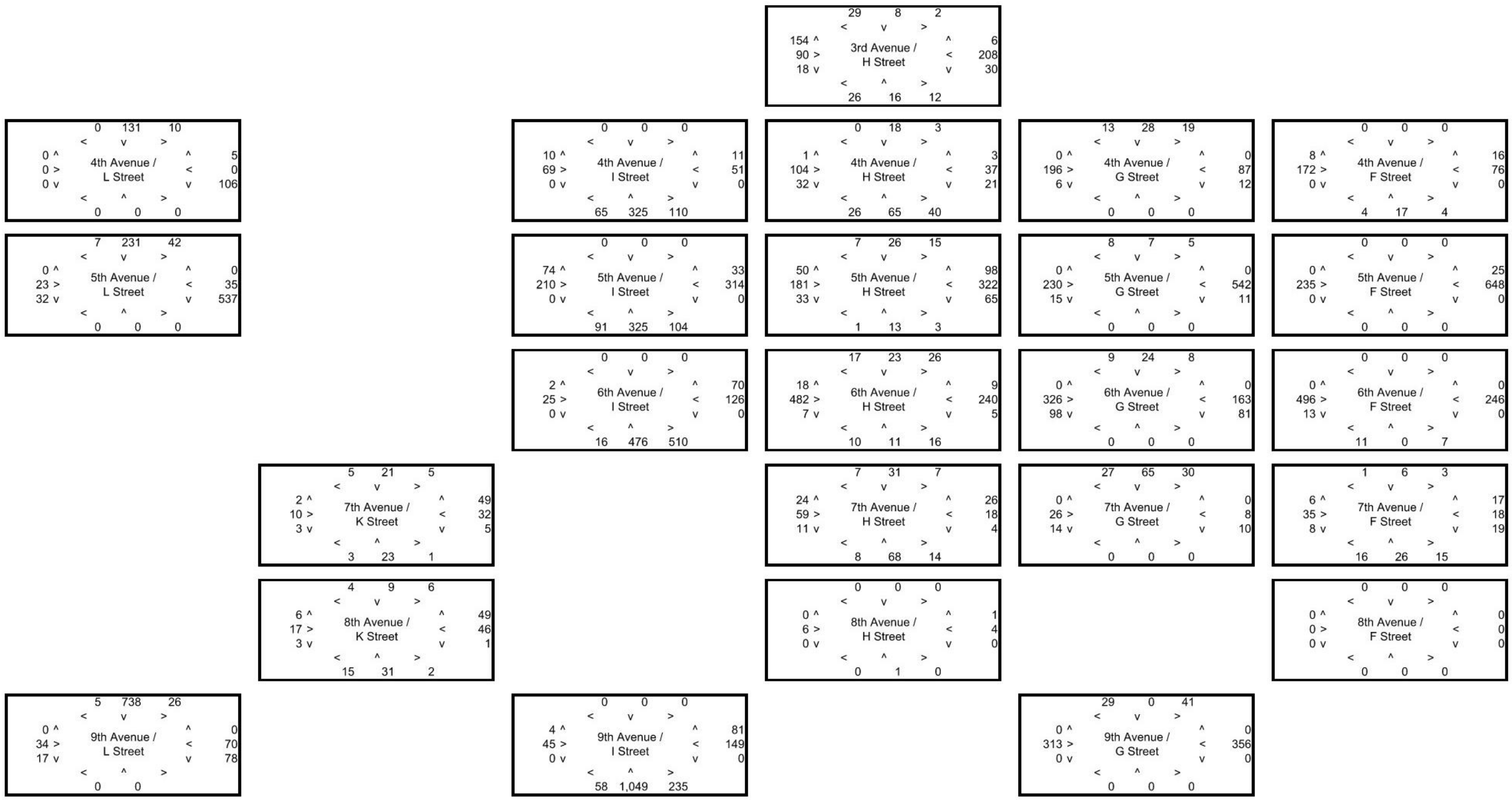


Figure C-20: Lane Reduction Between I/L Streets and Ingra/Gambell Streets AM TMVs – L Street to E Street

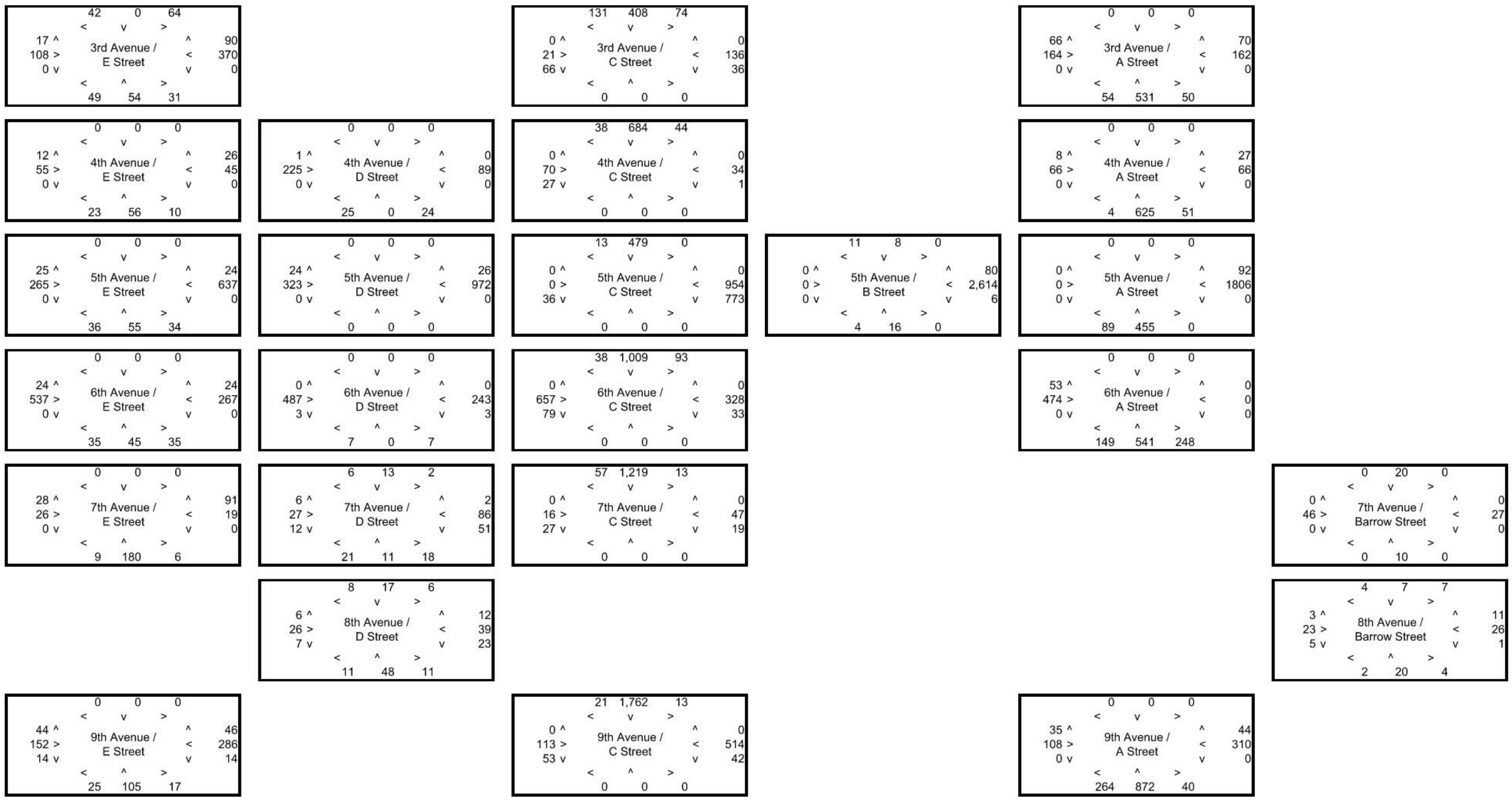


Figure C-21: Lane Reduction Between I/L Streets and Ingra/Gambell Streets AM TMVs – E Street to Barrow Street

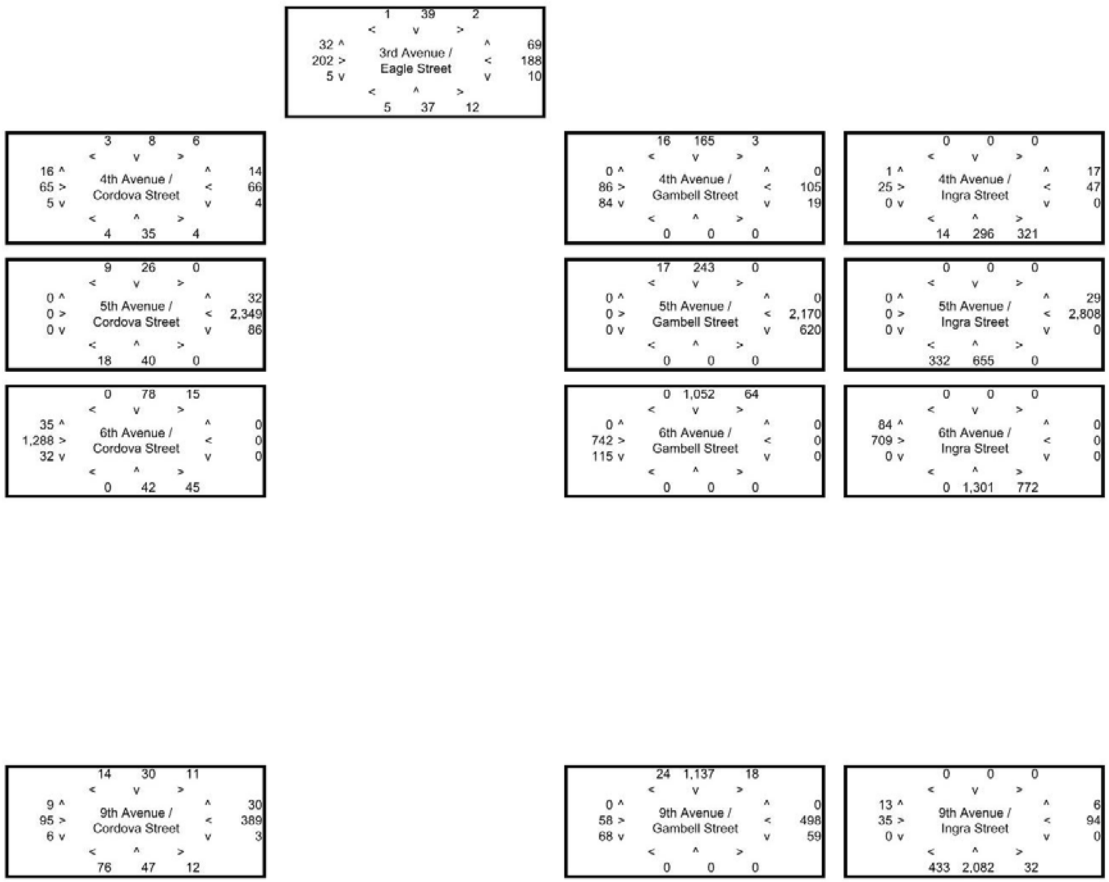


Figure C-22: Lane Reduction Between I/L Streets and Ingra/Gambell Streets AM TMVs – Cordova Street to Ingra Street

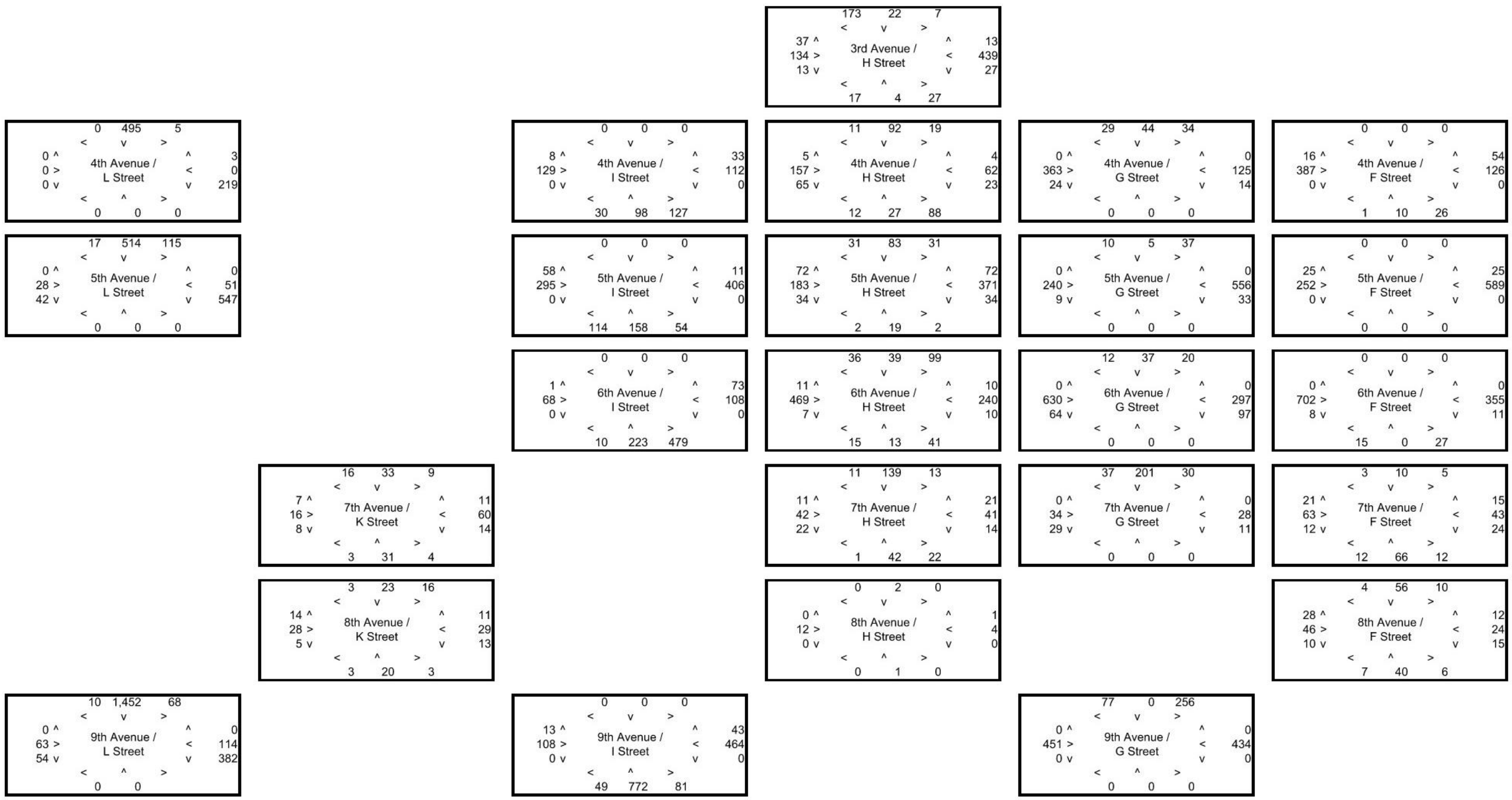


Figure C-23: Lane Reduction Between I/L Streets and Ingra/Gambell Streets PM TMVs – L Street to F Street

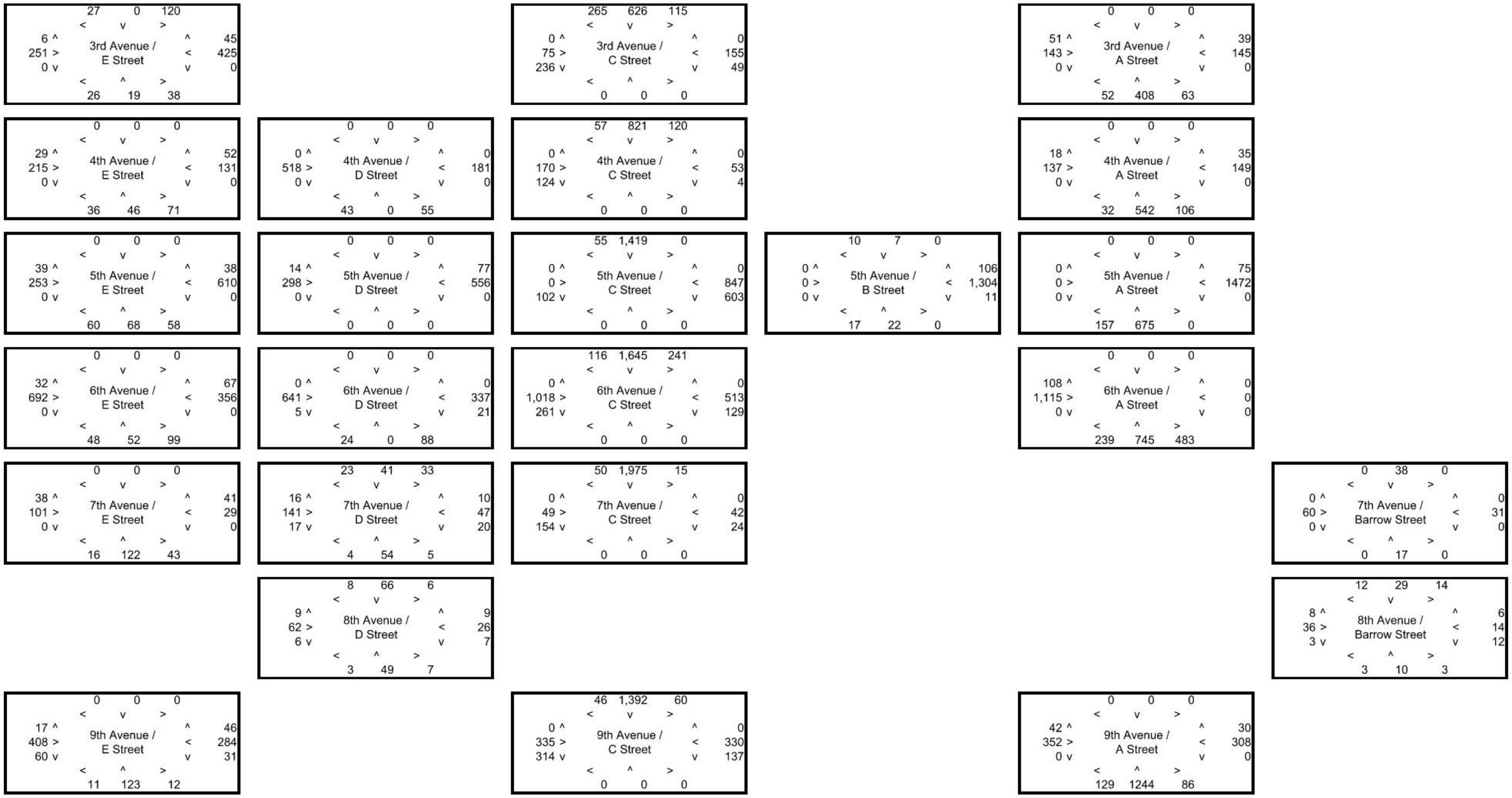


Figure C-24: Lane Reduction Between I/L Streets and Ingra/Gambell Streets PM TMVs – E Street to Barrow Street

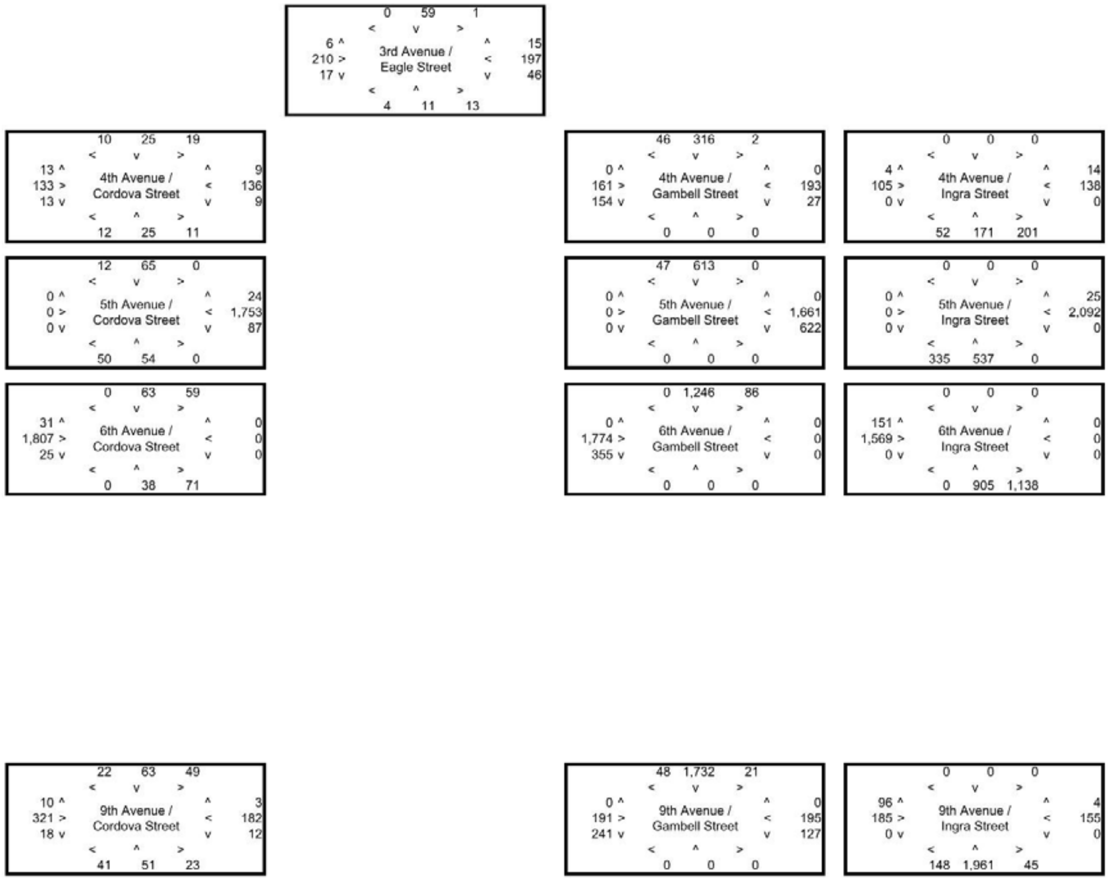


Figure C-25: Lane Reduction Between I/L Streets and Ingra/Gambell Streets PM TMVs – Cordova Street to Ingra Street

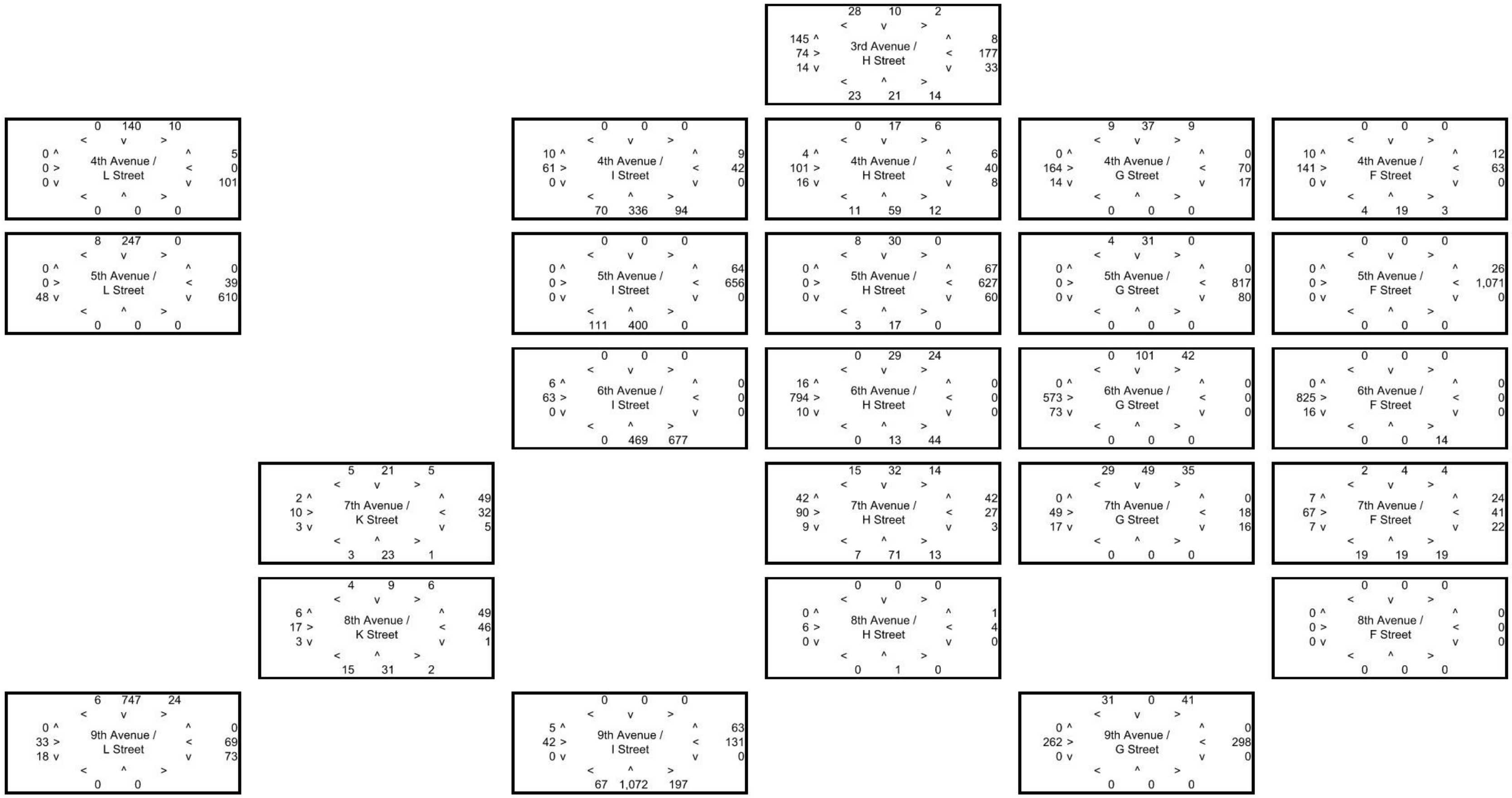


Figure C-26: Two-Way Conversion Between I/L Streets and A/C Streets AM TMVs – L Street to F Street

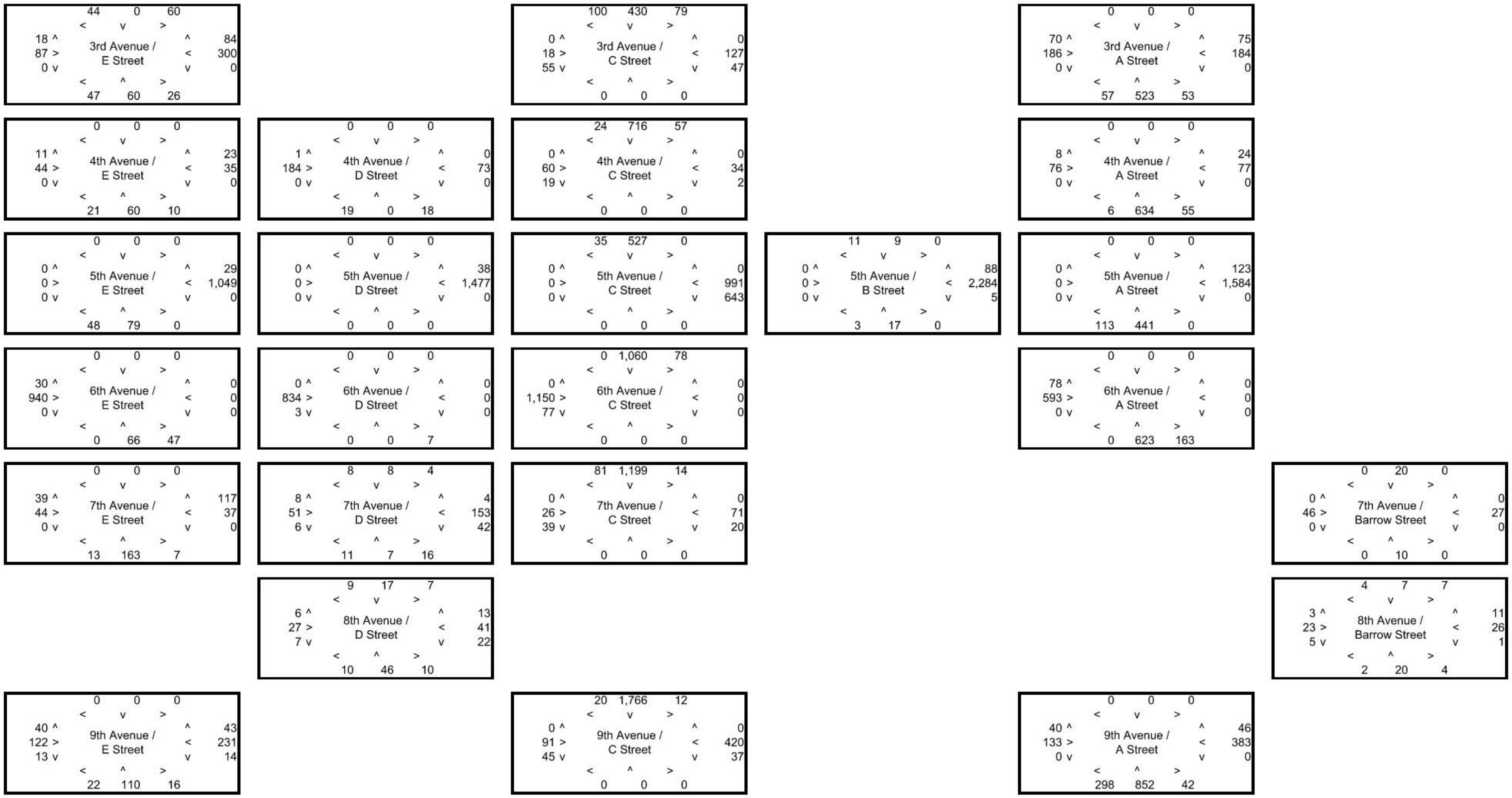


Figure C-27: Two-Way Conversion Between I/L Streets and A/C Streets AM TMVs – E Street to Barrow Street

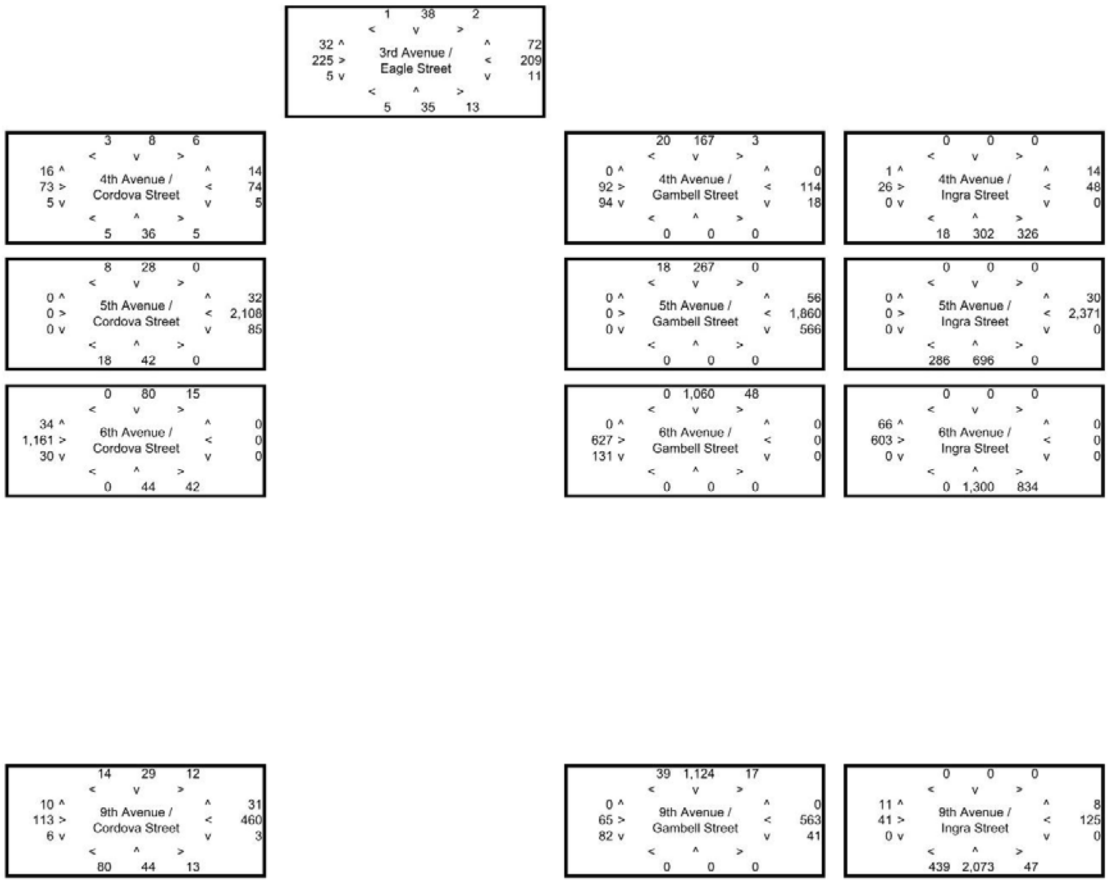


Figure C-28: Two-Way Conversion Between I/L Streets and A/C Streets AM TMVs – Cordova Street to Ingra Street

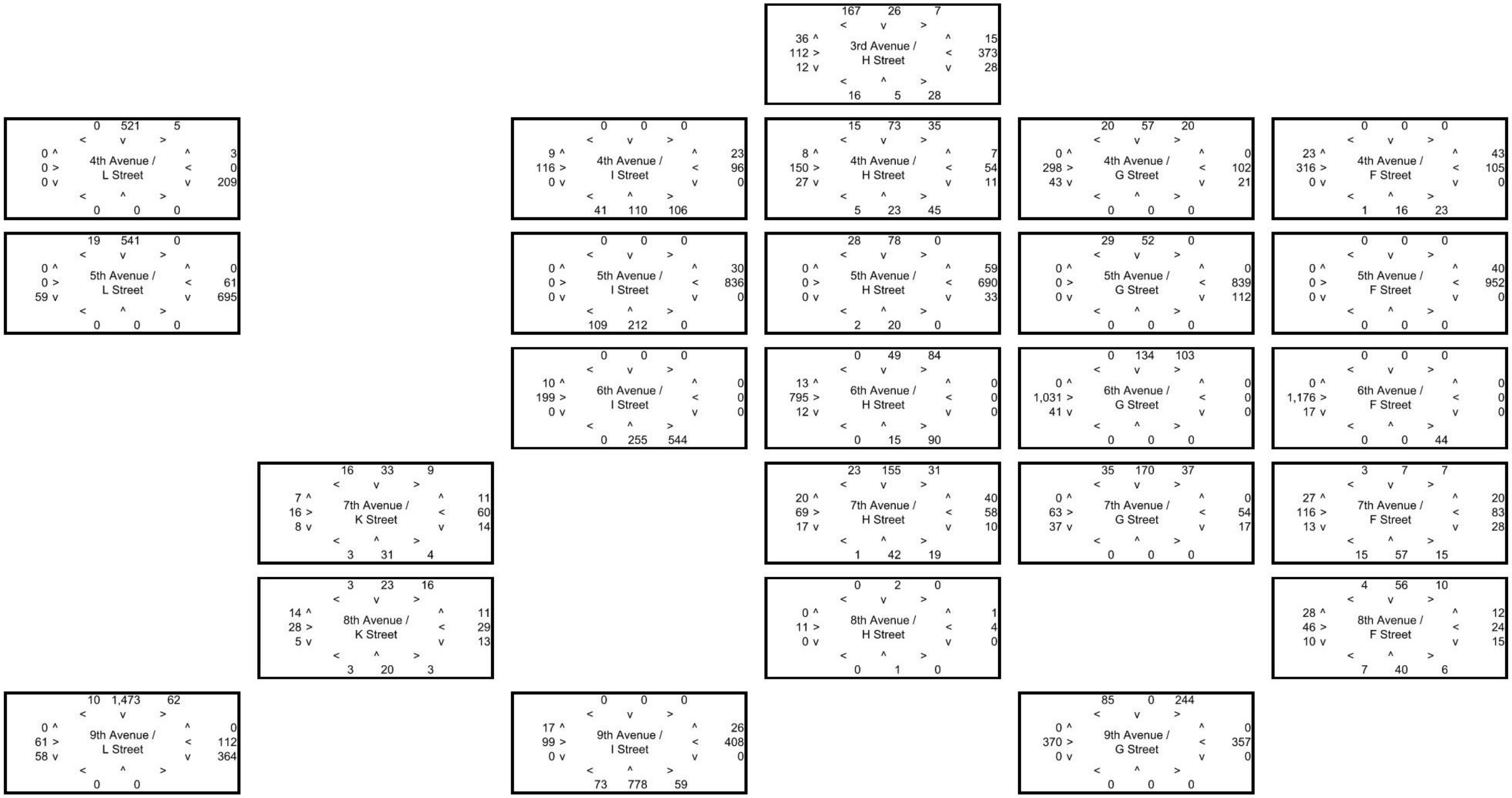


Figure C-29: Two-Way Conversion Between I/L Streets and A/C Streets PM TMVs – L Street to F Street

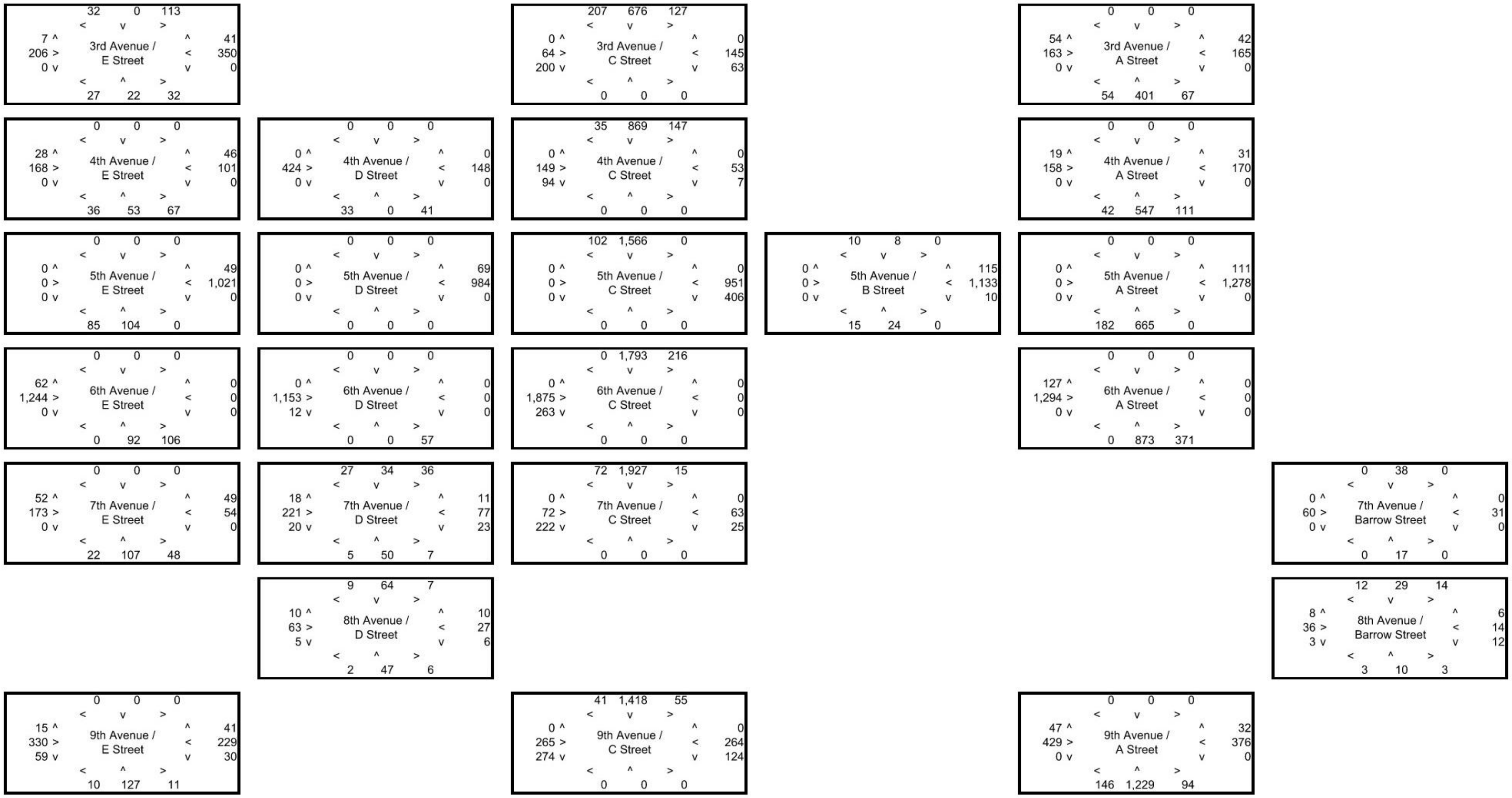


Figure C-30: Two-Way Conversion Between I/L Streets and A/C Streets PM TMVs – E Street to Barrow Street

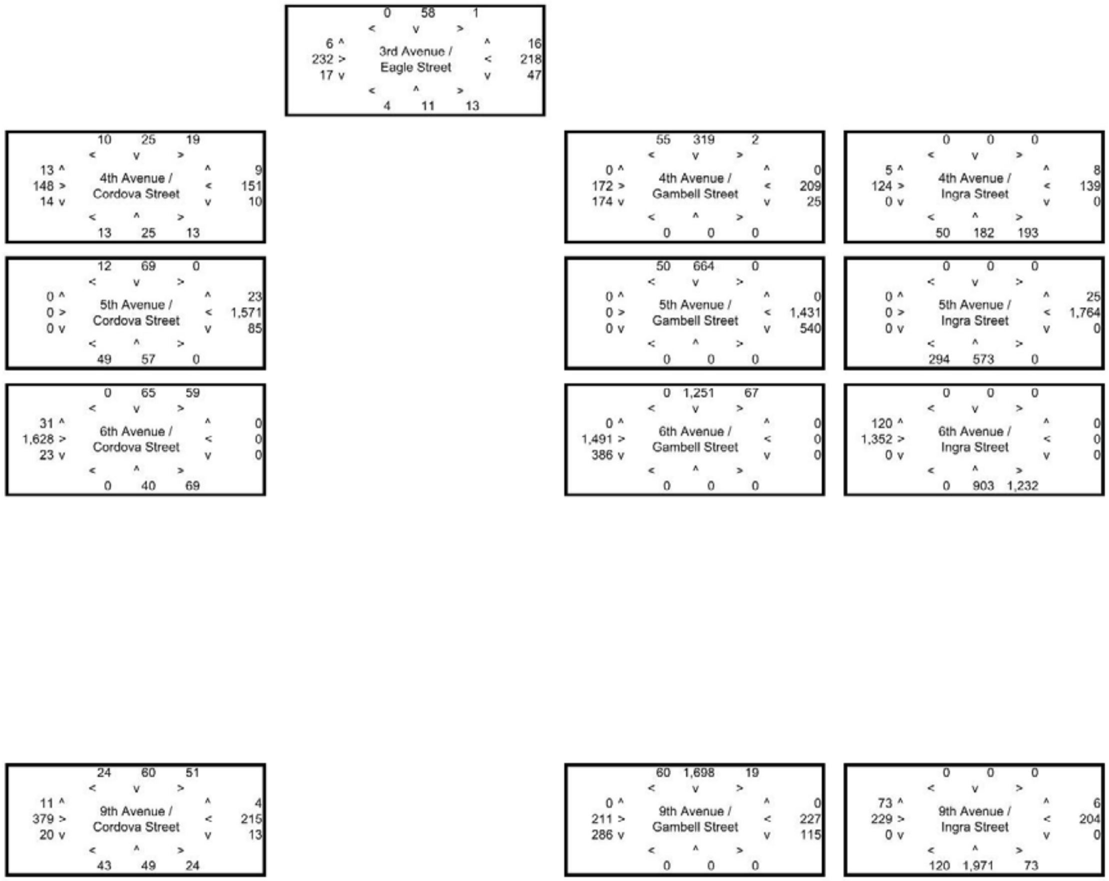


Figure C-31: Two-Way Conversion Between I/L Streets and A/C Streets PM TMVs – Cordova Street to Ingra Street

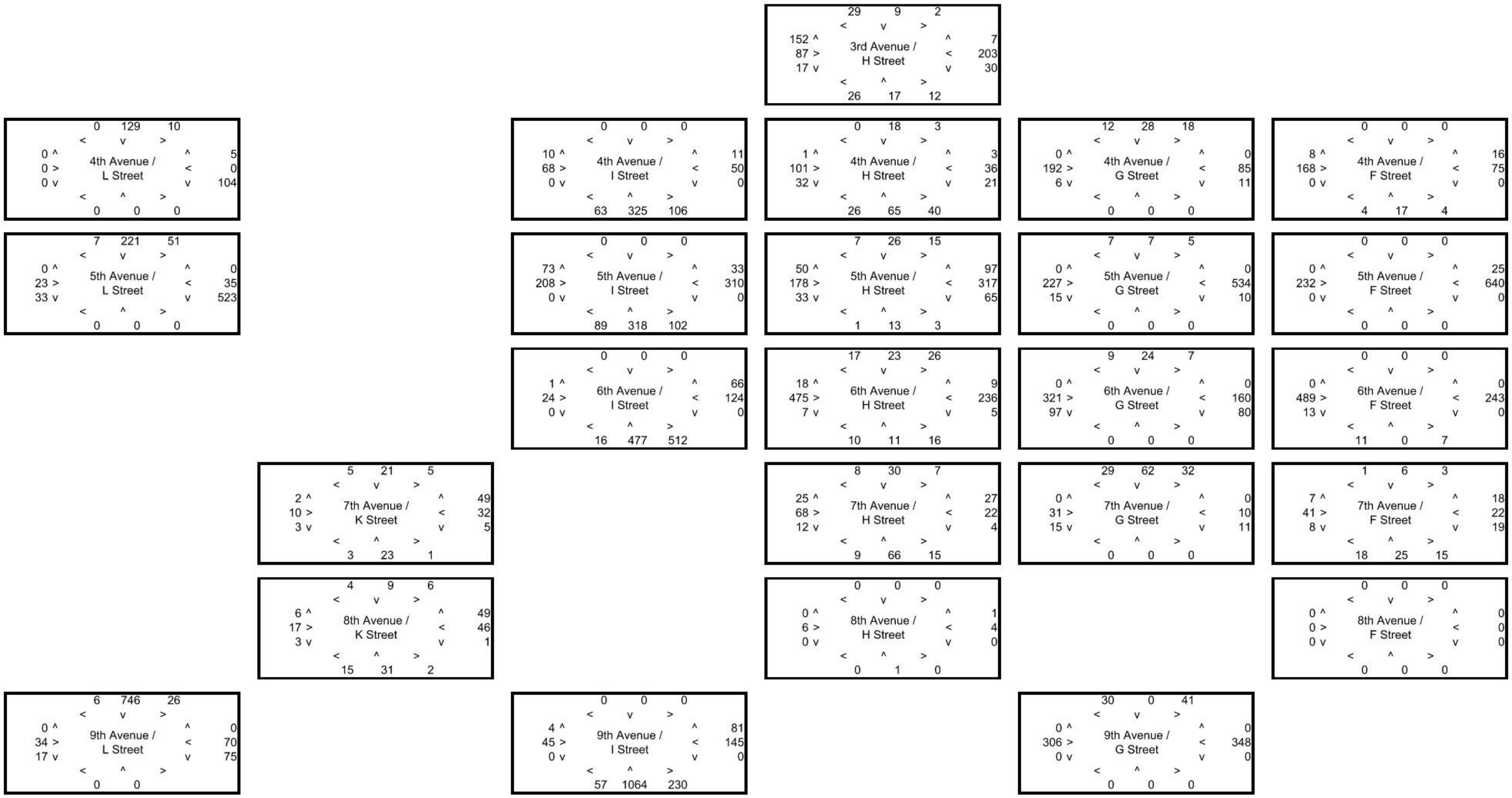


Figure C-32: Two-Way Conversion Between I/L Streets and Ingra/Gambell Streets AM TMVs – L Street to F Street

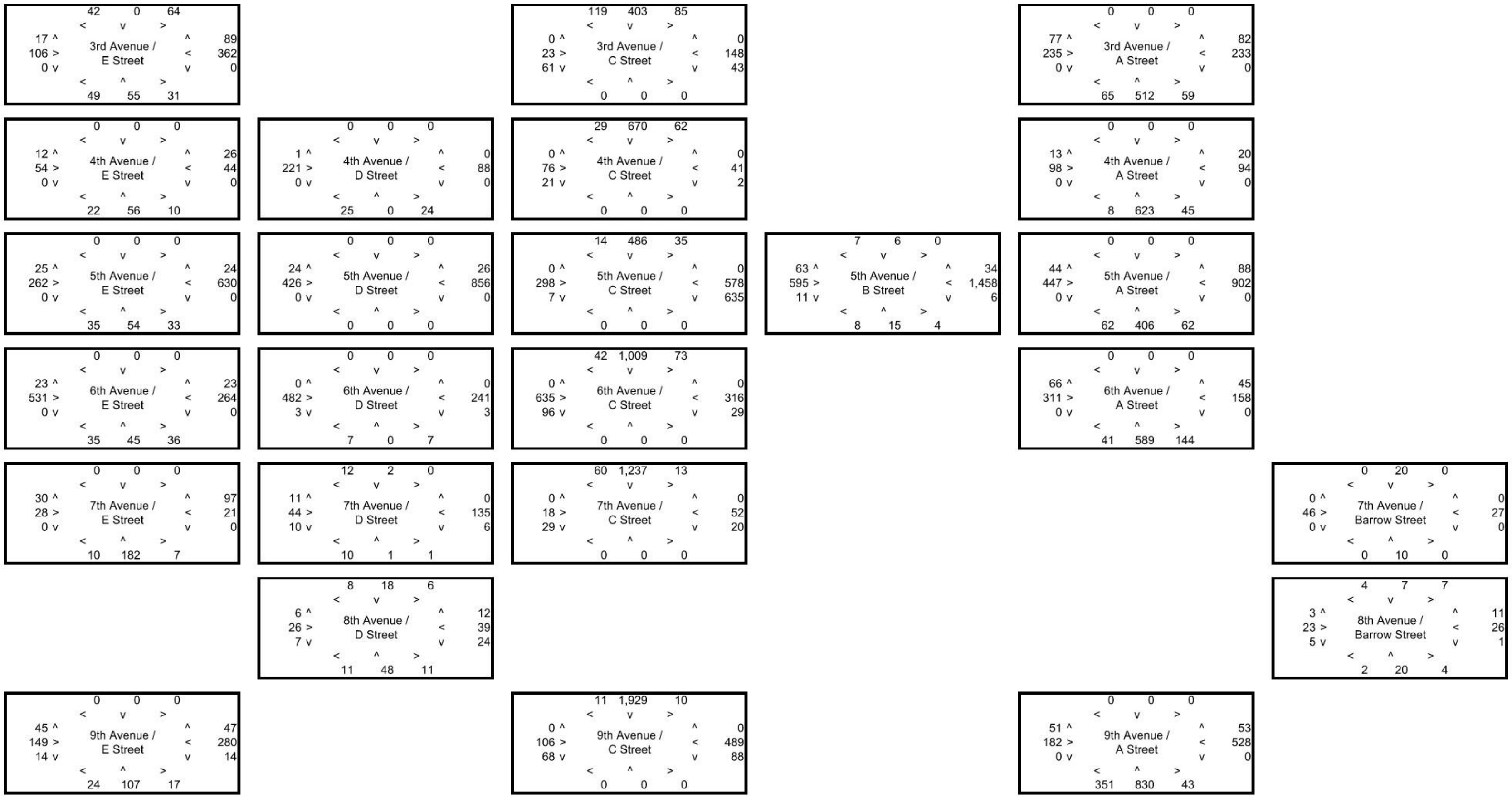


Figure C-33: Two-Way Conversion Between I/L Streets and Ingra/Gambell Streets AM TMVs – E Street to Barrow Street

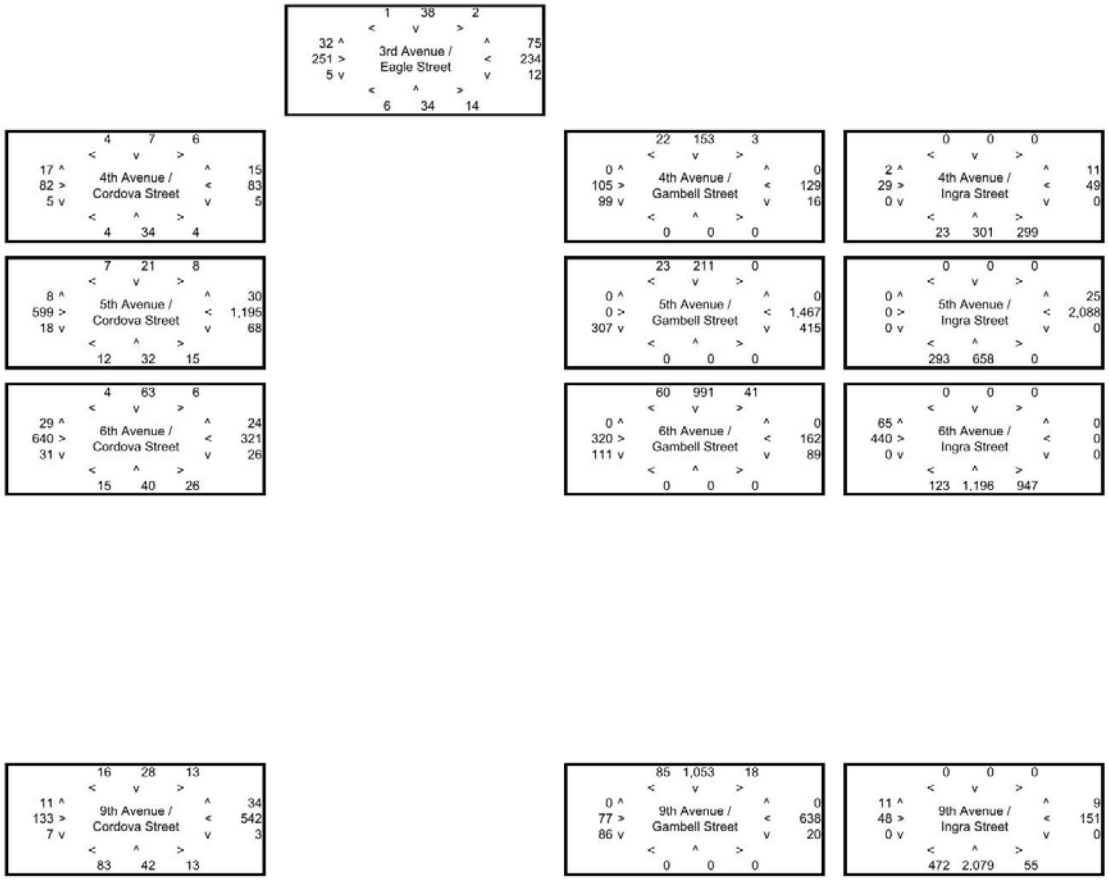


Figure C-34: Two-Way Conversion Between I/L Streets and Ingra/Gambell Streets AM TMVs – Cordova Street to Ingra Street

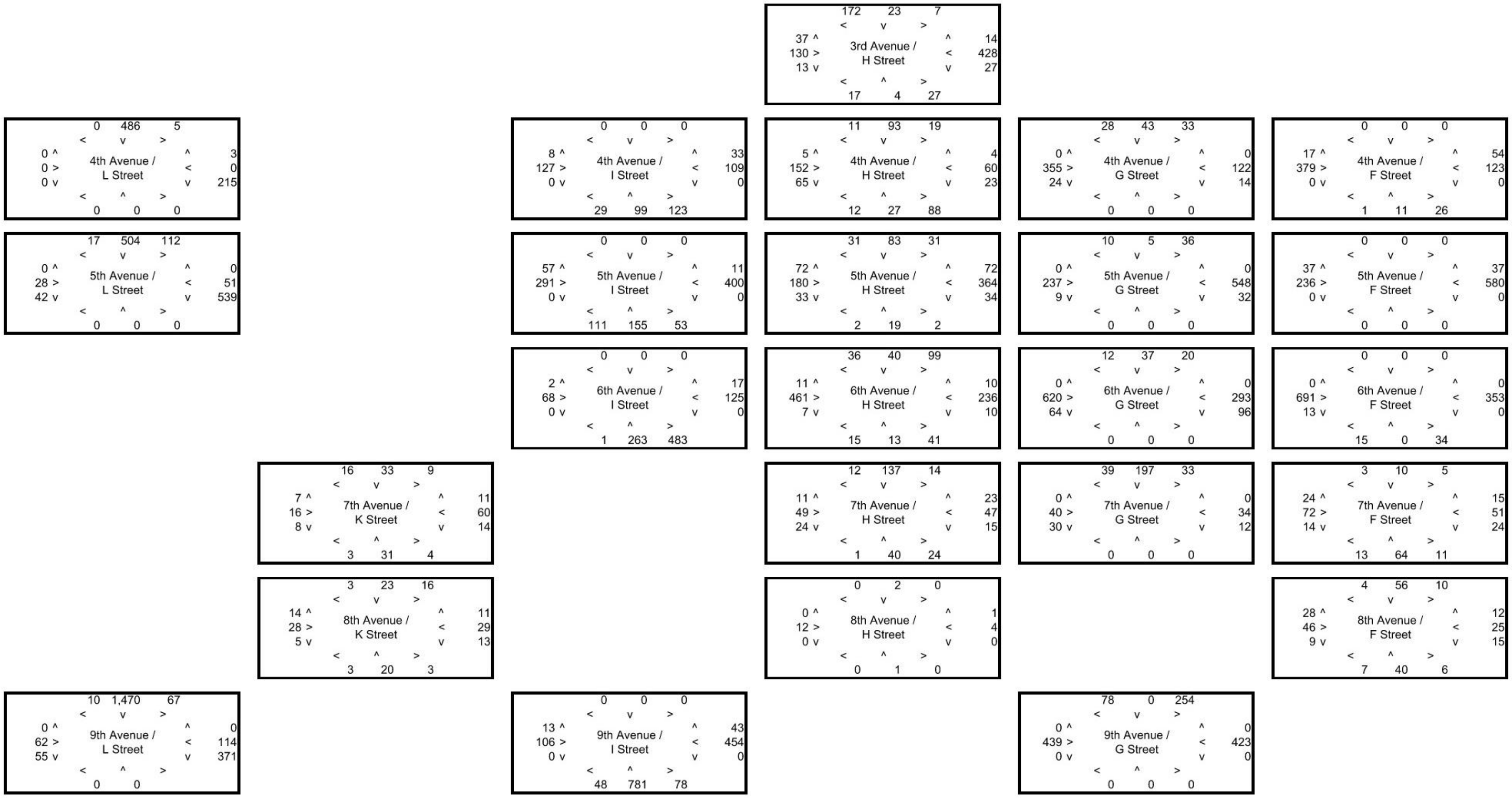


Figure C-35: Two-Way Conversion Between I/L Streets and Ingra/Gambell Streets PM TMVs – L Street to F Street

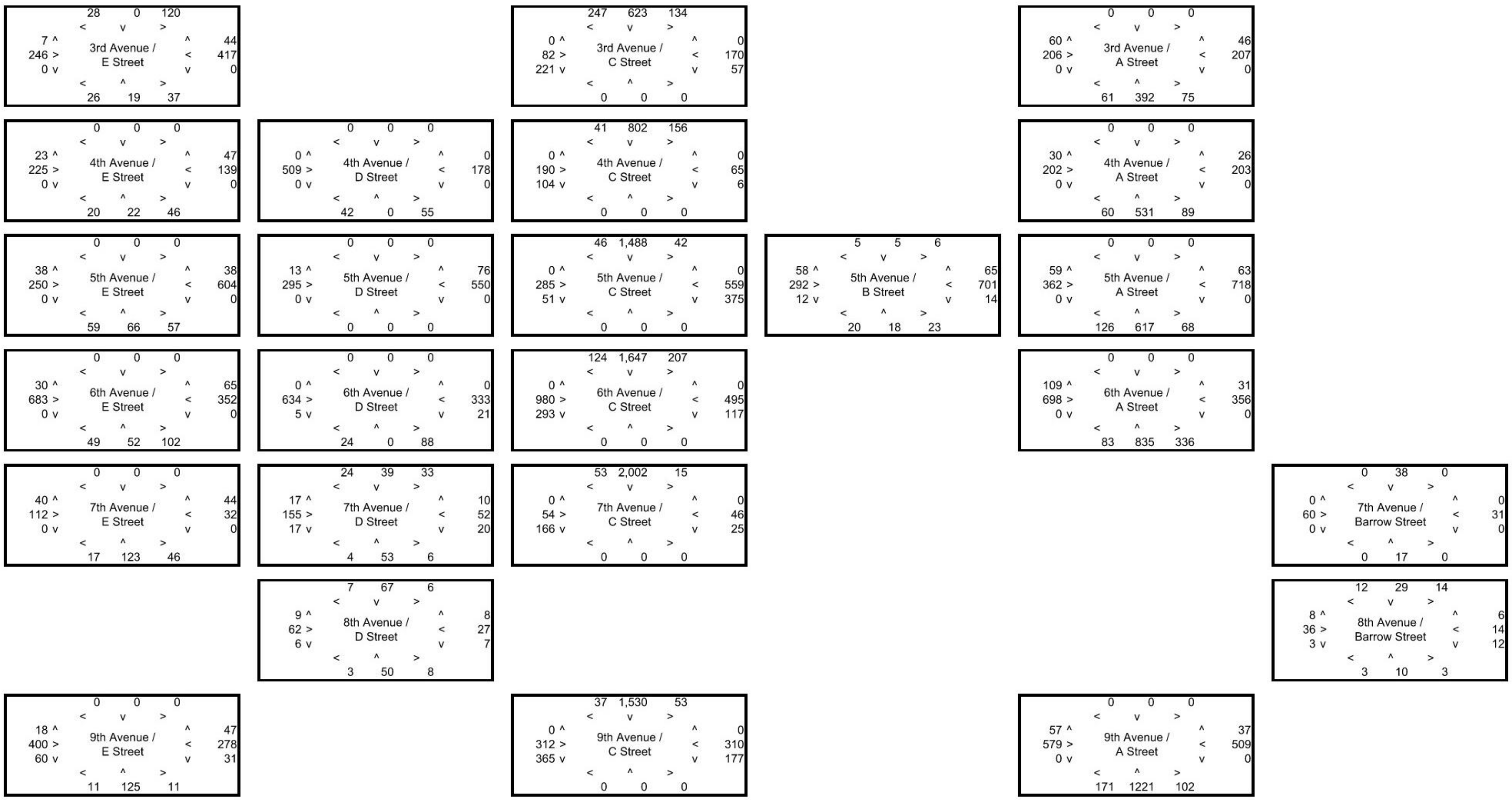


Figure C-36: Two-Way Conversion Between I/L Streets and Ingra/Gambell Streets PM TMVs – E Street to Barrow Street

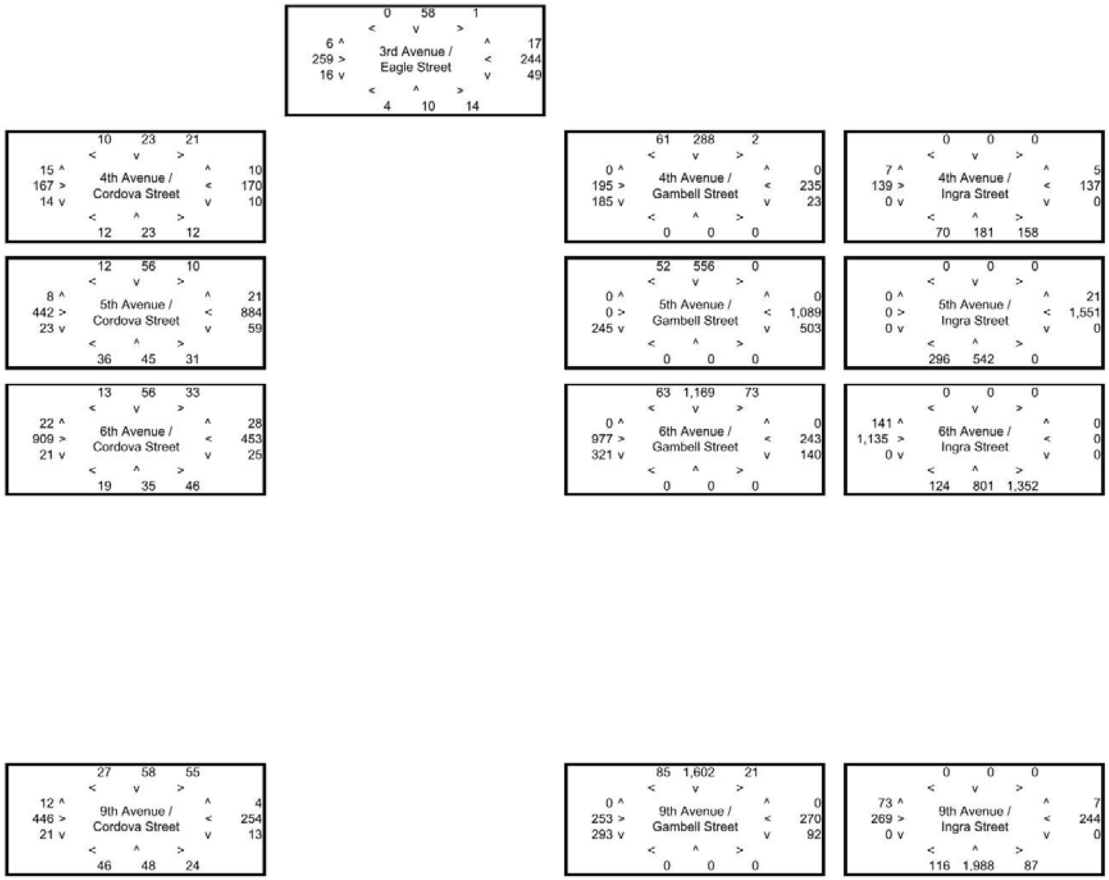


Figure C-37: Two-Way Conversion Between I/L Streets and Ingra/Gambell Streets PM TMVs – Cordova Street to Ingra Street

Appendix D Speed Limit Reduction Studies

Summary

Reducing vehicle speeds can increase safety for all road users, especially vulnerable road users. Speed limit reduction case studies from six cities were reviewed. In most cases, cities lowered speed limits, installed new speed limit signs, and publicized the change through public awareness campaigns, but many did not implement physical traffic calming treatments. These actions were a part of each city's Vision Zero initiative to reduce fatal and severe injury crashes.

Most of the studies found that there were benefits (or potential benefits) to vulnerable road users due to reductions in vehicle speeds, especially a reduction in the number of vehicles traveling at higher speeds. Nevertheless, speed limit reductions were not uniform across all roadways.

Seattle, Washington

To eliminate traffic fatalities and serious injuries, the Seattle City Council revised municipal codes in 2016 to lower default residential street speed limits from 25 mph to 20 mph and arterial street speed limits from 30 mph to 25 mph. This initiative began in the downtown area and later expanded to include urban villages. By 2020, Seattle Department of Transportation (SDOT) had installed new speed limit signs on over 90 miles of arterial streets, at ¼ mile increments, and planned to extend this to an additional 270 miles by May 2021.

A 2020 SDOT study across five urban centers revealed reductions in driver speeds, total crashes, and injury crashes after the speed limit reduction. Median driver speeds, 85^{th} percentile speeds and driver speeds above 40 mph were reduced by 9.9%, 7.1%, and 54.1% respectively. Total crashes were reduced by 22% and injury crashes decreased by 18%. These results indicate that lowering speed limits, even without additional marketing campaigns or enforcement, can effectively decrease driver speeds and enhance overall road safety.

Boston, Massachusetts

Boston lowered urban speed limits from 30 mph to 25 mph under its Vision Zero program. Boston's initiative resulted in a 29.3% reduction in the odds of drivers traveling over 35 mph. The initiative not only improved road safety but also collected growing community support, leading the Boston City Council to consider further reducing the speed limit to 20 mph and expanding the city's 20 mph Neighborhood Slow Street Zones.

Cambridge, Massachusetts

In March 2016, Cambridge City Council adopted Vision Zero and implemented measures to reduce speed limits from 25 mph to 20 mph on most local-access streets to enhance safety. Signs were installed at the entrance of each street and at intersections with major roads, ensuring that drivers were informed of the new speed limits.

A speed study on Broadway Street found that the implementation of the lower speed limit, coupled with clear signage and public awareness campaigns, resulted in a significant reduction in the 85th percentile speed from 29.3 mph to 25.9 mph. On Hampshire Street, similar actions led to a decrease in the 85th percentile speed from 27.9 mph to 25.1 mph. Additionally, the Cambridge Police Department employed a data-driven approach to enforcement, targeting areas with high crash rates and conducting proactive enforcement based on detailed crash analyses.

New York, New York

In New York, New York a multi-faceted approach was taken to increase traffic safety. In 2014 the Department of Citywide Administrative Services installed red light cameras and speed cameras at key intersections resulting in a 31% decrease in pedestrian injuries and 20% decline in all injury crashes. In addition, the citywide speed limit was reduced from 30 mph to 25 mph, increasing pedestrian crash survival rates from 20% to 30%. Additionally, penalties were implemented for dangerous driving, such as making it a misdemeanor to harm pedestrians or cyclists due to negligence, has aimed to deter reckless behavior effectively.

Additionally, the installation of new crosswalks, extended medians, and clearer lane designations have effectively reduced injury crashes by up to 63% at treated intersections. The introduction of traffic signal strategies, such as leading pedestrian intervals and coordinated arterial signal timing, has contributed to a safer traffic environment by minimizing speeding and intersection conflicts. As a result of these multifaceted approaches, fatalities at locations where major engineering changes were implemented since 2005 have decreased by 34%.

Portland, Oregon

In January 2018, Portland Bureau of Transportation (PBOT) implemented a speed limit reduction on residential streets from 25 mph to 20 mph. The initiative was supported by a comprehensive public awareness campaign known as "20 Is Plenty," which included extensive signage updates and community outreach efforts.

Before-and-after observations at 58 locations indicated average speeds were essentially unchanged (21.6 mph before the change and 21.7 mph post-implementation). However, the likelihood that vehicles would be driving above the speed limit was reduced significantly, with a 50% reduced likelihood of a vehicle driving at above 35 mph on the residential streets. Statistical models confirmed these reductions were significant, accounting for factors such as time-of-day, day-of-week, vehicle type, and roadway characteristics.

Minneapolis, Minnesota

In 2021 Minnesota Department of Transportation (MnDOT) lowered the default speed limit on most city streets from 30 mph to 20 mph, with select streets posted at 25 mph, 30 mph, or 35 mph. Driver speed data was collected before changes were implemented in summer 2020 and shortly after the implementation in June 2022. Mean driver speeds decreased at most locations.

The analysis indicated a general trend toward lower speeds, but the impact was not uniform across all locations: some locations experienced minimal changes in speeds or even increases in mean speeds. The data were collected shortly after the signs were installed, potentially not allowing enough time for drivers to adjust their behavior. Driver behavior may have also been influenced by other external factors such as construction.

Appendix E Transit Treatments

In-lane Stops

Sidewalk Stops: At an in-lane sidewalk stop, buses stop in a travel lane or bus lane adjacent to the curb. Stopping in-lane reduces passenger delay, increases transit reliability, and reduces wear on transit vehicles. Converting existing pull-outs into in-lane sidewalk stops can improve pedestrian space. In-lane sidewalk stops a0re effective on streets with low to moderate transit frequency and speeds of 30 mph or lower. In-lane sidewalk stops are a cost-effective treatment at locations where changes are not required to the existing sidewalk. This treatment is recommended for use on streets where pedestrian space and accessibility can be enhanced, as well as in constrained conditions where street width prevents separate bike and transit facilities, necessitating a shared bus-bike lane.

Source: Google Maps

Figure E-38: Boarding Island Constructed with Zicla© Blocks in Bellevue, WA

Challenges include causing traffic to queue behind stopped transit vehicles in mixed traffic without dedicated lanes and creating safety hazards on two-lane, two-way streets when vehicles attempt to overtake stopped buses. Ensuring enough space for stop amenities without obstructing the accessible boarding area or pedestrian flow can be difficult on narrow sidewalks.

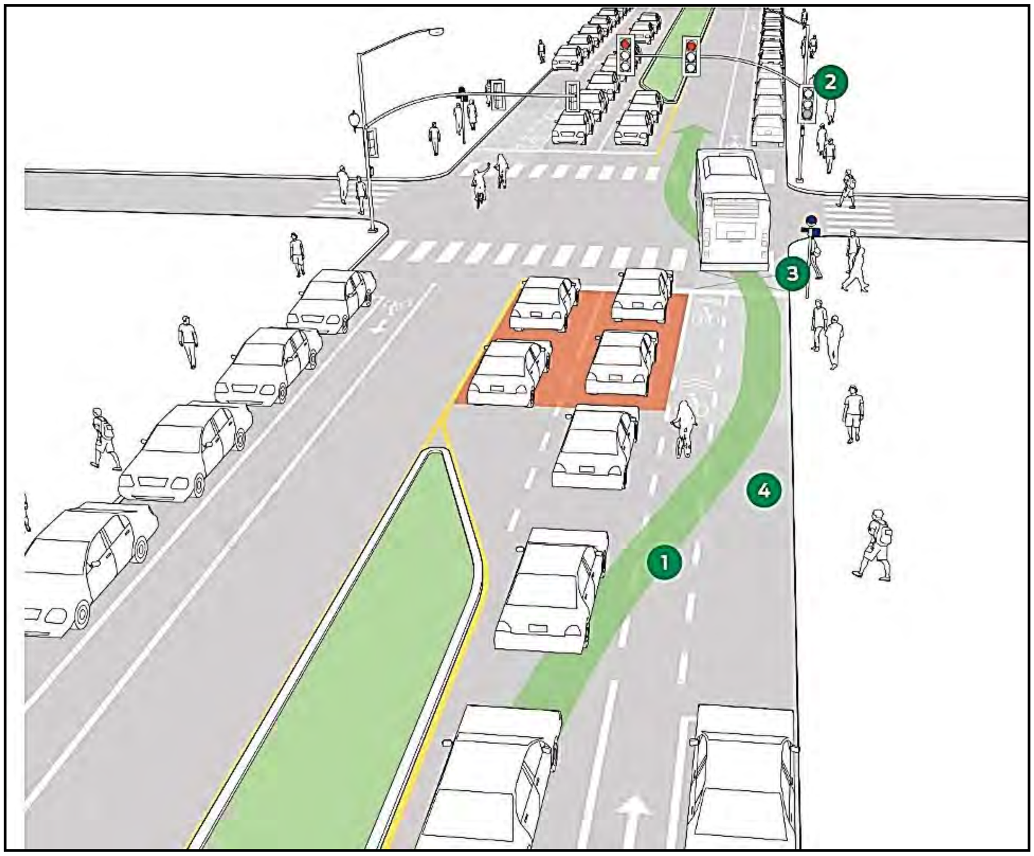
Side Boarding Islands: Side boarding islands (Figure E-38) are installed at locations with protected bike lanes. Raised platforms are installed separated from sidewalks, creating a protected bike lane for the length of the platform. Pedestrians will cross the bike lane to board the bus, creating a conflict point between pedestrians and bicycles.

Queue Jumps

Queue jumps enable buses to bypass other vehicles at signalized intersections (Figure E-39) using a leading bus interval or active signal priority. Queue jumps reduce bus delay, enhance schedule reliability, and improve overall transit performance by enabling buses to bypass congestion. Queue jumps can include a near-side or far-side stop, or it can be configured without a bus stop, depending on intersection dynamics and traffic conditions.

Queue jumps are effective at signalized intersections with low to moderate bus frequencies and high peak-hour traffic volumes, where they can enhance operational efficiency without compromising intersection safety.

Challenges associated with queue jump lanes are the need for adequate space for dedicated transit lanes and intersection modifications, potential impacts on right-turning traffic, and coordination with pedestrian movements.



Source: NACTO Transit Street Design Guide
Figure E-39: Example of a Queue Jump

Bus-only lanes

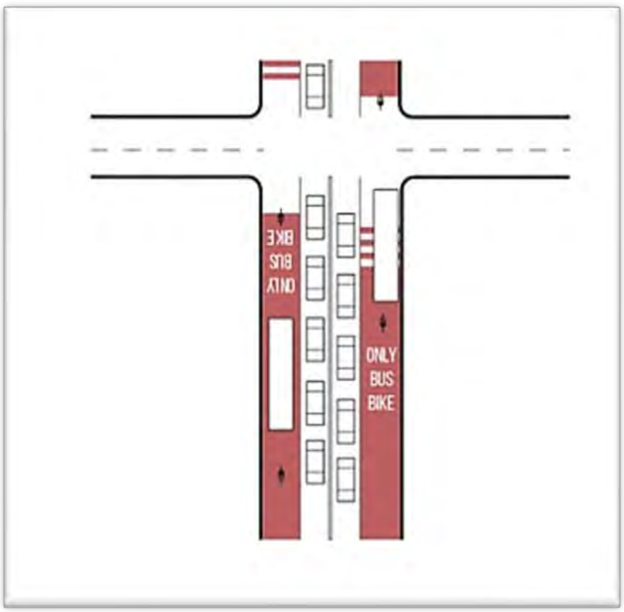
Bus-only lanes are lanes or segments of lanes exclusively for use by buses. Bus-only lanes allow buses to bypass congested areas streamlining operations and improving reliability. They are most effective in urban centers with high transit demand, on corridors prone to peak-hour congestion, and on major transportation routes connecting key districts. Signage, lane markings, and enforcement inform and reinforce an understanding of the use of the bus lane for general purpose drivers. Bus-lane restrictions may be time-of-day dependent.

Bus-only lanes may be obstructed by uninformed drivers. Community outreach programs and regular enforcement can improve compliance to bus-lane restrictions. More sophisticated strategies may be implemented if non-compliance persists.

Bus-Bike Lanes

Shared bus-bike lanes provide a dual-purpose solution for integrating buses and bicycles on low-speed urban streets. They are typically found on two-way streets with curbside or offset bus lanes. By allowing cyclists to pass buses only at stops and encouraging buses to stay behind cyclists, these lanes enhance safety and reduce conflicts. They improve transit service reliability by minimizing delays caused by interactions between buses and bicycles. As seen in Figure E-40, combined bus and bike lanes are wide enough for bikers to feel comfortable on the road.

Bus-bike lanes do not offer the same level of comfort as dedicated bikeways, especially during peak hours or on routes with high bus volumes and speeds. The interaction between buses and bicycles requires careful management to ensure smooth operation and minimize potential conflicts. Effective design includes clear pavement markings and signage to designate lanes for exclusive bus and bike use, along with appropriate lane widths that accommodate both modes safely, especially at bus stops where interactions are most frequent.

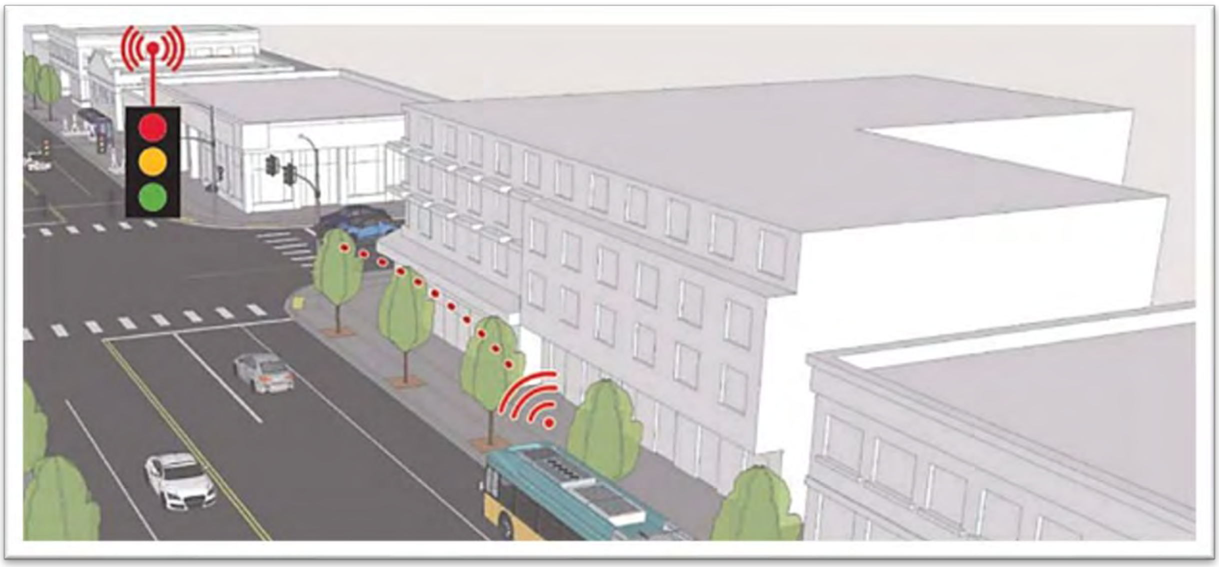


Source: NACTO
Figure E-40: Bus-Bike Lane

Transit Signal Priority

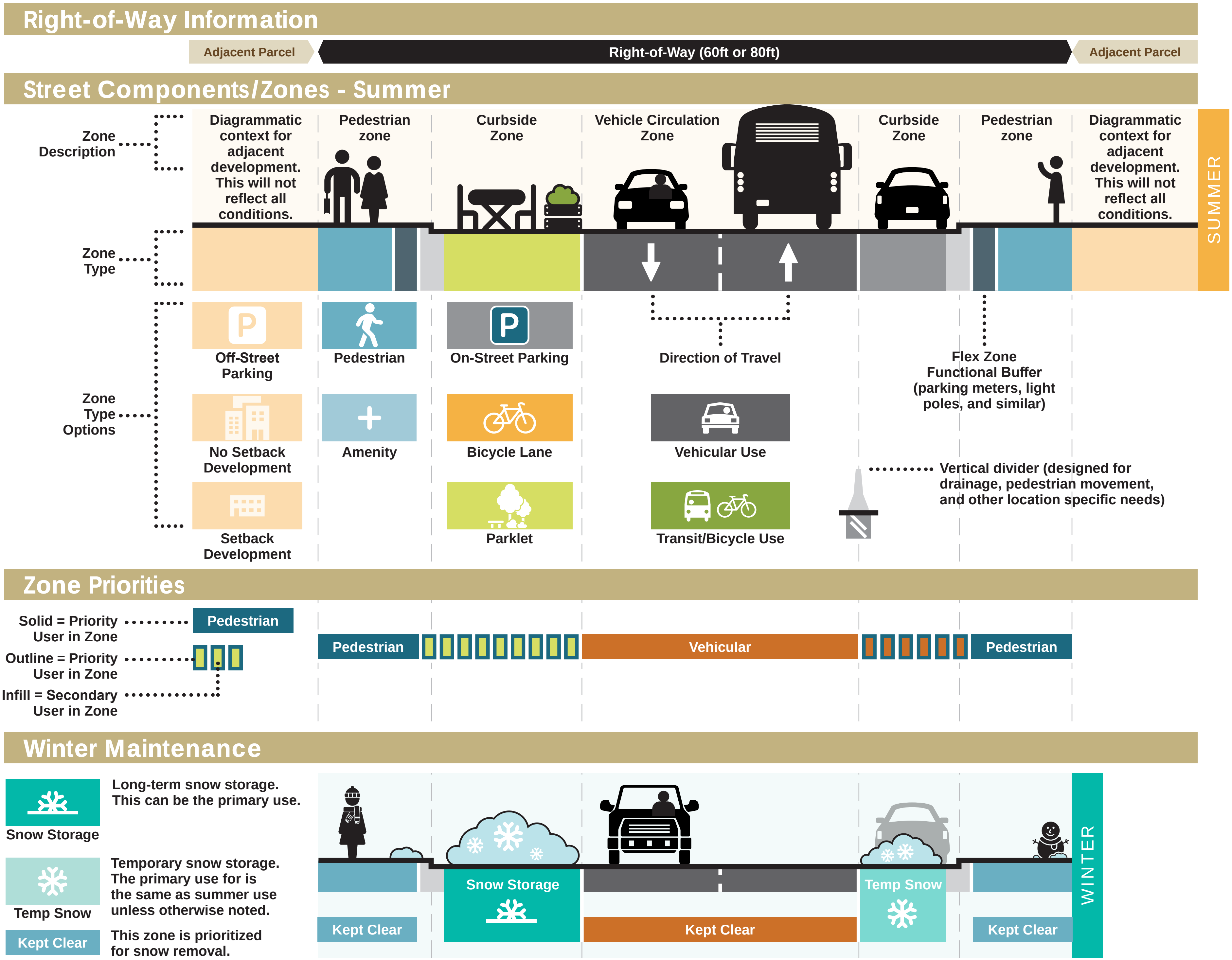
Transit Signal Priority (TSP) tools (illustrated in Figure E-41) adjust traffic signal timing to prioritize transit vehicles, reducing delays and improving reliability. Techniques such as green extension, red truncation, and phase insertion optimize traffic flow for buses at intersections; TSP is particularly beneficial on corridors with long signal cycles or high transit demand. Benefits include significant reductions in transit delay—up to 50% at targeted intersections—and improved travel time reliability, which is especially crucial where signal delays contribute significantly to overall transit delay. Implementing TSP requires coordination between transit agencies and signal operators, ensuring effective use of on-board and wayside technology to prioritize buses without affecting other traffic or pedestrians.

Challenges with TSP include potential delays for cross-street traffic and the need for sufficient bus volumes to justify implementation. It is most beneficial where transit vehicles can reliably reach intersections, supported by adequate detection systems and operational agreements. Locations ideal for TSP deployment include corridors with frequent bus service and intersections prone to transit delays due to signal phasing or traffic congestion. Proper planning and integration with existing signal systems and transit operations are essential for maximizing TSP effectiveness and minimizing impacts on overall traffic flow.

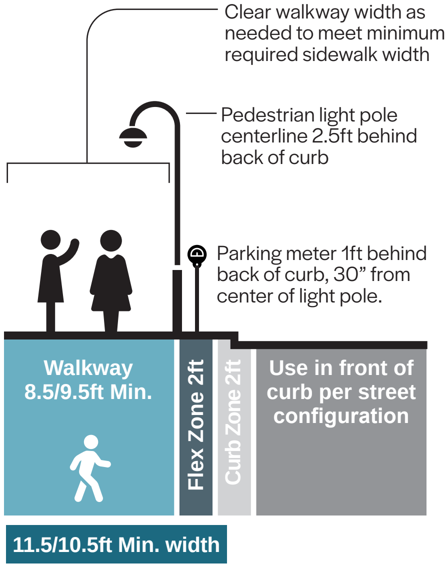


Source: King County Metro *Speed and Reliability Guidelines and Strategies*

Figure E-41: Transit Signal Priority, bus signaling to traffic light

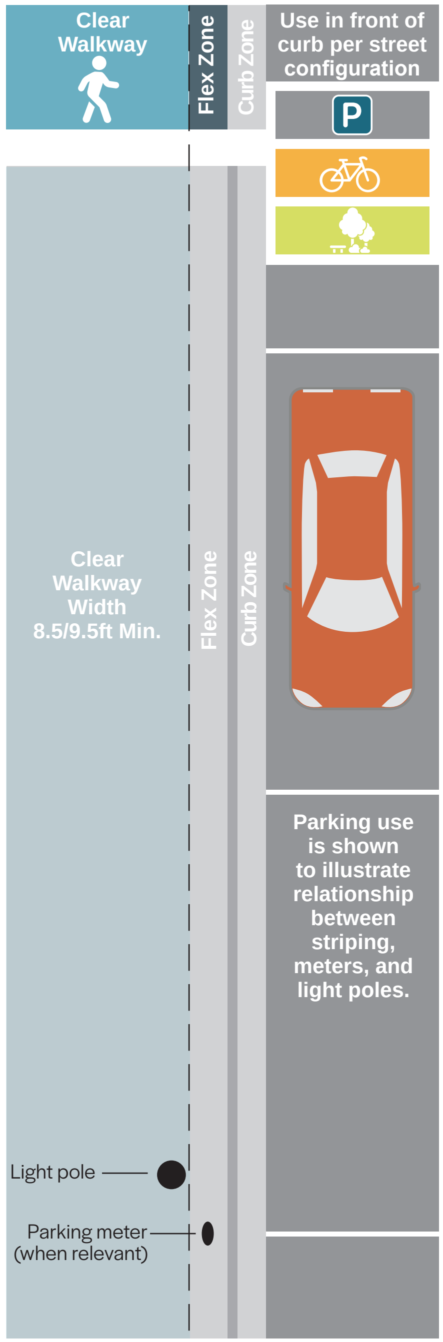

Right-of-Way Information
Adjacent Parcel
Right-of-Way (60ft or 80ft)
Adjacent Parcel
Street Components/Zones - Summer
Zone Description
Diagrammatic context for adjacent development. This will not reflect all conditions.
Pedestrian zone
Curbside Zone
Vehicle Circulation Zone
Curbside Zone
Pedestrian zone
Diagrammatic context for adjacent development. This will not reflect all conditions.
SUMMER
Zone Type
Zone Type Options
Off-Street Parking
Pedestrian
On-Street Parking
Direction of Travel
Flex Zone Functional Buffer (parking meters, light poles, and similar)
No Setback Development
Amenity
Bicycle Lane
Vehicular Use
Vertical divider (designed for drainage, pedestrian movement, and other location specific needs)
Setback Development
Parklet
Transit/Bicycle Use
Zone Priorities
Solid = Priority User in Zone
Pedestrian
Outline = Priority User in Zone
Infill = Secondary User in Zone
Pedestrian
Vehicular
Pedestrian
Winter Maintenance
Snow Storage
Long-term snow storage. This can be the primary use.
Temp Snow
Temporary snow storage. The primary use for is the same as summer use unless otherwise noted.
Kept Clear
This zone is prioritized for snow removal.
Snow Storage
Temp Snow
Kept Clear
Kept Clear
Kept Clear
WINTER

11.5 or 10.5ft Minimum Sidewalk Widths

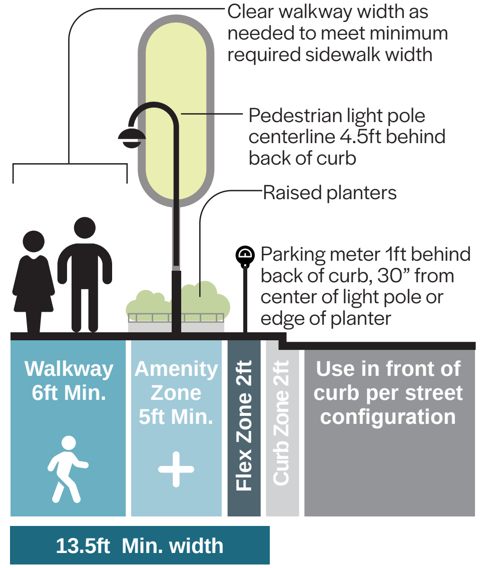


Minimum sidewalk width is defined by MOA requirements based on location.

Light poles are adjacent to (but offset from) parking striping, adjacent to front of vehicle, to reduce potential conflict with passenger doors and trunk access.

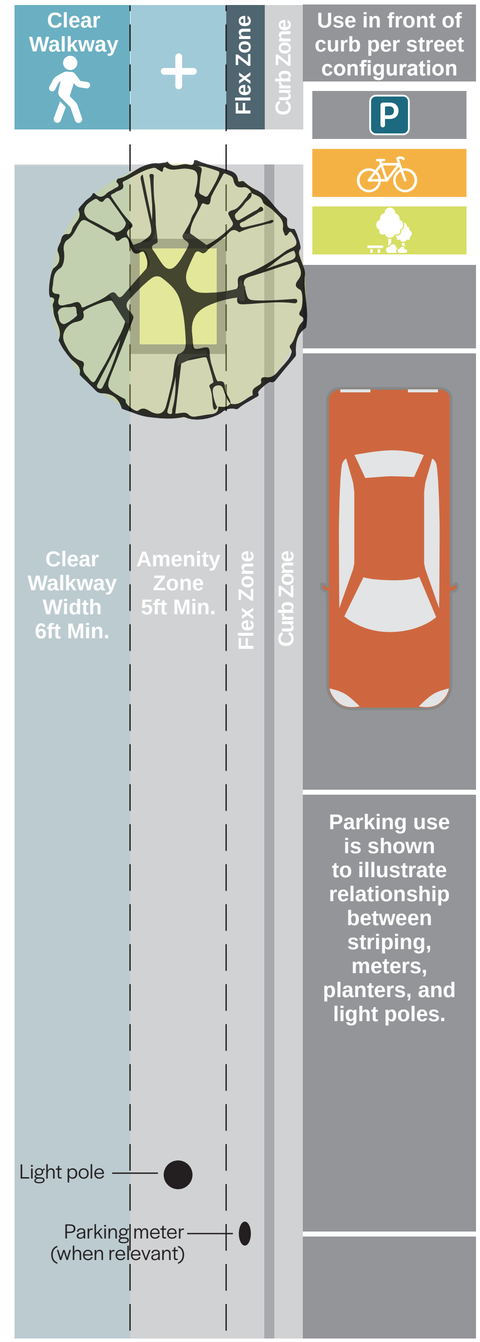


13ft or Greater Sidewalk Widths

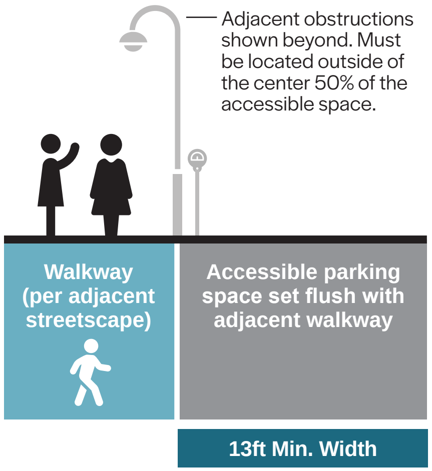


Minimum sidewalk width is defined by MOA requirements based on location, a minimum clear walkway width of 6 feet, and the remainder allocated to amenity zone use (5 feet minimum) or additional clear walkway width.

Light poles are adjacent to (but offset from) parking striping, adjacent to front of vehicle, to reduce potential conflict with passenger doors and trunk access. Planters are similarly aligned to be adjacent to the front of vehicles.



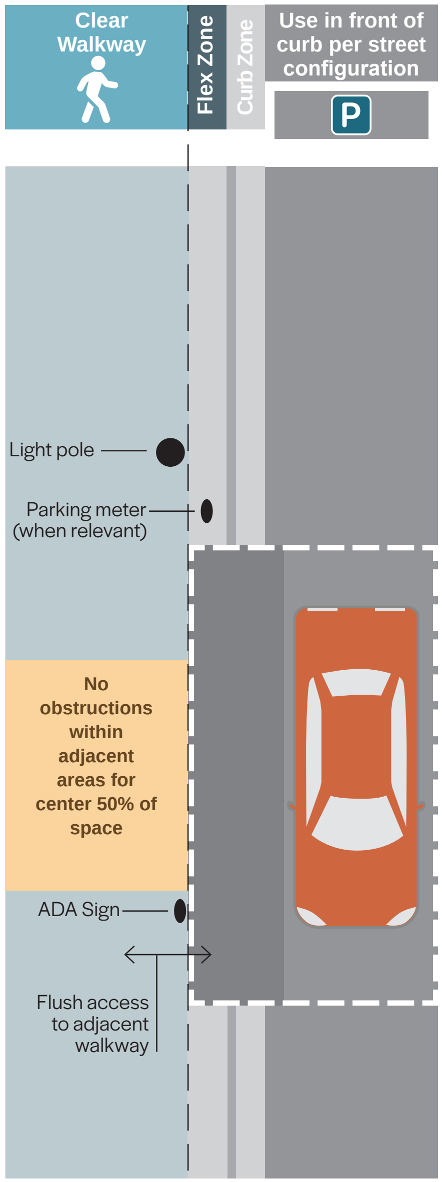
Parallel Accessible Parking - Flush with Sidewalk



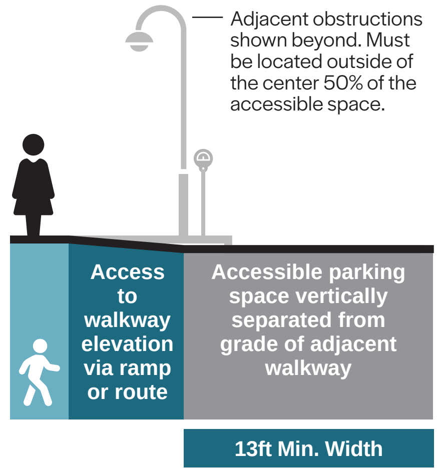
This diagram identifies the need for parallel accessible spaces, and illustrates the general intent for flush access.

It is important to consult Public Right-of-Way Accessibility Guidelines (PROWAG) for application and design guidance and requirements.

Note that alterations of existing streetscapes and new construction may be treated differently.



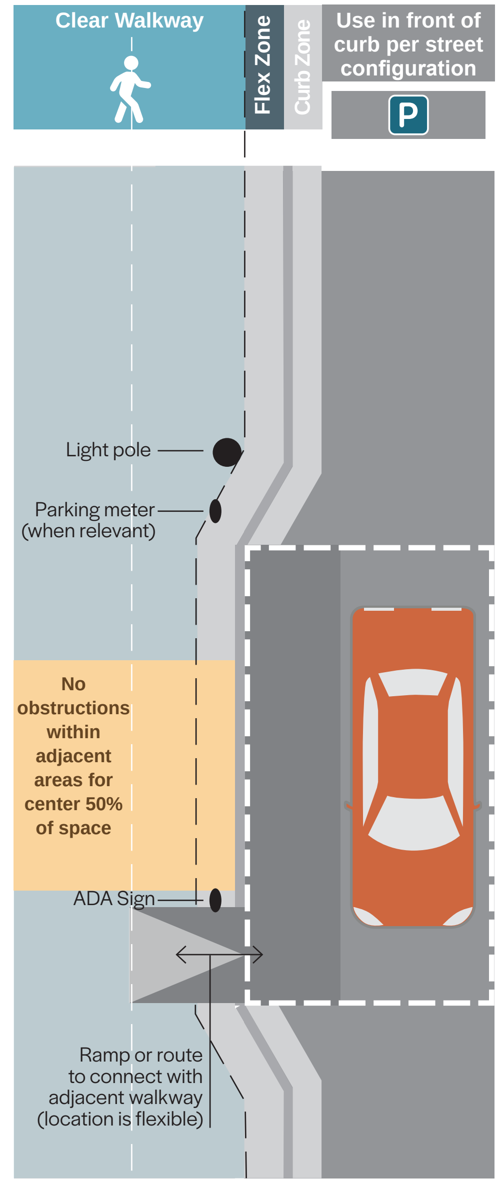
Parallel Accessible Parking - Ramped to Sidewalk



This diagram identifies the need for parallel accessible spaces, and illustrates the general intent of connecting between two elevations.

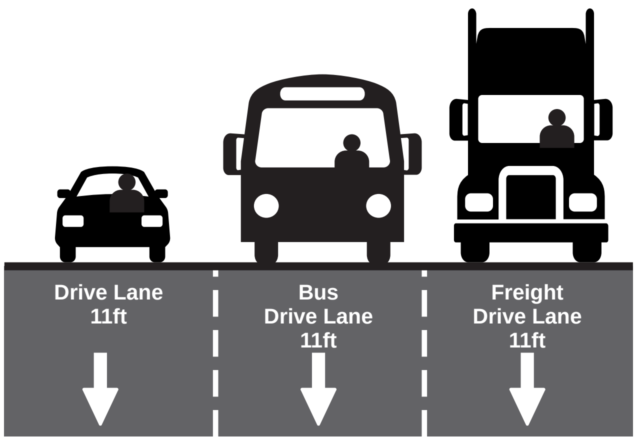
It is important to consult Public Right-of-Way Accessibility Guidelines (PROWAG) for application and design guidance and requirements.

Note that alterations of existing streetscapes and new construction may be treated differently.

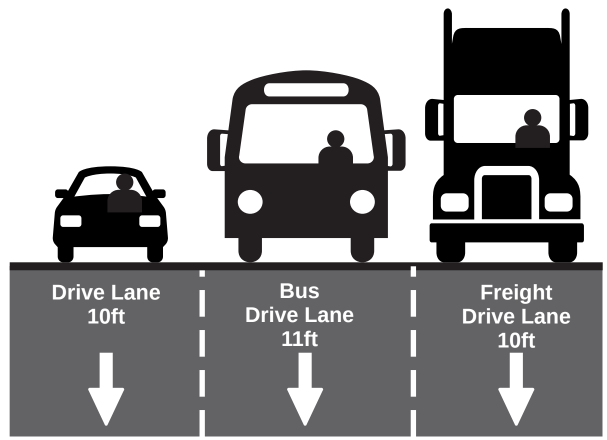


5' minimum route width to connect the accessible parking space to the adjacent pedestrian route. Reference PROWAG for requirements and additional options.

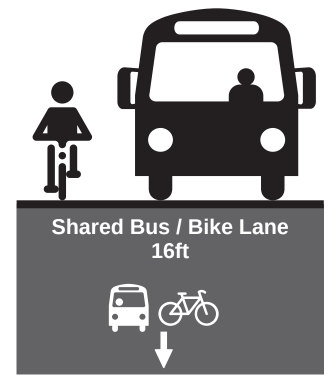
Arterial or Greater

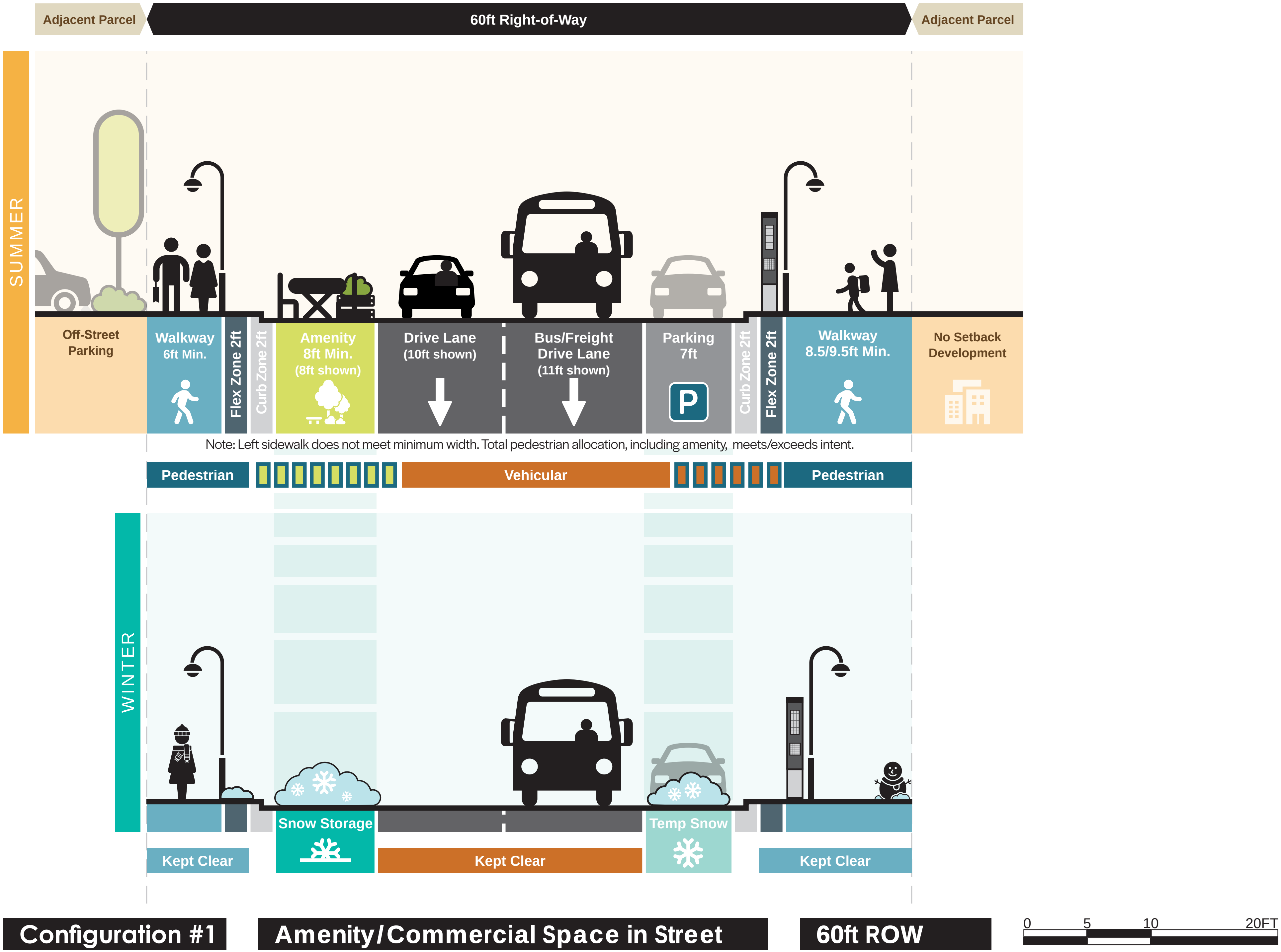


Drive Lanes: Collector or Lesser

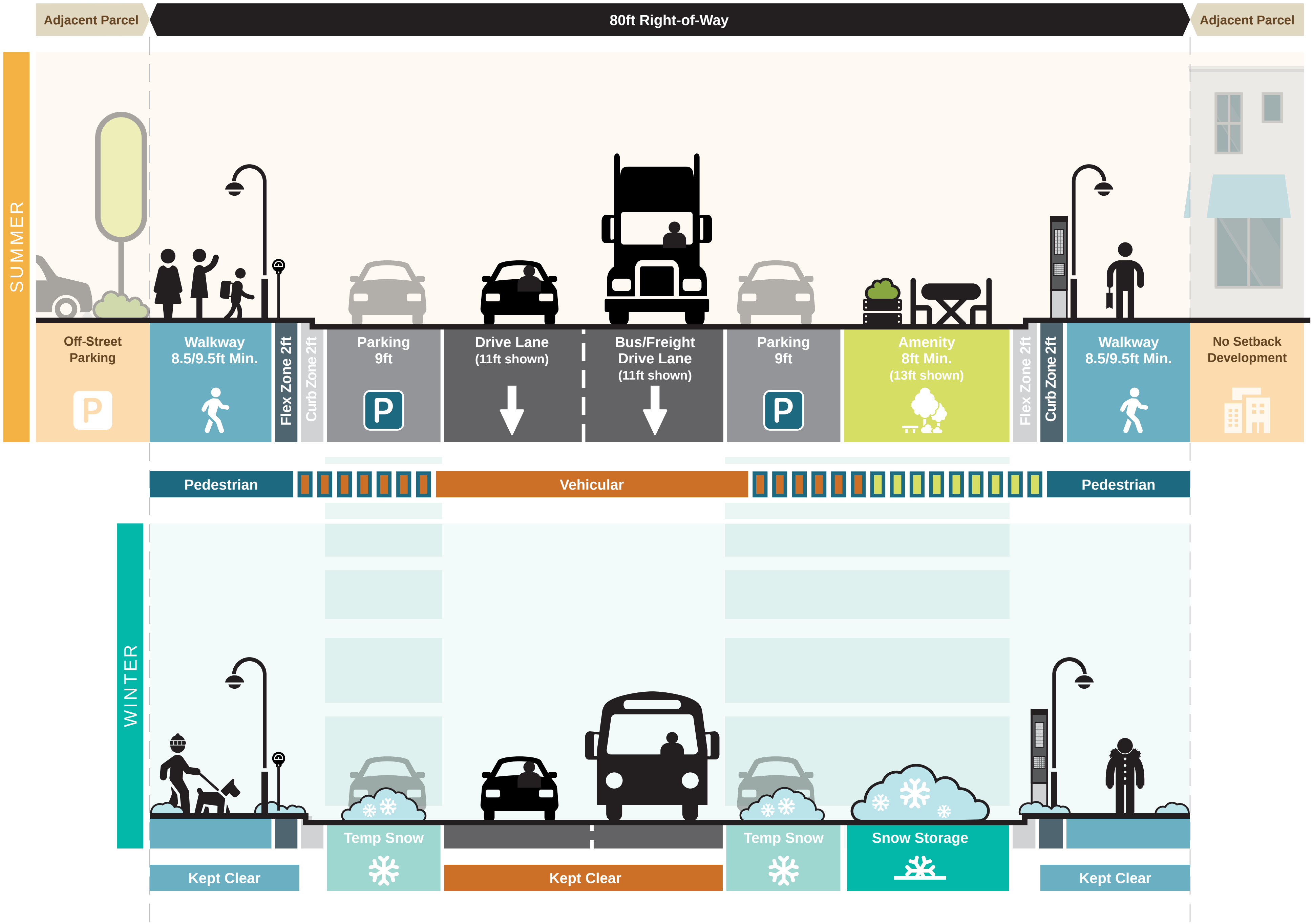


Shared Bus/Bike

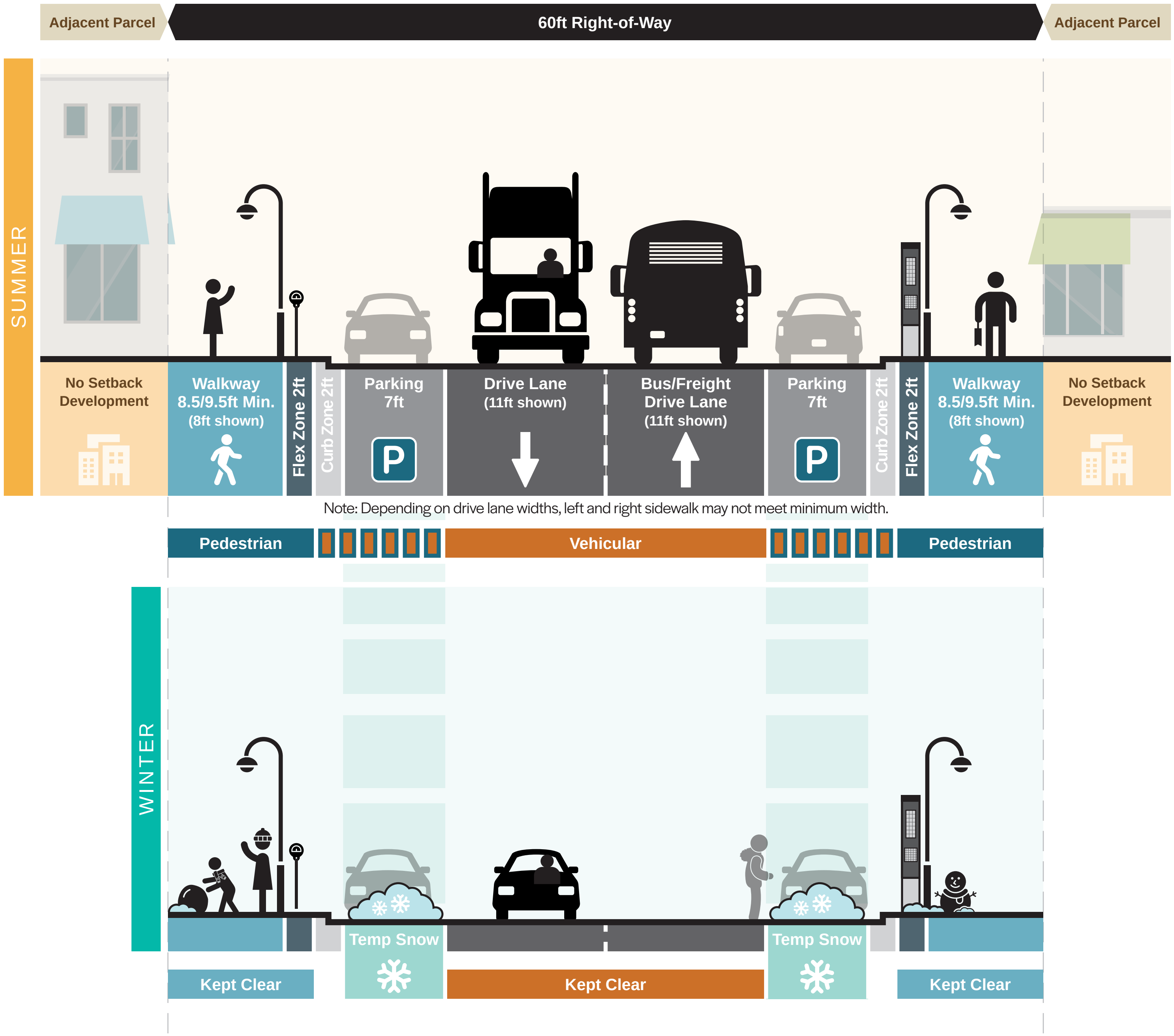




Configuration #1 **Amenity/Commercial Space in Street** **60ft ROW**

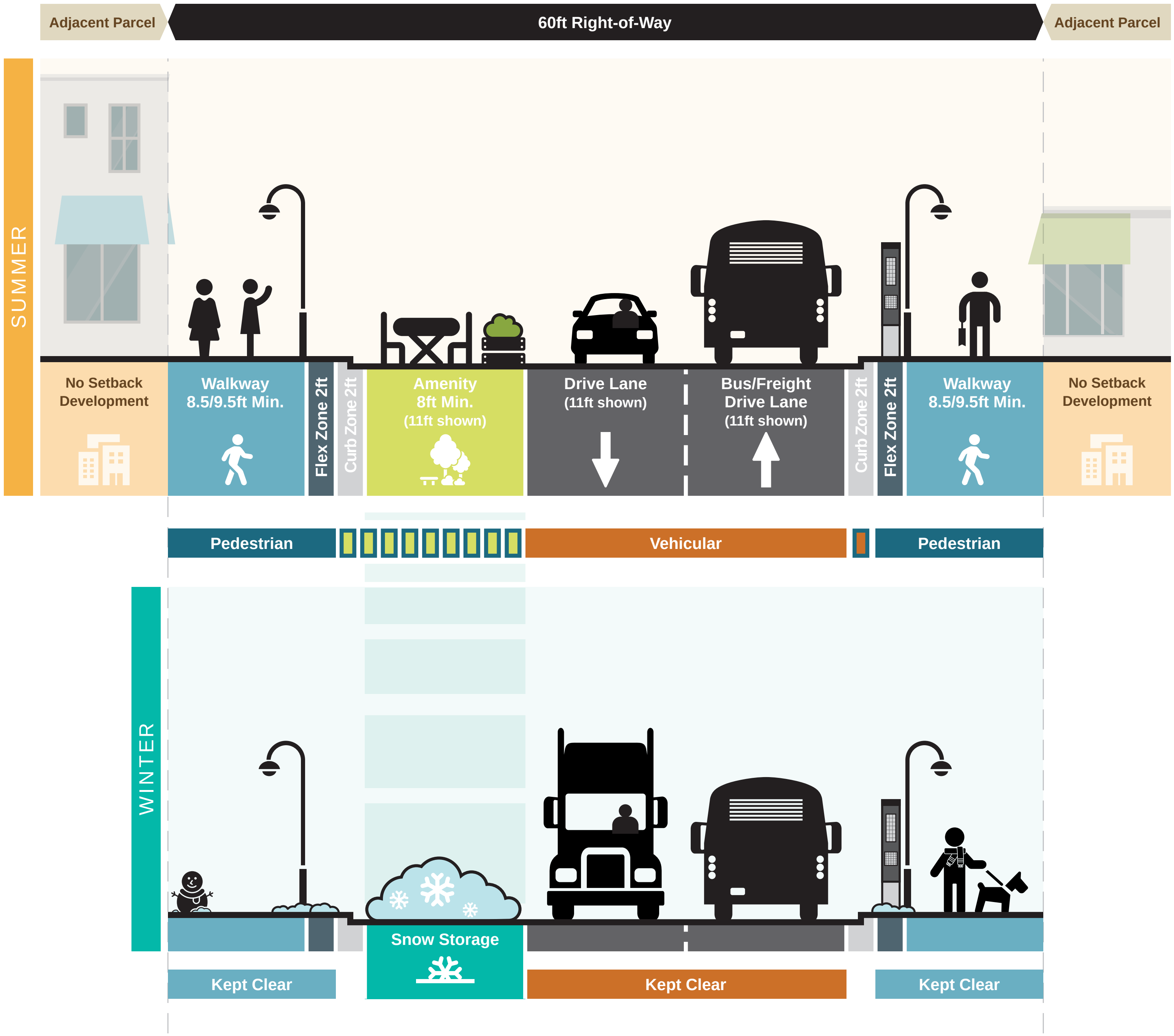


Configuration #2 | **Amenity/Commercial Space in Street** | **80ft ROW**

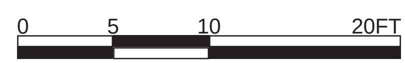


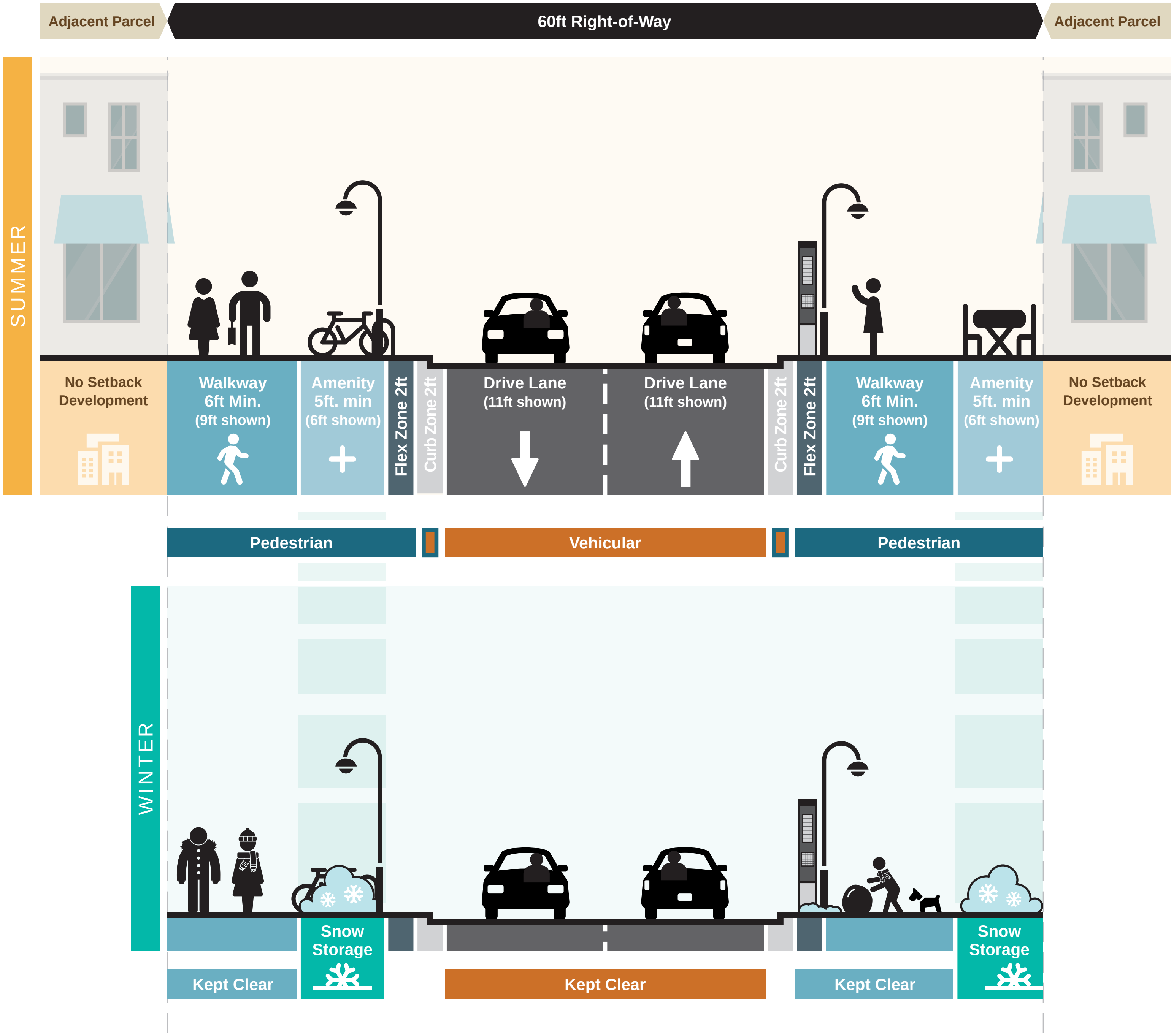
Configuration #3 **Parking Both Sides** **60ft ROW**

0 5 10 20FT

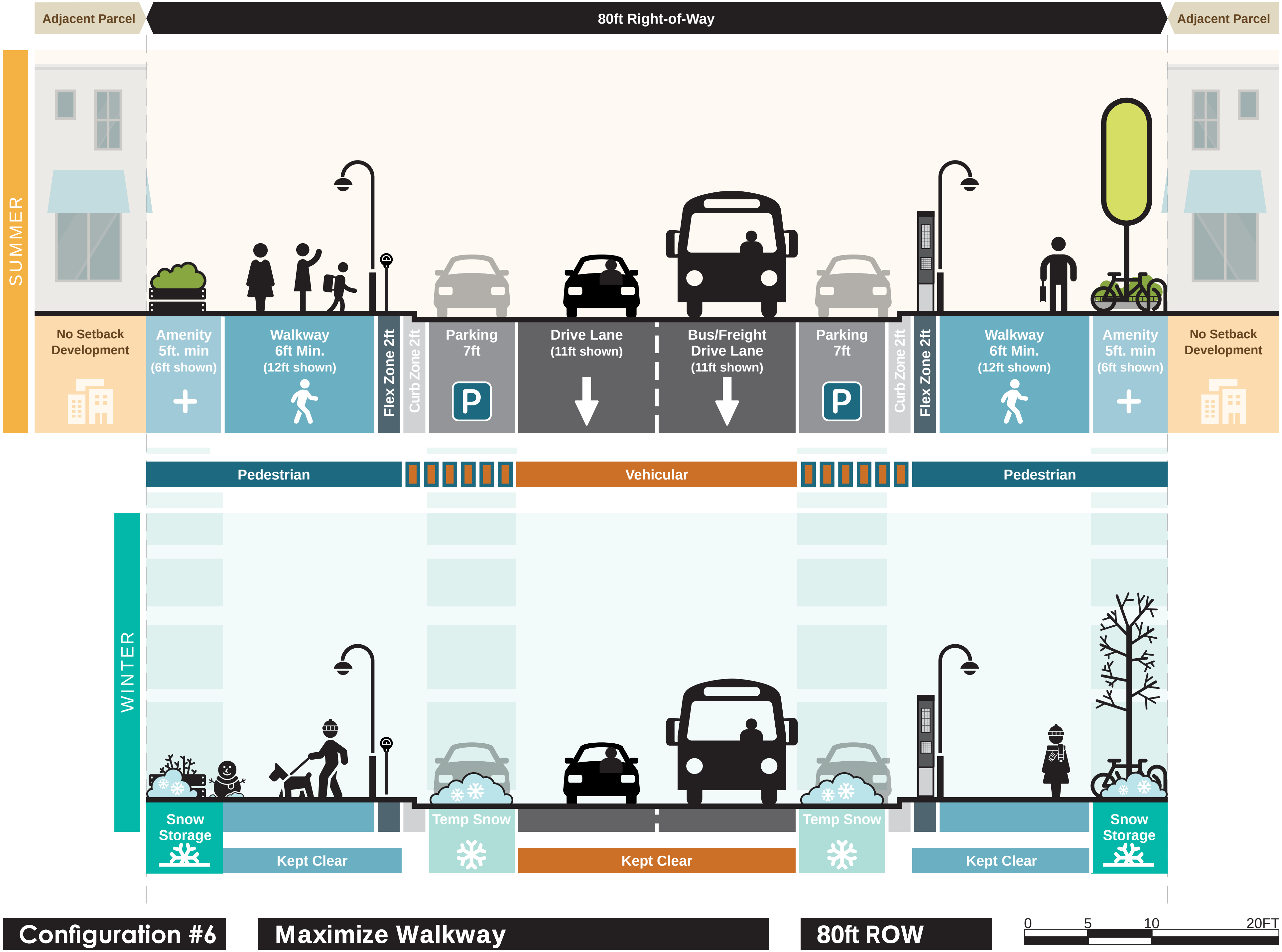


Configuration #4 **Amenity/Commercial Space in Street** **60ft ROW**

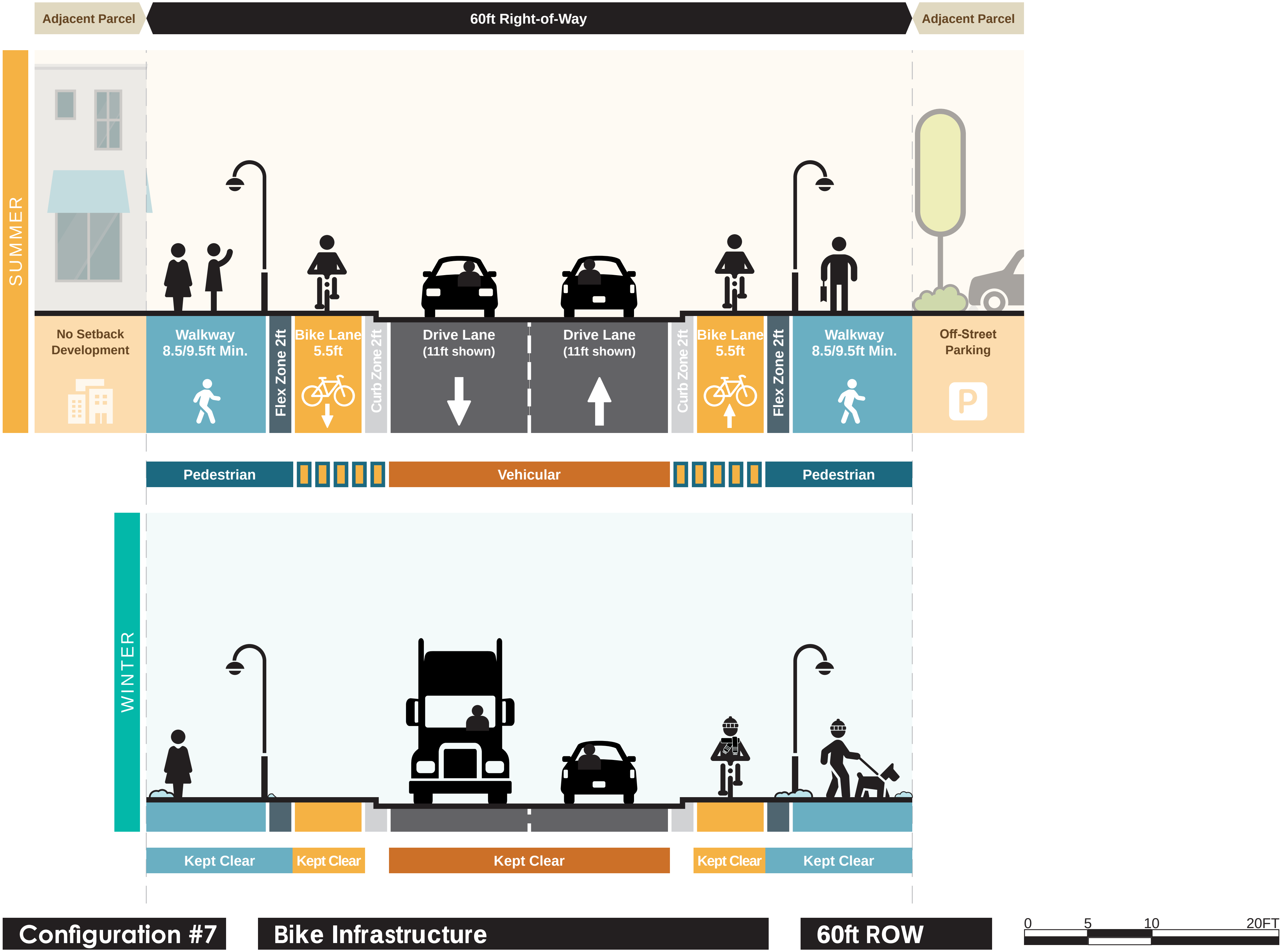




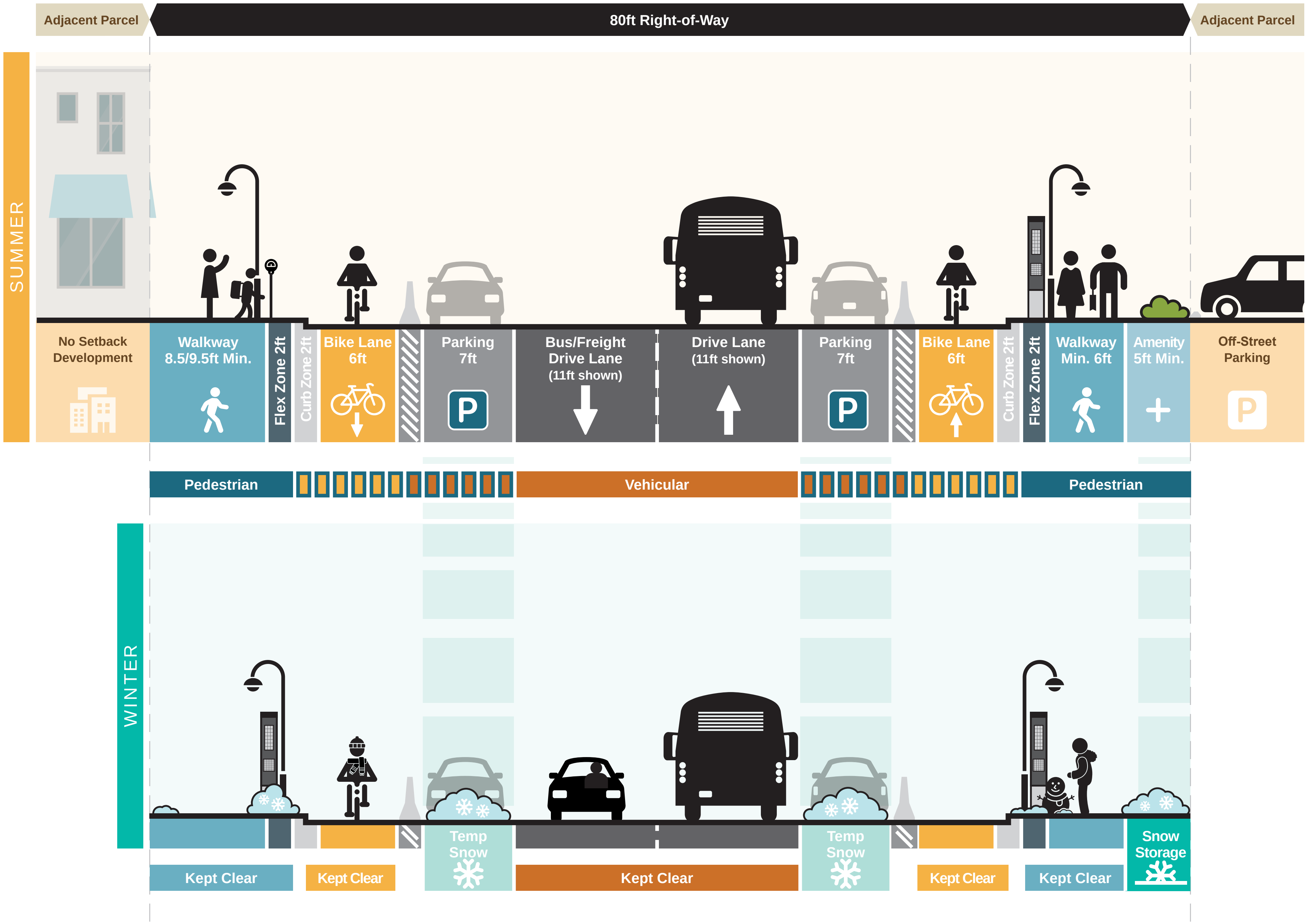
Configuration #5 **Maximize Walkway** **60ft ROW**



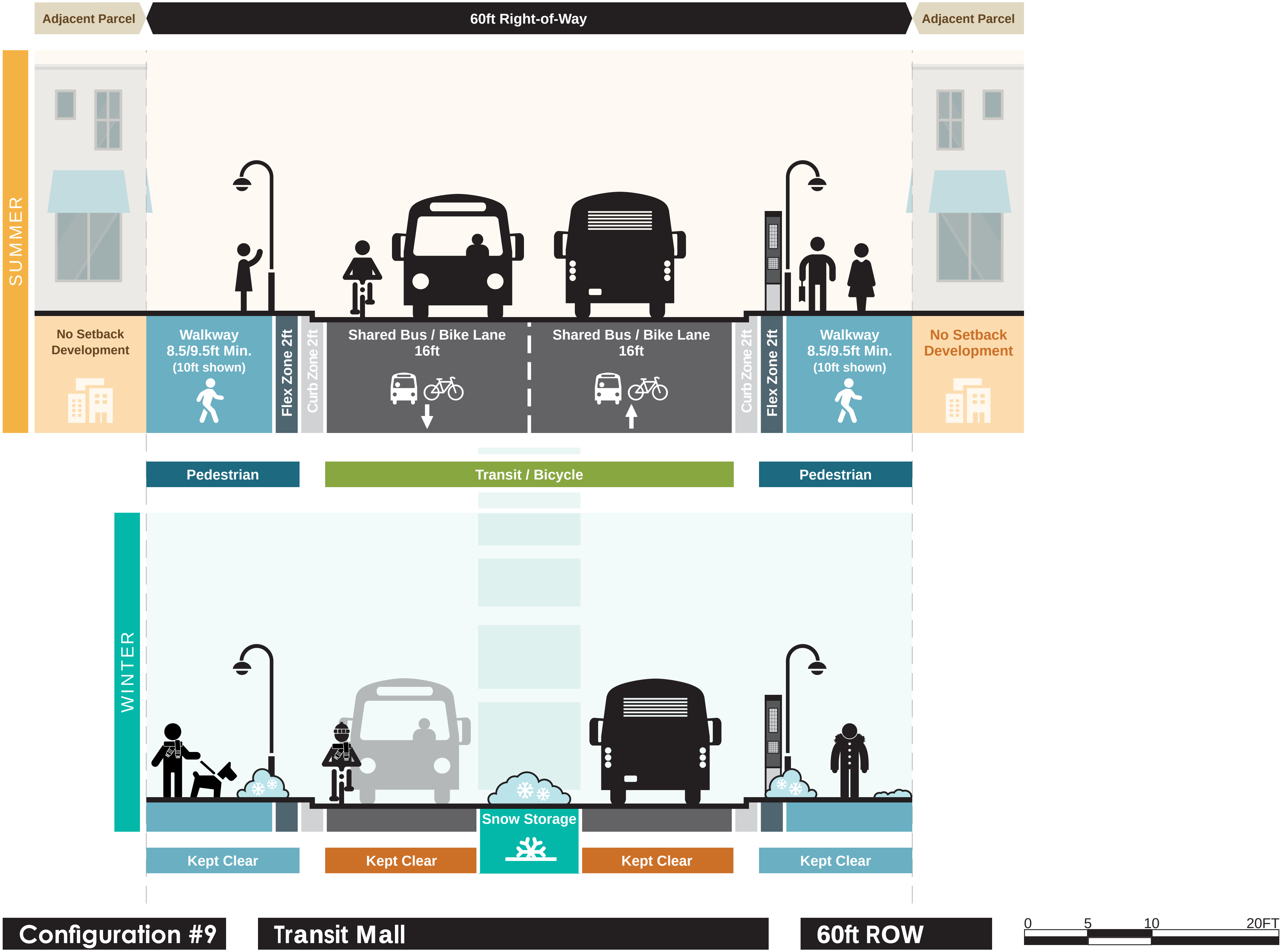
Configuration #6 | Maximize Walkway | 80ft ROW



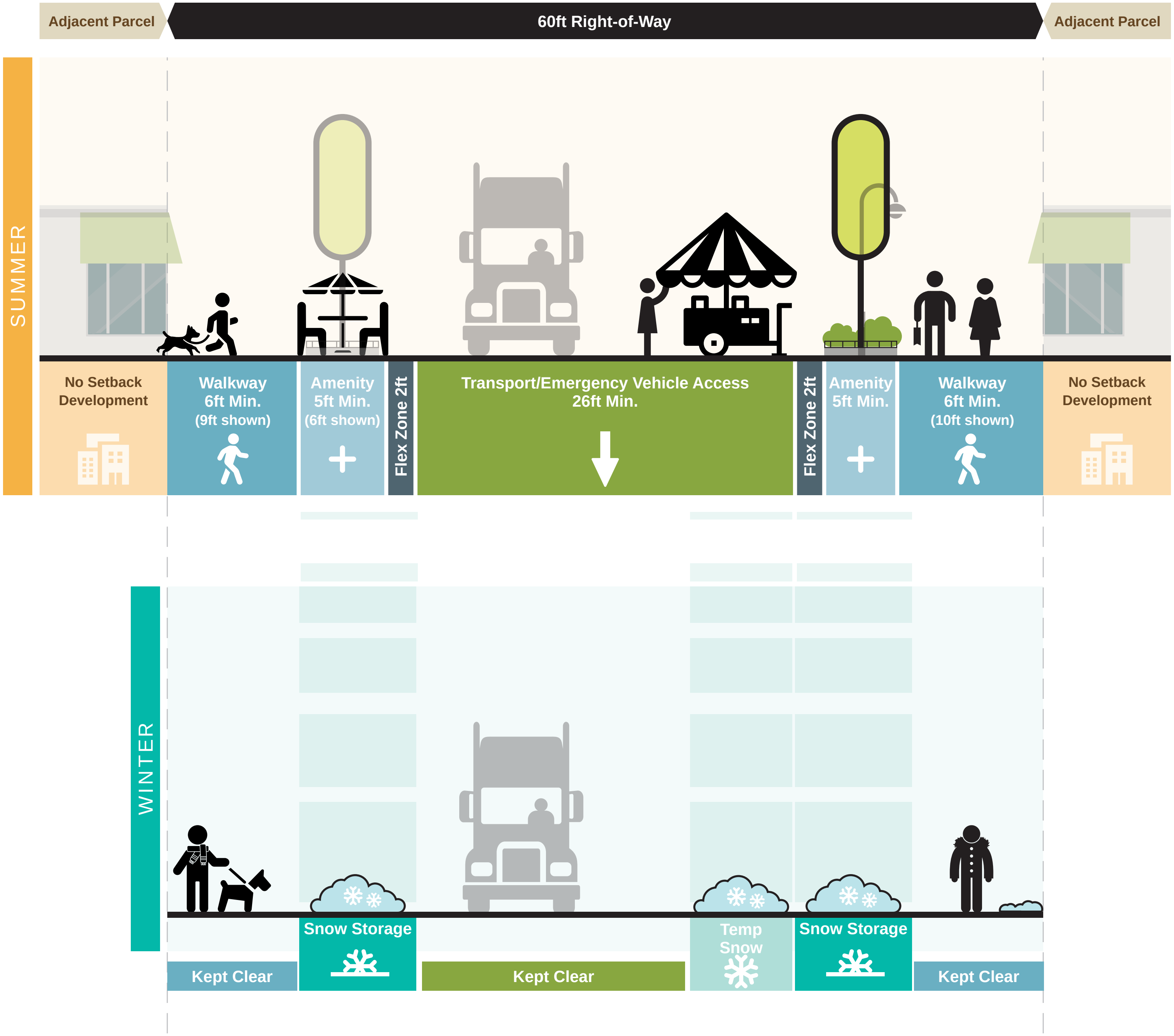
Configuration #7 | **Bike Infrastructure** | **60ft ROW**



Configuration #8 | Bike Infrastructure | 80ft ROW



Configuration #9 **Transit Mall** **60ft ROW**



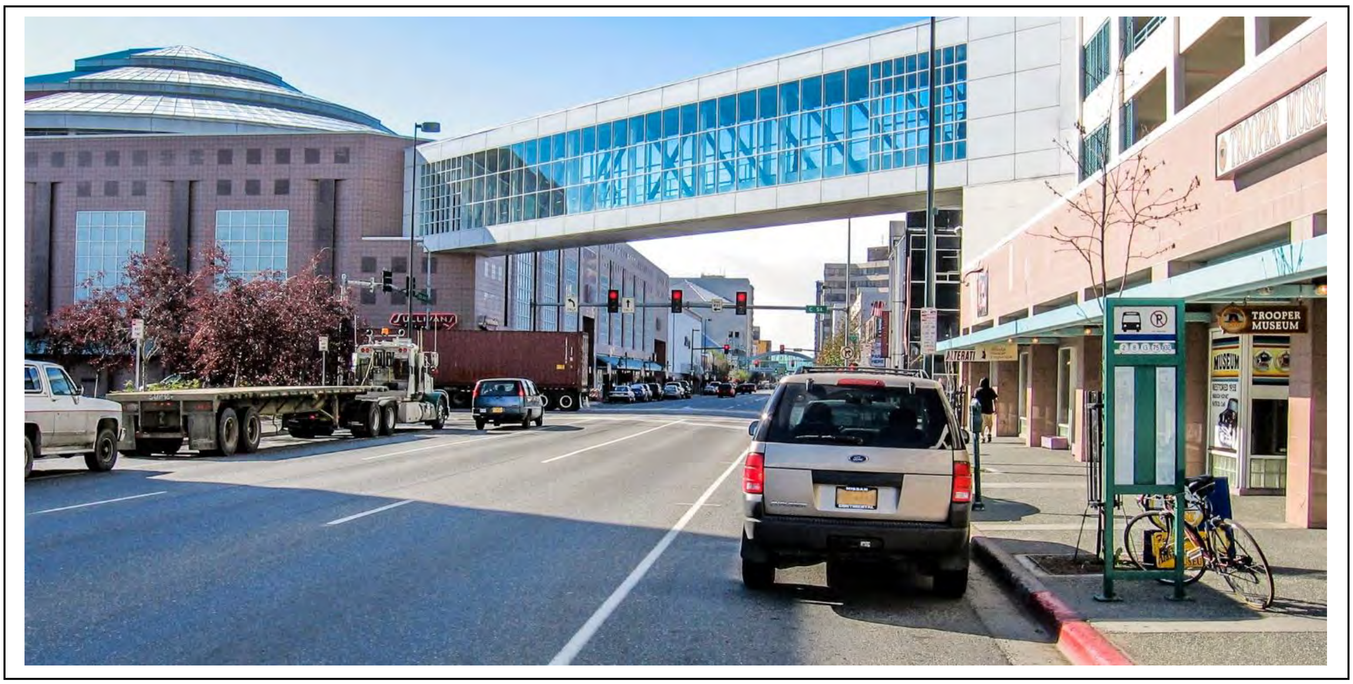
Configuration #10 **Pedestrian Infrastructure** **60ft ROW**

Downtown Streets Engineering Study

Purchase Order 2024000187

DRAFT Built Environment Research

June 2024



Prepared For:
Municipality of Anchorage

Prepared By:
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Anchorage, AK 99503
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AECL1102

Table of Contents

Figures

Tables

Abbreviations

AMATS	Anchorage Metropolitan Area Transportation Solutions
DOT&PF	Alaska Department of Transportation and Public Facilities
FHWA	The Federal Highway Administration
MOA	Municipality of Anchorage
NHS	National Highway Service
NMP	Non-Motorized Plan
PGDHS	*A Policy on Geometric Design of Highways and Streets*
KE	Kinney Engineering

1 Introduction

The Downtown Streets Engineering Study is a recommendation of the *Our Downtown Anchorage Downtown District Plan 2021*, approved by the Anchorage Assembly April 2023. The study includes the area bounded by N Street on the west, Ingra Street on the east, 10th Avenue on the south, and Ship Creek to the north, as shown in Figure 1.

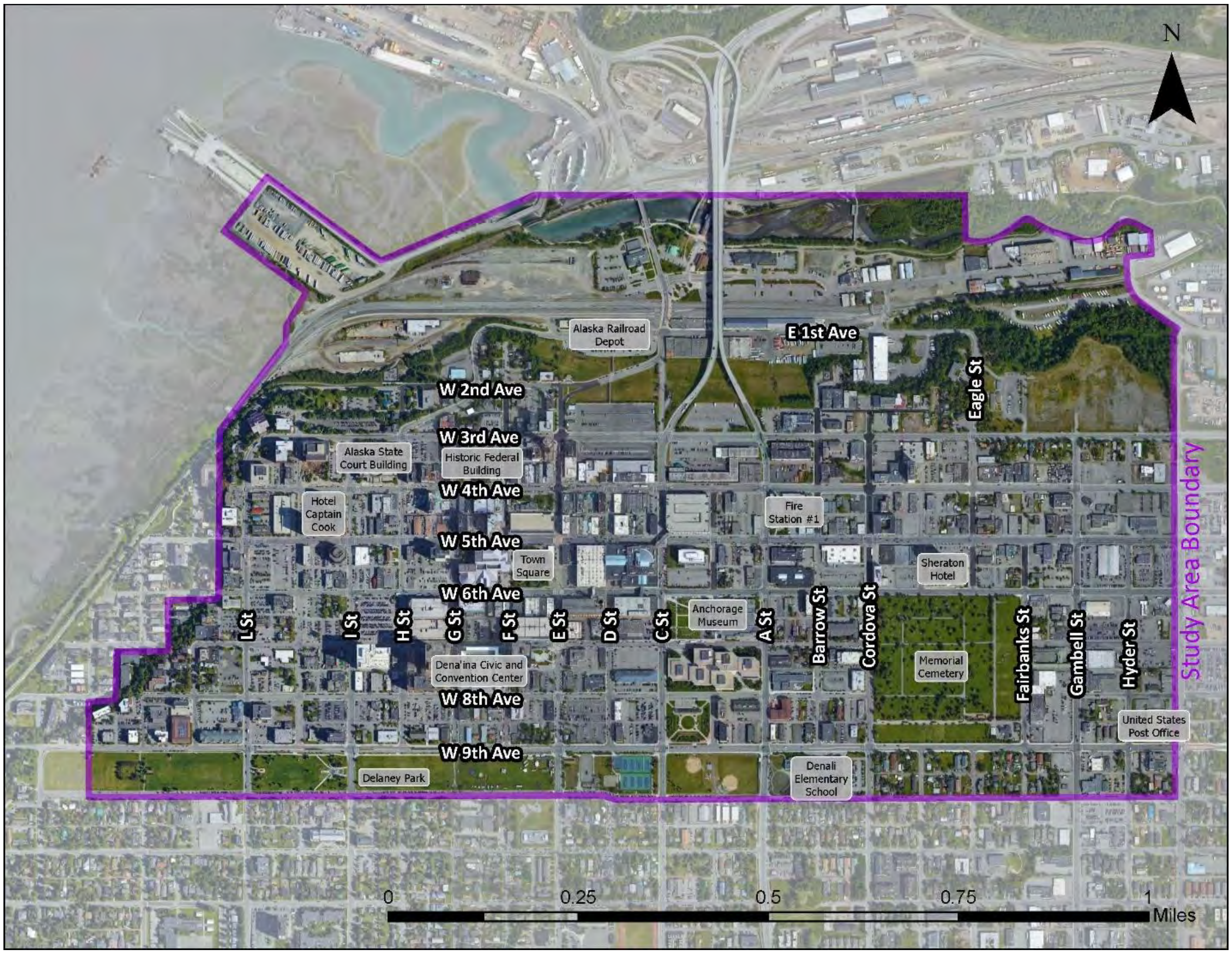


Figure 1: Downtown Streets Engineering Study Area Boundary

The desired outcomes of the Engineering Study include:

- Determine optimal ownership, operation, uses, and treatments to streets, sidewalks, and trails as proposed in the *2007 Downtown Plan*.
- Evaluate how the system is being used and by whom (including understanding travel to and from, within, and through downtown).
- Evaluate speed reductions; street conversions from one-way to two-way; street closures; bike boulevard connecting Ship Creek, Tony Knowles, and Chester Creek trails; transit

circulator route; coordinated parking strategy; secure bicycle parking; street ownership transfer; and truck traffic.

- Propose changes to the Design Criteria Manual and Title 21, if identified as a need.
- Update classification of downtown streets.
- Establish a Downtown Streets Capital Improvement Program (DTCIP). Provide information on how the street system should be changed, managed, and upgraded; provide timelines and cost estimates; identify the agencies responsibilities for project oversight.

This report describes background research that has been completed to support these outcomes.

2 Downtown Street Designations and User Types

The downtown Anchorage Street network serves passenger vehicles, pedestrians, and bicycles. Downtown streets are critical for moving freight and are essential to People Mover buses and Valley Transit buses. Every summer, downtown experiences an influx of tourists which increases pedestrian and bus volumes. On occasion, downtown streets are temporarily closed to host events such as the Running of the Reindeer and the ceremonial start of the Iditarod.

To make downtown Anchorage more accessible and connected for pedestrians, bicycles, and transit, multimodal transportation treatments have been identified through planning documents and stakeholder input.

2.1 Designations

Engineers and planners assign functional classifications to roads based on the desired use of the road within a network. Factors that can impact a roadway's functional classification include route length, access points, speed limit, route spacing, traffic volumes, and number of lanes.

The Municipality of Anchorage (MOA) and Alaska Department of Transportation and Public Facilities (DOT&PF) each have assigned functional classifications to downtown Anchorage streets. Additionally, several streets have a National Highway System (NHS) designation. Figure 2 shows each agencies classifications on a map, and Table 1 and Table 2 summarize the same information. Streets classified as "local" by the DOT&PF and "other" by the MOA are not included in the tables.

Between the two agencies, many streets have similar classifications. However, under the DOT&PF, classifications can be assigned on a block-by-block basis. For example, L Street is classified as a major collector between 3rd Avenue and 4th Avenue and as a minor collector between 4th Avenue and 5th Avenue. Additionally, in the study area, the highest classification assigned by the MOA is major arterial, while the DOT&PF classifies parts of Gambell Street, Ingra Street, 5th Avenue, and 6th Avenue as interstate.

NHS roads are important to the economy, mobility, and national defense. NHS roads tend to favor vehicular traffic over other modes or transport. More information about NHS road designations is in Appendix C: NHS Context and Applications.

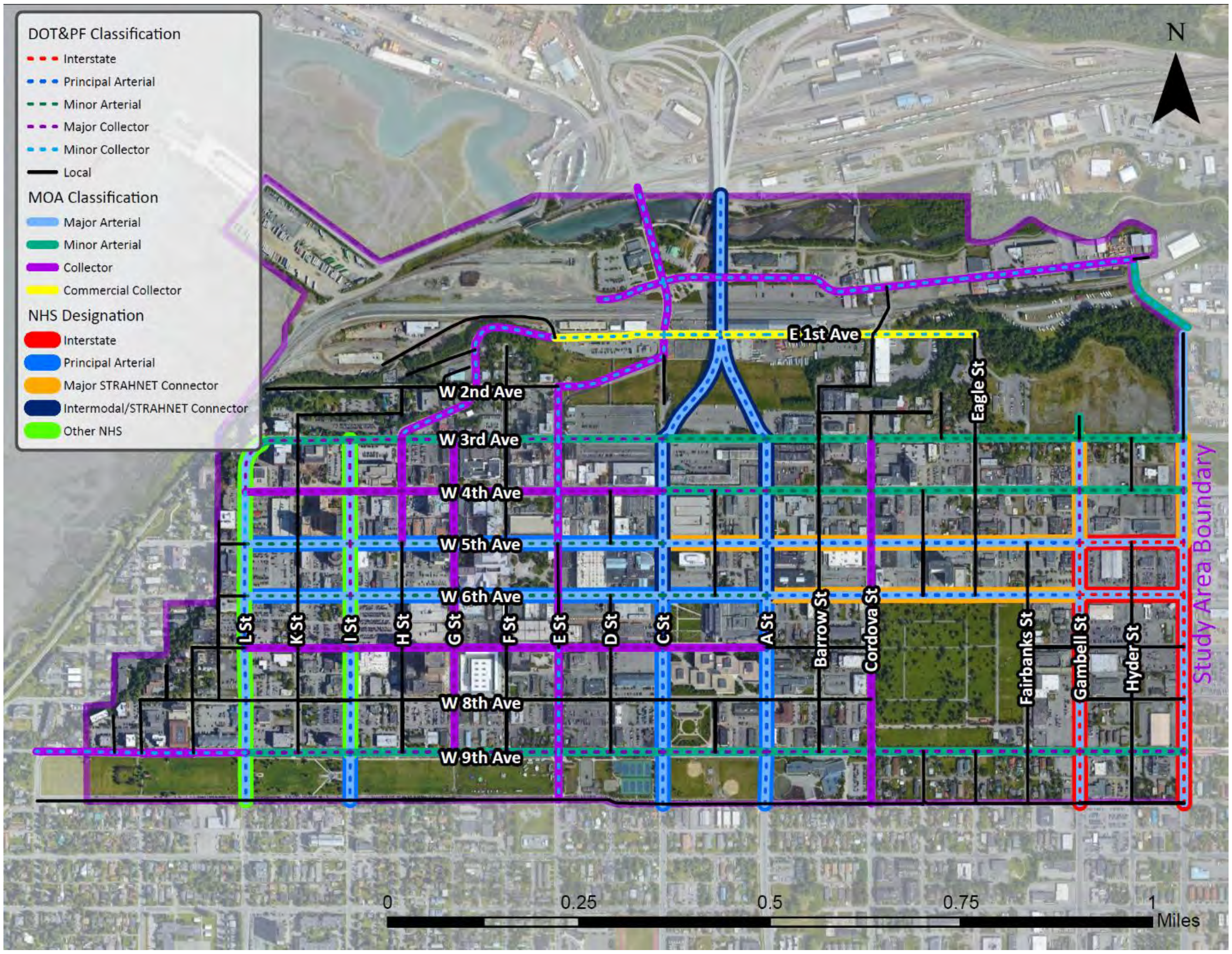


Figure 2. Functional Classifications of Downtown Anchorage Streets

Table 1. Functional Classification of West-East Oriented Streets in Downtown Anchorage

	North Extent	South Extent	MOA Classification	DOT&PF Classification	NHS Designation
L Street	3rd Avenue	4th Avenue	Major Arterial	Major Collector	Other NHS
	4th Avenue	5th Avenue		Minor Collector	
	5th Avenue	10th Avenue		Principal Arterial	
I Street	3rd Avenue	6th Avenue	Major Arterial	Major Collector	Other NHS
	6th Avenue	10th Avenue		Principal Arterial	
H Street	3rd Avenue	5th Avenue	Collector	Major Collector	
G Street	3rd Avenue	9th Avenue	Collector	Major Collector	
E Street	2nd Avenue	5th Avenue	Collector	Minor Collector	
	7th Avenue	10th Avenue		Minor Collector	
N C Street	1st Avenue	3rd Avenue	Collector	Minor Collector	
Port Access Road	Whitney Road	3rd Avenue	Major Arterial	Principal Arterial	Intermodal/STRAHNET Connector
C Street	3rd Avenue	6th Avenue	Major Arterial	Principal Arterial	Intermodal/STRAHNET Connector
	6th Avenue	10th Avenue			Map-21 Principal Arterial
A Street	Whitney Road	6th Avenue	Major Arterial	Principal Arterial	Intermodal/STRAHNET Connector
	6th Avenue	10th Avenue			Map-21 Principal Arterial
Cordova Street	1st Avenue	10th Avenue	Collector	Major Collector	
Gambell Street	3rd Avenue	5th Avenue	Major Arterial	Major Collector	Major STRAHNET Connector
	5th Avenue	10th Avenue		Interstate	Interstate
Ingra Street	3rd Avenue	5th Avenue	Major Arterial	Major Collector	Major STRAHNET Connector
	5th Avenue	10th Avenue		Interstate	Interstate

Table 2. Functional Classification of North-South Oriented Streets in Downtown Anchorage

	West/North Extent	East/ South Extent	MOA Classification	DOT&PF Classification	NHS Designation
Ship Creek Avenue	C Street	Ingra Street	Collector	Minor Collector	
1st Avenue	L Street	Ingra Street	Collector	Minor Collector	
2nd Avenue	E Street	C Street	Collector	Minor Collector	
3rd Avenue	L Street	A Street	Minor Arterial	Major Collector	
	A Street	Ingra Street		Minor Arterial	
4th Avenue	L Street	A Street	Collector	Major Collector	
	A Street	C Street		Minor Arterial	
	C Street	Ingra Street	Minor Arterial		
5th Avenue	L Street	C Street	Major Arterial	Minor Arterial	Map-21 Principal Arterial
	C Street	Gambell Street		Principal Arterial	Major STRAHNET Connector
	Gambell Street	Ingra Street		Interstate	Interstate
6th Avenue	L Street	A Street	Major Arterial	Minor Arterial	Map-21 Principal Arterial
	A Street	C Street			
	C Street	Gambell Street		Principal Arterial	Major STRAHNET Connector
	Gambell Street	Ingra Street		Interstate	Interstate
7th Avenue	L Street	A Street	Collector	Major Collector	
9th Avenue	L Street	Ingra Street	Minor Arterial	Major Collector	

2.2 Motorized Vehicles

Existing infrastructure makes travel to downtown Anchorage most convenient for motorized vehicles, resulting in most people traveling to downtown by motorized vehicles. Figure 3 shows one-way streets and traffic volumes in the study area. The major routes accessing downtown Anchorage are one-way couplets: L Street and I Street, C Street and A Street, and Gambell Street and Ingra Street all run north-south, connecting south Anchorage and the Seward Highway with downtown. 5th Avenue and 6th Avenue run east-west, connecting downtown with east Anchorage and the Glenn Highway.

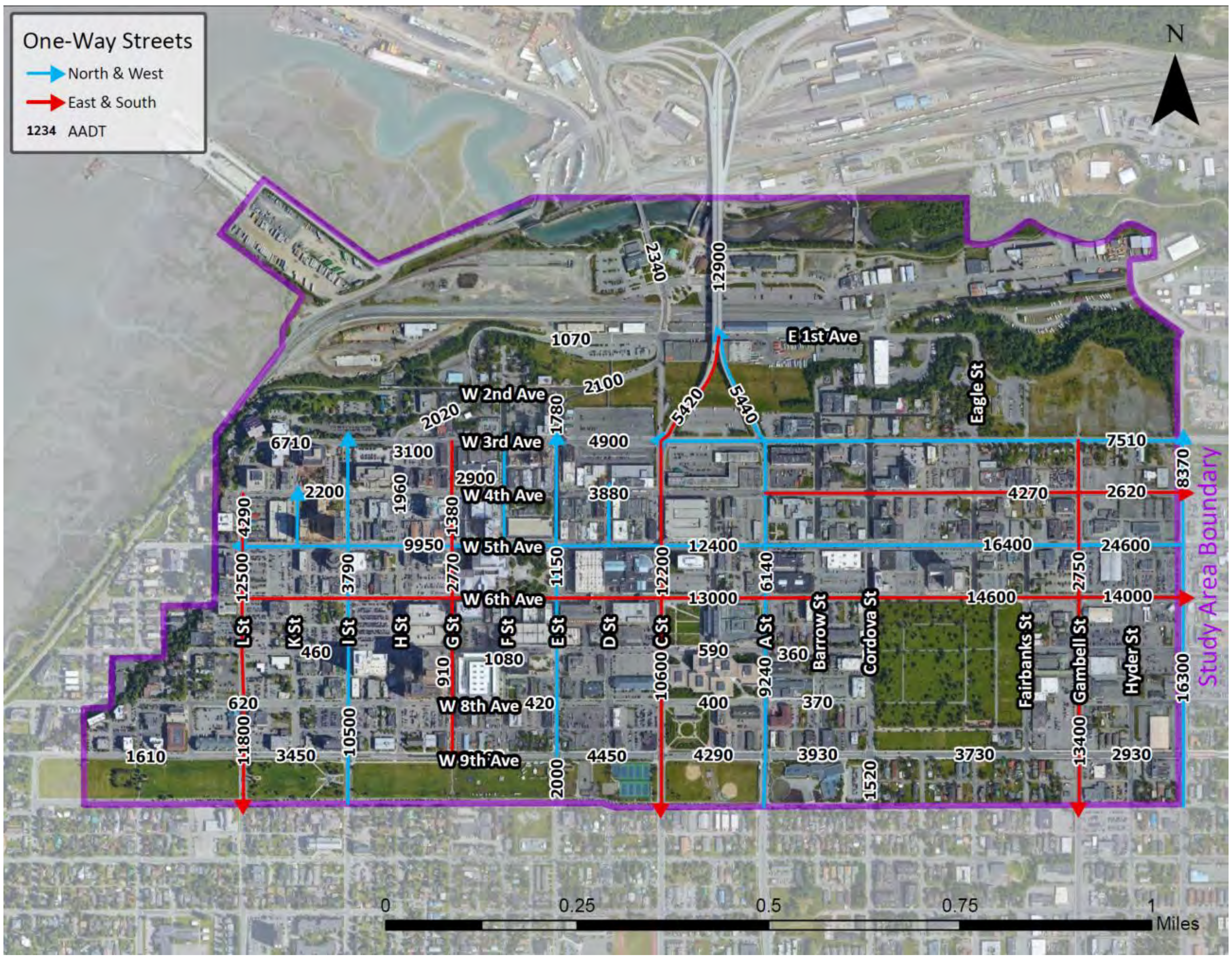


Figure 3. Downtown Street Volumes and Travel Directions

2.2.1 Curb Space

On-street parking is permitted on most downtown streets. Anchorage Community Development Authority (ACDA) manages on-street parking in the study area. Figure 4 shows metered parking spaces within the study area. Streets without meters are a mix of free parking and no parking. Surface level parking lots and parking garages are also available.

The *Anchorage Downtown Comprehensive Plan* (2007) identified underutilized surface level parking lots as a planning challenge. Underutilized parking lots contribute to undesirable pedestrian environments and can show a lack of investment in a community. Additionally, parking studies indicate that driving members of the public perceive parking garages as unsafe and prefer to park on-street near their destination. Despite the amount of underutilized surface level lots, there is a perception of a lack of parking within downtown Anchorage.

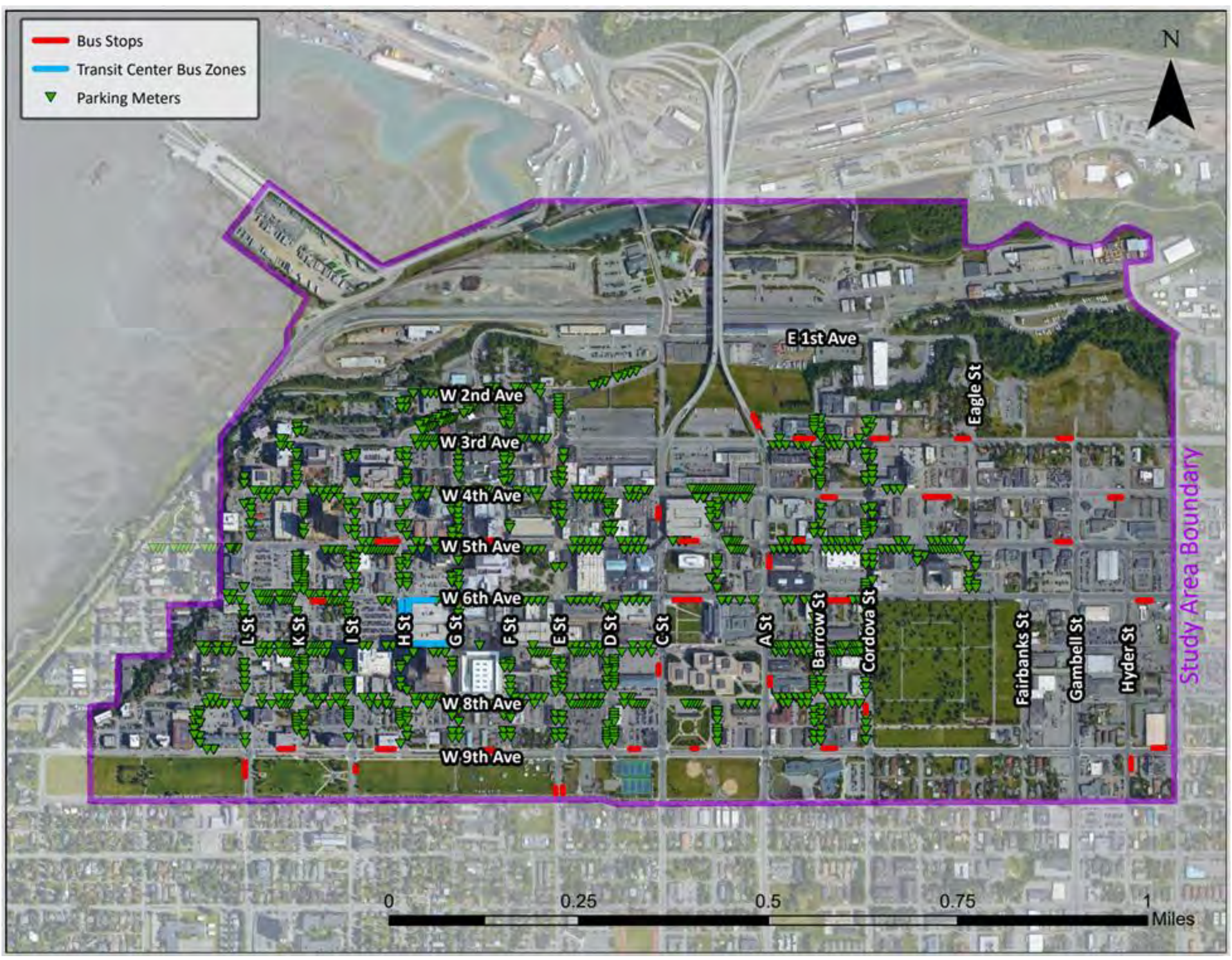


Figure 4. Metered Parking and Bus Stops in Downtown Anchorage

On-street metered parking is limited to two hours, three hours, or ten hours and is enforced Monday through Friday between 9 AM and 6 PM (excluding holidays). Parking permits are available in six zones downtown. Overnight on-street parking is prohibited during winter months to allow snow removal.

On-street parking, freight loading zones, passenger loading zones, and bus zones compete for curb space. Additionally, during summer months, tour operators are able to rent out curb space in some areas. Similarly, during construction activities downtown, contractors may rent metered spaces for staging or long term parking of construction equipment.

2.2.2 Seward Highway to Glenn Highway Planning and Environmental Linkage Study

The Seward Glenn Planning and Environmental Linkages study being conducted by the DOT&PF is evaluating connecting the Seward Highway and Glenn Highway. A Seward Highway to Glenn Highway connection could impact travel behavior and traffic flows going to or through downtown. The study is also exploring improving vehicular access between the Port of Alaska and the highway network. .

2.3 Bicycles

Bicycle network treatments are discussed in the following reports.

- *2021 AMATS Non-Motorized Plan*
- *Our Downtown Anchorage Downtown District Plan 2021*
- *Fairview Neighborhood Plan*

In Anchorage, bicycles are prohibited from riding on sidewalks within business districts (13 AAC 02.400). Much of the area within the Downtown Streets Engineering Study area falls within the definition of business zone. A local advocacy group, Bike Anchorage, has identified bike friendly streets within downtown. However bicycle infrastructure is limited to two single blocks of bicycle lanes on E Street and Cordova Street and some bicycle boulevards on segments of 3rd Avenue, 10th Avenue, and Cordova Street.

Bicycle infrastructure needs are listed and prioritized in the *2021 AMATS Non-Motorized Plan* (NMP). *Our Downtown Anchorage Downtown District Plan 2021* (Our Downtown) also identifies some needs, but in less detail and needs are not prioritized. *The Fairview Neighborhood Plan* calls for bicycle accessibility and connectivity to two greenbelts. Specifics are not provided.

Figure 5 shows existing bicycle infrastructure and identified bicycle infrastructure needs. Most needs in the NMP are identified as high or medium priority, and most needs are identified as separated bike ways in contrast to Our Downtown's call for bike lanes.

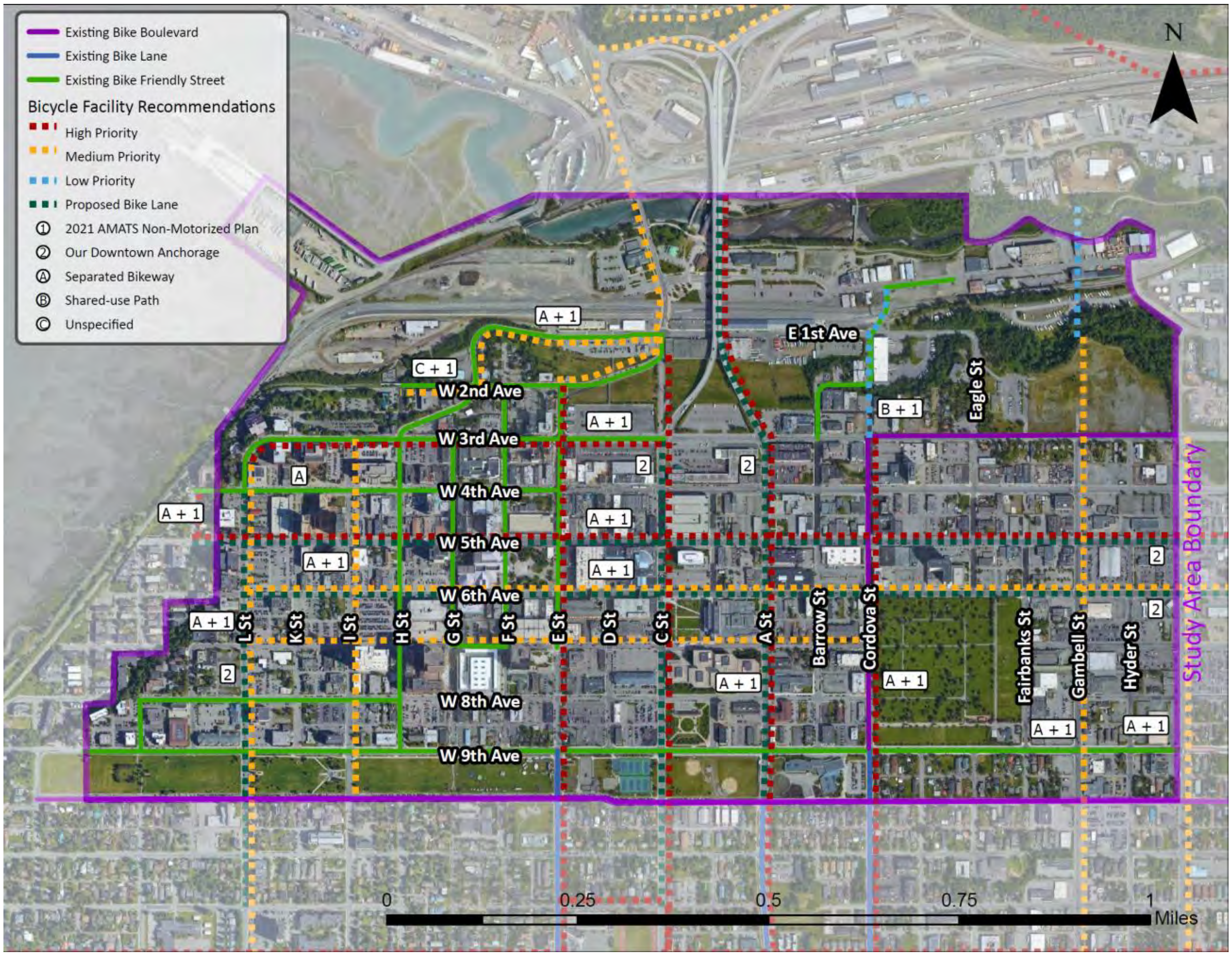


Figure 5. Existing and Proposed Bicycle Infrastructure.

2.4 Pedestrians

Pedestrian facility treatmentsments are discussed in the following reports.

- *2021 AMATS Non-Motorized Plan*
- *Our Downtown Anchorage Downtown District Plan 2021*
- *Fairview Neighborhood Plan*
- *Reimagining D Street | Area Wide Planning Study*

In the downtown area, 22 percent of residents do not own vehicles. These residents must instead walk, bike, use transit, or rely on others for rides.

Sidewalks exist on both sides of nearly all streets in the downtown engineering study area. The NMP identifies corridors with safety concerns and corridors for pedestrian treatments. Corridors identified as needing pedestrian treatments are prioritized by need for pedestrian safety, demand, equity, and connectivity to transit. Figure 6 shows safety corridors and prioritized corridors. A two-block segment of Hyder Street is the only segment without sidewalk on the safety concern corridors.

The *2023 Reimagining D Street | Area Wide Planning Study* presents a revitalization strategy for the D Street District, the area bounded between 6th Avenue and 9th Avenue and between E Steet and C Street. The plan calls for widened sidewalks and modified crossings within the D Street District. Pedestrian treatments overlap with low-priority pedestrian corridors on 9th Avenue and C Street.

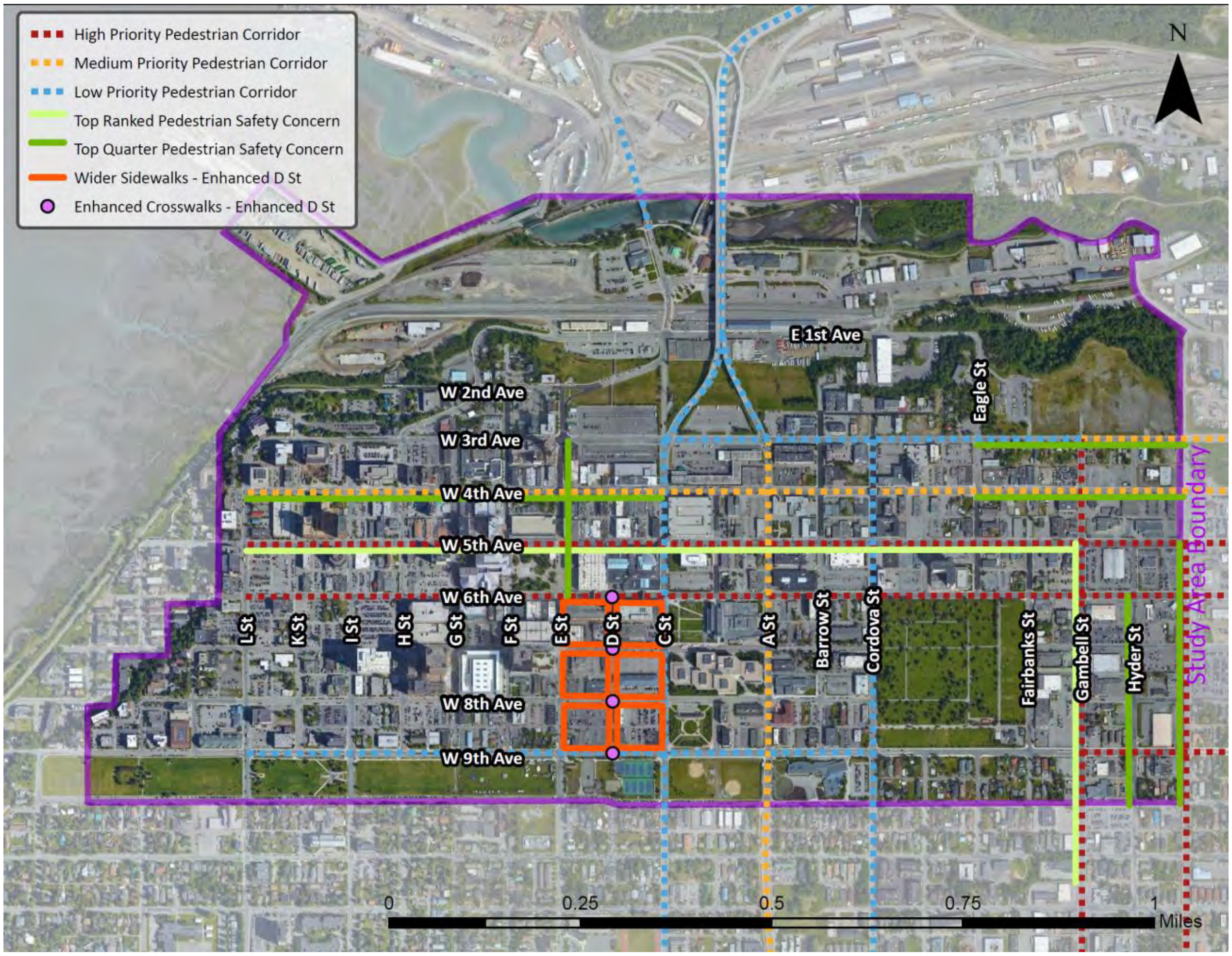


Figure 6. Pedestrian Network Needs and Safety Corridors

2.5 Freight

The Port of Alaska is the state's primary inbound cargo handling facility. Most road connections between the Don Young Port of Alaska northwest of downtown, Anchorage, and the rest of the state on the road system travel through downtown.

A truck route map, Figure 7, was adopted from thein the *2017 AMATS Freight Mobility Study*. Except when other no other access is available, the municipal code of Anchorage prohibits commercial vehicles with a gross weight of 11,000 pounds or greater from local and residential collector streets.

Major arterials are defined as northbound and southbound truck routes. Eastbound and westbound truck routes are limited to 3rd Avenue, 4th Avenue between C Street and Ingra Street, and two two-block segments of 9th Avenue. Post Road, one of two port accesses for double load trucks, feeds into Ingra Street and Gambell Street via 3rd Avenue and 4th Avenue.

Active transportation and traffic calming treatments could impact truck routes. Reducing access may increase travel time and costs for some truck routes and reduce robustness of the truck route network unless new routes are defined and streets modified accordingly.

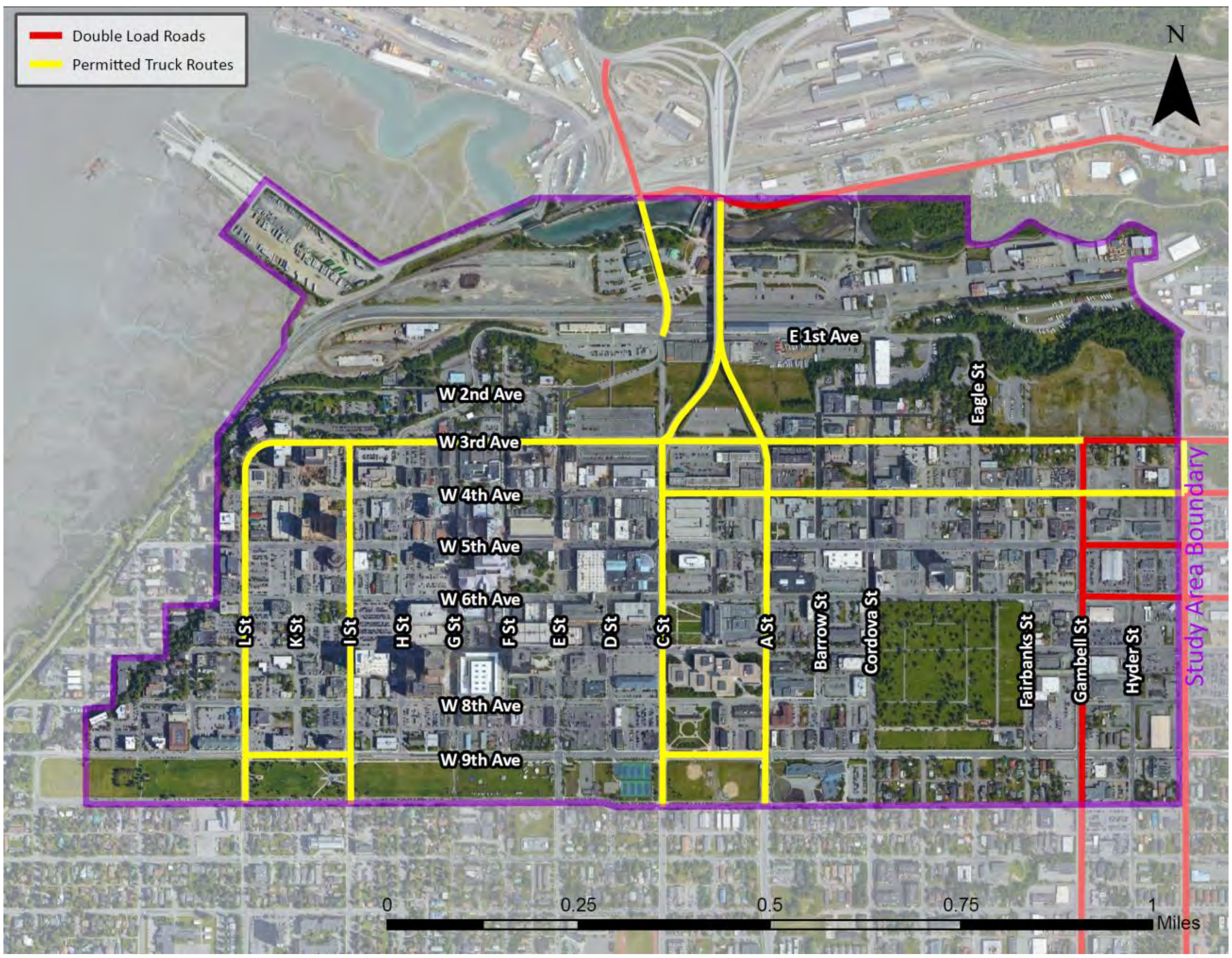


Figure 7. Downtown Anchorage Truck Routes.

The Seward Highway to Glenn Highway Planning and Environmental Linkage Study is exploring improving access, including for freight vehicles, between the Port of Alaska and the highway network.

2.6 Transit

The People Mover transit center is on the corner 6th Avenue and H Street. Its indoor waiting area and customer service counter closed in August 2020 and there are no plans to reopen it to the public. People Mover manages curb space on 7th Avenue, H Street and 6th Avenue for transit vehicles. Curb is painted red and/or No Parking signs are installed to prevent the general public form parking in bus zones.. Design standards from the Anchorage Design Criteria Manual give minimum pull-out bus stops lengths between 100 feet and 130 feet depending on a stop's location on a block.

Downtown is served by ten People Mover routes shown in Figure 8 Seven routes stop at the Transit Center and three at City Hall.

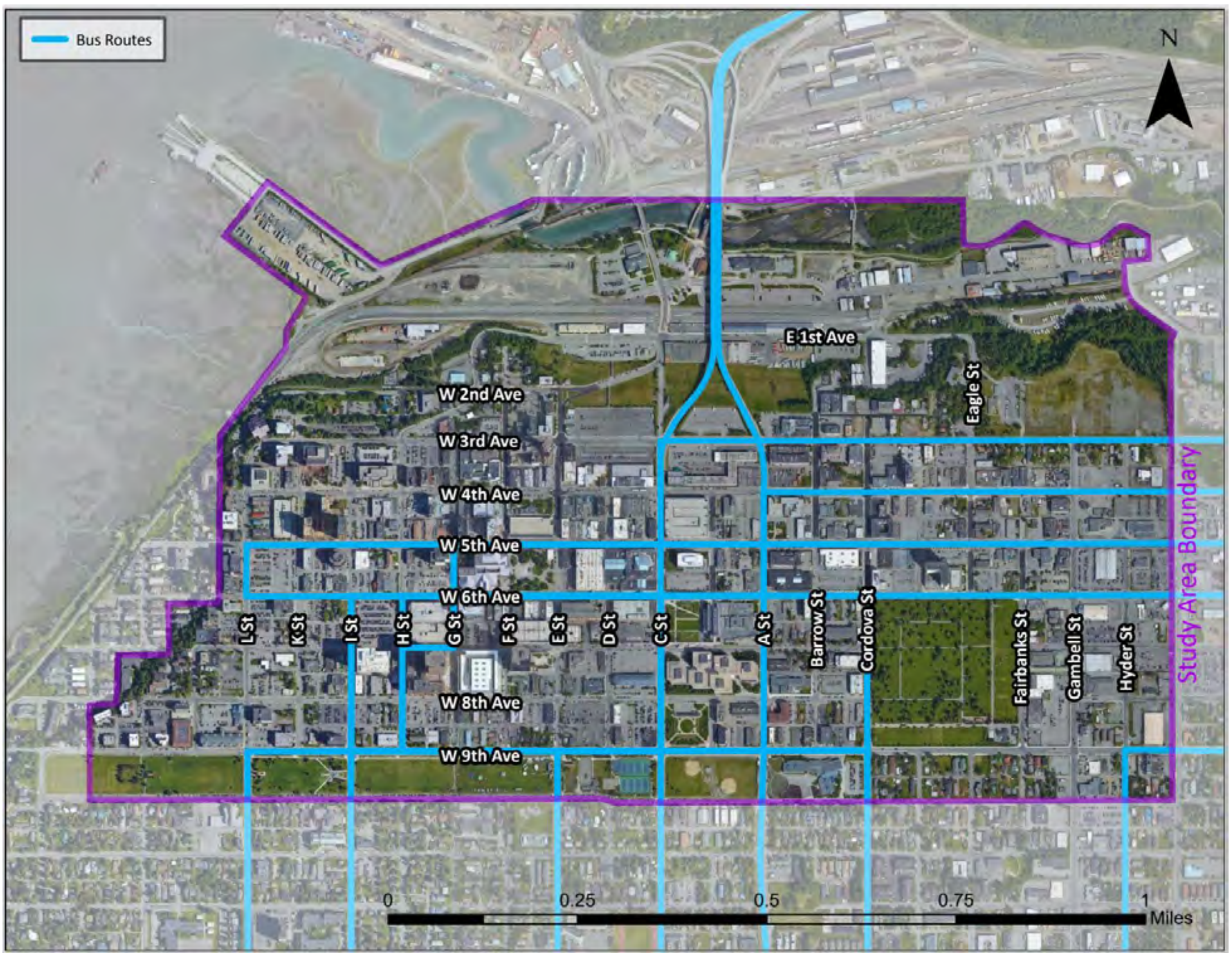


Figure 8. Streets With Bus Routes in Downtown Anchorage

An ongoing study will determine if the People Mover Transit Center should be relocated. Relocating the transit center would impact routing.

Additional transit services include Valley Transit and Interior Alaska Bus Line. Valley Transit provides passengers with transit service between the Valley Transit Park and Ride in Wasilla and the west side of H Street south of 6th Avenue in Anchorage. Year-round, Interior Alaska Bus Line connects Tok and Anchorage, stopping at 6th Avenue and G Street. They make weekly trips on Mondays, Wednesdays, and Fridays.

2.7 Tourism

During the summer months, downtown Anchorage experiences an influx of tourists and an increase in activity. Tour operators use buses to shuttle tourists to and from downtown destinations , increasing the number of large vehicles on the streets.

Tour operators also use the Egan Center, on 5th Avenue between F Street and E Street, as a hospitality center. Visitors may arrive or depart by bus from the Egan Center with luggage. Luggage can be stored at the Egan Center. The alley behind the Egan Center is essential for the operation of the hospitality center, and also serves as the freight entrance for other activities at the Egan Center.

Downtown Anchorage is also host to the Alaska Railroad Train Depot, several hotels, and other visitor attractions and services. To accommodate tour buses , operators may purchase permits from ACDA to reserve curb space for boarding and alighting of tourists. Parking meters at reserved locations are hooded, informing the general public that the curb space in unavailable for parking.

Despite being able to reserve curb space, events like trains arriving at the rail depot and offloading up to 2,000 visitors in a short period of time force tour buses to circulate downtown while waiting for an available passenger loading space.

Our Downtown calls for a summertime trolley service to increase transportation and circulation options downtown.

[waiting for information about tour bus routes to map]

2.8 Special Uses

The MOA, Anchorage Downtown Partnership, and other groups use downtown roads for special events on a non-regular basis. There are not rules or restrictions about what roads may be closed for special events. Each closure request is evaluated on a case-by-case basis. As a guiding principle, except for legacy events, 5th Avenue, 6th Avenue, Ingra Street, and Gambell Street are not fully closed for special events. When 5th Avenue and 6th Avenue are fully closed for a special event, traffic is rerouted to 3rd Avenue and 9th Avenue.

There is at least one annual event that occurs on the A Street/ C Street corridor north of 3rd Avenue. The event takes place during a weekend evening, and thus has minimal impact on port operations.

While the MOA issues special use permits, DOT&PF reviews permit requests and provides their approval for any closure.

3 Utilities

Utilities in downtown Anchorage are shown in Figure 9. Chugach Electric, Alaska Communications, GCI, ENSTAR Natural Gas, and Anchorage Water and Wastewater utility provide services in the area. Most utilities are routed in alleys and are underground. Fairbanks Street, Gambell Street, and Hyder Street have overhead electric and communications lines. Overhead street light power drops exist sporadically across the area.

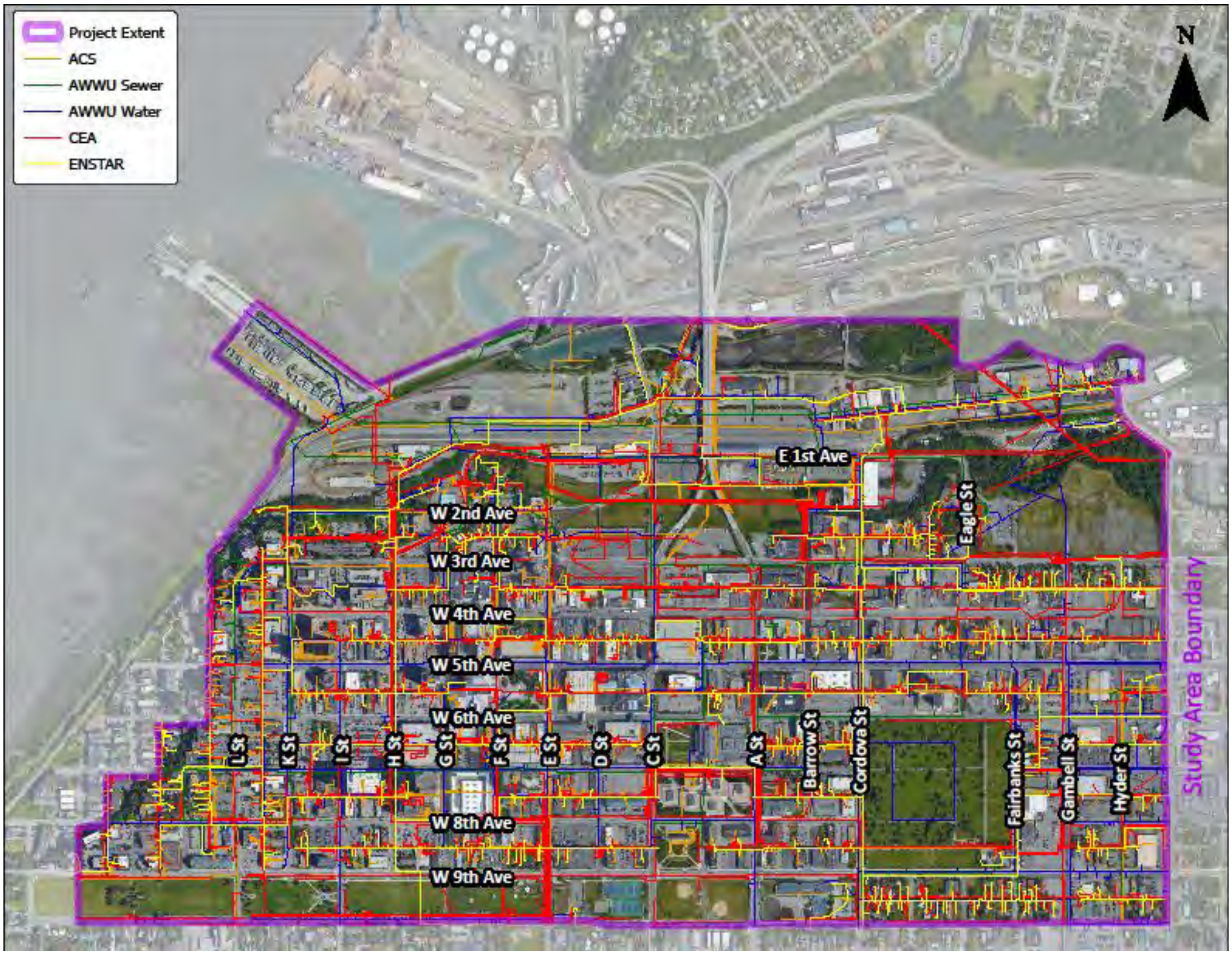


Figure 9. Downtown Anchorage Utilities

4 Downtown Street Design Criteria

The downtown street network contains municipal streets, state streets, and streets with an NHS designation. The ownership of the street and the source of treatment funding determine which design manual(s) need to be consulted and the order in which they must be consulted.

Design Criteria provide an explanation of which design manuals should be used and in what order they should be used in based on street ownership, funding source, and NHS designation.

Design criteria worksheets, prepopulated where appropriate, for local streets, collector streets, minor arterials, and major arterials are provided in Appendix B: Design Criteria.

The following manuals are referenced in the design criteria worksheets.

A Policy on Geometric Design on Highways and Streets, 2011

A *Policy on Geometric Design on Highways and Streets* (PGDHS) is published by the American Association of Traffic and Highway Officials (AASHTO). The PGDHS provides design guidance; however, agencies may adopt the PGDHS as a standard design document. Alaska DOT&PF has adopted the 2011 PGDHS as a design standard. The MOA states AASHTO standards should be met.

The PGDHS is updated on an irregular basis. An updated version of the PGDHS, allowing for greater flexibility in design, was released in 2018. A subsequent version is in the process of being drafted.

Alaska Highway Preconstruction Manual

The Alaska DOT&PF's *Alaska Highway Preconstruction Manual* (HPCM) is the state's design manual for developing and designing road projects in Alaska. The HPCM covers both federally funded projects and state-funded projects.

Alaska Traffic Manual

The *Alaska Traffic Manual* provides standards and guidance on the traffic control devices such traffic signs, street markings, and traffic signals. It is a supplement to the Federal Highway Administration's *Manual on Uniform Traffic Control Devices* (MUTCD). The most recent version was released in 2016 and is based on the 2009 MUTCD.

Anchorage Design Criteria Manual

The *Anchorage Design Criteria Manual's* (DMC) purpose is to provide traveled ways that are consistent, predictable, safe, and reliable, through the range of private development, municipal, and state roads to seamlessly integrate past, present, and future vehicular ways, pedestrian and bicycle ways, drainage, traffic operations, maintenance, and enforcement. The standards also ensure that safety concerns are addressed consistently and adequately. Consistency in all areas of the design effort results in a more cohesive road system within the Municipality.

Anchorage Metropolitan Area Transportation Solutions (AMATS) Non-Motorized Plan Ch. 7

The *AMATs Non-Motorized Plan*, adopted in November 2011, provides a vision of a connected network within Anchorage that enables pedestrians and cycles to travel throughout the city during all seasons. Chapter 7 of the Non-Motorized plan pulls from national, state, and local design guidance to describe how its vision can be achieved.

Bikeway Selection Guide

The Bikeway Selection Guide is decision support tool published by the FHWA. The guide summarizes advantages and disadvantages of different bicycle treatments and provides context-driven treatment selection guidance.

Downtown Lighting and Signals Upgrade Design Framework Sect. 2.1

Section 2.1 of the *Downtown Lighting and Signal Upgrade Design Framework* describes how roadways and facilities should be illuminated. The framework states roadways should be designed for high pedestrian activity.

Guide for the Development of Bicycle Facilities

The *Anchorage Design Criteria Manual* refers designers to *The Guide for the Development of Bicycle Facilities*, published by AASHTO, when designing roads with bicycle facilities. The guide provides geometric, striping, and signing guidelines for meeting bicycle travel and operations needs and the needs of other highway users. Signal guidelines are not published with the guide.

The Manual on Uniform Traffic Control Devices, 11th Edition

The MUTCD 11th Edition was released in December 2023. Chapter 4H of MUTCD provides national standards and guidance on bicycle signals. Each new MUTCD is modified to meet Alaska's needs and published as the *Alaska Traffic Manual* supplement. The most recent version of the Alaska Traffic Manual, adopted in 2016, is based on the 2009 MUTCD.

National Association of City Transportation Officials Design Guides

The National Association of City Transportation Officials (NACTO) publishes design guides to build safer, more accessible, and more equitable transportation networks. Each NACTO design guide has a specific focus. NACTO design guides that may be relevant to the Downtown

Anchorage Study include the *Urban Street Design Guide*, *Urban Bikeway Design Guide*, and *Transit Street Design Guide*.

Anchorage Municipal Code Title 21.11.070.D

Title 21, Land Use Planning, of the Anchorage Municipal Code of Ordinances, also known as Title 21, The Zoning Ordinance, or the Land Use Ordinance, provides provisions related to the planning and development of the Municipality of Anchorage.

Chapter 11 Section D, Pedestrian-Oriented Frontage Standards includes sidewalk width standards for downtown Anchorage.

Title 23, United States Code

Title 23, United States Code covers various aspects of highways including the NHS and interstates. Section 103 touches on the NHS and interstate system. Section 103 states that, "in Alaska highways on the interstate system shall be designed in accordance with such geometric and construction standards as are adequate for current and probable future traffic demands and the needs of the locality of the highway."

5 NHS Route Constraints and Flexibility

NHS roads are important to the economy, mobility, and national defense. Historically, NHS roads have focused on facilitating the safe and effect movement of vehicular traffic, but not the movement of other modes of transportation. Figure 10 shows NHS roads in downtown Anchorage.

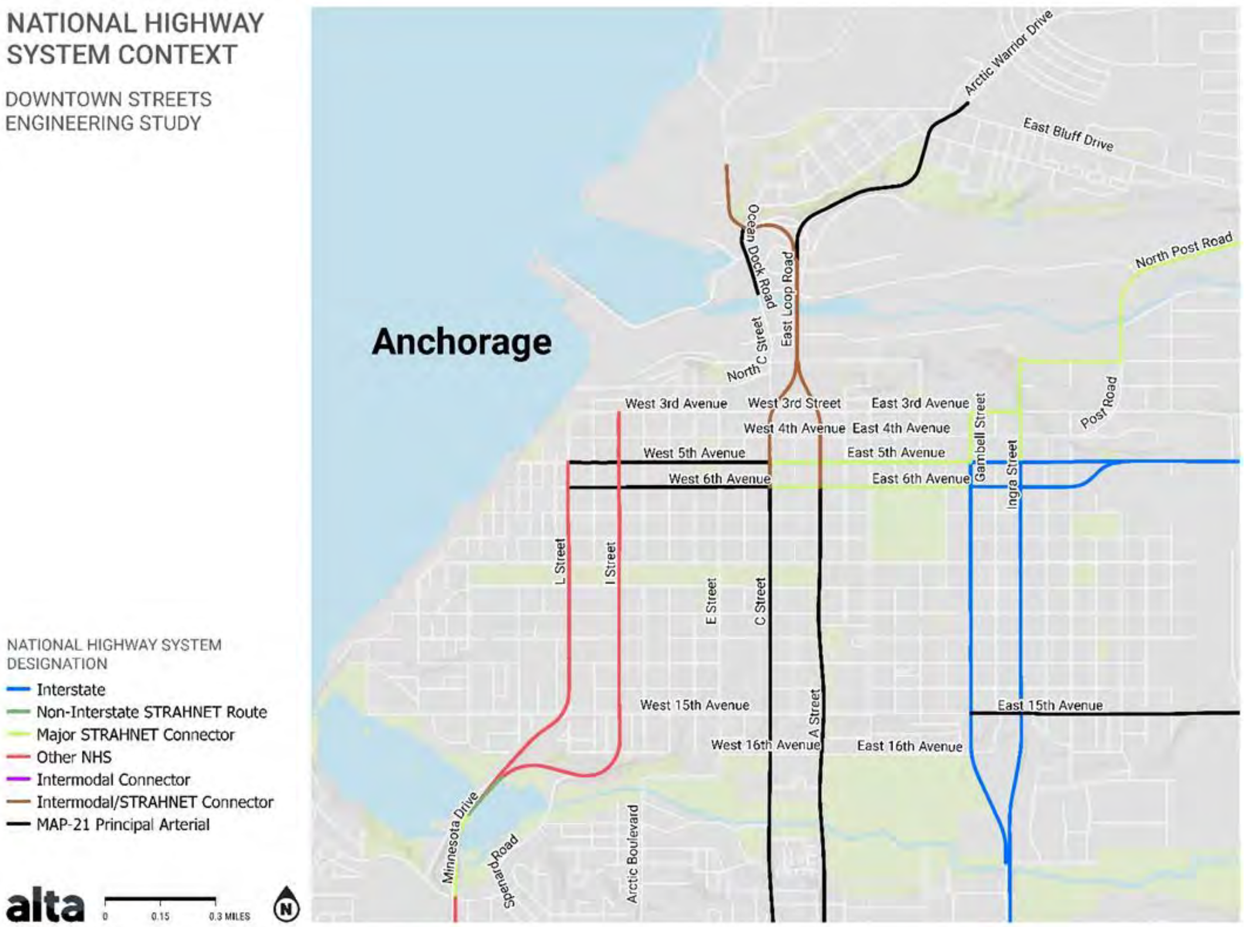


Figure 10. NHS Designated Roads in Downtown Anchorage (Source: Alta)

In 2012, the FHWA added about 220,000 miles of road to the NHS. The added roads, including parts of 5th Avenue, 6th Avenue, C Street and A Street, have a MAP-21, or Moving Ahead of Progress in the 21st Century, designation.. The FHWA has issued guidance on removing the NHS designation from roads with a MAP-21 designation. Roads with a STRAHNET designation are critical to Department of Defense operations.

Recent changes in federal rules grant state DOTs greater authority in determining how to meet federal standards on some NHS roads. In 2022 code regulating NHS roads was amended to allow

AASHTO 2018 PGDHS standard to be applied. However, if a state, like Alaska, has not adopted the 2018 PGDHS, then local design standards apply.

A memorandum summarizing the National Highway System (NHS) and how it impacts the constraints and flexibility of downtown Anchorage streets findings is in Appendix C:NHS Context and Applications.

This memo identifies several winter cities with single-snowfall typical maximums similar to Anchorage that have implemented pedestrian and bicycle infrastructure. The cities have published case studies, design guidelines, and other materials about design for pedestrians and bicycles during the winter months. A summary of the cities and associated resources is in Appendix D: Precedent Document.

6 Downtown Streets Right-of-Way Ownership

Detailed findings describing the ownership of key downtown routes can be found in Appendix E: Right-of-Way Ownership.

In summary, unless public ROW is created by deed, there is no document vesting ownership in a government entity or agency. In the case of key downtown routes, after statehood, DOT&PF conducted traffic studies, obtained ROW using federal funding, and was the primary agency maintaining the listed corridors.

- I Street and L Street
- A Street and C Street
- Gambell Street and Ingra Street
- 5th Avenue and 6th Avenue

Since their original construction, AKDOT&PF and MOA have upgraded these corridors using federal funds. The streets are classified as interstates, principal arterials, and minor arterials. They are also NHS routes and hold varying levels of importance to strategic defense.

Relinquishment of the ROW from DOT&PF to MOA of the high classification routes under consideration (such as 5th and 6th Avenues) would likely be a costly and lengthy procedure, even if both parties support the change. After relinquishment, MOA would still be required to meet FHWA maintenance and management processes. Whether or not the MOA chooses to pursue relinquishment, the metropolitan planning process (of which this study is a part) can be used to expand pedestrian and bicycle infrastructure using local or federal funds.

Appendix A: Review of Planning Documents

Introduction

Adopted planning documents were reviewed to determine the existing planning efforts underway in Downtown Streets project area.

Our Downtown Anchorage Downtown District Plan (MOA – 2021)

The 2021 Our Downtown Anchorage Downtown District Plan (Our Downtown) sets goals to provide a connected street and trail system that accommodates pedestrians, bicycles, and cars with a comfortable connection between the street, sidewalk, and buildings in downtown Anchorage. The plan incorporates community feedback with respect to street conversions, street treatments, coordinated parking strategy, speed limit reductions, and signal timing changes to decrease traffic speeds proposed in the 2007 Downtown Plan. The plan identifies the overarching goals for the downtown area:

1. Create a downtown for all
2. Jump-start development
3. Be economically sustainable
4. Provide more housing downtown
5. Increase connectivity
6. Activate the ground-floor environment
7. Provide a clear, sensible regulatory framework

Transportation-related recommendations from the 2007 Downtown Plan were intended to make downtown a more pedestrian, bicycle, transit-friendly, and safe place. Our Downtown builds on the 2007 Downtown Plan with two transportation system priorities. The first is optimizing multi-modal access to and within Downtown The second is creating a place that is enjoyable and safe for walking, biking, and using public transit. The priorities indicate This multi-modal system should continue to serve local automobile trips and provide tour bus access. Efforts should be made to minimize the impacts from cut-through traffic and freight movements in Downtown.

Non-Motorized Plan (AMATS – 2021)

The 2021 AMATS Non-Motorized Plan (NMP) provides the vision and goals for all modes of all-season, non-motorized travel in the planning area. The NMP's vision statement is "Anchorage is a world-class northern city that has an integrated network of routes accessible for people of all ages and abilities to walk, roll, or glide safely on shared use pathways and streets." Goals and objectives, used to track progress, are presented in the plan. The goals set in the NMP are:

1. Increase the use of non-motorized system

2. Promote and improve health and quality of life
3. Increase safety and security
4. Optimize maintenance for all seasons
5. Connect communities through all modes to all destinations
6. Measure non-motorized use and assets
7. Build community through education and involvement

The NMP provides design guidance based on national, state, and local guidelines and recommends that facilities meet local guidelines when possible. Guidance for maintenance and operations for these facilities is also included, with a focus on winter season maintenance requirements.

Projects are prioritized based on the NMP goals and objectives with input from agency staff, advisory groups, and public involvement. The NMP-recommended bicycle projects in the downtown area, with assigned priorities are:

High Priority:

- Separated bikeway on West 3rd Avenue between C Street and L Street.
- Separated bikeway on East 5th Avenue between Karluk Street and M Street.
- Separated bikeway on C Street between West 2nd Avenue and Klatt Road.
- Separated bikeway on Cordova Street between East 15th Avenue and East 3rd Avenue.
- Shared Used Pathway Study on Cordova Street between and East 3rd Avenue and Ship Creek Greenway.
- Separated bikeway on E Street between West 15th Avenue and West 2nd Avenue.
- Separated bikeway on Gambell Street between East 15th Avenue and East 3rd Avenue.

Medium Priority:

- Separated bikeway on West 1st Avenue between C Street and H Street.
- Separated bikeway on East 6th Avenue between Karluk Street and L Street.
- Separated bikeway on East 7th Avenue between Cordova Street and L Street.
- Separated bikeway on Christensen Drive/ 1st Avenue between C Street and 2nd Avenue.
- Separated bikeway on I Street between West 10th Avenue and West 3rd Avenue.
- Separated bikeway on Ingra Street between East 6th Avenue and East 3rd Avenue.
- Separated bikeway on Ingra Street between East 6th Avenue and East 13th Avenue.
- Separated bikeway on L Street between West 13th Avenue and West 3rd Avenue.

Priority pedestrian corridors identified in the NMP:

High Priority:

- 5th Avenue between L Street and Reeve Boulevard
- 6th Avenue between L Street and East 5th Avenue
- East 9th Avenue between Gambell Street and Latouche Street
- Gambell Street between East 16th Avenue and East 3rd Avenue
- Ingra Street between East 5th Avenue and East 15th Avenue

Medium Priority:

- 4th Avenue between L Street and East 3rd Avenue/ Post Road
- A Street between West 3rd Avenue and West Fireweed Lane
- East 3rd Avenue between Gambell Street and Post Road

Low Priority:

- 3rd Avenue between Gambell Street and C Street
- 9th Avenue between L Street and Cordova Street
- C Street between West 3rd Avenue and West 15th Avenue
- C Street between West 15th Avenue and West 9th Avenue
- Cordova between St East 3rd Avenue and East 16th Avenue

Top Quarter Pedestrian Safety Concern:

- 3rd Avenue between Eagle Street and Ingra Street
- 4th Avenue between L Street and C Street
- 4th Avenue between Eagle Street and Ingra Street
- E Street between 3rd Avenue and 6th Avenue
- Hyder Street between 9th Avenue and 14th Avenue
- Ingra Street between 5th Avenue 15th Avenue

Top Ranked Pedestrian Safety Concern

- 5th Avenue between L Street and Gambell Street
- Gambell Street between 5th Avenue and 16th Avenue

Downtown Signals & Lighting Reconnaissance Study (KE – 2018)

The 2018 Downtown Lighting and Signals Upgrade Reconnaissance Study evaluates the downtown traffic signal and street lighting systems and recommends treatments to infrastructure that does not meet current safety and design standards found in the Alaska Traffic Manual and the MOA Design Criteria Manual. A Design Framework (KE, 2020) for the downtown district was completed to assist designers in unifying the look and feel of the downtown district for users. Specific guidelines are provided for lighting, traffic signals, and any associated electrical system components. The framework also provides design guidance for civil treatments (e.g., sidewalk treatments, curb bulbs, on-street parking, and raised intersections) that can be completed concurrently with the lighting and signal upgrades. The 2018 Downtown Lighting and Signals Upgrade Reconnaissance Study lists 21 prioritized treatments based on the number of poor and fair elements on a block.

1. 4th Avenue between L Street and A Street
2. 3rd Avenue between L Street and Barrow Street
3. 4th Avenue between A Street and Ingra Street
4. 6th Avenue between L Street and Cordova Street
5. 5th Avenue between L Street and Cordova Street
6. F Street between 3rd Avenue and 5th Avenue
7. E Street between 2nd Avenue and 4th Avenue
8. Ingra Street between 3rd Avenue and 10th Avenue
9. L Street and I Street between 3rd Avenue and 10th Avenue
10. A Street and C Street between 3rd Avenue and 10th Avenue
11. West Spot Fix Project
12. 7th Avenue between L Street and Cordova Street
13. G Street between 5th Avenue and 7th Avenue
14. 5th Avenue between Cordova Street and Ingra Street
15. East Spot Fix Project
16. 2nd Avenue between H Street and 1st Avenue
17. 3rd Avenue between Barrow Street Ingra Street
18. 8th Avenue between L Street & Cordova Street
19. 6th Avenue between Cordova Street and Ingra Street
20. Infill lighting (Blocks with no lighting)
21. Infill lighting (Blocks with utility only lighting)

2023 Reimaging D Street Area Wide Planning (Stantec – 2023)

The 2023 Reimaging D Street Area Wide Planning (AWP) Study presents a plan to redevelop the six-block area D Street District between E Street and C Street and between 6th Avenue and 9th Avenue, the plan presents a mixed-used development. The document presents a district framework plan (DFP), which breaks down the development into four components. The Transportation / Streetscape component is the most relevant to the Downtown Streets Engineering Study. Treatments include widened sidewalks, narrower lanes, way finding signage, modified intersections, landscaping, and a festival corridor. Treatments as summarized in the AWP are listed below.

- C Street - Widen the sidewalk (on the west side of the right-of-way), add trees/landscaping, and install wayfinding signage.
- D Street - Transform the corridor into a "Festival Street" where segments can be closed to motorized vehicles to host events/community gatherings. Enhance intersections and crosswalks. Widen sidewalks and add a pedestrian shelter on the west side of the right-of-way. Add angled parking to the east side of the right-of-way, and add pavers/decorative pavement to travel lanes. Add gateway features/signage to each end of the corridor on D Street.
- 6th Avenue - Construct an enhanced intersection at D Street with crosswalks and decorative pavement. Add street parking, widen sidewalks (on the south side of the right-of-way), and add tree/ landscaping along the curb.
- 7th Avenue - Widen sidewalks (as feasible), narrow travel lanes (for traffic calming), retain parallel street parking stalls, add trees/landscaping, and construct mid-block pedestrian crossings.
- 8th Avenue - Widen sidewalks (as feasible), narrow travel lanes (for traffic calming), retain parallel street parking stalls, add trees/landscaping, and construct mid-block pedestrian crossings.
- 9th Avenue - Construct enhanced intersections at C Street and D Street with crosswalks and decorative pavement. Widen the sidewalk (on the north side of the right-of-way) and add trees/ landscaping. Install wayfinding signage depicting Downtown destinations.
- Alley Treatments - Reconstruct alley pavement (to serve infill projects) and add lighting/safety elements.

Anchorage Freight Mobility Study (AMATS – 2017)

The 2017 Anchorage Freight Mobility was drafted to prepare Anchorage's freight network for future growth. The study contains an updated local freight map which includes primary truck routes, double load routes, and secondary truck routes. The study identifies several freight generators in or adjacent to downtown including the Port of Anchorage, Alaska Railroad Anchorage Rail Yard, Suburban Propane, and Merrill Field. Additionally, the study identifies several challenges to freight routes in downtown, below.

- North C Street and Ocean Dock Road Intersection (multiple RR Crossing)
- Whitney Road (size, turning movements, no shoulders, trail/pedestrian/fishing concerns)
- School Bus storage area (use not ideally suited, some compatibility concerns)
- 3rd Avenue & Ingra/Gambell treatments (connects to the Ship Creek/Port Area)
- C Street & 5th/6th Avenue Intersections - (turning movements)
- 3rd Avenue: Post Road and Reeve Blvd. (capacity treatments)

Appendix B: Design Criteria

Project Name:	Downtown Streets Engineering Study		
☑ New Construction/Reconstruction	☐ Reconstruction (3R) ☐ Other:		
Project Number:		☐ NHS	☐ Non NHS
Functional Classification:	Local		
Design Year:		**Present ADT:**	
Design Year ADT:		**Mid Design Period ADT:**	
DHV:		**Directional Split:**	
Percent Trucks:		**Equivalent Axle Loading:**	
Pavement Design Year:		**Design Vehicle:**	City-Bus
Terrain:	Level	**Number of Roadways:**	
Design Speed/Posted Speed:	30/25 MPH		
Width of Traveled Way:	11 ft		
Width of Shoulders:	**Outside:** 3.5 ft	**Inside:**	
Cross Slope:	2% max		
Superelevation Rate:	6%		
Minimum Radius of Curvature:	275 ft		
Minimum K-Value for Vertical Curve:	**Sag:**	**Crest:**	
Maximum Allowable Grade:	7%		
Minimum Allowable Grade:	0.3%		
Stopping Sight Distance:	200 ft		
Lateral Offset to Obstruction:	Not applicable to local urban streets		
Vertical Clearance:	N/A		
Bridge Width:	N/A		
Bridge Structural Capacity:	N/A		
Passing Sight Distance:	N/A		
Surface Treatment:	**T/W:**	**Shoulders:**	
Side Slope Ratios:	**Foreslopes:**	**Backslopes:**	
Degree of Access Control:			
Median Treatment:			
Illumination:	High ped levels: Avg Illuminance = 0.9 foot-candles, Uniformity = 6.0, Veiling luminance = 0.4		
Curb Usage and Type:	20-ft radius curb return from edge of pavement or back of curb, 30-ft radius when intersecting collector		
Bicycle Provisions:	Design for all classes of riders. See additional bicycle facility sheet		
Pedestrian Provisions:	11.5 ft min sidewalk abutting street curb		
Misc. Criteria:	See additional below		

Proposed - Designer/Consultant: ______________________ **Date:** ____________

Accepted - Engineering Manager: ______________________ **Date:** ____________

Approved - Preconstruction Engineer: ______________________ **Date:** ____________

Shaded criteria are the *FWHA 2 controlling criteria for roads with speed limits below 50 mph*. For NHS routes only, these criteria must meet the in the Green Book (*AASHTO A Policy on Geometric Design of Highways and Streets*). For all other routes, these criteria must meet minimums established the minimums established in the *Alaska Highway Preconstruction Manual*. Otherwise a Design Exception must be approved by FHWA.

Design Criterion marked with a " # " do not meet minimums and have a Design Exception(s) and/or Design Waiver(s) approved.
See Appendix __ for Design Exception/Design Waiver approval(s) and approved design criteria values.

Parking Lane Width:	7 ft		
Pedestrian Facility Illumination:	High ped levels: Avg Horizontal Illuminance = 1.0 foot-candles, Uniformity = 4.0, Vertical luminance = 0.5		
Intersection Sight Distance:			
Case	# Additional Lanes Cı	ISD	
B1 Left turn from minor road	0	######	ft
B2 Right turn from minor road	0	######	ft
B3 Crossing maneuver from the minor roa	0	######	ft
D Intersections with traffic signal control		First stopped vehicle should be visible to first stopped vehicle at each approach	
E Intersections with all-way stop control		First stopped vehicle should be visible to first stopped vehicle at each approach	
F Left turns from the major road	0	######	ft

Project Name:	Downtown Streets Engineering Study			
☑ New Construction/Reconstruction	☐ Reconstruction (3R) ☐ Other:			
Project Number:			☐ NHS	☑ Non NHS
Functional Classification:	Collector			
Design Year:		**Present ADT:**		
Design Year ADT:		**Mid Design Period ADT:**		
DHV:		**Directional Split:**		
Percent Trucks:		**Equivalent Axle Loading:**		
Pavement Design Year:		**Design Vehicle:**	City-Bus	
Terrain:	Level	**Number of Roadways:**		
Design Speed/Posted Speed:	45/35 MPH			
Width of Traveled Way:	11 ft			
Width of Shoulders:	**Outside:**	**5 ft**	**Inside:**	
Cross Slope:	2% max			
Superelevation Rate:	6%			
Minimum Radius of Curvature:	660 ft			
Minimum K-Value for Vertical Curve:	**Sag:**		**Crest:**	
Maximum Allowable Grade:	7%			
Minimum Allowable Grade:	0.3%			
Stopping Sight Distance:	360 ft			
Lateral Offset to Obstruction:	Where establishing a full-width clear zone in an urban area is not practical due to right-of-way constraints			
Vertical Clearance:	N/A			
Bridge Width:	N/A			
Bridge Structural Capacity:	N/A			
Passing Sight Distance:	N/A			
Surface Treatment:	**T/W:**		**Shoulders:**	
Side Slope Ratios:	**Foreslopes:**		**Backslopes:**	
Degree of Access Control:				
Median Treatment:				
Illumination:	High ped levels: Avg Illuminance = 1.2 foot-candles, Uniformity = 4.0, Veiling luminance = 0.4			
Curb Usage and Type:	30-ft radius curb return from edge of pavement or back of curb			
Bicycle Provisions:	Design for Class A riders. See additional bicycle facility sheet.			
Pedestrian Provisions:	11.5 ft min sidewalk abutting street curb			
Misc. Criteria:	See additional below			

Proposed - Designer/Consultant: ______________________ **Date:** ____________

Accepted - Engineering Manager: ______________________ **Date:** ____________

Approved - Preconstruction Engineer: ______________________ **Date:** ____________

Shaded criteria are the *FWHA 2 controlling criteria for roads with speed limits below 50 mph* . For NHS routes only, these criteria must meet the in the Green Book (*AASHTO A Policy on Geometric Design of Highways and Streets*). For all other routes, these criteria must meet minimums established the minimums established in the *Alaska Highway Preconstruction Manual* . Otherwise a Design Exception must be approved by FHWA.

Design Criterion marked with a " # " do not meet minimums and have a Design Exception(s) and/or Design Waiver(s) approved.
See Appendix __ for Design Exception/Design Waiver approval(s) and approved design criteria values.

Parking Lane Width:	7 ft		
Pedestrian Facility Illumination:	High ped levels: Avg Horizontal Illuminance = 1.0 foot-candles, Uniformity = 4.0, Vertical luminance = 0.5		
Intersection Sight Distance:			
Case	# Additional Lanes Cı	ISD	
B1 Left turn from minor road	0	######	ft
B2 Right turn from minor road	0	######	ft
B3 Crossing maneuver from the minor roa	0	######	ft
D Intersections with traffic signal control		First stopped vehicle should be visible to first stopped vehicle at each approach	
E Intersections with all-way stop control		First stopped vehicle should be visible to first stopped vehicle at each approach	
F Left turns from the major road	0	######	ft

Project Name:	Downtown Streets Engineering Study		
☑ New Construction/Reconstruction	☐ Reconstruction (3R) ☐ Other:		
Project Number:		☐ NHS	☐ Non NHS
Functional Classification:	Minor Arterial - Class IIA		
Design Year:		**Present ADT:**	
Design Year ADT:		**Mid Design Period ADT:**	
DHV:		**Directional Split:**	
Percent Trucks:		**Equivalent Axle Loading:**	
Pavement Design Year:		**Design Vehicle:**	WB-20, City-Bus
Terrain:	Level	**Number of Roadways:**	
Design Speed/Posted Speed:	35/30 MPH		
Width of Traveled Way:	11 ft		
Width of Shoulders:	**Outside:**	**Inside:**	11 ft TWLTL
Cross Slope:	2% max		
Superelevation Rate:	6%		
Minimum Radius of Curvature:	380 ft		
Minimum K-Value for Vertical Curve:	**Sag:**	**Crest:**	
Maximum Allowable Grade:	5%		
Minimum Allowable Grade:	0.3%		
Stopping Sight Distance:	250 ft		
Lateral Offset to Obstruction:	In an urban environment the right-of-way is often limited and, in most cases, it is not practical to establish		
Vertical Clearance:	N/A		
Bridge Width:	N/A		
Bridge Structural Capacity:	N/A		
Passing Sight Distance:	N/A		
Surface Treatment:	**T/W:**	**Shoulders:**	
Side Slope Ratios:	**Foreslopes:**	**Backslopes:**	
Degree of Access Control:			
Median Treatment:			
Illumination:	High ped levels: Avg Illuminance = 1.7 foot-candles, Uniformity = 3.0, Veiling luminance = 0.3		
Curb Usage and Type:	40-ft radius curb return from edge of pavement or back of curb, 30-ft radius when intersecting collector		
Bicycle Provisions:	Design for Class A riders. See additional bicycle facility sheet.		
Pedestrian Provisions:	11.5 ft min sidewalk abutting street curb		
Misc. Criteria:	See additional below		

Proposed - Designer/Consultant: ______________________ **Date:** ____________

Accepted - Engineering Manager: ______________________ **Date:** ____________

Approved - Preconstruction Engineer: ______________________ **Date:** ____________

Shaded criteria are the *FWHA 2 controlling criteria for roads with speed limits below 50 mph* . For NHS routes only, these criteria must meet the in the Green Book (*AASHTO A Policy on Geometric Design of Highways and Streets*). For all other routes, these criteria must meet minimums established the minimums established in the *Alaska Highway Preconstruction Manual* . Otherwise a Design Exception must be approved by FHWA.

Design Criterion marked with a " # " do not meet minimums and have a Design Exception(s) and/or Design Waiver(s) approved.
See Appendix __ for Design Exception/Design Waiver approval(s) and approved design criteria values.

Pedestrian Facility Illumination: High ped levels: Avg Horizontal Illuminance = 1.0 foot-candles, Uniformity = 4.0, Vertical luminance = 0.5

Intersection Sight Distance:

Case	# Additional Lanes Cr	ISD
B1 Left turn from minor road	0	####### ft
B2 Right turn from minor road	0	####### ft
B3 Crossing maneuver from the minor road	0	####### ft
D Intersections with traffic signal control		First stopped vehicle should be visible to first stopped vehicle at each approach
E Intersections with all-way stop control		First stopped vehicle should be visible to first stopped vehicle at each approach
F Left turns from the major road	0	####### ft

Project Name:	Downtown Streets Engineering Study		
☑ New Construction/Reconstruction		☐ Other:	
Project Number:		☐ NHS	☐ Non NHS
Functional Classification:	Major Arterial - Class IIIC		
Design Year:		**Present ADT:**	
Design Year ADT:		**Mid Design Period ADT:**	
DHV:		**Directional Split:**	
Percent Trucks:		**Equivalent Axle Loading:**	
Pavement Design Year:		**Design Vehicle:**	WB-20, City-Bus
Terrain:	Level	**Number of Roadways:**	
Design Speed/Posted Speed:	55/45 MPH		
Width of Traveled Way:	12 ft		
Width of Shoulders:	**Outside:**	**Inside:**	
Cross Slope:	2% max		
Superelevation Rate:	6%		
Minimum Radius of Curvature:	1065 ft		
Minimum K-Value for Vertical Curve:	**Sag:**	**Crest:**	
Maximum Allowable Grade:	4%		
Minimum Allowable Grade:	0.3%		
Stopping Sight Distance:	495 ft		
Lateral Offset to Obstruction:	In an urban environment the right-of-way is often limited and, in most cases, it is not practical to establish		
Vertical Clearance:	N/A		
Bridge Width:	N/A		
Bridge Structural Capacity:	N/A		
Passing Sight Distance:	N/A		
Surface Treatment:	**T/W:**	**Shoulders:**	
Side Slope Ratios:	**Foreslopes:**	**Backslopes:**	
Degree of Access Control:			
Median Treatment:			
Illumination:	High ped levels: Avg Illuminance = 1.7 foot-candles, Uniformity = 3.0, Veiling luminance = 0.3		
Curb Usage and Type:	40-ft radius curb return from edge of pavement or back of curb, 30-ft radius when intersecting collector, m		
Bicycle Provisions:	Design for Class A riders. See additional bicycle facility sheet.		
Pedestrian Provisions:	11.5 ft min sidewalk abutting street curb		
Misc. Criteria:	See additional below		

Proposed - Designer/Consultant: ______________________ **Date:** __________

Accepted - Engineering Manager: ______________________ **Date:** __________

Approved - Preconstruction Engineer: ______________________ **Date:** __________

Shaded criteria are the *FWHA 2 controlling criteria for roads with speed limits below 50 mph*. For NHS routes only, these criteria must meet the in the Green Book (*AASHTO A Policy on Geometric Design of Highways and Streets*). For all other routes, these criteria must meet minimums established the minimums established in the *Alaska Highway Preconstruction Manual*. Otherwise a Design Exception must be approved by FHWA.

Design Criterion marked with a " # " do not meet minimums and have a Design Exception(s) and/or Design Waiver(s) approved.
See Appendix __ for Design Exception/Design Waiver approval(s) and approved design criteria values.

Pedestrian Facility Illumination: High ped levels: Avg Horizontal Illuminance = 1.0 foot-candles, Uniformity = 4.0, Vertical luminance = 0.5

Intersection Sight Distance:

Case	# Additional Lanes Cı	ISD
B1 Left turn from minor road	0	###### ft
B2 Right turn from minor road	0	###### ft
B3 Crossing maneuver from the minor roa	0	###### ft
D Intersections with traffic signal control		First stopped vehicle should be visible to first stopped vehicle at each approach
E Intersections with all-way stop control		First stopped vehicle should be visible to first stopped vehicle at each approach
F Left turns from the major road	0	###### ft

Roadway Classification:		Local	Collector	Minor Arterial	Major Arterial
Design Speed, MPH:		30/25	45/35	35/30	55/45
Preferred Bikeway Type:	Traffic Volume: 0-6,000vpd	Bike lane (buffer preffered)	Separated bike lane or shared use path	Separated bike lane or shared use path	Separated bike lane or shared use path
	Traffic Volume: >6,000vpd	Separated bike lane or shared use path	Separated bike lane or shared use path	Separated bike lane or shared use path	Separated bike lane or shared use path

Facility	Width, ft	Posted Speed,	Volume, vpd	Roadway setback, ft	
Yield Roadway	12				
Bicycle Boulevard		Max 25	3000 Max		
Buffered Bicycle Lanes	7				
Protected Bicycle Lanes	Lane: 5, Buffer: 3				
Signed Route					
Paved Shoulders	Min 4				
Advisory Shoulder	6, min 4				
Bicycle Lane	6 preferred, min 4				
Sidepath	8-12, min 8 in constrained conditions			min 5 or barrier	

Appendix C: NHS Context and Applications

MEMORANDUM

To: Kinney Engineering

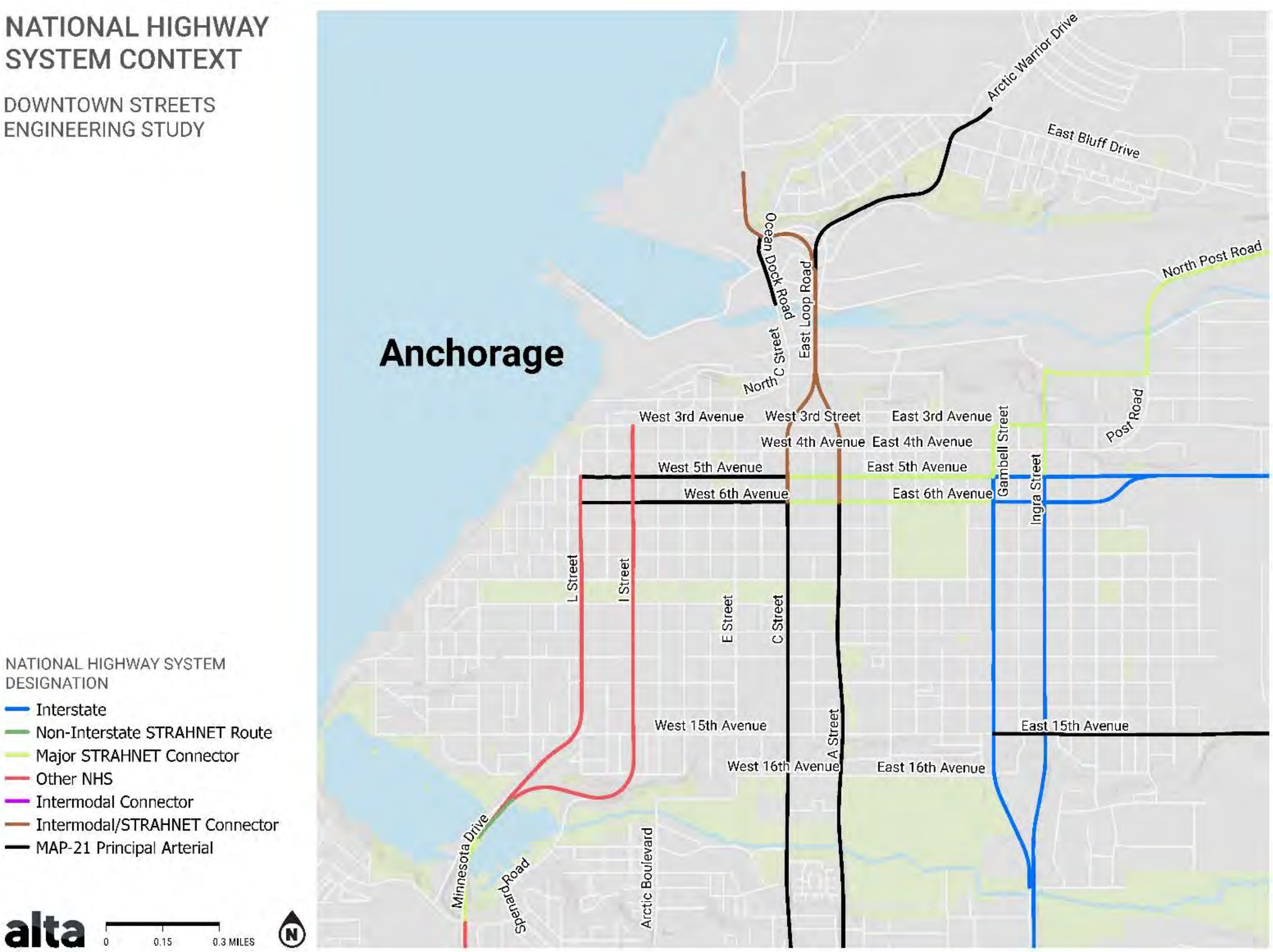
From: Alta Planning + Design

Date: June 12, 2024

Re: National Highway System Context & Applications | Anchorage Downtown Streets Engineering Study

Introduction

The National Highway System (NHS) designations were developed in the 1990s and include the Interstate Highway System and other roads important to the economy, mobility, and national defense. Many NHS-designated roads travel through the center of downtowns in both urban and rural areas. Some of these roads also serve as crucial spines for the delivery of goods. Several National Highway System (NHS) facilities travel through downtown Anchorage, as shown in the map below.



NHS classifications historically have been oriented towards efficient and safe travel of cars and trucks. They did not tend to foster street environments that are safe and comfortable for all users, including pedestrians and bicyclists. However, recent changes in the way that federal rules are applied have acknowledged and prioritized the importance of the aesthetic, historic, and community context of NHS roads. Recent amendments to federal rules have increased flexibility and enabled state DOTs greater authority in determining how to meet federal standards.

This is great news for Anchorage. The changes in NHS rules provide options for the Municipality of Anchorage and the Alaska Department of Transportation and Public Facilities (AKDOT&PF) to collaborate on the development of standards for Anchorage's downtown streets.

Sixth Avenue in downtown Anchorage carries through traffic from West to East.

Coordination

This work builds upon prior plans and work to develop downtown including *Our Downtown*, the 2020 *AMATS Non-Motorized Plan*, the *AGNEW::BECK* study, the *Seward to Glenn Connection Planning and Environmental Linkages (PEL) Study*, the *2007 Comprehensive Plan, the 2020 Land Use Plan,* the *1996 Areawide Trails Plan,* and the *Anchorage Design Criteria Manual*. *Our Downtown* (2021) stated that 22% of residents of the downtown core did not own a car at the time the survey was administered. This makes providing comfortable multimodal transportation options in downtown Anchorage especially important.

Anchorage Bicycle Network

The *AMATS Non-Motorized Plan* (2020) provided a recommended network for pedestrians and bicyclists that are located partly on each of the downtown NHS streets with the highest average annual daily traffic (AADT) in the downtown area. Since effective bicycle networks serve the majority of bicyclists, who are typically "interested but concerned" and do not feel comfortable riding amidst vehicle traffic, Anchorage will need to find ways to develop the low stress bicycle facilities that the *AMATS Non-Motorized Plan* recommends on some downtown NHS roads.

Context and Evaluation of NHS Designations

The NHS designations were developed in the 1990s and include the Interstate Highway System and other roads important to mobility, national defense, and the economy. NHS roads can be owned and maintained by states or local governments. The NHS is governed by United States Code and has been impacted by legislation in the last 10 years.

The section of United States Code that governs the NHS is the US Code of Federal Regulations (CFR), Title 23. Title 23 NHS standards specify that projects shall be safe and adequate to accommodate types and volumes of traffic for the following 20-year period. Section 625 designates standards, policies, and specifications.[1]

CFR Title 23, Section 109 sets design criteria that are approved by the USDOT Secretary in cooperation with state DOTs. Projects using federal funds are also required by Section 109 to consider aesthetic values, community cohesion, and cost savings. CFR Title 23 Part 658 provides guidance related to freight that operates without permits based on size and weight; appendices A, B, and C are relevant.[2]

In 2012, Moving Ahead for Progress in the 21st Century ("MAP-21") significantly expanded the NHS by about 60,000 miles. This addition to the NHS is referred to as the "expanded" or "enhanced" NHS. The Federal Highway Administration (FHWA) has provided guidance for states to request to remove these new NHS designations if desired, noting that there is no deadline for these requests.[3]

A few years later, the 2015 Fixing America's Surface Transportation Act (FAST Act) amended the above-mentioned CFR Title 23, Section 109 to provide additional flexibility and direction related to NHS roads considering community context. Section 1404 addresses design flexibility, allowing a local government to seek approval from the State DOT to use a roadway design that is locally preferred on an NHS facility.[4]

In 2016, FHWA provided even more flexibility by stating that for projects on lower-speed NHS roads with design speeds of less than 50 mph, just two of the ten controlling criteria (design speed and design loading structural capacity) are subject to FHWA design exception approval. This improves overall design flexibility of NHS roads.[5]

Most recently, Title 23, Section 625 was amended in 2022 to specify that the then-newly revised AASHTO 2018 Green Book design standards apply to NHS facilities. However, relevant state (or local guidance depending on road ownership) takes precedence. The background of Section 625 also notes that "State DOTs and local agencies should select design values based on factors including the context of the facility, needs of all project users, safety, mobility, human and natural environmental impacts, and project costs."[6]

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[1] https://www.fhwa.dot.gov/design/standards/231116.cfm
[2] https://uscode.house.gov/view.xhtml?req=%22federal-aid+highway+act%22&f=treesort&fq=true&num=1&hl=true&edition=prelim&granuleId=USC-prelim-title23-section103
[3] https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/section1122.cfm
[4] https://www.fhwa.dot.gov/design/standards/231116.cfm
[5] https://www.fhwa.dot.gov/design/standards/160505.pdf
[6] https://www.govinfo.gov/content/pkg/FR-2022-01-03/pdf/2021-28236.pdf

Classifications Review

Alta's analysis included a review of functional classifications and traffic counts referencing AKDOT&PF classification maps and FHWA NHS classification maps. These are summarized in the charts below and the map at the beginning of this document.

Classifications, East-West NHS Network					
	L Street to I Street	***I Street to C Street***	***C Street to A Street***	***A Street to Gambell St.***	***Gambell Street to Ingra Street and Karluk Street***
5th Avenue – AKDOT&PF Functional Classification	Minor Arterial	Minor Arterial	Principal Arterial	Principal Arterial	Interstate
5th Avenue – NHS Classification	MAP-21 Principal Arterial		Major STRAHNET Connector		Interstate
6th Avenue – AKDOT&PF Functional Classification	Minor Arterial	Minor Arterial	Minor Arterial	Principal Arterial	Interstate
6th Avenue – NHS Classification	MAP-21 Principal Arterial		Major STRAHNET Connector		Interstate

North-South Network, Classifications						
	L Street	***I Street***	***C Street***	***A Street***	***Gambell Street***	***Ingra Street***
3rd Avenue to 5th Avenue – AKDOT&PF Functional Classification	Major Collector/ Minor Collector	Major Collector	Principal Arterial	Principal Arterial	Major Collector	Major Collector
3rd Ave. to 5th Avenue– NHS Classification	Not NHS	"Other" NHS	Intermodal/ STRAHNET Connector	Intermodal/ STRAHNET Connector	Major STRAHNET Connector	Major STRAHNET Connector
5th Avenue to 6th Avenue – AKDOT&PF Functional Classification	Principal Arterial	Major Collector	Principal Arterial	Principal Arterial	Interstate	Interstate
5th Avenue to 6th Avenue – NHS Classification	"Other" NHS	"Other" NHS	Intermodal/ STRAHNET Connector	Intermodal/ STRAHNET Connector	Interstate	Interstate
6th Avenue to 15th Avenue – AKDOT&PF Functional Classification	Principal Arterial	Principal Arterial	Principal Arterial	Principal Arterial	Interstate	Interstate
6th Avenue to 15th Avenue – NHS Classification	"Other" NHS	"Other" NHS	MAP-21 Principal Arterial	MAP-21 Principal Arterial	Interstate	Interstate

Alta also reviewed Average Annual Daily Traffic (AADT) in downtown Anchorage using AKDOT&PF data.[7] Traffic counts are one factor that can influence the opportunity for reallocating existing vehicle road space to other modes, which may be required if multimodal infrastructure is implemented on NHS roads in downtown Anchorage.

Traffic counts on Anchorage's downtown streets are as follow:

- **1,000 AADT or less:** G Street, Eagle Street, Medfra Street, 7th Avenue, and 8th Avenue.
- **2,000 to 4,000 AADT:** 4th Avenue and 9th Avenue, between L Street and Ingra Street.
- **8,000 to 10,000 AADT:** 5th Avenue and 6th Avenue, between L Street and C Street.
- **10,000 to 15,000 AADT:** 5th Avenue and 6th Avenue, between C Street and Cordova Street.
- **13,000 to 25,000**: Seward Highway connection (5th Avenue and 6th Avenue east of Gambell Street; Gambell and Ingra Streets south of 6th Avenue).

Considering measurements like AADT and Level of Service (LOS) on the NHS, a 2016 FHWA memo (updated in 2018) clarified that "FHWA does not have regulations or policies that require specific minimum LOS values for projects on the NHS," and that "use of the Highway Capacity Manual for the operational analysis of projects on the NHS is not required if another traffic analysis method is determined to be more appropriate to fully identify and evaluate the performance and impacts of the proposed project alternatives."[8] This means that even on NHS roads with relatively high AADT, the FHWA does not specify minimum LOS values for NHS roads and could allow a Multimodal Level of Service (MMLOS) to be used in place of traditional LOS measures.

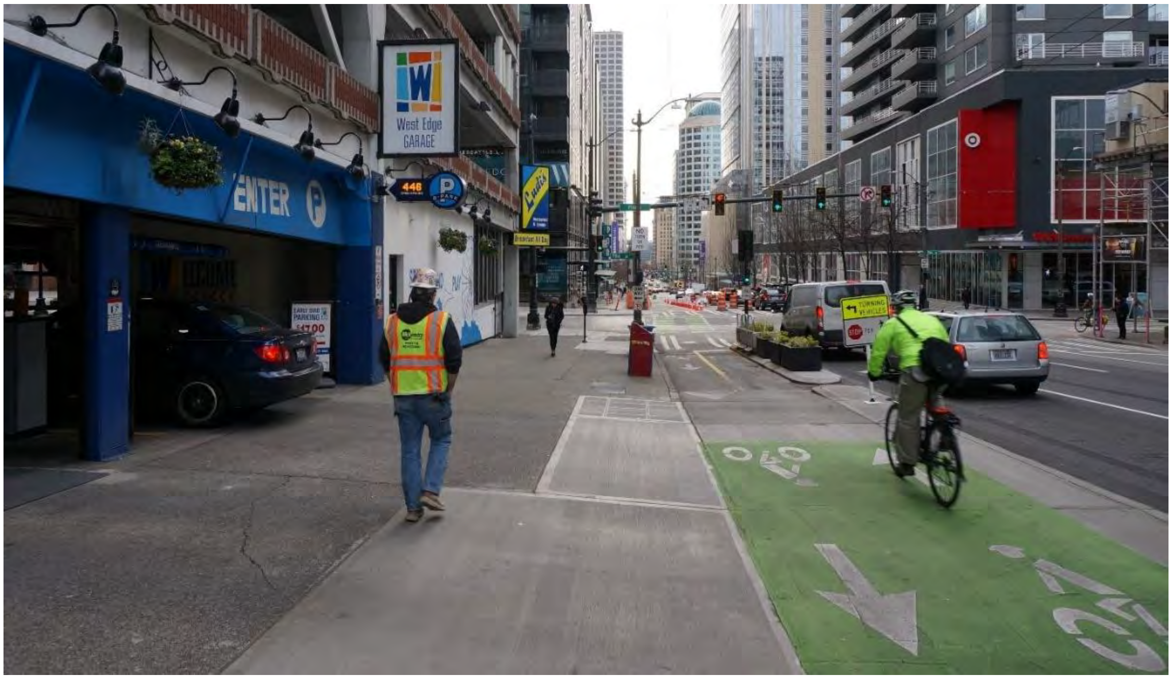
Multimodal NHS Project Case Studies

In many states, DOTs are partnering with local governments to provide infrastructure to slow traffic, improve sight distance, and increase safe and comfortable pedestrian and bicycle access on NHS roads. Alta researched bicycle and pedestrian infrastructure projects that have been implemented on several NHS roads.

Second Avenue Bikeway (Seattle, Washington)

The City of Seattle completed construction of a protected bicycle lane on Second Avenue in early 2018. Second Avenue is an NHS facility designated as a MAP-21 Principal Arterial. The project provided a route designed to be comfortable for people of all ages and abilities. The context of Second Avenue is that it is a downward-sloping road through an area of downtown that is densely developed with hotels and office buildings. The bikeway provides a new north-south connection and increased connectivity to the bicycle network in Seattle.

[7] Traffic counts from the Alaska Traffic Monitoring Program have slightly higher vehicle counts on arterials.
[8] FHWA Informational Memo: Level of Service on the National Highway System.
https://www.fhwa.dot.gov/design/standards/160506.pdf



Second Avenue bikeway improvements (Seattle, WA).

Downtown Pedestrian Infrastructure (Waterbury, Connecticut)

Waterbury, Connecticut installed a safety project on Grand Street, a MAP-21 Principal Arterial that travels through the center of the City's downtown. The City installed a demonstration project built using temporary, low-cost materials to shorten crossing distances, narrow travel lanes to 11.5', and provide no-parking areas to improve site distances at corners. The Waterbury project, especially early outreach to community members and businesses, could be a model for Anchorage. The project is found to have decreased vehicle speeds by 11%. Early community engagement was an essential part of project success, including work with businesses in relation to parking removal.

Marin Boulevard, Hoboken and Jersey City, New Jersey

The City of Hoboken completed the construction of a bikeway in 2023 that provides a low-stress north-south connection between Hoboken and Jersey City on Marin Boulevard, an NHS Intermodal Connector. This provides a connection to a preexisting bikeway constructed in 2010 on another NHS Intermodal Connector. The Marin Boulevard protected bikeway runs through a dense urban environment and includes high-visibility traffic-separated curbs, and flexible bollards. This effort was largely influenced by the City's Vision Zero work. The Marin Boulevard project provides a new connection between Hoboken and Jersey City to the South, thereby providing a comfortable biking option.

Other Examples

In addition to the preceding case studies, there are many examples of NHS roads that have been altered to accommodate multiple modes safely and comfortably. The table below provides a list of examples of NHS roads with multimodal facilities. The table is far from exhaustive. However, it provides a diverse set of examples from across the country that illustrate the multimodal possibilities and design flexibility available on the NHS.

The “Infrastructure” columns are marked with checkmarks where there are notable accommodations for that mode. While the table may not capture all types of multimodal infrastructure, the infrastructure examined generally includes:

- **Bicycle** infrastructure such as bike lanes, buffered bike lanes, or separated bike lanes.
- **Transit** infrastructure such bus/streetcar bulbs, dedicated transit lanes, or boarding islands.
- **Pedestrian** infrastructure such as curb extensions, enhanced crossings, or median islands.

Multimodal NHS Roads					
Roadway Information			*Infrastructure*		
Jurisdiction	*Street*	*NHS Designation(s)*	*Bicycle*	*Transit*	*Pedestrian*
Albany, NY	Delaware Ave	MAP-21 Principal Arterial			✓
Albany, NY	Madison Ave	MAP-21 Principal Arterial	✓		
Asheville, NC	Broadway St	MAP-21 Principal Arterial			✓
Bellingham, WA	E Chestnut St	MAP-21 Principal Arterial	✓		✓
Bellingham, WA	W Chestnut St	Intermodal Connector	✓		✓
Bellingham, WA	Meridian St	Intermodal Connector & Other NHS			✓
Baltimore, MD	W Centre St	MAP-21 Principal Arterial	✓		
Baltimore, MD	W 28th St	MAP-21 Principal Arterial	✓		✓
Baltimore, MD	E Pratt St	Other NHS	✓	✓	
Duluth, MN	W Superior St	MAP-21 Principal Arterial		✓	✓
Milwaukee, WI	E North Ave	MAP-21 Principal Arterial	✓		
Milwaukee, WI	N Farwell Ave / N Prospect Ave	Other NHS	✓		
Milwaukee, WI	N Broadway	Intermodal Connector		✓	
Missoula, MT	S 6th St	MAP-21 Principal Arterial	✓		✓
Missoula, MT	Brooks St	MAP-21 Principal Arterial	✓		
Plattsburgh, NY	City Hall Pl	MAP-21 Principal Arterial	✓		✓
Pittsburgh, PA	Stanwix St	MAP-21 Principal Arterial	✓		✓
Pittsburgh, PA	Liberty Ave	MAP-21 Principal Arterial		✓	✓
Portland, ME	Bedford Ave	MAP-21 Principal Arterial	✓		✓
Portland, OR	NW Broadway	MAP-21 Principal Arterial & Intermodal Connector	✓		
Portland, OR	NW 6th Ave	Intermodal Connector		✓	✓
Portland, OR	NE Grand Ave	MAP-21 Principal Arterial		✓	✓
Portland, OR	NE Martin Luther King Blvd	MAP-21 Principal Arterial		✓	✓

Multimodal NHS Roads					
Roadway Information			*Infrastructure*		
Jurisdiction	***Street***	***NHS Designation(s)***	***Bicycle***	***Transit***	***Pedestrian***
Rochester, NY	E Main St	MAP-21 Principal Arterial & Intermodal Connector	✓		✓
Seattle, WA	9th Ave N	MAP-21 Principal Arterial	✓		
Seattle, WA	Westlake Ave N	MAP-21 Principal Arterial		✓	
Seattle, WA	Roy St	Other NHS	✓		
Seattle, WA	S Jackson St	MAP-21 Principal Arterial		✓	✓
Spokane, WA	W Riverside Ave	Intermodal Connector		✓	✓
Tampa, FL	E Jackson St	MAP-21 Principal Arterial	✓		✓

Smart Growth America Demonstration Projects

Smart Growth America developed a program to train local agencies and state DOTs to collaborate to address safety on state-owned roads. Cohorts worked to implement quick-build projects. Results on these projects came from "strong leadership and clear intent from state DOT decision makers," including all parties working together in the face of challenges. Work in Soldotna, AK clarified that for success, AKDOT&PF will need to coordinate internally, and provide clear decision-making responsibility to one or two staff members, and communicate the names of those staff members to all parties. Recommendations are provided here: https://smartgrowthamerica.org/soldotna-ak-CLSA/

Next Steps

There are a couple of options for the Municipality of Anchorage and AKDOT&PF to foster safe, comfortable, and attractive infrastructure on NHS facilities in downtown Anchorage.

1. **Work within existing classifications to implement pedestrian and bicycle infrastructure.**
   For NHS facilities owned by AKDOT&PF, apply existing AKDOT&PF design guidance to make desired multimodal improvements. If needed and justified, apply for design exceptions from FHWA for the ability to use design standards that differ from AKDOT&PF standards, such as the National Association of City Transportation Officials (NACTO) Design Guide or other standards. AKDOT&PF would need to lead any design exception applications.

   For NHS facilities owned by the Municipality of Anchorage, desired local standards or the 2018 AASHTO Green Book may be used in NHS roadway design provided that the project does not include federal funds. For projects without federal funds, but that are on Anchorage-owned rights-of-way, the Municipality of Anchorage may use its own design standards or standards adopted by reference, such as those published by the NACTO.

   However, when an NHS project includes federal funds, AKDOT&PF standards preempt local design standards. The order of design guidance precedence is listed below for different funding scenarios.

Order of design guidance precedence **with** federal funds (when the higher number standard no longer applies, the municipality can apply the lower number):

1. Alaska Preconstruction Design Manual
2. 2018 AASHTO Green Book
3. Municipality of Anchorage standards

Order of design guidance precedence **without** federal funds:

1. Municipality of Anchorage standards
2. Alaska Preconstruction Design Manual OR 2018 AASHTO Green Book

2. **Reclassify or remove NHS designations from select downtown streets.**
   If the desired roadway design cannot be achieved within the constraints of existing NHS designations, initiate a collaborative process to reclassify or remove NHS designations. This option is complex, requires input from multiple interested and knowledgeable parties, and ultimately requires AKDOT&PF concurrence. The USDOT document *Highway Functional Classification Concepts, Criteria, and Procedures (2023)*[9] offers a process for changing roadway classifications.

   If this option is pursued, outcomes may be better if the Municipality of Anchorage owns the right-of-way or is willing to engage in a process to acquire the right-of-way. This is because the removal of an NHS designation does not remove state standards. State standards will still apply on state facilities because removing a highway from the NHS does not change state ownership. The state standards would therefore apply to state facilities despite the removal of NHS designations. Those standards could then impede the installation of some types of facilities to serve bicyclists and pedestrians unless the state obtains a design exception.

   Removal of NHS designation on a facility will also result in most of those facilities becoming ineligible for funding under the National Highway Performance Program (https://www.fhwa.dot.gov/specialfunding/nhpp/).The NHPP provides federal funding for NHS the construction and improvement of NHS facilities and supports state performance targets. If the Municipality pursues removal of an NHS designation and USDOT removes the NHS designation from a facility, the option for that facility to be federally funded under the NHPP will likely become unavailable.

In any of the above cases, the Municipality must proactively develop partnerships and support both internally and at AKDOT&PF surrounding the design of NHS roads in downtown Anchorage. This may include:

- Gaining a comprehensive understanding of AKDOT&PF processes.
- Referring to other state DOTs and cities that have implemented successful multimodal NHS projects to find guidance.
- Clarifying the line of internal AKDOT&PF decision-making to provide clear direction, ensure AKDOT&PF staff are well-versed in the reasons that downtown facilities be treated differently, ensure that AKDOT&PF staff

[9] https://www.fhwa.dot.gov/planning/processes/statewide/related/hwy-functional-classification-2023.pdf (pg. 35)

understand the adopted policy guidance documents which call for different road designs downtown, and ensure staff time is increased to respond to projects with complex design considerations.

- Develop clear channels of communication and anticipate potential constraints.
- Address staff reservations that are related to design.
- Educate staff on the possibilities for design flexibility.

Appendix D: Precedent Document

APPENDIX:

PRECEDENT GUIDANCE

version 2024-04-22

AI Image created with “anchorage urban street, 8' wide sidewalk, people walking on sidewalk, 8' wide bike lane, bikes on bike lane, good traffic flow”

AI Image created with “winter scene, anchorage street, 8’ wide sidewalk, people walking on sidewalk, bike lane s8’ wide bike lane, bikes on bike lane, bus stop, good traffic flow”

Overview
1

Precedent Assessment

"Design for winter, and summer will take care of itself."

In the precedent review, the initial focus was on finding winter city communities that share similarities to Anchorage in terms of snow. Their experience and available resources best apply to Anchorage, as they were created under similar conditions to ours. Further development of this Appendix will add sections that look to other locations to examine additional opptions for our use, including the potential need for their transformation to meet our unique context.

Climate

Precedent areas will ideally have similar single-snowfall typical maximums, allowing direct comparison of how cities and residents manage, remove, and are prepared for snow. Precedents should also have a similar potential for prolonged snowfall or multiple storm events that can illustrate outcomes when a location's management strategies are stressed. Lastly, typical temperatures should be similar due to the impact of thaw/freeze on the ability to drive over snow and difficulty in removal. The winter of 2023-24 in Anchorage exhibited how thaw/freeze can make streets unnavigable except at low speeds. In this review of precedent, we identify that Anchorage's climate does present unique challenges in the face of this thaw/freeze potential.

Data and Economy

The areas we have used for precedent vary in population. The precedents each include population, area, density, gross domestic product, and other information as relevant. This information can be used to understand better each location's context and temper its level of direct relevance. A key metric within this is population density and the ability of locations to maintain their infrastructure and manage snow.

Culture and Advantage

Review of these precedent areas needs to recognize how well-ingrained attitudes may be. There are locations where interacting with winter is a part of life and other locations where winter is something to be controlled as much as possible. An essential recognition within this is that some residents may be at a disadvantage in winter, such as not being able to afford warm clothing or a winter-friendly vehicle. These residents are the most impacted when there are inadequate transit or non-motorized facilities or snow affects the function of these facilities.

Transportation Metrics

Precedent locations need to move traffic. When traffic flows are high, adjacent neighborhoods are impacted significantly. Placemaking and neighborhood health require a high level of permeability for movement in all directions. When a street becomes convenient to motorists as a transportation corridor, it becomes impermeable. When placemaking and livability are reemphasized, motorist convenience is reduced. A goal in the planning we've reviewed is to place a higher emphasis on livability and broader ideas for moving people than just increasing vehicle capacity.

Anchorage, Alaska

Project Area Resources

The following are a selection of existing resources that provide requirements and guidance for the project area, in addition to extensive background information that provides essential context for this project to implement existing planning and community goals.

Our Downtown: Anchorage Downtown District Plan 2021

Our Downtown was a multi-year, multi-step project to update and implement the Anchorage Downtown Comprehensive Plan, including amending its zoning regulations, in order to meet Downtown's contemporary needs for growth and revitalization.

Link: Our Downtown 2021

2021 AMATS Non-Motorized Plan

The Non-Motorized Plan (NMP) provides the vision for a network of facilities for non-motorized travel within the Anchorage Metropolitan Area Transportation Solutions (AMATS) Planning Area to help residents travelsafely and efficiently without the need of a motor vehicle. The NMP merges planning efforts for on-street bicycle facilities, pedestrian sidewalks, and non-motorized shared-use pathway.

Link: 2021 AMATS Non-Motorized Plan

Roger Brooks Downtown Assessment

Anchorage was assessed in 2022, to provide an unbiased overview of Anchorage from the visitor's perspective. This included local marketing efforts, signage, attractions, critical mass, retail mix, ease of getting around, customer service, visitor amenities (parking and restrooms), resident amenities and quality of life, overall appeal, and the community's ability to attract overnight visitors.

Link: Presentation Video

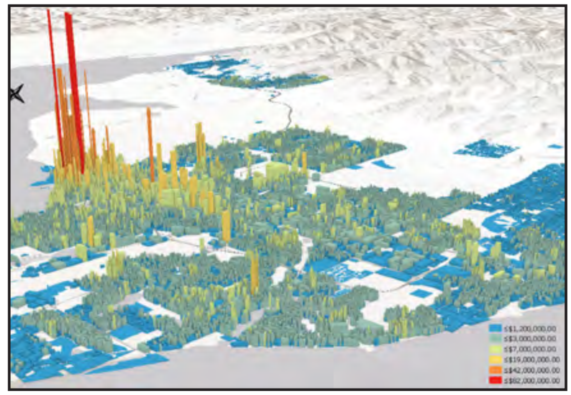
Link: Presentation Slideshow

Link: Downtown Assessment Report

Seward-to-Glenn PEL

This current study will identify and evaluate options to improve safety, livability, regional travel between the Seward and Glenn Highways, and local travel within the surrounding neighborhoods. Currently, the two controlled access freeways are connected through the study area by slower speed arterial roads. The project will also identify ways to improve access between the Port of Alaska and the highway network.

Link: Sewart-to-Glenn PEL Project Website



Taxable Value Per Acre (MOA Planning)

Location Characteristics:

- *Population:* 291,247
- *Area (sq.mi):* 78.8
- *Density (#/sq.mi):* 3,696
- *Year Est'd:* 1 920
- *Elev (ft):* 102
- *Latitude:* 61°13'00"N
- *GDP:* $27.809 billion
- *Climate:* Subarctic

Fairview Neighborhood Plan

The Plan is intended to serve as a tool to aid in the orderly growth and development of the Fairview neighborhood. It guides future public and private improvements in the area, provides a base of information for neighboring entities, is a tool to foster continued health and vitality of the neighborhood, and guides proposed redevelopment projects.

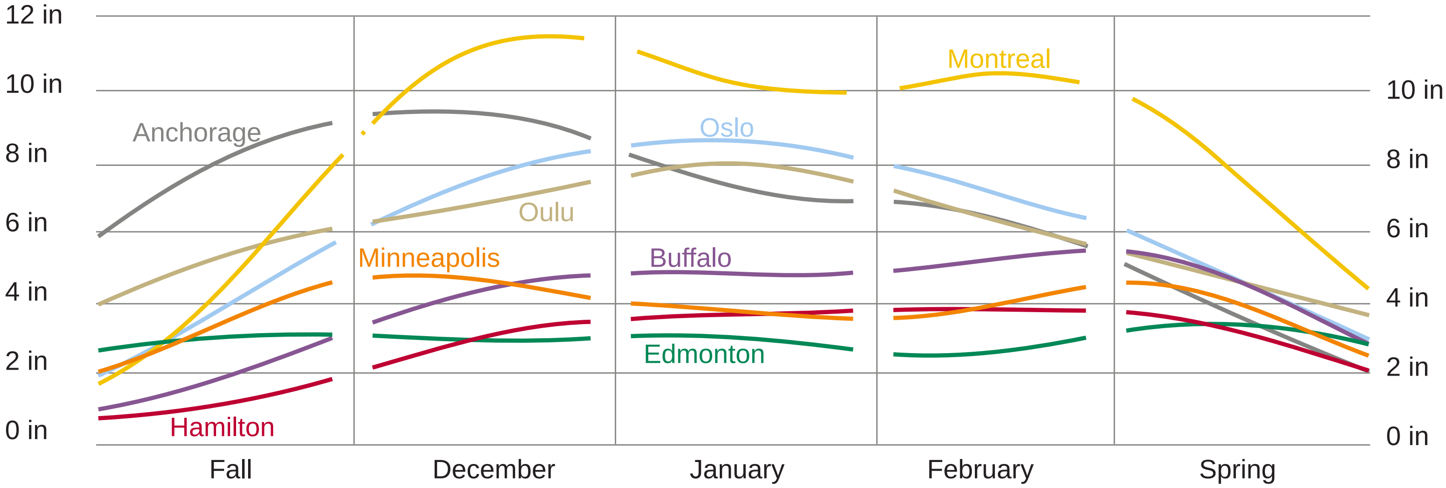
Link: 2014 Fairview Neighborhood Plan

AI Image created with “anchorage street, 8’ wide sidewalk, people walking on sidewalk, 8’ wide bike lane, bikes on bike lane, bus stop, good traffic flow”

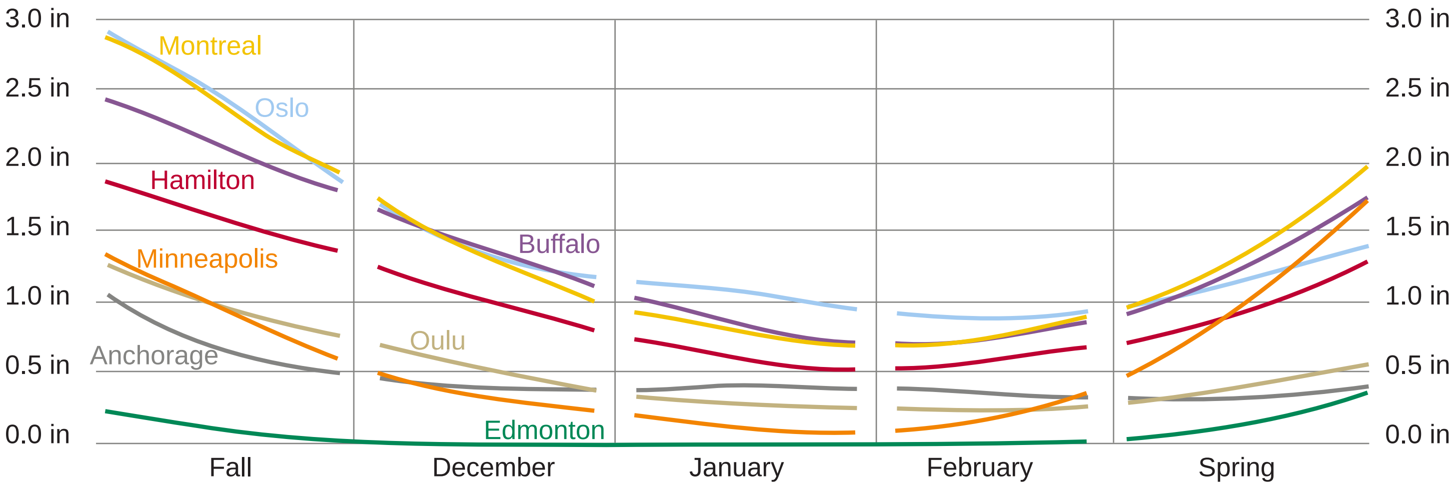
Precedent 2

Precedent Winter Comparisons

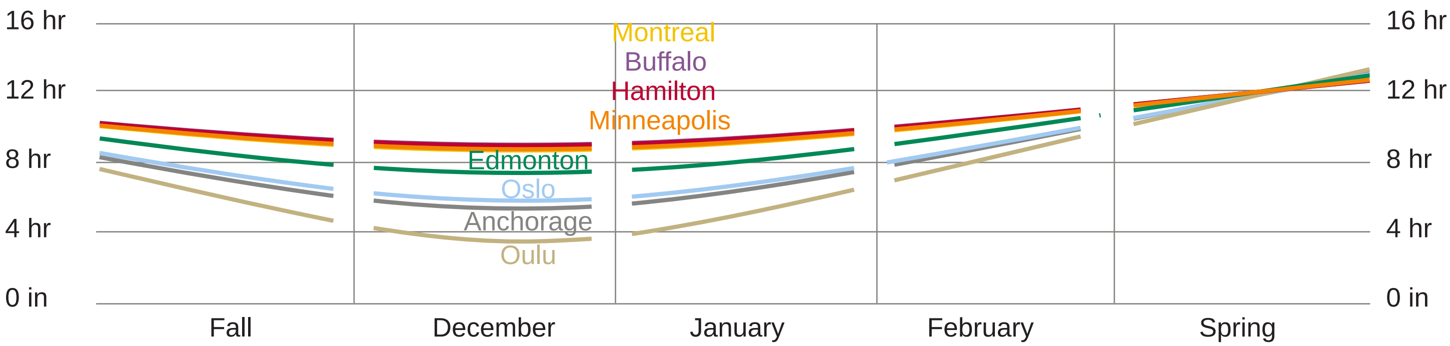
Average Monthly Snowfall in the Winter



Average Monthly Rainfall in the Winter



Average Monthly Sunshine in the Winter



Data from weatherspark.com

Montreal, Quebec, Canada

Resources

Reinvent Montreal Transportation plan

Montreal's 2008 Réinventer Montréal Plan de transport refers to building streets "plus conviviales," or more friendly, which is the French term for Complete Streets. Translated quote: "In the context of an anticipated increase in the number of cyclists and pedestrians, it is essential to work to make the streets more welcoming and more user-friendly, where each user can travel safely."

Link: Transportation Plan Website

Green Neighbourhoods: Guide to sustainable street planning in Montreal

The City of Montreal's 2013 "Quartiers Verts: Guide d'aménagement durable des rues de Montréal" includes numerous references to "Rues Conviviales" (Complete Streets). The guide is intended as a resource for neighbourhoods to use in transitioning to a sustainable public realm and to serve as a means of standardizing Complete Streets designs in Montreal (p. VI).

The guide promotes Complete Streets as a means of ensuring streets are designed with all users and modes in mind, with a particular emphasis on accommodating seniors, children and disabled people, and that street design promotes cycling, walking and transit use. The guide includes a wide variety of Complete Streets examples, neighbourhood maps, and design strategies for traffic calming, street greening, and prioritizing walking, cycling and transit.

Link: Guide too Sustainable Street Planning in Montreal (French)

2019 Case Studies

Fourteen case studies were conducted by Montreal Urban Ecology Centre's analyzing Complete Street transformations across the province of Quebec. At leasts six were within Montreal. Note that the link below provides access to case studies across Canada.

Link: Complete Streets for Canada Case Study Website

Old Montreal (www.ruta-patagonia.com/Tour-Detalle)

Location Characteristics:

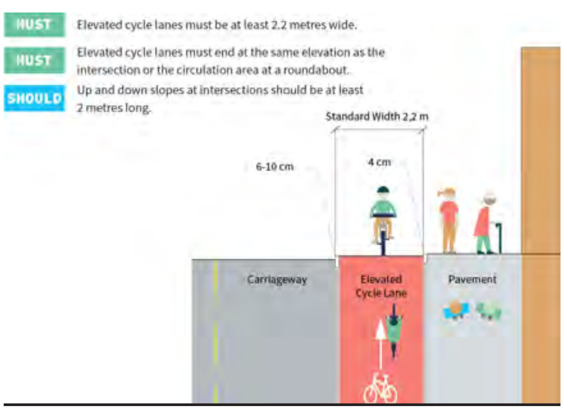
- *Population:* 1,791,508
- *Area (sq.mi):* 141.2
- *Density (#/sq.mi):* 12,691
- *Year Est'd:* 1642
- *Elev (ft):* 101.7
- *Latitude:* 45°30'32"N
- *GDP:* $221.9 billion CDN

Oslo, Norway

Oslo (boomers-daily.com/2022/02/19/winter-walks-oslo-capital-of-norway-4k/)

Location Characteristics:

▪ *Population:*	717,710
▪ *Area (sq.mi):*	164.5
▪ *Density (#/sq.mi):*	4,360
▪ *Year Est'd:*	1048
▪ *Elev (ft):*	357.6
▪ *Latitude:*	59°54'48"N
▪ *GDP:*	$70.97 billion Euro



Design direction for elevated cycle lanes

Resources

Car-free Livability Programme

Oslo's Car-free Livability Programme came about after a public survey revealed gaps in service for pedestrians and cyclists along with a pubic desire for a more pleasant urban environment. The Programme focused small pedestrian and bicycle infrastructure improvements in Ring 1, the central downtown area. The goal of the Programme was to place people highest on the list of transportation priorities over cars. The Programme also included art and landscaping as enhancements for "livable" streetscapes. Over the course of the program, the city tested out several different pilot projects for functionality and made the successful versions permanent. The city also slowly and systematically removed street parking and replaced it with bike and pedestrian facilities, while maintaining off-street parking lots and parking structures.

The approach to change was slow and intentional and focused on a continuous feedback loop from the public.

Link: Car-Free Livability Program

'Action Plan for Increased City Life 2018-2027'

In a planning effort directly Linked to the Car-free Livability Programme but intended to apply more widely across the city, the Action Plan for Increased City Life set about defining what the citizens of Oslo found valuable about urban life (urban economics, art and culture, mobility, people, architecture, innovation, and nature) and then set strategies for enhancing those qualities. Note that, despite the sub-arctic climate, the word "snö" does not appear at all in the document, though winter is mentioned several times as a limiting factor for high quality urban life.

Link: Action Plan for Increased City Life 2018-2027

Street Design Manual for Oslo

The Street Design Manual for Oslo was a direct result of the proceeding Car-free 'Livability Programme; and the Action Plan for Increased City Life 2018-2027.' Commissioned by the municipal government of Oslo, and led by landscape architects, the Street Design Manual is a mandatory planning and design handbook that is applicable to all street projects in Oslo, whether it is a new street or a street renovation. The manual firmly places priority on pedestrian and active transportation modes over vehicular circulation and includes green infrastructure solutions for stormwater runnoff.

Link: Street Design Manual for Oslo

Oulo, Finland

Resources

Programme for the Promotion of Walking and Cycling

As part of a strategy to promote a fiscally conservative approach to transportation planning that reduced government spending by reducing traffic fatalities and carbon emissions and improving public health, the Finnish government published the Programme for the Promotion of Walking and Cycling in 2018. By promoting walking and cycling over use of personal vehicles for short trips, they anticipated that they would "achieve a savings for society in the billions of euros."

The program includes strategies for the development of infrastructure and land use that promotes walking and cycling along with guidelines for legislation and identification of responsible parties. Guidelines for implementation focus on providing high-quality networks of protected cycling and walking routes that are made up of "mixed traffic," or Complete Streets, in transportation corridors with lower speeds (<30km/hr) and separated pathways for higher speed corridors.

Winter Maintenance

Several Finnish cities have made improvements to their transportation corridors to promote walking and cycling based on the Programme, but Oulu has garnered international attention for their unique approach to winter biking.
Oulu's success as a winter city that promotes a complete streets approach to transportation planning is rooted in its maintenance priorities. Bike routes and sidewalks are cleared of snow first and vehicular lanes last. Recognizing that even a few inches of snow is enough to present challenges for bikes and elderly pedestrians or people who use mobility devices, the sidewalks and bike paths are well graded and smooth year-round.

Link: Winter Cycling in Oulu

Oulu winter cycling innovations: signs and signals projected onto snow (oulu.com/en/living/mobility/cycling/)

Location Characteristics:

- *Population:* 212,738
- *Area (sq.mi):* 82.7
- *Density (#/sq.mi):* 2,572
- *Year Est'd:* 1605
- *Elev (ft):* 49.2
- *Latitude:* 65°00'51"N
- *GDP:* N/A

Pedestrian path of 8'4", cycleway of 13'4", and total width of 21'8". Since the total width is without curbs to allow the snowplough to treat the entire surface. Winter clearing produces a level surface of snow.

Buffalo, New York

Rochester, NY. (www.strongtowns.org/journal/2020/2/25/the-trouble-with-bike-infrastructure-in-snowy-cities)

Location Characteristics:

- *Population:* 276,486
- *Area (sq.mi):* 40.38
- *Density (#/sq.mi):* 6,846
- *Year Est'd:* 1832
- *Elev (ft):* 600.4
- *Latitude:* 42°53'11"N
- *GDP:* $84.673 billion

Union Street Cycle Track in Rochester. A resource for urban cyclists, but during five months of winter, it's covered with snow.

Resources

Buffalo Bicycle Master Plan Update

The city of Buffalo's complete streets program focuses primarily on bike infrastructure. The Buffalo Bicycle Master Plan Update from 2016 serves as its main guide for complete street construction and renovations. It is not as holistic an approach as some of the other guiding documents discussed here but it is a good resource for bike infrastructure design. The Master Plan includes guidelines on the planning and implementation of bike infrastructure and an extensive section of design guidelines for different types of bike facilities. While it may lack the information on pedestrian or public transit improvements that is included in other complete streets guides, the Buffalo Bicycle Master Plan was selected for inclusion in this study because of its thorough discussion of snow clearing operations for non-motorized transportation facilities in the Appendix E - Winter Bikeway Maintenance section.

Link: Buffalo Bicycle Master Plan

Appendix E - Winter Bikeway Maintenance

Appendix E consists of a white paper that examines best practices for winter bikeway maintenance based on case studies gathered from cities with similar climates. The paper includes examples of different strategies for snow clearing and winter maintenance from places like Salt Lake City, Oulu, Chicago, Minneapolis, and Vienna, all of which have cold climates with lots of snow.

Topics include snow-clearing, de-icing, traditional practices vs. new innovations like application of hot sand, and clearing prioritizations. Like the Oulu guide, the authors of Appendix E recommend prioritizing the clearing of bikeways as soon as possible after snowfall and clearing them down to the pavement instead of grooming them. 'Primary bikeways should be cleared first, providing the best access to the greatest number of people possible following a heavy storm event."

Link: Buffalo Bicycle Master Plan - Appendix E

Minneapolis, Minnesota

Resources

Minneapolis 2040: Policy 17

"The City's Complete Street Policy creates a modal hierarchy in the public right of way. The Policy prioritizes walking and pedestrians first, followed by bicycling and taking transit, and lastly driving motor vehicles. This policy framework guides all transportation-related decisions and encompasses all elements in the public right of way. The Complete Streets Policy vision is to improve the environment, the health and safety of residents, and support and strengthen the local economy."

City of Minneapolis Street Design Guide

The City of Minneapolis Street Design Guide requires a complete street approach for all road projects. It defines street typologies and makes specific design recommendations for each typology that address all modes of travel.

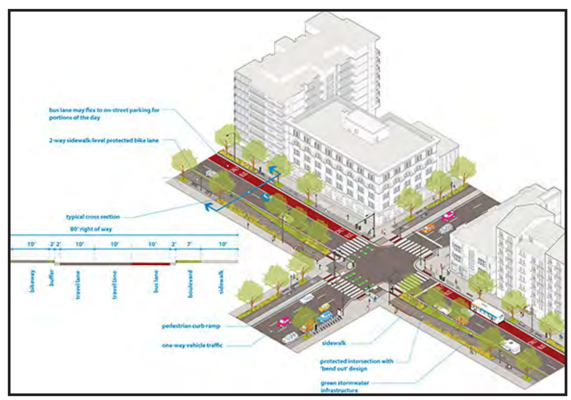
Interestingly, the typical sections for roads and lanes in the design guide are much narrower than typical Anchorage construction. Recommendations for streets that average 5,000 to 20,000 ADT are only required to have one vehicle travel lane in either direction and the lanes are specified at 10' unless it is a freight route, in which case 11' width is acceptable. This allows for much more room in the ROW for active transportation infrastructure.

Link: City of Minneapolis Street Design Guide

Street Design Guide. (sdg.minneapolismn.gov/design-guidance/intersections/bikeway-intersection-design/queue-boxes)

Location Characteristics:

- *Population:* 425,096
- *Area (sq.mi):* 54.0
- *Density (#/sq.mi):* 7,870
- *Year Est'd:* 1850
- *Elev (ft):* 866.1
- *Latitude:* 44°58'55"N
- *GDP:* $277.6 billion



Downtown core street guidance

Hamilton, Ontario, Canada

(Hamilton Complete Streets Design Guidelines)

Location Characteristics:

- *Population:* 597,010
- *Area (sq.mi):* 431.3
- *Density (#/sq.mi):* 1,384
- *Year Est'd:* 1846
- *Elev (ft):* 397.0
- *Latitude:* 43°15'24"N
- *GDP:* $37.0 billion CDN

Establishing pedestrian zones

Resources

Hamilton Complete Streets Design Guidelines

Published in June of 2022, the Hamilton Complete Streets Design Guidelines are notable for its "Outside In" approach that promotes design that is flexible and responsive to the context of the corridor. It includes overarching guidelines for the planning and implementation of complete street designs, a description of the major elements of complete streets, and then discusses Hamilton streets' typologies and options for intersection treatments.

The Guidelines also include a decision making flow chart for use during design that addresses things like limited ROW width, other site specific issues, prioritization of uses within the corridor, and adjacent land uses.

Link: Complete Streets Design Guidelines

Complete Street Audit Tool

The city of Hamilton has published an interactive spreadsheet to help guide decision making during municipal project planning that is based on their Complete Streets Design Guidelines. The spreadsheet allows the planner to enter data on the existing conditions and compare the existing conditions to the desired complete streets outcome for that street typology. The results for each street provide a useful resource for project prioritization.

Link: Complete Street Audit Tool (Excel)

Edmonton, Alberta, Canada

Resources

Winter City Design Guidelines

This document provides a strategic tool for providing developers, architects, engineers and planners with a framework for their projects, identifying the City's intentions in terms of what kinds of development and what levels of quality it deems acceptable.

Link: Winter City Design Guidelines/

Complete Streets Design and Construction Standards

Edmonton's Complete Streets Design and Construction Standards manual approaches complete streets with the idea that some modes of transport will inevitably be prioritized over others, but the prioritization process will depend on the corridor context. Streets in popular shopping areas will prioritize pedestrians while streets in low-density or more rural areas might prioritize through vehicular traffic. With this in mind, the manual includes an entire section titled "Design Process, Trade-offs and Evaluation." It also includes design requirements for complete streets, recommended street sections for the various street typologies, construction specifications, and standard drawings.

Link: Complete Streets Design and Construction Standards

132nd Ave

132nd Ave is currently undergoing a major renovation based on the complete streets principals. 132nd Ave is a collector street with a typical 4-lane street section with narrow sidewalks. The renovation will add different features along the length of the corridor that promote safety and enhance active transportation use such as raised crosswalks, protected bike lanes, vegetated medians, and on-street parking. Note: the design materials for this project name property owners as responsible for clearing snow off of the sidewalks during the winter instead of relying on the municipality snow clearing operations to do so.

Link: Project Website

Complete streets design for 132nd Ave. (www.edmonton.ca/sites/default/files/public-files/132Ave_Draft_Design_Booklet)

Location Characteristics:

- *Population:* 1,087,172
- *Area (sq.mi):* 264
- *Density (#/sq.mi):* 4,108
- *Year Est'd:* 1795
- *Elev (ft):* 2116.1
- Latitude: 53°32'04"N
- *GDP:* $91.57 billion CDN

State of Ohio

A photo from the MORPC Complete Streets story map. (Image source: https://storymaps.arcgis.com/stories/7cbf7c1ea77b43aeb3e186003731ca3b)

Resources

Mid-Ohio Regional Planning Commission Complete Streets Policy and Resources

Acting as a central planning hub for the communities of central Ohio, the MORPC has a web-based resource center for complete streets policy guidelines and planning and design resources. All projects completed with federal funding, using MORPC as the pass-through funding agency, are expected to comply with the MORPC complete streets policy, which was recently updated in 2021. The MORPC relies on other agencies, such as NACTO and FHWA, for design guidelines and details, but they offer a MORPC Complete Streets Equipment Library that allows users to Borrow count equipment and other tools for collecting data for complete streets projects.

Link: MORPC Complete Streets Policy and Resources

MORPC Complete Streets story Map

The MORPC Complete Streets Story Map is an interactive tool that educates users about complete streets. It is "a companion to the tools and resources of the 2020-2050 Active Transportation Plan. It includes context and additional information for practitioners to assist with decision-making for roadway design projects." It covers information like the definition of active transportation, a description and discussion of traffic stress, design considerations for complete streets, and Links to other planning and design resources.

Link: MORPOC Complete Streets Story Map

Appendix E: Right-of-Way Ownership

DOWNTOWN STREETS ENGINEERING STUDY

ROW Research Report: A history of major road corridors serving downtown Anchorage and options for increased local control

June 11, 2024

Introduction

Next year will mark 50 years since the City of Anchorage and the Greater Anchorage Area Borough merged to form the Municipality of Anchorage. Many residents may not be aware of the complex history of local government and the financial and administrative challenges to provide community infrastructure including road construction and maintenance.[1] To understand the current road maintenance scheme in Anchorage, it will be helpful to briefly explain the factors that contributed to it, including a review of what a public ROW is and how DOT&PF and MOA exercise authority over ROW on behalf of the public.

Who "Owns" Public Road Rights of Way (ROW)?

In Alaska, there are multiple ways that a public ROW is established. ROW can be created by deed, by plat, by statute, by Public Land Order (PLO) and by public use. It is not unusual for a road corridor in Alaska to contain all these sources of ROW – what matters is whether the public has sufficient rights to use the land. Government can assert and defend those rights for the public.

Unless the ROW is created by deed, there is no distinct title document vesting ownership in a government entity or agency. The term "ownership" is often used interchangeably with "jurisdiction." For purposes of this planning effort, who "owns" the ROW is not as relevant as who *manages* the ROW. Within municipalities with road powers, the management authority of roads generally resides with the local government, but there are exceptions, as we see in Anchorage.

State-maintained and managed public ROW in Alaska has its origins before statehood. Across the Territory of Alaska, the Alaska Road Commission (ARC) and the Bureau of Public Roads (BPR) constructed roads within and across cities and towns.[2] This much needed support for public infrastructure was key to Alaska's progress. The pattern and extent of settlement was intertwined with the development of roads. A similar patchwork of local and state-maintained roads is seen in other communities such as Palmer, Wasilla, Fairbanks, and Nome.

R&M CONSULTANTS, INC.

Decades after statehood, DOT&PF still maintains and manages most of the routes inherited from ARC and BPR, channeling federal funding to improve traffic flow and safety within and between communities. The purpose of this report is to give a brief history of major corridors within or serving the study area: 5th/6th Avenue (Glenn Highway), Ingra/Gambell (Seward Highway), the A/C Street corridor (specifically, the Port Access) and the I/L Street corridor (Minnesota Drive). To do that, we need to step outside the Downtown Streets study area and look at the bigger picture of road development.

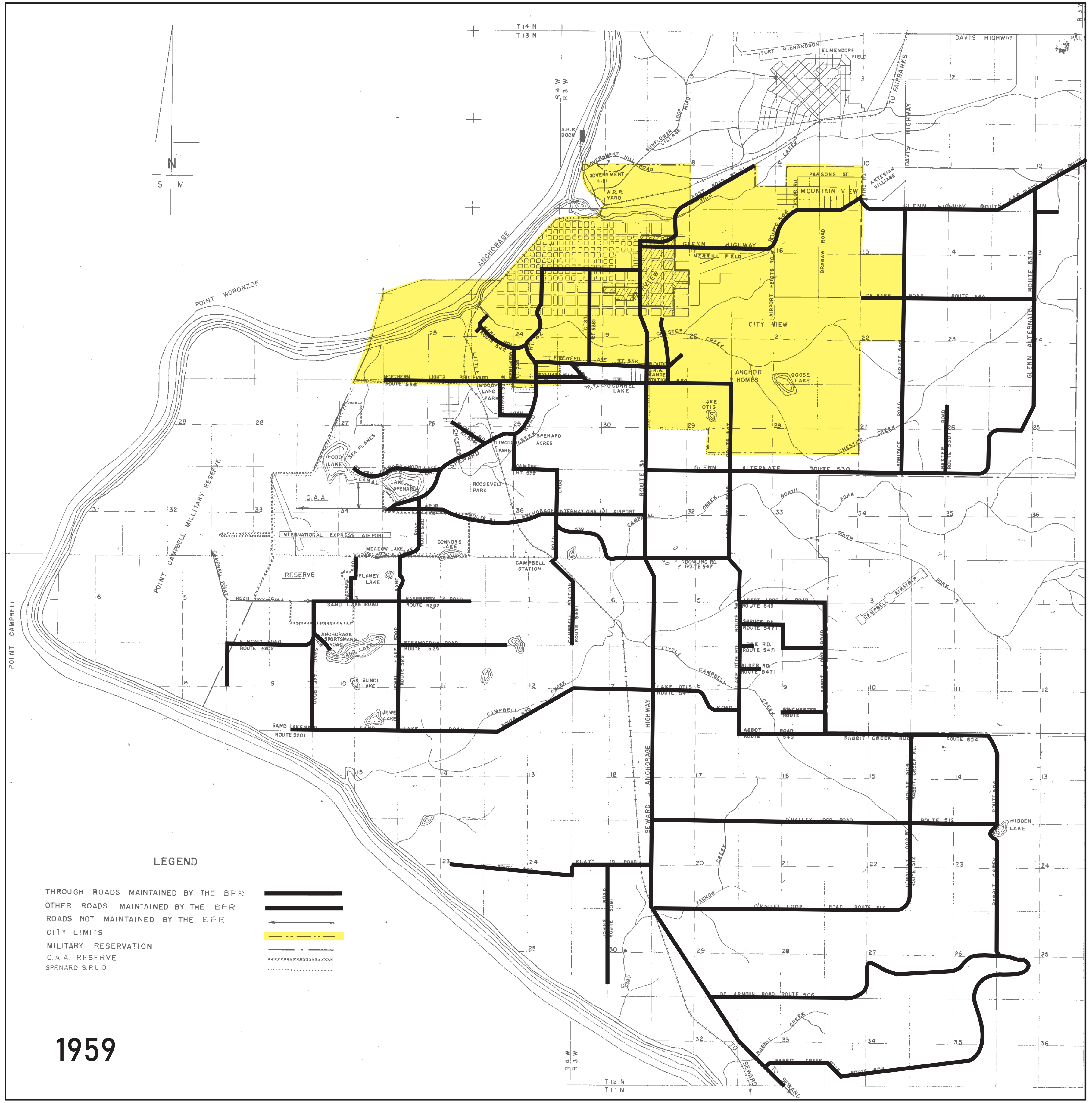
Anchorage's road system: then and now

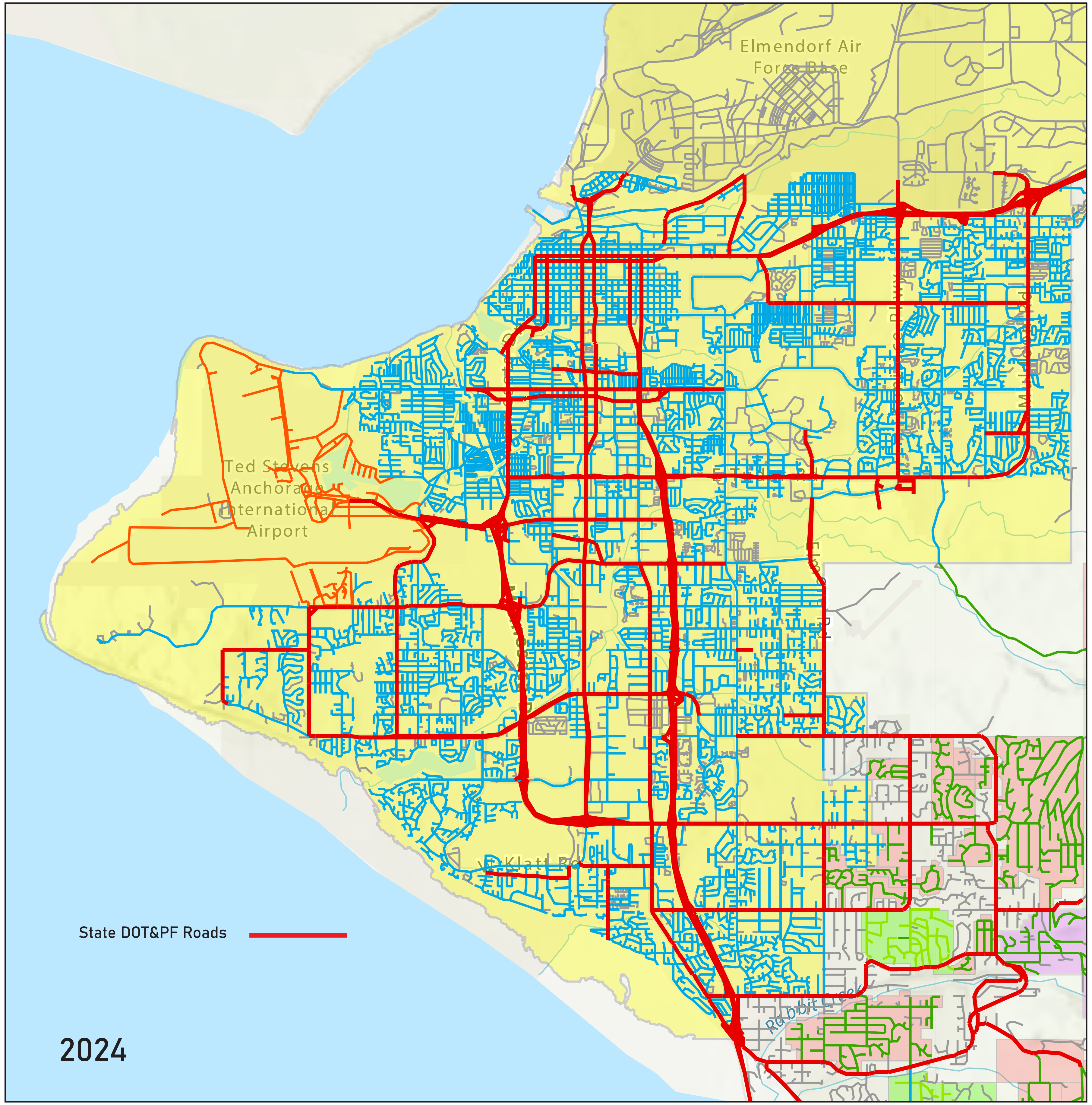
The history of Anchorage's present road system is inseparable from that of the ARC/BPR. In many respects, how our early infrastructure was built and by whom is tied to our long tenure as a U.S. Territory. No other state or territory has an agency like the Alaska Road Commission in its past, and rarely has a government agency done so much with so few resources. Many books, articles and documentaries on the ARC are available for an in-depth review[3], but only a summary is necessary to frame this discussion.

In the lower 48 states, road construction was the responsibility of local or state government, although in some cases, private companies built toll roads. The first Federal Road Act of 1916 established regular appropriations for road construction to be allocated among the states. The Territory of Alaska was excluded from the federal-aid apportionment though forest highways were regularly funded by these Acts. The 1921 Federal Highway Act expanded the funding structure and established the early Federal Aid Highway System of primary and secondary roads that were eligible for federal matching funds. 1921 saw the last of the lower 48 states admitted to the Union - it would be 35 more years before Alaska gained the benefit of the federal-aid system of highway funding.

ARC funding was appropriated annually by Congress and could only be described as meager until WWII made Alaska's geographic location an important crossroads and a focus of military spending. In the 1940s, the Glenn Highway was extended from Palmer to the Richardson Highway, a rail link built to Whittier, and a road link built around Turnagain Arm to complete the Seward Highway. The influx of military personnel and private citizens brought thousands of people to Anchorage. Most of the population lived outside Anchorage city limits and petitioned the ARC to build roads to serve their homesteads or subdivisions. The extent of the buildout is clear from reports and historic maps prepared through the years by ARC and BPR.

For example, the graphic on the following page compares the Anchorage road system at statehood to today's network. The figure left is based on a 1959 BPR map that reflected road names and route numbers listed on the first Federal-Aid Highway System tabulation for Alaska. Anchorage city limits is highlighted in yellow on the BPR map. The figure right was generated from the MOA GIS online database as of April 2024.[4]


LEGEND
THROUGH ROADS MAINTAINED BY THE BPR
OTHER ROADS MAINTAINED BY THE BPR
ROADS NOT MAINTAINED BY THE BPR
CITY LIMITS
MILITARY RESERVATION
C.A.A. RESERVE
SPENARD S.P.U.D.
GLENN HIGHWAY
SEWARD HIGHWAY
INTERNATIONAL AIRPORT
POINT CAMPBELL
POINT WORONZOF
1959


Elmendorf Air Force Base
Ted Stevens Anchorage International Airport
State DOT&PF Roads
2024

In 1959, the Glenn Highway (Route 42) and Seward Highway (Route 31) were well-established, and "C" Street Extension already existed. The intersection of Spenard Road and Anchorage International Airport Road was the official start of Route 42, following Spenard Road to the west side of the townsite between L and N Street and continuing along 9th Avenue to meet the Seward Highway. Significant improvements in traffic capacity and highway safety occurred soon after this map was completed.

In the 1950s, the City of Anchorage Planning Commission prepared both a Street Plan and a General Highway Plan through two specialized committees organized for transportation planning purposes.[5] The 1955 Street Plan identified an alternate route for Spenard Road and a viaduct over C Street to serve Government Hill and Elmendorf AFB. Both plans recognized that without federal or territorial funding, the recommended improvements could not be constructed.

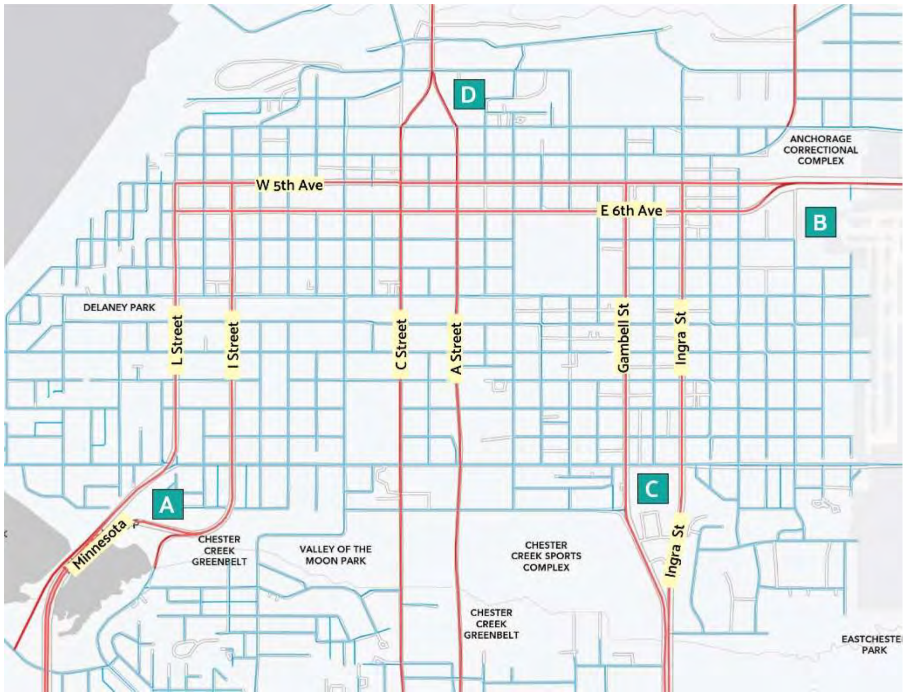
In 1956, BPR became the federal manager of the Alaska Highway System, and the Territory of Alaska was included in the federal-aid system for the first time. The Territorial Legislature created the Alaska Highway and Public Works Department in 1957 to plan and manage the projected federal expenditures for highways. Under the same law, communities of 5,000 people or more were required to prepare a local highway master plan as a resource to plan funding priorities. The provisions of that territorial law survive today in Alaska Statute (A.S.) 19.20.080, Municipal master highway plan. The Anchorage Area Preliminary Highway Plan, published in October 1957, again identified the C Street viaduct and the Spenard Road relocation as important corridors that would improve safety and traffic flow.[6]

The Official Street and Highway Plan published November of 1963 reported that the one-way couplet design for 5th & 6th Avenues, I & L Streets and Gambell and Ingra Streets was now part of the Federal Aid Primary System plan. The Minnesota Drive bypass and a viaduct across Ship Creek was to be built by the State with Federal funds.[7]

Early municipal highway plans guided the construction of the following major projects in and adjoining the Downtown Streets study area (see graphic next page). DOT&PF acquired ROW for these projects using federal-aid funds.

A. Hillcrest, aka Spenard Thruway (Minnesota Drive) widened Minnesota Drive and constructed the connection through Westchester Lagoon to the I/L Street corridors in the Anchorage Townsite. Construction was underway in 1967 and completed two years later with a cost of $3.65 million. Related upgrades to 5th, 6th, I and L Streets were under contract in 1968 and completed in 1969 for a project cost of $595,000. An agreement between the City and DOT&PF related to this project was signed in 1968, providing for management of parking, traffic control devices and encroachments.[8]
B. The Fifth-Sixth Avenue Couplet project acquired ROW to widen 6th Avenue and construct a connection from Sixth Avenue to Fifth Avenue between Gambell and Medfra Street. The contract was issued in 1966 and finished that year for a cost of $315,000.[9]
C. The Ingra from Fifth to Gambell Couplet project acquired and constructed a connecting corridor to Ingra Street northbound. The project began in 1966 and was completed in 1967 for a contract cost of $1.64 million.[10]

D. The ROW for the A/C couplet serving the Port of Anchorage and Elmendorf AFB was acquired in the early 1970s and constructed in two phases from 1973-76. The first phase cost $10.8 million.[11]



1969 route mapping describes each federal aid route and gives a tabulation of construction projects. The major corridors in the Downtown Streets study area were already constructed in some form in 1969, with only the Port Access in its current configuration yet to be built.[12]

These corridors have been improved for vehicular users for decades using federal funds administered by DOT&PF and matching funds primarily from the state, but also from MOA. The investment in the major corridors is reflected in their functional classifications, which are the highest categories in the system: Interstate, Principal Arterial and Minor Arterial. They are now National Highway System (NHS) routes[13] with varying levels of strategic importance. Federal Highway Administration (FHWA) mapping of the NHS System for Anchorage shows that the A/C couplet serving the Port has a higher strategic importance than the 5th/6th and I/L Street corridors to the west of the couplet [14] because intermodal access is one of the key features of a strategic NHS route.

Federal funding has clearly had a significant impact on the Anchorage road system, but as the community has grown and changed, current road designs have come into conflict with a new vision for downtown Anchorage.

MOA options for more local control over downtown streets

Decades ago, traffic studies focused on alleviating congestion and getting traffic in and out of downtown Anchorage. "Downtown" was the destination, but now many residents live and work outside of the townsite. How many travelers driving through Anchorage's downtown could use a different route, while supporting all the people who want to park, work, shop and dine in historic Anchorage? A new traffic pattern may make a change of status for 5th/6th Avenue an obvious choice - routing “through” traffic elsewhere so the corridor accommodates vehicular, pedestrian and bicycle transport as the emphasis. MOA already performs all winter maintenance on state-owned roads within the Downtown Streets study area and maintains the sidewalks and some streetlights on state-owned roads. If MOA wanted the 5th & 6th Avenue arterial routes reconfigured to accommodate more pedestrian and bicycle traffic, how would that be accomplished? Two options are apparent:

Option 1*: Use the metropolitan planning process to implement a new vision for the study area.*

Over the last 4 decades, federal transportation policy has evolved beyond vehicle-only corridors to shared corridors that support bicycle and walking activities. In just the last few years, shared corridor planning has become a standard for implementation nationwide. The Bipartisan Infrastructure Law (BIL) of 2021 emphasized roadway safety for <u>all</u> users, including bicyclists and pedestrians. In response, FHWA has encouraged all states to adopt the “Complete Streets” approach to planning and constructing surface transportation.[15]

According to FHWA, “A Complete Street is safe, and feels safe, for all users. FHWA is focused on supporting transportation agencies to plan, develop and operate equitable streets and networks that prioritize safety, comfort, and connectivity to destinations for all people who use the street network.” AMATS already has an approved Complete Streets policy[16], and DOT&PF is currently developing its own policy.[17] The Downtown Streets plan will play an integral role in emphasizing what the community wants in future transportation planning for all the routes within and serving the city center of Anchorage. The Complete Streets approach could be a way to implement this new vision.

Deficiencies in pedestrian and bicycle facilities in downtown Anchorage were documented in AMATS MTP 2040 and continue as MTP 2050 is in the review stage. By evaluating the most critical needs for improvement and identifying those corridors that are of highest priority, the Downtown Streets plan can recommend projects that may be included in the next AMATS TIP plan. Project nominations open in 2026 for the next TIP.

The added advantage to using the metropolitan planning process is that federal funds can be used to plan, design and construct bicycle and pedestrian infrastructure. FHWA has identified funding sources on their “Complete Streets” website, including a link to a detailed matrix of pedestrian and bicycle infrastructure funding opportunities.[18]

Option 2*: Request relinquishment of the selected corridor, which means a conveyance of all DOT&PF’s interest in the corridor to MOA for continued transportation purposes*.[19]

The advantage to relinquishment is that MOA would get full control of the corridor, but that control would come with additional cost. Improvement projects along the corridor may still be funded by federal dollars, but priority funding is not guaranteed. All maintenance (including summer season repairs) and property management duties will become MOA’s responsibility.

A key task of ROW property management is the control of non-highway uses within the ROW corridor. According to DOT&PF's Alaska ROW Manual, "Any non-highway use within the ROW, except for a mailbox or a newspaper box attached to a mailbox, is considered to be an encroachment." Currently, DOT&PF manages encroachments, driveways and business signs that are allowed by both state law and FHWA regulations through a permit process. The management of outdoor advertising along Alaska's highways is also a function of DOT&PF. Any encroachments, driveways and business signs not authorized will be removed by DOT&PF, with few exceptions. Property owners are notified and given an opportunity to remove an encroachment unless it constitutes a safety hazard. Failure to manage non-highway uses of the ROW violates state law and FHWA regulations and may result in sanctions such as a freeze of federal highway funds.

Disposal of any ROW interest, which includes both the transfer of ROW to another government agency as well as vacation of ROW, is also regulated by both DOT&PF's ROW Manual (Chapter 9.10) and FHWA regulations at 23 CFR 620, Subpart B. FHWA concurrence is required if federal funds were used to acquire the interest identified for disposal.

The advantage to DOT&PF of relinquishing a highway corridor is the immediate release of the financial burden of their portion of maintenance costs, however, past discussions with FHWA indicate that DOT&PF will not be relieved of responsibility for enforcing FHWA regulations or maintenance deficiencies, even if the transfer to a municipality occurs.[20] In other words, FHWA will hold DOT&PF responsible for all management or maintenance of a relinquished road. This is not an unexpected conclusion. DOT&PF's management responsibilities are outlined in the April 2015 Stewardship and Oversight (S&O) Agreement with FHWA.[21] Nothing in this agreement implies that local governments can assume DOT&PF's role. FHWA regulations clearly state that maintenance duties of State highway departments may be delegated to other governments, but the department will still be responsible for maintenance.[22] The DOT&PF Maintenance and Operations (M&O) Manual [23] provides the guidelines for maintenance that may be expected if a road transfer or relinquishment occurs.

Cities and municipalities are not lining up with applications for relinquishment of state-maintained roads for a reason. MOA will have to convince DOT&PF that relinquishment is in DOT&PF's best interest, and that MOA will manage the ROW and maintain the roadway according to DOT&PF and FHWA requirements in the S&O Agreement and M&O Manual.

FHWA regulations allow relinquishment of a highway facility.[24] Contracts with Local Public Agencies (LPAs) are allowed under Chapter 2.4.1 of the DOT&PF ROW Manual and Road Transfers are addressed in a single paragraph under Chapter 9.10.9. Road transfers/relinquishments are accomplished using a Memorandum of Understanding (MOU), the terms of which will be negotiated between DOT&PF and MOA. Unfortunately, there is no detailed State of Alaska procedure for relinquishment in writing. Twenty years ago, DOT&PF drafted a Local Agency Procedures Manual, but it was not approved. Since that time, each request for relinquishment by local government has been dealt with on a case-by-case basis and there are no instances of such a high classification route as 5th or 6th Avenue that have been completed.

For example, an agreement between DOT&PF and the City and Borough of Juneau (CBJ) was signed in 2012 for "planning, design, construction and ownership" of Shell Simmons Drive in Juneau. This route is on the NHS system for Alaska and is classified as a major collector, but the segment involved is only 800 feet in length.[25] Of particular interest is Section VI. *CBJ's Right-of-Way, Operations and Maintenance Obligations* which thoroughly addresses the duties CBJ agreed to assume, in compliance with DOT&PF and FHWA directives. The transfer has not been completed, as it is still shown as a state route in DOT&PF's GIS mapping.

Although relinquishment of a corridor is possible, it is clearly time-consuming. Assuming the original CBJ agreement took a year to negotiate, nearly 12 years have passed since it was signed. If MOA seeks relinquishment on some of the Downtown Streets, the result may be no more control or options than it has at the present time, but with the added costs of DOT&PF and FHWA maintenance and management requirements.

Summary

The network of state-maintained roads has largely been in place since statehood with some substantial improvements in vehicular traffic capacity and efficiency constructed with federal funds. Like many federal grants, the money brings significant responsibility that is not easily circumvented.

The community can still make its voice heard. The Downtown Streets plan can take this opportunity to envision what the city center will look like, with or without changes to the status of 5th & 6th Avenues and other major corridors.

Endnotes and References

[1] See Chapter 10 of Imagining Anchorage: the making of America's northermost metropolis for an excellent explanation of this history (full citation below).
[2] Three agencies were responsible for road planning and construction in the territorial years. The Bureau of Public Roads (BPR) constructed roads and trails in the National Forests (about 5% of Alaska) and the Alaska Road Commission (ARC) constructed roads and trails outside the forests. The Territorial Board of Road Commissioners did not have a construction division, but it did select projects and contribute funds to ARC for construction. The Federal-Aid Highway Act of 1956 abolished the ARC, and its functions, duties and authority were transferred to the BPR in the U.S. Department of Commerce. At statehood, the Secretary of Commerce transferred the highway system, as well as real property such as highway maintenance stations, to the State of Alaska.
[3] See Alaska Roads Historic Overview, prepared for Alaska DOT&PF, February 2014 for content and references to other sources of information on ARC and BPR.
[4] Sources for Map Exhibit: 1) BPR Map No. 225, "Anchorage Vicinity Map", latest Revision 7/24/1959, from CRDOT&PF map collection 2) Federal-Aid Primary Highway System as approved February 26, 1957, from Record Group 30, Records of the BPR, National Archives and Records Administration (NARA), Washington, D.C. and 3) pdf generated from MOA online database April 2024.
[5] Anchorage Area General Highway Plan, August 1954 and Preliminary Anchorage Street Plan, February 1955, prepared by the City Planning Commission, Highway Planning Committee and Street Planning Committee, scanned from originals in the CR DOT&PF Planning Library.
[6] Anchorage Area Preliminary Highway Plan, prepared by City Planning Commission, Highway Planning Committee, October 1957, scanned from original document in the CR DOT&PF Planning Library.
[7] Official Street & Highway Plan, Plan Report No. 1963-2, City Planning Commission, Anchorage, Alaska, scanned from original document in CR DOT&PF Planning Library.
[8] Project Plans for ROW AK Proj. No. F-042 1(22)/Construction AK Proj. Nos. F-042-1(26) and F-042-1(28) and State of Alaska Department of Highways Project Annual Report, 1967 and 1968 from Central Region (CR) DOT&PF collection.
[9] Project Plans for ROW/Construction AK. Proj. No. F-042-1(15) and State of Alaska Department of Highways Annual Report, 1966 and 1967 from CR DOT&PF collection.
[10] Project Plans for ROW AK Proj. No. F-031-2(20)/Construction AK Proj. F-031-2(21) and State of Alaska Department of Highways Annual Report, 1966 and 1967 from CR DOT&PF collection.
[11] Project Plans for ROW AK Proj. No. F-042-1(23)/Construction AK Proj. F-042-1(47) and AK Proj ALF-042-1(62) and State of Alaska Department of Highways Annual Report, 1964 and 1974 from CR DOT&PF collection.
[12] See 1968 DOH Road Inventory mapping for FAP 42-1, Section A (2 sheets), FAP 31-2, Section B, and FAS 539 from CR DOT&PF map collection, latest revision October 1969.
[13] From State of Alaska National Highway Systems Maps, April 2006: "*The National Highway System (NHS) is an interconnected system of routes that serve important national functions, e.g., security, commerce, and travel. The NHS is comprised of Interstate and defense routes, other principal arterial routes, and routes connecting to major intermodal facilities such as airports, ports, and ferry terminals. With a few exceptions, all NHS routes in Alaska are owned by ADOT&PF.*"
[14] Map of National Highway System: Anchorage, AK, FHWA October 1, 2020, downloaded from https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/alaska/anchorage_ak.pdf
[15] See https://highways.dot.gov/complete-streets for more details on FHWA Complete Streets resources.
[16] AMATS Complete Streets Policy, available online at https://www.muni.org/Departments/OCPD/Planning/AMATS/Documents/Complete_Streets/20230928_Complete%20Streets%20Policy_Revision_Tracked_Changes.pdf
[17] See https://dot.alaska.gov/stwdplng/completestreets/ for progress on the State of Alaska's Complete Streets policy.
[18] Pedestrian and Bicycle Funding Opportunities matrix, downloaded from https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.pdf
[19] ADOT&PF Alaska Right-of-Way Manual, Chapter 12: Definitions, latest revision February 2022, available online at https://dot.alaska.gov/stwddes/dcsrow/ and FHWA regulations at 23 CFR 710.105 Definitions, available online at https://www.ecfr.gov/current/title-23/chapter-I/subchapter-H/part-710/subpart-A/section-710.105

[20] Excerpt from email from Elizabeth Hoffman, FHWA Alaska Division to John F. Bennett, NR DOT&PF Chief ROW Agent, dated 7/14/2011 states "If the relinquishment is a rural major collector or higher, the facility would need to be maintained in perpetuity. If the relinquishment is a local or rural minor collector, the facility would need to be maintained for the 20 years (road facility) design life or 75 (bridge facility) design life. The FHWA would hold DOT&PF accountable for ensuring that the local government continues to meet the requirements for maintenance and keeping the ROW clear of encroachments."

[21] Stewardship and Oversight Agreement on Project Assumption and Program Oversight by and Between Federal Highway Administration, Alaska Division and the Alaska Department of Transportation and Public Facilities, available online at https://www.fhwa.dot.gov/federalaid/stewardship/agreements/ak.pdf

[22] See 23 CFR 1.27 at https://www.ecfr.gov/current/title-23/chapter-I/subchapter-A/part-1/section-1.27

[23] DOT&PF M&O manual, available online at https://dot.alaska.gov/stwddes/research/assets/pdf/ak_maint-ops_hb.pdf

[24] See 23 CFR 620 Subpart B - Relinquishment of Highway Facilities at https://www.ecfr.gov/current/title-23/chapter-I/subchapter-G/part-620

[25] Memorandum of Agreement Between the City and Borough of Juneau & Alaska Department of Transportation and Public Facilities for Juneau-Yandukin Drive/Shell Simmons Drive Pavement Rehabilitation (Glacier Hwy to Egan Dr) (Federal Project #NH-000S(806) ~ State Project #68045), signed 8/20/2012.

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