



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Transportation and
Public Facilities

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January 30, 2019

Ms. Eryn Boone, Supervisor
Girdwood Board of Supervisors
P.O. Box 390
Girdwood, AK 99587

SUBJECT: Alyeska Highway Pathway Sweeps at Stop Bars

Dear Supervisor Boone,

Our Department agrees there are always more options we can add to address pathway concerns along Alyeska Highway. The key will always be how much those options cost compared to the newly built pathway in place, and can they be delivered and maintained with the reduced staff we have in the area?

Department representatives have been to the community several times for meetings on this subject during design and construction. We met at the end of construction July 10, 2017 with many community members of the Girdwood Land Use Committee. We biked the route and observed users able to safely use the full pathway width and shy from traffic when desired. We listened and we agreed to do more by completing striping showing the path edge across sidestreets and filled the sharp corners raised at that time. We next responded on April 24, 2018 to the same GBOS concerns expressed in your newest letter.

Most recently we met with the Girdwood Fire Chief and a Municipal manager November 16, 2018 regarding the Seward Highway, and the Alyeska pathway subject came up. We agreed to consider additional striping and signing messages to address ongoing concerns, ideally to be placed in summer 2019. Those additional potential changes have since been reviewed and found to not be consistent with our current standard and beyond our current ability to install/maintain.

The capital project work is done as stated in our April 2018 letter to GBOS. There is no remaining funding to rebuild the pathway or make additional modifications. The last project significantly changed road width and continuously flowing ditches and pipes at great cost. The most reasonable next steps appear to be minor traffic control changes within the resources we have and consistent with our standards. This will be a difficult consideration recognizing decreasing maintenance budgets and minimal field staff available.

Pathway sweeps have been a design standard for DOTPF since 1986. A major Anchorage safety study in 2005 showed most bicycle crashes involve right turning vehicles at unsignalized intersections and driveways. This led to continued use of sweeps on major roads in the MatSu, Anchorage, and Kenai using the same detail used on Alyeska Highway. Projects have built them on Knik-Goose Bay Road, the Parks Highway, Palmer-Wasilla Highway, Tudor Road, Muldoon Road, and the Kenai Spur Highway to name just a few.

Several Anchorage roadways are top ranking bicycle crash corridors due to the lack of sweeps. Most notable is Lake Otis Parkway. For this reason, sweeps have been recognized as future project needs in the MOA Bicycle Plan since 2007.

Sweeps maximize visibility between both parties. National guidance in AASHTO and NACTO note visibility is an important safety tool. These guides acknowledge a higher likelihood of either the bicyclist or the motorist not seeing or stopping for each other when a pathway crosses a sidestreet well ahead of the expected STOP bar. Visibility is the reason the Alyeska pathway design uses sweeps at the larger sidestreets with STOP bars. We did try to minimize sweeps rather than apply them to all sidestreets. We used buffers only after further clearing and YIELD to Bikes signs at very low volume sidestreets.

The use of sweeps means more likely stopped vehicles and lower risk to bicyclists in this zone between the lane and 15 feet. This is supported by historical crash outcomes reviewed in 2005. WSDOT Diagram 1-1 submitted by GBOS shows this same sweep in concept. Using Diagram 1-1 from the edge of vehicle lane, a stopping motorist's eye is 31 feet from the edge of lane. Yet, the design standard for a motorist stopping and looking both ways is 15 to 17 feet. This reflects the most likely observed stopping point for a motorist. There is a higher risk of a moving vehicle and a moving cyclist conflicting further back from the roadway where sight distance is typically less, as is typical of Lake Otis Parkway for example.

Our Department's design also is more consistent with the rules of the road and yielding. Crossing driveways requires due care by both parties. National design guidance and standards recognize that due care by both of the two parties is not always a high probability. That means that crossing a sidestreet further back has a higher likelihood of higher vehicle speed upon conflict. While crossing closer to the stop bar, the odds are better that vehicle speed is closer to zero when not looking first, and a bicyclist is more likely to use due care when crossing a sweep after a "chicane" than shooting straight across a sidestreet.

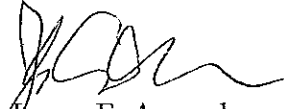
Our Department agrees we need to regularly take stock of our methods over time. Sweeps were updated in 2005 based upon extensive crash study showing roads such as Lake Otis Parkway had many bicycle crashes without sweeps. Projects from that time forward moved pathways closer to the roadway where sidestreet motorist stopping was more likely. This safety review was the basis for the 2007 MOA Bike Plan summaries and sweep adoption.

Since then, we have looked back at performance over the last decade, producing an updated report (copy attached) re-evaluating the sweeps method. This report was underway and completed shortly after project construction, with Girdwood concerns part of our consideration. What we find is that sweeps are not strongly better or worse than buffered crossings to date in terms of crash performance.

We do show that sweeps have less serious crashes at sidestreets than buffered paths, but the data over a decade is too small to make this conclusive. The data strongly shows that sidestreet motorists not yet at a stop are the number one conflict, especially for the bicyclists approaching from the right. In 2017, using a data driven approach, we have "split the difference" by modifying our design to move the path the width of the shoulder back from the travel lane. This balances the path user's desire for separation and the design standard for a motorist stopping and looking both ways distance of 15 to 17 feet. This design also better accommodates the use of the shoulder as a class A bike lanes in the future.

I look forward to attending the next GBOS meeting, please let me know when and where that will take place, to discuss the above and anything else of interest.

Very Respectfully,



James E. Amundsen, P.E.
Chief, Highway Design Group
Central Region

Attachments - 1

cc: Mayor Ethan Berkowitz, Municipality of Anchorage
Senator Cathy Giessel, Senate District X,
Representative Jennifer Johnston, House District X,
Assemblyman John Weddleton,
Assemblywoman Suxanne LaFrance
David Kemp
Scott Thomas



MEMORANDUM

STATE OF ALASKA

Department of Transportation and Public Facilities
Central Region-Division of Design and Engineering Services
Highway Design Section

To: **Jim Amundsen, Chief**
Highway Design Section

Date: June 28, 2017

Thru:

Phone No.: 269-0639

From: **Scott E. Thomas, P.E.**
Central Region Traffic Engineer

Subject: CR-T-1 Pathway Sweeps
and Stop Bar Review

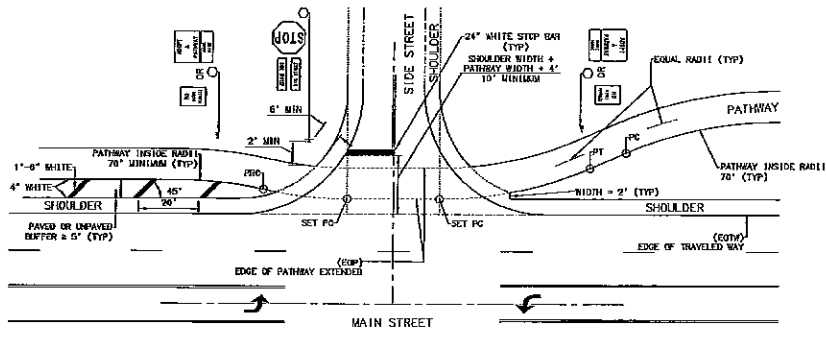
In 1986 and 1990, DOT/PF managers formally implemented pathway "sweeps" closer to main roads, in front of stop bars (attached). This is a safety measure to minimize crashes that are primarily due to sidestreet approach vehicles and right turning vehicles from the mainline. This method was illustrated in the 1990 AASHTO Bicycle Design Guide (Fig 22) and remains similar in the 2011 AASHTO Bicycle Design Guide (Fig 5-4) and Chapter 1210 of the Highway Preconstruction Manual (Fig 1210-4).

Staff conducted a decade long crash review of bicycle crashes at various STOP controlled crossing types. The final results still do not have enough data to show significant benefits or disbenefits. However, it remains obvious sight triangles are improved at sweeps, sidestreet vehicles are more likely to be stopped, and the speed at the point of conflict is reduced for all parties. Even so, projects with sweeps occasionally result in calls of concern for bicycling close to traffic, especially children. This is the same concern as for sidewalks next to major arterials. Buffers are preferred by casual and less experienced users. Regardless of the design solution, ITE best practice findings are that younger children (≤ 10 yrs) need to be supervised near traffic.

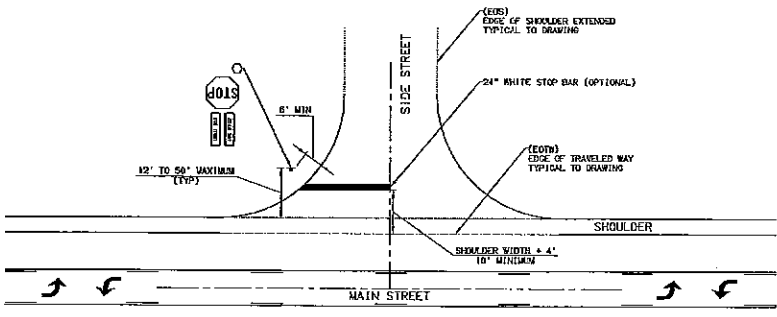
Based on the information above, CR-T-1.03 is significantly modified to place sweeps adjacent to the road shoulder rather than into part of the shoulder (as has been done since at least 2004). This separates uses into dedicated independent "lanes" and avoids shared use between conflicting parties. It allows future bike lanes or shoulder bikeways to be easily retrofitted. This does result in pushing the stop bar and driver's eye further back than the AASHTO design guideline of 14.4 to 17 feet from edge of traveled way. There is no apparent or strong crash increase is observable in the data when the stop bar is an additional 5 to 8 feet back. It is still desirable to keep stop bars as close to AASHTO guidelines as possible. Vehicles can stop at the stop-bar first, then creep forward as needed to clear the pathway in order to see further down a roadway.

CR-T-1.10 is the new version and still conforms with the original 1986 recommendations.

Attached: CR-T-1.10 Unsignalized Intersection STOP and Crossing detail
Feb 23, 1990 Sidewalk/Pathway Intersection Features Memo
June 27, 2017 Bicycle-Vehicle Crashes at Approach Type (2003-2012)



TYPICAL UNCUBED RETURN WITH PATHWAY



TYPICAL UNCUBED RETURN WITHOUT SIDEWALK

UNCUBED INTERSECTION NOTES: (IN PRIORITY ORDER)

- SIGNING:**
1. LOCATE STOP SIGN SO IT IS VISIBLE TO APPROACHING TRAFFIC AND NEAR THE STOP BAR.
 2. PROVIDE 2' OF CLEARANCE BETWEEN EDGE OF STOP SIGN PANEL AND EDGE OF PATHWAY OR SIDEWALK.
 3. PROVIDE 4' OF CLEARANCE BETWEEN EDGE OF STOP SIGN PANEL AND EDGE OF SIDE STREET.
 4. PLACE PATHWAY REGULATORY SIGNS AT COLLECTOR OR ARTERIAL ROADWAY INTERSECTIONS, TYPICALLY GREATER THAN 1000 VEHICLES A DAY, OR SIDE STREETS CONNECTING THROUGH TRAFFIC TO OTHER COLLECTORS OR ARTERIALS.
 5. "NO MOTOR VEHICLES" SIGNS ARE NOT REQUIRED WITHIN THE MUNICIPALITY OF ANCHORAGE.
 6. SEE PLANS FOR PATHWAY SIGNING REQUIRED AT SIDE STREETS.

- STRIPING:**
1. STOP BARS ARE NOT REQUIRED WHEN NO PATHWAY OR SIDEWALK IS PRESENT. SEE PLANS.
 2. LOCATE STOP BAR 4' MINIMUM BEHIND THE WIDTH OF PATHWAY.
 3. BREAK CENTERLINE STRIPING WITHIN INTERSECTIONS WHICH HAVE DESIGNATED TURN LANES.
 4. CONTINUE CENTERLINE STRIPING THROUGH INTERSECTIONS WITH CENTER TURN-LEFT-TURN-RIGHT LANES OR WHEN THERE ARE NO LEFT TURN LANES.
 5. CONTINUE LANE "SKIP" STRIPING THROUGH INTERSECTIONS.
 6. DELETE OUTERMOST EDGE OF TRAVELED WAY STRIPING AT INTERSECTIONS OR WRAP EDW STRIPING TO SIDE STREET EDW.
 7. MATCH SIDE STREET STRIPING IF STRIPING IS PRESENT.

REVISIONS		
Date	Description	By
02/06/12	ADDS AREA	SET
02/06/12	ADDED NOTES	SET
02/06/12	AREA NOTES NOT REQ	SET
02/06/12	ADDED BUFFER	SET

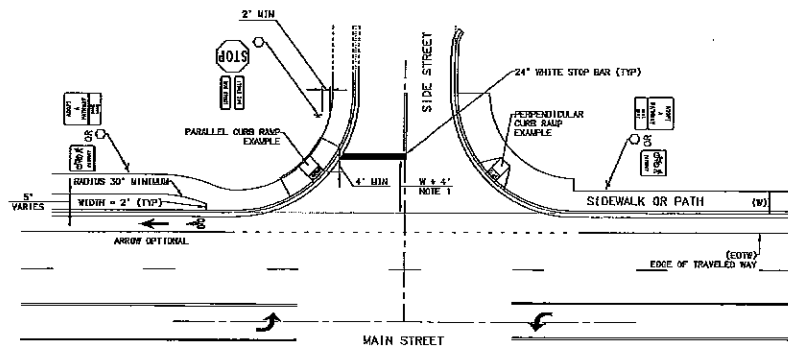
SHEET 1 OF 2

State of Alaska
Department of Transportation
& Public Facilities
**UNSIGNALIZED INTERSECTION
STOP AND CROSSING**

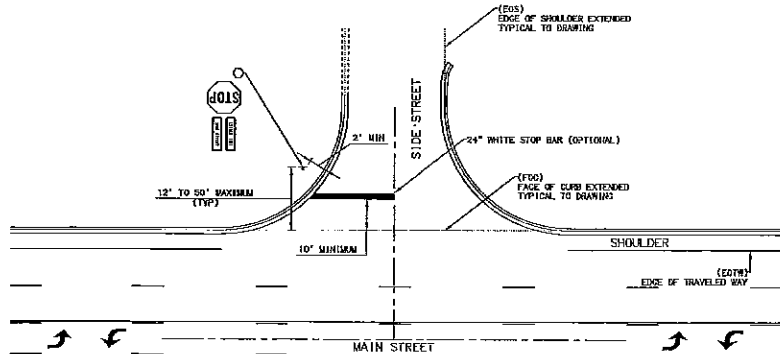


Date 06/20/12

CR-T-01.10



TYPICAL CURBED RETURN WITH SIDEWALK



TYPICAL CURBED RETURN WITHOUT SIDEWALK

CURBED INTERSECTION NOTES:

SIGNING:

1. LOCATE STOP SIGN SO IT IS VISIBLE TO APPROACHING TRAFFIC AND NEAR THE STOP BAR.
2. PROVIDE 2' OF CLEARANCE BETWEEN EDGE OF STOP SIGN PANEL AND EDGE OF PATHWAY OR SIDEWALK.
3. PROVIDE 4' OF CLEARANCE BETWEEN EDGE OF STOP SIGN PANEL AND SIDE STREET FACE OF CURB.
4. PLACE PATHWAY REGULATORY SIGNS AT COLLECTOR OR ARTERIAL ROADWAY INTERSECTIONS, TYPICALLY GREATER THAN 1000 VEHICLES A DAY, OR SIDE STREETS CONNECTING THROUGH TRAFFIC TO OTHER COLLECTORS OR ARTERIALS.
5. "NO MOTOR VEHICLES" SIGNS ARE NOT REQUIRED WITHIN THE MUNICIPALITY OF ANCHORAGE.
6. SEE PLANS FOR PATHWAY SIGNING REQUIRED AT SIDE STREETS.

STRIPING:

1. STOP BARS ARE NOT REQUIRED WHEN NO PATHWAY OR SIDEWALK IS PRESENT. SEE PLANS.
2. LOCATE STOP BAR 4' MINIMUM BETWEEN THE TOE OF CURB RAMP AND EDGE OF STOP BAR OR A DISTANCE OF THE WIDTH OF THE SIDEWALK OR PATHWAY PLUS 4'.
3. BREAK CENTERLINE STRIPING WITHIN INTERSECTIONS WHICH HAVE DEDICATED TURN LANES.
4. CONTINUE CENTERLINE STRIPING THROUGH INTERSECTIONS WITH CENTER TWO-WAY-LEFT-TURN-ONLY LANES OR WHEN THERE ARE NO LEFT TURN LANES.
5. CONTINUE LANE "SKIP" STRIPING THROUGH INTERSECTIONS.
6. DELETE OUTERMOST EDGE OF TRAVELED WAY STRIPING AT INTERSECTIONS OR WRAP EDGE STRIPING TO SIDE STREET EDGE.
7. MATCH SIDE STREET STRIPING IF STRIPING IS PRESENT.

REVISIONS		
Date	Description	By
6/21/17	SHEET MARKED AND DRAWING	SET
6/21/17	NOTES ADDED	SET
6/21/17	REVISED NOTES	SET
6/21/17	REVISED NOTES	SET

SHEET 2 OF 2

State of Alaska
Department of Transportation
& Public Facilities

**UNSIGNALIZED INTERSECTION
STOP AND CROSSING**

APPROVED
06/20/17

Date 06/20/17

CR-T-01.10 Sheet 2 of 2



TECHNICAL MEMORANDUM

STATE OF ALASKA

Department of Transportation and Public Facilities
Central Region-Division of Design and Engineering Services
Highway Design Section

To: File

Date: June 27, 2017

Thru: Scott E. Thomas, P.E. *SET*
Central Region Traffic Engineer

Phone No.: 269-0648

From: Sarah Salvucci, Eng. Asst. *SS*
Highway Design-Traffic and Safety

Subject: Bicycle-Vehicle Crashes at
Approach Type (2003-2012)

Per 1986 memorandum, Central Region of the Alaska Department of Transportation and Public Facilities established sweep type approaches as standard practice at stop sign controlled intersections. A study exploring the relationship between approach type at intersections and frequency of crashes was conducted to examine the effects of those guidelines over time. Findings indicate the density of intersections may be more influential than approach type. Otherwise the type of design used is currently inconclusive in Alaska.

Police reported bicycle-vehicle crashes at stop sign controlled intersections from 2003-2012 were categorized as one of five sidewalk approach types in terms of distance from the roadway at the intersection. If inadequate information was available, the crash was labeled as unknown. The five classifications were buffer, minimal buffer, no buffer, sweep, and other. In this paper sidewalk refers to both pathways and sidewalks; no distinction was made to limit unnecessary variables.

The term buffer was applied to a sidewalk located more than five feet from the edge of the roadway with no change on approach to an intersection. Minimal buffer was used to describe when the sidewalk was less than five feet, but not adjacent, to the roadway. No buffer was the case when the sidewalk was adjacent to the roadway. Sweep was used when the sidewalk was farther from the roadway between intersections and then swept with the edge flush to the roadway at intersections. The term other denoted those intersections not possible to place in any of the above four classifications.

Google Earth was used to categorize intersection corners at the time of crash occurrence by utilizing the historic feature. A total of 169 bicycle-vehicle crashes were classified at stop sign intersections in Central Region from 2003-2012. Of those, 159 occurred within the Municipality of Anchorage. In order to compare the crash results with the relative occurrence of each type, all stop sign controlled intersections, regardless of crashes, on 22 arterial roads in Anchorage were classified using the same categories as the crash data. This was done by using 2016 Google Earth to ensure consistent and clear images across the city. A total of 1366 intersection corners were categorized. On the 22 selected roads, there were 131 bicycle-vehicle crashes.

Figure 1 compares bicycle-vehicle crashes from 2003-2012, to the frequency of each approach type on 22 roads in Anchorage. Crashes appear to occur at approach types at roughly the same frequency as the number of approach types occur around the city. No buffers are where crashes occur the most, but they are also the most frequent type of approach in Anchorage. No buffers appear to have a slightly higher proportional amount of crashes than approach type while buffers

have slightly less crashes than proportional approach type. Sweeps and minimal buffers both have a similar crash occurrence to their physical occurrence in Anchorage.

In the scatter plot in Figure 2, there does not appear to be a clear trend for each sidewalk approach type. The overall trend seems to be the more approaches per mile, the more crashes occur per mile, regardless of individual sidewalk approach type. No buffer crashes occur most often on intersection dense roads around town and have almost all instances of more than one crash per mile.

Noticeable in Figure 3, there are few of each type of bicycle-vehicle crashes at stop sign controlled intersections with the exception of the no buffer category. Significant results are hard to derive from small sample sizes.

Due to the sample size of the bicycle-vehicle crashes it is difficult to assert one type of approach is better than another. Each approach type appears to have roughly proportional crashes to physical occurrences in Anchorage. It appears higher density of stop sign controlled intersections is a stronger indicator to crashes than sidewalk approach type. No buffers have the most crashes and occur the most frequently on intersection dense roads. Buffers have less proportional total crashes. Sweeps and minimal buffers both have few crashes, making them hard to characterize due to the lack of data.

Additional decades of data would be helpful to form significant conclusions. Furthermore, future research could expand the data set by observing relative conflict between the different user groups. Strava, an app used to track individual running and bicycling, could be useful to determine relative bicycle use. Adding data on bicycle usage levels per sidewalk type would help to compute and compare crash rates based on exposure to conflict. This would be similar to how vehicular crash rates are compared.

Attachments:

Figure 1: Bicycle-Vehicle Crashes Relative to Sidewalk Approach Occurrence on Select Roads in Anchorage

Figure 2: Bicycle-Vehicle Crashes on Sidewalk Approaches at Stop Sign Controlled Intersections

Figure 3: Severity of Bicycle-Vehicle Crashes at Stop Sign Controlled Intersections

Example of Each Sidewalk Approach Type

Bicycle-Vehicle Crash Data

Figure 1

Bicycle-Vehicle Crashes Relative to Sidewalk Approach Occurrence on Select Roads in Anchorage

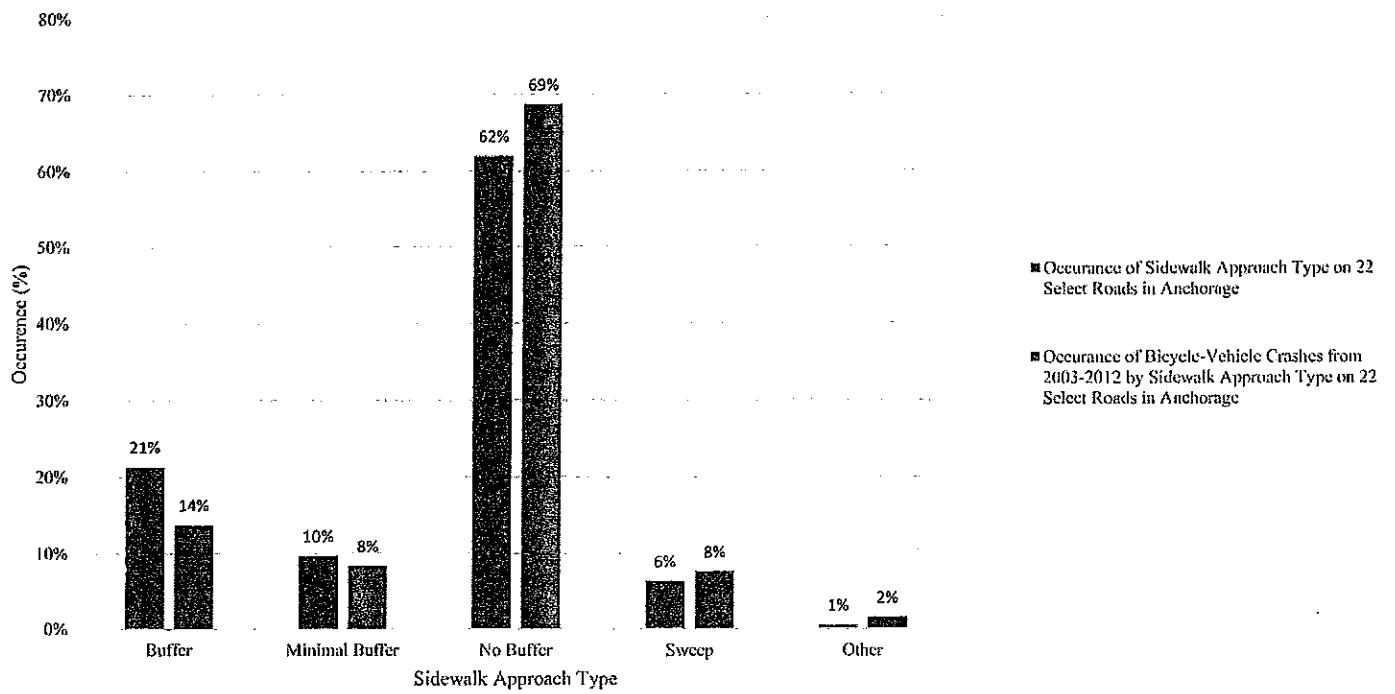


Figure 2

Bicycle-Vehicle Crashes on Sidewalk Approaches at Stop Sign Controlled Intersections

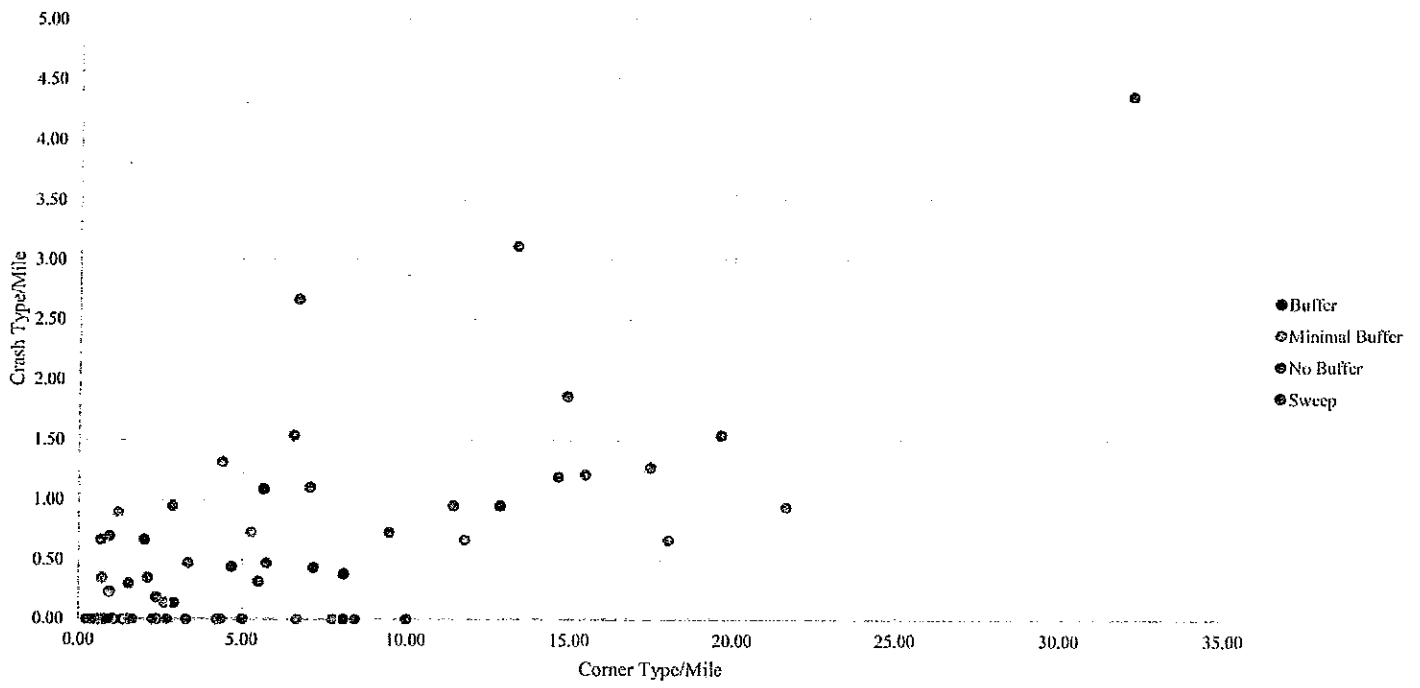
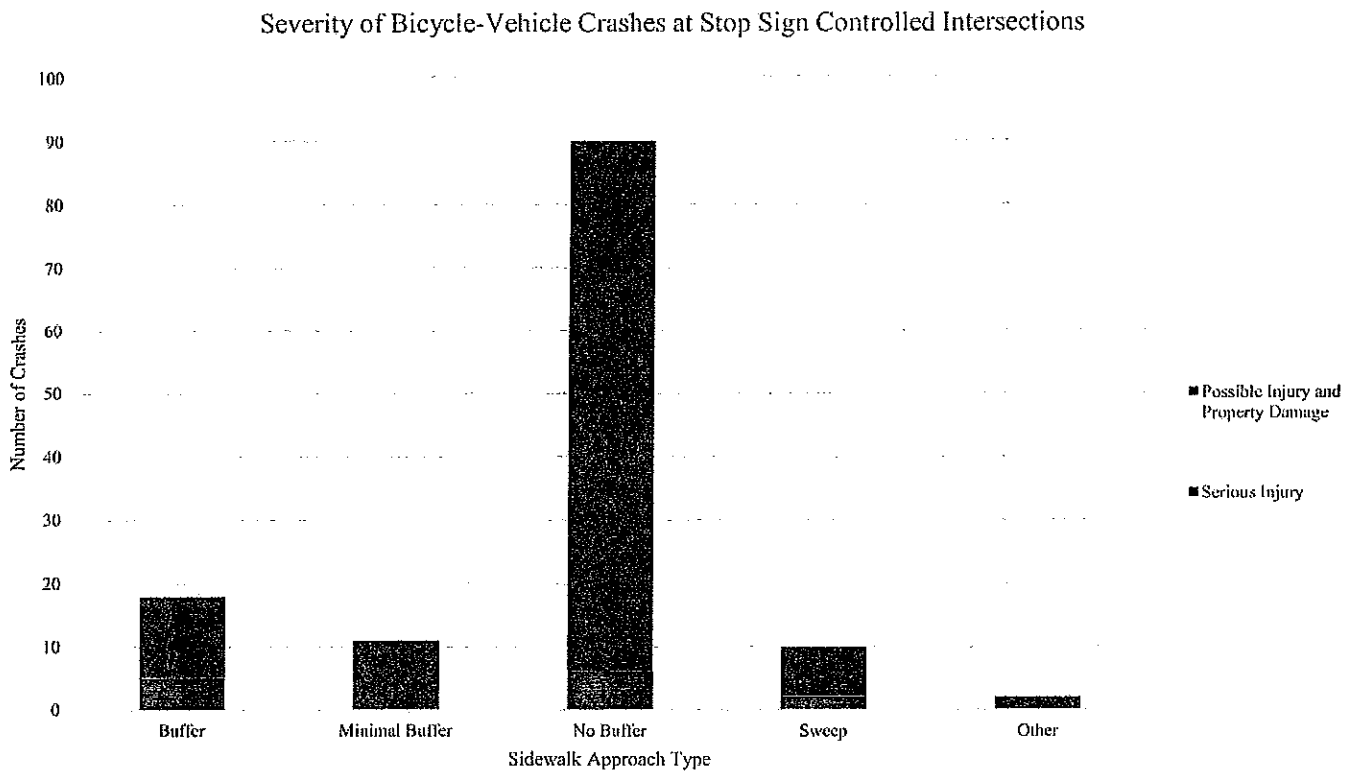
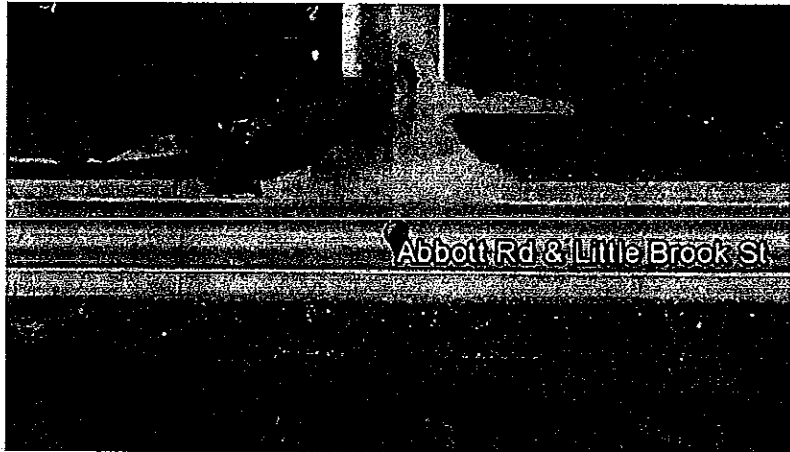





Figure 3



Example of Each Sidewalk Approach Type

<p>Buffer</p>	 <p>Abbott Rd & Little Brook St</p> <p>This photograph shows a sidewalk approach with a wide, clear buffer zone between the sidewalk and the street. The sidewalk is wide and appears to be made of concrete or a similar material. The street is visible in the background, and the overall scene is well-lit.</p>
<p>Minimal Buffer</p>	 <p>Bragaw St & E 19th Ave</p> <p>This photograph shows a sidewalk approach with a minimal buffer zone. The sidewalk is narrow and appears to be made of concrete or a similar material. The street is visible in the background, and the overall scene is well-lit.</p>
<p>No Buffer</p>	 <p>E Northern Lights Blvd & Fairbanks St</p> <p>This photograph shows a sidewalk approach with no buffer zone. The sidewalk is narrow and appears to be made of concrete or a similar material. The street is visible in the background, and the overall scene is well-lit.</p>
<p>Sweep</p>	 <p>E Dimond Blvd & Dimond Cir</p> <p>This photograph shows a sidewalk approach with a sweep zone. The sidewalk is narrow and appears to be made of concrete or a similar material. The street is visible in the background, and the overall scene is well-lit.</p>

ACCNUM	PCASENUM	CDSRTE	ACCM	Year	Mon	Day	ACCTIM	STREET	CROSSSTREET	INTER	REFUN	INTERDII	RDJUNCT	NU	ACCSEVERI	TO	M/MI
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201258108	12-028692	BORO04	0	2012	6	21	1706	34TH	C STREET	0				4-WAY INT 2	NON-INCAI	1	0 1

ACCNUM	PCASENUM	CDSRTE	ACCM	Year	Mon	Day	ACCTIN	STREET	CROSSSTREET	INTER	REFUN	INTERDII	RJUNCT	NU	ACCSEVERI	TO	M/MI
200307213	330449	134330	0.13	2003	6	8	1517	ARCTIC NB	W 19TH	0	AT INT	NOT APP	4-WAY INT	1	PROPERTY	0	0
200408655	431191	134330	0.88	2004	7	6	1644	ARCTIC	31ST WB	0	NOT A	NOT APP	T - INTERSE	1	NON-INCAI	1	0
200510798	541263	134100	1.191	2005	9	12	1719	BENSON BLVD	EIDE ST S/B	0	AT INT	NOT APP	OTHER	1	INCAPACIT	1	0
200708897	751055	133780	0.73	2007	10	17	603	ARLENE ST NB	W 88TH AVE E	0	AT INT	NOT APP	4-WAY INT	1	NON-INCAI	1	0
200512809	545223	134140	4.092	2005	10	4	1626	LAKE OTIS PKW	79TH AVE EB	0	AT INT	NOT APP	T - INTERSE	1	PROPERTY	0	0
200412349	446615	134553	0.24	2004	9	30	1651	BARROW ST N/E	6TH AVE E/B	0	AT INT	NOT APP	4-WAY INT	1	PROPERTY	0	0
200906629	9024600	133700	1.679	2009	5	20	734	DIMOND BLVD	CARNELIAN ST	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
200806866	8037812	134750	1.64	2008	8	13	1200	NORTHERN LIG	LILY ST	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
201177980	11-030093	134779	0.38	2011	6	29	1300	UAA DR	ALUMNI DR	0	AT INT	W/	T - INTERSE	2	NON-INCAI	1	0
200307969	334663	134700	0.17	2003	6	30	1300	BONIFACE PKW	42ND AVE EB	0	AT INT	NOT APP	OTHER	1	PROPERTY	0	0
200510962	543034	134700	0.26	2005	9	22	1658	BONIFACE NB	40TH EB	0	AT INT	NOT APP	OTHER	1	NON-INCAI	1	0
200312127	351946	13395051	0.49	2003	9	25	1600	BRAGAW ST SB	16TH AVE WB	0	AT INT	NOT APP	4-WAY INT	1	PROPERTY	0	0
200412970	448964	133900	0.787	2004	10	15	1521	MULDOON RD	LITTLE DIPPER	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
200408104	428745	134771	0.28	2004	6	22	2109	36TH	LOIS NB	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
201251398	12-037589	13395051	0.49	2012	8	10	1333	BRAGRAW	16 TH AVE	0	AT INT	W/	4-WAY INT	2	INCAPACIT	1	0
200606106	627188	133203	0	2006	6	11	1329	BRIARWOOD D	DIMOND BLVD	0	AT INT	NOT APP	T - INTERSE	1	PROPERTY	0	0
200309655	341304	134341	2.26	2003	8	2	1652	C STREET NB	20TH AVE WB	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
200608783	635028	134341	1.58	2006	7	25	810	C STREET WB	10TH AVE	0	AT INT	NOT APP	4-WAY INT	1	NON-INCAI	1	0
201098246	10045934	134341	3.19	2010	9	25	133	C STREET	34TH AVE	0	AT INT	NOT APP	4-WAY INT	1	NON-INCAI	1	0
201171408	11-036910	134341	2.649	2011	8	9	1414	C STREET	FIREWEED BLV	250	FEET	SOUTH	DRIVEWAY	2	INCAPACIT	1	0
200706137	737092	133916	0	2007	7	27	1814	CENTENNIAL C	PECK AVE EB	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
200806175	8034603	134810	0.1	2008	7	25	1455	COMMERCIAL	W CHIPPERFIE	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
200804339	8028075	13455153	0.61	2008	6	17	1951	CORDOVA ST	TUDOR RD	0	AT INT	NOT APP	OTHER	1	NON-INCAI	1	0
200607658	631460	134100	1.015	2006	7	5	1124	BENSON BLVD	CHEECHAKO S	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
200309169	339053	134500	2.44	2003	7	22	1813	DEBARR RD W	ATKINSON DR	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
200500468	51421	134770	1.91	2005	1	10	1722	36TH WB	LOCARNO NB	0	AT INT	NOT APP	NOT A JUN	1	PROPERTY	0	0
201096064	10026245	134500	3.2	2010	6	6	2224	DEBARR RD	ENTRANCE TO	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
201105390		134500	0.3	2011	8	8	2000	DEBARR RD	AK REGIONAL	0	AT INT	NOT APP	DRIVEWAY	1	PROPERTY	0	0
200311437	348891	133700	0.99	2003	9	10	1206	DIMOND BLVD	C STREET	150	FEET	EAST	DRIVEWAY	1	INCAPACIT	2	0
201098866	10045444	134130	1.242	2010	9	22	1621	LAKE OTIS PKW	W CAMPUS DR	0	AT INT	NOT APP	4-WAY INT	1	NON-INCAI	2	0
200706051	736529	133700	0.977	2007	7	24	1751	DIMOND BLVD	C STREET	200	FEET	EAST	DRIVEWAY	1	INCAPACIT	1	0
200308819	337792	134140	1.737	2003	7	16	1434	LAKE OTIS PKW	42ND AVE WB	0	AT INT	NOT APP	T - INTERSE	1	NON-INCAI	1	0
200711478	739608	133700	0.936	2007	8	10	2048	300 W DIMONI	COSTCO ENT	0	AT INT	NOT APP	NOT A JUN	1	NON-INCAI	1	0
200803756	8024431	134140	1.737	2008	5	28	1630	LAKE OTIS PKW	42ND AVE	0	AT INT	NOT APP	4-WAY INT	1	NON-INCAI	1	0
200909328	9037977	133700	0.622	2009	8	2	1147	DIMOND BLVD	KING ST	700	FEET	WEST	T - INTERSE	1	NON-INCAI	1	0
200909435	9038596	133700	0.124	2009	8	5	1914	DIMOND BLVD	BRIARWOOD	0	AT INT	NOT APP	OTHER	1	NON-INCAI	1	0

ACCTNUM	PCASENUM	CDSRTE	ACCTM Year	Mon	Day	ACCTIN	STREET	CROSSSTREET	INTER	REFUN	INTERDII	RJUNCT	NUACC	SEVERI	TO	M/MI
200911048	9046711	133700	1.008	2009	9	18	2107 DIMOND	C STREET	500	FEET	EAST	OTHER	1	NON-INCAI	1	0 1
200806274	8035117	134140	1.737	2008	7	28	1900 LAKE OTIS PKVE	42ND AVE	0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
201178576	11-033212	133700	0.124	2011	7	18	1709 DIMOND BLVD	BRIARWOOD	50	AT INT	W/ T	- INTERSE	2	NON-INCAI	1	0 1
200709099	751874	134516	0.42	2007	10	22	1045 NORTHWAY DE	DEBARR RD	W 0	AT INT	NOT APPT	- INTERSE	1	INCAPACIT	1	1 0
200608795	6035471	134557	0.78	2006	7	27	1705 E STREET	WB 6TH AVE	0	AT INT	NOT APPT	- INTERSE	1	PROPERTY	0	0 0
200509356	531962	133899	3.528	2005	7	20	641 TUDOR RD	SB FLORINA ST	EE 250	FEET	WEST	DRIVEWAY	1	INCAPACIT	1	1 0
200911137	9047142	133698	0.08	2009	9	21	1340 EIDE ST	SB BENSON BLVD	0	AT INT	NOT APPT	4-WAY INT	1	PROPERTY	0	0 0
200906295	9022984	133735	3.508	2009	5	11	1706 ELMORE RD	AMBASSADOR	0	AT INT	NOT APPT	4-WAY INT	1	NON-INCAI	1	0 1
201257190	12-022480	133735	3.228	2012	5	16	1743 ELMORE RD	EAST TUDOR	R 300	FEET	SOUTH	DRIVEWAY	2	NON-INCAI	1	0 1
200611613	646769	134120	1.28	2006	9	29	1804 W FIREWED LA	S45 FIREWEE	C 0	AT INT	NOT APPT	NOT A JUN	1	NON-INCAI	1	0 1
201076957	10031982	134120	1.44	2010	7	9	954 FIREWEED LN	DORBRANDT	50	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
200705520	734070	134116	0.27	2007	7	10	1552 FLORINA ST	SB TUDOR RD	0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
200806411	8035756	134100	1.077	2008	8	1	753 BENSON BLVD	DAWSON ST	0	AT INT	NOT APPT	4-WAY INT	1	NON-INCAI	1	0 1
200408875	432416	134200	0.479	2004	7	12	1918 GAMBELL NB	10TH AVE	EB 0	AT INT	NOT APPT	4-WAY INT	1	NON-INCAI	1	0 1
200909895	9040968	134100	1.077	2009	8	18	1235 BENSON BLVD	DAWSON ST	0	AT INT	NOT APPT	4-WAY INT	1	INCAPACIT	1	1 0
200308517	336472	134140	5.724	2003	7	9	2143 LAKE OTIS PKW	RIDGEMONT	E 0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
200606342	629004	134343	0.06	2006	6	21	1100 HOLLYWOOD	EASH PL	0	AT INT	NOT APPT	4-WAY INT	1	PROPERTY	0	0 0
200308557	336609	134105	0.25	2003	7	10	1537 HYDER ST	SB 9TH AVE	0	AT INT	NOT APPT	4-WAY INT	1	NON-INCAI	1	0 1
200906022	9020895	134750	6.31	2009	4	30	1337 W NORTHERN	MINNESOTA	400	FEET	WEST	OTHER	1	NON-INCAI	1	0 1
200805818	8032720	133750	2.393	2008	7	14	1720 JEWEL LAKE	RICHEVIGNY	ST 0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
201257072	12-021321	134117	0.19	2012	5	9	1723 FOLKER	TUDOR	0	AT INT	W/ 4-WAY INT	2	NON-INCAI	1	0 1	
201250968	12-020777	134730	0	2012	5	6	1433 CHECKMATE	TUDOR	0	AT INT	W/ T	- INTERSE	2	INCAPACIT	1	1 0
200906638	9024719	133950S1	0.88	2009	5	20	1740 SAN JERONIM	C BRAGAW ST	0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
200805679	8031930	133220	1.379	2008	7	9	2032 KLATT RD	(NEV) HILLTOP	0	AT INT	NOT APPT	4-WAY INT	1	NON-INCAI	1	0 1
200305015	320690	134454S2	0.11	2003	4	18	1801 KLEVIN ST	WB MT VIEW	DR 0	AT INT	NOT APPT	4-WAY INT	1	NON-INCAI	1	0 1
200305760	324300	134140	0.814	2003	5	7	1733 LAKE OTIS	SB 27TH	WB 0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
201098052	10031141	133750	1.899	2010	7	4	1009 JEWEL LAKE	RC LAKEWAY	ST 0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
200807325	8040154	134544	0.97	2008	8	27	805 11TH AVE	A STREET	0	AT INT	NOT APPT	4-WAY INT	1	PROPERTY	0	0 0
200309508	340638	134140	1.737	2003	7	30	1522 LAKE OTIS	PKW 42ND	AVE 0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	2	0 2
200509080	535455	134140	4.313	2005	8	8	1737 LAKE OTIS	EB AZZURITE	NB 0	AT INT	NOT APPT	- INTERSE	1	PROPERTY	0	0 0
200909651	9039702	135241	0.32	2009	8	11	1707 GLENN NB	N E NORTH	EAGLE 0	AT INT	NOT APPT	- INTERSE	1	PROPERTY	0	0 0
200607602	630340	134140	1.737	2006	6	28	1729 LAKE OTIS	PKW E 42ND	AVE 0	AT INT	NOT APPT	4-WAY INT	1	NON-INCAI	1	0 1
200705123	732152	133700	0.222	2007	6	29	1059 DIMOND	BLVD OLD SEWARD	150	FEET	EAST	T - INTERSE	1	INCAPACIT	1	1 0
200612173	647622	134140	2.099	2006	10	4	806 LAKE OTIS	PKW HOMESTEAD	C 0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
200805812	8032666	133724	2.271	2008	7	14	1119 ABBOTT RD	LITTLE BROOK	0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1
200906333	9023138	134140	0.657	2009	5	12	1154 LAKE OTIS	PKW MAPLE	AVE 0	AT INT	NOT APPT	- INTERSE	1	NON-INCAI	1	0 1

ACCNUM	PCASENUM	CDSRTE	ACCM	Year	Mon	Day	ACCTM	STREET	CROSSSTREET	INTER	REFUN	INTERDII	RDJUNCT	NUACC	SEVERI	TO	M/MI
201257554	12-024821	134140	1.737	2012	5	30	1517	LAKE OTIS	42ND	0	AT INT. W/	T - INTERSE	2	NON-INCAI	1	0	1
201099168	10035925	134104	0.15	2010	7	31	1734	LOIS DR	SPENARD RD	0	AT INT NOT APP	4-WAY INT	1	NON-INCAI	1	0	1
200508386	531500	134300	1.24	2005	7	17	1713	MINNESOTA DI	36TH SB	0	AT INT NOT APP	T - INTERSE	1	PROPERTY	0	0	0
200910768	9045195	134300	6.28	2009	9	10	1549	MINNESOTA	BENSON	100	FEET NORTH	OTHER	1	NON-INCAI	1	0	1
201097445	10028157	134300	5.57	2010	6	17	2030	W 41ST AVE	MINNESOTA D	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
201099061	10024405	134300	6.34	2010	5	27	1045	MINNESOTA DI	N LIGHTS BLV	150	FEET SOUTH	T - INTERSE	1	PROPERTY	0	0	0
200805879	8033078	135228	0	2008	7	16	1625	CREST VIEW LN	EAGLE RIVER F	0	AT INT NOT APP	4-WAY INT	1	NON-INCAI	1	0	1
200605036	620353	133900	2.671	2006	5	3	1759	MULDOON RD	5TH AVE WB	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
201177542	11-027572	133900	1.595	2011	6	15	758	MULDOON	20TH	0	AT INT. W/	T - INTERSE	2	NON-INCAI	1	0	1
201238809		133900	2.402	2012	10	12	1545	MULDOON RD	OLD HARBOR J	0	AT INT NOT APP	4-WAY INT	1	NON-INCAI	1	0	1
200705305	732870	134750	0.06	2007	7	3	1513	NORTHERN LIG	MULDOON RD	330	FEET WEST	DRIVEWAY	1	NON-INCAI	1	0	1
200707110	742692	134750	7.67	2007	8	28	1854	HOWE PLACE	NORTHERN LI	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	3	0	3
200805956	8033438	134750	0.06	2008	7	18	1613	NORTHERN LIG	MULDOON_RI	300	FEET WEST	T - INTERSE	1	NON-INCAI	1	0	1
200906261	9021482	135225	2.07	2009	5	3	1536	EAGLE RIVER R	CREST VIEW L	0	AT INT NOT APP	4-WAY INT	1	NON-INCAI	1	0	1
200305874	324909	134500	2.56	2003	5	10	2232	DEBARR RD	EDWARD ST	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
200907582	9029647	134750	2.76	2009	6	17	734	NICHOLS ST	NORTHERN LI	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
201095158	10034524	134750	4.87	2010	7	23	1435	NORTHERN LIG	FAIRBANKS ST	0	AT INT NOT APP	OTHER	1	NON-INCAI	1	0	1
201095219	10036582	134750	2.96	2010	8	4	1253	E NORTHERN L	ARCA DR	0	AT INT NOT APP	CROSSOVE	1	NON-INCAI	1	0	1
201177310	11-025968	134750	0.68	2011	6	5	1754	BRITTANY	NORTHERN LI	0	AT INT. W/	4-WAY INT	2	PROPERTY	0	0	0
200610828	643376	134140	2.704	2006	9	10	1643	LAKE OTIS PKW	PAGO PAGO A	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	2	0	2
200511537	544384	135200	0.753	2005	9	29	1852	HANSON WB	OLD GLENN H	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
200705548	734221	135200	0.603	2007	7	11	1525	OLD GLENN HV	PARK PLACE	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
200706078	736700	135200	1.013	2007	7	25	1630	BOWEN CIRCLE	OLD GLENN H	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
200907565	9029530	135200	1.433	2009	6	16	1507	NORTH JUANIT	OLD GLENN A	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
200805478	8030831	133200	3.609	2008	7	3	1743	OLD SEWARD	GOLDENBERR	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
200806588	8036698	133200	2.856	2008	8	6	2021	HANES ST	OLD SEWARD	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
200907389	9028446	133200	2.856	2009	6	10	1239	HANES ALLEY	OLD SEWARD	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
201076816	10036960	133200	6.974	2010	8	6	1355	OLD SEWARD	EXIT OF 4800	0	AT INT NOT APP	NOT A JUN	1	NON-INCAI	1	0	1
201090540	10031057	133200	7.004	2010	7	3	2058	48TH AVE	OLD SEWARD	0	AT INT NOT APP	OTHER	1	INCAPACIT	1	1	0
200406816	422477	133500	0.112	2004	5	18	1042	OMALLEY	OMALLEY CTR	0	AT INT NOT APP	OTHER	1	NON-INCAI	1	0	1
200405757	416951	134310	0.72	2004	4	13	15	SPENARD RD E	FOREST RD NB	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
200307710	333555	134140	2.704	2003	6	24	1807	LAKE OTIS PKW	PAGO PAGO D	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1
200806540	8036864	13391751	0.04	2008	8	5	1838	PECK AVE	MULDOON RD	0	AT INT NOT APP	4-WAY INT	1	NON-INCAI	1	0	1
200507506	527469	133899	1.557	2005	6	24	1534	TUDOR RD	DENALI ST	350	FEET EAST	T - INTERSE	1	NON-INCAI	1	0	1
200413323	449884	134452	0.38	2004	10	21	1430	PRICE ST S/B	PARSONS AVE	0	AT INT NOT APP	4-WAY INT	1	NON-INCAI	1	0	1
200307526	332589	133765	2.11	2003	6	19	1910	RASPBERRY RD	NB WHITEHAL	0	AT INT NOT APP	T - INTERSE	1	NON-INCAI	1	0	1

ACCNUM	PCASENUM	CDSRTE	ACCM	Year	Mon	Day	ACCTIN	STREET	CROSSSTREET	INTER	REFUN	INTERDII	RDIUNCT	NU	ACCSEVERI	TO	M	MII
201076471	10032746	133857	0.09	2010	7	13	1604	REKA DR	KATRINA CI	0		AT INT NOT APFT - INTERSE	1	NON-INCAE	1	0	1	
201076239	10038854	130000	125.2	2010	8	17	1334	SEWARD HWY	22ND AVE	0		AT INT NOT APF OTHER	1	NON-INCAE	1	0	1	
201234697		133899	1.354	2012	6	22	1715	TUDOR ROAD	CORDOVA STR	0		AT INT NOT APF 4-WAY INT	1	NON-INCAE	1	0	1	
200506822	524185	134310	1.39	2005	6	4	1312	SPENARD RD S	WYOMING DR	0		AT INT NOT APF 4-WAY INT	1	NON-INCAE	1	0	1	
200909943	9041215	134310	1.18	2009	8	19	1653	SPENARD RD	WOODLAND E	0		AT INT NOT APF 4-WAY INT	1	NON-INCAE	1	0	1	
201178756	11-033949	134310	1.18	2011	7	22	2003	WOODLAND DIS	SPENARD RD	0		AT INT. W/ T - INTERSE	2	NON-INCAE	1	0	1	
200306291	326629	133908	0	2003	5	19	1650	TELEPHONE AV	DENALI ST	0		AT INT NOT APF 4-WAY INT	1	PROPERTY	0	0	0	
200707941	746551	134463	0.13	2007	9	19	1735	THOMPSON RE	SCHODDE ST	0		AT INT NOT APFT - INTERSE	1	NON-INCAE	1	0	1	
200312811	355203	133899	0.848	2003	10	13	1840	TUDOR WB	BERING NB	0		AT INT NOT APF 4-WAY INT	1	NON-INCAE	1	0	1	
200411888	445146	133745	0.38	2004	9	21	1922	VICTOR RD	OLYMPIC DR	0		AT INT NOT APFT - INTERSE	1	NON-INCAE	1	0	1	
200963829		133745	0.18	2009	9	12	1900	VICTOR ROAD	MINERVA WA	0		AT INT NOT APFT - INTERSE	1	NON-INCAE	1	0	1	
201096394	10036641	133899	0.568	2010	8	4	1750	TUDOR RD	COPE STREET	0		AT INT NOT APFT - INTERSE	1	NON-INCAE	1	0	1	
201176600	11-021106	133899	3.345	2011	5	7	1706	E. TUDOR ROA	GRUMMAN ST	0		AT INT. W/ T - INTERSE	2	PROPERTY	0	0	0	
201256712	12-018677	133899	1.865	2012	4	24	1359	TUDOR	JUNEAU	0		AT INT. W/ T - INTERSE	2	NON-INCAE	1	0	1	
200708943	751306	133899	3.864	2007	10	18	1558	TUDOR RD SB	TUDOR CENTE	0		AT INT NOT APF 4-WAY INT	1	NON-INCAE	1	0	1	

MEMORANDUM

State of Alaska
Department of Transportation & Public Facilities

TO: John J. Burkholder, P.E.
Gerry W. Kintz, P.E.
Frank J. Lombardo, P.E.
Carl A. Nelson, P.E.
Jeanne A. Lematta, P.E.

DATE: February 23, 1990

FILE NO: 1040

TELEPHONE NO: 266-1700

FROM: Michael R. Tooley
Design Section Chief
Design Section III

SUBJECT: Sidewalk/Pathway
Intersection
Features

There has been considerable discussion concerning where sidewalks/pathways should cross low volume approach roadways. The primary concern is bicycles not stopping and being struck by a vehicle.

A meeting between Messrs. Steven Horn, Jim Childers and John Burkholder developed guidelines for consideration. The discussion focused on what type of approach would require the sidewalk/pathway to terminate at the radius of the intersection of a road or driveway. The Region places stop signs with stop bars at all public approaches and private approaches of major traffic generators if the development has an internal circulation network. Any low volume approach such as a private residential driveway would not normally have a stop sign/bar. It is therefore recommended that:

1. Only those approaches requiring stop signs/bars as shown on the traffic plans, will have sidewalks/pathways terminate within the radius of approaches in front of the stop bar.
2. Those approaches not requiring a stop sign/bar may have the sidewalk/pathway cross at some other location which allows good sight distance for both vehicle and bicyclist. If this cannot be provided, the sidewalk/pathway should be brought into the intersection and a stop sign/bar provided for the approach.

This procedure should be applied to new as well as existing sidewalks/pathways on all design projects.

/skm

cc: Steven R. Horn, P.E., Preliminary Design and Environmental Supervisor
Tony D. Barter, P.E., Traffic/Safety Engineer, Traffic, Safety and
Utilities Section

Read & Return

10/23/86

Scott 7864 "Post-It" Routing-Request Pad

ROUTING - REQUEST

Don

Bill to 11/6/86

A.C. MEMORANDUM

Doug. DSO

Bob. Rec

Please

- READ
- HANDLE
- APPROVE
- and
- FORWARD
- RETURN
- KEEP OR DISCARD
- REVIEW WITH ME

To Don Medford
 After consulting with us
 Northern Region developed
 the attached policy for
 signing & marking pathway
 signs. I can use. Please
 label to Project Managers.

Date 10/15/86

From Steve Horn

TO: Ron Tanner **RT**
 Senior Traffic/Safety
 Northern Region

FROM: Tim Miller
 Traffic Safety Engr.
 Northern Region

TELEPHONE NO: 451-2276

SUBJECT: Signing & Marking Bike Paths

DATE: September 29, 1986

All
 DG-3
 Proj. MNGRS-
 X.C. 10/24/86

Policy for the signing and marking of bike paths is needed to insure consistency in application in the Region. In particular, the question of how to handle the case where a parallel bike path crosses a STOP sign controlled side street approach needs to be resolved.

After checking the AASHTO Bike Guide, MUTCD, and calling Steve Horn in Central Region I recommend the following standards be adopted.

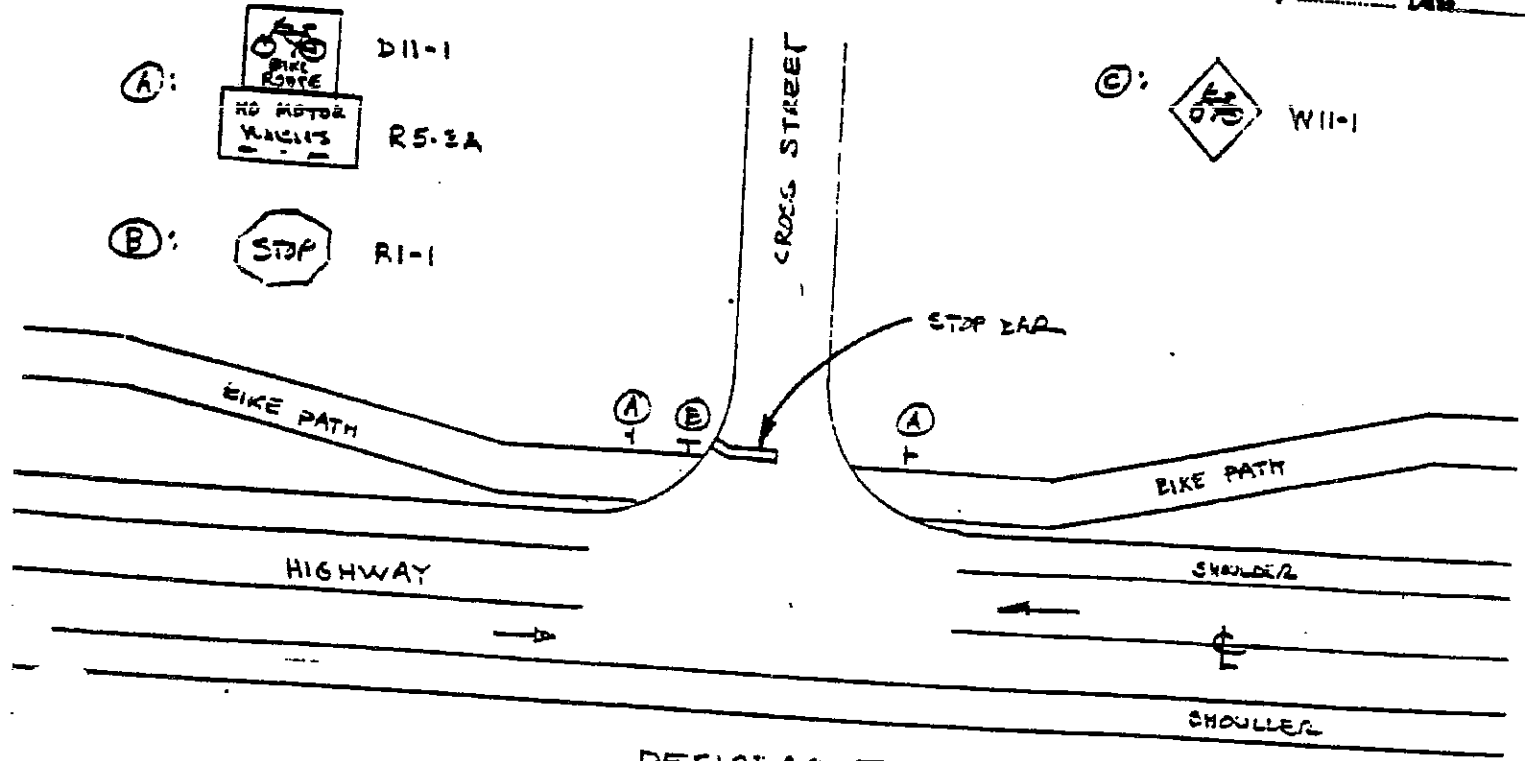
1. Bikeway geometrics should include swinging the bikeway toward the highway so that the bike path crosses the side street approach in a location where the crosswalk would normally be located.
2. Stop bars, rather than crosswalks should be installed on the stopped approach.
3. Except for the case where the bikeway crosses the through highway, STOP signs should not be used on the bike path unless under special conditions (i.e. inadequate sight distance, unexpected traffic conflicts, etc.).

The attached drawing summarizes the signing and markings I recommend for the desirable design, undesirable design, and mid-block cases.

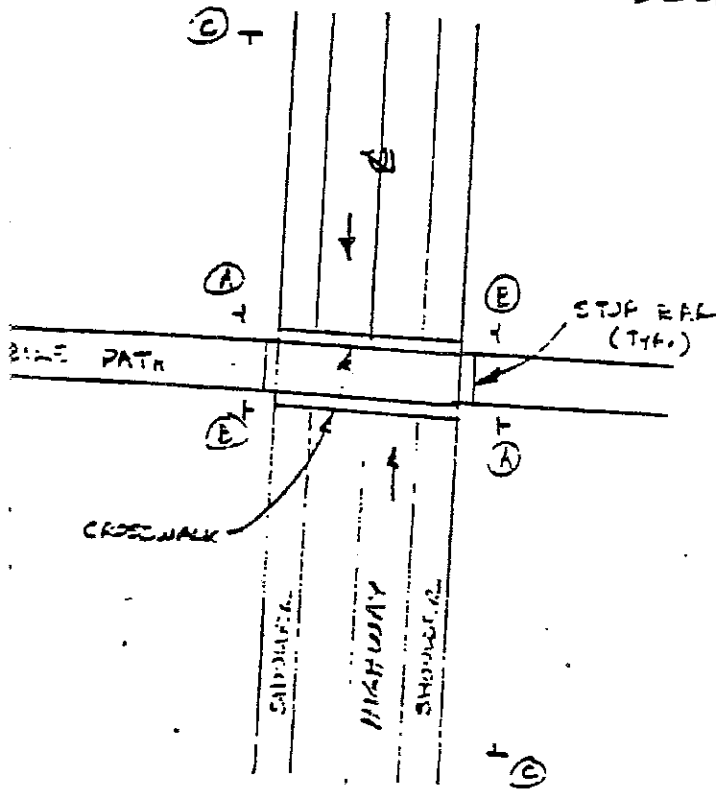
Computations

Project No. _____
 Bridge No. _____
 Calc. by T. MILLER Date 9-29
 Checked by _____ Date _____

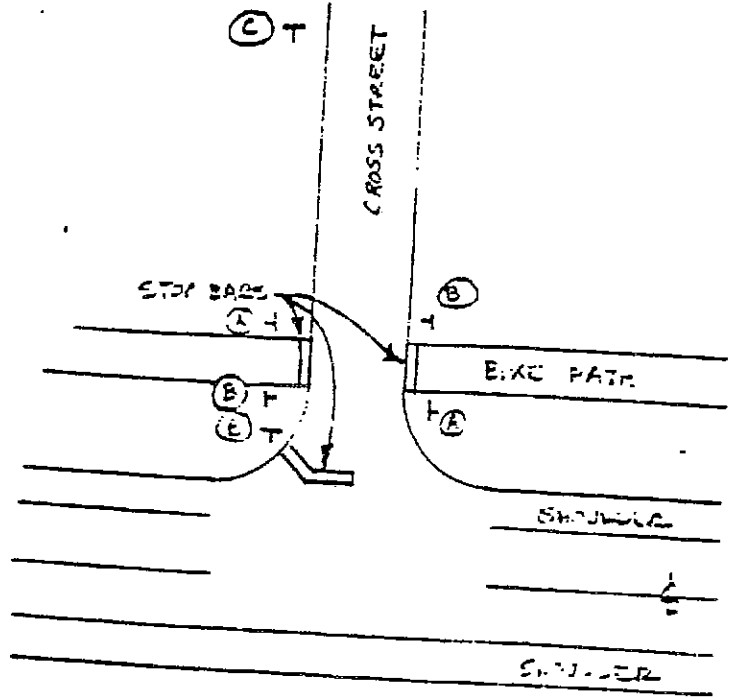
TYPICAL BIKE PATH SIGNING & MARKINGS



DESIREABLE



MID-BLOCK X-ING



UNDESIRABLE