Traffic Data and Reports

# Appendix F

48th and Cordova
Projected Traffic Volumes

By: Rebecca C.
Date: 7/23/2020

Popultation Growth Rate 0.80% Anchorage 2040 LUP

Lois Drive

| | | | |
|---|---|---|---|
| AADT (2018) | 2522 | Based on DOT State AADT data | |
| 30th Hour | 10.3% | NORTHERN LIGHTS BLVD - WEST OF FOREST PARK DR | |
| Directional Distribution NB/SB | 60% | 40% | |
| Design Hour Volume | 260 | | |
| Peak Hour Factor Lois | 0.92 | | |

Lois and 32nd Ave. Weekday

| | |
|---|---|
| NB Traffic | 1262 |
| EB Traffic | 285 |
| SB Traffic | 727 |
| WB Traffic | 290 |

Houston Radar Count east of Minnesota 1160 4/2/2019

W. 32nd Avenue

| | | | |
|---|---|---|---|
| AADT (2019) | 1113 | Adjusted based on Counts | |
| 30th Hour | 10.3% | NORTHERN LIGHTS BLVD - WEST OF FOREST PARK DR | |
| Directional Distribution EB/WB | 80% | 20% | |
| Design Hour Volume | 115 | | |
| Peak Hour Factor W. 32nd Ave. | 0.70 | | |

Lois and 32nd Ave. Weekend

| | |
|---|---|
| NB Traffic | 1141 |
| EB Traffic | 603 |
| SB Traffic | 247 |
| WB Traffic | 240 |

AADT Projections

Growth Rate 0.80%

| **AADT Projections** | **2020** | **2025** | **2045** |
|---|---|---|---|
| **Lois Drive** | 2560 | 2670 | 3130 |
| **W. 32nd Avenue** | 1120 | 1170 | 1370 |

Directional Distribution 2020

| | PM Peak | | | | | AM peak | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **NB** | **EB** | **SB** | **WB** | **Total** | **NB** | **EB** | **SB** | **WB** | **Total** |
| **Lois Drive** | 158 | 0 | 105 | 0 | 264 | 105 | 0 | 105 | 0 | 211 |
| **W. 32nd Avenue** | | 23 | | 92 | 115 | 0 | 92 | 0 | 23 | 115 |

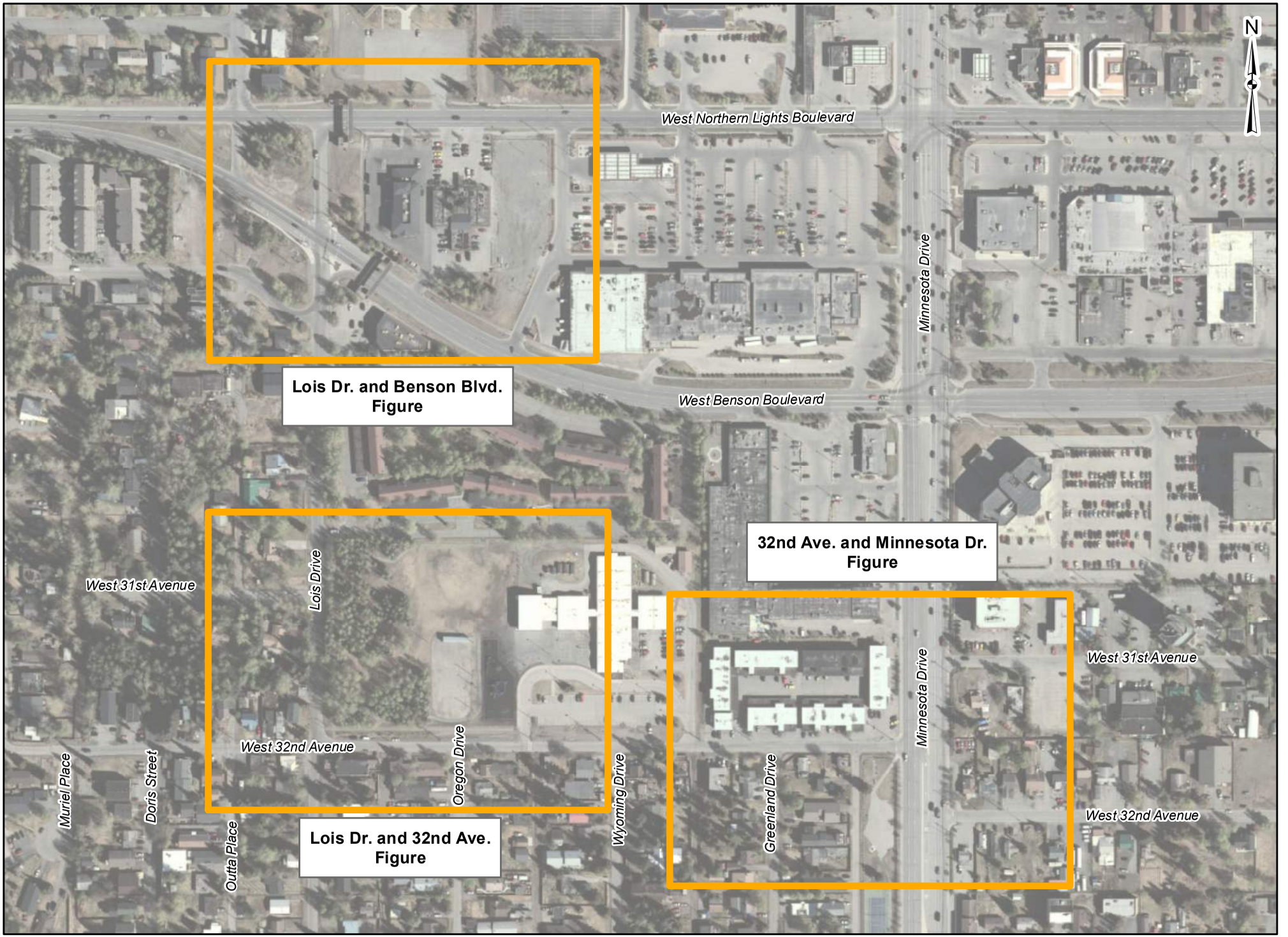
Directional Distribution 2025

| | PM Peak | | | | | AM peak | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **NB** | **EB** | **SB** | **WB** | **Total** | **NB** | **EB** | **SB** | **WB** | **Total** |
| **Lois Drive** | 165 | 0 | 110 | 0 | 275 | 110 | 0 | 165 | 0 | 275 |
| **W. 32nd Avenue** | 0 | 24 | 0 | 96 | 121 | 0 | 96 | 0 | 24 | 121 |

Directional Distribution 2045

| | PM Peak | | | | | AM Peak | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **NB** | **EB** | **SB** | **WB** | **Total** | **NB** | **EB** | **SB** | **WB** | **Total** |
| **Lois Drive** | 193 | 0 | 129 | 0 | 322 | 129 | 0 | 193 | 0 | 322 |
| **W. 32nd Avenue** | 0 | 28 | 0 | 113 | 141 | 0 | 28 | 0 | 113 | 141 |

# Lois Dr. and 32nd Ave. Collision Figure Key Map
## 2012-2018



# Lois Dr. and Benson Blvd. Collision Figure
# 2012-2018


* Symbol locations for schematic purposes only

# Lois Dr. and 32nd Ave. Collision Figure
# 2012-2018


* Symbol locations for schematic purposes only

# West 32nd Ave. and Minnesota Dr. Collision Figure
## 2012-2018


* Symbol locations for schematic purposes only

# FUTURE ESALs WORK SHEET w/o GROWTH RATE - W. 32nd Avenue

## FHWA 13 Classifications

| Classification | Description | Load Factor * | PTTc (% AADT) |
|---|---|---|---|
| **Single Unit** | | | |
| Class 01 | Motorcycles | 0.0000 | 0.03 |
| Class 02 | Automobiles, Automobiles w/trailers | 0.0004 | 65.5 |
| Class 03 | Pickups, Pickups w/trailers | 0.0150 | 30.17 |
| Class 04 | Buses (2 or 3 axle) | 0.9230 | 0.15 |
| Class 05 | Delivery Trucks, RV's, Dump Trucks (2 axles, 6 tires) | 0.2870 | 3.27 |
| Class 06 | Dump Trucks, RV's (3 axles) | 1.5100 | 0.62 |
| Class 07 | Concrete Trucks, Fuel/Propane Delivery Trucks (4 or more axles) | 1.3200 | 0 |
| **Single Trailer** | | | |
| Class 08 | Tractor/Truck w/trailer (3 or 4 axles) | 1.9100 | 0.06 |
| Class 09 | Tractor/Truck w/trailer (5 axles) | 2.0100 | 0.16 |
| Class 10 | Tractor/Truck w/trailer (6 or more axles) | 1.8300 | 0.03 |
| **Multi-Trailer** | | | |
| Class 11 | Tractor/Truck w/2 trailer (5 axles) | 2.830 | 0 |
| Class 12 | Tractor/Truck w/2 trailer (6 axles) | 2.880 | 0 |
| Class 13 | Tractor/Truck w/2 trailer (7 or more axles) | 2.920 | 0.01 |
| **Misc** | | | |
| Class 14 | Recreation Vehicles | 0.0640 | 0 |

* Load Factors for Northern and Central Regions Only

## Average Annual Daily Traffic

| Item | Description | Year | Traffic Count |
|---|---|---|---|
| AADT E | The two way AADT expected during current year | 2025 | 1170 |
| AADT F | The two way AADT expected at the end of the Design Period | 2045 | 1370 |

Design Period (N) = 20

Nunber of Lanes (L) = 2

| %T in Design Lane, TDL | No. Lanes |
|---|---|
| 2 | 100 |
| 4 | 90 |
| 6 | 80 |

**Step 1**

Calculate Traffic Growth Factor ($TGF_F$) from $AADT_E$ and $AADT_F$

$TGF_F = AADT_F / AADT_E$ = 1.17

**Step 2**

Calculate the compounding growth rate "i"

t = year of $AADT_F$ - year of $AADT_E$ = 20

$TGF_F = (1+I)^t$ = 0.0079

**Step 3**

Calculate Traffic Growth Factor ($TGF_N$) from $AADT_E$ to the AADT expected the 1st year after future construction

y = yr of $AADT_F$ - yr of $AADT_E$ - Design Period = 0

$TGF_N = (1+I)^y$ = 1.000

**Step 4**

Calculate new traffic ($AADT_N$) expect the 1st year after future construction

$AADT_N = (AADT_E)(TGF_N)$ = 1170

**Step 5**

Calculate Number of Light Traffic ($NLT_C$) per day in design lane for each classifiction 1, 2, 3, and 14

$NLT_C = (AADT_N)(PTT_C/100)/L$

| | |
|---|---|
| NLT 1 | 0 |
| NLT 2 | 383 |
| NLT 3 | 176 |
| NLT 14 | 0 |

**Step 6**

Calculate Number of Heavy Traffic ($NLT_C$) per day in design lane for each classifiction 4 through 13

$NHT_C = (AADT_N)(PTT_C/100)(TDL/100)*.5$

| | |
|---|---|
| NLT 4 | 1 |
| NLT 5 | 19 |
| NLT 6 | 4 |
| NLT 7 | 0 |
| NLT 8 | 0 |
| NLT 9 | 1 |
| NLT 10 | 0 |
| NLT 11 | 0 |
| NLT 12 | 0 |
| NLT 13 | 0 |

**Step 7**

Calculate the Initial Daily ESAL ($IDE_C$) for Classifications 1,2,3 and 14

$IDE_C = NHT_C (LF_C)$

| | |
|---|---|
| IDE 1 | 0.0 |
| IDE 2 | 0.2 |
| IDE 3 | 2.6 |
| IDE 14 | 0.0 |

**Step 8**

Calculate the Initial Daily ESAL ($IDE_C$) for Classifications 4 through 13

$IDE_C = NHT_C (LF_C)$

| | |
|---|---|
| IDE 4 | 0.8 |
| IDE 5 | 5.5 |
| IDE 6 | 5.5 |
| IDE 7 | 0.0 |
| IDE 8 | 0.7 |
| IDE 9 | 1.9 |
| IDE 10 | 0.3 |
| IDE 11 | 0.0 |
| IDE 12 | 0.0 |
| IDE 13 | 0.2 |

**Step 9**

Calculate the total Initial Daily ESAL's the 1st year after constr.

Initial ESAL = (Total IDE) = 18

**Step 10**

Calculate the total Initial Annual ESAL's the 1st year after constr.

Initial Annual ESAL = (Total IDE)(365) = 6432

**Step 11**

Calculate the comulative ESAL's in the design lane over the Design Period of the project

$CGF = ((1+I)^n-1)/I$ = 21.5791

Design ESALs = (Initial Annual ESAL)(CGF) = 139,000

# FUTURE ESALs WORK SHEET w/o GROWTH RATE - Lois Drive

## FHWA 13 Classifications

| Classification | Description | Load Factor * | PTTc (% AADT) |
|---|---|---|---|
| **Single Unit** | | | |
| Class 01 | Motorcycles | 0.0000 | 0.03 |
| Class 02 | Automobiles, Automobiles w/trailers | 0.0004 | 65.5 |
| Class 03 | Pickups, Pickups w/trailers | 0.0150 | 30.17 |
| Class 04 | Buses (2 or 3 axle) | 0.9230 | 0.15 |
| Class 05 | Delivery Trucks, RV's, Dump Trucks (2 axles, 6 tires) | 0.2870 | 3.27 |
| Class 06 | Dump Trucks, RV's (3 axles) | 1.5100 | 0.62 |
| Class 07 | Concrete Trucks, Fuel/Propane Delivery Trucks (4 or more axles) | 1.3200 | 0 |
| **Single Trailer** | | | |
| Class 08 | Tractor/Truck w/trailer (3 or 4 axles) | 1.9100 | 0.06 |
| Class 09 | Tractor/Truck w/trailer (5 axles) | 2.0100 | 0.16 |
| Class 10 | Tractor/Truck w/trailer (6 or more axles) | 1.8300 | 0.03 |
| **Multi-Trailer** | | | |
| Class 11 | Tractor/Truck w/2 trailer (5 axles) | 2.830 | 0 |
| Class 12 | Tractor/Truck w/2 trailer (6 axles) | 2.880 | 0 |
| Class 13 | Tractor/Truck w/2 trailer (7 or more axles) | 2.920 | 0.01 |
| **Misc** | | | |
| Class 14 | Recreation Vehicles | 0.0640 | 0 |

* Load Factors for Northern and Central Regions Only

## Average Annual Daily Traffic

| Item | Description | Year | Traffic Count |
|---|---|---|---|
| AADT E | The two way AADT expected during current year | 2025 | 2670 |
| AADT F | The two way AADT expected at the end of the Design Period | 2045 | 3130 |

Design Period (N) = 20

Nunber of Lanes (L) = 2

| %T in Design Lane, TDL | No. Lanes |
|---|---|
| 2 | 100 |
| 4 | 90 |
| 6 | 80 |

**Step 1**

Calculate Traffic Growth Factor ($TGF_F$) from $AADT_E$ and $AADT_F$

$TGF_F = AADT_F / AADT_E$ = 1.17

**Step 2**

Calculate the compounding growth rate "i"

t = year of $AADT_F$ - year of $AADT_E$ = 20

$TGF_F = (1+I)^t$ = 0.0080

**Step 3**

Calculate Traffic Growth Factor ($TGF_N$) from $AADT_E$ to the AADT expected the 1st year after future construction

y = yr of $AADT_F$ - yr of $AADT_E$ - Design Period = 0

$TGF_N = (1+I)^y$ = 1.000

**Step 4**

Calculate new traffic ($AADT_N$) expect the 1st year after future construction

$AADT_N = (AADT_E)(TGF_N)$ = 2670

**Step 5**

Calculate Number of Light Traffic ($NLT_C$) per day in design lane for each classifiction 1, 2, 3, and 14

$NLT_C = (AADT_N)(PTT_C/100)/L$

| | |
|---|---|
| NLT 1 | 0 |
| NLT 2 | 874 |
| NLT 3 | 403 |
| NLT 14 | 0 |

**Step 6**

Calculate Number of Heavy Traffic ($NLT_C$) per day in design lane for each classifiction 4 through 13

$NHT_C = (AADT_N)(PTT_C/100)(TDL/100)*.5$

| | |
|---|---|
| NLT 4 | 2 |
| NLT 5 | 44 |
| NLT 6 | 8 |
| NLT 7 | 0 |
| NLT 8 | 1 |
| NLT 9 | 2 |
| NLT 10 | 0 |
| NLT 11 | 0 |
| NLT 12 | 0 |
| NLT 13 | 0 |

**Step 7**

Calculate the Initial Daily ESAL ($IDE_C$) for Classifications 1,2,3 and 14

$IDE_C = NHT_C (LF_C)$

| | |
|---|---|
| IDE 1 | 0.0 |
| IDE 2 | 0.3 |
| IDE 3 | 6.0 |
| IDE 14 | 0.0 |

**Step 8**

Calculate the Initial Daily ESAL ($IDE_C$) for Classifications 4 through 13

$IDE_C = NHT_C (LF_C)$

| | |
|---|---|
| IDE 4 | 1.8 |
| IDE 5 | 12.5 |
| IDE 6 | 12.5 |
| IDE 7 | 0.0 |
| IDE 8 | 1.5 |
| IDE 9 | 4.3 |
| IDE 10 | 0.7 |
| IDE 11 | 0.0 |
| IDE 12 | 0.0 |
| IDE 13 | 0.4 |

**Step 9**

Calculate the total Initial Daily ESAL's the 1st year after constr.

Initial ESAL = (Total IDE) = 40

**Step 10**

Calculate the total Initial Annual ESAL's the 1st year after constr.

Initial Annual ESAL = (Total IDE)(365) = 14678

**Step 11**

Calculate the comulative ESAL's in the design lane over the Design Period of the project

$CGF = ((1+I)^n-1)/I$ = 21.5912

Design ESALs = (Initial Annual ESAL)(CGF) = 317,000

# Intersection Accident Rate Calculations

Project: 32nd & Lois
Roadway: Lois
Intersection: 32nd

## Intersection Accident Rate

| | |
|---|---|
| Begin Year: | 2012 |
| End Year: | 2018 |
| AADT: | 3,500 |
| No. of Accidents: | 3 |
| Millions of Vehicles Entering: | 8.9425 |
| Accident Rate: | 0.34 |

## Intersection Volumes

| Year | ADT |
|---|---|
| 2012 | 3,500 |
| 2013 | 3,500 |
| 2014 | 3,500 |
| 2015 | 3,500 |
| 2016 | 3,500 |
| 2017 | 3,500 |
| 2018 | 3,500 |

## Intersection Critical Accident Rate

| | |
|---|---|
| Statewide Average Accident Rate: | 0.55 |
| Millions of Vehicles Entering: | 8.9425 |
| Critical Accident Rate (90.0%): | 0.92 |
| Critical Accident Rate (95.0%): | 1.01 |
| Critical Accident Rate (99.5%): | 1.24 |
| Critical Accident Rate (99.9%): | 1.37 |

## "*k*" Factors

| Level of Confidence | *k* |
|---|---|
| 90.0% | 1.282 |
| 95.0% | 1.645 |
| 99.5% | 2.576 |
| 99.9% | 3.090 |

# NORTHERN LIGHTS BLVD - WEST OF FOREST PARK DRIVE - TOTAL

**ROUTE: 134750** **MILEPOINT: 6.800** **STATION NUMBER: 1110550U 0** **PERMANENT STN SUMMARY: 2013**

| MNTH | MADT | % AADT | 6AM - 10PM | 10PM - 6AM | PERCENT OF AADT FOR DAY OF WEEK MON | TUE | WED | THU | FRI | WKDY | SAT | SUN | HISTORY YEAR | AADT | PERCENT GROWTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN | 20287 | 90.6 | 90.1 | 9.9 | 100.5 | 99.2 | 107.3 | 108.7 | 114.2 | 106.0 | 92.6 | 77.4 | 2013 | 22383 | 0.6 |
| | | | | | | | | | | | | | 2012 | 22246 | -1.2 |
| FEB | 21193 | 94.7 | 90.4 | 9.6 | 102.7 | 105.6 | 107.2 | 108.4 | 108.2 | 106.4 | 91.5 | 76.5 | 2011 | 22509 | -1.5 |
| | | | | | | | | | | | | | 2010 | 22843 | -0.3 |
| MAR | 21645 | 96.7 | 90.6 | 9.4 | 98.9 | 105.3 | 106.6 | 105.9 | 109.6 | 105.3 | 92.6 | 81.0 | 2009 | 22923 | -1.2 |
| | | | | | | | | | | | | | 2008 | 23210 | -3.1 |
| APR | 22877 | 102.2 | 91.1 | 8.9 | 102.2 | 104.2 | 105.6 | 106.8 | 110.6 | 105.9 | 91.2 | 79.5 | 2007 | 23952 | 4.3 |
| | | | | | | | | | | | | | 2006 | 22955 | -4.4 |
| MAY | 24129 | 107.8 | 90.3 | 9.7 | 98.4 | 104.8 | 106.3 | 104.7 | 108.3 | 104.5 | 93.1 | 84.3 | 2005 | 24005 | -3.9 |
| | | | | | | | | | | | | | 2004 | 24978 | -1.1 |
| JUN | 23950 | 107.0 | 88.7 | 11.3 | 101.8 | 105.2 | 106.6 | 107.0 | 107.0 | 105.5 | 91.2 | 81.2 | 2003 | 25246 | 0.8 |
| | | | | | | | | | | | | | 2002 | 25041 | -1.3 |
| JUL | 23070 | 103.1 | 88.8 | 11.2 | 106.3 | 108.6 | 109.1 | 98.7 | 104.5 | 105.4 | 89.0 | 83.8 | 2001 | 25382 | -0.3 |
| | | | | | | | | | | | | | 2000 | 25452 | -1.3 |
| AUG | 23748 | 106.1 | 90.1 | 9.9 | 102.6 | 106.1 | 106.4 | 106.6 | 107.9 | 105.9 | 90.2 | 80.2 | 1999 | 25780 | 3.5 |
| | | | | | | | | | | | | | 1998 | 24901 | 3.3 |
| SEP | 23326 | 104.2 | 90.8 | 9.2 | 94.1 | 108.8 | 107.5 | 107.5 | 111.2 | 105.8 | 93.1 | 77.8 | 1997 | 24099 | 2.1 |
| | | | | | | | | | | | | | 1996 | 23593 | -0.9 |
| OCT | 22954 | 102.6 | 91.3 | 8.7 | 102.2 | 105.4 | 106.8 | 106.7 | 109.0 | 106.0 | 92.5 | 77.4 | 1995 | 23799 | -2.7 |
| | | | | | | | | | | | | | 1994 | 24448 | 1.8 |
| NOV | 20926 | 93.5 | 90.6 | 9.4 | 106.0 | 108.9 | 110.7 | 98.9 | 106.9 | 106.3 | 91.1 | 77.4 | 1993 | 24010 | 8.8 |
| | | | | | | | | | | | | | 1992 | 22070 | -8.3 |
| DEC | 20488 | 91.5 | 89.7 | 10.3 | 107.0 | 108.4 | 98.4 | 102.8 | 111.9 | 105.7 | 92.6 | 79.0 | 1991 | 24058 | 3.5 |
| | | | | | | | | | | | | | 1990 | 23246 | 4.1 |
| AADT | 22383 | | 90.2 | 9.8 | 101.9 | 105.9 | 106.5 | 105.2 | 109.1 | 105.7 | 91.7 | 79.6 | 1989 | 22327 | |

| HIGH DAYS | 1ST | 2ND | 3RD | 4TH | 5TH | 6TH | 7TH | 8TH | 9TH | 10TH | AVG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VOLUME | 27018 | 26827 | 26610 | 26403 | 26358 | 26348 | 26275 | 26270 | 26212 | 26169 | 26449 |
| DAY | 08/23 | 05/03 | 05/10 | 10/04 | 08/30 | 05/24 | 05/23 | 06/07 | 05/31 | 06/14 | |
| % AADT | 120.7 | 119.9 | 118.9 | 118.0 | 117.8 | 117.7 | 117.4 | 117.4 | 117.1 | 116.9 | 118.2 |

| HIGH HOURS | 1ST | 2ND | 3RD | 4TH | 5TH | 6TH | 7TH | 8TH | 9TH | 10TH | 20TH | 30TH | 40TH | 50TH | AVG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VOLUME | 2486 | 2446 | 2436 | 2422 | 2421 | 2420 | 2420 | 2411 | 2403 | 2390 | 2355 | 2310 | 2300 | 2281 | 2426 |
| HOUR | 6PM | 6PM | 6PM | 6PM | 6PM | 6PM | 6PM | 6PM | 6PM | 6PM | 6PM | 6PM | 6PM | 6PM | |
| DAY | 06/11 | 09/06 | 07/09 | 07/10 | 10/31 | 08/20 | 06/05 | 06/04 | 09/03 | 08/05 | 08/21 | 07/22 | 08/30 | 10/15 | |
| % AADT | 11.1 | 10.9 | 10.9 | 10.8 | 10.8 | 10.8 | 10.8 | 10.8 | 10.7 | 10.7 | 10.5 | 10.3 | 10.3 | 10.2 | 10.8 |

**PERCENT OF AADT BY HOUR**

| 1AM | 2AM | 3AM | 4AM | 5AM | 6AM | 7AM | 8AM | 9AM | 10AM | 11AM | 12PM | 1PM | 2PM | 3PM | 4PM | 5PM | 6PM | 7PM | 8PM | 9PM | 10PM | 11PM | 12AM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.2 | 0.8 | 0.6 | 0.5 | 0.6 | 1.2 | 2.5 | 4.9 | 5.1 | 4.4 | 4.7 | 5.4 | 6.2 | 6.2 | 6.4 | 7.2 | 7.8 | 8.5 | 7.0 | 5.5 | 4.5 | 3.8 | 2.9 | 2.0 |

# Lois Dr. Upgrade


| Lois Drive | | | | | |
|---|---|---|---|---|---|
| Wednesday (03/27/2019) | | | | | |
| | *Total* | *AM* | *PM* | *Peak Count* | *85th Percentile Speed* |
| **SB** | 1088 | 298 | 730 | 114 (*5:00-6:00 PM*) | 30.0 |
| **NB** | 1783 | 723 | 956 | 244 (*8:00-9:00 AM*) | 29.0 |


| 32nd Avenue Location 1 | | | | | |
|---|---|---|---|---|---|
| Tuesday ( 04/02/2019) | | | | | |
| | *Total* | *AM* | *PM* | *Peak Count* | *85th Percentile Speed* |
| **WB** | 777 | 195 | 535 | 95 (*4:00-5:00 PM*) | 23.0 |
| **EB** | 383 | 138 | 221 | 55 (*8:00-9:00 AM*) | 21.0 |

## Legend

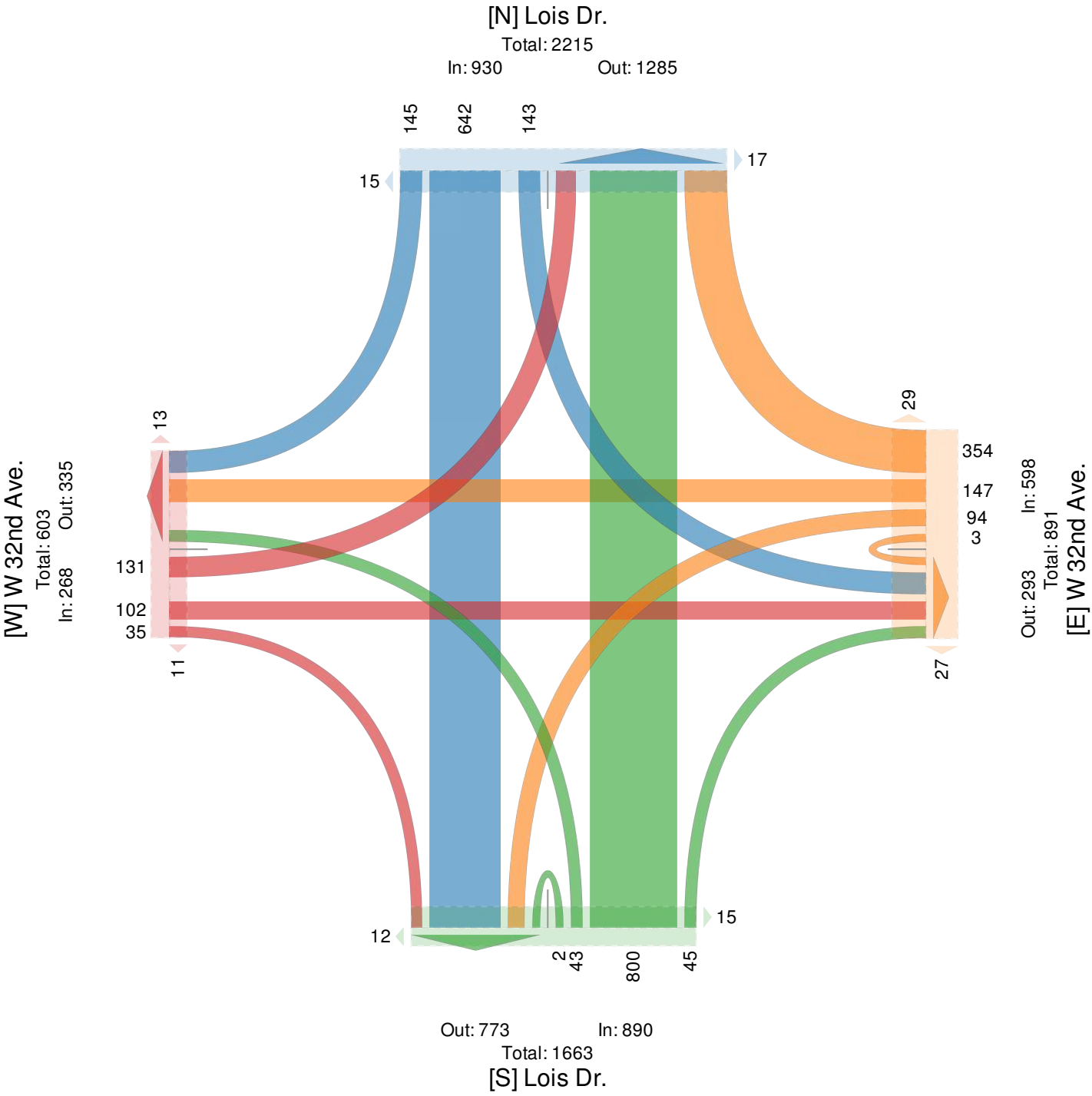
Radar Location and Direction

Area of Analysis


| 32nd Avenue Location 2 | | | | | |
|---|---|---|---|---|---|
| Thursday (04/04/2019) | | | | | |
| | *Total* | *AM* | *PM* | *Peak Count* | *85th Percentile Speed* |
| **WB** | 767 | 257 | 473 | 89 (*8:00 - 9:00 AM*) | 24.0 |
| **EB** | 347 | 140 | 196 | 61 (*8:00 - 9:00 AM*) | 24.0 |

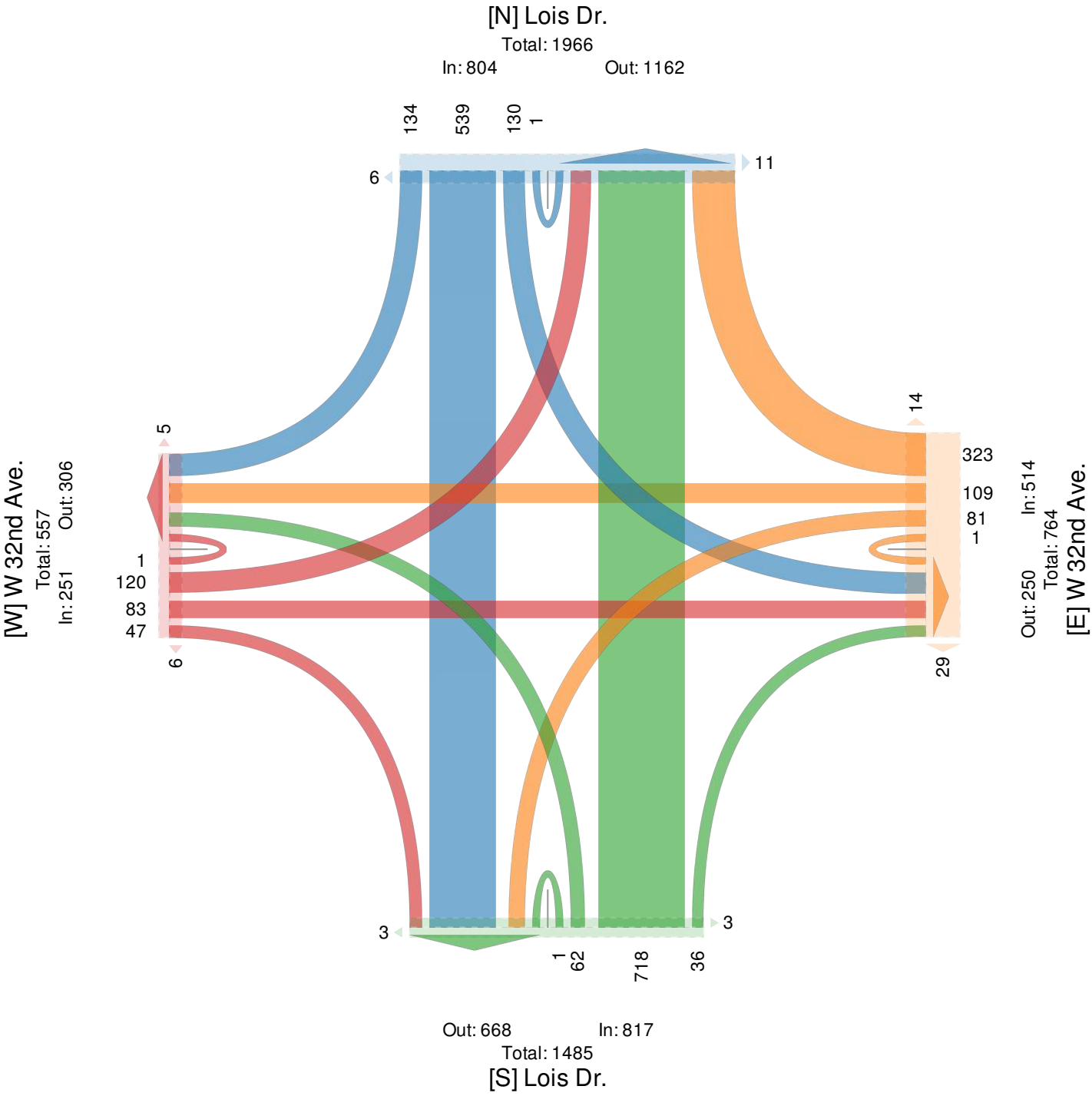
**Lois and 32nd - TMC**
Wed May 13, 2020
Full Length (11:30 PM-12:30 AM (+1))
All Classes (Vehicles, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 764136, Location: 61.1917, -149.920291

Provided by: CRW Engineering Group, LLC
3940 Arctic Blvd, Suite 300,
Anchorage, AK, 99503, US



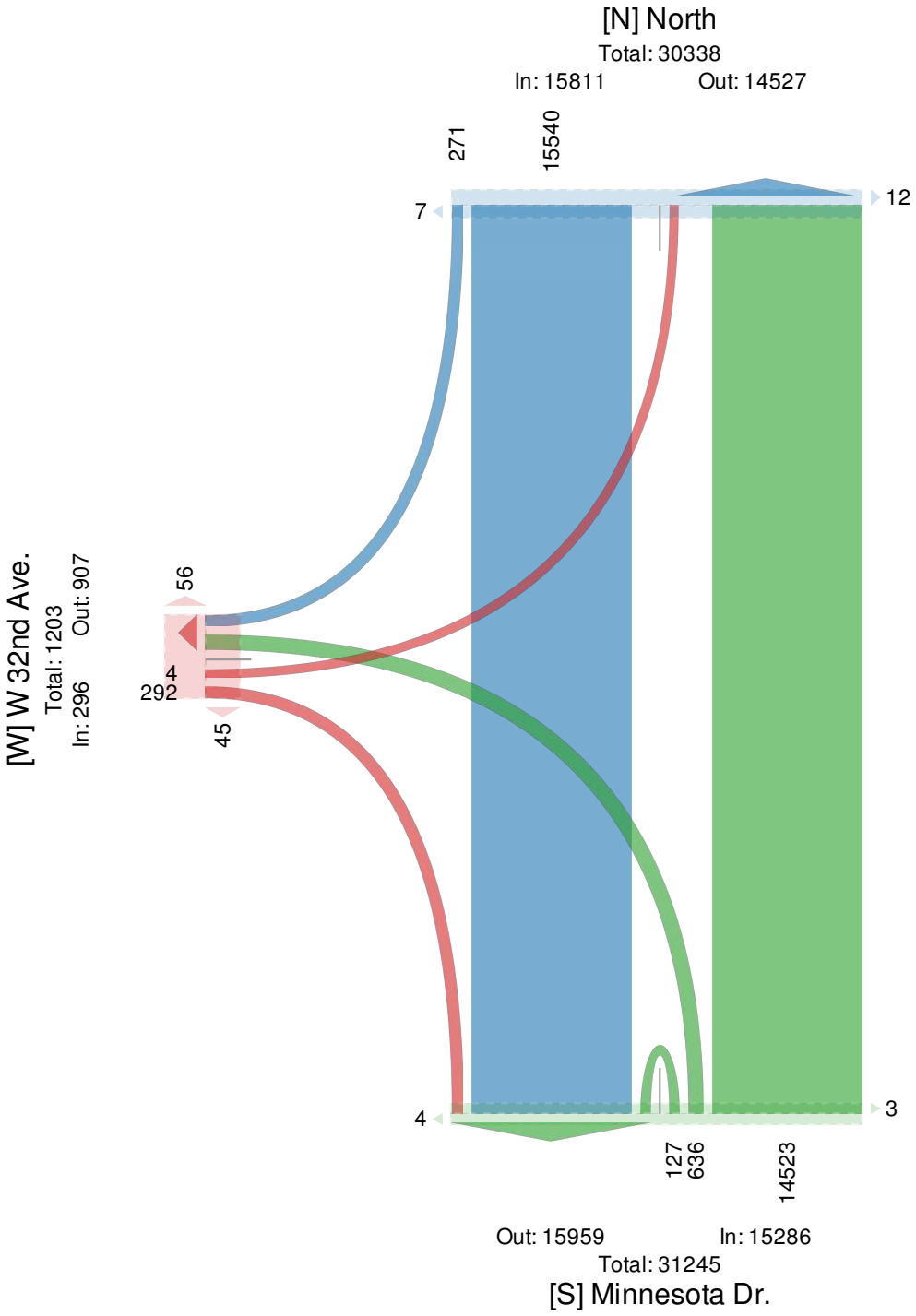
**Lois and 32nd Weekend 5/16 - TMC**
Fri May 15, 2020
Full Length (11:30 PM-12:30 AM (+1))
All Classes (Vehicles, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 764139, Location: 61.1917, -149.920291

Provided by: CRW Engineering Group, LLC
3940 Arctic Blvd, Suite 300,
Anchorage, AK, 99503, US



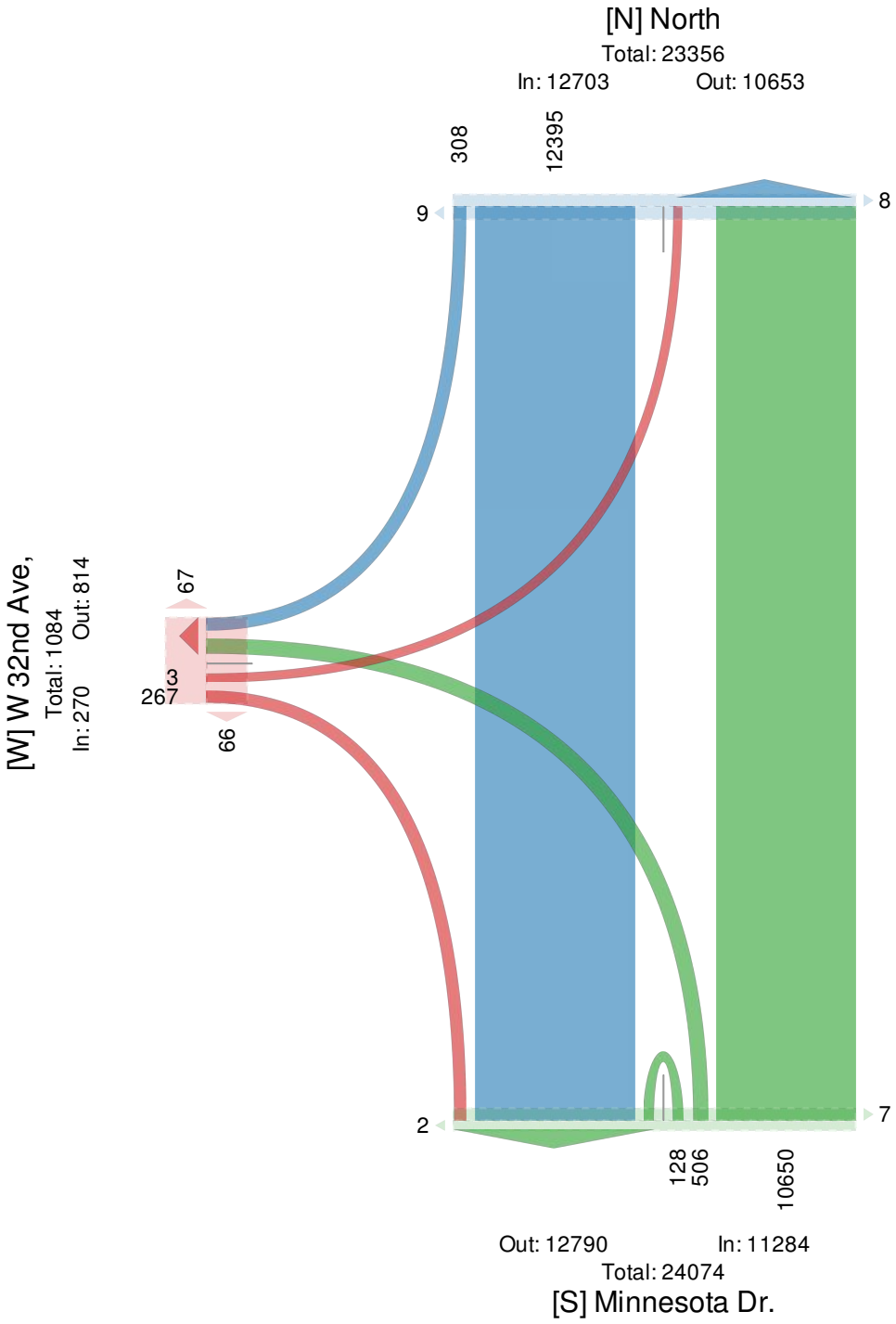
**32nd and Minnesota 2020 - TMC**
Wed May 20, 2020
Full Length (11:30 PM-12:30 AM (+1))
All Classes (Vehicles, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 764700, Location: 61.191527, -149.91344

Provided by: CRW Engineering Group, LLC
3940 Arctic Blvd, Suite 300,
Anchorage, AK, 99503, US



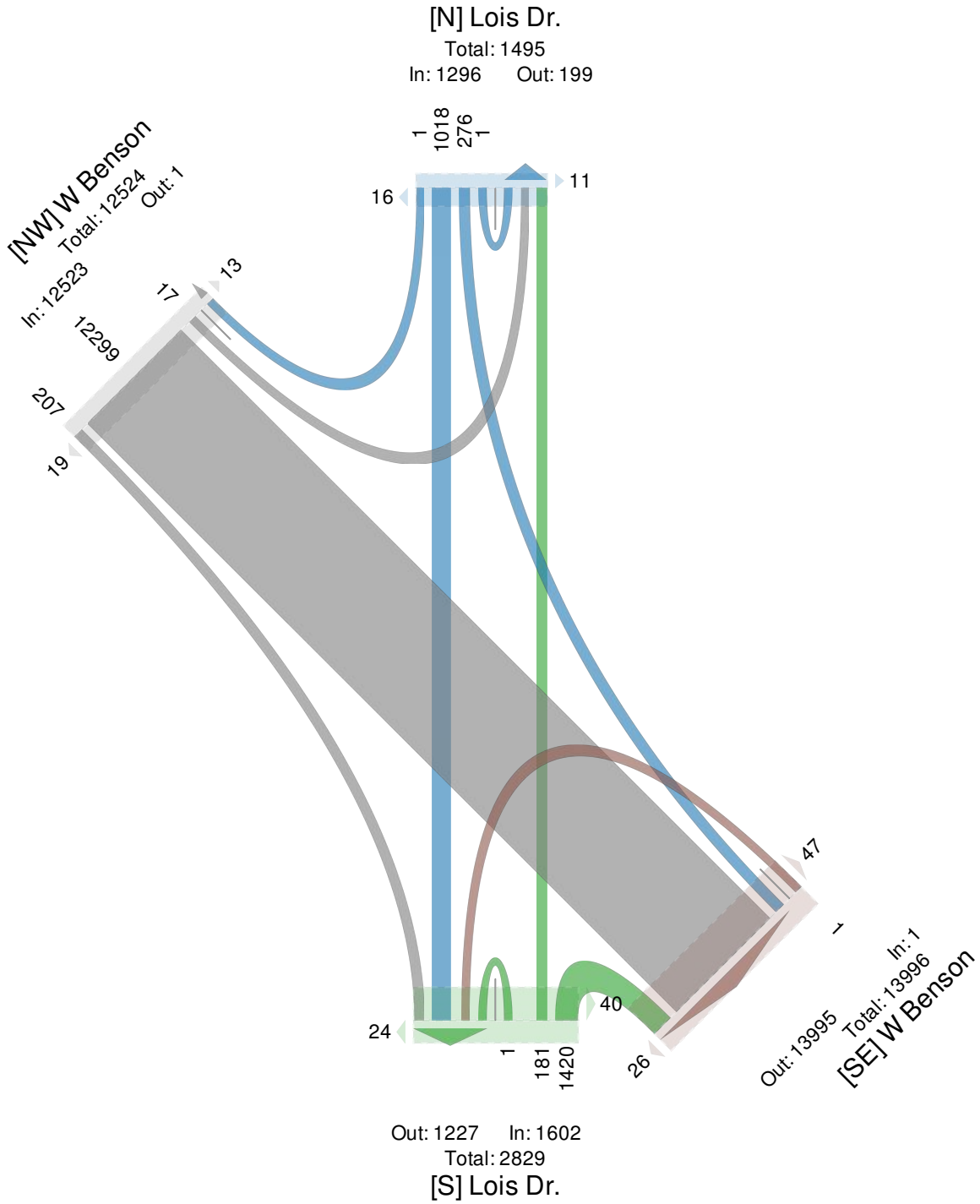
**32nd and Minnesota Weekend - TMC**
Fri May 22, 2020
Full Length (11:30 PM-12:30 AM (+1))
All Classes (Vehicles, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 764703, Location: 61.191527, -149.91344

Provided by: CRW Engineering Group, LLC
3940 Arctic Blvd, Suite 300,
Anchorage, AK, 99503, US



**Lois & Benson Weekday V2 2020 - TMC**
Wed May 27, 2020
Full Length (11:30 PM-12:30 AM (+1))
All Classes (Vehicles, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 765104, Location: 61.194805, -149.920582

Provided by: CRW Engineering Group, LLC
3940 Arctic Blvd, Suite 300,
Anchorage, AK, 99503, US



**Lois and Benson Weekend V2 2020 - TMC**
Fri May 29, 2020
Full Length (11:30 PM-12:30 AM (+1))
All Classes (Vehicles, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 765105, Location: 61.194805, -149.920582

Provided by: CRW Engineering Group, LLC
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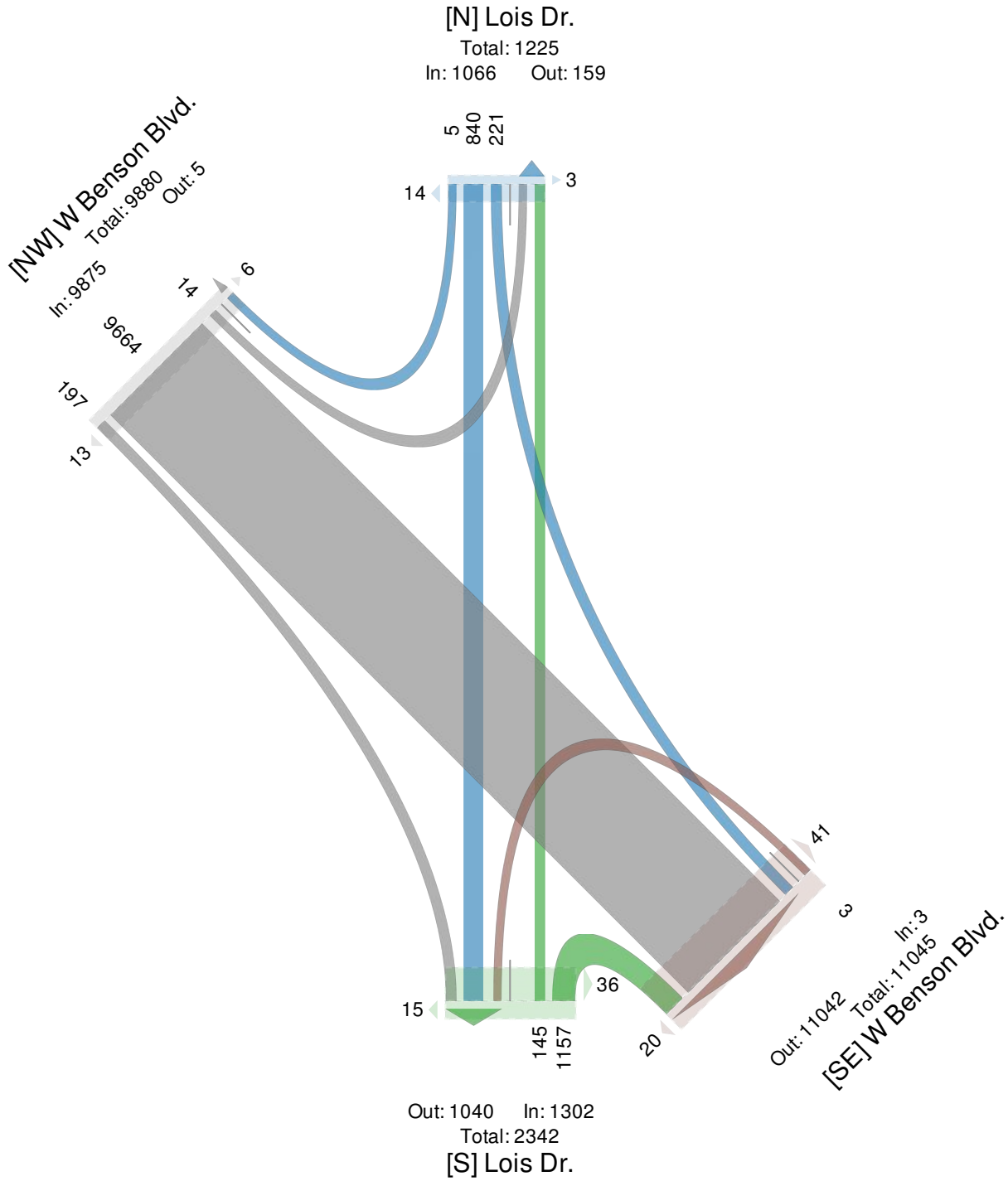

~~(ADT), the posted or statutory speed limit or 85th-percentile speed, the geometry of the location, the possible consolidation of multiple crossing points, the availability of street lighting, and other appropriate factors.~~

09 ~~New marked crosswalks alone, without other measures designed to reduce traffic speeds, shorten crossing distances, enhance driver awareness of the crossing, and/or provide active warning of pedestrian presence, should not be installed across uncontrolled roadways where the speed limit exceeds 40 mph and either:~~

~~A. The roadway has four or more lanes of travel without a raised median or pedestrian refuge island and an ADT of 12,000 vehicles per day or greater; or~~

~~B. The roadway has four or more lanes of travel with a raised median or pedestrian refuge island and an ADT of 15,000 vehicles per day or greater.~~

09A *Where crosswalks are marked on approaches controlled by traffic signals or stop signs, transverse crosswalk lines should be used.*

09B *Where crosswalks are marked on uncontrolled approaches or at midblock locations, longitudinal crosswalk lines should be used.*

09C *Decisions to mark crosswalks on uncontrolled approaches or at midblock locations should be made in accordance with Table 3B-101.*

## Table 3B-101. Recommended Practice for Crosswalk Marking on Uncontrolled Approaches or at Midblock Locations

| No of Lanes | Raised Median? | Vehicle ADT | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | <9,000 | | | | >9,000 to 12000 | | | | >12,000 to 15,000 | | | >15,000 | | |
| | | Speed Limit (MPH) | | | | | | | | | | | | | |
| | | <30 | 35 | 40 | >45 | <30 | 35 | 40 | >45 | <30 | 35 | >40 | <30 | 35 | >40 |
| 2 | No | C | C | M | N | C | C | M | N | C | C | N | C | M | N |
| 3 | No | C | C | M | N | C | M | M | N | M | M | N | M | N | N |
| >4 | Yes | C | C | M | N | C | M | N | N | M | M | N | N | N | N |
| >4 | No | C | M | N | N | M | M | N | N | N | N | N | N | N | N |

Source: FHWA-RD-01-075, Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations, 2002

C Candidate sites for marked crosswalks. Before marking a crosswalk, the site should be studied to ensure it is suitable. The study may include a review of pedestrian volumes, available gaps, sight distance (see Note 1), vehicle mix, pedestrian mix, distance to adjacent crossings (see Note 2), etc. Crosswalks should not be installed at locations with fewer than 20 pedestrian crossings per peak hour (or 15 for elderly and/or child pedestrians).

M Marginal candidate sites for marked crosswalks: Pedestrian accident risk may increase if crosswalks are marked. If pedestrian improvements are necessary, other options should be explored before marking crosswalks.

N Crosswalks should not be installed at these locations.

Notes: 1. Marked crosswalks should not be installed on uncontrolled approaches or at midblock locations where visibility distance of pedestrians or the crosswalk would be less than the "Stopping Sight Distance for Design" given in the latest version of the AASHTO A Policy on Geometric Design of Highways and Streets. Desirably, crosswalks would only be installed where there is sufficient sight distance to allow pedestrians to cross the road without conflicting with vehicles continuing at the 85th-percentile speed, assuming the pedestrian starts walking at the moment the vehicle comes into sight. Pedestrian crossing time should be computed in accordance with the procedure for determining adequate gaps given in the Institute of Transportation Engineers Traffic Engineering Handbook (page 78 in the 4th Edition).

2. Crosswalks should not be installed on uncontrolled approaches or at midblock locations where they will encourage pedestrians to divert from nearby signalized or grade-separated pedestrian crossings.

09D *Crosswalks at intersections should be located as shown in Alaska Standard Drawings Manual, Standard Drawing T-23.*

*Guidance:*

11 *Because non-intersection pedestrian crossings are generally unexpected by the road user, warning signs (see Section 2C.50) should be installed for all marked crosswalks at non-intersection locations. ~~and adequate visibility should be provided by parking prohibitions.~~*

# PART 4
# HIGHWAY TRAFFIC SIGNALS

## CHAPTER 4A. GENERAL

[This is a new section. There is no corresponding section in the MUTCD.]

### Section 4A.100 Traffic Control Device Alternatives for Crossings

*Guidance:*

01 *Traffic control devices or strategies for improving higher use crossing locations should be selected to provide warning to motorists or to assist pedestrians with gaps for crossing. Traffic control devices or strategies should be matched to conditions at the crossing location with consideration of the following factors associated with the potential for vehicle-pedestrian conflict: pedestrian volume, traffic volume, roadway width, and traffic speed.*

02 *Table 4A-101 should be used to evaluate conditions at crossing locations to determine the grouping of traffic control devices (non-electrical, electrical warning, or electrical regulatory) which most efficiently meets the level of conflict. Pedestrian volumes used in Table 4A-101 should be frequent and routinely occurring, such as an average annual peak hourly volume which recurs on a daily or weekly basis or a seasonal peak hourly volume which recurs over three or more months. Where the operating speed of traffic has been studied and found to be significantly different from the posted speed limit (such as a posted advisory speed, an entry to a roundabout, or a segment with good sight distance and little roadside activity), the operating speed should be used in Table 4A-101, otherwise the posted speed limit should be used.*

03 *Table 4A-102 should be used to select traffic control devices or strategies within the grouping of traffic control devices identified in Table 4A-101. Performance of traffic control devices or strategies should be evaluated with engineering judgment before moving to a device grouping with higher command of motorist attention.*

Option:

04 Crash history, walking speed, pedestrian age, and maintenance and operations needs may also be considered when selecting traffic control devices or strategies. These additional factors may be used with engineering judgment to adjust upward or downward from the initial traffic control device selection.

## Table 4A-101. Grouping of Traffic Control Device Alternatives Based on Conditions at Uncontrolled Crossing Locations

| Recurring Hourly Pedestrian (PED) Crossing Volume | Vehicular Traffic Volume and Speed | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Vehicle AADT (vpd) | | | | | | | | | | | | | |
| | | | <= 4500 | >4500 to 9,000 | | | | > 9,000 to 12,000 | | | | >12,000 to 15,000 | | | >15,000 | | |
| | | | Speed (MPH) | | | | | | | | | | | | | | |
| | No. of Lanes | Raised Median or Refuge? | All | <=30 | 35 | 40 | >=45 | <=30 | 35 | 40 | >=45 | <=30 | 35 | 40 | <=30 | 35 | 40 |
| **< 20 /hr** | Any | Any | NE See also 2C.01 and 3B.18 | | | | | | | | | | | | | | |
| **>=20 /hr** | 2,3 | Yes | NE: See also 2C.01 and 3B.18 | NE | NE | EW | ER | NE | NE | EW | ER | NE | NE | ER | NE | EW | ER |
| | 2 | No | | NE | NE | EW | ER | NE | NE | EW | ER | NE | NE | ER | NE | EW | ER |
| | 3 | No | | NE | NE | EW | ER | NE | EW | EW | ER | EW | EW | ER | | ER | ER |
| | >=4 | Yes | | NE | NE | EW | ER | NE | EW | ER | ER | EW | EW | ER | ER | ER | ER |
| | >=4 | No | | NE | EW | ER | ER | EW | EW | ER | ER | ER | ER | ER | ER | ER | ER |
| **School Crossing** | EW - See Part 7 for school routes, beacon systems, and Part 4 for Signal Warrants | | | | | | | | | | | | | | | | |
| **>= 20 /hr** | ER - See Part 4 for Pedestrian Hybrid Beacon Guidelines and School Crossing Warrants (Engineering Study required) | | | | | | | | | | | | | | | | |
| **>=75 /hr** | ER - See Part 4 for Traffic Control Signal Warrants (Engineering Study required) | | | | | | | | | | | | | | | | |

**DEVICE GROUPING**

**NE:** Non-electrical devices (sight distance, signs, striping, medians, etc.)

**EW:** Electrical warning devices (beacons, lighting, sign borders, in-pavement lights, etc.)

**ER:** Electrical regulatory devices (hybrid beacons, signals)

**Abbreviations**

**vpd:** vehicles per day (typically annual average daily traffic or ADT)

**AADT:** Annual Average Daily Traffic (volume in vehicles per day)

**MPH:** Miles per hour

**PED Crossing Volume:** Frequent and recurring, e.g. average annual peak hourly volume or seasonal peak hourly volume over three months or more

Reduce PED volume to 15 / hr for NE, EW devices, or by by 50% for ER devices if elderly and/or child pedestrians recur frequently.

## Table 4A-102. Recommended Order of Selection for Traffic Control Devices or Strategies at Uncontrolled Crossing Locations

| | Priority of factors for consideration after Table 4A-101 | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | | | |
| DEVICE GROUPING | PED VOLUME | SAFETY HISTORY | SIGHT DISTANCE | GAPS | TRAFFIC CONTROL STRATEGIES FOR A CROSSING LOCATION | ORDER OF DEVICE SELECTION | OPTIONAL DEVICES |
| NE - Non-electrical[1] | > 20/hr and factors 2, 3, or 4 | < 75 %ile crash history | Above Minimum PSD | ≥ 1 per minute average or ≥ 1 per adjacent signal cycle | Devices not provided for sites with adequate gaps, good visibility, low pedestrian volume or low crash history | None | |
| | | > 75 %ile crash history, primarily crossing related | Below minimum PSD, Above minimum SSD | < 1 per 2 minutes average or < 1 per adjacent signal cycle | Locate or provide alternative crossing location (primarily to improve sight distance) | Increasing Command ↓ of Attention/Respect | |
| | | | | | Median refuge island or divided/split highway lanes (primarily to achieve gaps)[2] | | |
| | | | | | Standard retroreflective signs (primarily for warning or drawing attention) | | |
| | | | | | High visibility warning signs, markings, delineators, or post reflectors (primarily for warning or drawing attention) | | |
| | | | | | *Flag-carry* | | |
| | | | | | *Portable in-street signs*[3] | | |
| EW - Electrical Warning | >20/hr and factors 2, 3, or 4 OR > 75 /hr | > 95 %ile crash history, primarily crossing related | Below minimum PSD, Above minimum SSD with high visibility devices | < 1 per 2 minutes average or < 1/ adjacent signal cycle | Pedestrian street lighting electrolier(s) [4] | Increasing Command ↓ of Attention/Respect | |
| | | | | | Ped Activated Rectangular Rapid Flashing Beacons RRFB (when >=40 MPH; >2 lanes; or roundabout exits)[5] | | |
| | | | | | Overhead active alternating LED beacon w/ped detection[5] | | |
| | | | | | Continuous single roundel LED beacons above sign[6] | | |
| | | | | | Continuous single Overhead LED beacon | | |
| | | | | | *LED bollards for walkways (primarily used in transit areas)* | | |
| | | | | | *Continuous LED flashing borders in-sign* | | |
| | | | | | *Ped activated LED flashing borders in-sign* | | |
| | | | | | *Combined side mount and Overhead ped activated beacons* | | |
| | | | | | *In pavement crosswalk lights*[7] | | |
| | | | | | *Other electrical warning devices* | | |
| ER - Electrical Regulatory[8] | >= 20/hr | > 95 %ile crash history, primarily crossing related | Below minimum SSD | < 1 per 2 minutes average or < 1 per adjacent signal cycle | *Pedestrian Hybrid Beacon (Engineering Study required)* | Increasing Command ↓ of Attention/Respect | |
| | >= 75/hr | | | | *Signal, Midblock signal, or Half-signal (Engineering Study required)* | | |

**FOOTNOTES to Table 4A-102**

1. NE - nonelectrical project solutions are acceptable until an electrical project can be determined as needed
2. Median refuge may be used to convert undesirable gaps into adequate two stage gaps
3. Consider portable in-street signs primarily for special events and school control. These require active onsite oversight.
4. Provide overhead lighting at marked crosswalks when feasible to address nighttime ped crossing issues
5. Active flashing beacon systems are preferable to passive beacon systems
6. Flashing beacon systems may be used to mark zones not identifiable as a single crossing, or areas without overhead lighting
7. In pavement lights should only be considered in a low risk environment for damage, where there is extensive maintenance capability
8. Should be 1/4 mile or more from existing signals on arterial 2 way roadways, unless coordinated with existing signals

**DEVICE GROUPING**

- **NE:** Non-electrical devices. See Section 3B.18.
- **EW:** Electrical warning devices - use at unsignalized, midblock locations where conflict with signals is not a concern.
- **ER:** Electrical regulatory devices.
- **OPT:** Optional devices which are low priority enhancements due to frequent maintenance and resource limitations

**OTHER FACTORS/TERMS**

- **PED VOLUME:** Frequent and recurring, e.g. average annual peak hourly volume or seasonal peak hourly volume over three months or more. Reduce PED volume to 15 / hr for NE, EW devices, or by by 50% for ER devices if elderly and/or child pedestrians recur frequently
- **SAFETY HISTORY:** Analysis of ped-vehicle crash data related to crossing attempts, including experience at locations with similar characteristics
- **%ile:** Percentile grouping of locations based on analysis of statewide crossing-related ped-vehicle crash data
- **SIGHT DISTANCE:** Unobstructed road distance visible to a pedestrian or motorist providing time necessary to execute crossing or driving maneuvers
- **PSD:** Pedestrian Sight Distance (PSD) = (2.5 s + Crossing Distance/3.5 fps) x Posted Speed fps
- **SSD:** Motorist Stopping Sight Distance (SSD), See Tables 3-1 and 3-2, AASHTO Policy on Geometric Design of Highways and Streets
- **GAPS:** Spacing of vehicular traffic, such that pedestrians have an opportunity to execute a crossing
- **avg:** Average measurement per hour
- **LED:** Light Emitting Diode or alternative light source