

AMATS: Seward Highway to Glenn Highway Connection Planning & Environmental Linkage Study

State Project No.: CFHWY00550
Federal Project No.: 0001653

Pedestrian and Bicycle Study

February 7, 2024

This planning document may be adopted in a subsequent environmental review process in accordance with 23 USC 168 Integration of Planning and Environmental Review and 23 CFR 450 Planning Assistance and Standards.

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by DOT&PF pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

Prepared for:

Alaska Department of Transportation and Public Facilities

Prepared by:

*RSG
1515 SW 5th Avenue, Suite 1030
Portland, OR 97201*

Contents

1.0 PEDESTRIAN AND BICYCLE STUDY OVERVIEW	4
PURPOSE OF THE PEDESTRIAN AND BICYCLE STUDY.....	4
METHODS.....	4
FIELD WORK SUMMARY AND REAL-WORLD CONTEXT	7
2.0 STRENGTHS AND LIMITATIONS OF THE PEDESTRIAN AND BICYCLE STUDY	11
3.0 PEDESTRIAN AND BICYCLE OBSERVATIONS.....	12
OBSERVED PEDESTRIAN & BICYCLE FLOWS IN THE SEWARD-GLENN CORRIDOR AT THE MACRO SCALE	12
OBSERVED PEDESTRIANS, BICYCLES, AND VEHICLES AT THE INGRA, GAMBELL, AND HYDER INTERSECTIONS.....	38
4.0 PEDESTRIAN AND BICYCLE FINDINGS AND DISCUSSION	53
DISCERNIBLE PATTERNS IN THE MACRO-SCALE ACTIVE TRANSPORT MOVEMENTS.....	53
IMPLICATIONS OF THE ACTIVE TRANSPORTATION AND VEHICLE VOLUMES FOR THE CURRENT SITUATION	53
IMPLICATIONS OF THE STUDY OBSERVATIONS FOR THE SG PEL ALTERNATIVES DESIGNS	54
CARE IN INTERPRETING THESE FINDINGS	54

LIST OF FIGURES

FIGURE 1: COUNT LOCATION MAP IN THE SEWARD-GLENN CORRIDOR CONTEXT	6
FIGURE 2: COUNT LOCATION MAP SHOWING KEY ATTRACTIONS AND BUS STOPS	7
FIGURE 3: STREET VIEW OF HYDER STREET BETWEEN 5 TH AVE AND 6 TH AVENUE	8
FIGURE 4: STREET VIEW OF GAMBELL STREET AND 13 TH AVENUE	9
FIGURE 5: ANCHORAGE LAND USE PLAN MAP	10
FIGURE 6: WEEKDAY AVERAGE AND PEAK HOURLY PEDESTRIANS BY INTERSECTION.....	13
FIGURE 7: WEEKEND AVERAGE AND PEAK HOURLY PEDESTRIANS BY INTERSECTION.....	14
FIGURE 8: WEEKDAY AVERAGE DAILY PEDESTRIANS BY INTERSECTION.....	15
FIGURE 9: WEEKEND AVERAGE DAILY PEDESTRIANS BY INTERSECTION.....	16
FIGURE 10: WEEKDAY AVERAGE AND PEAK HOURLY BICYCLES BY INTERSECTION.....	17
FIGURE 11: WEEKEND AVERAGE HOURLY AND PEAK HOUR BICYCLES BY INTERSECTION.....	18
FIGURE 12: WEEKDAY AVERAGE DAILY BICYCLES BY INTERSECTION.....	19
FIGURE 13: WEEKEND AVERAGE DAILY BICYCLES BY INTERSECTION.....	20
FIGURE 14: WEEKDAY EXPOSURE INDEX MAP BY EXPOSURE INDEX RANK ORDER	28
FIGURE 15: WEEKEND EXPOSURE INDEX MAP BY EXPOSURE INDEX RANK ORDER	29
FIGURE 16: AVERAGE PEDESTRIANS COUNTED BY HOUR OF THE DAY	30
FIGURE 17: AVERAGE BICYCLES COUNTED BY HOUR OF THE DAY	32
FIGURE 18: WEEKDAY DAILY AVERAGE PEDESTRIANS CROSSING AT MID-BLOCK LOCATIONS	34
FIGURE 19: WEEKEND DAILY AVERAGE PEDESTRIANS CROSSING AT MID-BLOCK LOCATIONS.....	35
FIGURE 20: WEEKDAY AND WEEKEND AVERAGE HOURLY PEDESTRIANS CROSSING AT MID-BLOCK LOCATIONS.....	36
FIGURE 21: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 5TH AVENUE	40
FIGURE 22: 5 TH AVENUE WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT JUNEAU STREET AND KARLUK STREET	41
FIGURE 23: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 6TH AVENUE	42
FIGURE 24: 6 TH AVENUE WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT JUNEAU STREET AND KARLUK STREET	43
FIGURE 25: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 7TH AVENUE	44
FIGURE 26: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 8TH AVENUE	45
FIGURE 27: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 9TH AVENUE	46
FIGURE 28: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 10TH AVENUE.....	47
FIGURE 29: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 11TH AVENUE.....	48
FIGURE 30: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 12TH AVENUE.....	49
FIGURE 31: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 13TH AVENUE.....	50
FIGURE 32: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 14TH AVENUE.....	51

FIGURE 33: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 15TH AVENUE.....	52
--	-----------

LIST OF TABLES

TABLE 1: WEEKDAY AVERAGE DAILY PEDESTRIANS, BICYCLES AND VEHICLES BY INTERSECTION	21
TABLE 2: WEEKEND AVERAGE DAILY PEDESTRIANS, BICYCLES AND VEHICLES BY INTERSECTION	22
TABLE 3: WEEKDAY PEAK HOUR PEDESTRIAN AND BICYCLE VOLUMES BY INTERSECTION.....	23
TABLE 4: WEEKEND PEAK HOUR PEDESTRIAN AND BICYCLE VOLUMES BY INTERSECTION.....	24
TABLE 5: WEEKDAY EXPOSURE INDEX.....	26
TABLE 6: WEEKEND EXPOSURE INDEX.....	27
TABLE 7: AVERAGE PEDESTRIANS COUNTED BY HOUR OF THE DAY	31
TABLE 8: AVERAGE BICYCLES COUNTED BY HOUR OF THE DAY	33

1.0 Pedestrian and Bicycle Study Overview

The Seward Highway to Glenn Highway Connection Planning & Environmental Linkage Study (SG PEL) is identifying and evaluating options to improve transportation mobility, safety, access, and connectivity between the Seward Highway, near 20th Avenue and the Glenn Highway, east of Airport Heights. The study is also examining ways to improve access to and from the Port of Alaska (POA) and the highway network. Alaska Department of Transportation and Public Facilities (DOT&PF) engaged a consultant team including HDR and RSG to conduct the study. The current highway-to-highway connection is made through downtown Anchorage via Ingra and Gambell Streets, which together form a one-way couplet.

PURPOSE OF THE PEDESTRIAN AND BICYCLE STUDY

The current Ingra/Gambell couplet (“the couplet”) carries high daily volumes of motor vehicles through neighborhoods that contain a mix of residential, commercial, and public uses. The Seward-Glenn PEL team (Team) and community stakeholders want to understand the amount and location of pedestrians and bicyclists currently moving through the corridor around the couplet. Such information can inform many of the planning and design questions that pertain to potential future configurations of the highway-to-highway connection. For example, locations with particularly high current pedestrian volumes may suggest specific design choices, while intersections with high counts of vehicles plus high pedestrian counts may indicate the need for certain safety measures.

This Pedestrian and Bicycle Study (PBS) is the first of its kind in Anchorage (other than counts conducted on “Bike to Work Day”) and should be thought of as the initial snapshot of pedestrian and bicycle volumes in this study area. It is intended to provide “macro” level summary information (e.g., total volume by intersection) and some “micro” level detail at the level of individual crosswalks and roadway approaches (known as “legs”) to each intersection. The PBS is subject to some limitations, described further below.

METHODS

To support the PBS, the project team commissioned the traffic count firm IDAX to count pedestrians, bicycles and vehicles at all Ingra and Gambell intersections within the study area (green locations in *Figure 1* and to count pedestrians and bicycles at all Hyder intersections (red locations in *Figure 1* per the following parameters:

1. Counts were done continuously for 15 hours from 6 am to 9 pm on two weekdays plus one weekend day (Saturday or Sunday) tabulated at 15-minute increments (for vehicles) and hourly increments (for bicycles and pedestrian).
2. Counts were done on days with non-inclement weather (no greater than 20% chance of forecast precipitation).
3. Counts were performed to support summarization of:
 - a. Total vehicle right turns through each crossing.
 - b. Total vehicles entering the intersection (i.e., “total entering volume” or TEV).
 - c. Total bicycles per intersection leg (in both directions, if applicable).
 - d. Total pedestrians in each crossing.
4. Count typology included:

- a. Pedestrians
- b. Bicycles
- c. Total motorized vehicles
- d. Light trucks
- e. Medium trucks
- f. Heavy (articulated) trucks

Counting equipment in the field consisted of digital video cameras positioned to capture both intersection volumes and mid-block pedestrian crossings. IDAX staff captured the video then manually analyzed it to provide the volume counts described above. If any equipment failed or the team detected quality issues, that time period for that intersection was re-counted on a similar day a week or two weeks later. RSG staff subsequently quality-checked, analyzed and visualized that data into this report.

Figure 1 below illustrates the core study area surrounding the couplet and identifies the intersections at which count data were obtained. Note that to maximize the geographic coverage given the project's resources, pedestrians, bicycles, and motor vehicles were *all* counted at all Ingra and Gambell intersections (intersections shown in green) while the Hyder intersections counted *only* pedestrians and bicycles (intersections shown in red).

Intersections along Hyder Avenue were studied on October 10th, 11th, 12th, and 14th, 2023. All other intersections were studied September 13th, 14th, and 16th, 2023. These patterns mean that each location was counted for two weekdays from 6am to 9pm, and one weekend day for the same time span. The time of month was chosen to ensure that schools were in session and prior to the onset of winter. This plan captures the highest usage periods of the day, while counting two weekdays and averaging their results smooths out some of the daily variation that is typically found in active transportation volumes.

It is important to note that the count data obtained, regardless of mode, represents a bicycle, pedestrian, or vehicle sighted in a specific physical location during the time period described above. The same person, bicycle, or vehicle may have been counted at multiple locations. In other words, these data do not represent person trips or vehicle trips; they are purely volumes.

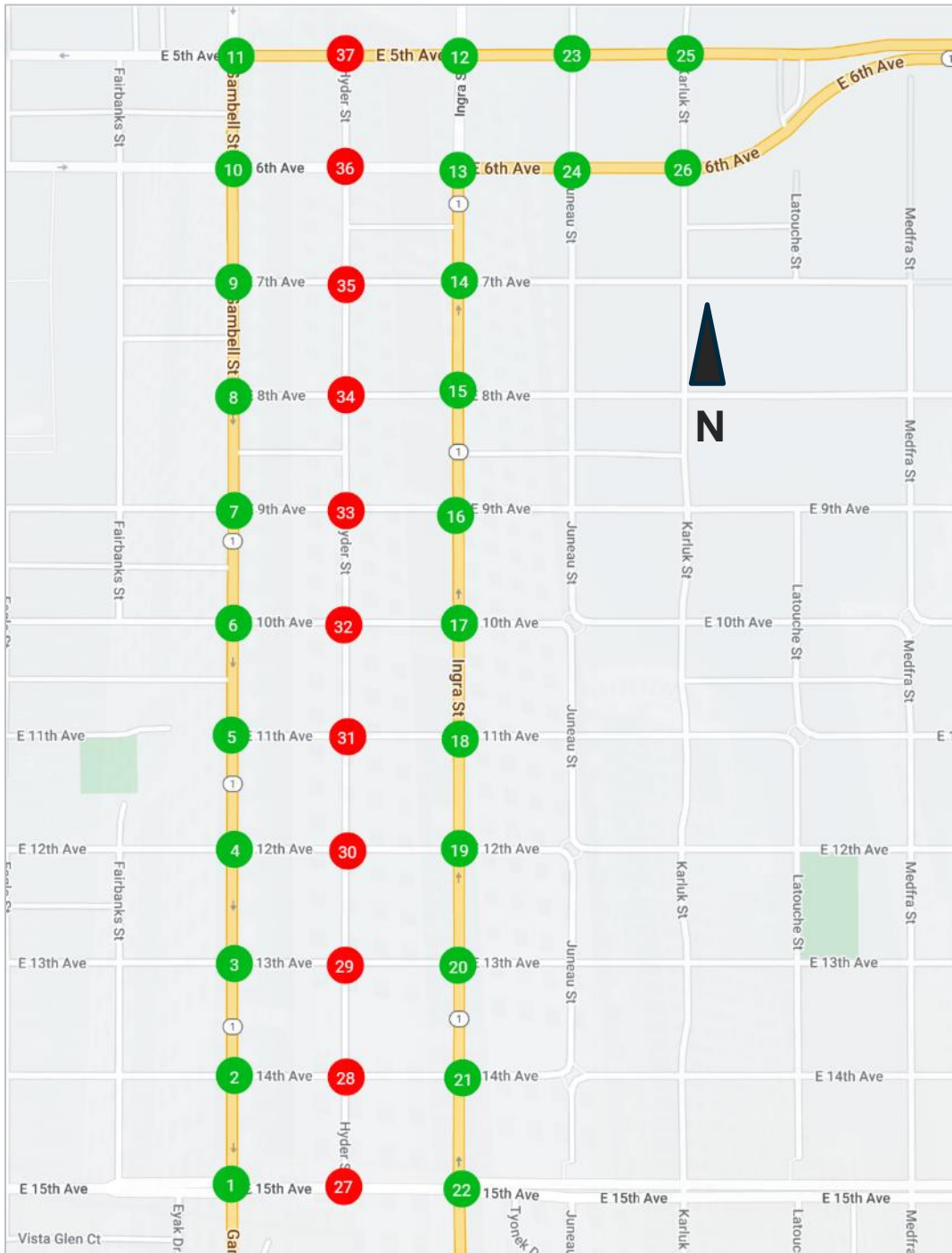


FIGURE 1: COUNT LOCATION MAP IN THE SEWARD-GLENN CORRIDOR CONTEXT

Source: IDAX

Intersections along Hyder Avenue were studied on October 10th, 11th, 12th, and 14th, 2023. All other intersections were studied September 13th, 14th, and 16th, 2023.

Red intersections include pedestrian and bicycle counts only; green intersections include counted motor vehicles, pedestrians, and bicycles.

Intersection numbers assigned for data management purposes appear in the green and red circles to aid in the reader's interpretation of following maps and tables.

FIELD WORK SUMMARY AND REAL-WORLD CONTEXT

Key attractions currently found in the area include grocery stores, transit stops, lodging, auto services and dealerships, and general retail stores. *Figure 2* shows a map of key land uses and bus stops to further illustrate the current built environment characteristics and amenities. Note that the project alternatives may alter the future built environment in ways that directly affect active transportation and vehicle travel demand.

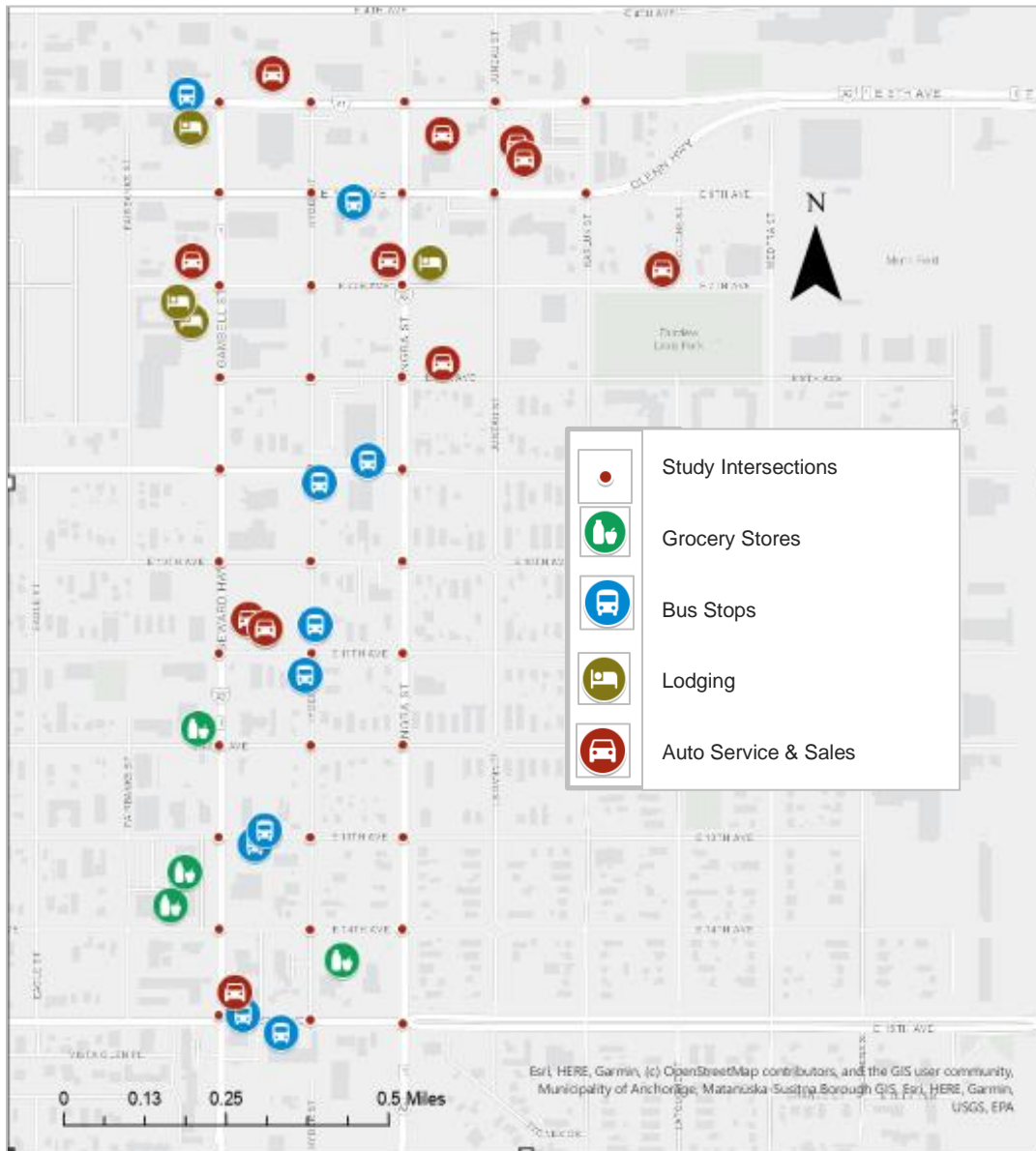


FIGURE 2: COUNT LOCATION MAP SHOWING KEY ATTRactions AND BUS STOPS

Source: RSG, Google Maps

A caveat to interpreting the data: *Figure 3* shows the location of one block of Hyder Street that was observed to have high mid-block pedestrian crossing volumes; it is informative to note that the nearest buildings are car dealerships and a gas station. The photograph also shows that there is no mid-block crosswalk between 5th Avenue and 6th Avenue on Hyder and that the only destination on the left (west) side is the parking lot of the auto dealership. Although the counts by themselves do not reveal the reasons for pedestrians' trips, the relatively high number of pedestrians crossing at this location (see the following section headed *Observed Pedestrian & Bicycle Flows In the Seward-Glenn Corridor at the Macro Scale*) may be attributable to employees going to move vehicles from surrounding parking to the dealership and service center; or to other land uses such as the nearby gas station and its convenience store. This example illustrates the care that must be taken in interpreting these findings—very local land uses can create very specific patterns and types of pedestrian demand.



FIGURE 3: STREET VIEW OF HYDER STREET BETWEEN 5TH AVE AND 6TH AVENUE

Source: Google Maps

Figure 4 shows the intersection at Gambell and 13th Avenue, one of the higher volume intersections for pedestrians within the study area. There is a grocery store, a spine treatment center, some nearby residences, and a bus stop. This may be an important location for nearby residents and bus riders who go to this grocery store on the buses serving this stop. There are crosswalks and pedestrian signals at the traffic light, as well as a median on the west leg of the intersection. There is little to no street furniture, which is a similar situation to many of the studied intersections.



FIGURE 4: STREET VIEW OF GAMBELL STREET AND 13TH AVENUE

Source: Google Maps

It is also important to note that the land use, business, and residential environment currently prevailing in the study area may evolve given the goals of the Anchorage Land Use Plan (LUP). The map below illustrates the plan's proposed land use typology. It shows that the LUP designates the land around the couplet and the inbound highways as targeted for either "City Center" density or, at minimum, "Compact Mixed-Use Residential—Low Density." In other words, the current LUP allows for considerable increases in both residential and employment densities over the current densities on the ground now.

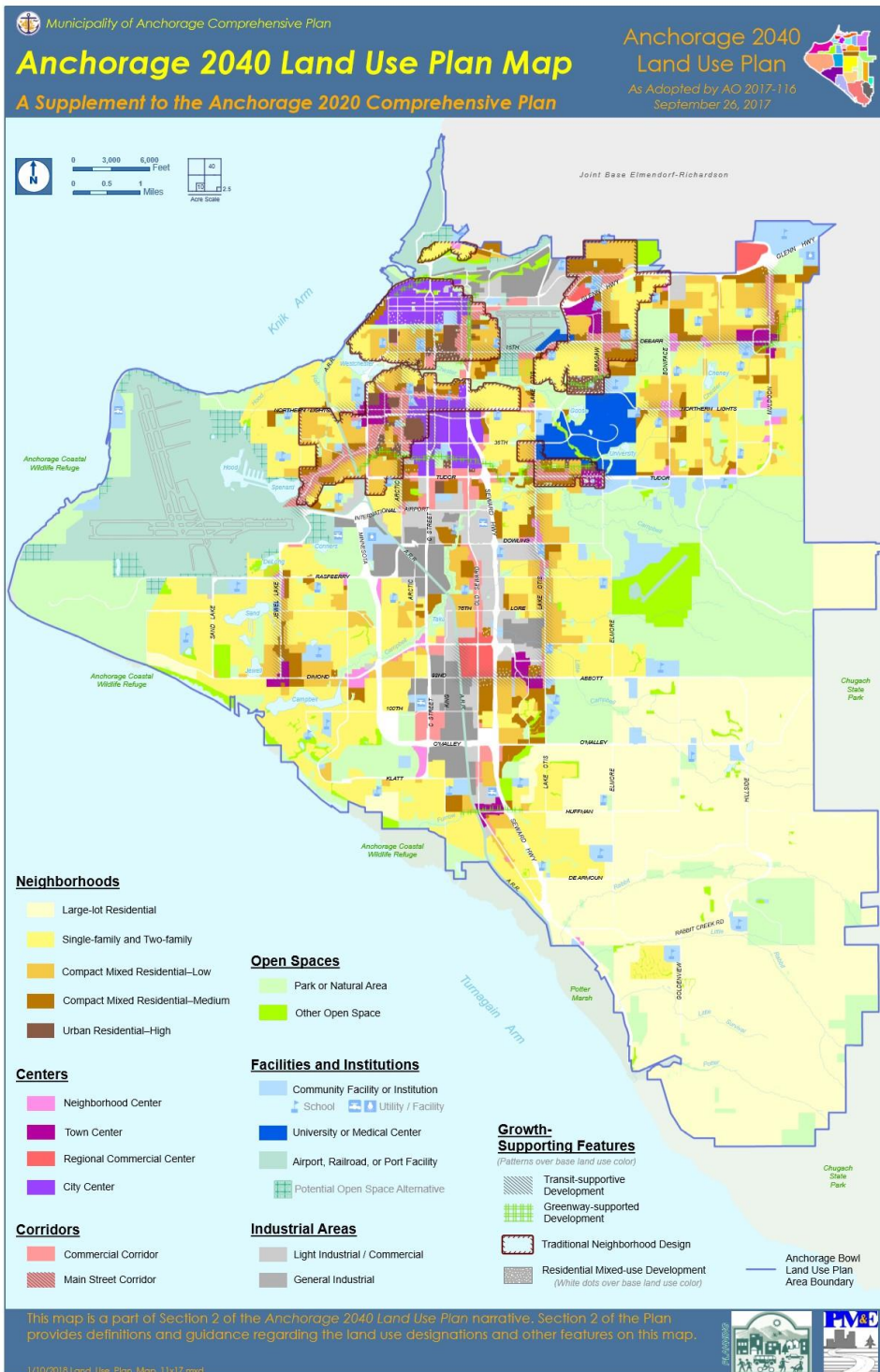


FIGURE 5: ANCHORAGE LAND USE PLAN MAP

Source: Municipality of Anchorage.

https://www.muni.org/Departments/OCPD/Planning/Publications/Documents/Anchorage%202040%20Land%20Use%20Plan/2040_Land_Use_Plan_Map_Adopted_9-26-17.pdf

2.0 Strengths and Limitations of the Pedestrian and Bicycle Study

This study is, to the team’s awareness, the first attempt beyond annual “Bike to Work Day” events to comprehensively count pedestrians on Anchorage surface streets (although the Anchorage region does have some automated bicycle counters on regional trails). The *AMATS Non-Motorized Plan* advocates for comprehensive and ongoing counts, so this PBS is a first step in illustrating what might be done in the future.¹

Strengths of the PBS include good spatial and temporal coverage. All core study area intersections were counted (at least for pedestrians and bicycles); day-of-week counting covered both workweek and weekend days; the 6am to 9pm time period encompasses the bulk of typical daily volumes across all modes; and the weather was generally benign—by Anchorage standards--during the counting process.

Limitations of the study are primarily that (a) it may not capture all the variation typically seen in active transportation volumes across many days² and seasons; and that (b) it says nothing about how active transportation travelers *might* behave in the future, especially if the highway-to-highway connection is reconfigured in ways that change land uses and/or alter viable bicycle and pedestrian routes. In other words, readers should take care in interpreting the PBS findings; there could be noticeable variation in current, real-world bicycle and pedestrian volumes over time and the study does not predict such volumes for the long-term future.

¹ Anchorage Metropolitan Transportation Solutions. *Non-Motorized Plan*. 2021.

https://www.muni.org/Departments/OCPD/Planning/AMATS/Pages/1_nonmotorized.aspx

² Short-duration active transportation counts would ideally be done for a two-week period. Permanent count locations are even more useful because they can track seasonal variations. The *AMATS Non-Motorized Plan* seeks to develop the necessary resources to achieve this.

3.0 Pedestrian and Bicycle Observations

This chapter of the PBS is descriptive; the *Pedestrian and Bicycle Findings and Discussion* chapter below discusses patterns and findings revealed by the data.

OBSERVED PEDESTRIAN & BICYCLE FLOWS IN THE SEWARD- GLENN CORRIDOR AT THE MACRO SCALE

This “macro” section reports the data findings in the form of project area maps and tables at the daily and hourly level. This high-level view illustrates project-area-wide patterns and provides an at-a-glance general understanding of where bicycles and pedestrians were observed and in what numbers. The following two sections provide intersection-level details for the Gambell-Hyder-Ingra intersections at the east-west cross streets and the 5th-6th avenue intersections at their north-south cross streets, respectively.

The macro maps and tables show several statistics--total volumes per hour, total daily volumes (“daily” meaning within the 6am to 9pm counting window)—for workweek and weekend days. To allow for better comparison between weekdays and weekend days, weekend maps use the same data scale as the corresponding weekday map for each dataset. The minimum and maximum weekday data points may or may not exist in the weekend set, but the legend will accurately reflect the scale of the map points. The hourly numbers give a sense of what usage levels would be in a short time span (e.g., what a pedestrian might experience during the duration of their trip) while the daily numbers illustrate total demand. Hourly figures include the average number of bicycles or pedestrians per hour for each intersection as well as the number of bicycles or pedestrians entering the intersection during the peak hour. The intersection-level data appears in one section followed by the mid-block pedestrian crossings in a separate section.

Observed Data at The Daily Level by Intersection

The maps in *Figure 6* through *Figure 13* below illustrate pedestrian and bicycle volumes at the intersection level on the hourly and daily scales; *Table 1* and *Table 2* list the summary statistics illustrated by those maps plus vehicle counts where available; *Table 3* and *Table 4* show the peak hour for pedestrians and bicycles respectively and the observed peak hour volumes. The data appears separately for average weekdays and a weekend day.

Figure 14 and *Figure 15* show an exposure index based on pedestrian and vehicle volumes at the daily scale for the average observed weekday and weekend, followed by *Table 5* and *Table 6* which list the data used in those figures.

The final four charts in this section show the observed total number of pedestrians and bicycles by hour for the average weekday and average weekend day. The purpose of these distributions is to give a broad sense of high-demand periods for the active transportation modes (to the extent that there is an observable pattern). It bears repeating a key message from the

Strengths and Limitations of the Pedestrian and Bicycle Study chapter: pedestrian and bicycle utilization generally display much more temporal variability than motor vehicle utilization, so these data should be interpreted with care.

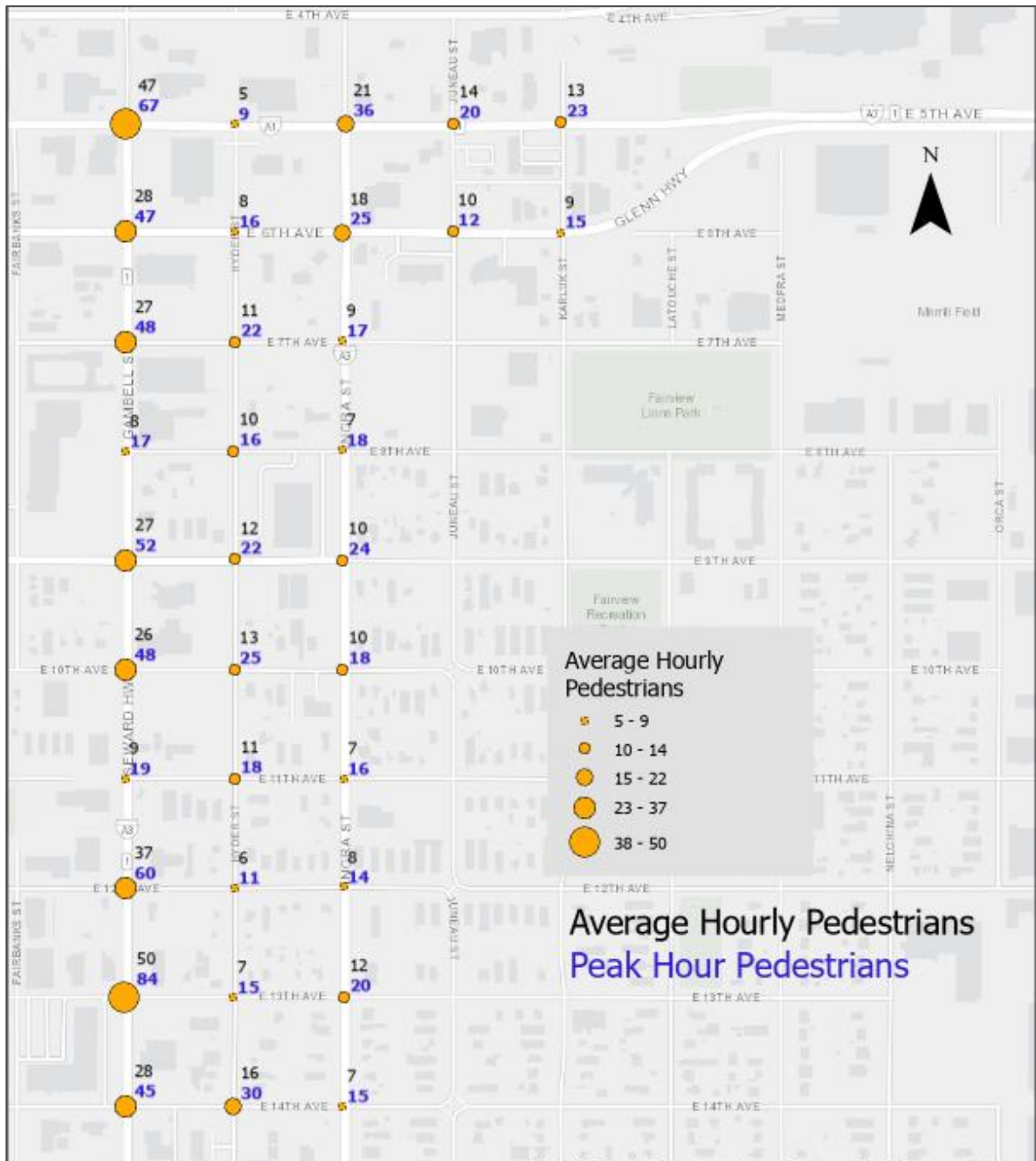


FIGURE 6: WEEKDAY AVERAGE AND PEAK HOURLY PEDESTRIANS BY INTERSECTION

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

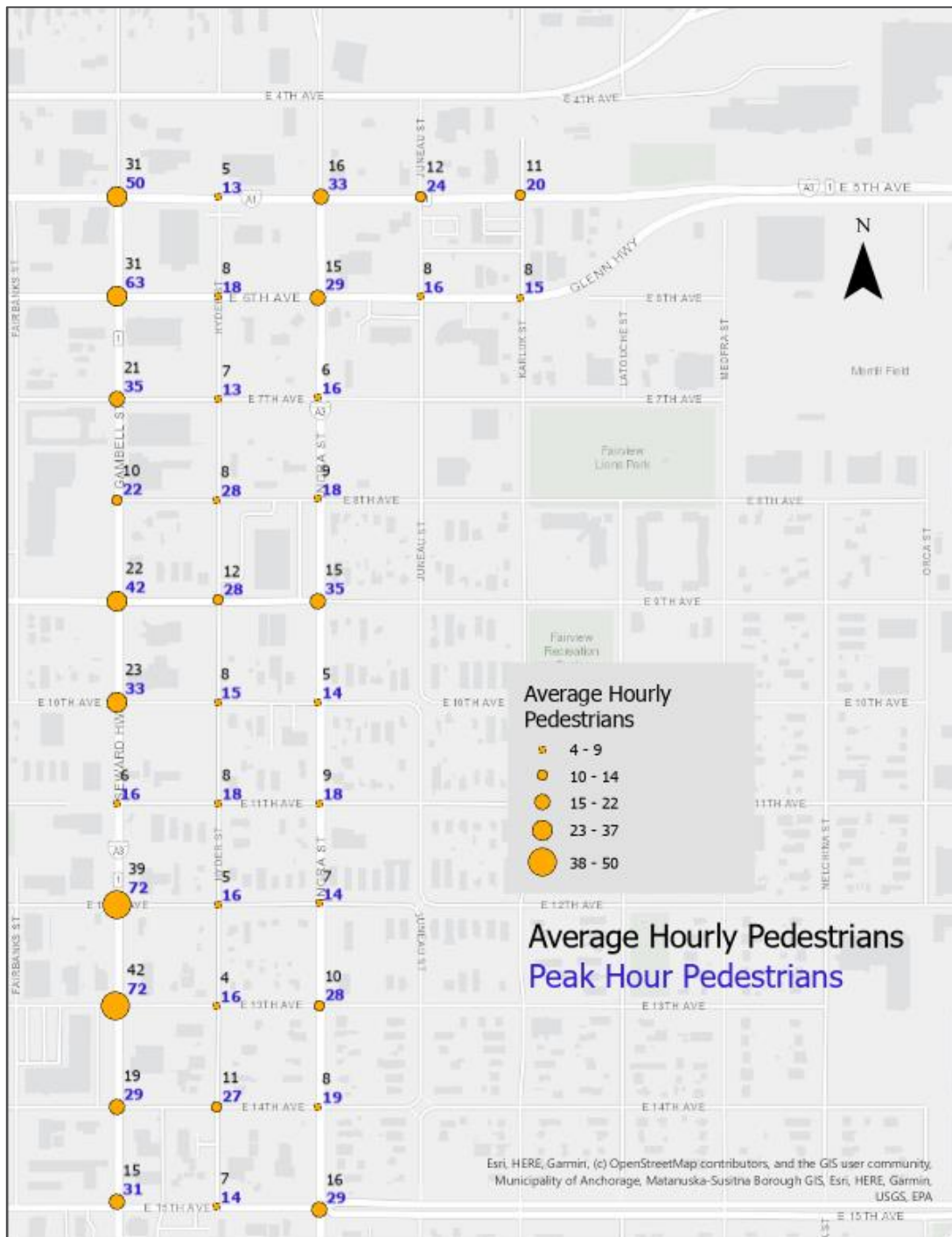


FIGURE 7: WEEKEND AVERAGE AND PEAK HOURLY PEDESTRIANS BY INTERSECTION

Sources: IDAX, RSG

Weekend legend and scale match those from the equivalent weekday map to allow for direct comparison. Legend values still accurately show the range of values that correspond to intersection point size and pedestrian volume.

Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th. Data was collected from 6:00 AM to 9:00 PM.

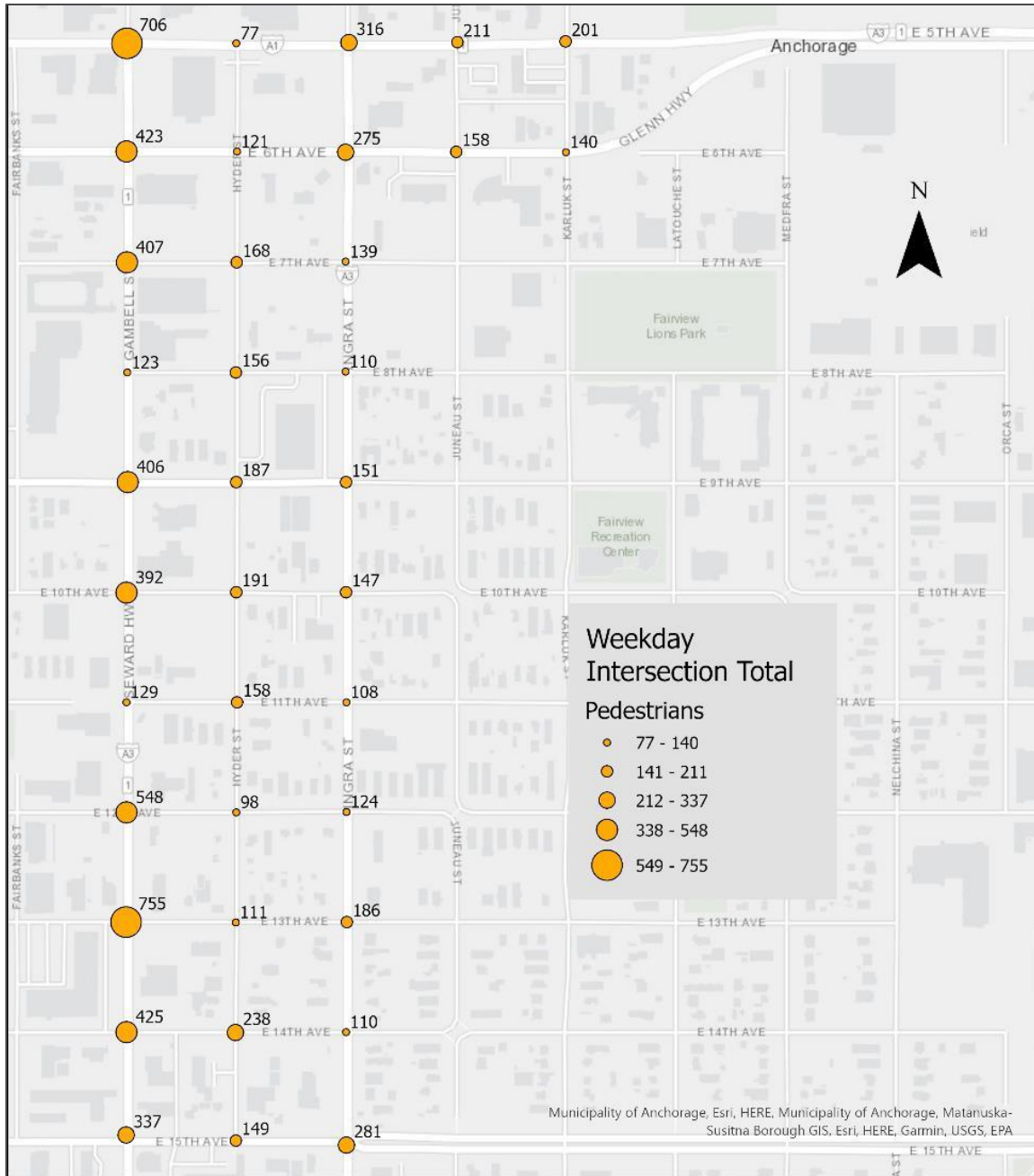


FIGURE 8: WEEKDAY AVERAGE DAILY PEDESTRIANS BY INTERSECTION

Sources: IDAX, RSG

“Daily” includes the period 6:00AM to 9:00PM

Weekday intersection averages were calculated using data collected along Hyder Street Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

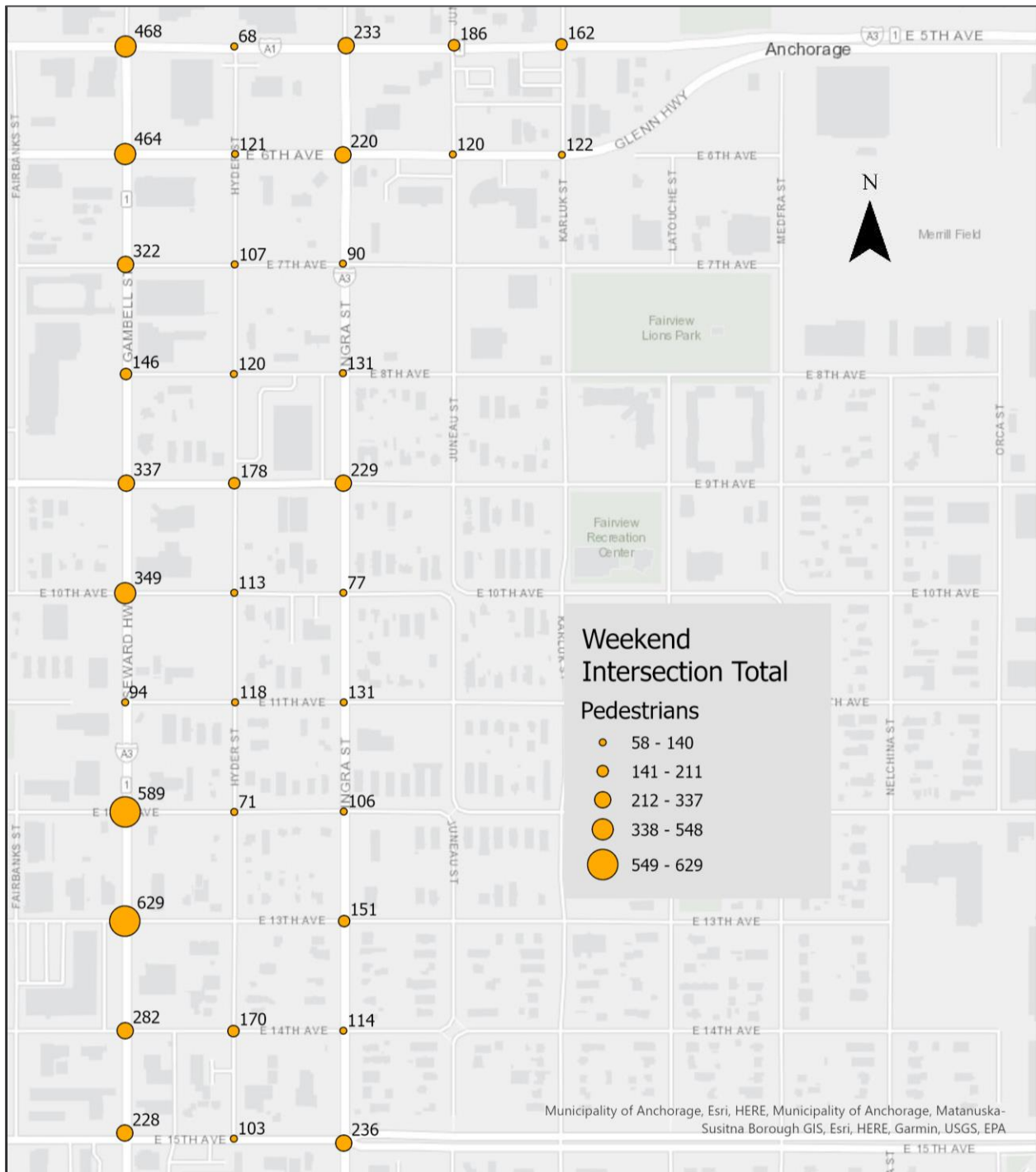


FIGURE 9: WEEKEND AVERAGE DAILY PEDESTRIANS BY INTERSECTION

Sources: IDAX, RSG

Weekend legend and scale match those from the equivalent weekday map to allow for direct comparison. Legend values still accurately show the range of values that correspond to intersection point size and pedestrian volume.

Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th. Data was collected from 6:00 AM to 9:00 PM.

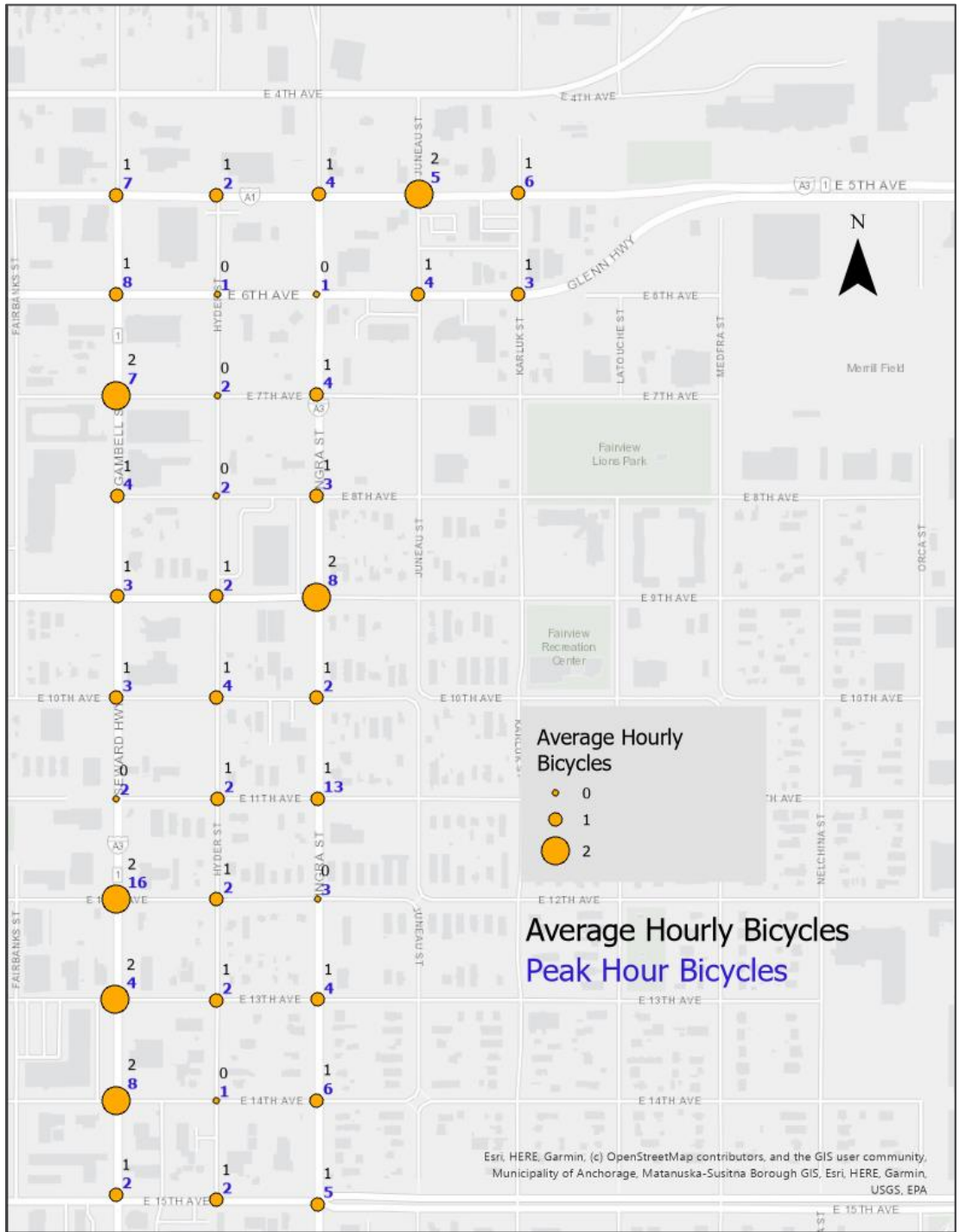


FIGURE 10: WEEKDAY AVERAGE AND PEAK HOURLY BICYCLES BY INTERSECTION

Sources: IDAX, RSG
 Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

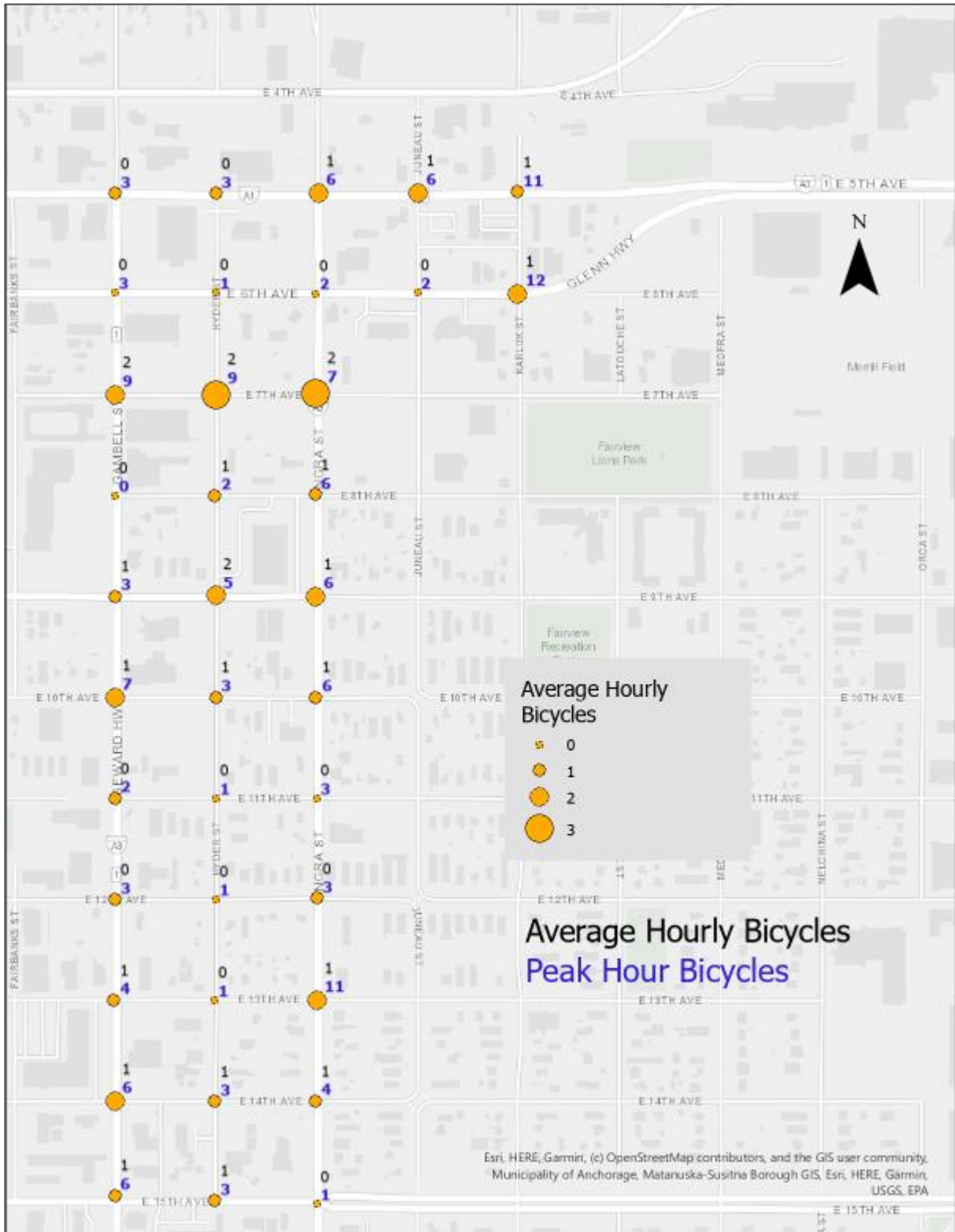


FIGURE 11: WEEKEND AVERAGE HOURLY AND PEAK HOUR BICYCLES BY INTERSECTION

Sources: IDAX, RSG
 Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th. Data was collected from 6:00 AM to 9:00 PM.

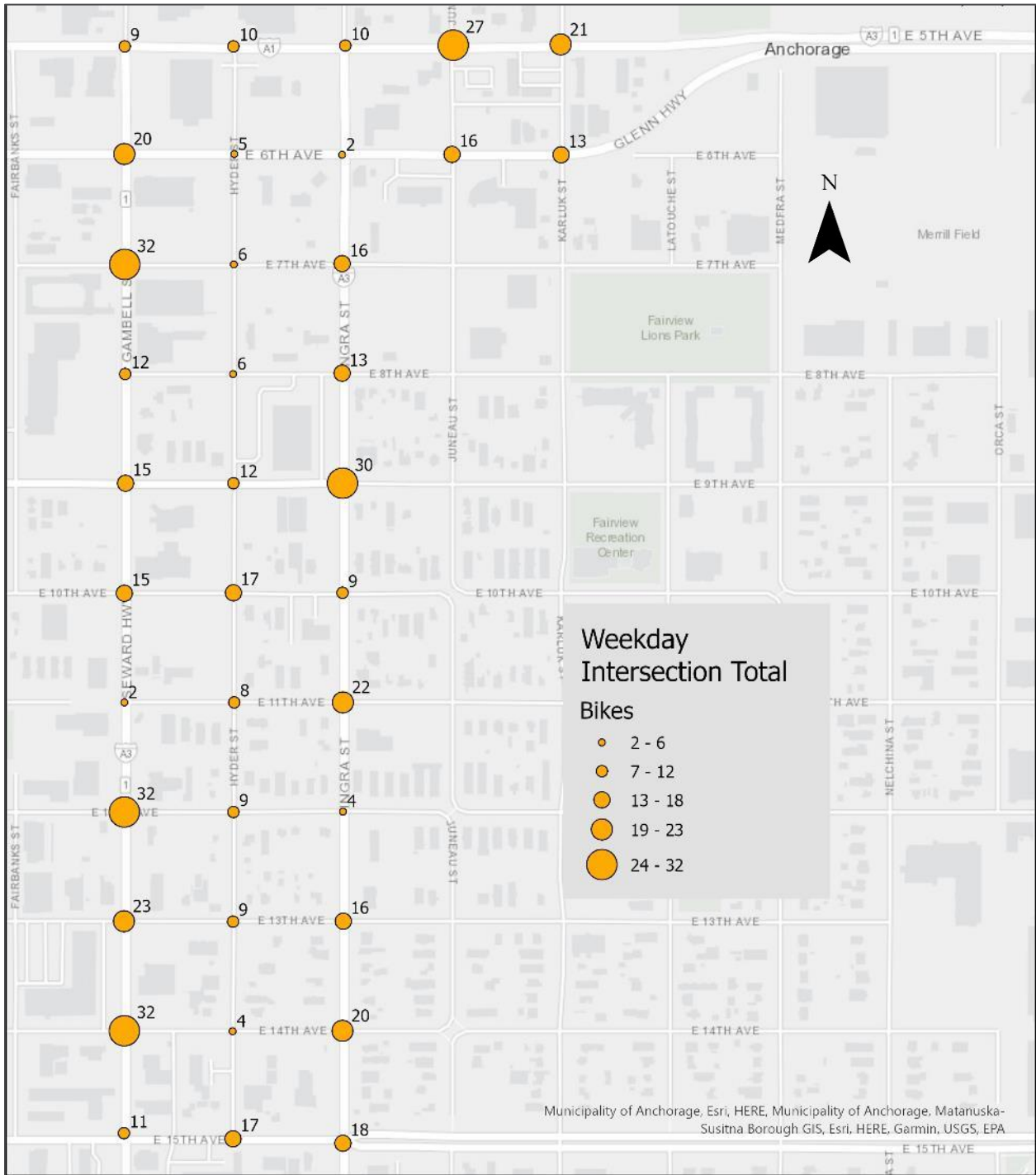


FIGURE 12: WEEKDAY AVERAGE DAILY BICYCLES BY INTERSECTION

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

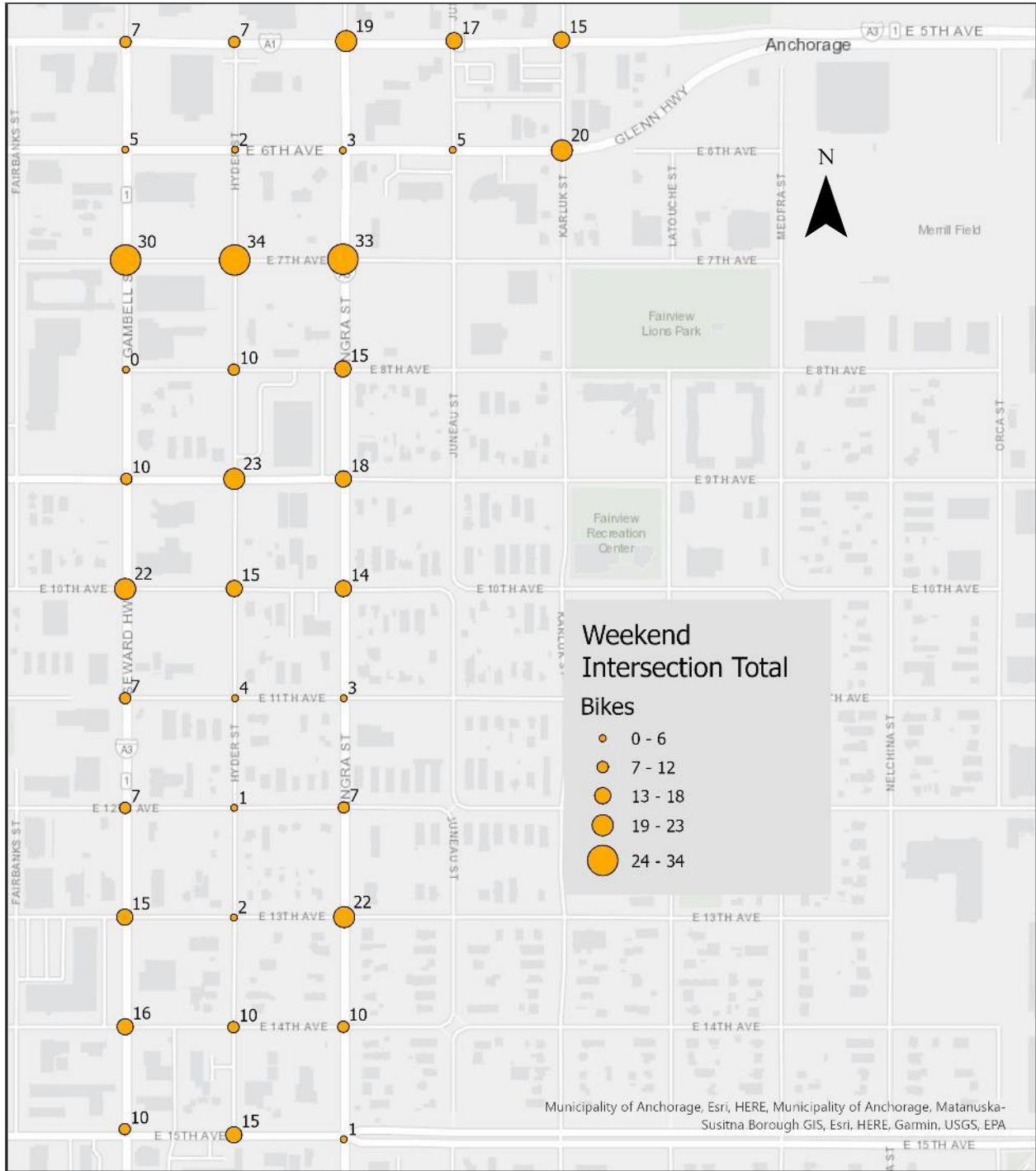


FIGURE 13: WEEKEND AVERAGE DAILY BICYCLES BY INTERSECTION

Sources: IDAX, RSG

Weekend legend and scale match those from the equivalent weekday map to allow for direct comparison. Legend values still accurately show the range of values that correspond to intersection point size and pedestrian volume.

Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th. Data was collected from 6:00 AM to 9:00 PM.

TABLE 1: WEEKDAY AVERAGE DAILY PEDESTRIANS, BICYCLES AND VEHICLES BY INTERSECTION

ID	Through Street	Cross Street	Average Daily Pedestrians	Average Daily Bikes	Total Entering Volume of Vehicles
1	Gambell	15th	337	11	65,417
2	Gambell	14th	425	32	35,792
3	Gambell	13th	755	23	37,081
4	Gambell	12th	548	32	34,606
5	Gambell	11th	129	2	33,792
6	Gambell	10th	392	15	34,151
7	Gambell	9th	406	15	39,536
8	Gambell	8th	123	12	30,295
9	Gambell	7th	407	32	30,162
10	Gambell	6th	423	20	53,895
11	Gambell	5th	706	9	63,028
12	Ingra	5th	316	10	61,002
13	Ingra	6th	275	2	60,004
14	Ingra	7th	139	16	35,678
15	Ingra	8th	110	13	35,940
16	Ingra	9th	151	30	41,725
17	Ingra	10th	147	9	39,003
18	Ingra	11th	108	22	39,195
19	Ingra	12th	124	4	39,676
20	Ingra	13th	186	16	40,914
21	Ingra	14th	110	20	39,863
22	Ingra	15th	281	18	76,593
23	Juneau	5th	211	27	44,352
24	Juneau	6th	158	16	43,167
25	Karluk	5th	201	21	45,858
26	Karluk	6th	140	13	45,708
27	Hyder	5th	77	10	N/A
28	Hyder	6th	121	5	N/A
29	Hyder	7th	168	6	N/A
30	Hyder	8th	156	6	N/A
31	Hyder	9th	187	12	N/A
32	Hyder	10th	191	17	N/A
33	Hyder	11th	158	8	N/A
34	Hyder	12th	98	9	N/A
35	Hyder	13th	111	9	N/A
36	Hyder	14th	238	4	N/A
37	Hyder	15th	149	17	N/A

Sources: IDAX, RSG

“Daily” includes the period from 6:00 AM to 9:00 PM. The “ID” column corresponds to the numbering in Figure 1. Hyder Avenue vehicle counts were not collected. Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

TABLE 2: WEEKEND AVERAGE DAILY PEDESTRIANS, BICYCLES AND VEHICLES BY INTERSECTION

ID	Through Street	Cross Street	Avg Daily Pedestrians	Average Daily Bikes	Average Daily Vehicles
1	Gambell	15th	228	10	48,960
2	Gambell	14th	282	16	27,846
3	Gambell	13th	629	15	29,241
4	Gambell	12th	589	7	27,066
5	Gambell	11th	94	7	26,410
6	Gambell	10th	349	22	26,398
7	Gambell	9th	337	10	29,016
8	Gambell	8th	146	0	23,236
9	Gambell	7th	322	30	23,124
10	Gambell	6th	464	5	41,130
11	Gambell	5th	468	7	49,360
12	Ingra	5th	233	19	48,322
13	Ingra	6th	220	3	46,900
14	Ingra	7th	90	33	28,966
15	Ingra	8th	131	15	29,296
16	Ingra	9th	229	18	32,846
17	Ingra	10th	77	14	31,138
18	Ingra	11th	131	3	31,636
19	Ingra	12th	106	7	31,614
20	Ingra	13th	151	22	32,666
21	Ingra	14th	114	10	31,946
22	Ingra	15th	236	1	59,190
23	Juneau	5th	186	17	37,646
24	Juneau	6th	120	5	35,684
25	Karluk	5th	162	15	38,871
26	Karluk	6th	122	20	37,876
27	Hyder	5th	68	7	N/A
28	Hyder	6th	121	2	N/A
29	Hyder	7th	107	34	N/A
30	Hyder	8th	120	10	N/A
31	Hyder	9th	178	23	N/A
32	Hyder	10th	113	15	N/A
33	Hyder	11th	118	4	N/A
34	Hyder	12th	71	1	N/A
35	Hyder	13th	57	2	N/A
36	Hyder	14th	170	10	N/A
37	Hyder	15th	103	15	N/A

Sources: IDAX, RSG

"Daily" includes the period from 6:00 AM to 9:00 PM.

The "ID" column corresponds to the numbering in Figure 1.

Hyder Avenue vehicle counts were not collected.

Weekend intersection averages and totals were calculated using data collected on Saturday, October 1

TABLE 3: WEEKDAY PEAK HOUR PEDESTRIAN AND BICYCLE VOLUMES BY INTERSECTION

ID	Through Street	Cross Street	Peak Pedestrian Hour	Peak Hour Pedestrian Crossings	Peak Bicycle Hour	Peak Hour Bicycle Entering Volume
1	Gambell	15th	3:00:00 PM	35	6:00:00 PM	2.5
2	Gambell	14th	1:00:00 PM	45	7:00:00 PM	8.5
3	Gambell	13th	5:00:00 PM	83.5	8:00:00 PM	4
4	Gambell	12th	5:00:00 PM	59.5	3:00:00 PM	15.5
5	Gambell	11th	5:00:00 PM	19	3:00:00 PM	1.5
6	Gambell	10th	5:00:00 PM	48.5	4:00:00 PM	3
7	Gambell	9th	5:00:00 PM	52	5:00:00 PM	3
8	Gambell	8th	6:00:00 PM	17	4:00:00 PM	3.5
9	Gambell	7th	5:00:00 PM	47.5	3:00:00 PM	7
10	Gambell	6th	8:00:00 PM	47	3:00:00 PM	7.5
11	Gambell	5th	5:00:00 PM	67	8:00:00 PM	7
12	Ingra	5th	7:00:00 PM	36	3:00:00 PM	4
13	Ingra	6th	7:00:00 PM	25	4:00:00 PM	1
14	Ingra	7th	3:00:00 PM	17	4:00:00 PM	3.5
15	Ingra	8th	3:00:00 PM	17.5	3:00:00 PM	3
16	Ingra	9th	3:00:00 PM	23.5	8:00:00 PM	8.5
17	Ingra	10th	3:00:00 PM	18	8:00:00 PM	2
18	Ingra	11th	7:00:00 PM	15.5	3:00:00 PM	13
19	Ingra	12th	11:00:00 AM	14	7:00:00 PM	3
20	Ingra	13th	6:00:00 PM	19.5	7:00:00 PM	4
21	Ingra	14th	7:00:00 PM	15	3:00:00 PM	6.5
22	Ingra	15th	2:00:00 PM	27.5	3:00:00 PM	5
23	Juneau	5th	2:00:00 PM	20	3:00:00 PM	5
24	Juneau	6th	10:00:00 AM	12.5	6:00:00 PM	3.5
25	Karluk	5th	12:00:00 PM	23	8:00:00 PM	6.5
26	Karluk	6th	12:00:00 PM	15	8:00:00 AM	3
27	Hyder	5th	3:00:00 PM	9	10:00:00 AM	1.5
28	Hyder	6th	2:00:00 PM	16	7:00:00 AM	1
29	Hyder	7th	3:00:00 PM	21.5	8:00:00 AM	1.5
30	Hyder	8th	12:00:00 PM	16.5	2:00:00 PM	1.5
31	Hyder	9th	4:00:00 PM	22	5:00:00 PM	2.5
32	Hyder	10th	1:00:00 PM	25	2:00:00 PM	4.5
33	Hyder	11th	11:00:00 AM	18	11:00:00 AM	2
34	Hyder	12th	6:00:00 PM	11	8:00:00 AM	1.5
35	Hyder	13th	6:00:00 PM	15	3:00:00 PM	2
36	Hyder	14th	2:00:00 PM	29.5	6:00:00 AM	1
37	Hyder	15th	2:00:00 PM	17	5:00:00 PM	2.5

Sources: IDAX, RSG

“Daily” includes the period from 6:00 AM to 9:00 PM. The “ID” column corresponds to the numbering in Figure 1. Hyder Avenue vehicle counts were not collected. Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th.

TABLE 4: WEEKEND PEAK HOUR PEDESTRIAN AND BICYCLE VOLUMES BY INTERSECTION

ID	Through Street	Cross Street	Peak Pedestrian Hour	Peak Hour Pedestrian Crossings	Peak Bicycle Hour	Peak Hour Bicycle Entering Volume
1	Gambell	15th	12:00:00 PM	31	5:00:00 PM	6
2	Gambell	14th	12:00:00 PM	29	5:00:00 PM	6
3	Gambell	13th	7:00:00 PM	72	2:00:00 PM	4
4	Gambell	12th	1:00:00 PM	72	3:00:00 PM	3
5	Gambell	11th	7:00:00 PM	16	7:00:00 AM	2
6	Gambell	10th	5:00:00 PM	33	11:00:00 AM	7
7	Gambell	9th	7:00:00 PM	42	10:00:00 AM	3
8	Gambell	8th	7:00:00 PM	22	6:00:00 AM	0
9	Gambell	7th	7:00:00 PM	35	7:00:00 AM	9
10	Gambell	6th	7:00:00 PM	63	3:00:00 PM	3
11	Gambell	5th	4:00:00 PM	50	4:00:00 PM	3
12	Ingra	5th	5:00:00 PM	33	4:00:00 PM	6
13	Ingra	6th	7:00:00 PM	29	9:00:00 AM	2
14	Ingra	7th	2:00:00 PM	16	3:00:00 PM	7
15	Ingra	8th	5:00:00 PM	18	5:00:00 PM	6
16	Ingra	9th	7:00:00 PM	35	5:00:00 PM	6
17	Ingra	10th	2:00:00 PM	14	5:00:00 PM	6
18	Ingra	11th	4:00:00 PM	18	6:00:00 PM	3
19	Ingra	12th	2:00:00 PM	14	12:00:00 PM	3
20	Ingra	13th	5:00:00 PM	28	2:00:00 PM	11
21	Ingra	14th	4:00:00 PM	19	7:00:00 PM	4
22	Ingra	15th	7:00:00 PM	29	2:00:00 PM	1
23	Juneau	5th	8:00:00 PM	24	3:00:00 PM	6
24	Juneau	6th	9:00:00 AM	16	6:00:00 AM	2
25	Karluk	5th	9:00:00 AM	20	6:00:00 PM	11
26	Karluk	6th	2:00:00 PM	15	8:00:00 PM	12
27	Hyder	5th	12:00:00 PM	13	12:00:00 PM	3
28	Hyder	6th	12:00:00 PM	18	9:00:00 AM	1
29	Hyder	7th	11:00:00 AM	13	6:00:00 PM	9
30	Hyder	8th	6:00:00 PM	28	6:00:00 AM	2
31	Hyder	9th	6:00:00 PM	28	11:00:00 AM	5
32	Hyder	10th	12:00:00 PM	15	11:00:00 AM	3
33	Hyder	11th	3:00:00 PM	18	8:00:00 AM	1
34	Hyder	12th	12:00:00 PM	16	5:00:00 PM	1
35	Hyder	13th	12:00:00 PM	16	8:00:00 AM	1
36	Hyder	14th	4:00:00 PM	27	10:00:00 AM	3
37	Hyder	15th	5:00:00 PM	14	12:00:00 PM	3

Sources: IDAX, RSG

“Daily” includes the period from 6:00 AM to 9:00 PM. The “ID” column corresponds to the numbering in Figure 1. Hyder Avenue vehicle counts were not collected. Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th.

Tables 5-6 and Figures 14-15, shown below, rank intersections by an exposure metric calculated by the formula:

$$\frac{\text{Vehicles} * \text{Pedestrians}}{\text{MAX (Vehicles} * \text{Pedestrians)}}$$

This captures, in a broad sense, the relative exposure to cars that pedestrians face in the form of the number vehicles to which a given pedestrian may be exposed, on average across the day. The highest exposure index rank is 1, which corresponds to the highest exposure or most potential danger, and 26 is the lowest ranking, which corresponds to the least danger.

The following section--Observed Pedestrians, Bicycles, and Vehicles at the Ingra, Gambell, and Hyder Intersections--provides details at each intersection and contains more precise exposure statistics (in the form of vehicle right turns on red) by intersection approach leg. This daily exposure metric provides a high-level understanding of which intersections now have a high pedestrian exposure to auto traffic.

From the point of view of pedestrians, bicycles are another vehicle that creates risk. The tables above and the following section provide total observed bicycles by intersection and total observed bicycles by intersection leg, respectively. From the point of view of bicyclists, the number of vehicles is of paramount concern, thus the focus on vehicle counting where possible in this study. While resources to compute a bicycle Level of Traffic Stress (LTS) metric did not exist (since that would require more detailed data on the physical infrastructure), that the vehicle volumes in this effort could be used as part of a later LTS computation.

TABLE 5: WEEKDAY EXPOSURE INDEX

Thru St	Cross St	Vehicles	Pedestrians	Exposure Index
Gambell	5th	63,028	706	1
Gambell	13th	37,081	754.5	2
Gambell	6th	53,895	422.5	3
Gambell	15th	65,417	337	4
Ingra	15th	76,593	281	5
Ingra	5th	61,002	315.5	6
Gambell	12th	34,606	548	7
Ingra	6th	60,004	274.5	8
Gambell	9th	39,536	405.5	9
Gambell	14th	35,792	424.5	10
Gambell	10th	34,151	391.5	11
Gambell	7th	30,162	407	12
Juneau	5th	44,352	211	13
Karluk	5th	45,858	201	14
Ingra	13th	40,914	185.5	15
Juneau	6th	43,167	157.5	16
Karluk	6th	45,708	139.5	17
Ingra	9th	41,725	151	18
Ingra	10th	39,003	147	19
Ingra	7th	35,678	139	20
Ingra	12th	39,676	124	21
Ingra	14th	39,863	110	22
Gambell	11th	33,792	128.5	23
Ingra	11th	39,195	107.5	24
Ingra	8th	35,940	110	25
Gambell	8th	30,295	123	26

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

TABLE 6: WEEKEND EXPOSURE INDEX

Thru St	Cross St	Vehicles	Pedestrians	Exposure Index
Gambell	5th	49,360	468	1
Gambell	6th	41,130	464	2
Gambell	13th	29,241	629	3
Gambell	12th	27,066	589	4
Ingra	15th	59,190	236	5
Ingra	5th	48,322	233	6
Gambell	15th	48,960	228	7
Ingra	6th	46,900	220	8
Gambell	9th	29,016	337	9
Gambell	10th	26,398	349	10
Gambell	14th	27,846	282	11
Ingra	9th	32,846	229	12
Gambell	7th	23,124	322	13
Juneau	5th	37,646	186	14
Karluk	5th	38,871	162	15
Ingra	13th	32,666	151	16
Karluk	6th	37,876	122	17
Juneau	6th	35,684	120	18
Ingra	11th	31,636	131	19
Ingra	8th	29,296	131	20
Ingra	14th	31,946	114	21
Gambell	8th	23,236	146	22
Ingra	12th	31,614	106	23
Ingra	7th	28,966	90	24
Gambell	11th	26,410	94	25

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

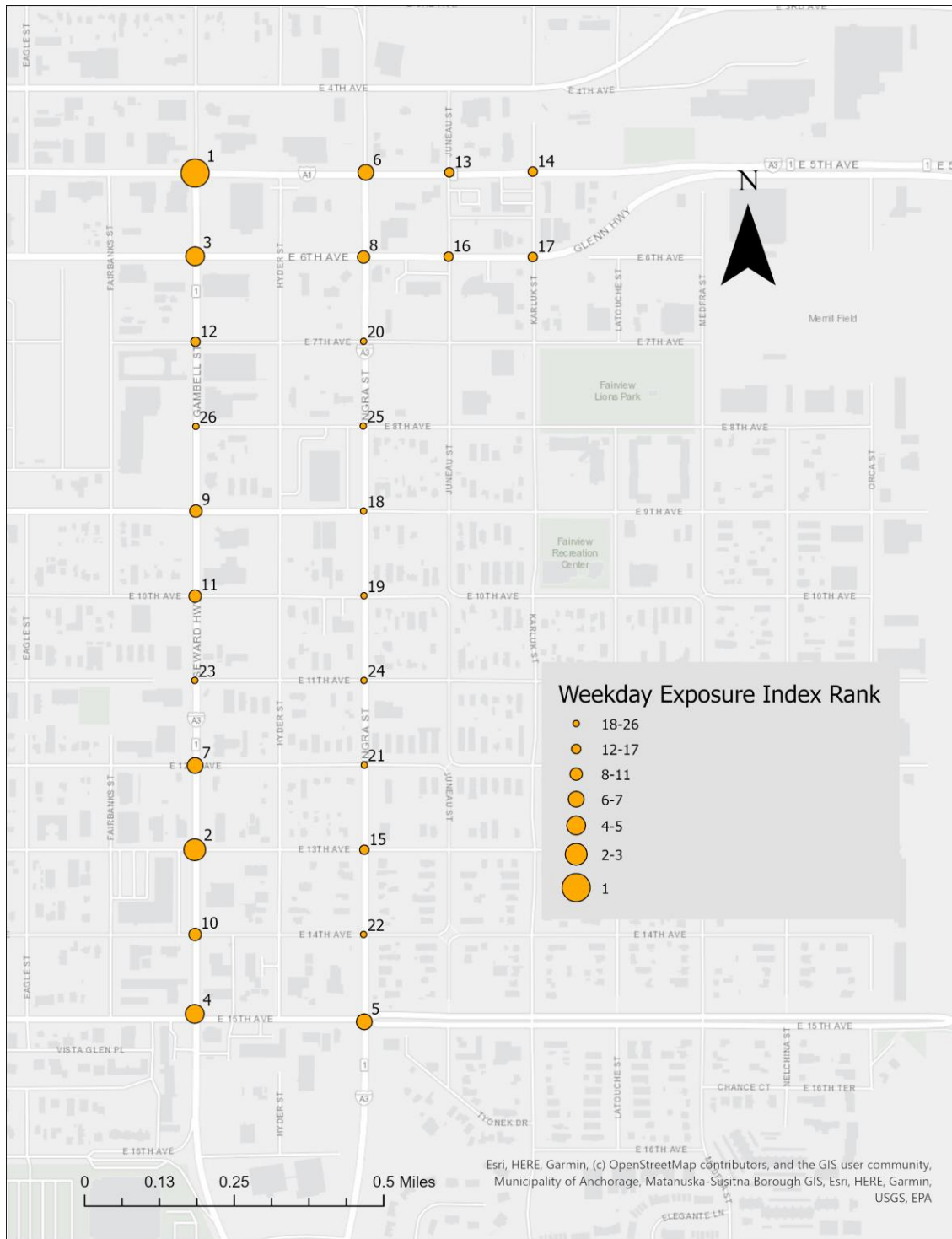


FIGURE 14: WEEKDAY EXPOSURE INDEX MAP BY EXPOSURE INDEX RANK ORDER

(Lowest Number Is Highest Exposure)

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, October 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

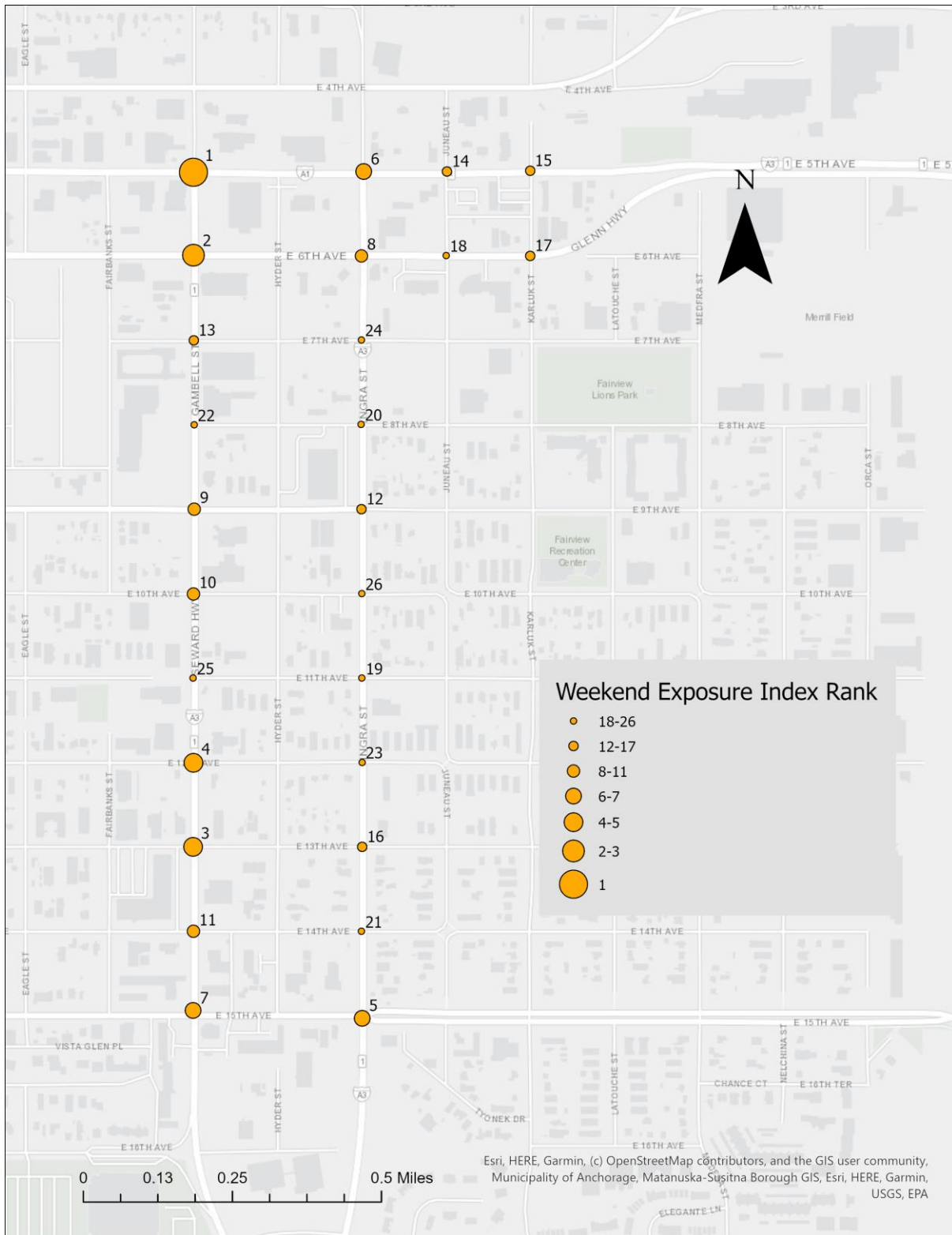


FIGURE 15: WEEKEND EXPOSURE INDEX MAP BY EXPOSURE INDEX RANK ORDER

(Lowest Number Is Highest Exposure)

Sources: IDAX, RSG

Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th. Data was collected from 6:00 AM to 9:00 PM.

The following charts illustrate the temporal pattern of when bicyclists and pedestrians are present in the entire study area taken as a whole. The hourly distributions are the average of the hourly bicyclists or pedestrians counted. For example, if the counters observed 20 pedestrians total across all intersections on Wednesday from 10am to 11am and 10 pedestrians across all intersection on Thursday in the same hour, the chart would show 15 pedestrians between 10am and 11am. The purpose of this metric is to show the time-of-day patterns of bicycle and pedestrian utilization across the study area. These patterns may suggest particular design needs (e.g., lighting).

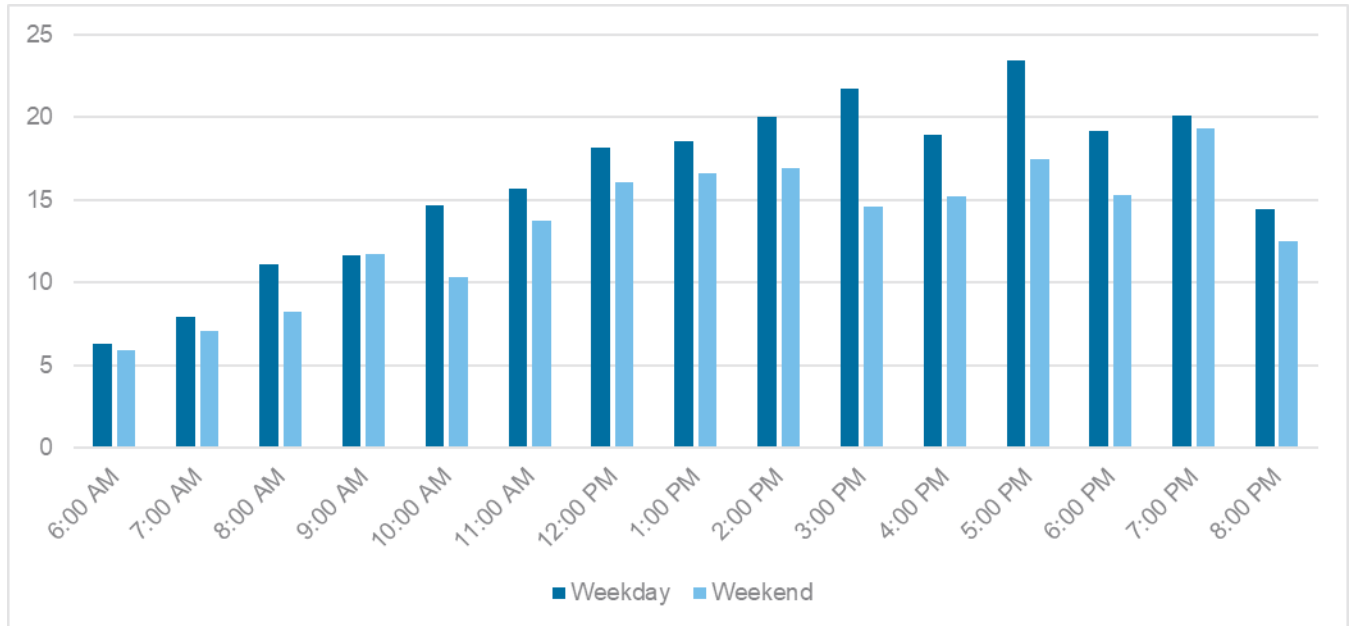


FIGURE 16: AVERAGE PEDESTRIANS COUNTED BY HOUR OF THE DAY

Sources: IDAX, RSG

Daily Count Period: 6am to 9pm

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, October 14th, 2023. Data was collected from 6:00 AM to 9:00 PM. Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th.

TABLE 7: AVERAGE PEDESTRIANS COUNTED BY HOUR OF THE DAY

Hour	Weekday	Weekend
6:00 AM	6.30	5.89
7:00 AM	7.92	7.11
8:00 AM	11.11	8.22
9:00 AM	11.66	11.70
10:00 AM	14.65	10.38
11:00 AM	15.70	13.76
12:00 PM	18.19	16.11
1:00 PM	18.53	16.62
2:00 PM	20.05	16.92
3:00 PM	21.77	14.59
4:00 PM	18.93	15.22
5:00 PM	23.41	17.49
6:00 PM	19.19	15.32
7:00 PM	20.11	19.30
8:00 PM	14.45	12.51

Sources: IDAX, RSG

Daily Count Period: 6am to 9pm

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, October 14th, 2023. Data was collected from 6:00 AM to 9:00 PM. Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th.

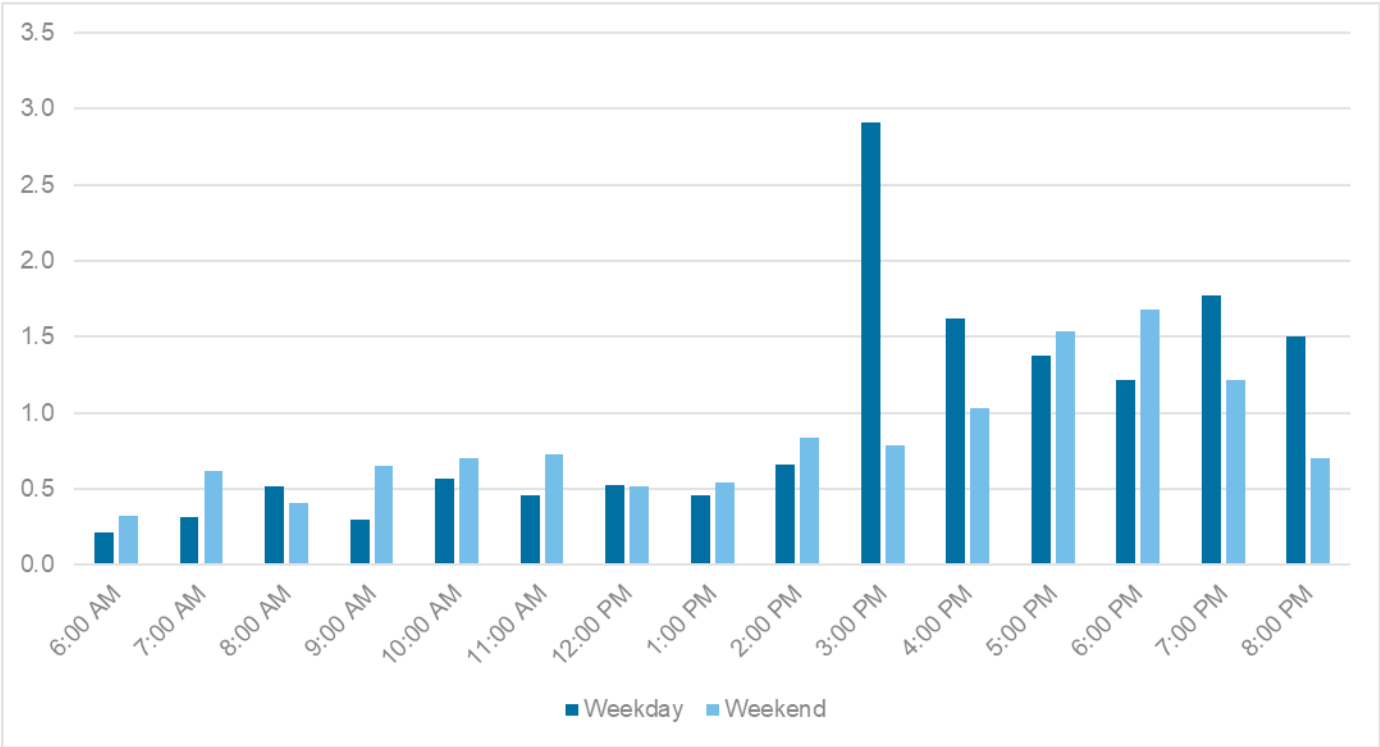


FIGURE 17: AVERAGE BICYCLES COUNTED BY HOUR OF THE DAY

Sources: IDAX, RSG

Daily Count Period: 6am to 9pm

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, October 14th, 2023. Data was collected from 6:00 AM to 9:00 PM. Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th.

TABLE 8: AVERAGE BICYCLES COUNTED BY HOUR OF THE DAY

Hour	Weekday	Weekend
6:00 AM	0.22	0.32
7:00 AM	0.31	0.62
8:00 AM	0.51	0.41
9:00 AM	0.30	0.65
10:00 AM	0.57	0.70
11:00 AM	0.46	0.73
12:00 PM	0.53	0.51
1:00 PM	0.46	0.54
2:00 PM	0.66	0.84
3:00 PM	2.91	0.78
4:00 PM	1.62	1.03
5:00 PM	1.38	1.54
6:00 PM	1.22	1.68
7:00 PM	1.77	1.22
8:00 PM	1.50	0.70

Sources: IDAX, RSG

Daily Count Period: 6am to 9pm

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, October 14th, 2023. Data was collected from 6:00 AM to 9:00 PM. Weekend intersection averages and totals were calculated using data collected on Saturday, October 14th.

Observed Data at the Daily Level at Mid-Block Locations

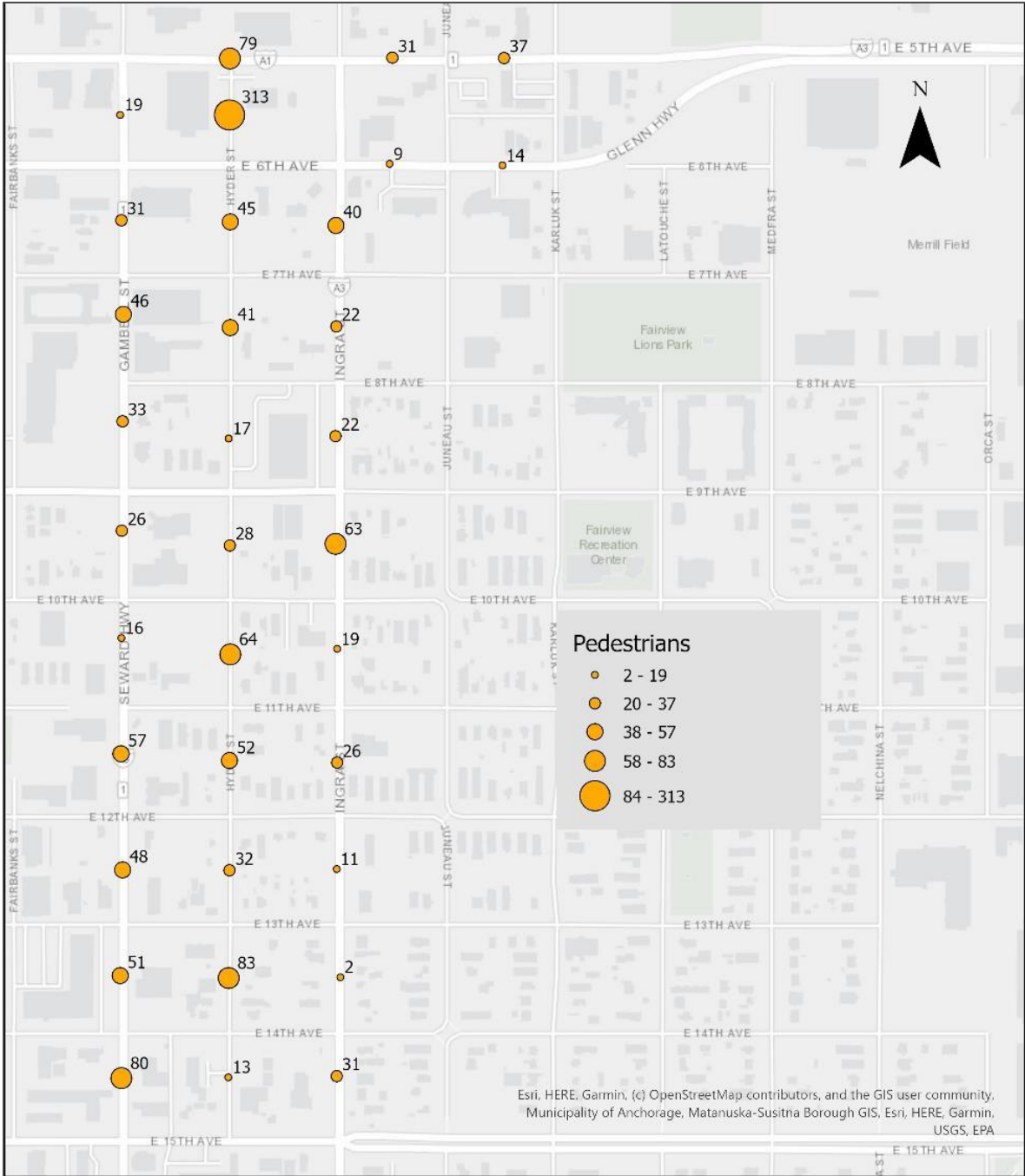


FIGURE 18: WEEKDAY DAILY AVERAGE PEDESTRIANS CROSSING AT MID-BLOCK LOCATIONS

Sources: IDAX, RSG
 Weekend legend and scale match those from the equivalent weekday map to allow for direct comparison. Legend values still accurately show the range of values that correspond to intersection point size and pedestrian volume.
 Weekday mid-block totals and averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and

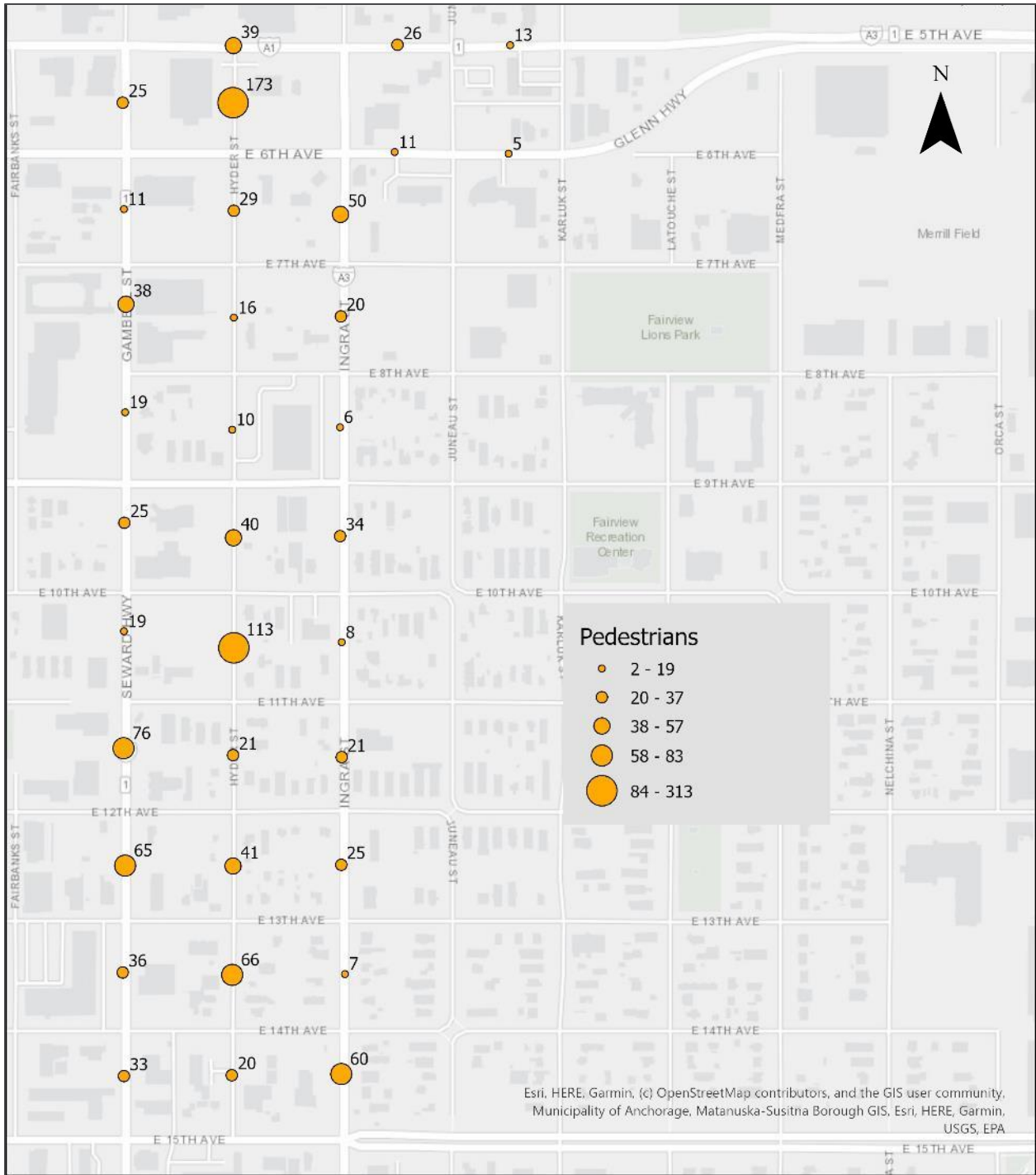


FIGURE 19: WEEKEND DAILY AVERAGE PEDESTRIANS CROSSING AT MID-BLOCK LOCATIONS

Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, 2023. Data was collected from 6:00 AM to 9:00 PM.

Sources: IDAX, RSG

Weekend mid-block averages and totals were calculated using data collected on Saturday, October 14th.

Weekend legend and scale match those from the equivalent weekday map to allow for direct comparison. Legend values still accurately show the range of values that correspond to intersection point size and pedestrian volume.

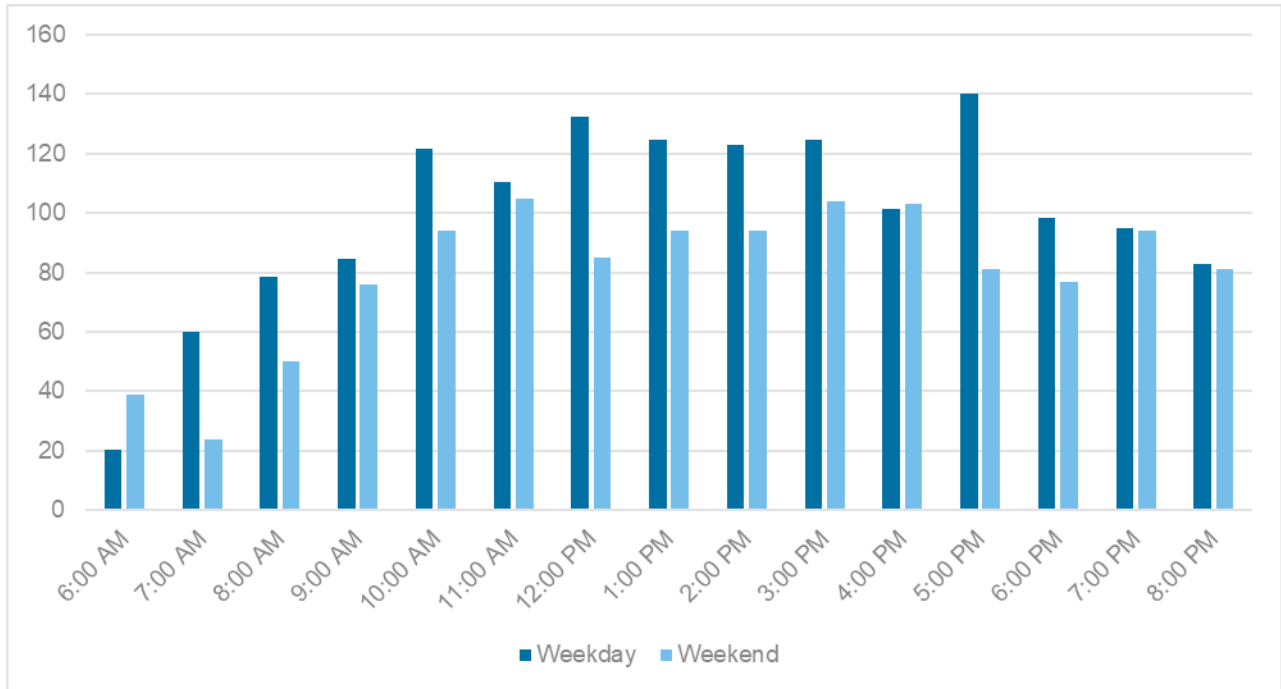


FIGURE 20: WEEKDAY AND WEEKEND AVERAGE HOURLY PEDESTRIANS CROSSING AT MID-BLOCK LOCATIONS

Sources: IDAX, RSG

Weekday mid-block totals and averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, 2023. Data was collected from 6:00 AM to 9:00 PM. Weekend mid-block averages and totals were calculated using data collected on Saturday, October 14th. Data was collected from 6:00 AM to 9:00 PM.

Discussion of Historic Crash Data in the Corridor

The *AMATS: Seward Highway to Glenn Highway Connection – System Performance Memorandum* discussed non-motorized crashes and public comments on safety. That report contained a map of public comments regarding non-motorized traffic safety issues, which showed the area of this study as receiving many such comments. Additionally, Gambell Street, Ingra Street, and 5th Avenue were identified as having a high bicycle Level of Traffic Stress, which considers several factors to account for general comfort of bicyclists.

Using Municipality of Anchorage (MOA) Traffic Department Data, the *System Performance Memorandum* identified intersections of 15th and Gambell and 15th and Ingra as high-density vehicle/pedestrian crash locations. Those two intersections as well as 6th and Karluk were identified also as high-density vehicle/bicycle crash locations. The *Memorandum* also notes that crash data closely aligns with public input and concerns related to pedestrian and bicyclist safety. Ingra Street between 13th Avenue and 11th Avenue was identified as a segment in the 75th percentile of pedestrian crashes. Overall, these identifications support further study of these intersections and pedestrian and bicyclist safety in the area. For full details see the *System Performance Memorandum*.³

³ Alaska Department of Transportation and Public Facilities; Anchorage Metropolitan Transportation Solutions. *AMATS: Seward Highway to Glenn Highway Connection – System Performance Memorandum*. 2022.

OBSERVED PEDESTRIANS, BICYCLES, AND VEHICLES AT THE INGRA, GAMBELL, AND HYDER INTERSECTIONS

This section and the section following provide details of the observed bicycle and pedestrian volumes at each intersection in the studied area. Vehicle volumes are included for the Ingra and Gambell intersections; the Hyder intersections do not have vehicle counts to balance resources so that more temporal coverage of all intersections could be provided.

The data appears in schematic diagrams that illustrate the pedestrian crossing areas (not all of which are marked crosswalks) plus the approaching and departing street segments. The schematics also provide curved arrows that represent the possible turn movements made by vehicles as they first approach the intersection, make a turn, then depart the intersection. Straight arrows represent the through movements by vehicles. The way to interpret these diagrams by the volume of interest is as follows:

- Pedestrian volumes are shown by individual crosswalk or intersection crossing area (“crosswalk” will be used to describe both situations, regardless of whether the crossing area is formally demarcated as a crosswalk). There are typically four crosswalks per intersection, so there are typically four pedestrian volumes represented in the schematics. Zero values indicate that no pedestrians were observed for that crosswalk in the counting period. The counting time period appears in the caption and sub-captions below each intersection.
- Bicycle volumes are shown by individual intersection “leg” (the street departing the intersection in a given direction). There are typically four legs per intersection, so there are typically four bicycle volumes represented in the schematics. These numbers represent ALL bicycles in both directions (if applicable) on each leg. Zero values indicate that no bicycles were observed for that crosswalk in the counting period. The counting time period appears in the caption and sub-captions below each intersection. Note also that the bicycle count appears in the crosswalk part of the schematic for convenience and because the bicycle counts can also be interpreted as the total bicycles passing through the pedestrian crosswalk on a daily basis.
- Vehicle volumes (for Ingra and Gambell, vehicles were not counted at the Hyder intersections) appear in the diagrams as counts of total average vehicles within the counting period making specific turn movements. The rationale for this is that safety research has found that vehicles turning across the pedestrian crosswalk present the highest-risk of vehicle-pedestrian crashes. Vehicle right-turns-on-red (RTOR) was chosen as the key indicator variable at the intersection level for pedestrian risk given its importance in the safety literature.^{4,5} While pedestrians are also at risk from left turning vehicles, right turns tend to be higher in volume at most intersections and right-turning vehicles are closer to pedestrians when they initiate the turns, increasing the chance of a

⁴ Hu, Wen and Cicchino, “Jessica B. Relationship of pedestrian crash types and passenger vehicle types.” *Journal of Safety Research*, 82 (2022) 392–401.

⁵ <https://www.iihs.org/news/detail/suvs-other-large-vehicles-often-hit-pedestrians-while-turning>

crash. Total volumes for vehicles can be seen in the prior section maps and tables via the “total entering volume” statistic. Bicycles can also be a danger to pedestrians but given their relatively low volumes and lower risk of more deadly crash types, were not included in the RTOR statistic.

- Medium and high values are denoted by text color in the diagrams. Medium is denoted by orange text and is used for values between the mean and the 75th percentile. High is denoted by red text and is used for values above the 75th percentile.

5th Avenue Intersections

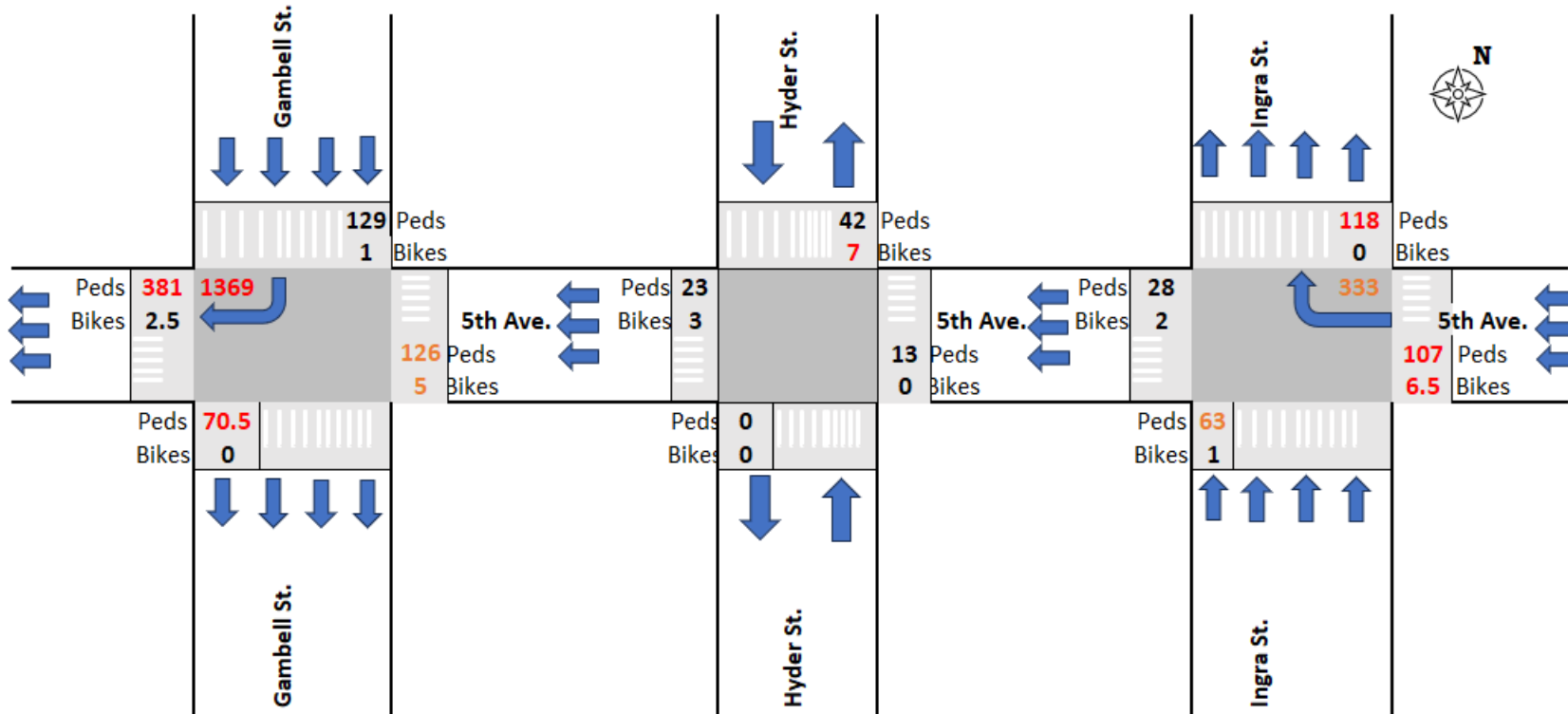


FIGURE 21: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 5TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

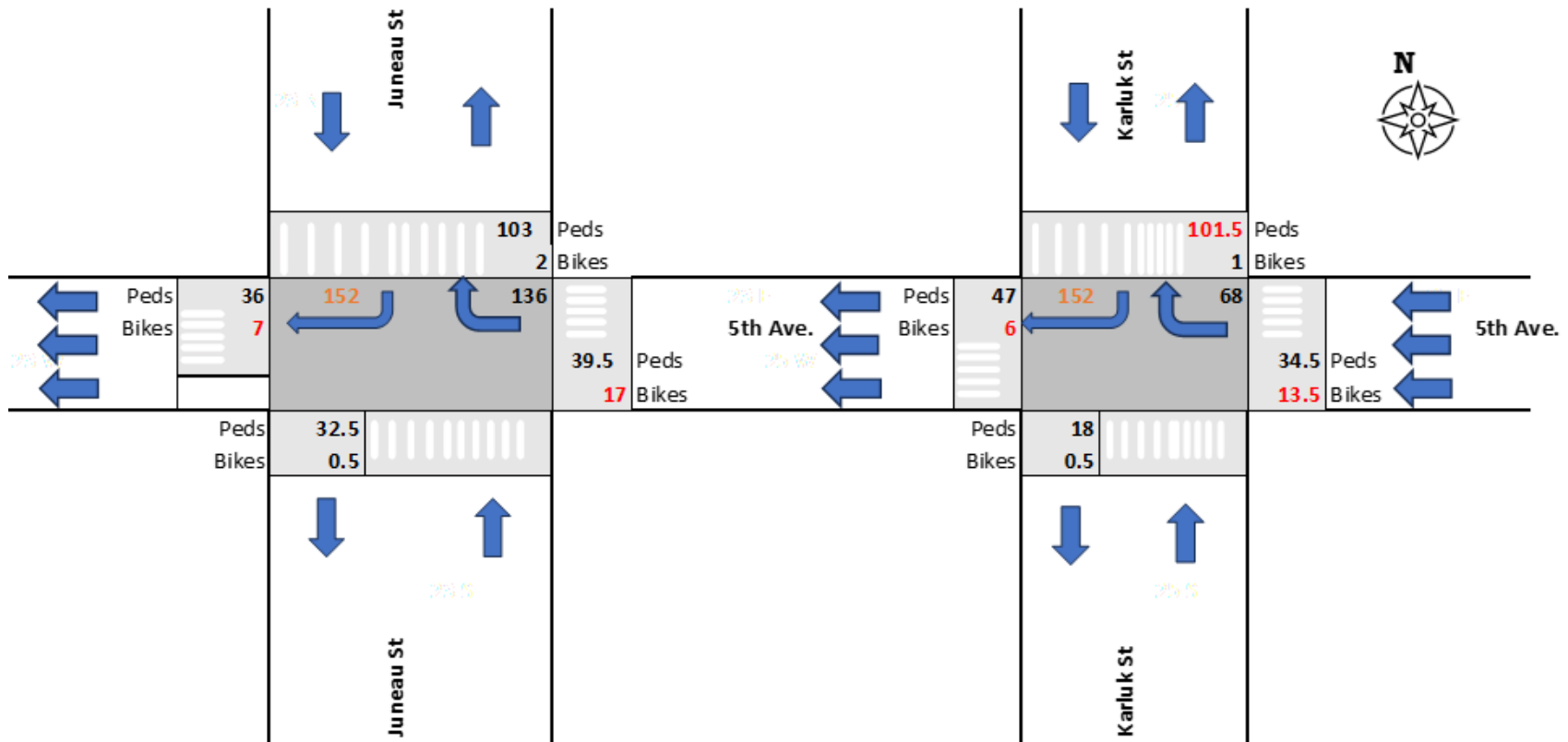


FIGURE 22: 5TH AVENUE WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT JUNEAU STREET AND KARLUK STREET

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

6th Avenue Intersections

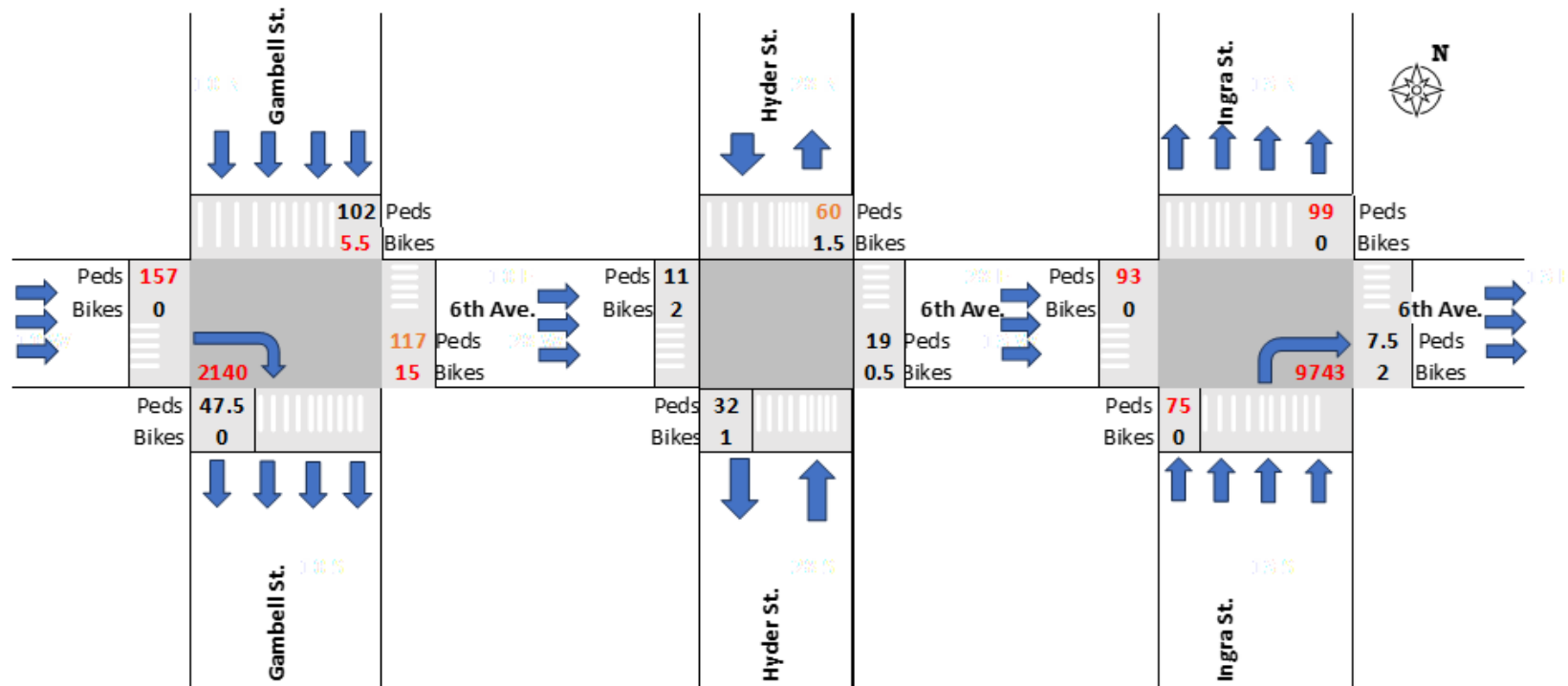


FIGURE 23: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 6TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

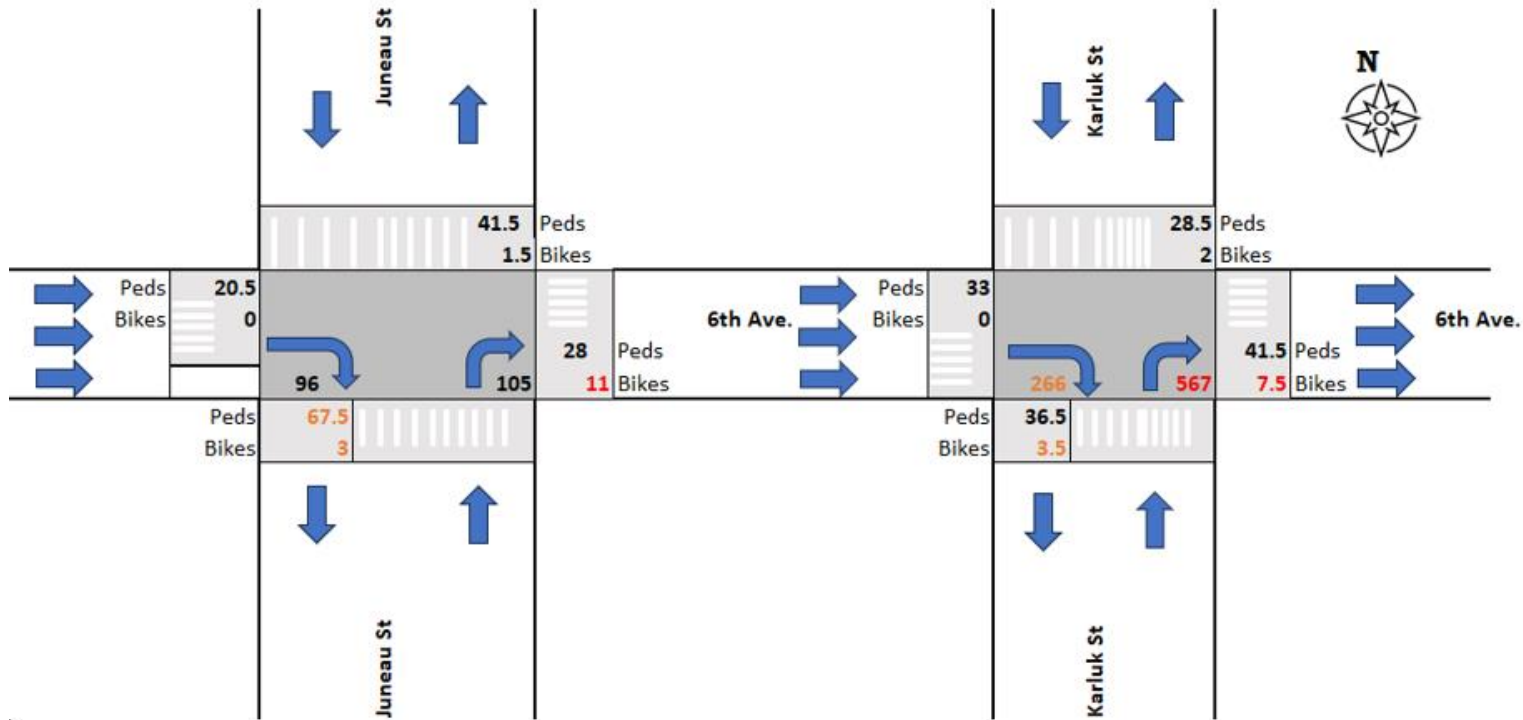


FIGURE 24: 6TH AVENUE WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT JUNEAU STREET AND KARLUK STREET

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

7th Avenue Intersections

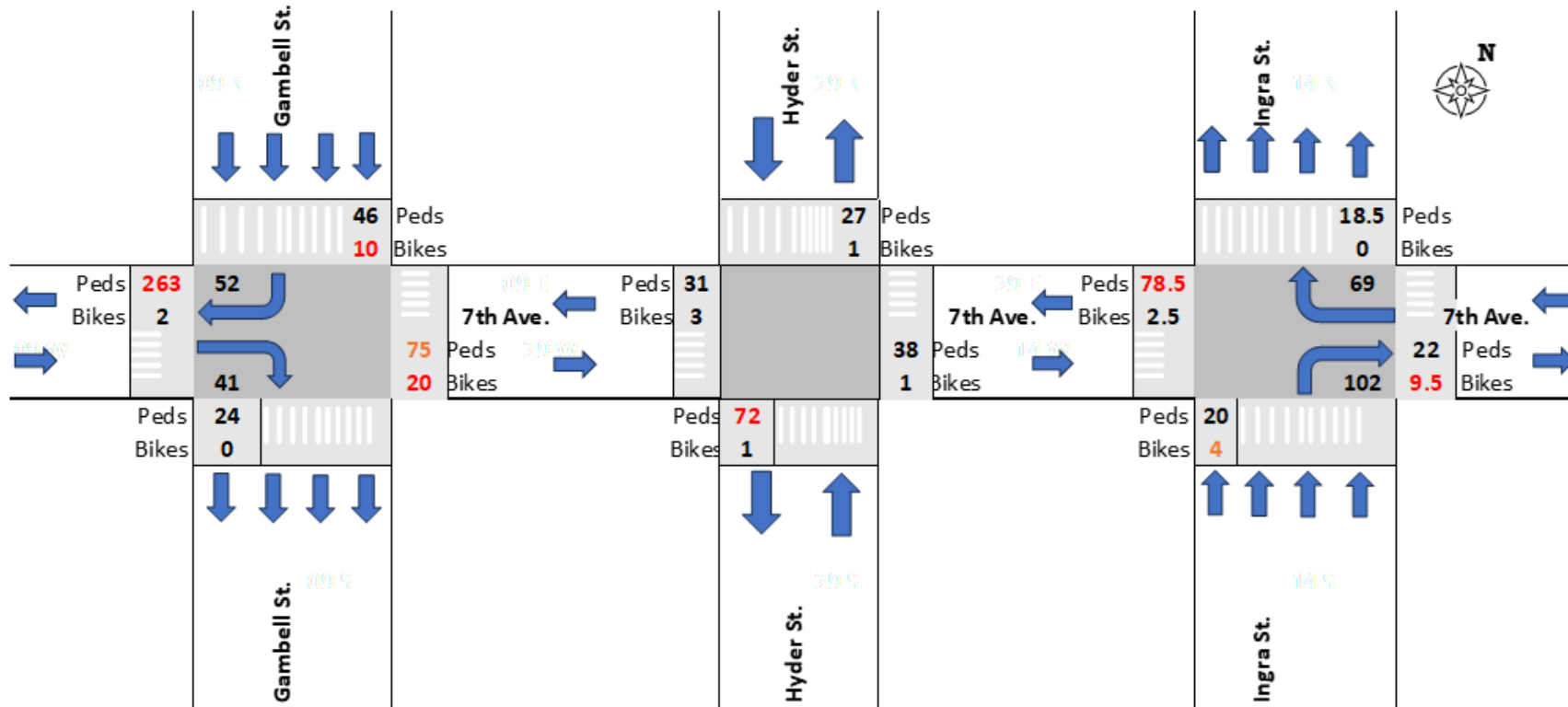


FIGURE 25: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 7TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

8th Avenue Intersections

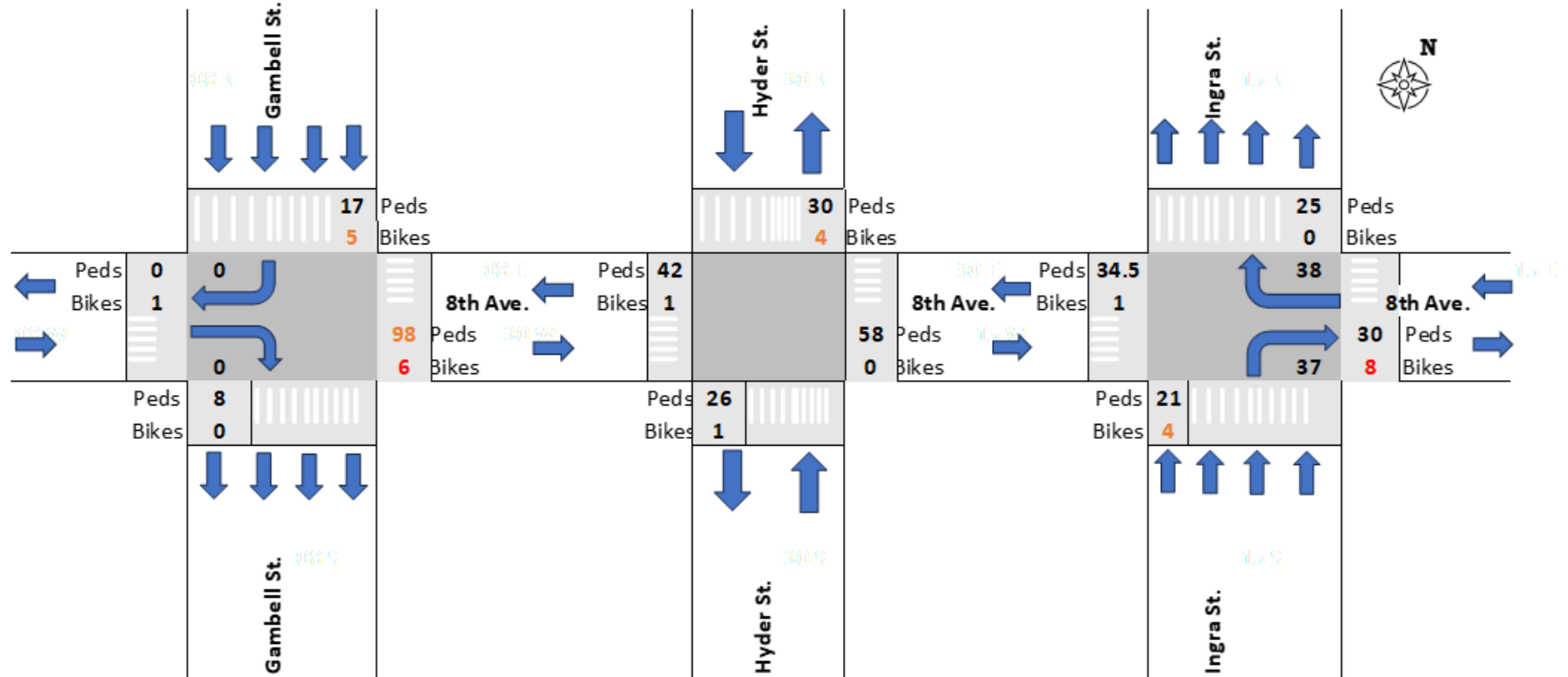


FIGURE 26: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 8TH AVENUE

Sources: IDAX, RSG

Weekday averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

9th Avenue Intersections

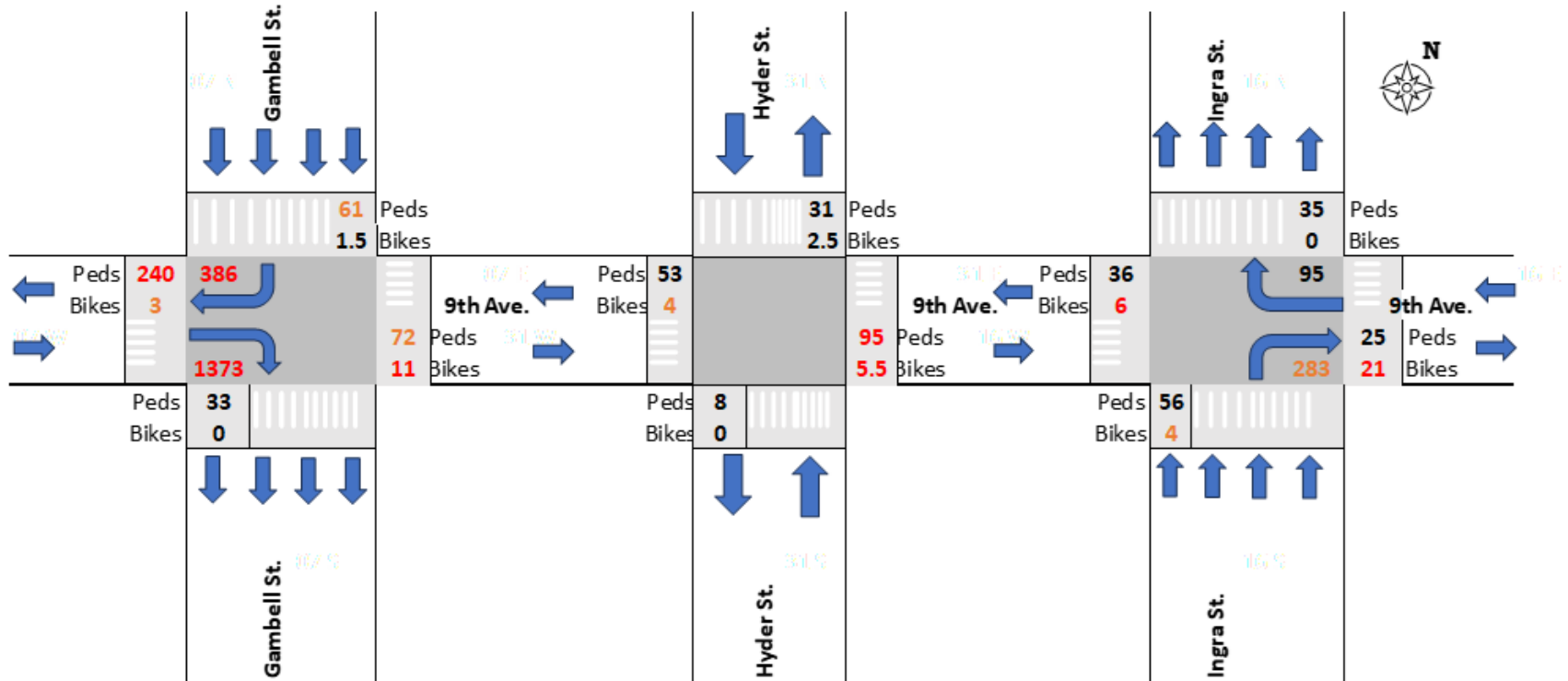


FIGURE 27: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 9TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

10th Avenue Intersections

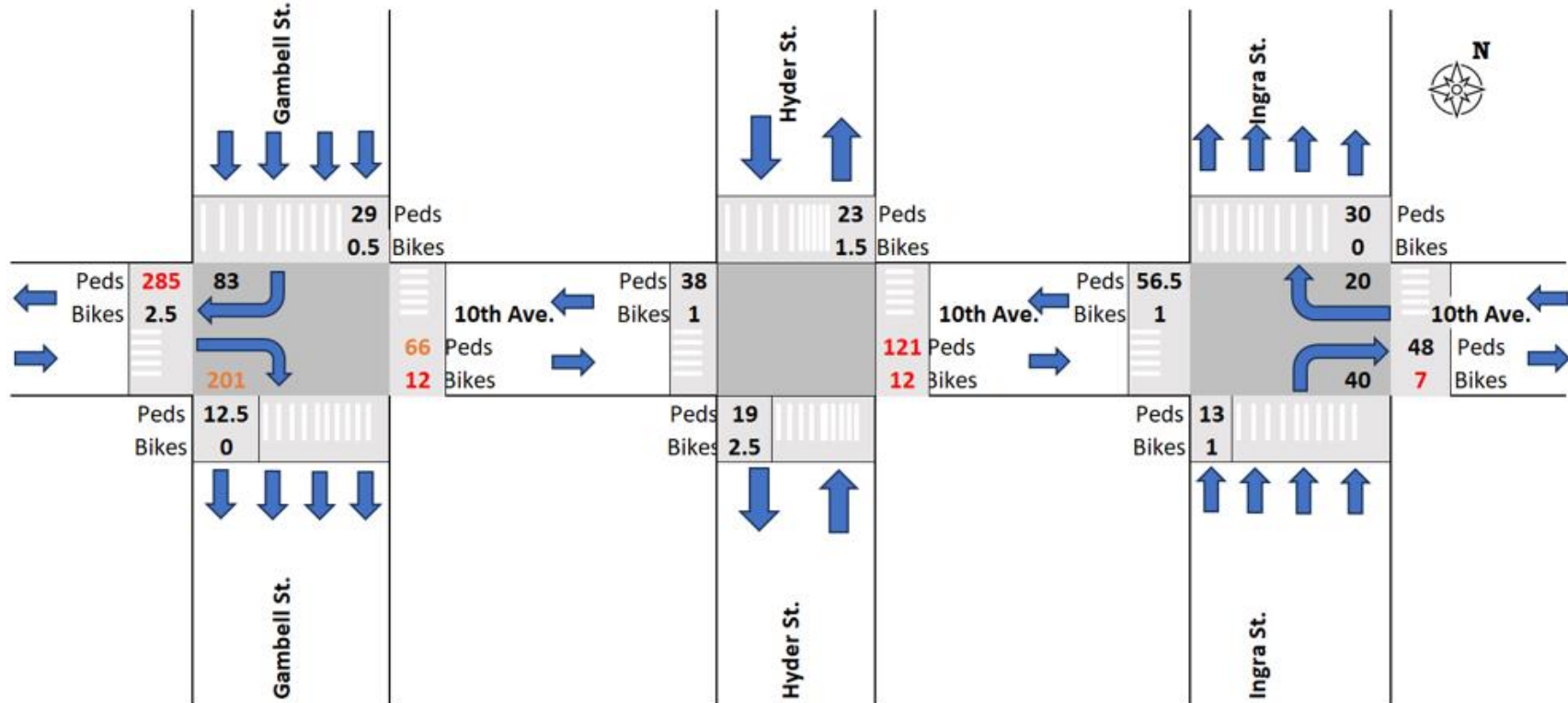


FIGURE 28: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 10TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

11th Avenue Intersections

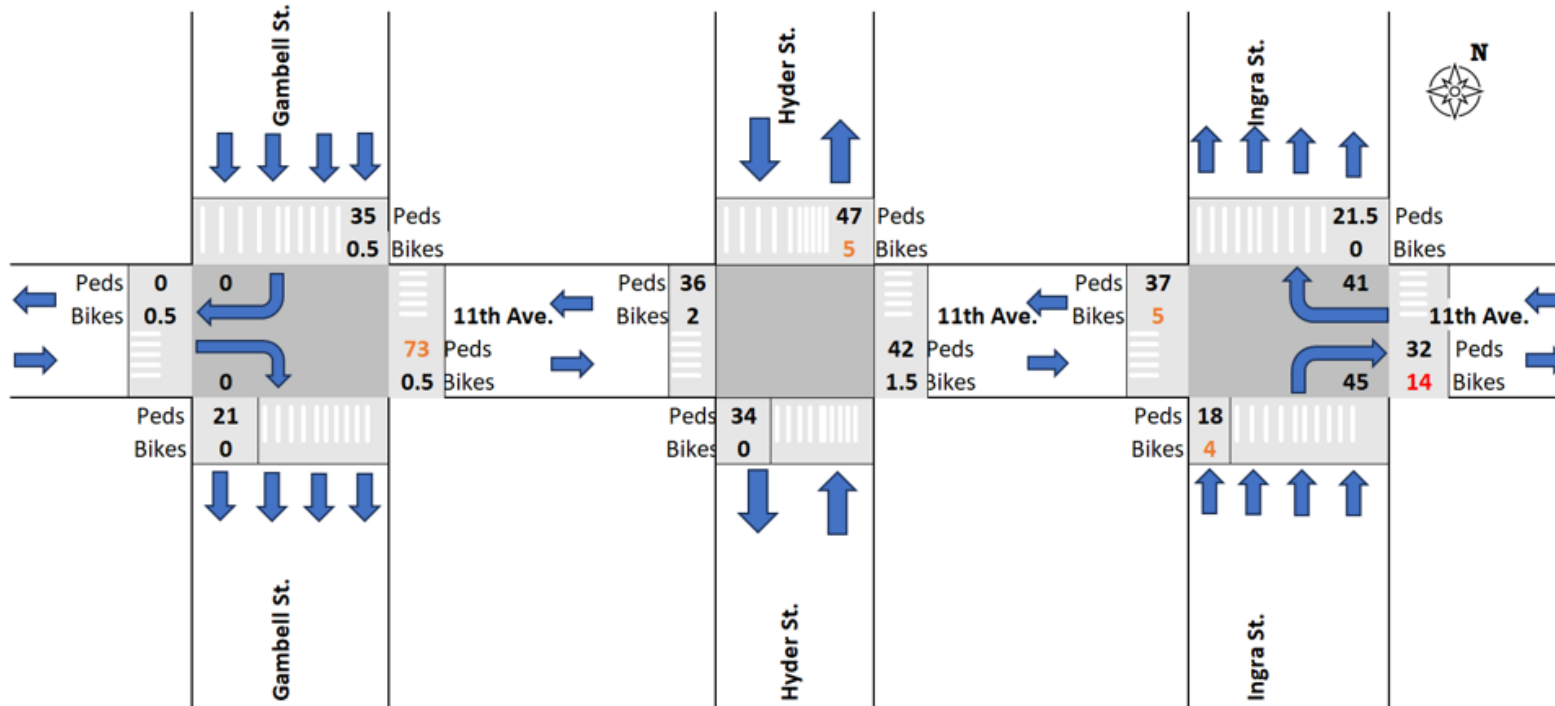


FIGURE 29: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 11TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

12th Avenue Intersections

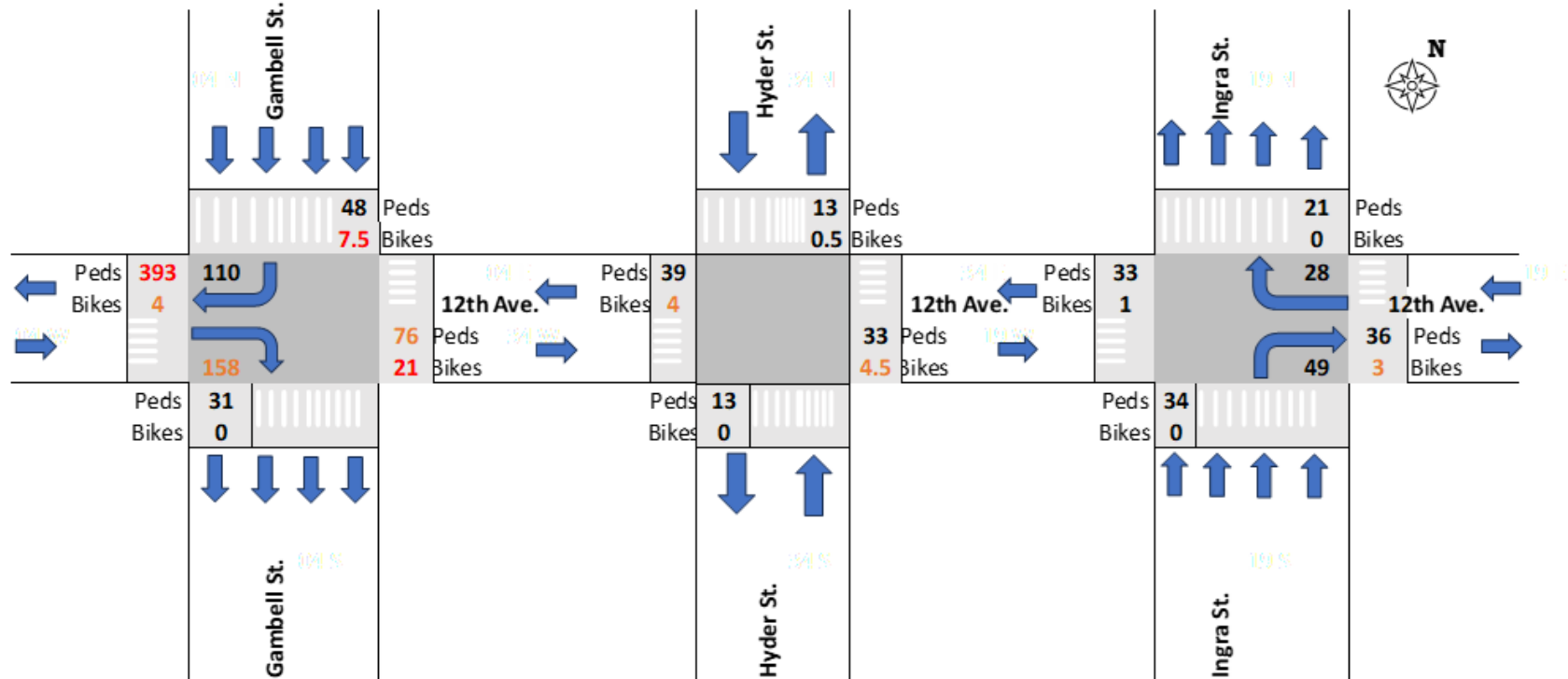


FIGURE 30: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 12TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

13th Avenue Intersections

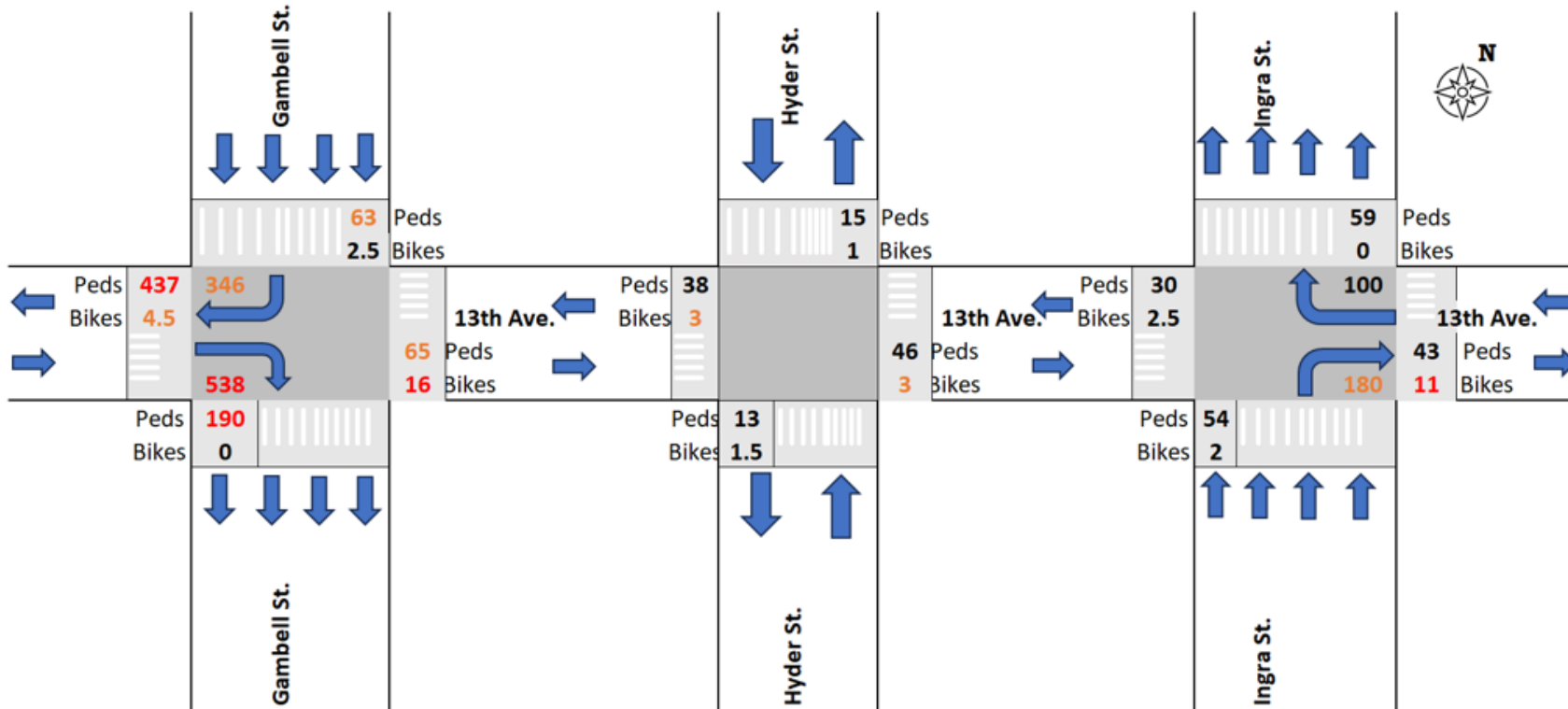


FIGURE 31: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 13TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

14th Avenue Intersections

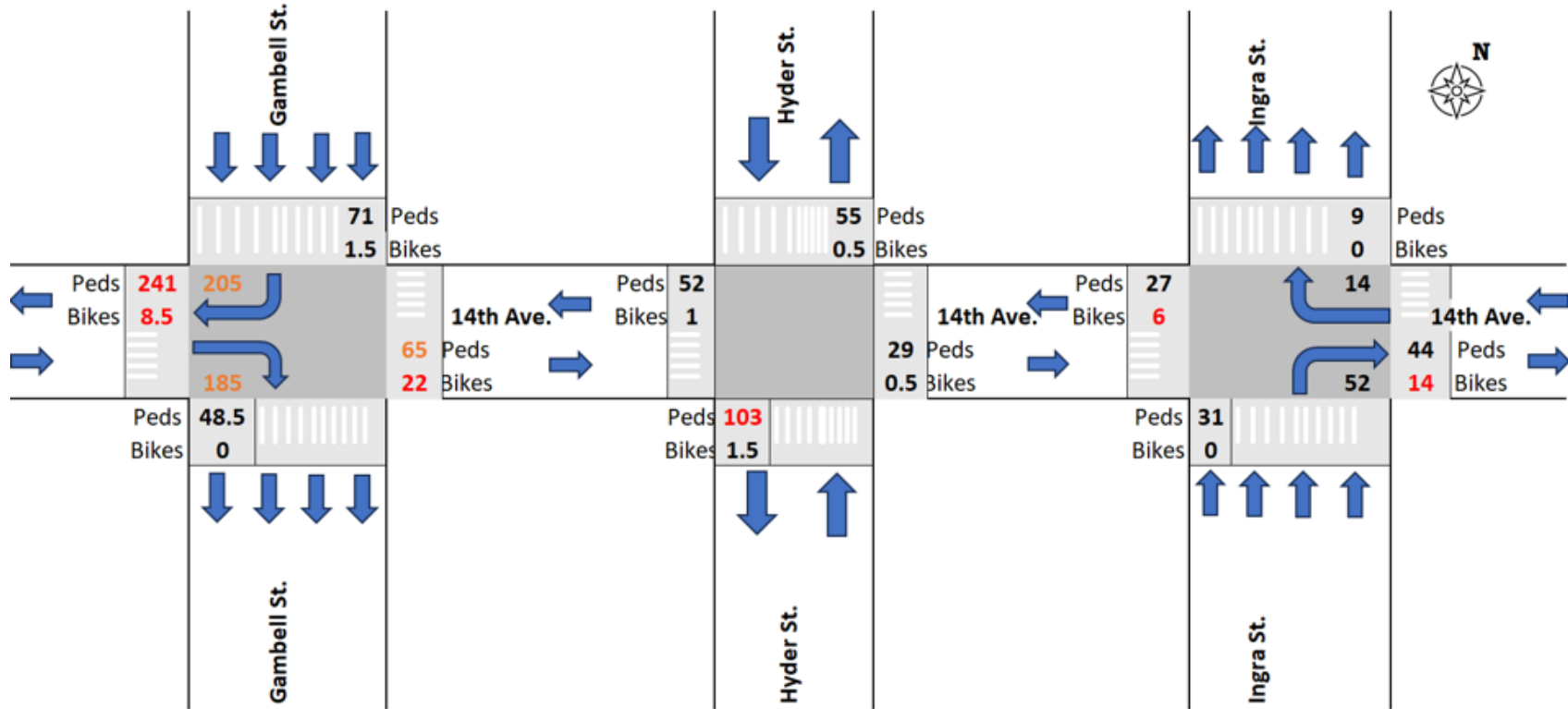


FIGURE 32: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 14TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

15th Avenue Intersections

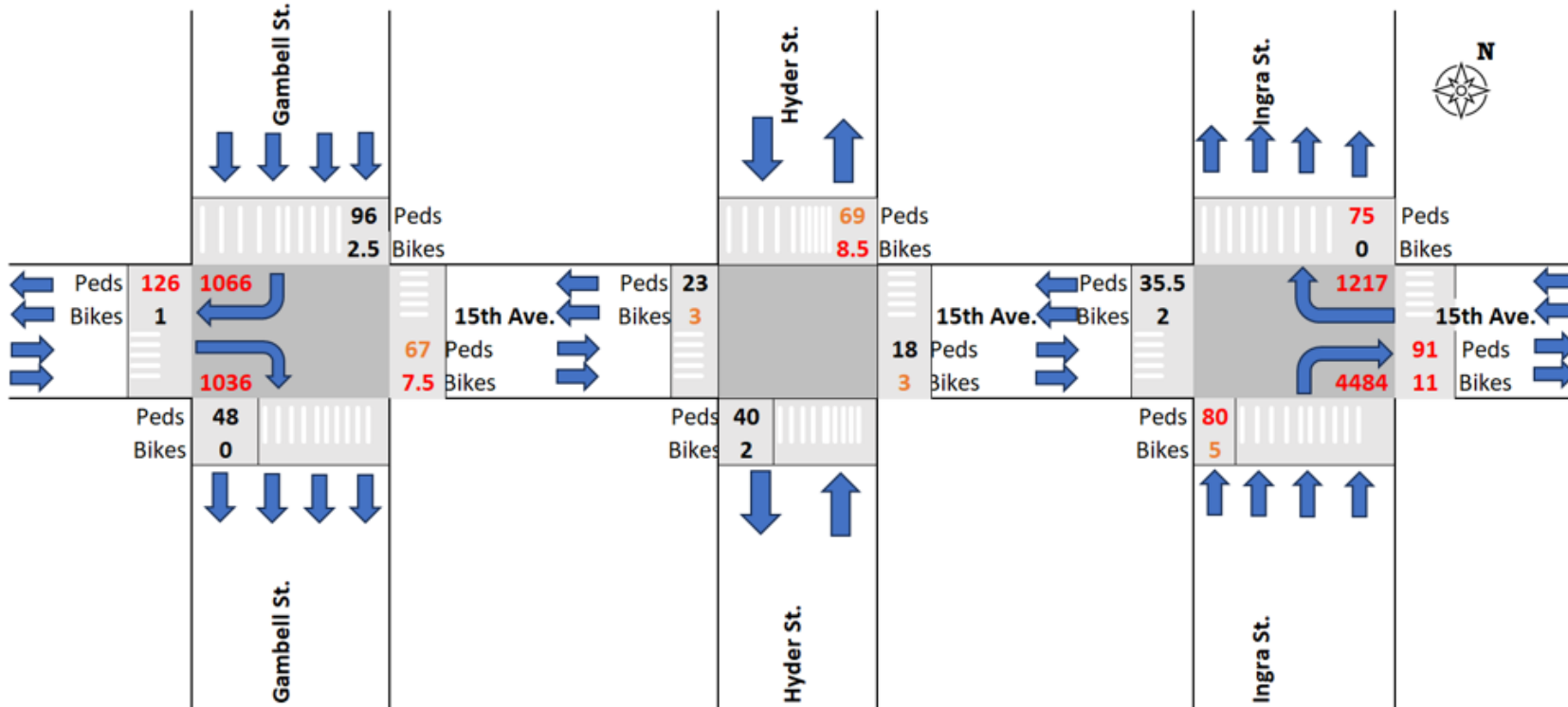


FIGURE 33: INGRA, GAMBELL, AND HYDER WEEKDAY AVERAGE DAILY VEHICLE RIGHT TURNS, PEDESTRIANS IN CROSSWALKS, AND BIKES IN LEG AT 15TH AVENUE

Sources: IDAX, RSG

Weekday intersection averages were calculated using data collected along Hyder Street on Tuesday, October 10th and Wednesday, October 11th, 2023, except for Hyder Street and 10th Avenue, which was studied on Tuesday, October 10th and Thursday, October 12th, 2023. All other intersections (along Ingra, Gambell, Juneau, and Karluk) were studied on Wednesday, September 13th, and Thursday, September 14th, 2023. Data was collected from 6:00 AM to 9:00 PM.

4.0 Pedestrian and Bicycle Findings and Discussion

DISCERNIBLE PATTERNS IN THE MACRO-SCALE ACTIVE TRANSPORT MOVEMENTS

The average intersection within the study area experienced about 16 pedestrian crossings per hour on weekdays and 1 bicycle entering the intersection per hour. The highest volume intersections for active transport movements are 5th and Gambell and 13th and Gambell. The calculated exposure index estimated those two intersections as the highest for exposure to auto traffic, which aligns with findings from historic crash data in the corridor. The exposure metric also supports prior studies' identification of the 15th Avenue axis as being a high-risk area—the 15th Avenue intersections at Gambell and Ingra rank between 7th and 4th highest vehicle/pedestrian exposure.

Observed weekday pedestrian volumes tended to be higher in the afternoon, with the peak being 5:00-6:00 PM. Weekend counts follow a similar pattern of volume, although pedestrian volumes were found to be lower overall on the weekend. Bicycle volumes peak from 3:00-4:00 PM and are much higher 3:00-8:00 PM than 6:00 AM-2:00 PM—this may suggest that many bicycle trips in the studied are recreational rather than utilitarian, although this is speculative. Readers should note that the bicycle volumes are very low, so one more or less bicycle counted considerably changes percentile rankings and the hourly distribution pattern—given the low volumes, the bicycle data should be interpreted with care.

Mid-block crossings do not follow the same pattern as intersection crossings. The highest volumes of mid-block crossings are along Hyder, where there is less vehicle traffic than Gambell and Ingra. There do not appear to be many attractions near the hot spots of mid-block pedestrian crossings, but very local land uses (e.g., employees of nearby car dealerships and repair shops crossing for business purposes) are the most likely explanation for the mid-block pedestrian volumes. The mid-block pedestrian volume hourly distributions are more uniform across the day than the intersection distributions, with the lowest points in the early morning.

IMPLICATIONS OF THE ACTIVE TRANSPORTATION AND VEHICLE VOLUMES FOR THE CURRENT SITUATION

The diagrams above showing pedestrian and bicycle crossings for each leg of each intersection highlight the number of vehicular right turns across pedestrian crosswalks. Turning vehicles generally pose the highest risk to pedestrians and cyclists, and where right turns exist, they far outnumber pedestrians. Red numbers in the diagrams signify high volumes, and the intersections--like those along 15th Avenue--where the vehicle right turn movement counts are high and the pedestrian crossings are high indicating the most potential for conflicts.

The movement diagrams also reveal more about where pedestrians may be going. There are no obvious destinations that we can say for certain are attracting pedestrians and cyclists travelling through the study intersections, but the locations of grocery stores, bus stops, and places of employment may be likely attractors. Intersections like 13th and Gambell and 14th and Gambell show high volumes on pedestrians on the west legs of the intersections, which is adjacent to Carr's grocery store. Similarly, the west leg of 7th and Gambell has a high volume of pedestrians and is located next to a hotel. Conversely, intersections like Ingra and 5th show a high volume of pedestrians, but there are no obvious attractors; this could indicate pass-through foot traffic to and from other destinations outside the couplet itself. The intersections observed to have high pedestrian volumes are consistent with the *System Performance Memorandum*⁶ findings and public commentary received during the SG PEL study.

IMPLICATIONS OF THE STUDY OBSERVATIONS FOR THE SG PEL ALTERNATIVES DESIGNS

This study highlights intersections that are most utilized by pedestrians and cyclists, as well as intersections with high potential for crash risks. These may suggest areas where SG PEL alternative design should pay special attention because design changes can increase or decrease pedestrian and bicycle safety. The studied intersections are dominated by motor vehicles, but this study has shown evidence of hundreds of pedestrians which utilize these intersections, where improved safety features could benefit active transportation travelers.

CARE IN INTERPRETING THESE FINDINGS

While the observed volumes and the exposure statistics are useful information to inform SG PEL alternatives design, the observations made for this study have limitations (as discussed in the *Strengths and Limitations of the Pedestrian and Bicycle Study* chapter above). Furthermore, volume and exposure are not the only factors that affect active transportation safety. The presence or absence of traffic control signals, marked crosswalks, bicycle lanes or physically protected bikeways, lighting, curb and street geometry, "refuges" such as raised medians, traffic calming measures such as speed bumps, and so on are all contributing factors to safety. The volume and exposure information in this report should be combined with this other information (including, as previously mentioned, thought about the potential future land use responses to SG PEL project alternatives) to make fully informed judgements about the current and potential future active transportation safety characteristics of the Seward-Glenn connection.

⁶ Op. Cit.