



MEMORANDUM

To: Kathryn Vo and Wil Buller, AC Transit

From: Randy Durrenberger, PE; Ryan Dole, P.E., T.E.
Kimley-Horn and Associates, Inc.

Date: November 14, 2025

Subject: AC Transit International Quick Build – Before-After Implementation Analysis

Overview

International Boulevard has historically experienced the presence of dangerous driving, collisions, fatalities, and excessive speeds along the entire corridor from 16th Avenue to 107th Avenue in Oakland based on data and observations from the City of Oakland Department of Transportation (OakDOT). Since the TEMPO Bus Rapid Transit (BRT) went into operation on August 9, 2020, these driving behaviors have continued and include illegal use of the center-running transit lane, speeding illegal left turns, illegal U-turns, and queue cutting according to input from AC Transit and OakDOT. Data supporting these observations is presented in this memorandum.

The International Quick Build project is implementing surface treatments such as red paint, lane channelizers, and supplemental signage at initial locations to evaluate the effectiveness of deterring illegal and improper use of the transit only lane, enhancing transit reliability, and improving safety along the corridor. This memorandum assesses and summarizes conditions along International Boulevard in February 2024 before implementation of Quick Build treatments, and in February/May 2025 after implementation of Quick Build treatments. This memorandum also summarizes conditions during an interim period in December 2024 in which data was collected at 34th Avenue, 37th Avenue, and 40th Avenue prior to the installation of three speed cushions in the transit only lane by OakDOT.

Data collection for all periods included tube counts, field observations, and on-board transit observations to assess trends and magnitude of improper use of the transit lane, speed distribution, illegal turns, extent of queue cutting, and other improper traffic movements.

Project Treatment and Location Selection Process

In early 2023, the International Boulevard Quick Build project compiled and assessed collision and citation data to identify key hot spots along the corridor to identify and evaluate surface treatments intended to deter illegal, improper, and unsafe driving behaviors. The maps of data used in the location selection are provided in **Attachment A**, including:

Figure A-1: Heat Map of All Collisions (SWITRS, 8/2020-12/2022)

Figure A-2: Heat Map of Bicycle-Involved Collisions (SWITRS, 8/2020-12/2022)

Figure A-3: Heat Map of Pedestrian-Involved Collisions, Aug. 2020 – Dec. 2022 (SWITRS)

Figure A-4: Oakland Police Department Citations, 2021-2022 (OPD)

Figure A-5: Oakland Police Department Bus Lane Violations, 2021-2022 (OPD)

Figure A-6: Heat Map of Vehicles Cutting into Bus Lane (AC Transit, 8/2020-12/2022)

Figure A-7: Heat Map of On-Board Passenger Falls from Bus Stopping (AC Transit, 8/2020-12/2022)

Analysis of collision and incident data in the previous report led to focusing on the following locations for placement of surface treatments for further evaluation. These locations experienced the presence of fatalities, and higher concentration of pedestrian- and bicycle-involved collisions, severe injuries, bus incidents, queue cutting, and illegal turns (e.g., prohibited U-turns and left-turns from the transit lane).

- 15th-17th Avenue
- 20th-23rd Avenue
- 28th-29th Avenue
- Fruitvale Avenue-35th Avenue
- 37th-39th Avenue
- High Street-52nd Avenue
- 62nd-65th Avenue
- 75th-79th Avenue
- 81st-84th Avenue

BEFORE CONDITIONS

Before Data Collection

Building on the hot spot segments above and input from AC Transit and OakDOT staff, 14 locations were identified to collect 3-day bi-directional tube count data. Three-day data was selected as a dataset to illustrate traffic patterns throughout the day and allows for identification of data anomalies due to equipment failures/vandalism, work zones, collisions, double-parked vehicles, and other traffic flow impacts. Volume, speed, and classification data was collected on Tuesday, Wednesday, and Thursday in 15-minute increments at each of the 14 locations in both directions. Speed was determined using 2 tubes spaced 10-feet apart and measuring the time between an axle crossing each tube. Tubes were placed at midblock locations for greater consistency in speed. A summary of volume and speed data is provided in **Attachment B**. Classification was determined by measuring the time between the front and subsequent axle(s) crossing a single tube. Data was collected separately for the general purpose lane and the transit lane in both directions. The 14 locations are as follows:

- 16th Avenue
- 21st Avenue
- 30th Avenue
- 34th Avenue
- 37th Avenue
- 40th Avenue
- 48th Avenue
- 58th Avenue
- 64th Avenue
- 75th Avenue
- 82nd Avenue
- 88th Avenue
- 96th Avenue
- 102nd Avenue

Some locations required recounts due to vandalized equipment or vehicles parking on the tubes. Recounts occurred during the following week in February on the same day of the week (Tuesday, Wednesday, or Thursday) as the original bad count data to obtain as close to a representative 3 days of data as possible. Recounts were conducted at EB 64th Avenue, EB 75th Avenue, EB 82nd Avenue, EB 96th Avenue, EB 102nd Avenue, and WB 102nd Avenue.

To supplement tube count data, Kimley-Horn staff conducted AM and PM peak period field observations at the following 5 locations to note the extent of specific violations (e.g., illegal turns, queue cutting, double parking) related to overall traffic:

- 21st Avenue
- 30th Avenue
- 64th Avenue
- 75th Avenue
- 96th Avenue

Before Data Assessment

NON-TRANSIT VOLUME IN TRANSIT LANE

Volumes were assessed as average daily traffic (ADT) over 3 days of counts as well as AM and PM peak periods (AM peak is westbound, PM peak is eastbound). Two-hour peak periods were generally 7:45am-9:45am and 4pm-6pm.

In evaluating the extent of non-transit vehicles using the transit lane, note that there are 110 transit vehicles per day per direction that are scheduled to use the transit lane, broken down as follows:

- 12:00am-6:00am 30-minute headways (12 buses)
- 6:00am-7:00pm 10-minute headways (78 buses)
- 7:00pm-12:00am 15-minute headways (20 buses)

Figure C-1 in **Attachment C** details the number of non-transit vehicles that were counted in the transit lane compared to the general purpose lane. Several locations such as 34th, 37th, 48th, and 96th Avenues experienced 10-25% non-transit vehicles in the transit lane in both directions. Eastbound (PM) 21st, 40th, and 82nd Avenues also experienced more than 10% non-transit vehicles in the transit lane. Conversely, other locations such as 16th, 58th, 64th, 88th, and 102nd Avenues experienced 5% or less non-transit vehicles in the transit lane in both directions; EB 75th Avenue, WB 21st Avenue, and WB 30th Avenue also experienced less than 5% non-transit vehicles in the transit lane.

Based on a field review of geometry and operations along the corridor, locations with higher non-transit violations could be attributable to several factors (example locations in parenthesis):

- Adjacent schools, retail, apartments, and fast-food restaurants may encourage more illegal left turns and U-turns for access (EB 21st, EB 34th, EB 64th Avenues).
- The transit lane is used for illegal left turns or U-turns in segments with limited allowable turns (EB 30th, EB/WB 34th, EB 37th, EB/WB 96th Avenues).
- Queue cutting to bypass a queue of traffic at a signal.
- Using the adjacent transit lane to pass vehicles in the general-purpose lane.
- It is possible that cars are straddling the curb and transit lane due to on-street parking that narrows the available general purpose lane.

Each of the count locations will receive channelizer treatments as part of the International Quick Build project to potentially deter these infractions. As the after data is collected and analyzed, we will determine if channelizers are successful at deterring these movements and if the volume of non-transit vehicles in the transit lane is reduced.

SPEED

Speed data was assessed as average speed over 3 days in 5 mph increments and summarized in the figures below. Throughout the 14 bi-directional locations, the overall general purpose lane

average speeds ranged from 16.7-27.9 mph, while the transit lane average speeds ranged from 21.8-38.1 mph. Figures D-1 and D-2 in **Attachment D** illustrate a comparison of the general purpose lane speeds versus the transit lane speeds at each count location in each direction. The pie charts represent the distribution of speed across all speed buckets above 5 mph over the posted speed limit; red reflects higher speeds. The data called out at each location reflects 85th percentile speed and associated ADT volumes.

Throughout the corridor in the general purpose lane, the 85th percentile speed was mostly within 5 mph above the respective posted speed limit. The outliers were EB 40th-88th Avenue, where 85th percentile speeds were 30-35 mph. This may be occurring because the posted speed limit in the eastbound direction was 25 mph, but 30 mph in the westbound direction. In other locations, like EB 16th-21st Avenue, 85th percentile speeds were below the 30 mph posted speed limit. The International Quick Build project will be changing all posted speed limit signs to 25 mph, so the change in 85th percentile speed will be noted again after the project is constructed.

The transit lane experienced a wider range of 85th percentile speeds, all of them higher than the adjacent general purpose lane. Specific noteworthy observations with the speed data:

- WB 16th, 21st, 37th, and 96th Avenues were the only locations that measured an 85th percentile speed within 5 mph above the respective posted speed limit (25-34 mph).
- EB 37th, 40th, 82nd, and 88th Avenues, and WB 34th and 88th Avenues experienced 85th percentile speeds more than 20 mph over the speed limit (45-53 mph).
- EB 34th, 37th, 40th, 82nd, and 96th Avenues, and WB 34th and 96th Avenues had the highest volume of non-transit vehicles traveling faster than the 85th percentile speed (108-236 non-transit vehicles).
- The Fruitvale area in the EB direction from 30th-40th Avenue, and both directions from 82nd-102nd Avenue have the highest 85th percentile speeds, and the highest speed differential compared to the adjacent general purpose lane.

These specific areas will be further reviewed against data collected after the International Quick Build project is constructed.

FIELD OBSERVATIONS

One-hour AM and PM peak period field observations were conducted at 5 locations throughout the corridor (21st, 30th, 64th, 75th, and 96th Avenue) to capture a perspective of the following non-transit use of the transit lane:

- **Illegal turns** – U-turns and left turns from transit lane.
- **Queue cutting** – Using the transit lane to bypass a queue of traffic at a signalized intersection.
- **Double parking** – Delivery trucks or other vehicles parked in the general-purpose lane, requiring traffic to use the transit lane as a bypass.

The two-person Kimley-Horn team also rode the bus the entire length of the corridor in both directions to gain further perspective on traffic patterns, violations, and trends, and to observe violations that potentially could impact transit service. The following observations were noted:

- More than half of all observed violations were illegal U-turns and left turns from the transit lane. More of these violations were noted at 64th Avenue, but illegal turns are also notable at 21st, 30th, and 75th Avenue.

- More than 95% of all observed violations were illegal turns and queue cutting.
- Queue cutting was more prevalent at 30th, 75th, and 96th Avenue.
- Double parking was primarily observed at 21st and 30th, but the small sample size and randomness of double parking does not provide conclusive data.

Based on field observations, the following could be contributing factors to violations:

- The presence of a fast food restaurant could promote increased illegal turns that access the restaurant.
- Lack of permitted left turns from 16th-21st Avenue and 23rd-25th Avenue could promote illegal turns.
- Schools at 21st Avenue and 28th Avenue could be contributing to heavier illegal turns associated with student drop-off/pick-up.
- There are a few driveways in which vehicles used the transit lane for left turns.

Instances of vehicles bypassing a double-parked vehicle represented a low number of observed transit lane use and impacts to transit operations. Double parking typically (and sometimes frequently) occurs with truck deliveries and trash collection. Trash collection vehicles traveling along International Boulevard frequently double park to collect a series of trash bins in each block. When the trash collection vehicle stops, other vehicles bypass the trash collection truck using the transit lane. Reviewing the 3-day count data, we noted numerous data points that could represent instances of double parking (i.e., 15-minute general purpose lane volume was zero or low and adjacent transit lane volume was high), specifically at 37th, 40th, 48th, 82nd, and 96th Avenues. It was also noted that non-delivery vehicles are often parked for extended periods of time in loading zones (near 34th Avenue, for example), requiring delivery drivers to park in the through lane and requiring traffic to use the transit lane to bypass the double-parked vehicle. Double parking could become problematic when channelizers are present along the lane line as other vehicles will not be able to pass the vehicle without running over the channelizers.

INTERIM CONDITIONS

Interim Data Collection

Interim data was collected in December 2024 at three locations to assess the benefits of Quick Build treatments prior to the installation of speed cushions by OakDOT in the transit only lane in the vicinity of 34th Avenue, 37th Avenue, and 40th Avenue. This data consisted of two-day, 24-hour volume, speed, and classification for the transit only lane and general purpose lane in both directions. Due to vandalism, about a half-day of data was lost in the general purpose lane of EB 34th Avenue and 37th Avenue, but the resulting data was sufficient to draw conclusions on driver behavior after channelizers were installed. Data was not recounted due to timing of speed cushion installation.

To supplement tube count data, we also conducted 1-hour AM and PM peak period field observations at the three locations to note the extent of specific violations (e.g., illegal turns, queue cutting, double parking) related to overall traffic.

Interim Data Assessment

NON-TRANSIT VOLUME IN TRANSIT LANE

Although total volumes experienced some variation due to 'holiday' traffic, the volume of non-transit vehicles in the transit lane has been nearly eliminated after lane channelizers have been installed. **Figure 1** shows that non-transit vehicles in the transit only lane have reduced 94-100% compared to Before volumes, while the general purpose lane had nominal volume reduction up to 18% due to holiday variances.

Compared to the before volumes in the transit only lane, the interim total volumes at these 3 locations was reduced by an average of 87%. Before volumes in transit only lanes ranged from 202 to 1684 vehicles including AC Transit buses and non-transit vehicles illegally driving in the transit only lane. During the interim evaluation period, ADT in the transit only lanes ranged from 110 to 159 vehicles, including AC Transit buses and non-transit vehicles. Per the Tempo schedule, there should be at least 110 transit vehicles per day, so based on the interim volumes, non-transit volumes have significantly decreased.

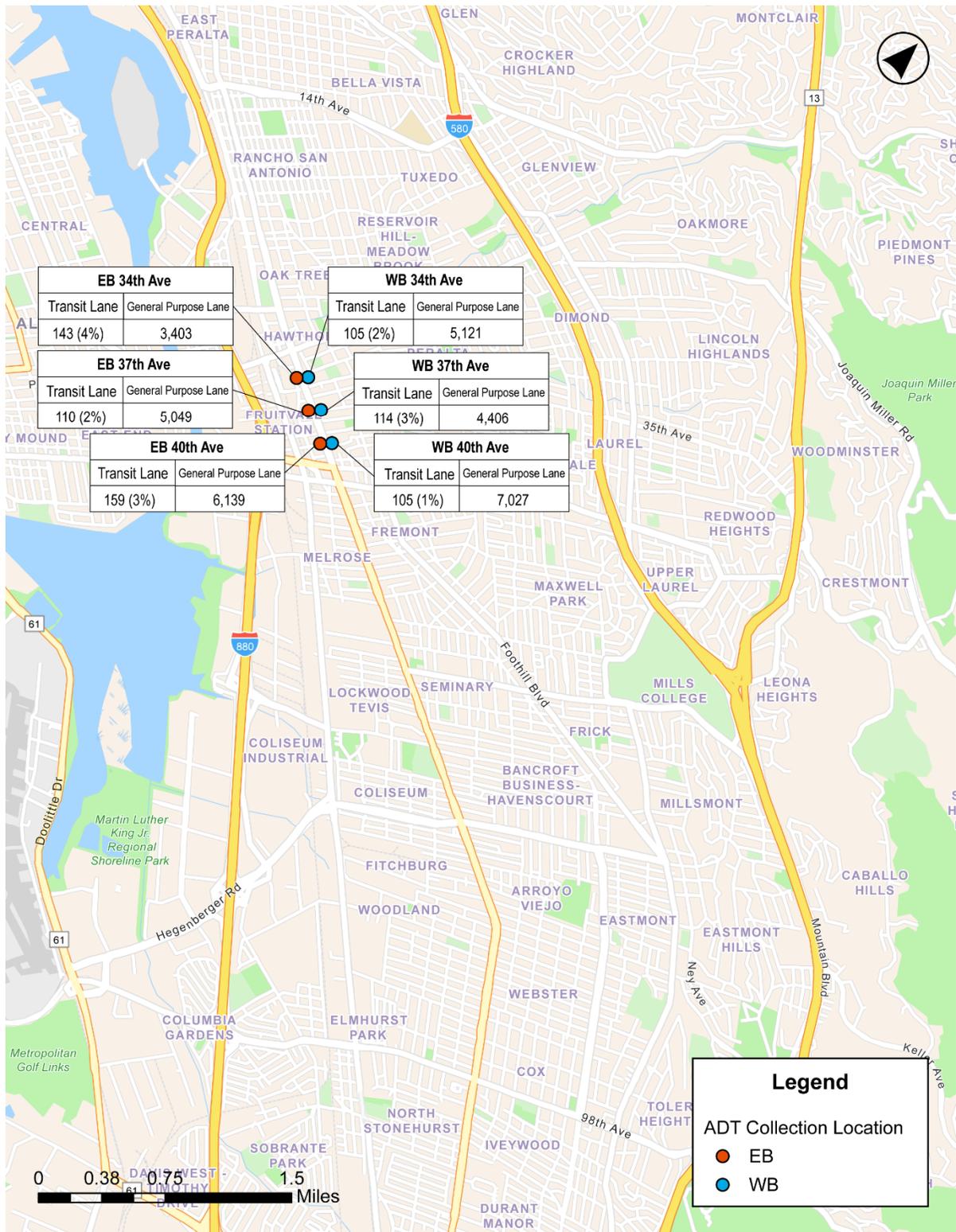


Figure 1: Non-Transit Vehicles in Transit Lane (ADT)

SPEED

Speed data was collected in 5 mph increments and summarized in **Figures 2 and 3** below. These figures illustrate a comparison of the general purpose lane speeds versus the transit lane speeds at each count location in each direction. The pie charts represent the distribution of speed across all speed buckets above 5 mph over the posted speed limit; red reflects higher speeds. At these three interim bidirectional locations, the overall general purpose lane average speeds remained within 5 mph of the speed limit, experiencing minor speed reduction up to 5%, as represented by the 85th percentile speed.

The transit lane experienced more dramatic benefits in speed reduction. Five of 6 locations experienced a considerably reduction in 85th percentile speed, up to 21 mph less. All locations are within 7 mph of the 25 mph posted speed limit. WB 37th Avenue is a slight outlier experiencing an increase in speed of 3 mph since the Before data was relatively low compared to other transit lane data. This location will be further evaluated during the After assessment.

These reductions in average speed also mitigate some comments in the Before assessment:

- EB 37th Avenue and 40th Avenue no longer have speeds more than 20 mph over the posted speed limit.
- EB 34th, 37th, 40th Avenues no longer have notable volumes that exceed 50 mph (3 vehicles total for all locations).
- The speed differential between general purpose lane and transit only lane at these three locations has reduced from as much as 23 mph to 2 mph.

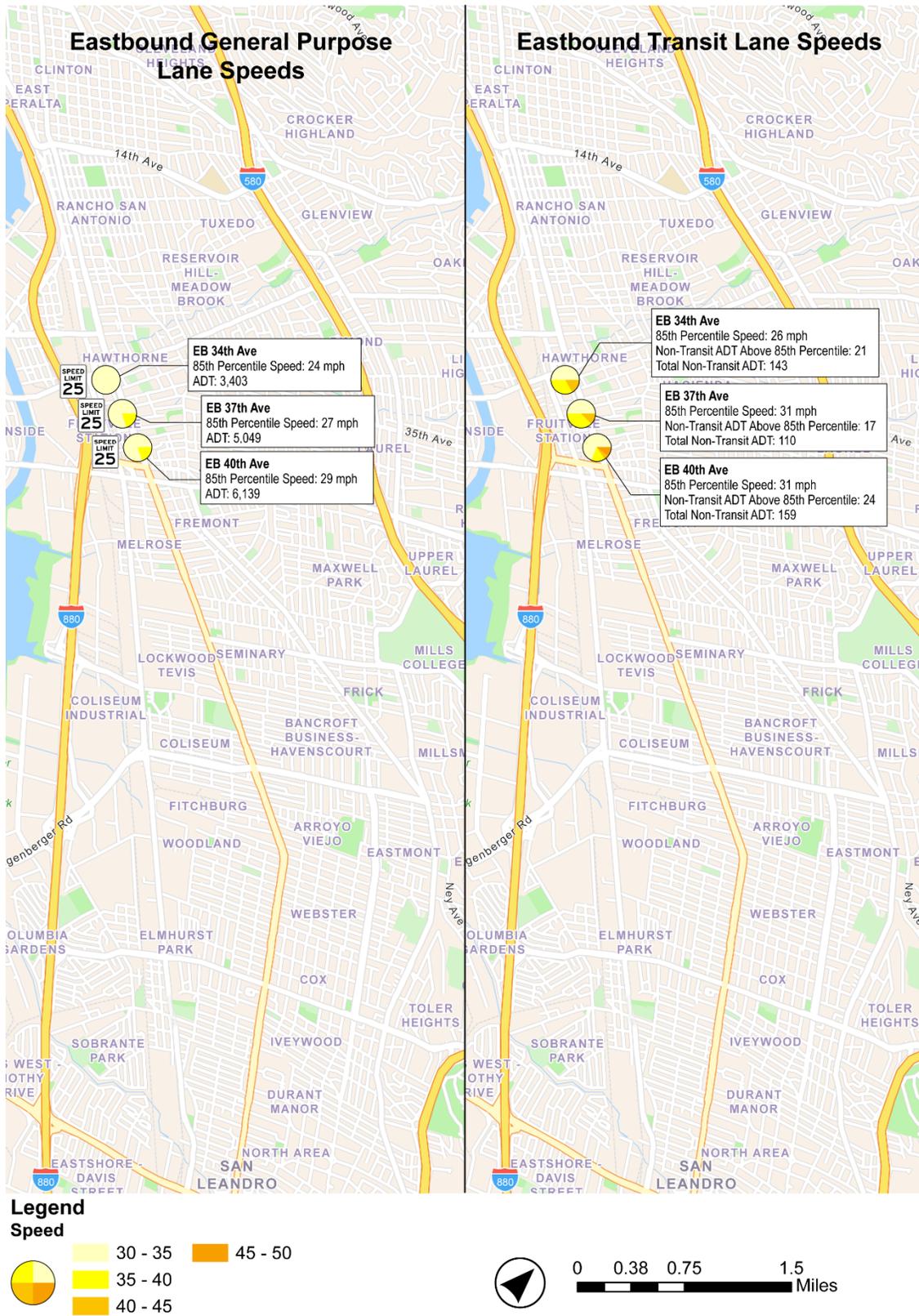


Figure 2: Eastbound General Purpose and Transit Lane Speeds

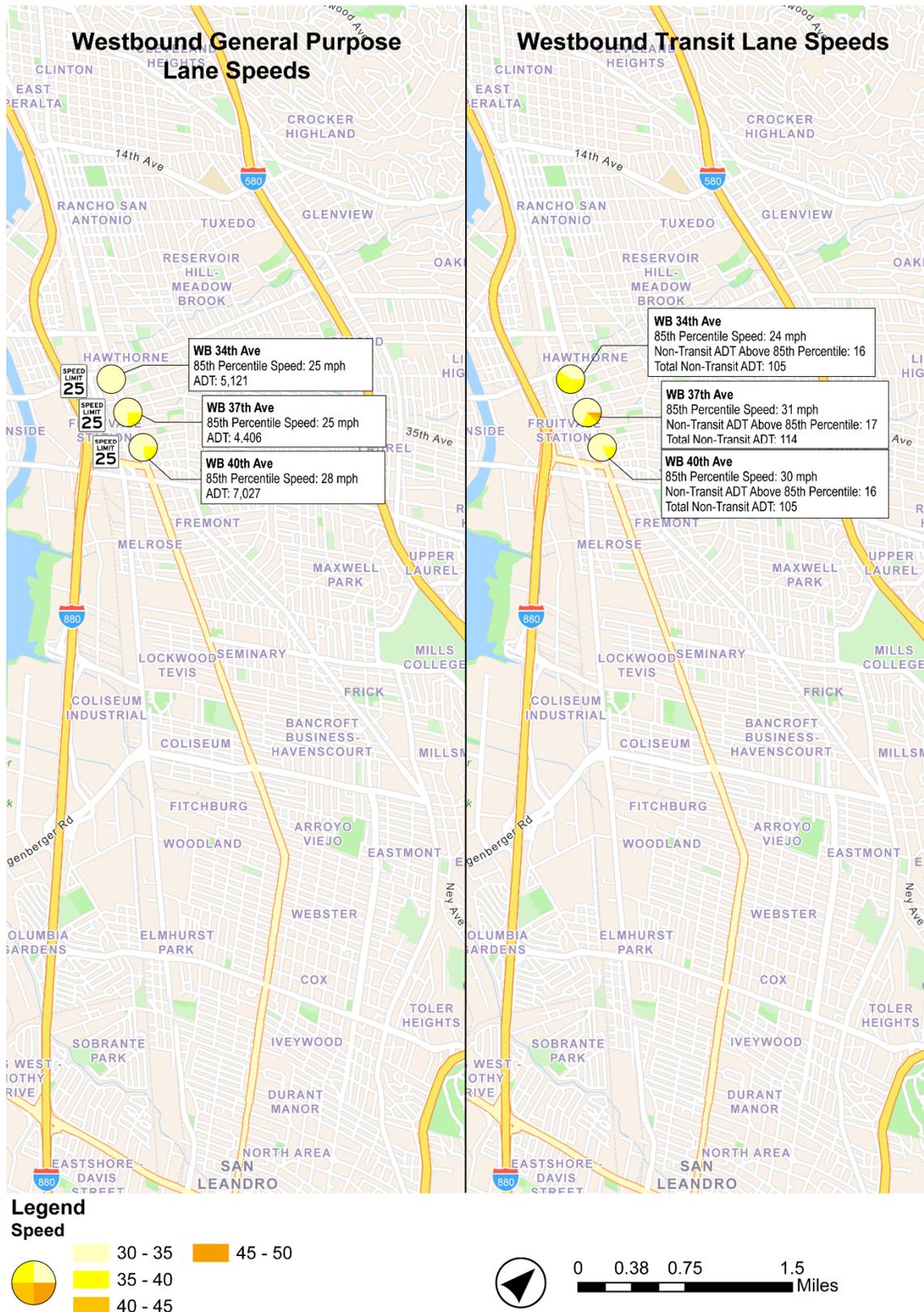


Figure 3: Westbound General Purpose and Transit Lane Speeds

FIELD OBSERVATIONS

One-hour AM and PM peak period field observations were conducted at 3 locations (34th, 37th, and 40th Avenue) on December 17-18, 2024 to capture a perspective of the following non-transit use of the transit lane:

- **Illegal turns** – U-turns and left turns from transit lane.
- **Queue cutting** – Using the transit lane to bypass a queue of traffic at a signalized intersection.
- **Double parking** – Delivery trucks or other vehicles parked in the general-purpose lane, requiring traffic to use the transit lane as a bypass.

The following observations are qualitative in nature based on observer notes and interpretations of driver behavior. Not enough data was collected to draw conclusions on the change in frequency of these observations with respect to the before condition unless stated otherwise.

- There were very few instances of non-transit vehicles using the transit only lane from 34th-40th Avenue.
- There were very few instances of queue cutting during the AM and PM despite lengthy queues for prolonged periods of time at traffic signals.
- There are still notable observations of illegal U-turns and left turns from the transit lane.
- More than half of all observed violations were illegal U-turns and left turns from the transit lane. This occurred more at 40th Avenue than at 34th or 37th Avenue.
- There was a higher occurrence of bicycles in the transit only lane compared to Before observations.
- Instances of double parking were not noted during the observation period at any of the 3 locations. Double parking was noted in the count data – twice at EB 34th Avenue and twice at EB 40th Avenue, as evidenced by a slightly higher volume in the transit only lane for a short increment.

Based on field observations, the following could be contributing factors to violations:

- Illegal turns are likely to occur out of convenience for drivers to access a driveway, business, or residential street immediately rather than travel to an approved turn.
- Bicyclists may perceive the transit only lane as a more protected thoroughfare compared to other options.

AFTER CONDITIONS

After Data Collection

Following the construction of the project, 3-day bi-direction tube count data collection was performed in March 2025 at the same 14 locations as before the project. Three-day data was chosen to demonstrate variable daily traffic patterns and allow for anomalies to present themselves. Volume and speed data was collected on Tuesday, Wednesday, and Thursday in 15-minute increments at each of the 14 locations in both directions. Speed was determined using 2 tubes spaced 10-feet apart and measuring the time between an axle crossing each tube. Tubes were placed at midblock locations for greater consistency in speeds. A summary of volume and speed data is provided in

Attachment B. Data was collected separately for the general purpose lane and the transit lane in both directions. The 14 locations are as follows:

- 16th Avenue
- 21st Avenue
- 30th Avenue
- 34th Avenue
- 37th Avenue
- 40th Avenue
- 48th Avenue
- 58th Avenue
- 64th Avenue
- 75th Avenue
- 82nd Avenue
- 88th Avenue
- 96th Avenue
- 102nd Avenue

To supplement tube count data, we also conducted 1-hour AM and PM peak period field observations at 8 locations throughout the corridor to note the extent of specific violations (e.g., illegal turns, queue cutting, double parking) related to overall traffic:

- 16th Avenue
- 21st Avenue
- 30th Avenue
- 34th Avenue
- 37th Avenue
- 40th Avenue
- 64th Avenue
- 82nd Avenue

After Data Assessment

VOLUMES

Figures 4 details the number of vehicles that were counted in the transit lane compared to the general purpose lane. **Table 1** and **Figures 5** through **32** depict the total volumes counted in the general-purpose lanes and transit lanes by location, and the comparison of the before-after counts at each location. Each count location received channelizer treatment as part of the project.

Based on a review of the before and after volume data, the following interpretations and conclusions were identified.

- Channelizers and other project improvements have greatly deterred violations in the transit only lanes since all count locations experienced a reduction in traffic in the transit lanes after the project was completed.
 - When considering all volumes in the transit lane from the before versus after conditions, there was an overall volume reduction of around 83%.
 - Before volumes in transit only lanes ranged from 202 to 1684 vehicles including AC Transit buses and non-transit vehicles illegally driving in the transit only lane. After ADT in transit only lanes ranged from 84 to 145 vehicles including AC Transit buses and non-transit vehicles illegally driving in the transit only lane.
- Per the Tempo schedule, there should be at least 110 transit vehicles per day; however, there were some count locations reporting ADTs less than the expected number of scheduled buses. The data collection firm did not report any vandalism or loss of data concerns that would impact data collection.
 - Studies have shown pneumatic road counters may have typical absolute error of up to 10% (source: <https://trid.trb.org/View/1257430>), which may be contributing to the variances in the after data. In addition, another factor may have been bus schedule differences (e.g., reduced number of buses due to staffing shortage). As such, the volumes collected appear to be within a reasonable variation range.

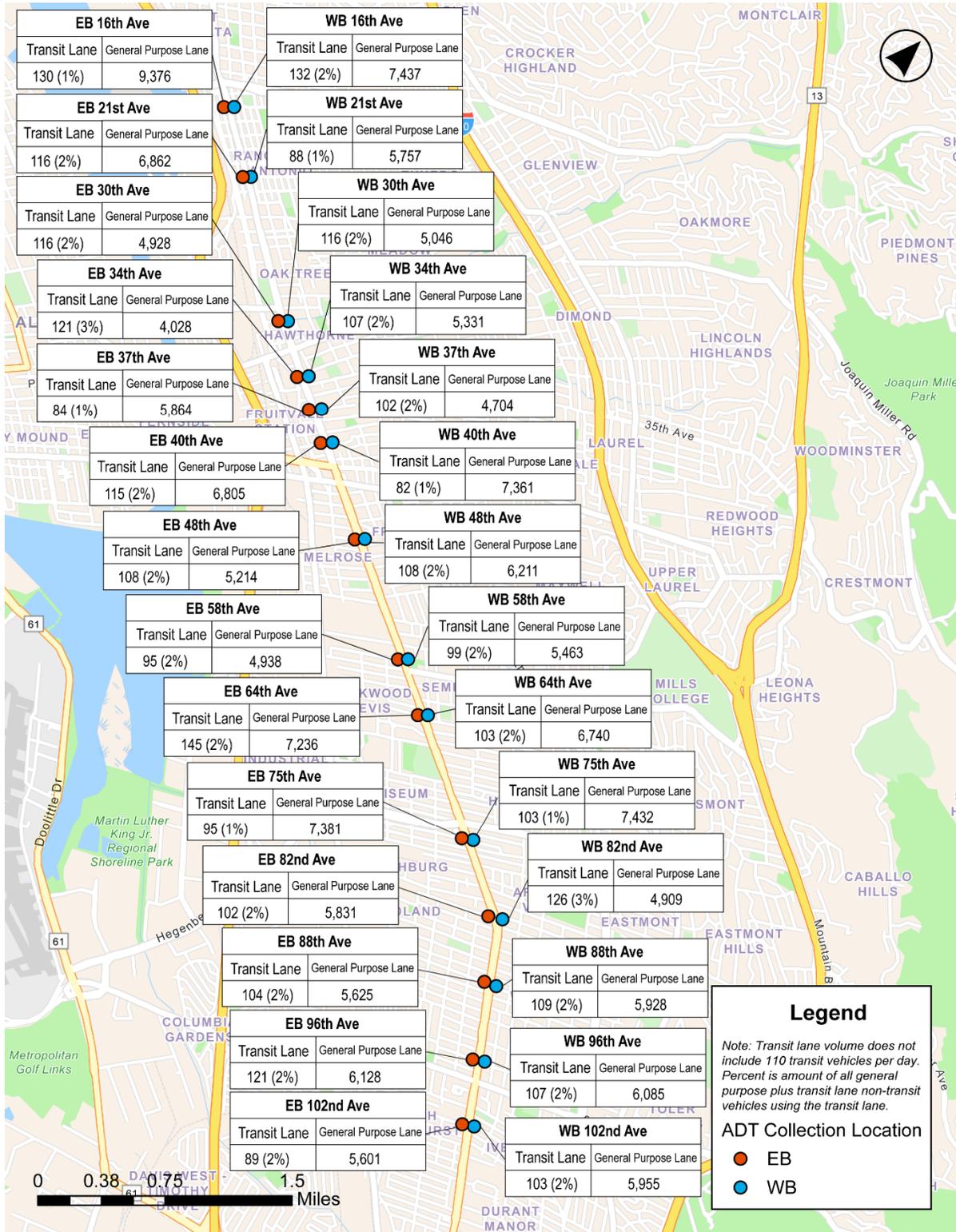


Figure 4: Non-Transit Vehicles in Transit Lane (ADT)

Table 1: Before-After Volume Comparison

Location	EB				WB			
	Before ADT	After ADT	Total Net Change	% Change	Before ADT	After ADT	Total Net Change	% Change
1 (16 th Ave.) - General Purpose Lane	8,329	9,376	1047	13%	6,230	7,437	1207	19%
1 (16 th Ave.) - Transit Only Lane	339	130	-209	-62%	199	132	-67	-34%
2 (21 st Ave.) - General Purpose Lane	6,126	6,862	737	12%	5,335	5,757	423	8%
2 (21 st Ave.) - Transit Only Lane	758	116	-642	-85%	339	88	-251	-74%
3 (30 th Ave.) - General Purpose Lane	4,038	4,928	890	22%	5,255	5,046	-209	-4%
3 (30 th Ave.) - Transit Only Lane	474	116	-358	-76%	259	116	-144	-55%
4 (34 th Ave.) - General Purpose Lane	4,117	4,028	-89	-2%	5,180	5,331	150	3%
4 (34 th Ave.) - Transit Only Lane	1,072	121	-951	-89%	1,684	107	-1577	-94%
5 (37 th Ave.) - General Purpose Lane	6,158	5,864	-294	-5%	3,787	4,704	917	24%
5 (37 th Ave.) - Transit Only Lane	1,137	84	-1053	-93%	699	102	-597	-85%
6 (40 th Ave.) - General Purpose Lane	7,049	6,805	-244	-3%	7,220	7,361	141	2%
6 (40 th Ave.) - Transit Only Lane	971	115	-856	-88%	710	82	-629	-89%
7 (48 th Ave.) - General Purpose Lane	5,507	5,214	-293	-5%	3,444	6,211	2767	80%
7 (48 th Ave.) - Transit Only Lane	701	108	-593	-85%	767	108	-660	-86%
8 (58 th Ave.) - General Purpose Lane	6,042	4,938	-1104	-18%	6,127	5,463	-664	-11%
8 (58 th Ave.) - Transit Only Lane	202	95	-107	-53%	296	99	-197	-67%
9 (64 th Ave.) - General Purpose Lane	7,358	7,236	-122	-2%	6,760	6,740	-20	0%
9 (64 th Ave.) - Transit Only Lane	523	145	-379	-72%	192	103	-89	-46%
10 (75 th Ave.) - General Purpose Lane	8,139	7,381	-758	-9%	7,380	7,432	52	1%
10 (75 th Ave.) - Transit Only Lane	547	95	-452	-83%	710	103	-608	-86%
11 (82 nd Ave.) - General Purpose Lane	5,661	5,831	171	3%	5,964	4,909	-1055	-18%
11 (82 nd Ave.) - Transit Only Lane	1,195	102	-1093	-91%	539	126	-413	-77%
12 (88 th Ave.) - General Purpose Lane	6,315	5,625	-690	-11%	6,293	5,928	-365	-6%
12 (88 th Ave.) - Transit Only Lane	299	104	-195	-65%	347	109	-238	-69%
13 (96 th Ave.) - General Purpose Lane	6,160	6,128	-32	-1%	6,168	6,085	-83	-1%
13 (96 th Ave.) - Transit Only Lane	1,429	121	-1308	-92%	833	107	-726	-87%
14 (102 nd Ave.) - General Purpose Lane	7,034	5,601	-1433	-20%	6,916	5,955	-961	-14%
14 (102 nd Ave.) - Transit Only Lane	292	89	-203	-69%	509	103	-406	-80%
Total - General Purpose Lane	88032	85817	(2,215)	-3%	82059	84359	2,300	3%
Total - Transit Only Lane	9939	1541	(8,398)	-84%	8084	1483	(6,601)	-82%

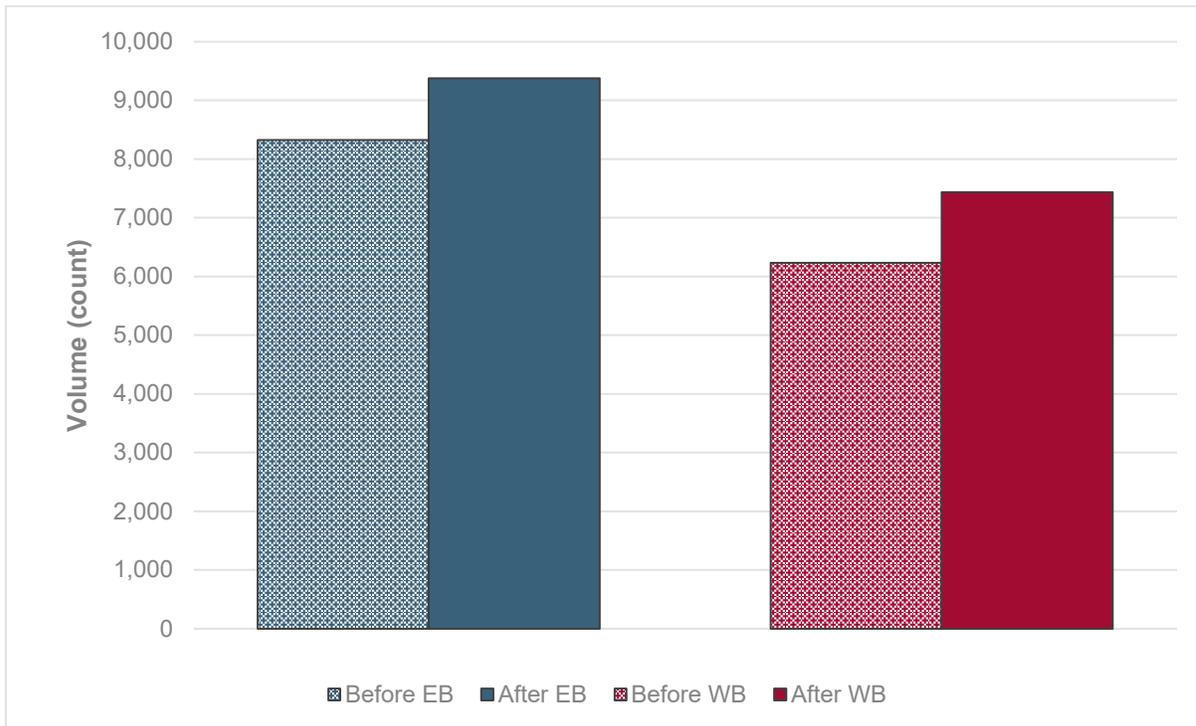


Figure 5: Total Volumes in General Purpose Lane at 16th Ave

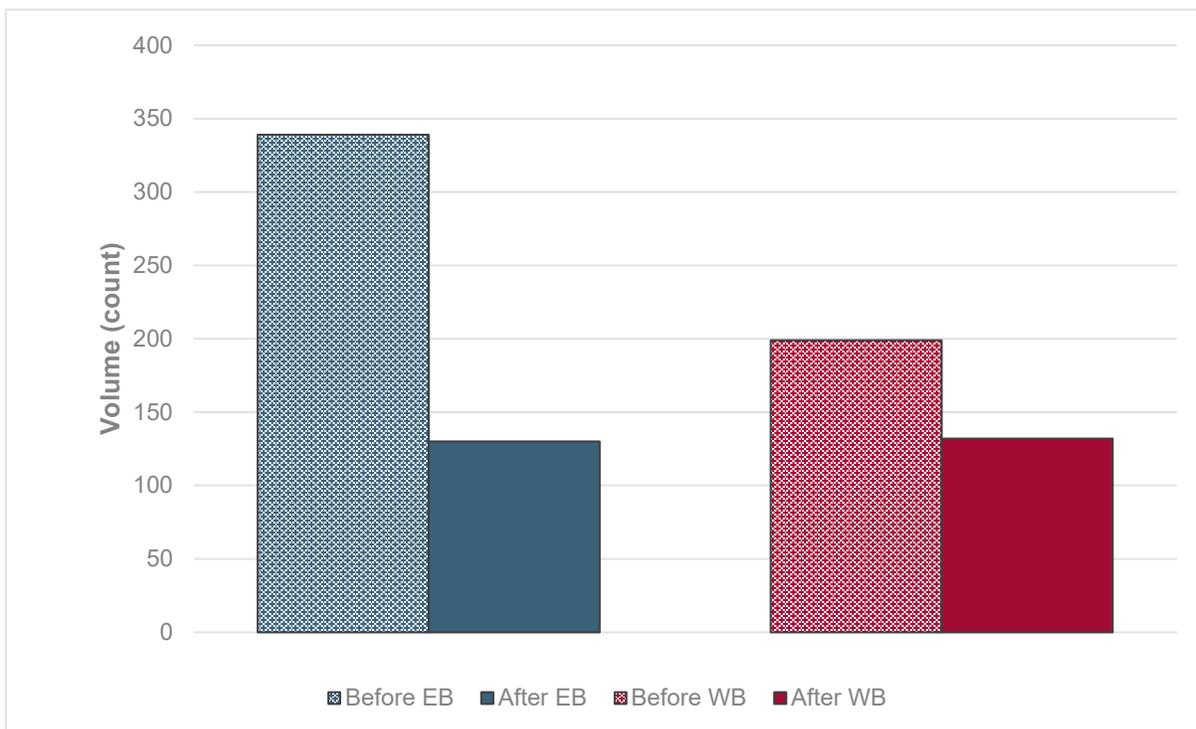


Figure 6: Total Volumes in Transit Lane at 16th Ave

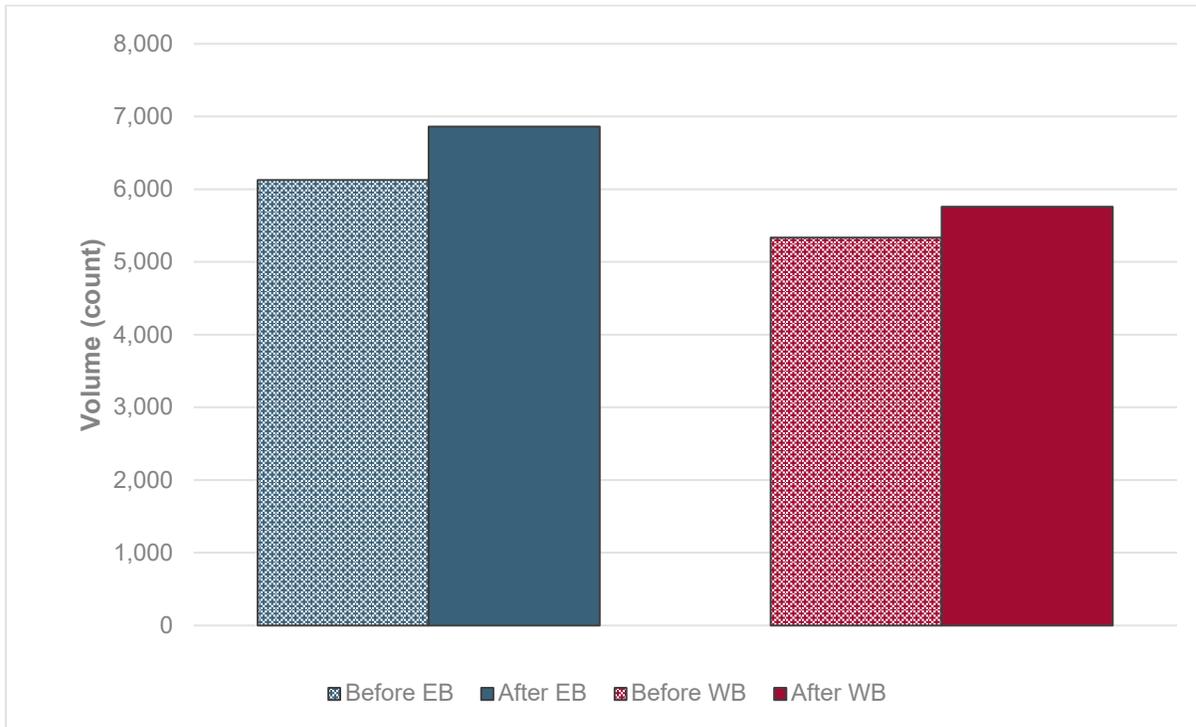


Figure 7: Total Volumes in General Purpose Lane at 21st Ave

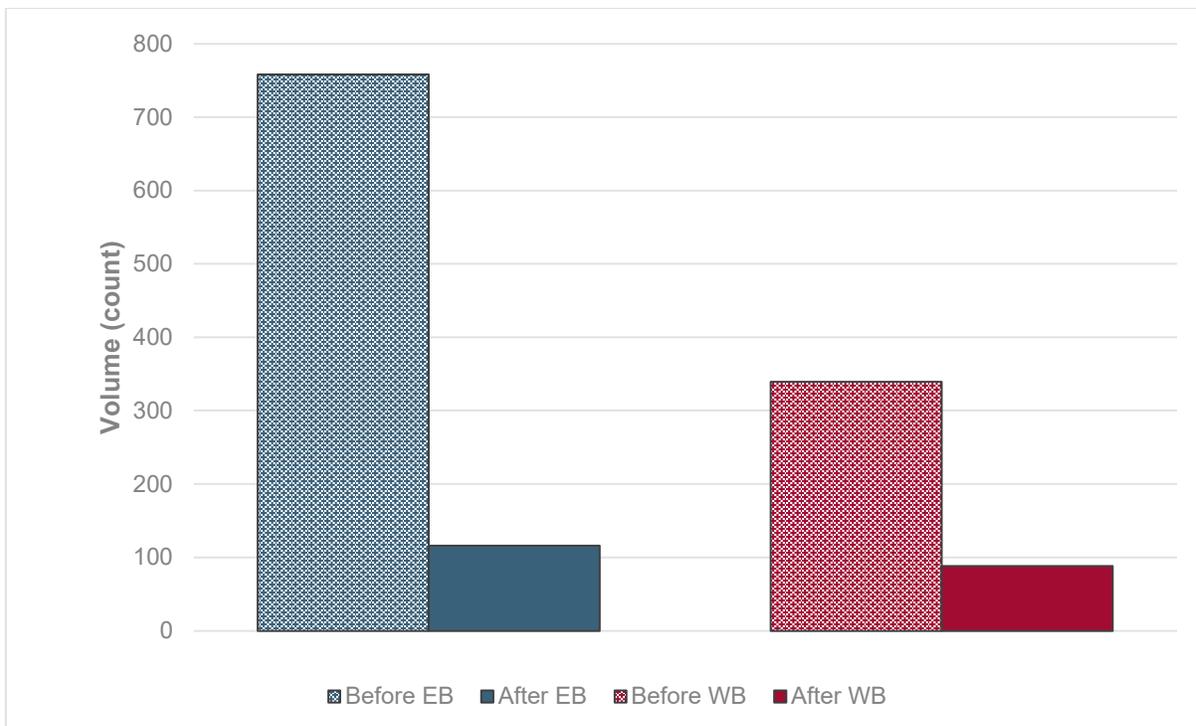


Figure 8: Total Volumes in Transit Lane at 21st Ave

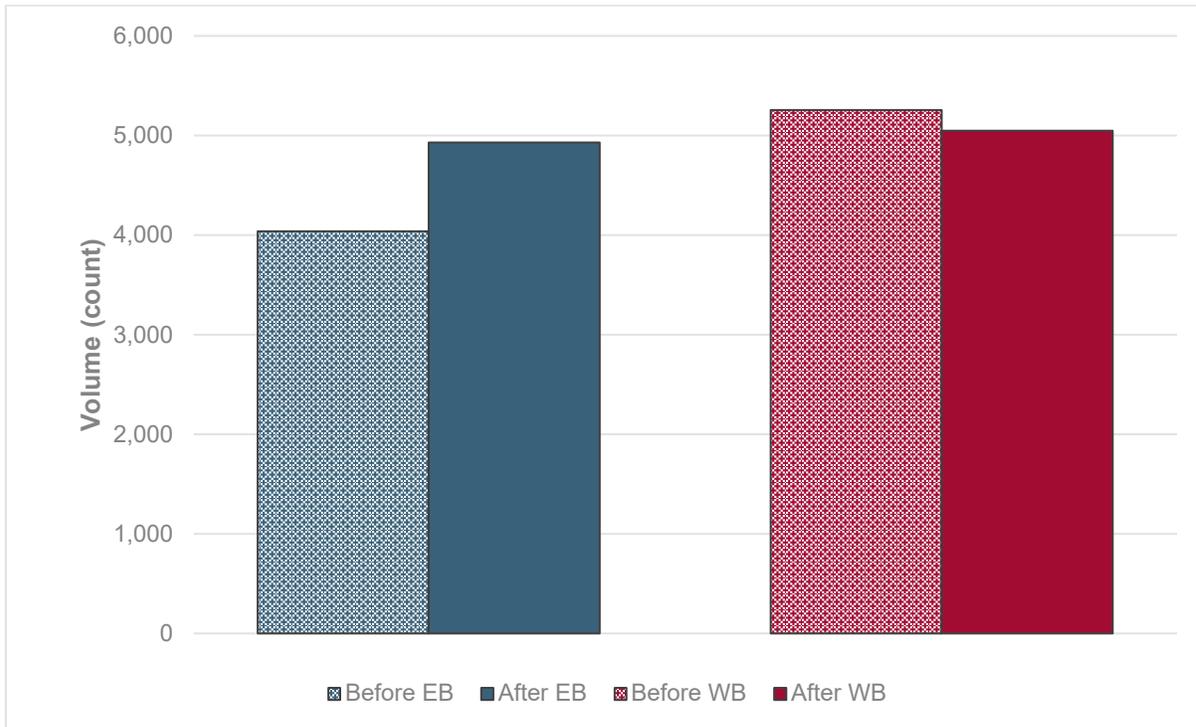


Figure 9: Total Volumes in General Purpose Lane at 30th Ave

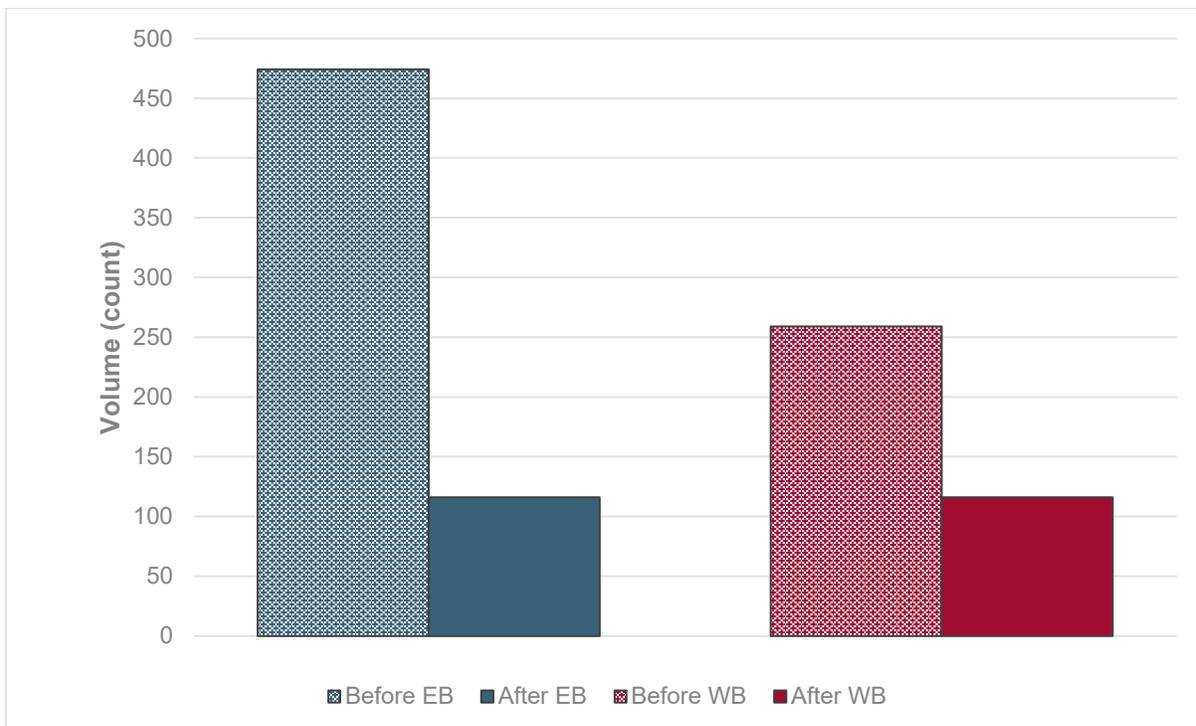


Figure 10: Total Volumes in Transit Lane at 30th Ave

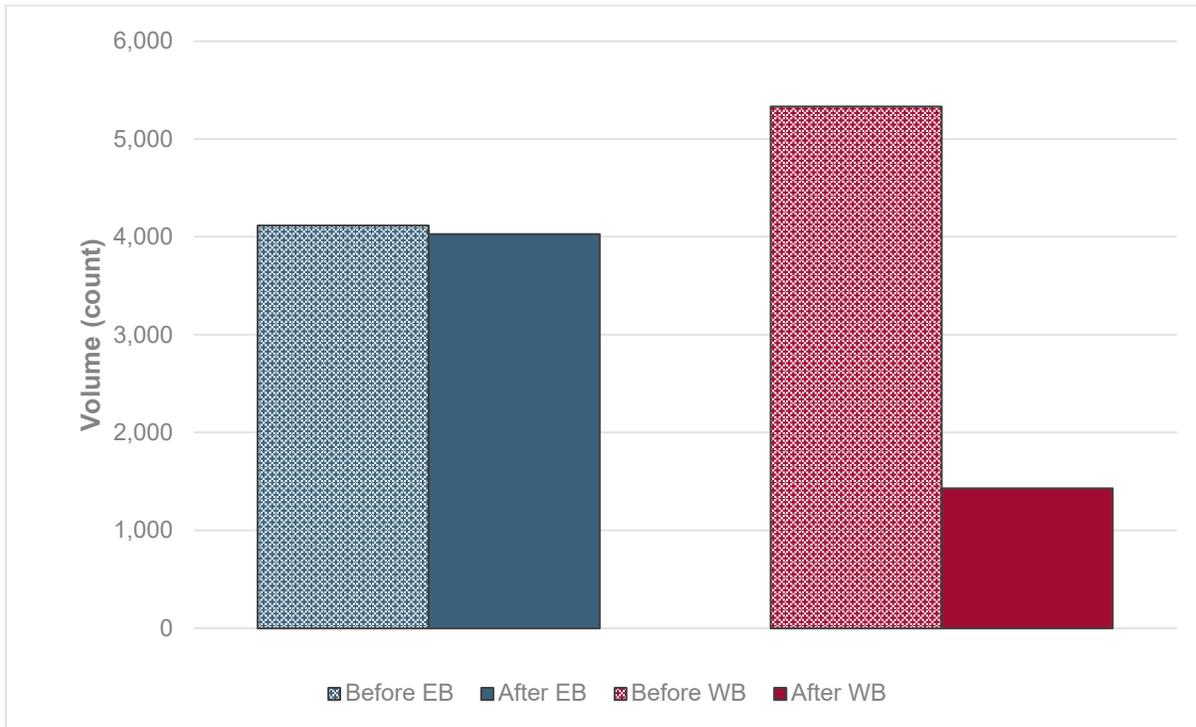


Figure 11: Total Volumes in General Purpose Lane at 34th Ave

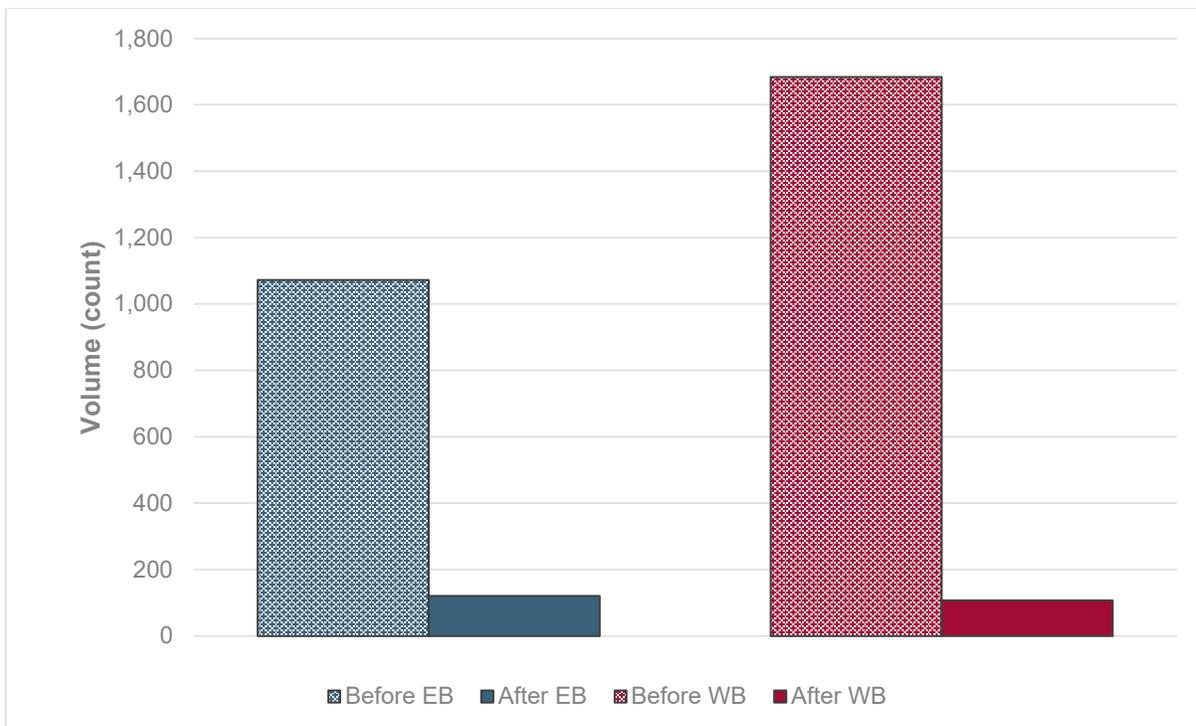


Figure 12: Total Volumes in Transit Lane at 34th Ave

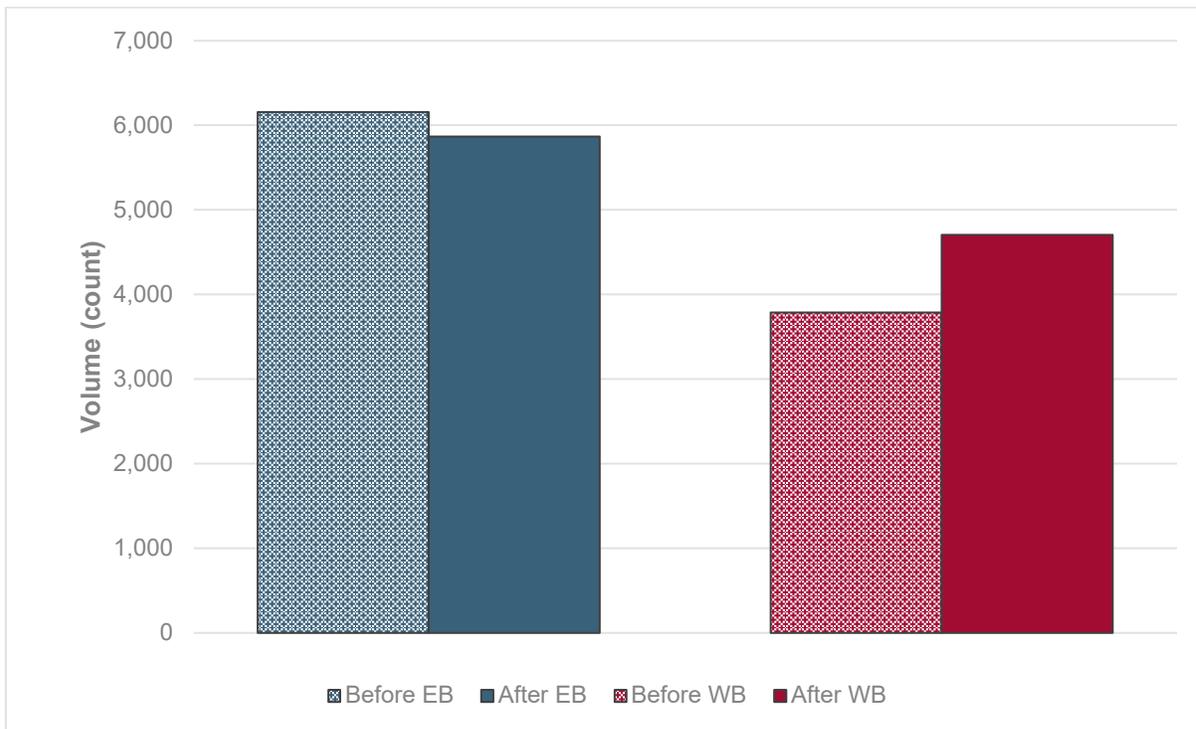


Figure 13: Total Volumes in General Purpose Lane at 37th Ave

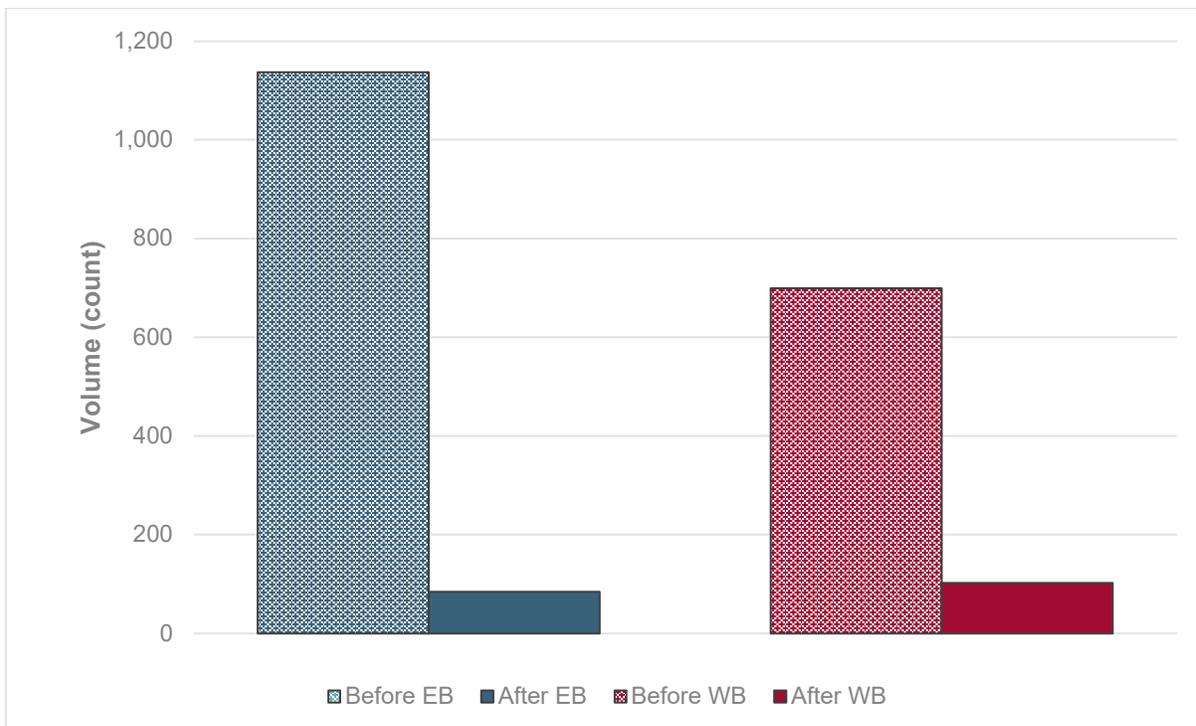


Figure 14: Total Volumes in Transit Lane at 37th Ave

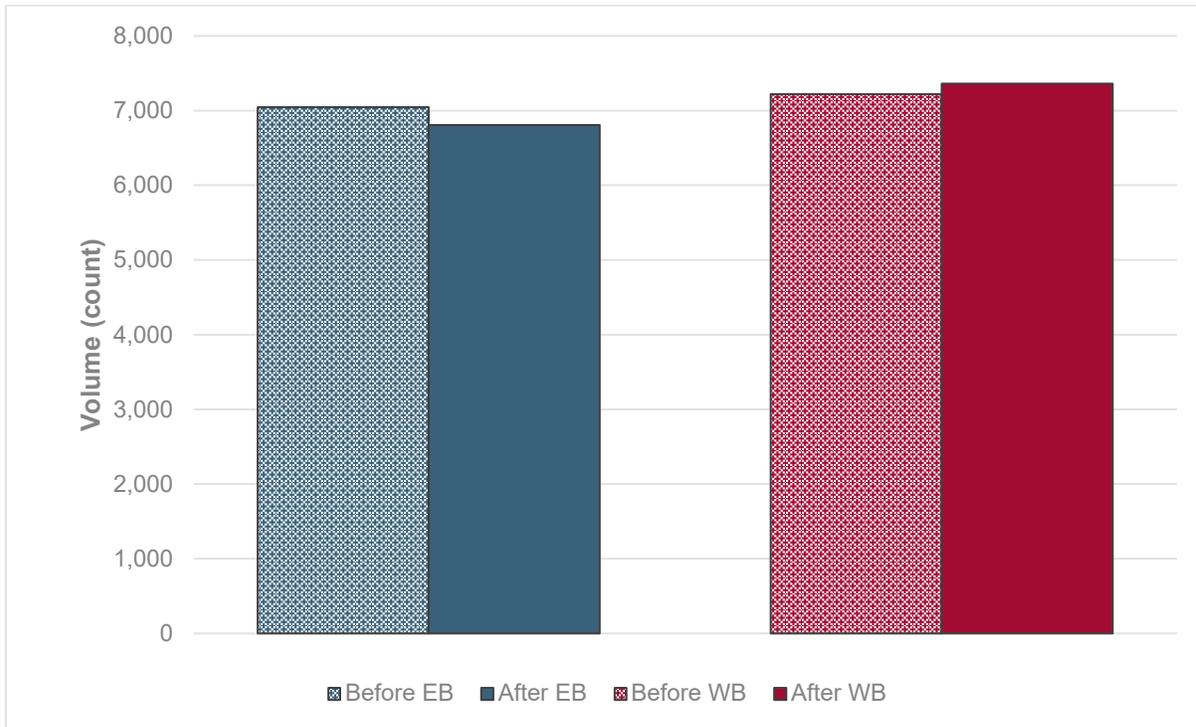


Figure 15: Total Volumes in General Purpose Lane at 40th Ave

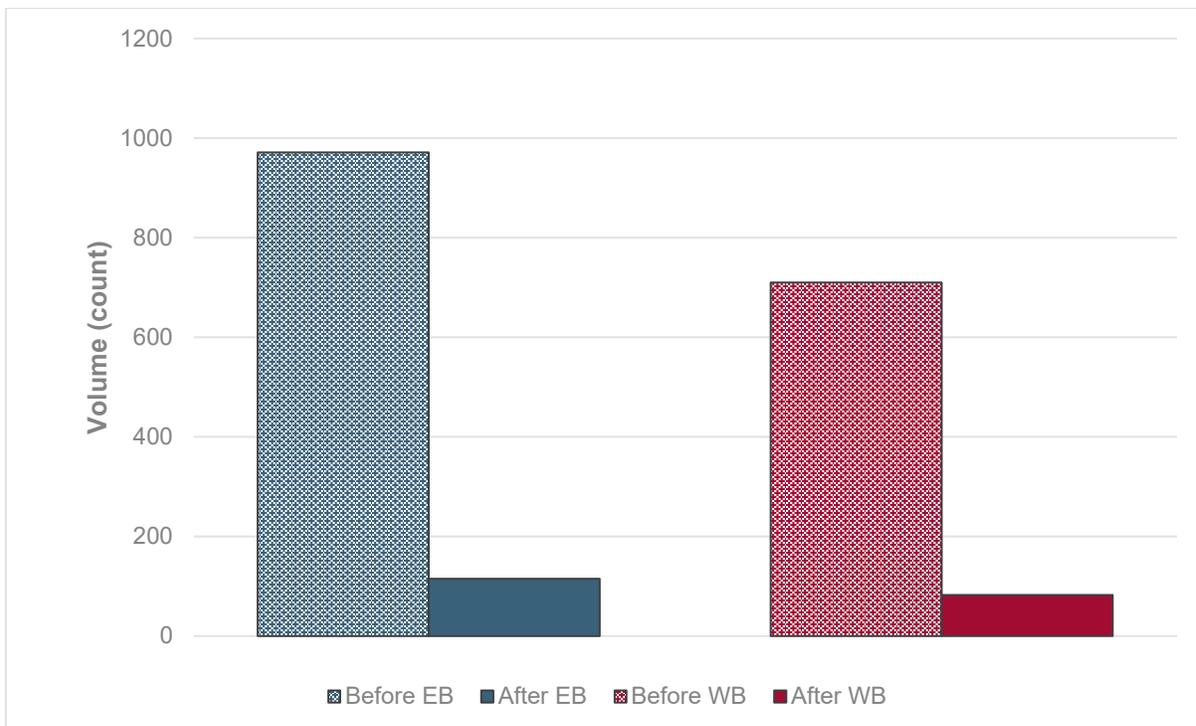


Figure 16: Total Volumes in Transit Lane at 40th Ave

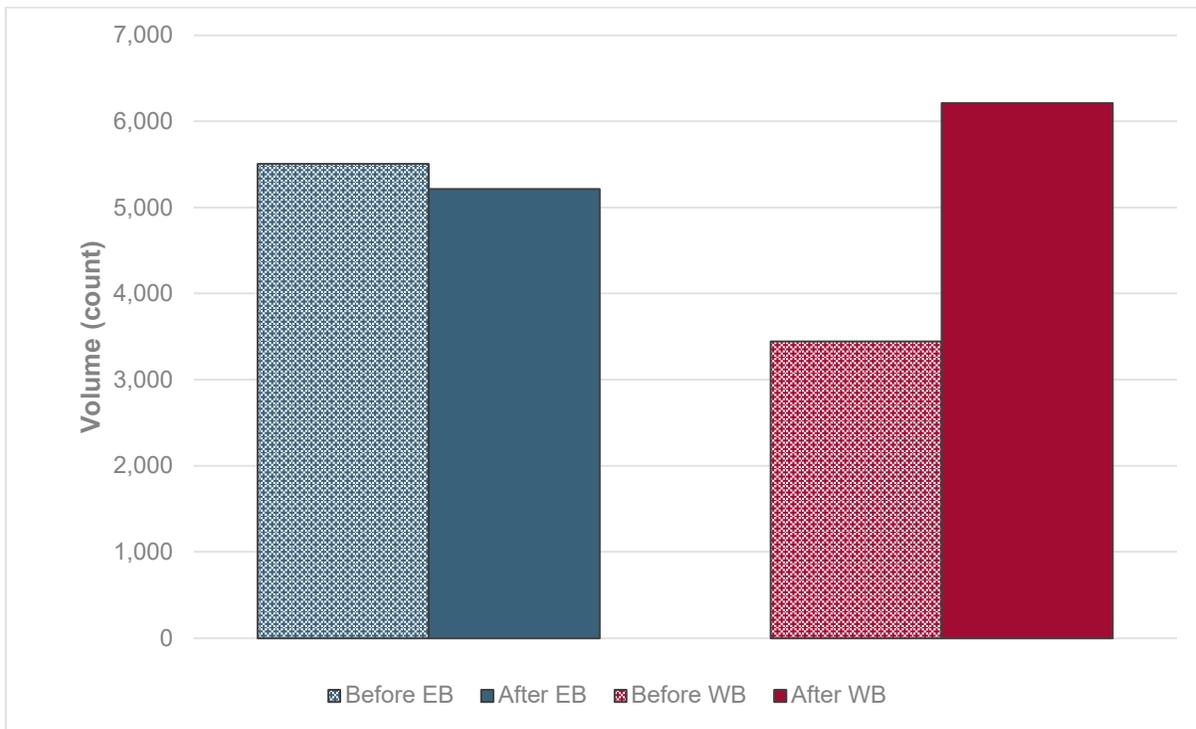


Figure 17: Total Volumes in General Purpose Lane at 48th Ave

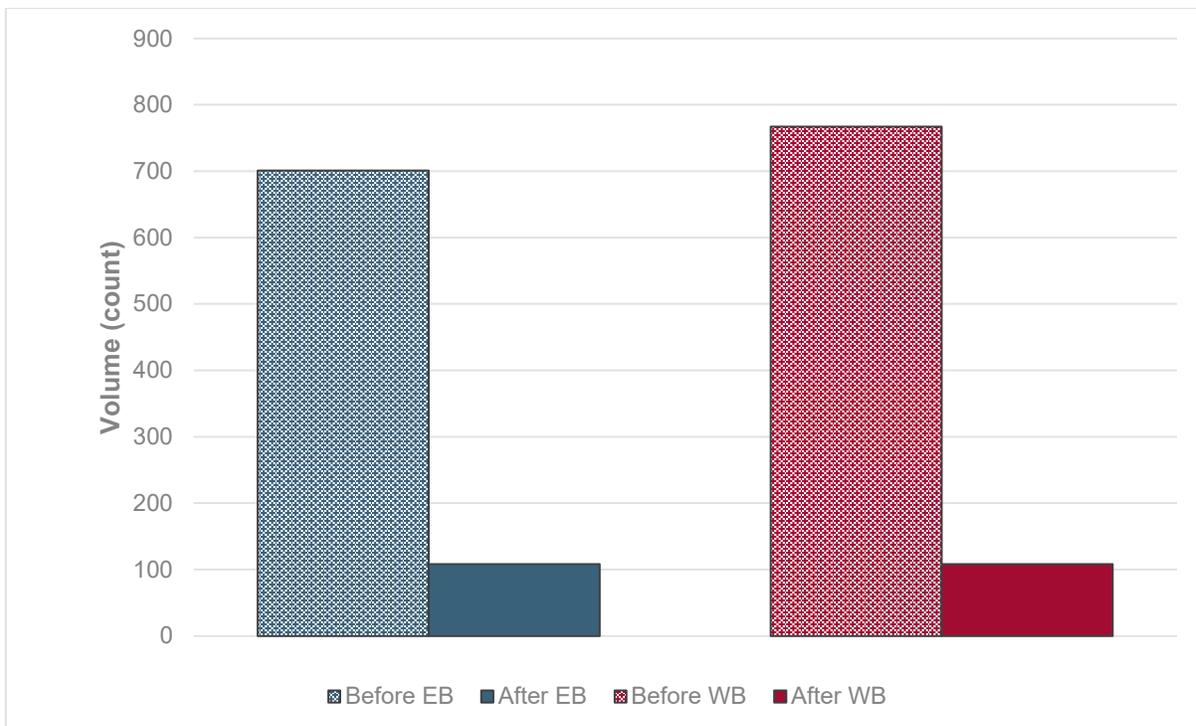


Figure 18: Total Volumes in Transit Lane at 48th Ave

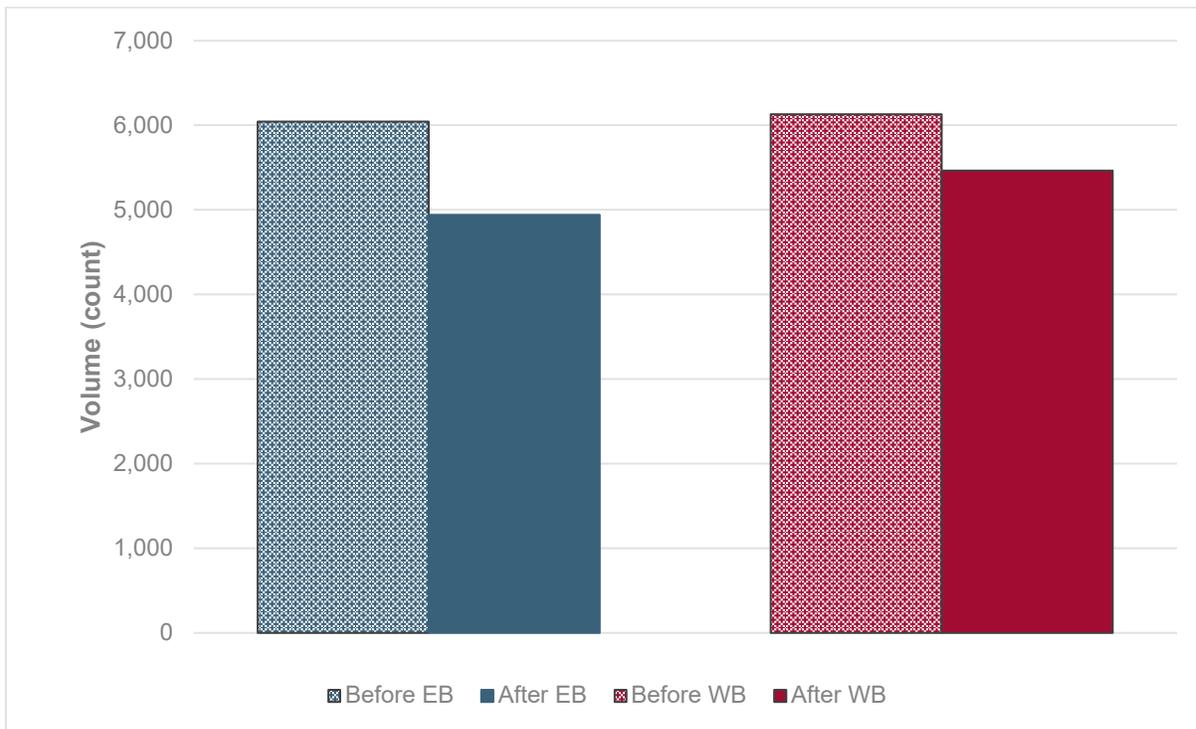


Figure 19: Total Volumes in General Purpose Lane at 58th Ave

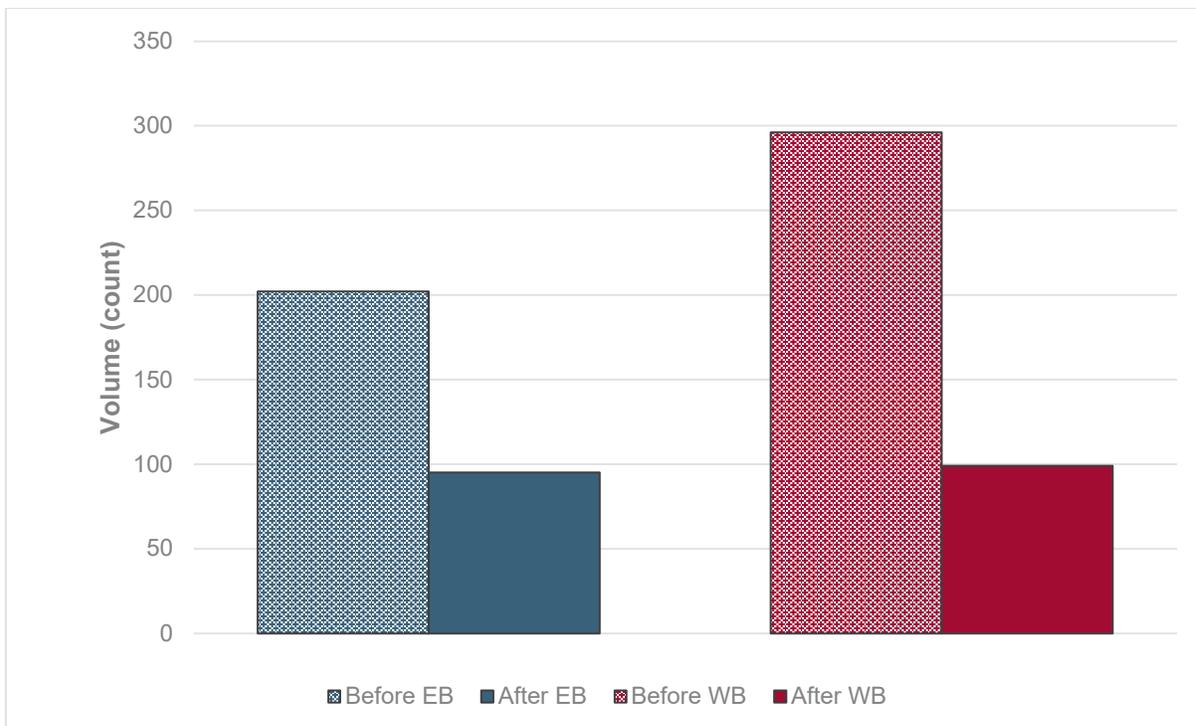


Figure 20: Total Volumes in Transit Lane at 58th Ave

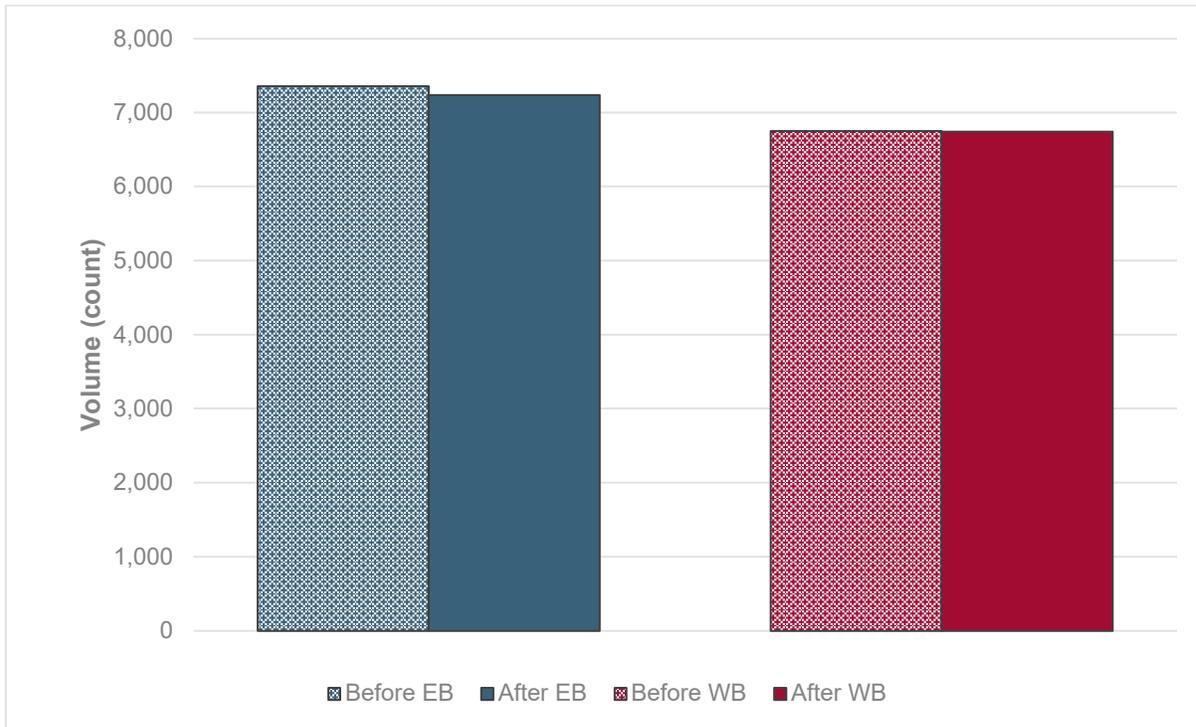


Figure 21: Total Volumes in General Purpose Lane at 64th Ave

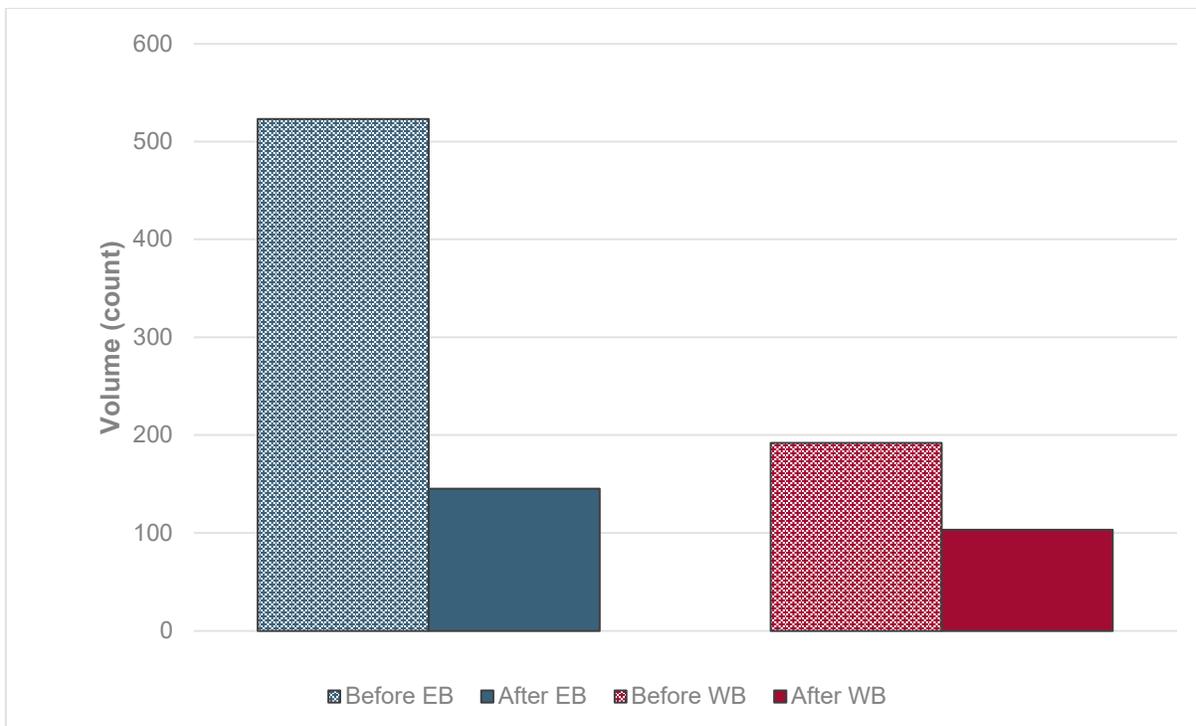


Figure 22: Total Volumes in Transit Lane at 64th Ave

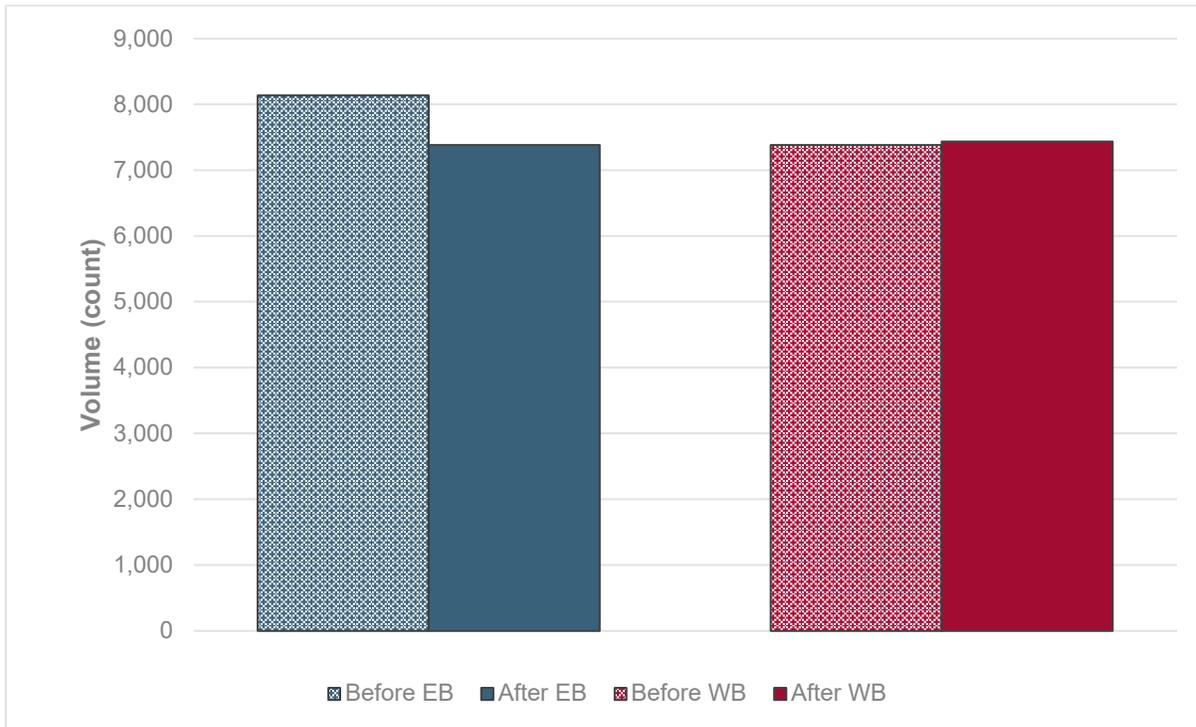


Figure 23: Total Volumes in General Purpose Lane at 75th Ave

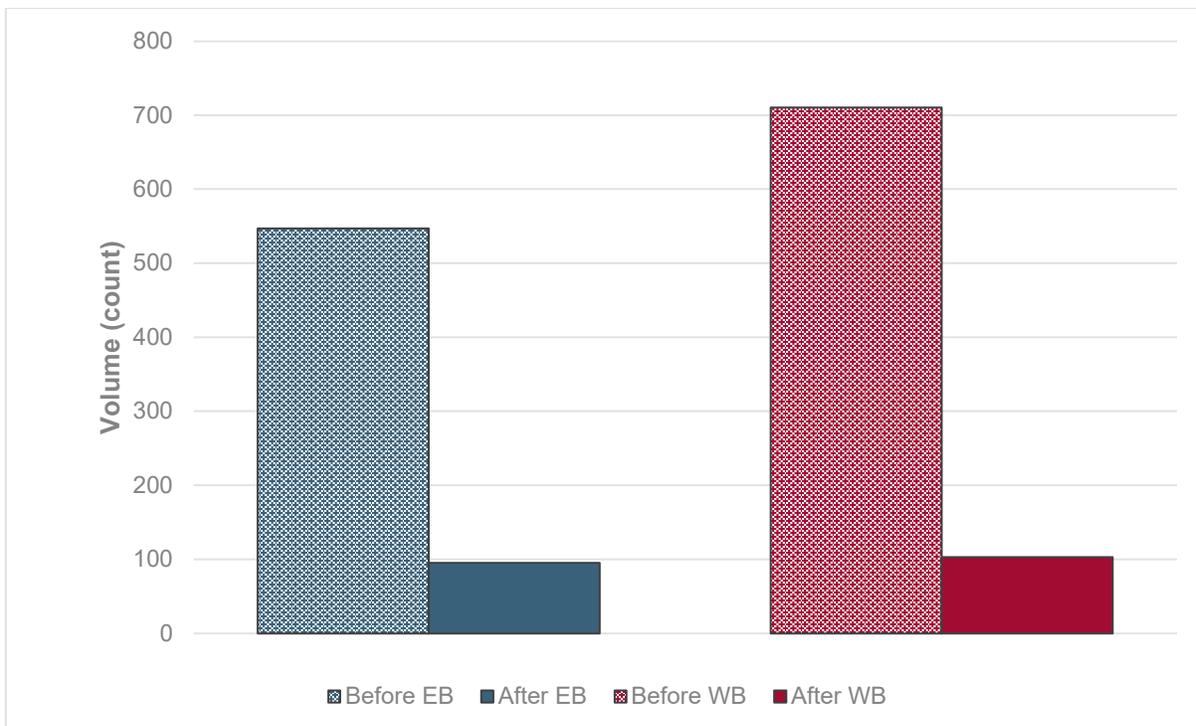


Figure 24: Total Volumes in Transit Lane at 75th Ave

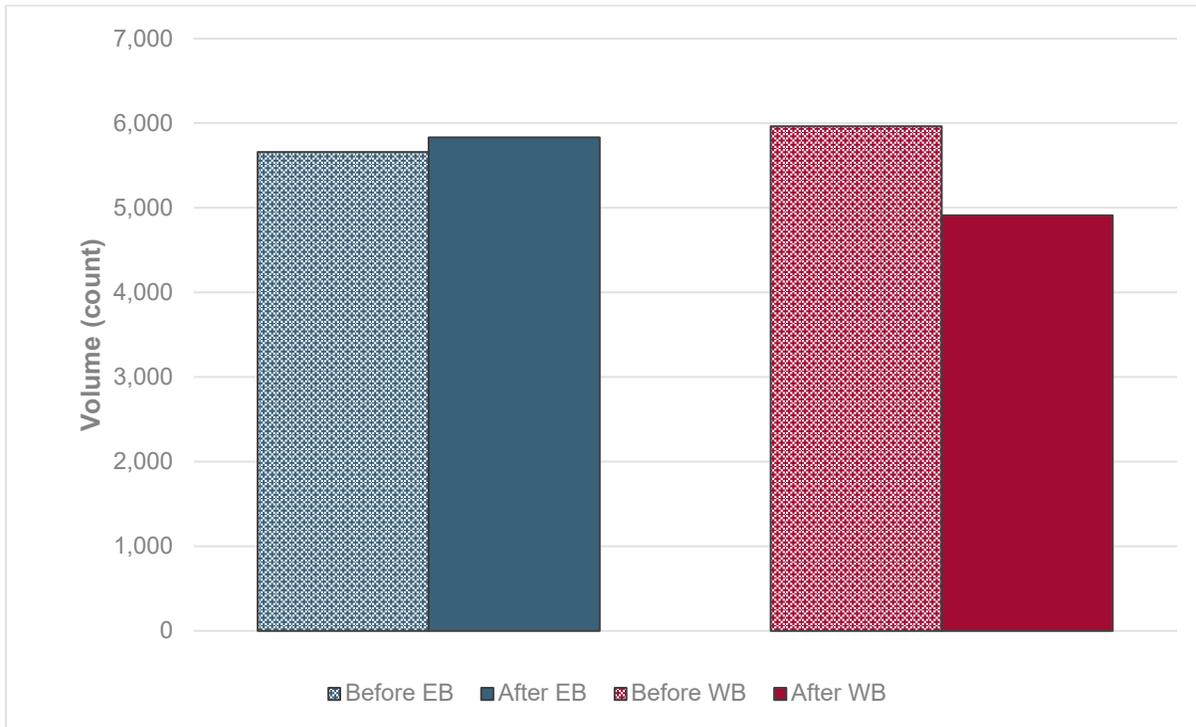


Figure 25: Total Volumes in General Purpose Lane at 82nd Ave

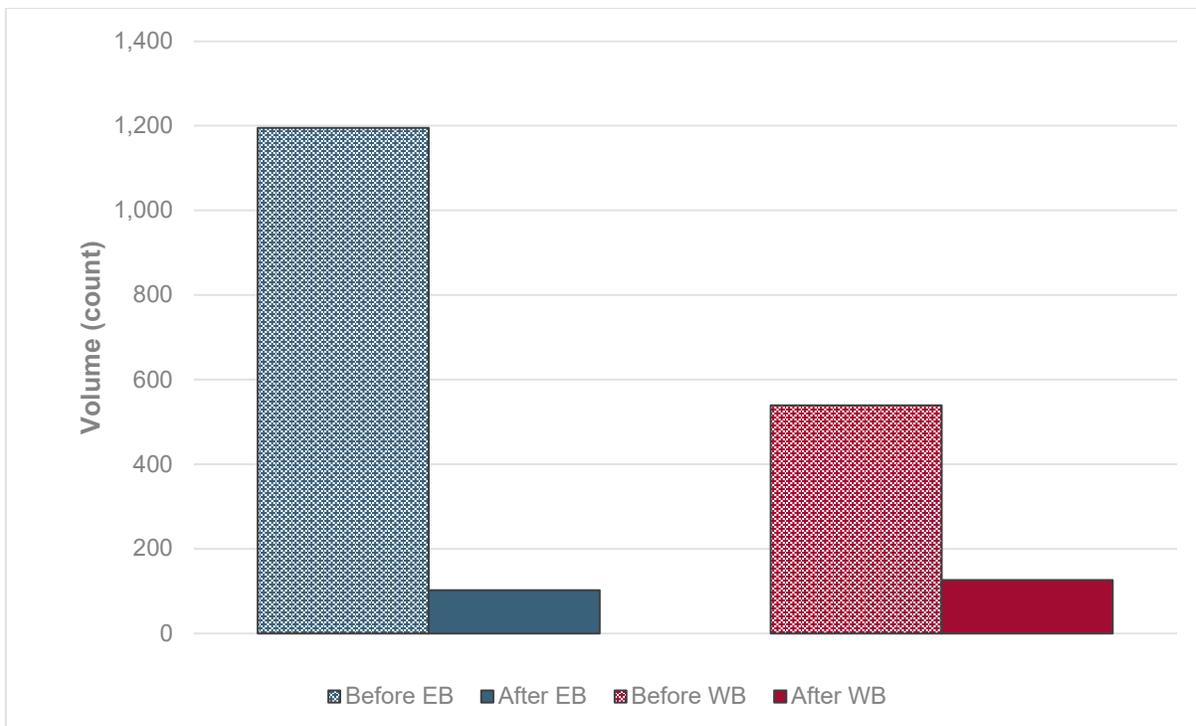


Figure 26: Total Volumes in Transit Lane at 82nd Ave

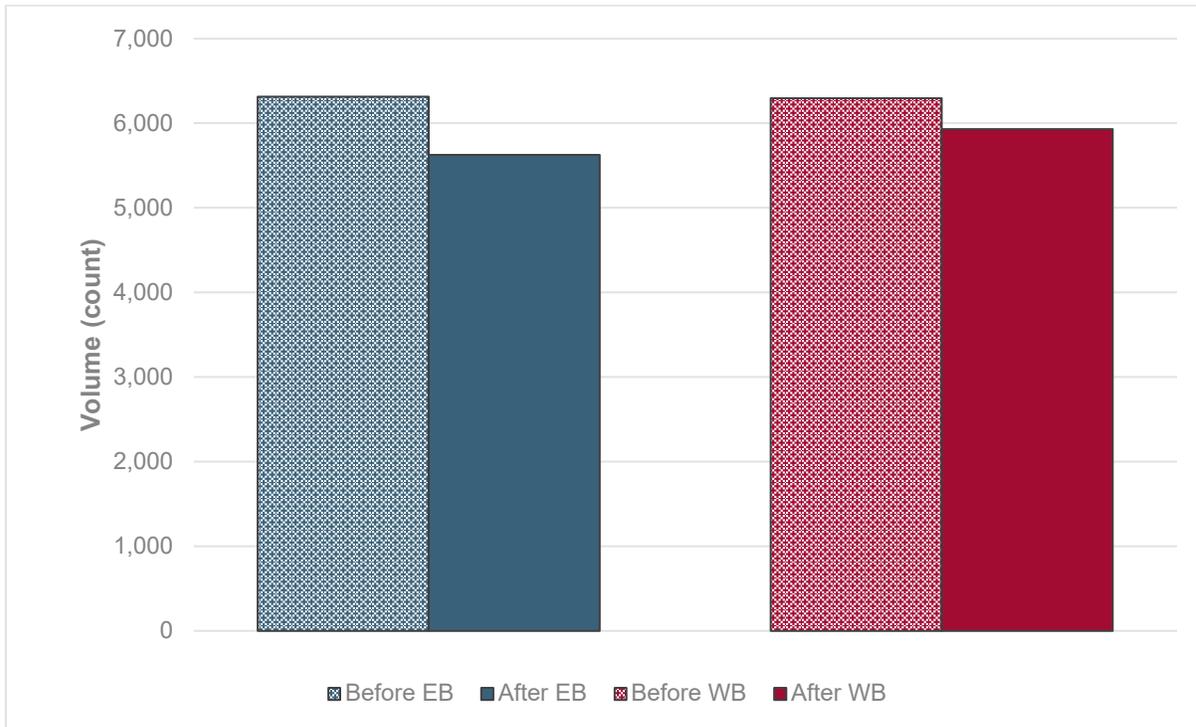


Figure 27: Total Volumes in General Purpose Lane at 88th Ave

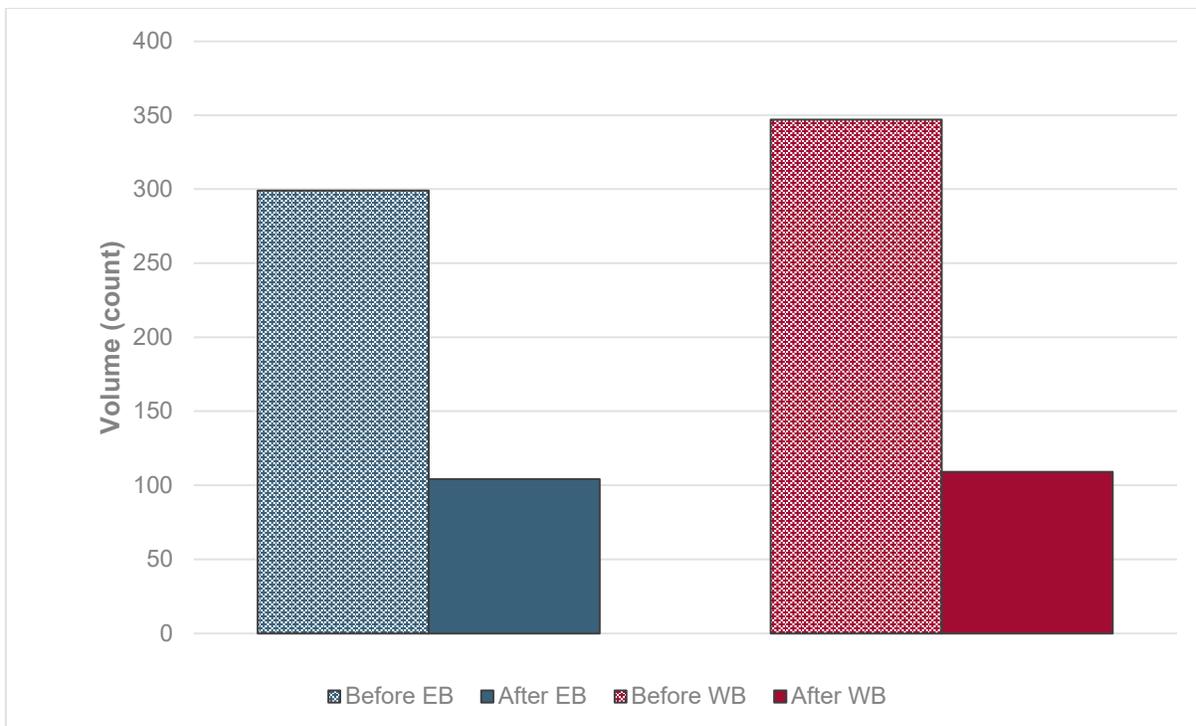


Figure 28: Total Volumes in Transit Lane at 88th Ave

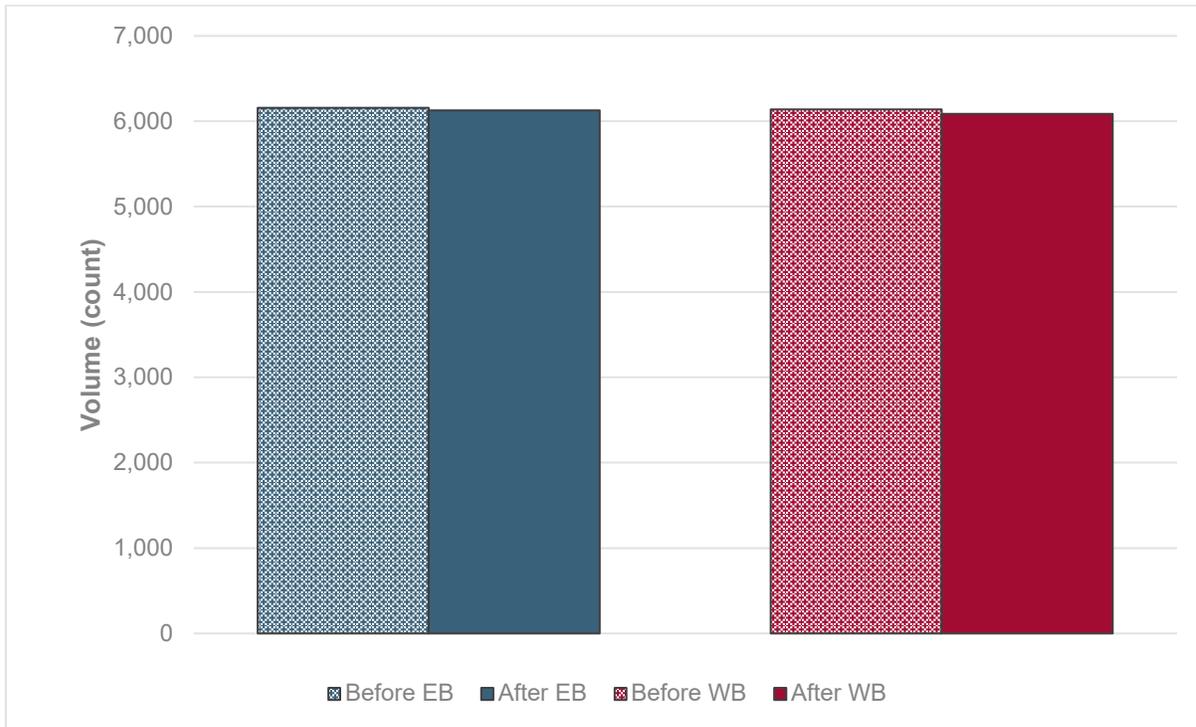


Figure 29: Total Volumes in General Purpose Lane at 96th Ave

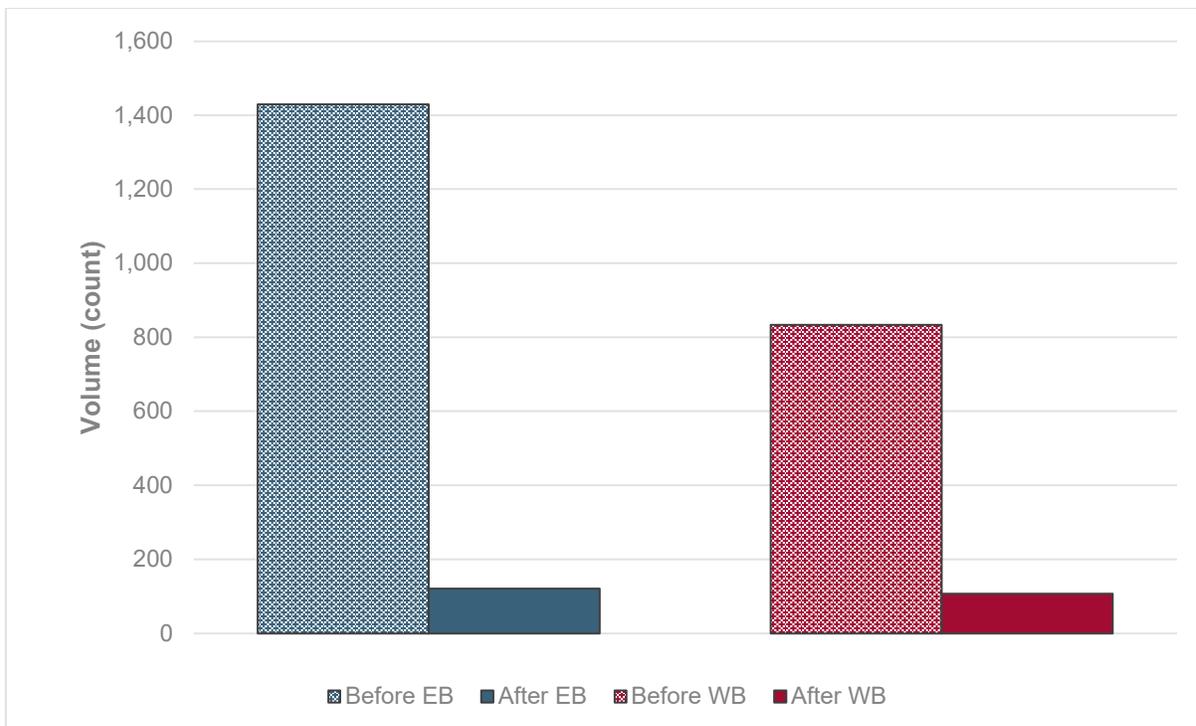


Figure 30: Total Volumes in Transit Lane at 96th Ave

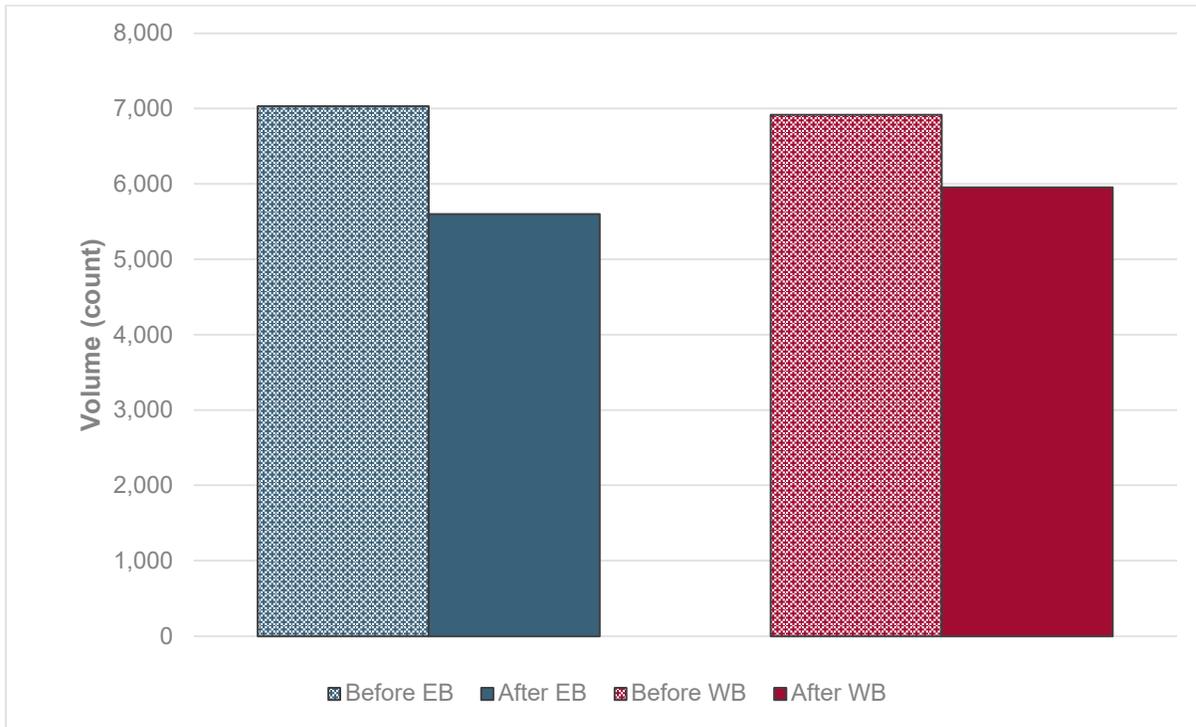


Figure 31: Total Volumes in General Purpose Lane at 102nd Ave

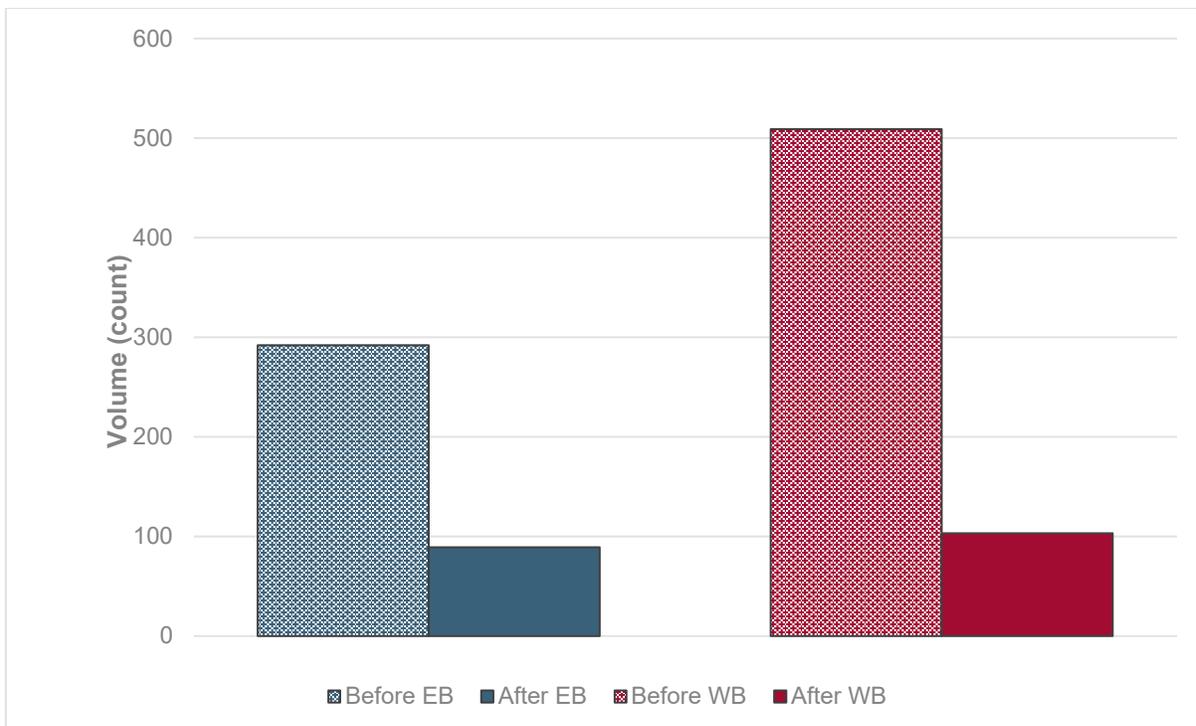


Figure 32: Total Volumes in Transit Lane at 102nd Ave

SPEED

Speed data was assessed as the average speed over a 3 day mid-week period in 5 mph increments and summarized in **Figures 33 and 34**. The pie charts represent the distribution of speeds in speed buckets over 5 mph of the posted limit, with the color getting darker as speed increases. **Table 2** depicts the comparison of the before-after speeds for the general purpose lanes and transit lanes by location. **Figures 35 through 62** depict the distribution of speed observed in the general purpose lanes and transit lanes by location. As part of the International Quick Build Project, all posted speed limit signs were lowered from 30 mph to 25 mph.

Based on a review of the before and after speed data, the following interpretations and conclusions were identified.

- Overall, the speed data shows significant reductions in both general purpose and transit only lane speeds due to the installation of channelizers.
 - General Purpose Lanes
 - Before speeds:
 - Average: 23.9 mph
 - 50th percentile: 23.3 mph
 - 85th percentile: 29.4 mph
 - After speeds:
 - Average: 22.0 mph
 - 50th percentile: 21.9 mph
 - 85th percentile: 27.5 mph
 - Transit Only Lanes
 - Before speeds:
 - Average: 29.2 mph
 - 50th percentile: 25.9 mph
 - 85th percentile: 40.2 mph
 - After speeds:
 - Average: 24.4 mph
 - 50th percentile: 23.6 mph
 - 85th percentile: 28.3 mph
- In the after condition, most of the general purpose lane 85th percentile speeds were within 5 mph of the posted 25 mph speed limit. The outliers EB were at 48th and 88th Avenues and WB at 64th and 88th Avenues;
 - At these four outlier locations, 85th percentile speeds were reduced from before the channelizer installation, except for WB 88th Avenue which went from 32mph to 34mph.
- After transit lane 85th percentile speeds are now all within 9mph of the posted speed limit of 25mph. Many decreases in 85th percentile speeds compared to before conditions were between 15 and 20 mph, and the greatest decrease in 85th percentile speed was 31.1 mph (WB 58th Ave segment)
- Speed differentials between transit and general-purpose lane traffic through Fruitvale, and from 82nd to 102nd Avenues have reduced between 7 mph and 23mph.
- As shown in the Transit Only Lane speed distribution charts, instances of speeds 10+ mph above speed limit decreased in nearly all segments

- The only location not showing a reduction in excessive speeding was WB 16th Avenue. This segment is at the beginning of the transit lane and saw more Non-Transit ADT above the 85th percentile than all other WB locations.
- The percentage of vehicles in the transit lane traveling greater than 10 mph above the speed limit before and after the project were 22% and 6%, respectively, so excessive speeding has decreased.
- WB 58th Avenue after data showed the corridor's lowest 85th percentile speed of 16mph, which could be due to the Tempo stop that exists at the 58th intersection.
- In the after condition, EB 64th Avenue had the most Non-Transit ADT above with 85th percentile at 22 vehicles, and 145 total non-transit vehicles but also had an 85th percentile speed of 25mph.

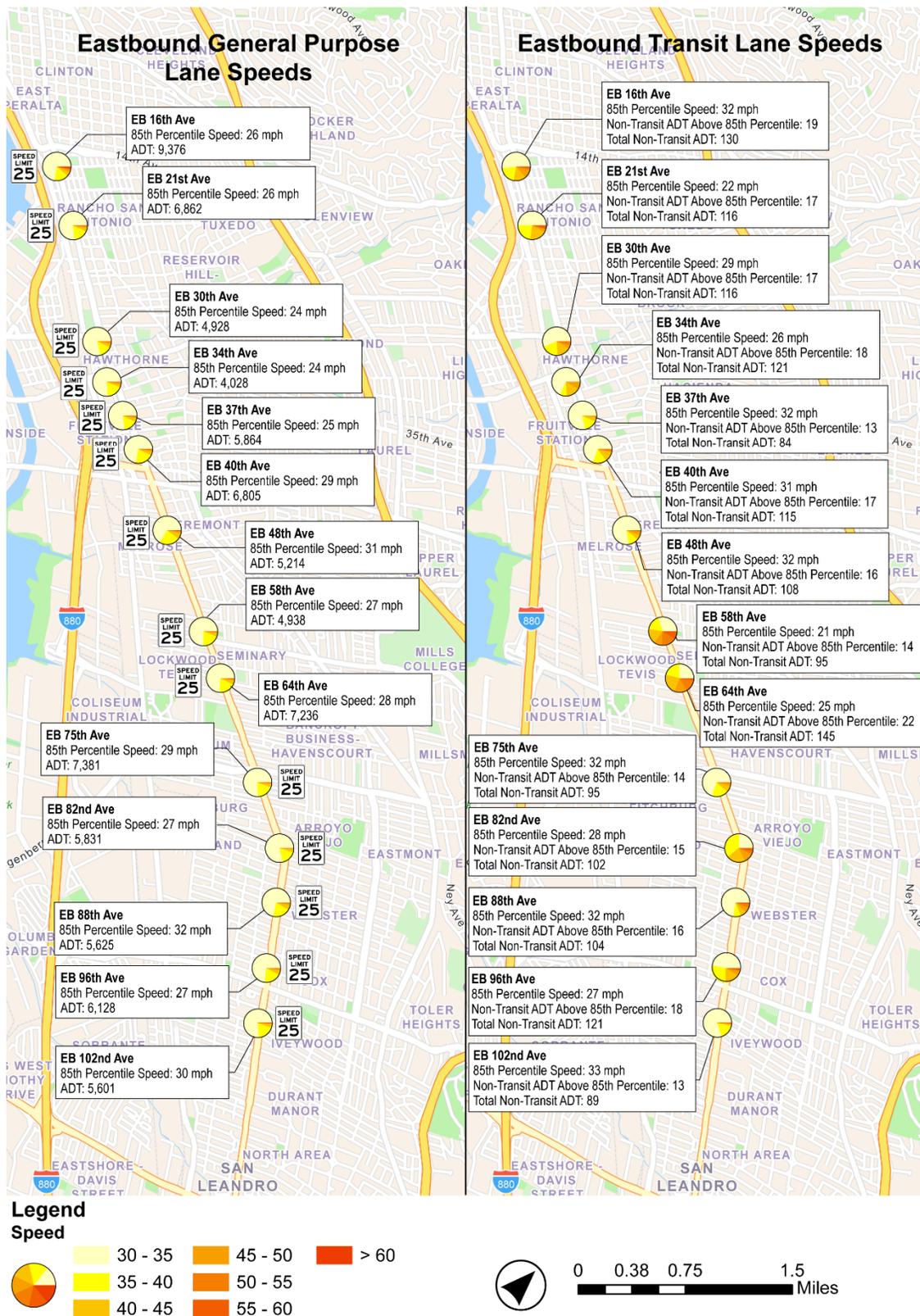


Figure 33: Eastbound General Purpose and Transit Lane Speeds

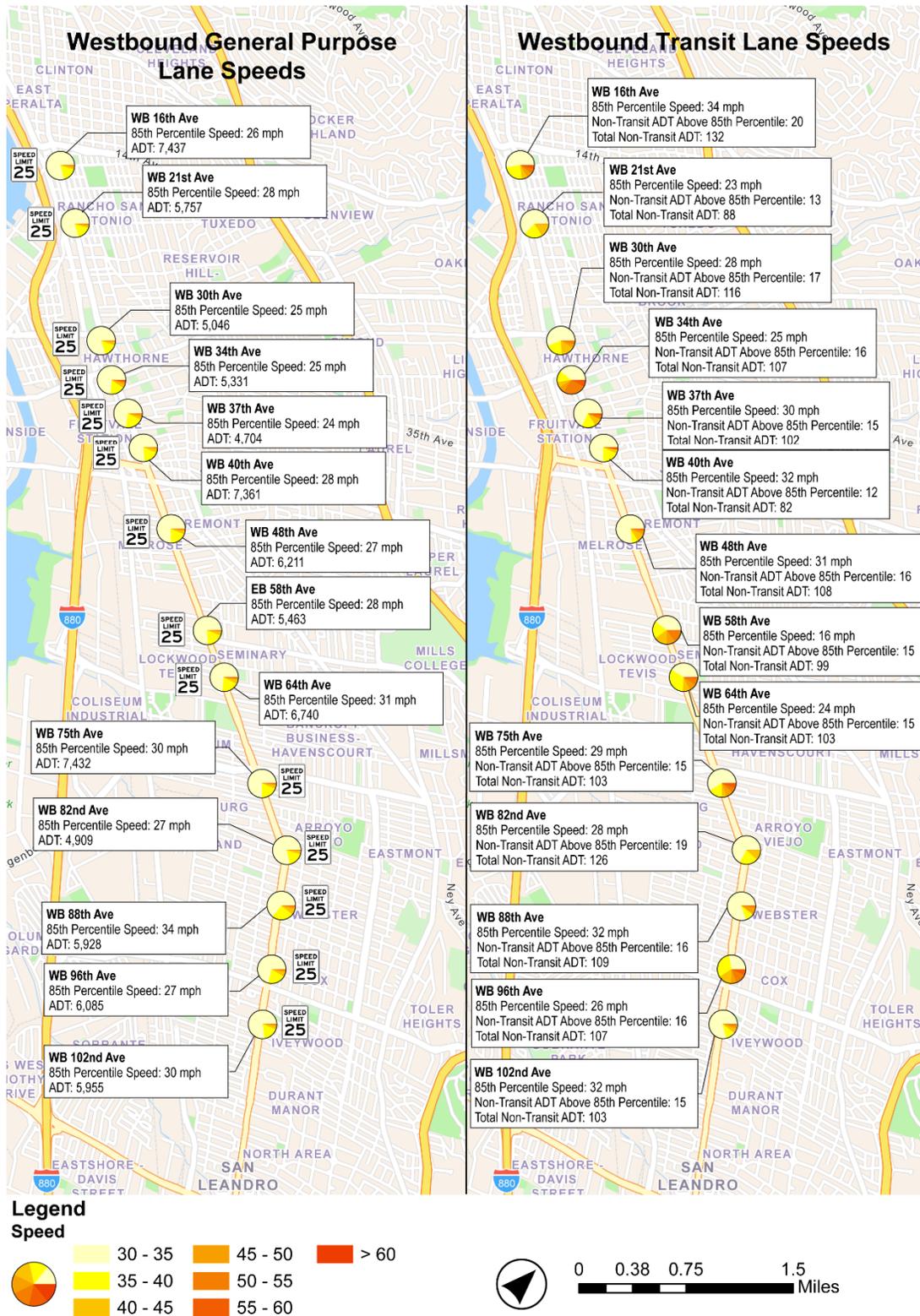


Figure 34: Westbound General Purpose and Transit Lane Speeds

Table 2: Before-After Speed (in MPH) Comparison

Location	EB										WB									
	Before (mph)			After (mph)				EB Change (%)			Before (mph)			After (mph)				WB Change (%)		
	Average	50th %-tile	85th %-tile	Average	50th %-tile	85th %-tile	Transit vs GP Diff	Average (%)	50th %-tile (%)	85th %-tile (%)	Average	50th %-tile	85th %-tile	Average	50th %-tile	85th %-tile	Transit vs GP Diff	Average	50th %-tile	85th %-tile
1 (16 th Ave.) - General Purpose Lane	23.1	22.9	27.3	21.4	21.1	26.2		-1.7	-1.8	-1.1	22.8	22.5	27.1	21.3	21.2	25.9		-1.5	-1.3	-1.2
1 (16 th Ave.) - Transit Only Lane	28.8	27.4	36.0	26.7	25.1	32.3	6.1	-2.1	-2.3	-3.7	27.0	26.1	32.7	28.3	27.1	34.5	8.6	1.3	1.0	1.8
2 (21 st Ave.) - General Purpose Lane	20.5	20.2	25.2	20.7	20.7	25.7		0.2	0.5	0.5	23.0	22.9	27.3	23.5	23.3	27.8		0.5	0.4	0.5
2 (21 st Ave.) - Transit Only Lane	26.1	23.0	36.2	17.8	16.0	21.6	-4.1	-8.3	-7.0	-14.6	24.7	22.8	31.5	20.5	19.8	22.9	-4.9	-4.2	-3.0	-8.6
3 (30 th Ave.) - General Purpose Lane	21.6	20.1	27.4	18.1	17.6	23.5		-3.5	-2.5	-3.9	22.8	22.3	27.0	21.2	21.1	25.1		-1.6	-1.2	-1.9
3 (30 th Ave.) - Transit Only Lane	29.3	25.2	39.6	23.7	22.7	29.3	5.8	-5.6	-2.5	-10.3	25.9	24.5	31.1	25.2	25.0	27.9	2.8	-0.7	0.5	-3.2
4 (34 th Ave.) - General Purpose Lane	21.0	17.0	28.6	18.2	17.3	24.4		-2.8	0.3	-4.2	22.4	20.5	27.0	13.9	19.4	25.1		-8.5	-1.1	-1.9
4 (34 th Ave.) - Transit Only Lane	28.0	22.9	42.1	21.2	20.5	26.1	1.7	-6.8	-2.4	-16.0	29.6	23.8	44.7	21.6	21.3	24.8	-0.3	-8.0	-2.5	-19.9
5 (37 th Ave.) - General Purpose Lane	22.3	20.9	25.2	20.3	20.0	25.1		-2.0	-0.9	-0.1	20.9	20.2	27.2	18.5	18.1	23.8		-2.4	-2.1	-3.4
5 (37 th Ave.) - Transit Only Lane	31.0	25.4	47.9	27.2	26.3	31.6	6.5	-3.8	0.9	-16.3	21.8	20.9	28.3	24.7	23.8	29.5	5.7	2.9	2.9	1.2
6 (40 th Ave.) - General Purpose Lane	25.3	23.9	30.7	23.5	22.9	28.8		-1.8	-1.0	-1.9	22.9	22.5	29.3	21.8	21.6	27.7		-1.1	-0.9	-1.6
6 (40 th Ave.) - Transit Only Lane	33.7	28.6	49.9	27.2	26.9	31.2	2.4	-6.5	-1.7	-18.7	26.7	25.6	33.7	27.6	27.4	32.3	4.6	0.9	1.8	-1.4
7 (48 th Ave.) - General Purpose Lane	25.8	25.4	31.8	24.6	24.3	30.5		-1.2	-1.1	-1.3	24.6	24.3	29.1	21.6	21.3	26.7		-3.0	-3.0	-2.4
7 (48 th Ave.) - Transit Only Lane	27.7	26.4	34.9	27.8	27.4	32.3	1.8	0.1	1.0	-2.6	27.9	25.9	35.8	27.1	26.6	30.8	4.1	-0.8	0.7	-5.0
8 (58 th Ave.) - General Purpose Lane	25.0	24.8	31.0	20.6	20.3	26.6		-4.4	-4.5	-4.4	26.9	26.5	32.1	23.0	22.7	27.8		-3.9	-3.8	-4.3
8 (58 th Ave.) - Transit Only Lane	24.6	18.5	38.3	18.9	17.0	20.9	-5.7	-5.7	-1.5	-17.4	29.8	27.3	47.4	14.7	12.2	16.3	-11.5	-15.1	-15.1	-31.1
9 (64 th Ave.) - General Purpose Lane	24.2	23.6	29.6	23.0	22.5	28.2		-1.2	-1.1	-1.4	27.4	27.1	33.7	25.4	25.4	31.0		-2.0	-1.7	-2.7
9 (64 th Ave.) - Transit Only Lane	24.8	21.3	34.3	22.2	21.0	25.3	-2.9	-2.6	-0.3	-9.0	27.4	22.3	40.6	20.8	20.3	23.9	-7.1	-6.6	-2.0	-16.7
10 (75 th Ave.) - General Purpose Lane	25.5	25.1	31.0	23.7	23.7	29.1		-1.8	-1.4	-1.9	24.1	23.7	30.5	23.9	23.9	29.6		-0.2	0.2	-0.9
10 (75 th Ave.) - Transit Only Lane	29.8	27.4	40.0	27.9	27.9	32.1	3.0	-1.9	0.5	-7.9	29.2	26.5	39.4	25.0	24.7	28.6	-1.0	-4.2	-1.8	-10.8
11 (82 nd Ave.) - General Purpose Lane	26.3	24.9	30.7	22.8	22.5	27.0		-3.5	-2.4	-3.7	24.0	23.8	30.3	20.3	19.7	26.6		-3.7	-4.1	-3.7
11 (82 nd Ave.) - Transit Only Lane	33.9	28.7	48.3	25.3	25.2	27.5	0.5	-8.6	-3.5	-20.8	32.9	30.2	45.1	23.1	22.1	28.2	1.6	-9.8	-8.1	-16.9
12 (88 th Ave.) - General Purpose Lane	27.9	27.4	34.1	25.9	25.8	31.6		-2.0	-1.6	-2.5	27.1	26.3	32.3	27.8	27.1	33.7		0.7	0.8	1.4
12 (88 th Ave.) - Transit Only Lane	37.4	32.7	51.3	29.2	28.6	32.3	0.7	-8.2	-4.1	-19.0	38.1	33.7	52.8	27.9	27.9	31.9	-1.8	-10.2	-5.8	-20.9
13 (96 th Ave.) - General Purpose Lane	23.5	22.0	30.1	21.4	21.1	27.3		-2.1	-0.9	-2.8	16.7	21.7	27.7	21.1	20.7	27.0		4.4	-1.0	-0.7
13 (96 th Ave.) - Transit Only Lane	29.3	24.3	42.9	23.2	23.0	27.5	0.2	-6.1	-1.3	-15.4	26.0	24.3	33.5	22.4	20.2	25.9	-1.1	-3.6	-4.1	-7.6
14 (102 nd Ave.) - General Purpose Lane	24.8	24.6	30.3	24.4	24.2	29.7		-0.4	-0.4	-0.6	25.5	25.0	30.6	24.6	24.6	29.7		-0.9	-0.4	-0.9
14 (102 nd Ave.) - Transit Only Lane	34.0	29.6	45.5	27.9	27.8	32.7	3.0	-6.1	-1.8	-12.8	32.3	29.6	41.4	27.4	26.9	31.6	1.9	-4.9	-2.7	-9.8

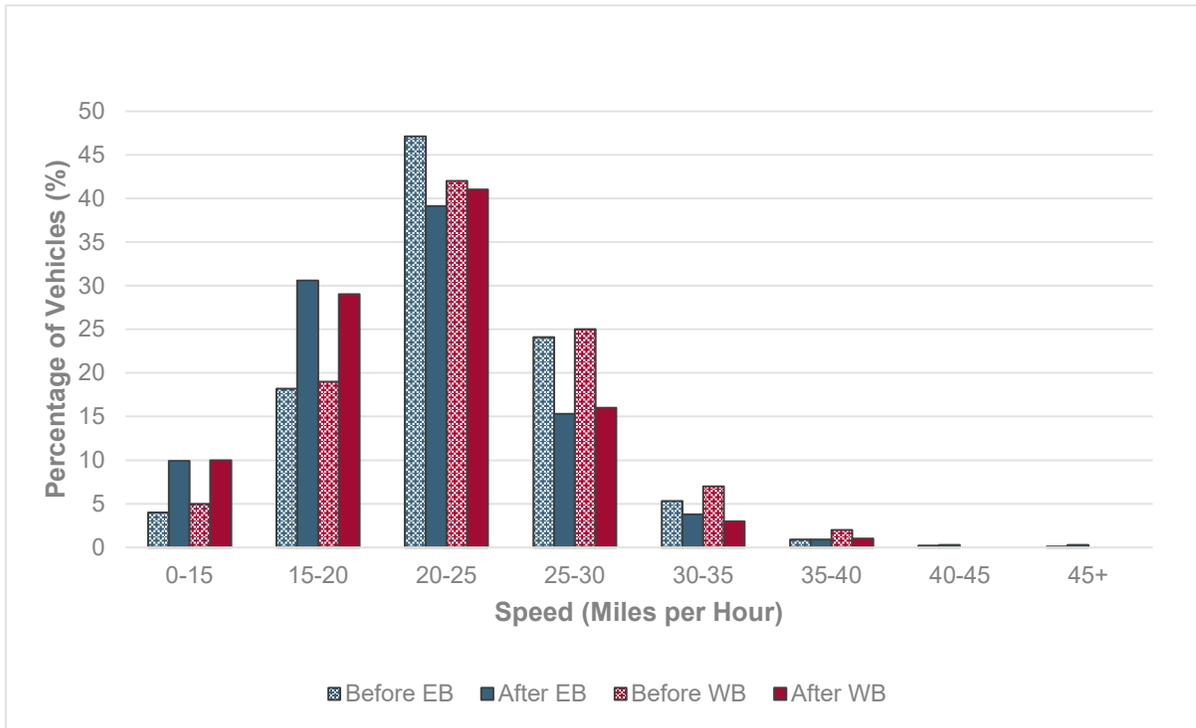


Figure 35: Vehicle Speeds in General Purpose Lane at 16th Ave

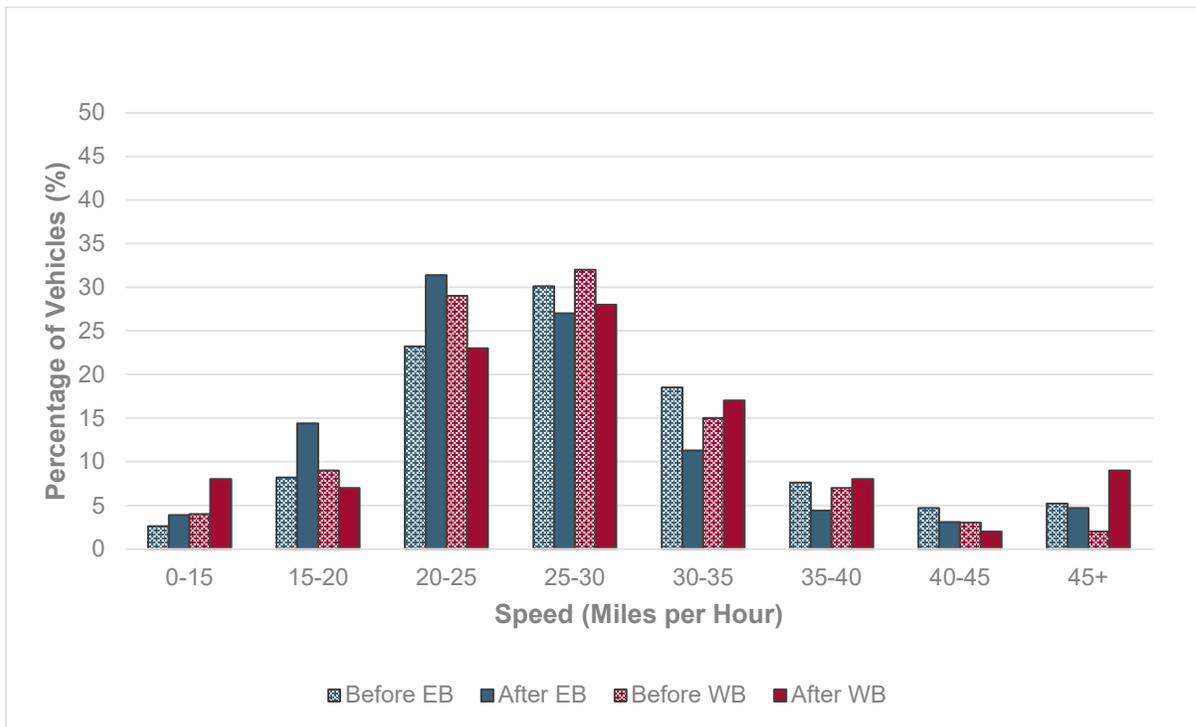


Figure 36: Vehicle Speeds in Transit Lane at 16th Ave

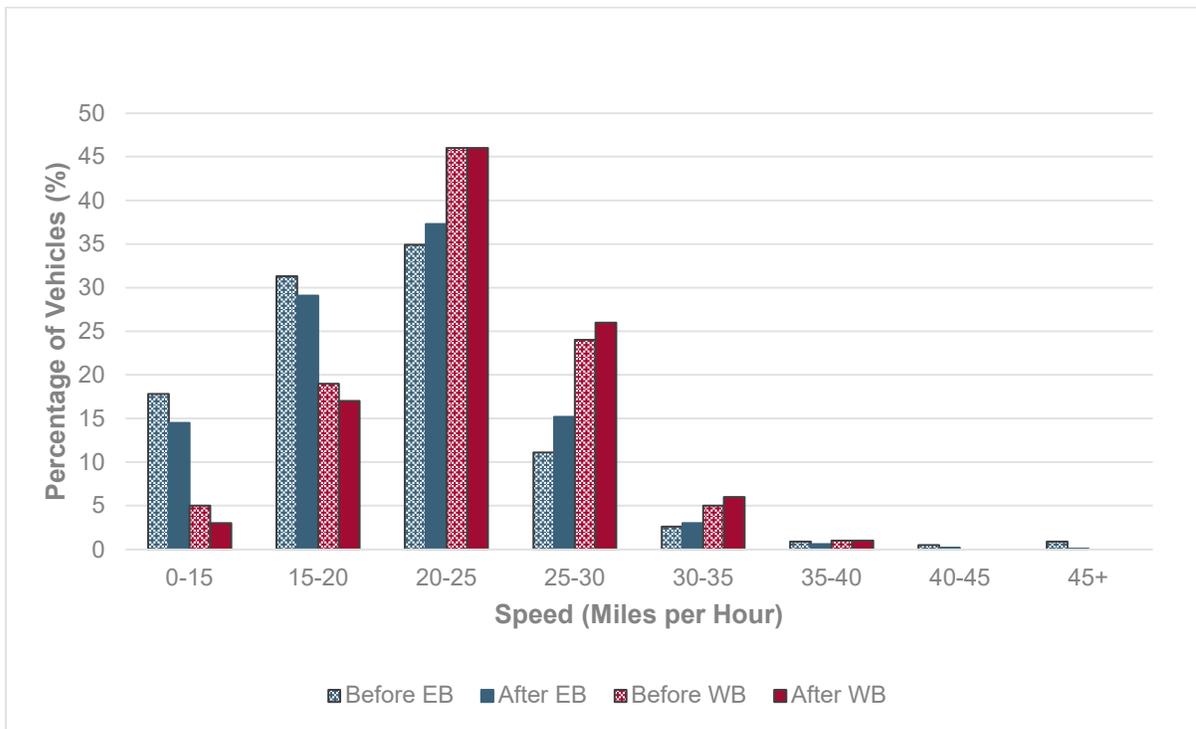


Figure 37: Vehicle Speeds in General Purpose Lane at 21st Ave

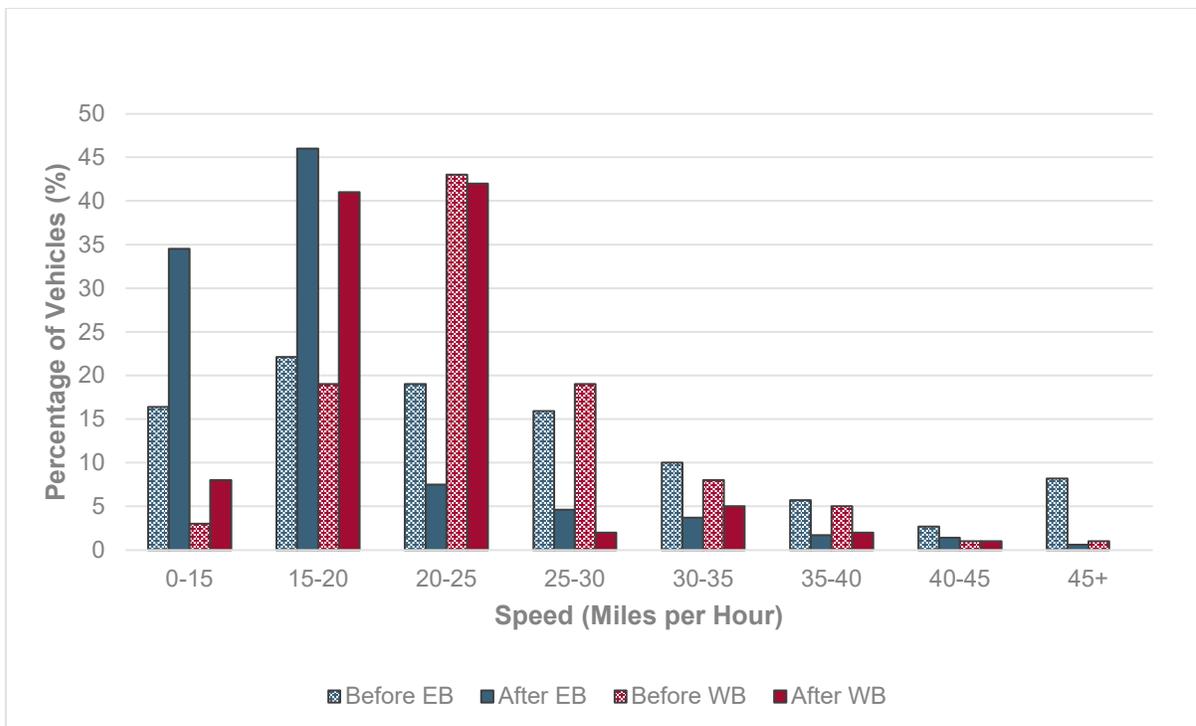


Figure 38: Vehicle Speeds in Transit Lane at 21st Ave

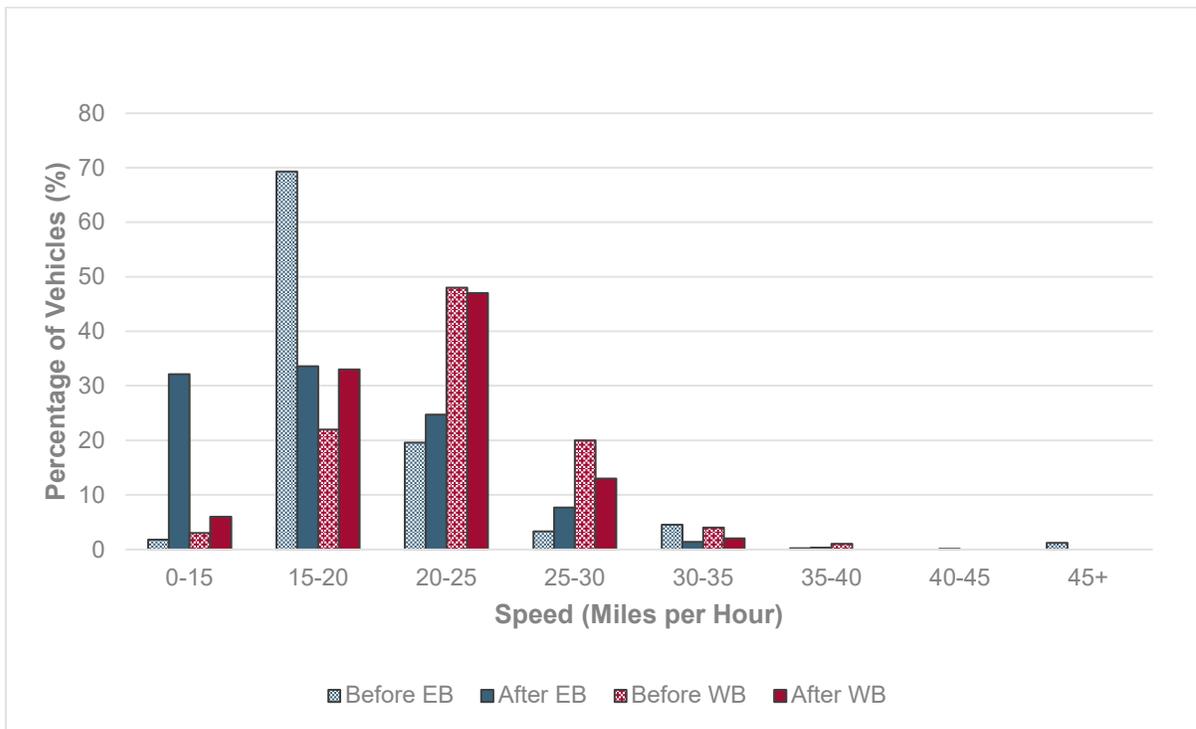


Figure 39: Vehicle Speeds in General Purpose Lane at 30th Ave

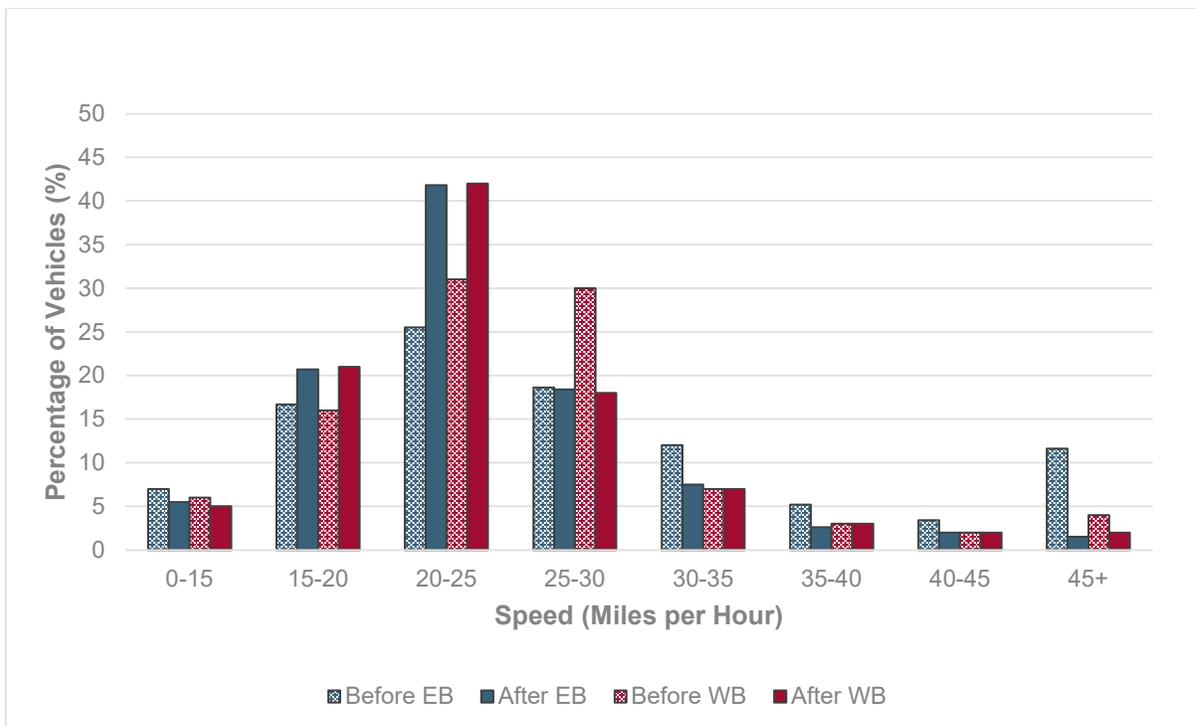


Figure 40: Vehicle Speeds in Transit Lane at 30th Ave

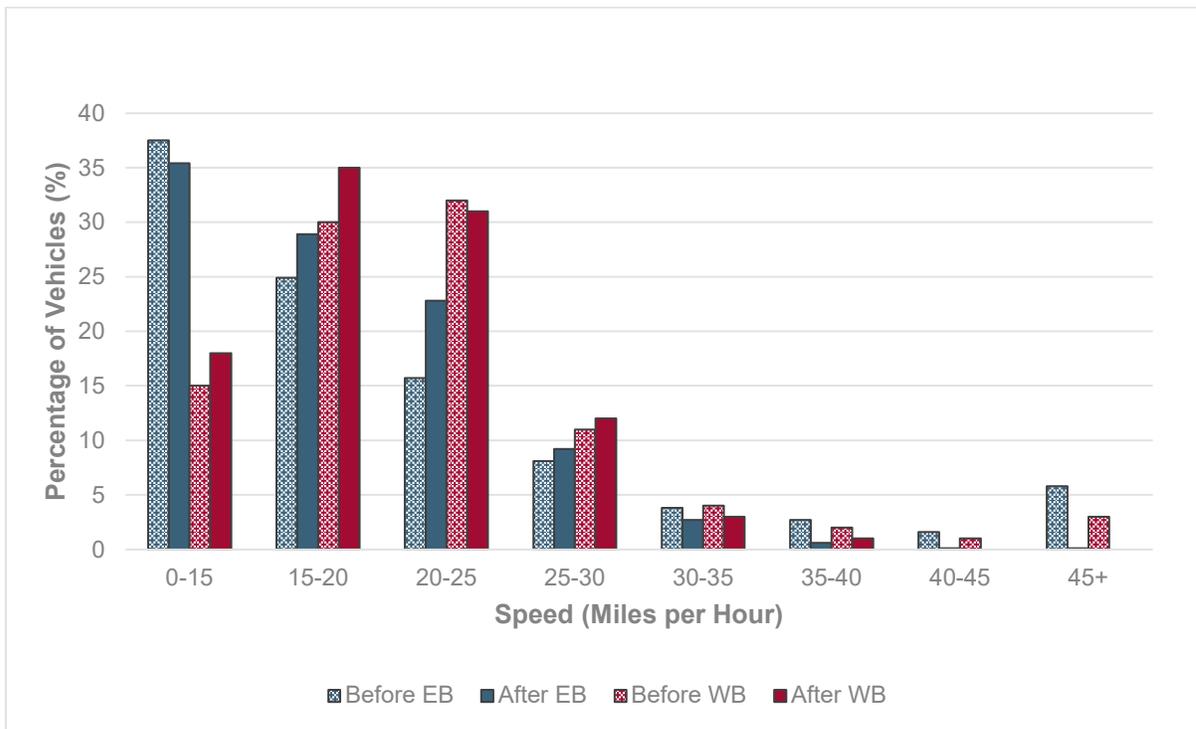


Figure 41: Vehicle Speeds in General Purpose Lane at 34th Ave

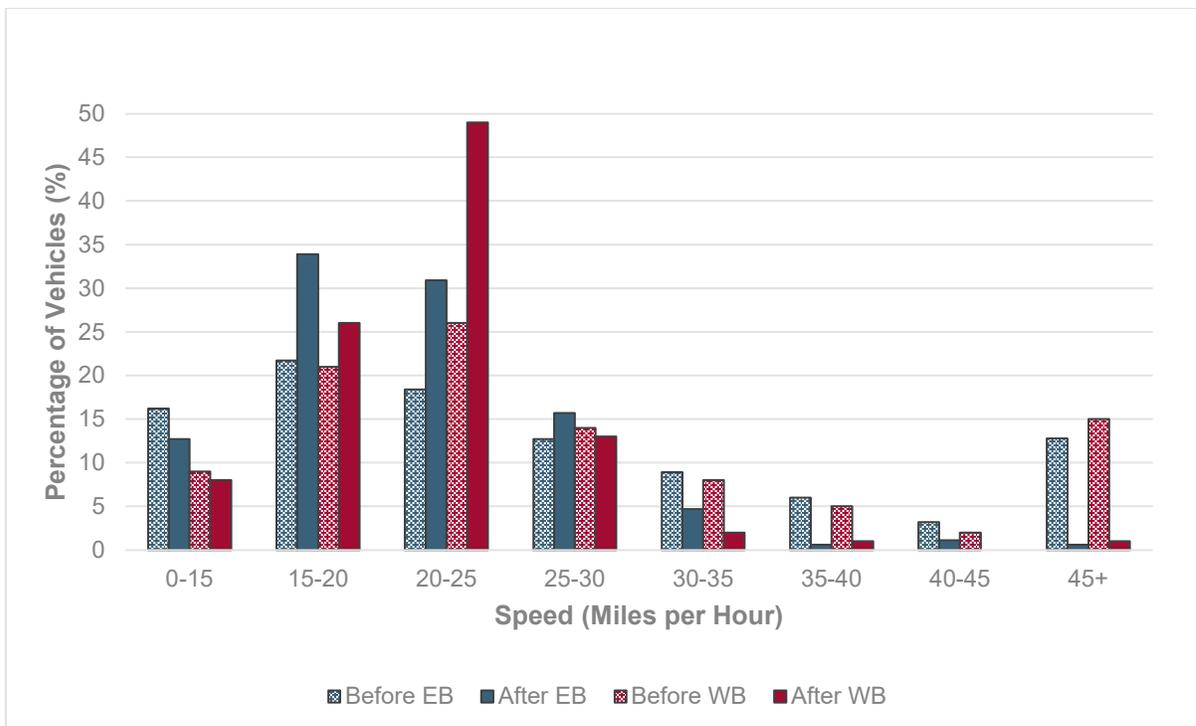


Figure 42: Vehicle Speeds in Transit Lane at 34th Ave

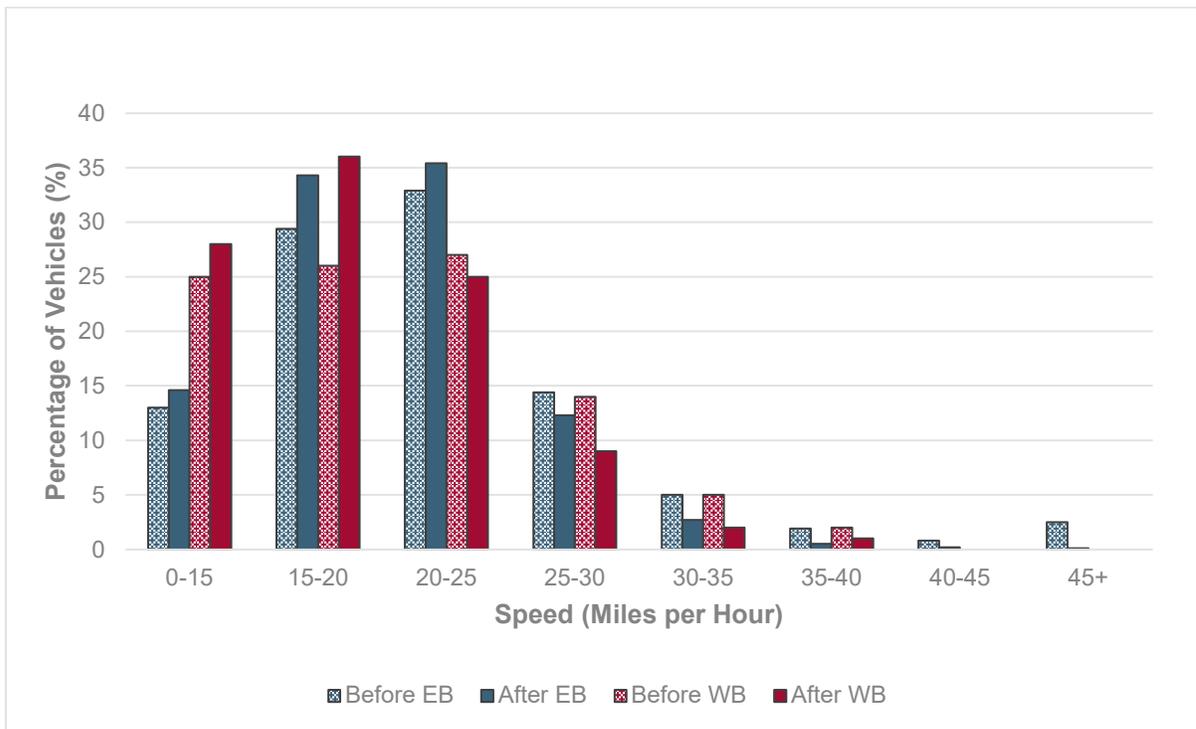


Figure 43: Vehicle Speeds in General Purpose Lane at 37th Ave

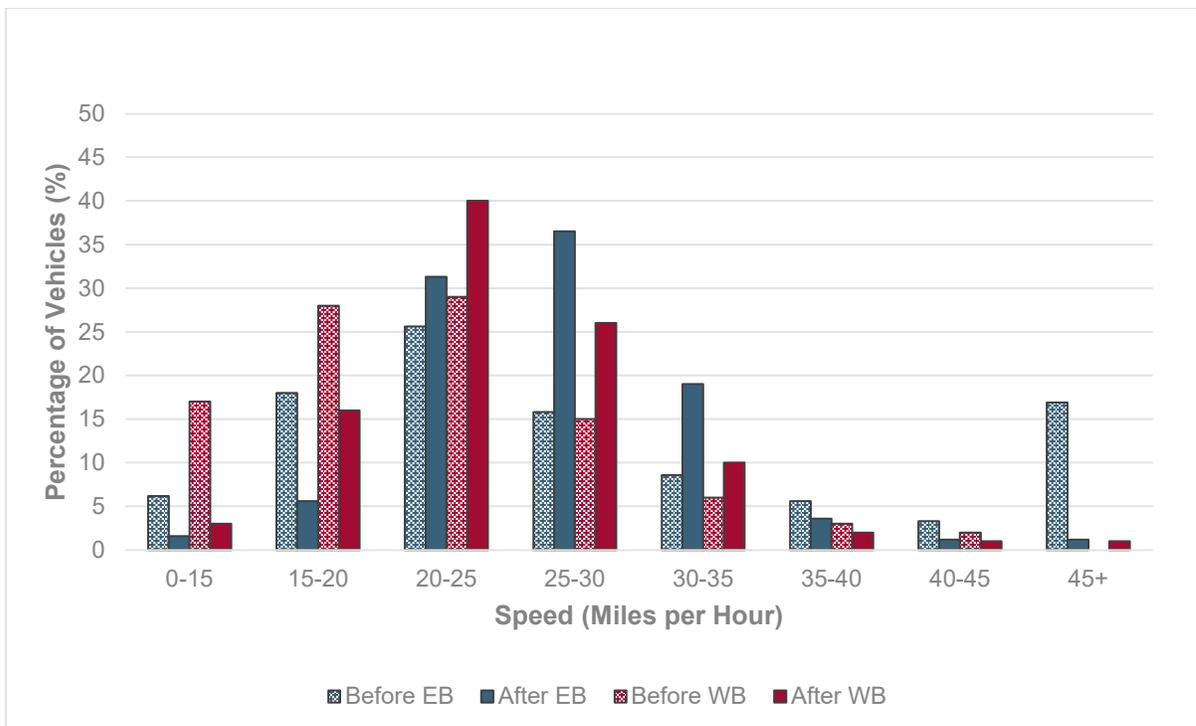


Figure 44: Vehicle Speeds in Transit Lane at 37th Ave

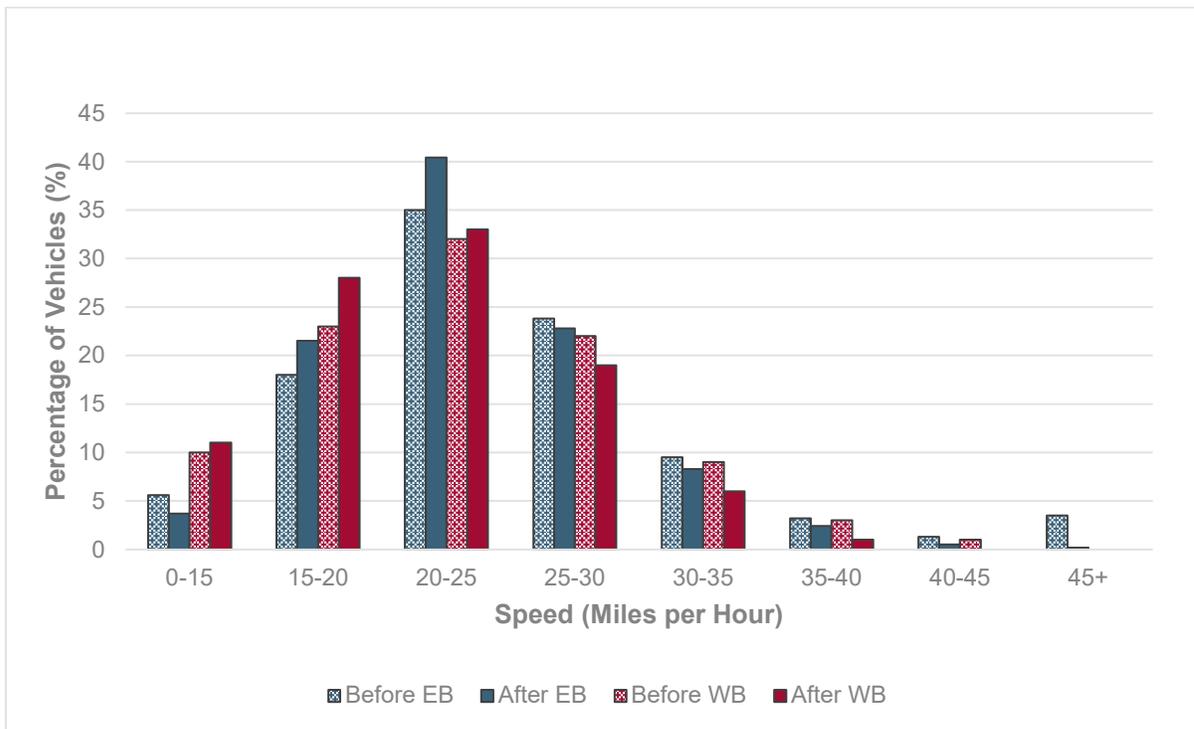


Figure 45: Vehicle Speeds in General Purpose Lane at 40th Ave

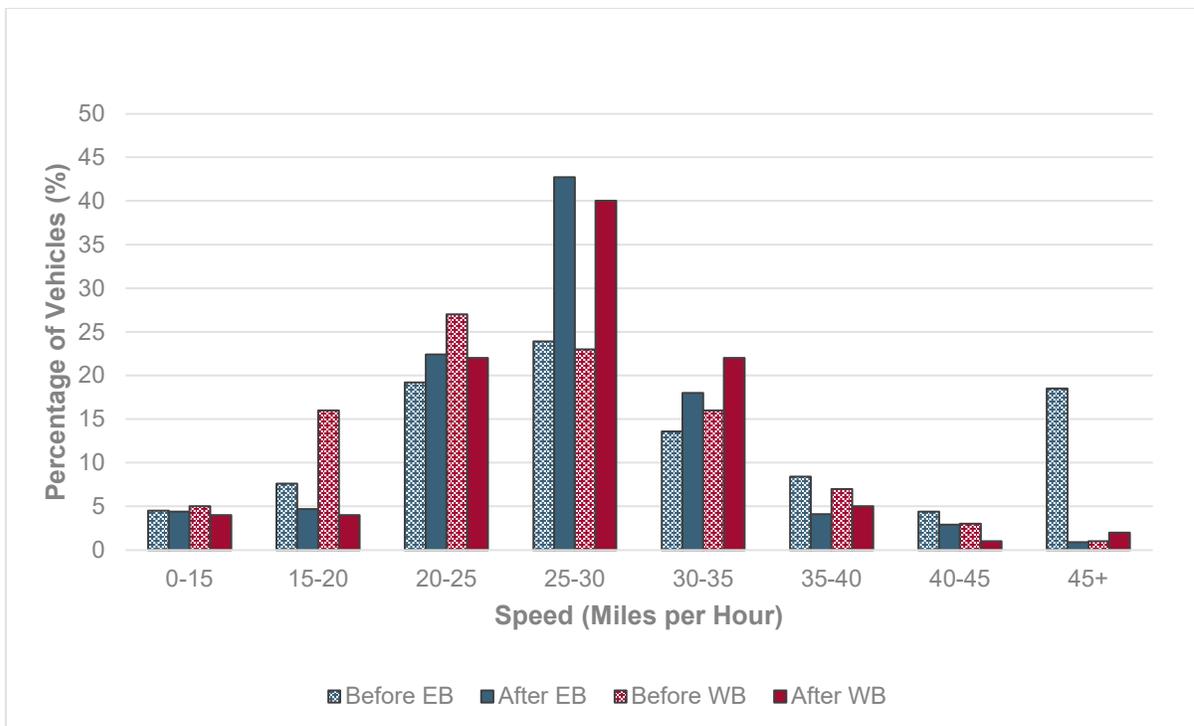


Figure 46: Vehicle Speeds in Transit Lane at 40th Ave

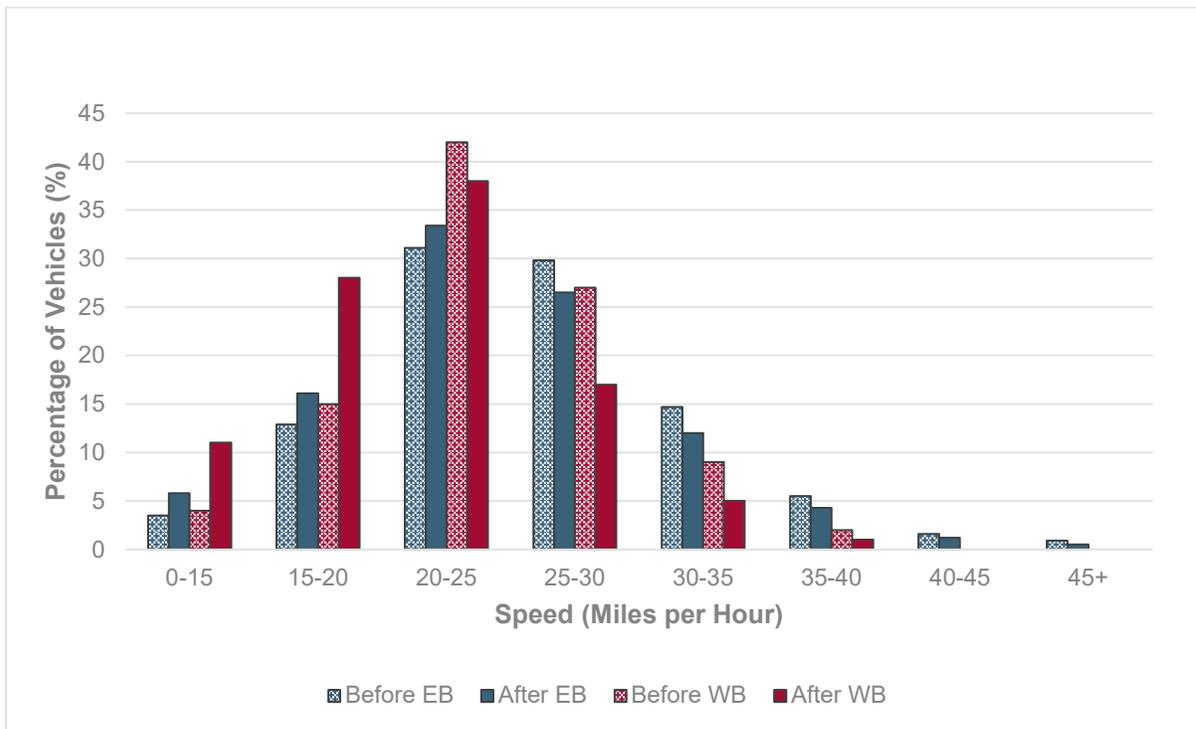


Figure 47: Vehicle Speeds in General Purpose Lane at 48th Ave

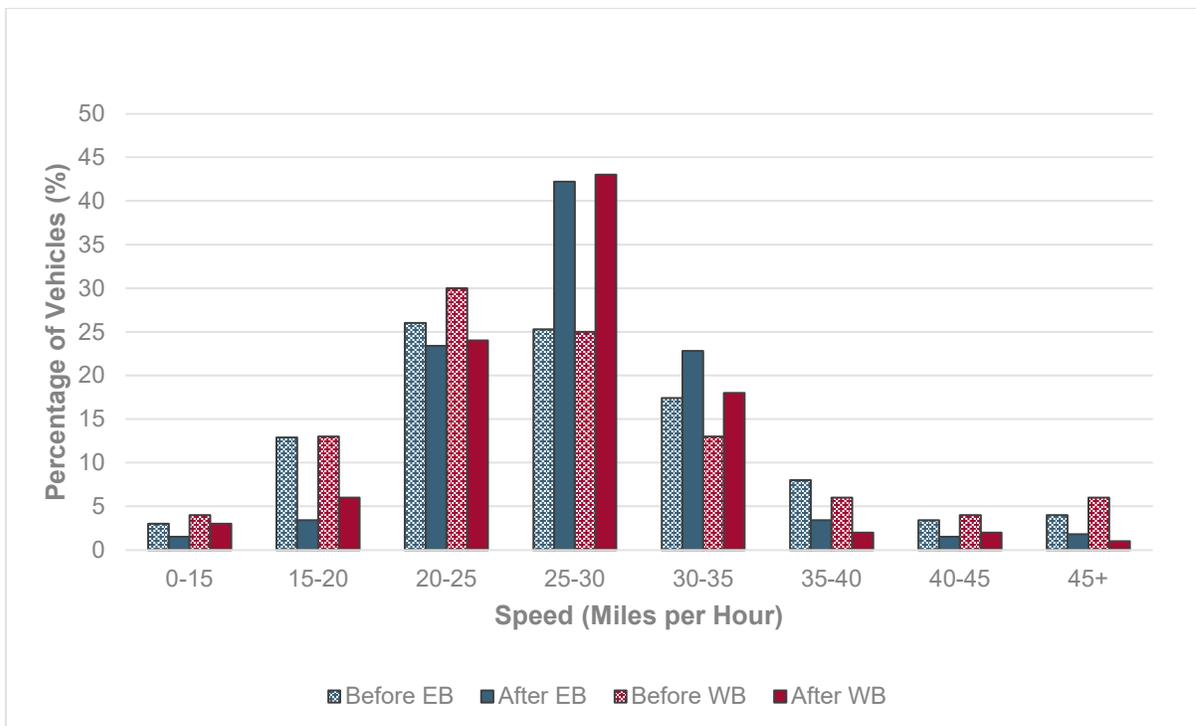


Figure 48: Vehicle Speeds in Transit Lane at 48th Ave

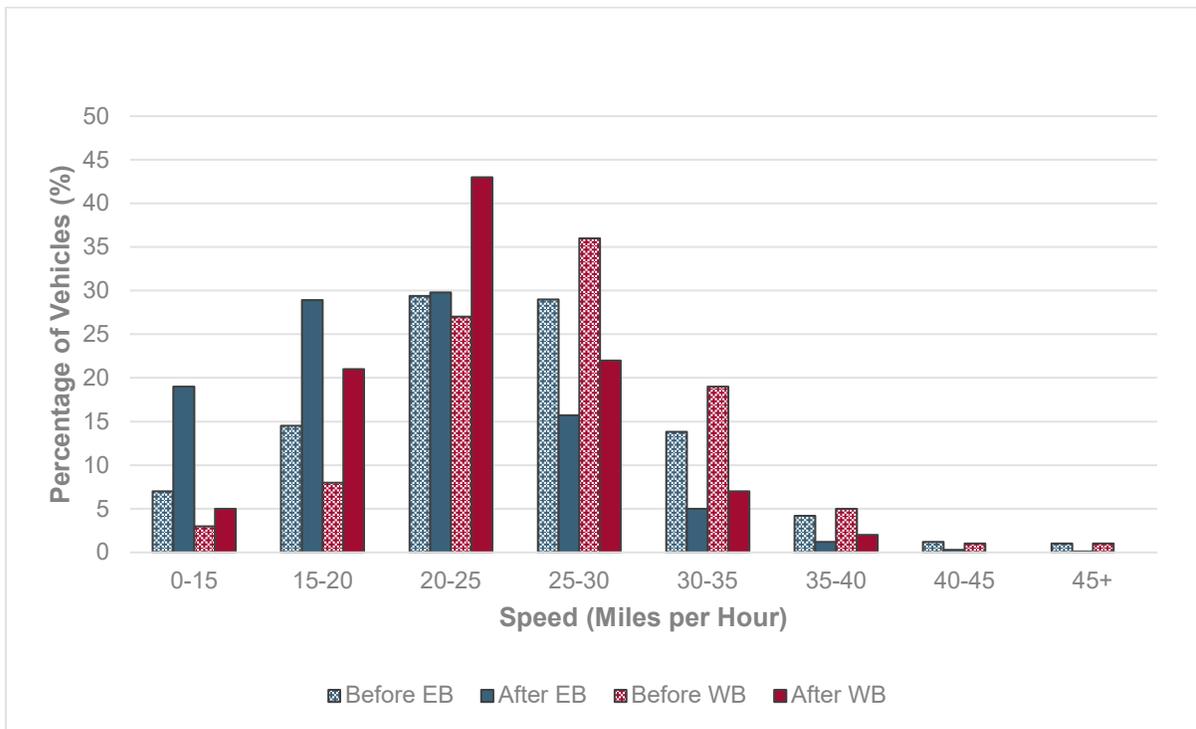


Figure 49: Vehicle Speeds in General Purpose Lane at 58th Ave

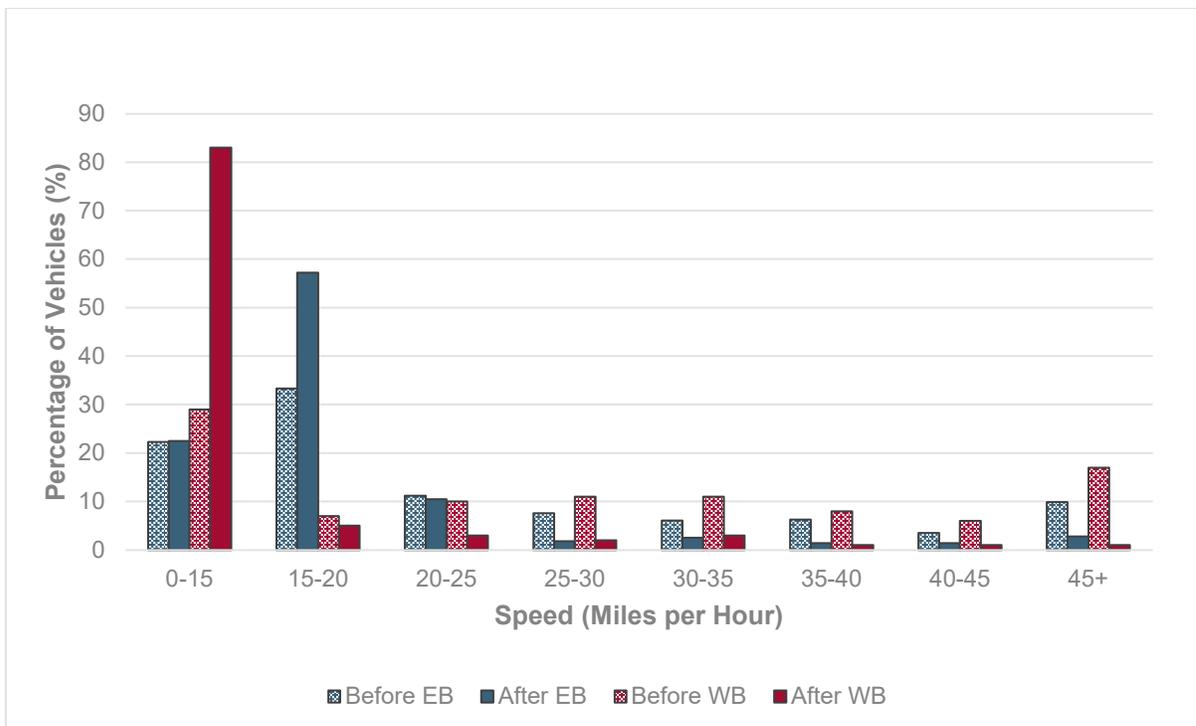


Figure 50: Vehicle Speeds in Transit Lane at 58th Ave

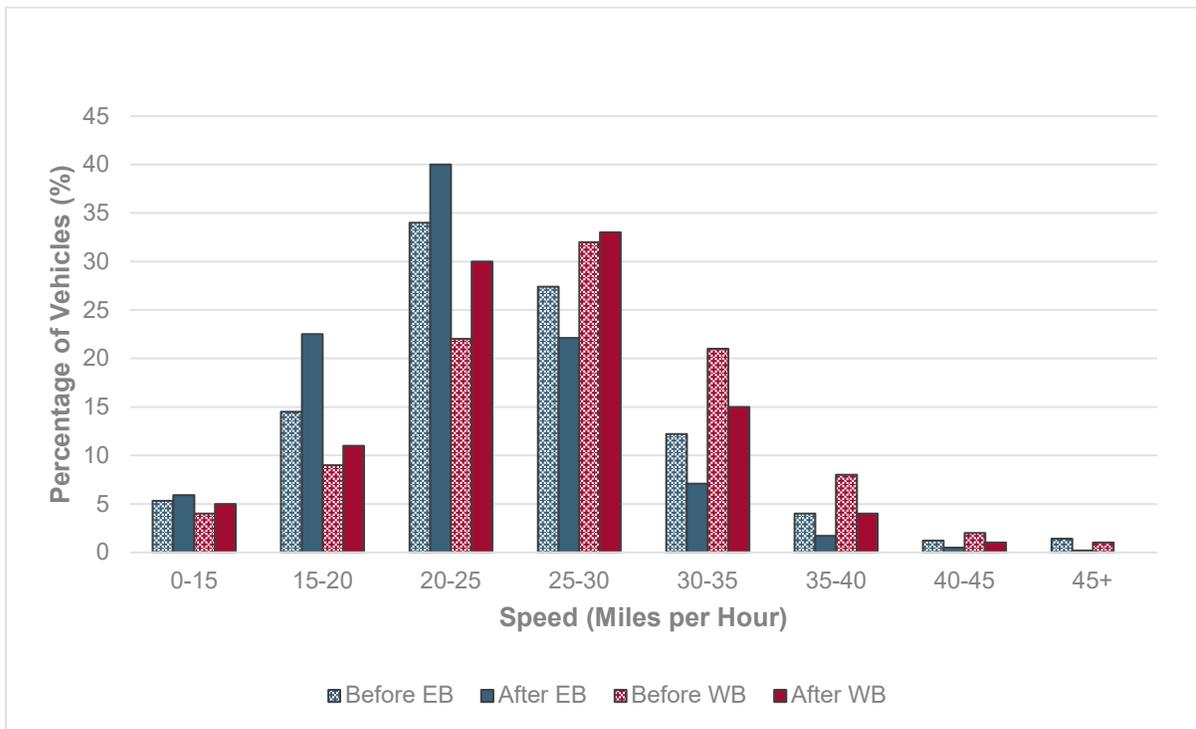


Figure 51: Vehicle Speeds in General Purpose Lane at 64th Ave

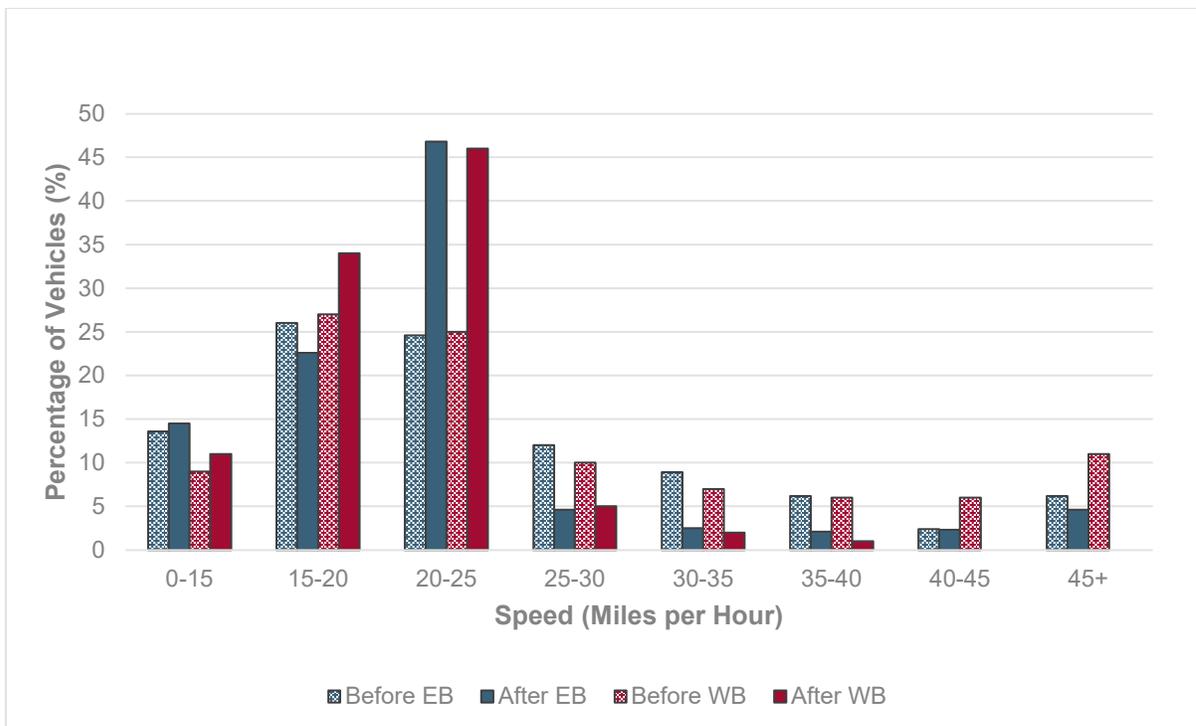


Figure 52: Vehicle Speeds in Transit Lane at 64th Ave

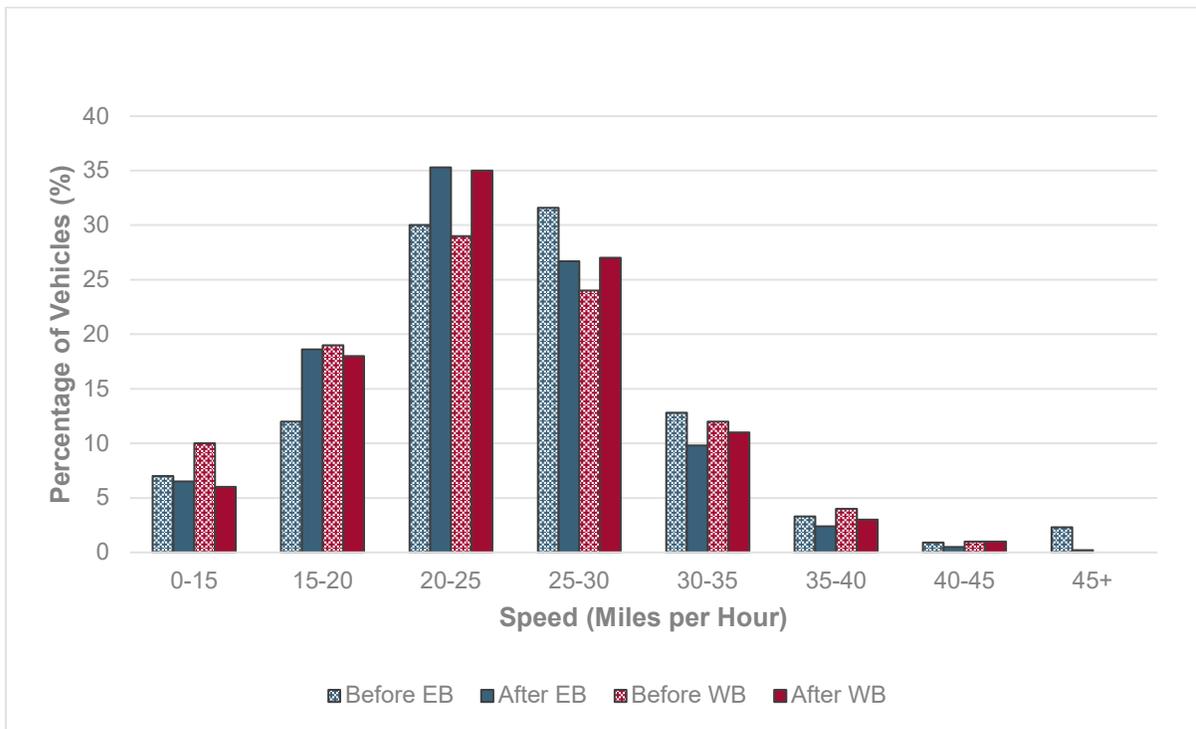


Figure 53: Vehicle Speeds in General Purpose Lane at 75th Ave

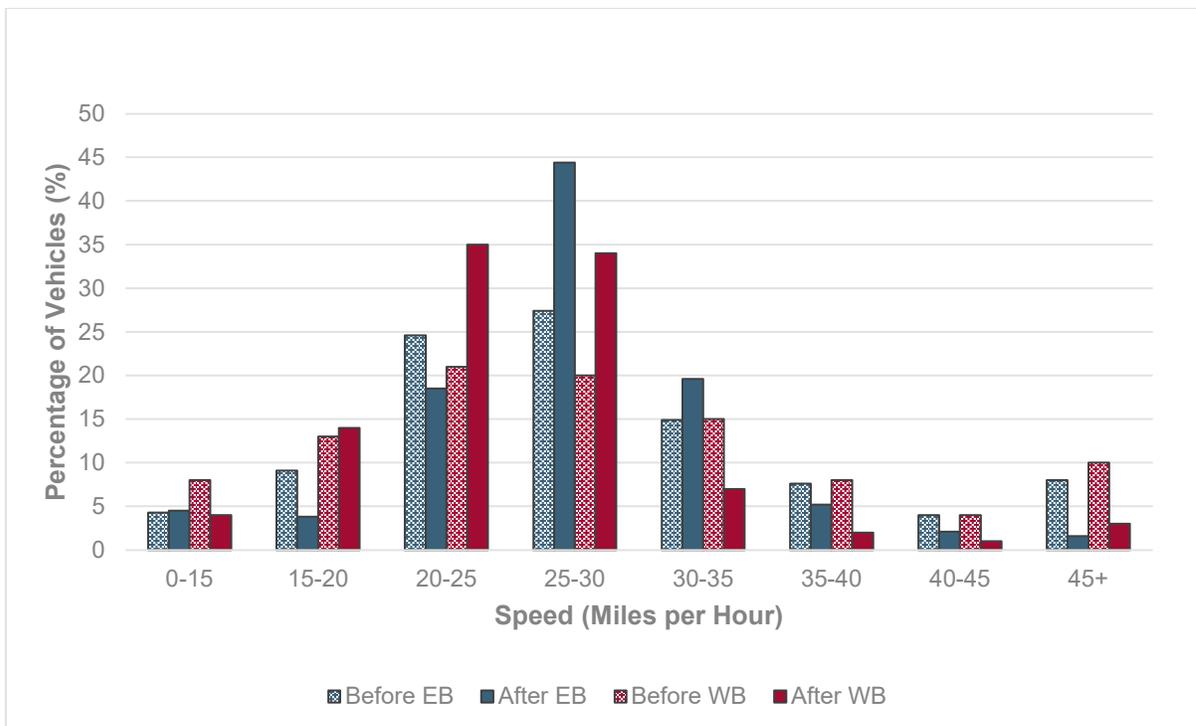


Figure 54: Vehicle Speeds in Transit Lane at 75th Ave

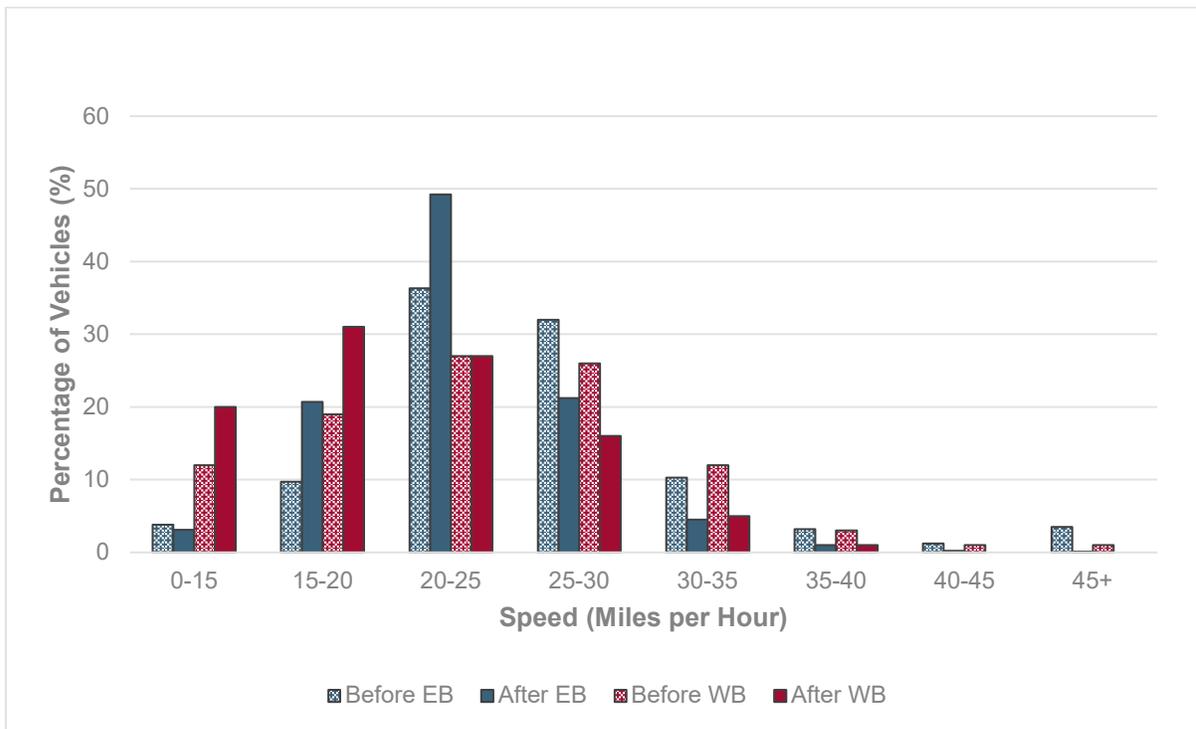


Figure 55: Vehicle Speeds in General Purpose Lane at 82nd Ave

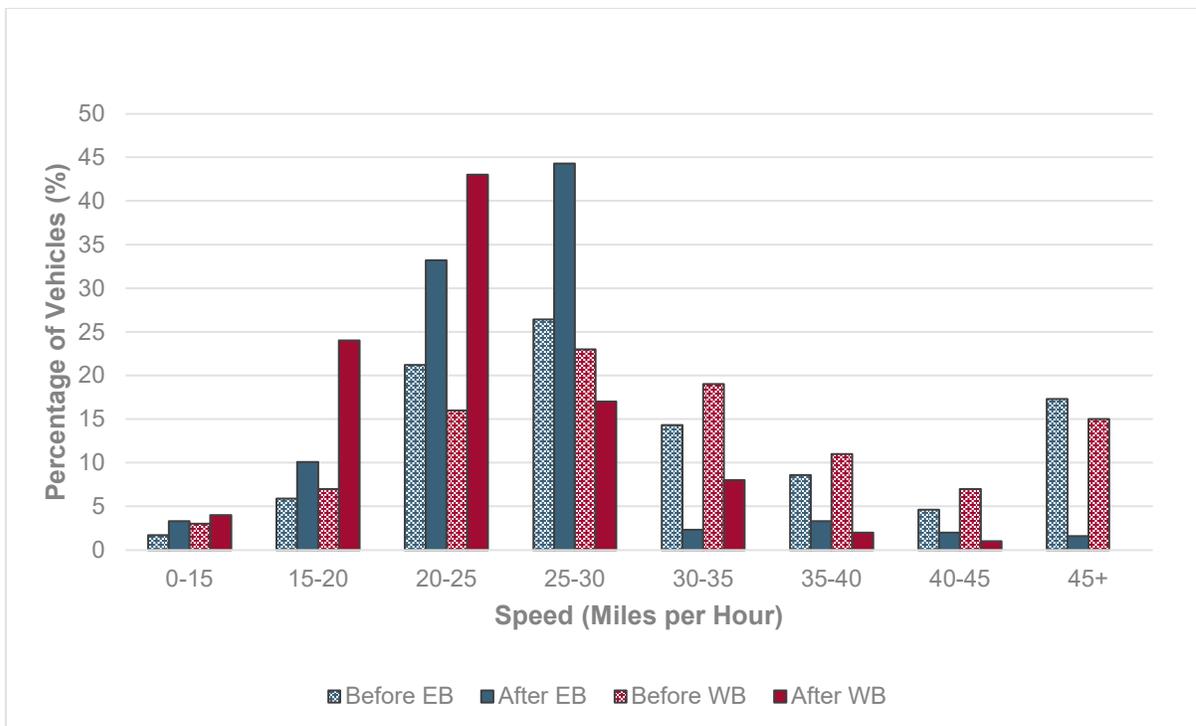


Figure 56: Vehicle Speeds in Transit Lane at 82nd Ave

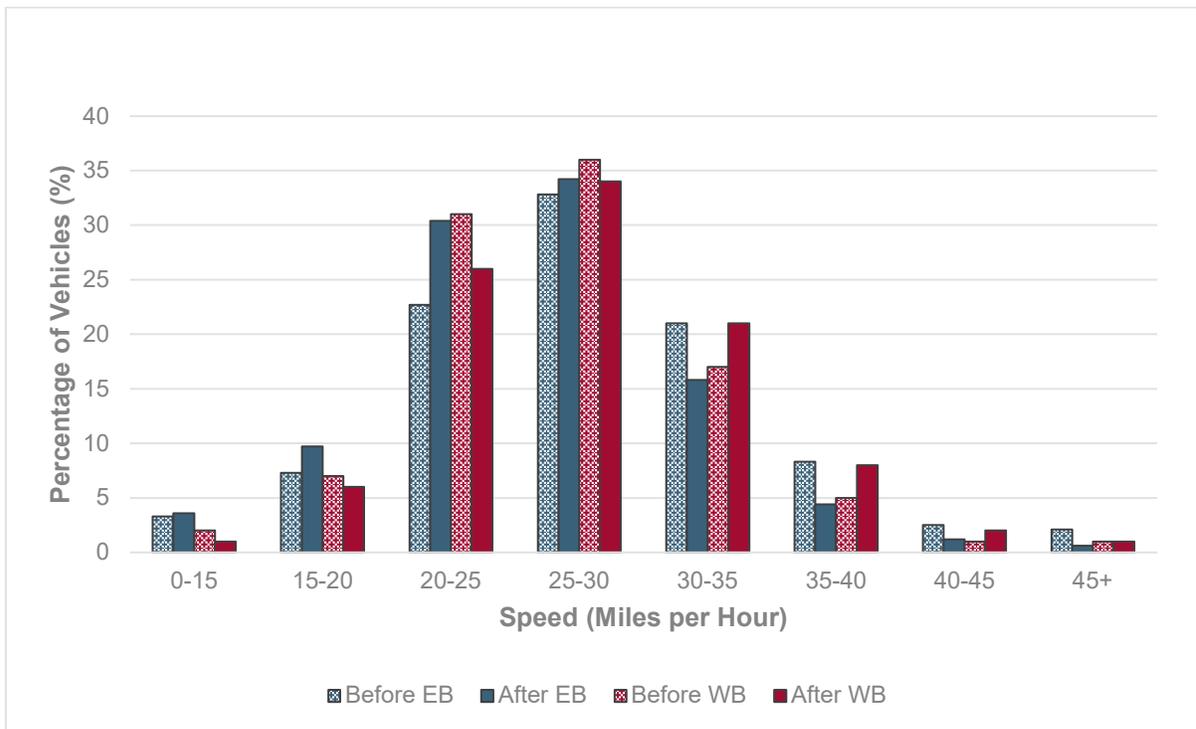


Figure 57: Vehicle Speeds in General Purpose Lane at 88th Ave

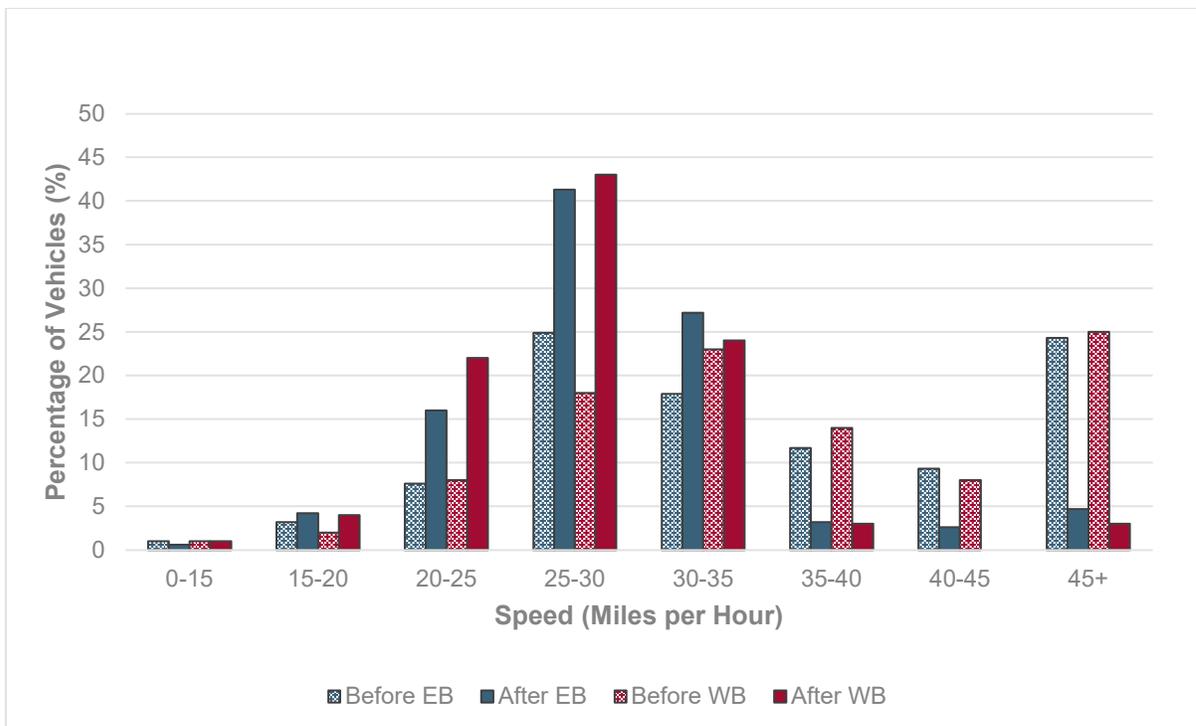


Figure 58: Vehicle Speeds in Transit Lane at 88th Ave

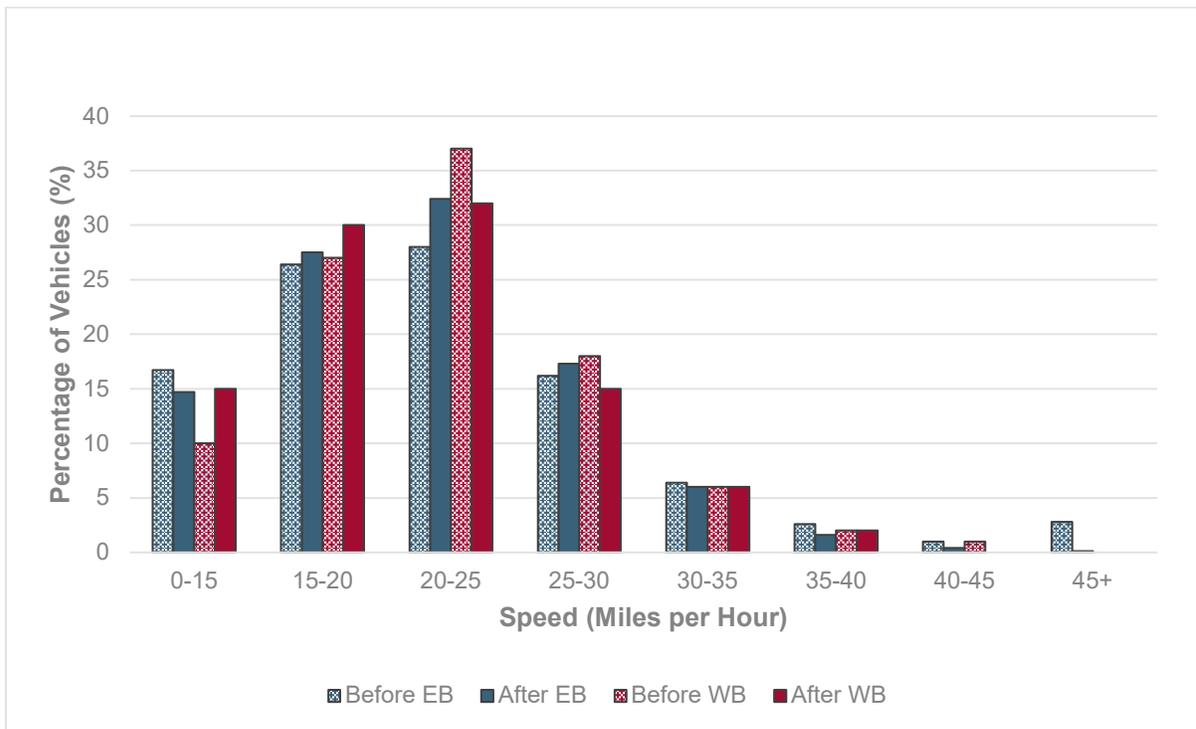


Figure 59: Vehicle Speeds in General Purpose Lane at 96th Ave

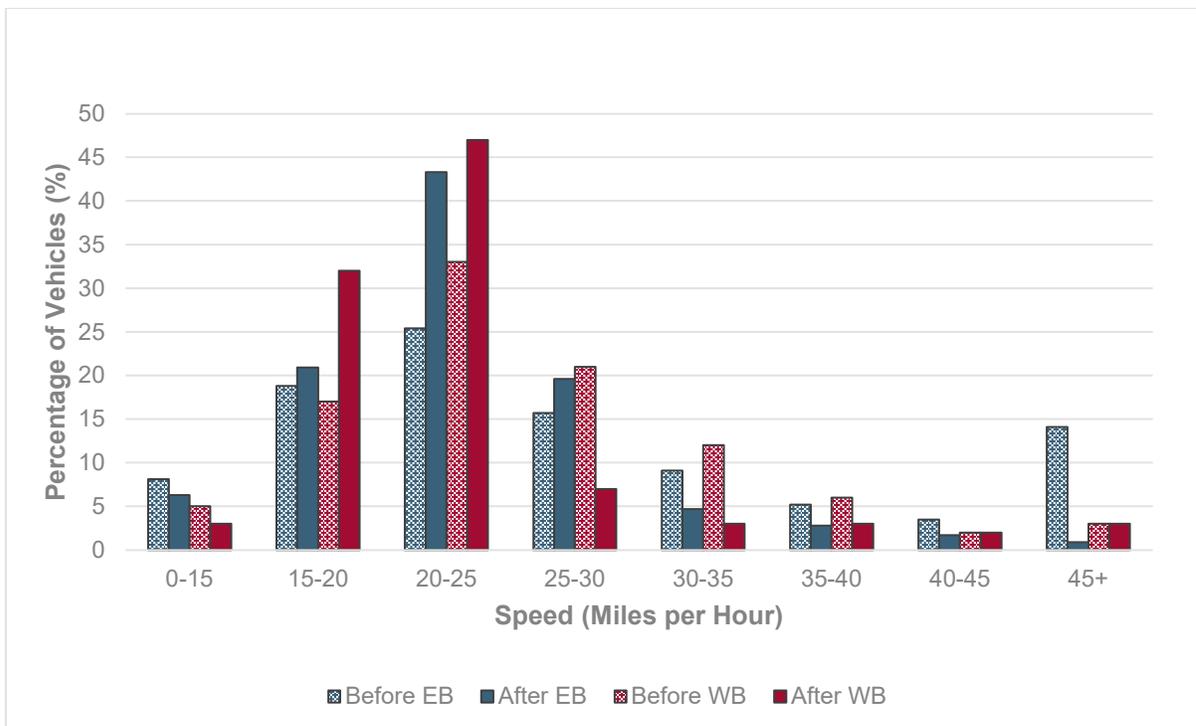


Figure 60: Vehicle Speeds in Transit Lane at 96th Ave

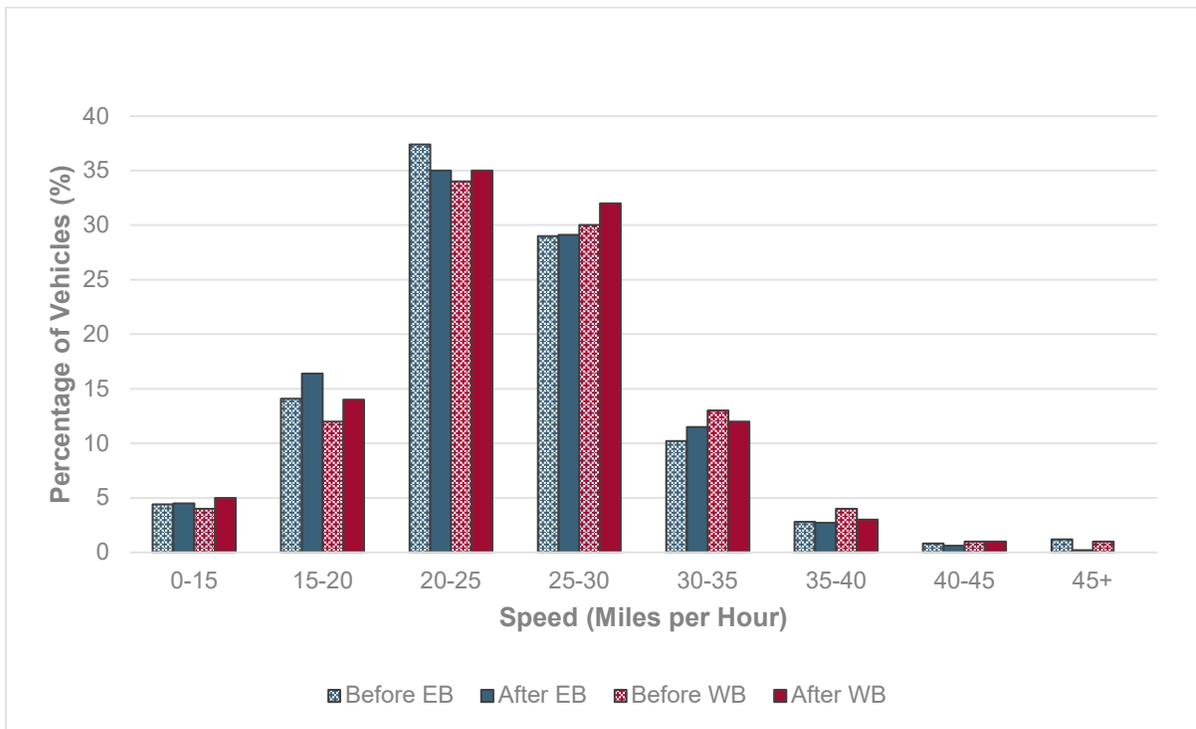


Figure 61: Vehicle Speeds in General Purpose Lane at 102nd Ave

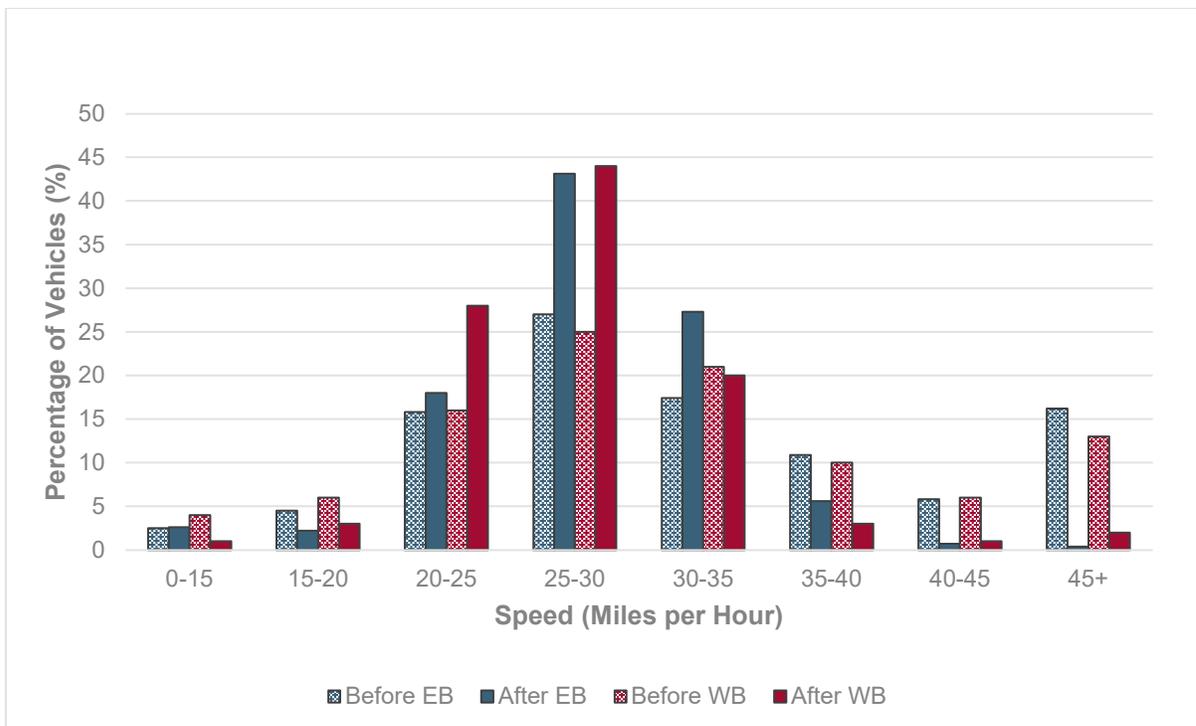


Figure 62: Vehicle Speeds in Transit Lane at 102nd Ave

FIELD OBSERVATIONS

One-hour AM and PM peak period field observations were conducted by Kimley-Horn staff at 8 locations throughout the corridor (16th, 21st, 30th, 34th, 37th, 40th, 64th, and 82nd Avenue) to observe illegal turns, queue cutting, and double parking activities that could not be directly inferred from the volume and speed data collected. The following observations are qualitative in nature based on observer notes and interpretations of driver behavior. Not enough data was collected to draw conclusions on the change in frequency of these observations with respect to the before condition unless stated otherwise.

- Compared to before observations, there are very few transit lane violations throughout the corridor, which is consistent with the volume data.
- For the observed violations at 30th and 34th Avenues, our field observer noted that drivers appeared to enter the transit lane by mistake because drivers would merge out of the transit lane at the next intersection
- Regular illegal side street through movements crossing the center line and transit lanes occurred at 37th, 40th, 64th, 80th Avenues
- Traffic trying to cross between 66th Avenue and Havenscourt Avenue via turn lanes caused queues spilling into bus lanes
- While observers noted fewer general vehicles in the transit lanes compared to the before-project conditions, non-transit vehicles were still observed travelling and speeding in the transit lanes, which is consistent with the speed and volume data described above.
- A charter bus drove through the transit lane
- There were no significant observations of queue cutting
- Bikes and scooters were observed in the transit lane, up to 12 in an hour. ATVs, golf carts, and motorized scooters were also noted.
 - Bicyclists and other alternative motorized vehicles may perceive the transit lane as more protected as there is no designated bike lane.
- During the Before analysis, we noted that double parking could be an issue when channelizers are present as vehicles will not be able to pass without running over channelizers. However, during the after condition, it was observed that cars would navigate through the channelizers to temporarily use the transit lane to pass double parked cars. Based on the ability for drivers to divert around double-parked cars, it appears the diverters are not a strong enough transit lane violation deterrent in double parking situations.
- The after-study observations were conducted on a day with trash collection activities. There were multiple intersection observations where vehicles used the transit lane to bypass the trucks. Similar to the double-parking observation above, cars would navigate through the channelizers to temporarily use the transit lane to pass the waste management trucks.
- Illegal left turn and U-turn movements through/across the centerline and transit lane were most common for at parking lot driveways, gas stations, and intermediate residential streets.
- While channelizers were observed to deter violations of vehicles in the transit lane, vehicles regularly would perform illegal turn movements from the general-purpose lane, crossing through the transit lane and painted medians.
 - During the before condition, more vehicles were observed to enter the transit lane to make illegal left-turn or U-turn movements.
 - In the after condition, vehicles were less likely to enter the transit lanes before making an illegal turn but conversely were more likely to turn from the general-purpose lane.

- Additional turning movement data collection is necessary to quantify how many illegal turning movements are occurring.

CLOSING

The quick-build improvements implemented in this project have significantly lowered non-transit volumes in the transit only lanes, resulting in total volumes in the transit lane to reduce by 83%. Due to the reduction in non-transit vehicles in the transit lanes, average speeds in the transit lane decreased by nearly 5 mph, and the percentage of vehicles in the transit lane traveling greater than 10 mph above the speed limit before and after the project were 22% and 6%, respectively. Overall, the speed data shows significant reductions in both general purpose and transit only lane speeds. The lower non-transit volumes and less speeding by the violators in the transit lane have reduced conflicts for buses, improving overall operations of the Line 1T – Tempo Bus Rapid Transit.

Based on the positive outcomes of the quick-build improvements, AC Transit anticipates administering a follow up project to install a second phase of speed reduction and transit lane violation deterrence. The future phase anticipates considering and evaluating speed reduction elements, and additional transit lane paint treatments. The future phase may also consider and evaluate additional physical separation between the transit lane and general purpose lane, potentially considering increasing the frequency of channelizers or considering different types of treatments. AC Transit and OakDOT will continue to partner for forthcoming projects along the corridor to collect collision and fatality data to confirm that the quick build improvements improved safety on the corridor through the overall vehicle speed reductions.

ATTACHMENT A

**CANDIDATE SEGMENT SELECTION AND TREATMENT RECOMMENDATIONS
MAPS**

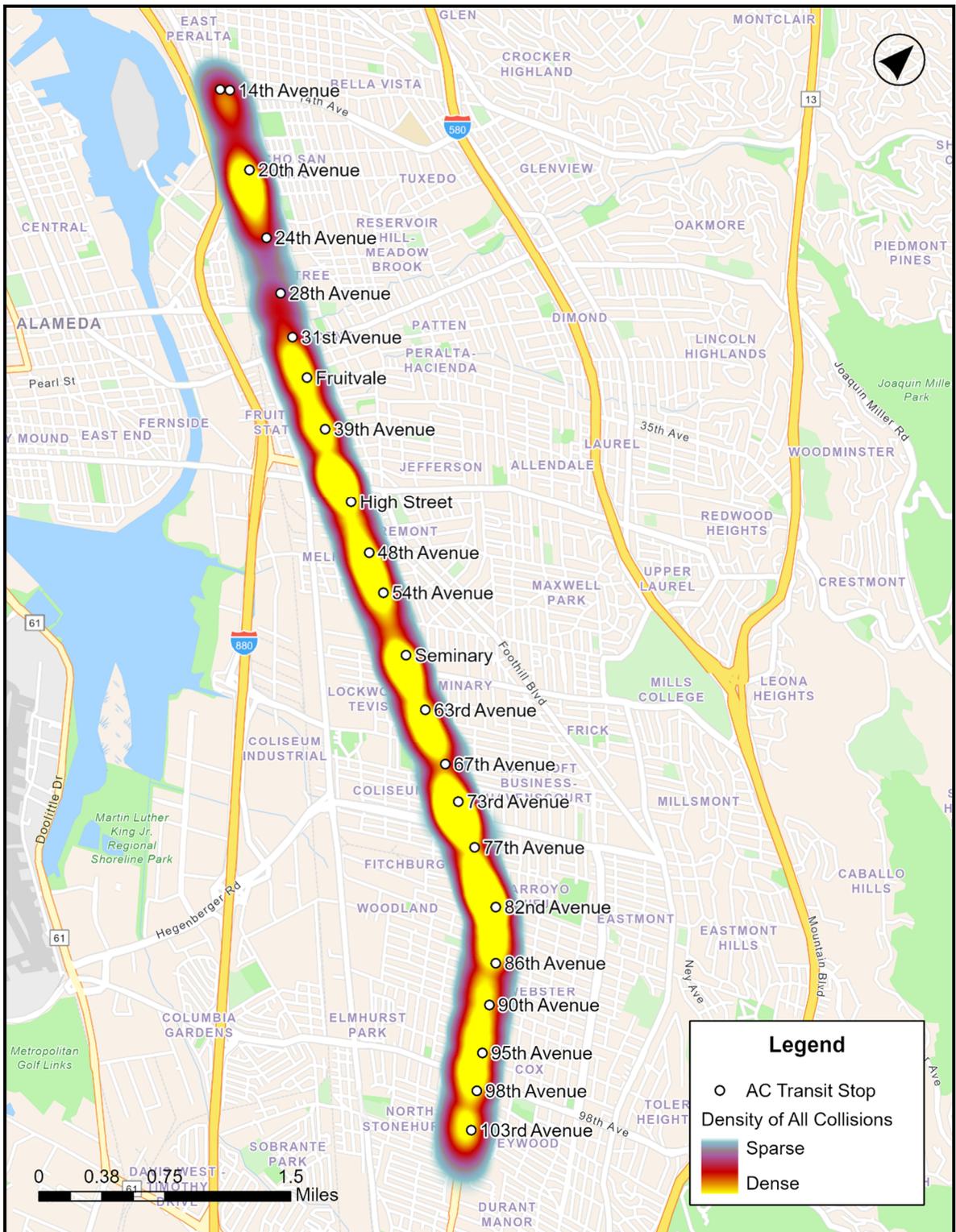


Figure A-1: Heat Map of All Collisions, Aug. 2020 – Dec. 2022 (SWITRS)



Figure A-2: Map Bicycle-Involved Collisions, Aug. 2020 – Dec. 2022 (SWITRS)

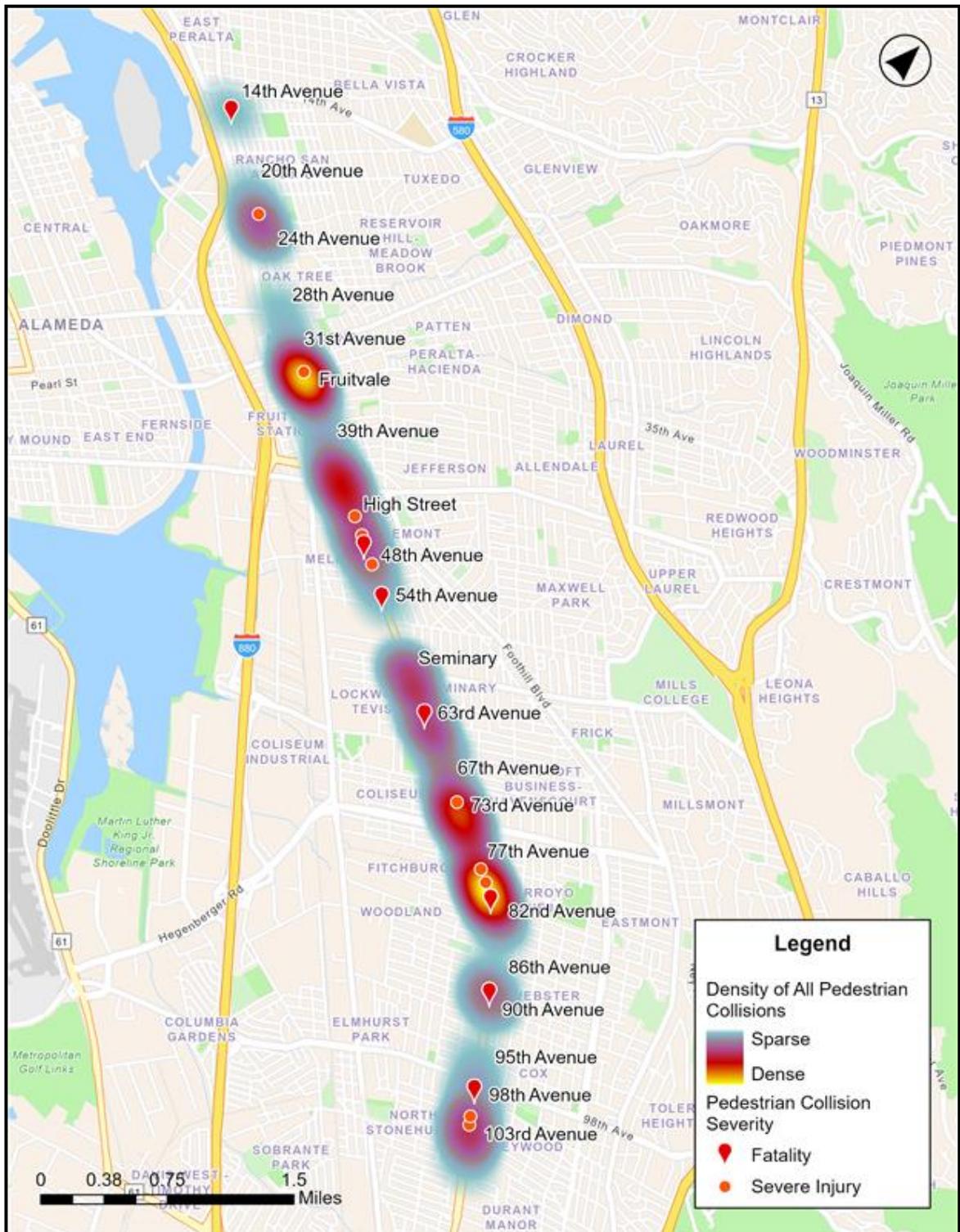


Figure A-3: Heat Map of Pedestrian-Involved Collisions, Aug. 2020 – Dec. 2022 (SWITRS)

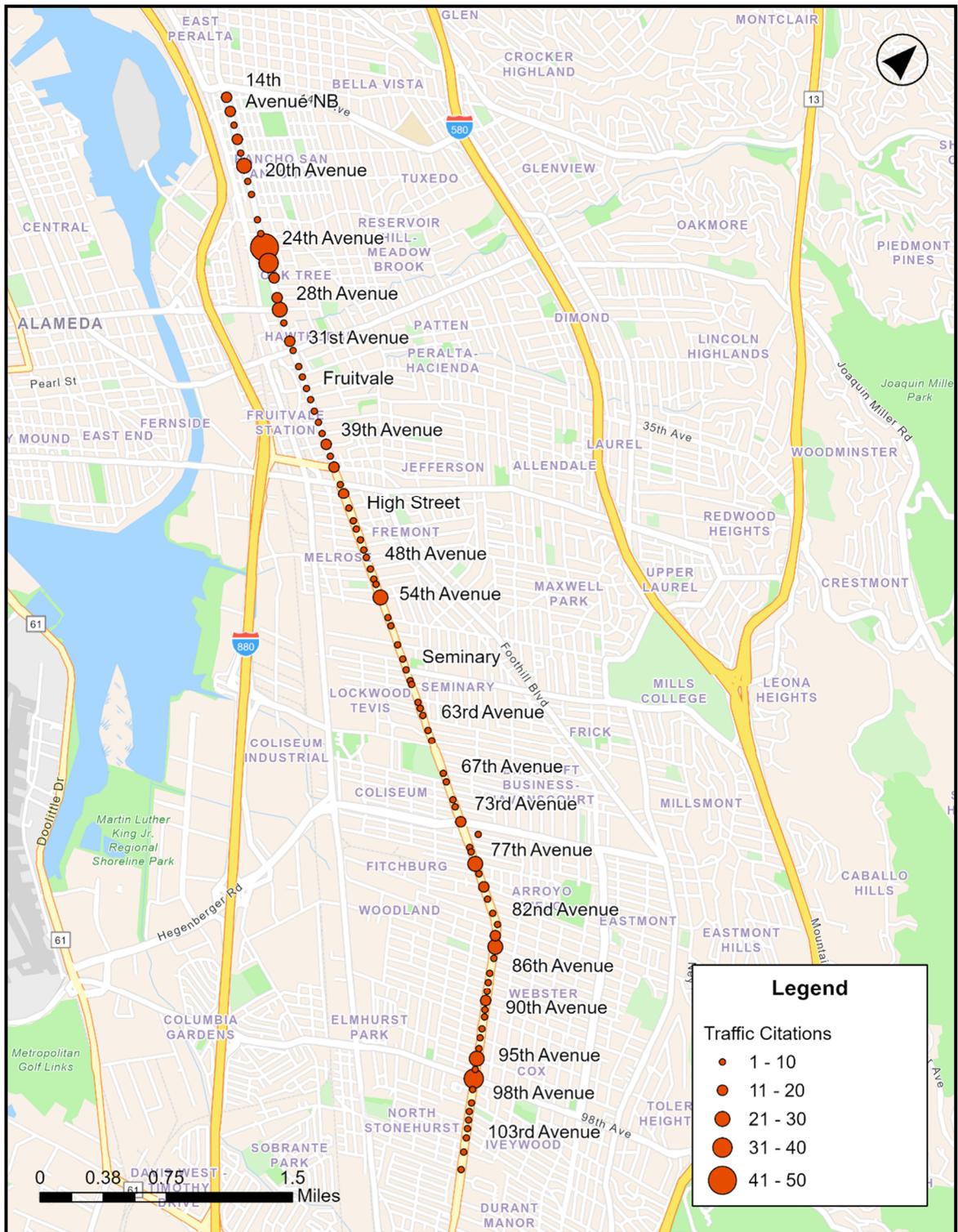


Figure A-4: Oakland Police Department Citations, 2021-2022 (OPD)

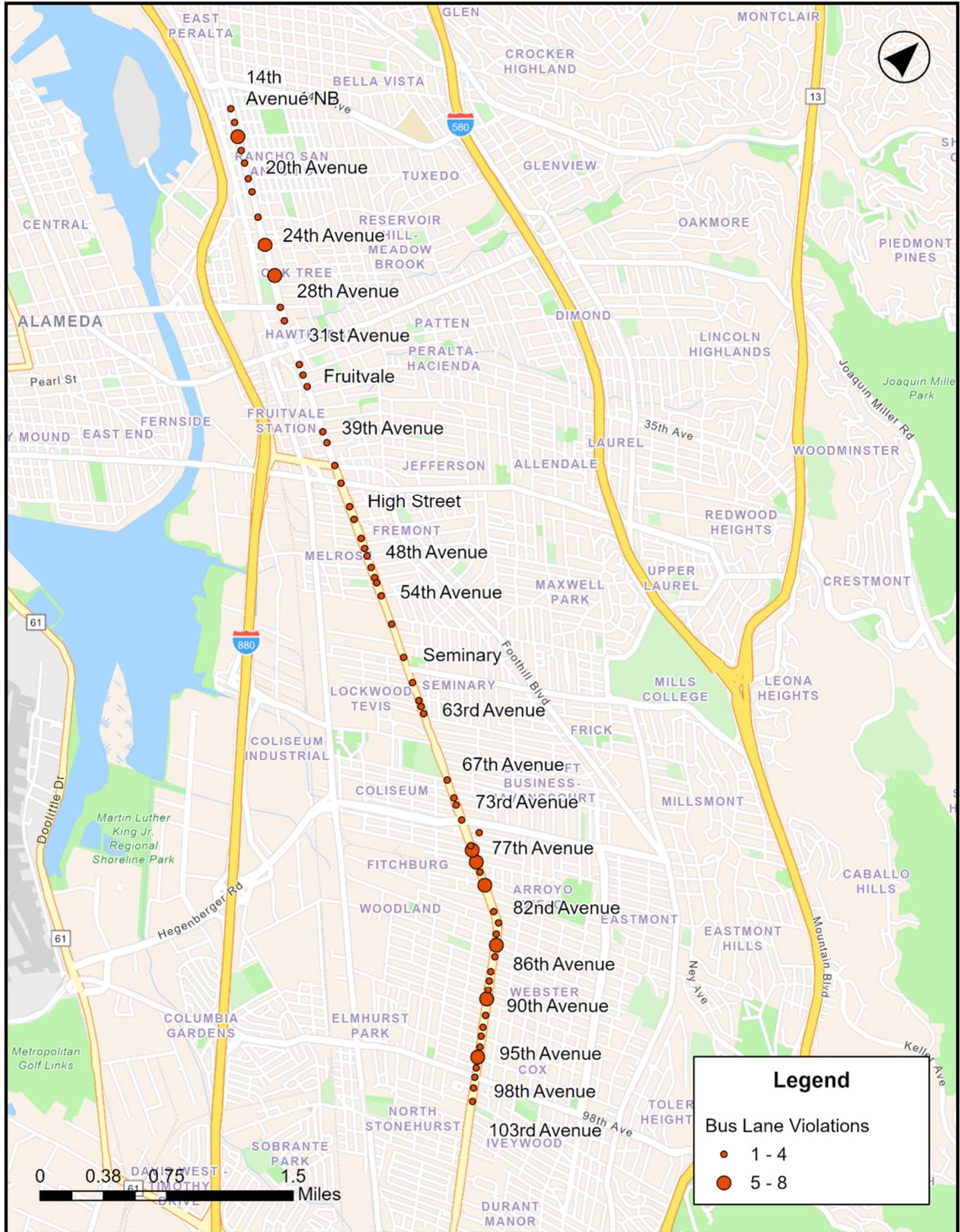


Figure A-5: Oakland Police Department Bus Lane Violation Citations, 2021-2022 (OPD)

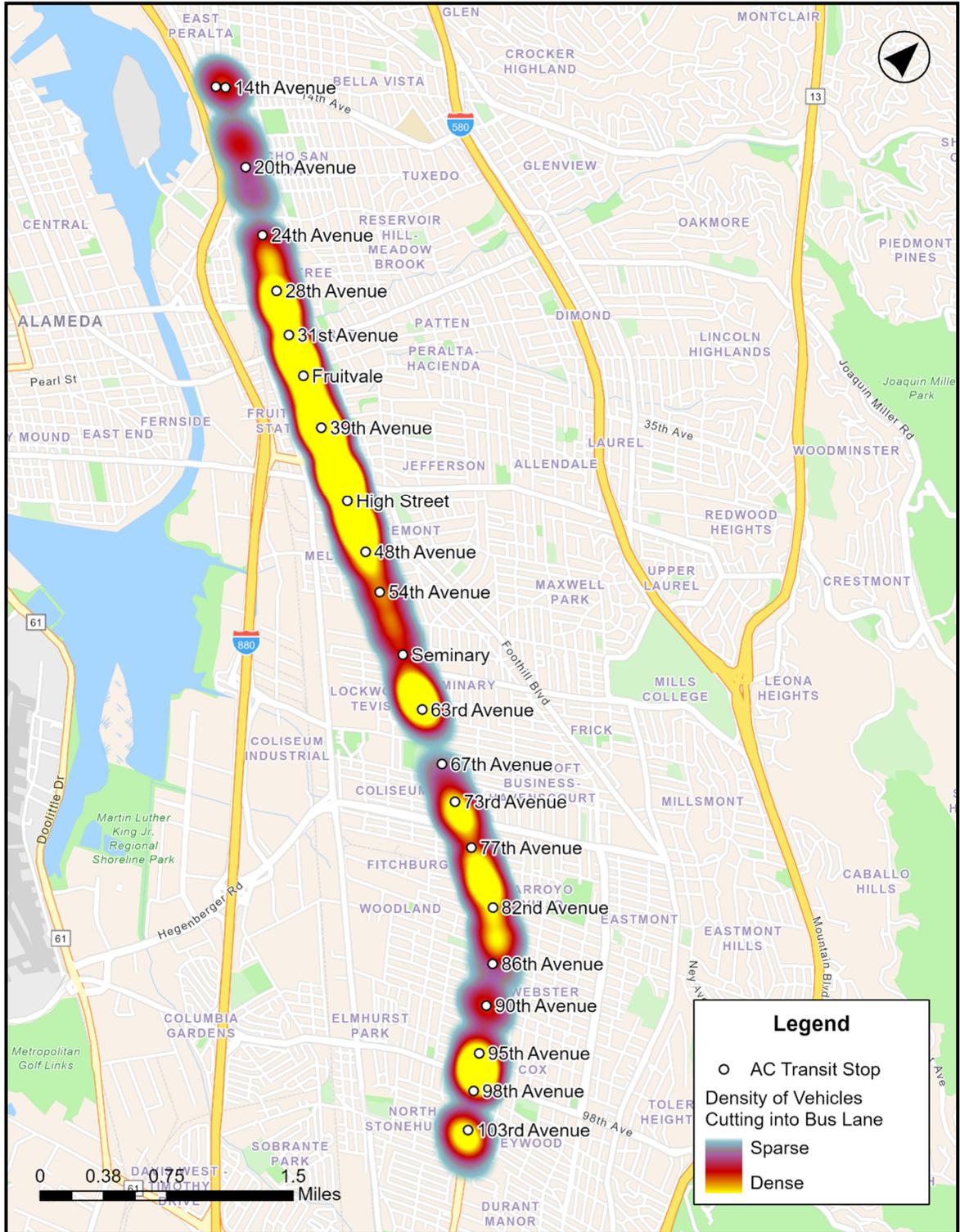


Figure A-6: Heat Map of Vehicles Cutting into Bus Lane (AC Transit, 8/2020-12/2022)

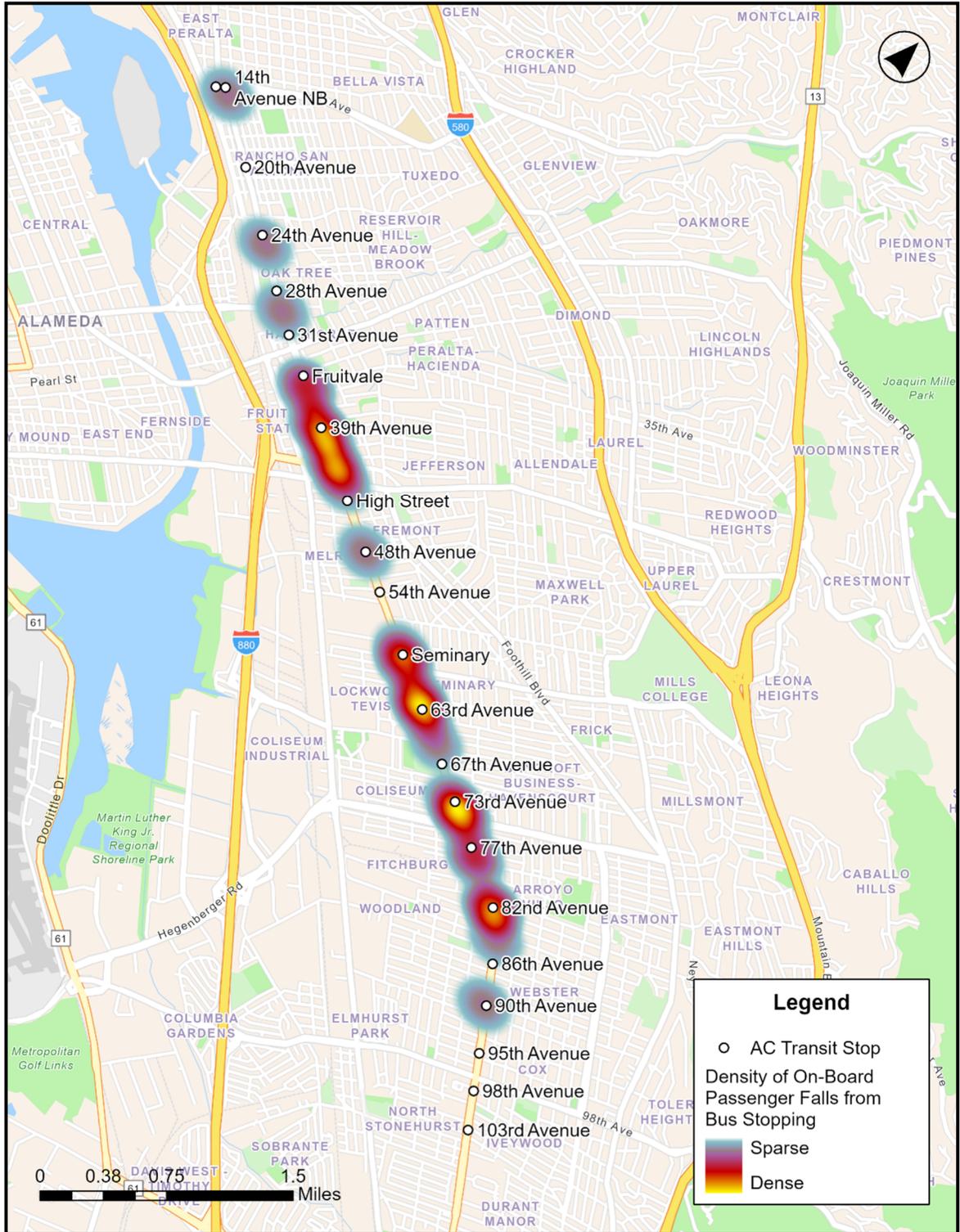


Figure A-7: Heat Map of On-Board Passenger Falls from Bus Stopping (AC Transit)

ATTACHMENT B

SUMMARY OF GENERAL PURPOSE AND TRANSIT LANE DATA

EB General Purpose and Transit Only Lane - Before Data																						
Location	Posted Speed Limit	ADT	<15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	>70	Below speed limit	<5 mph over speed limit	>10 mph over speed limit	Weighted Average Speed	50th Percentile Speed	85th Percentile Speed	Volume above 85th percentile
1 (16 th Ave.) - General Purpose Lane	30	8,329	335	1,516	3,923	2,007	443	75	17	7	4	1	1	-	0	7,782	8,225	30	23.1	22.9	27.3	1,249
1 (16 th Ave.) - Transit Only Lane	30	339	9	28	79	102	63	26	16	8	6	1	1	1	1	217	280	33	28.8	27.4	36.0	51
2 (21 st Ave.) - General Purpose Lane	30	6,126	1,088	1,918	2,136	680	158	56	30	12	14	8	8	5	13	5,823	5,980	145	20.5	20.2	25.2	919
2 (21 st Ave.) - Transit Only Lane	30	758	124	167	144	120	76	43	21	16	9	8	9	6	13	556	632	126	26.1	23.0	36.2	114
3 (30 th Ave.) - General Purpose Lane	25	4,038	75	2,796	792	134	182	7	1	48	2	-	1	-	-	3,663	3,797	59	21.6	20.1	27.4	606
3 (30 th Ave.) - Transit Only Lane	25	474	33	79	121	88	57	25	16	9	10	4	7	6	19	233	321	96	29.3	25.2	39.6	71
4 (34 th Ave.) - General Purpose Lane	25	4,117	1,545	1,026	648	333	155	110	64	44	48	25	29	18	72	3,219	3,552	410	21.0	17.0	28.6	618
4 (34 th Ave.) - Transit Only Lane	25	1,072	174	233	198	136	95	64	35	26	23	13	16	12	48	604	740	236	28.0	22.9	42.1	161
5 (37 th Ave.) - General Purpose Lane	25	6,158	803	1,809	2,025	884	308	118	52	39	35	14	15	13	42	4,637	5,520	329	22.3	20.9	25.2	924
5 (37 th Ave.) - Transit Only Lane	25	1,137	70	205	291	180	98	63	37	35	36	17	24	14	68	565	745	294	31.0	25.4	47.9	171
6 (40 th Ave.) - General Purpose Lane	25	7,049	392	1,268	2,470	1,681	669	227	90	52	48	24	30	19	79	4,130	5,810	569	25.3	23.9	30.7	1,057
6 (40 th Ave.) - Transit Only Lane	25	971	44	74	187	232	132	81	43	29	40	18	23	15	55	304	536	303	33.7	28.6	49.9	146
7 (48 th Ave.) - General Purpose Lane	25	5,507	193	709	1,714	1,639	807	302	87	29	15	3	5	1	1	2,617	4,256	444	25.8	25.4	31.8	826
7 (48 th Ave.) - Transit Only Lane	25	701	21	91	182	178	122	56	24	15	5	1	4	1	1	294	472	108	27.7	26.4	34.9	105
8 (58 th Ave.) - General Purpose Lane	25	6,042	423	873	1,776	1,750	834	257	72	28	12	6	6	1	4	3,072	4,823	385	25.0	24.8	31.0	906
8 (58 th Ave.) - Transit Only Lane	25	202	45	67	23	15	12	13	7	7	5	1	2	2	2	135	150	39	24.6	18.5	38.3	30
9 (64 th Ave.) - General Purpose Lane	25	7,358	393	1,066	2,500	2,015	899	298	89	35	22	8	15	5	14	3,959	5,974	187	24.2	23.6	29.6	1,104
9 (64 th Ave.) - Transit Only Lane	25	523	71	136	129	63	47	33	13	11	6	3	3	2	7	336	399	45	24.8	21.3	34.3	79
10 (75 th Ave.) - General Purpose Lane	25	8,139	568	980	2,443	2,574	1,043	267	75	48	33	16	32	26	34	3,991	6,565	531	25.5	25.1	31.0	1,221
10 (75 th Ave.) - Transit Only Lane	25	547	24	50	134	150	82	42	22	18	7	6	3	3	7	208	358	108	29.8	27.4	40.0	82
11 (82 nd Ave.) - General Purpose Lane	25	5,661	217	548	2,053	1,813	582	178	67	48	28	18	27	11	70	2,818	4,631	447	26.3	24.9	30.7	849
11 (82 nd Ave.) - Transit Only Lane	25	1,195	20	70	254	316	170	103	55	40	43	14	24	16	70	344	660	364	33.9	28.7	48.3	179
12 (88 th Ave.) - General Purpose Lane	25	6,315	206	462	1,432	2,074	1,326	523	160	58	31	13	11	5	14	2,100	4,174	814	27.9	27.4	34.1	947
12 (88 th Ave.) - Transit Only Lane	25	299	3	10	23	74	54	35	28	22	20	6	7	4	13	35	110	136	37.4	32.7	51.3	45
13 (96 th Ave.) - General Purpose Lane	25	6,160	1,028	1,624	1,726	998	393	161	59	34	32	17	27	17	44	4,378	5,376	391	23.5	22.0	30.1	924
13 (96 th Ave.) - Transit Only Lane	25	1,429	116	269	363	224	130	75	51	40	34	22	32	19	54	748	973	327	29.3	24.3	42.9	214
14 (102 nd Ave.) - General Purpose Lane	30	7,034	310	993	2,631	2,041	717	200	57	27	17	9	9	4	19	5,975	6,692	142	24.8	24.6	30.3	1,055
14 (102 nd Ave.) - Transit Only Lane	30	292	7	13	46	79	51	32	17	11	11	3	6	3	13	145	196	64	34.0	29.6	45.5	44

WB General Purpose and Transit Only Lane - Before Data

Location	Posted Speed Limit	ADT	<15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	>70	Below speed limit	<5 mph over speed limit	>10 mph over speed limit	Weighted Average Speed	50th Percentile Speed	85th Percentile Speed	Volume above 85th percentile
1 (16 th Ave.) - General Purpose Lane	30	6,230	290	1,195	2,622	1,555	422	96	29	14	5	2	1	1	-	5,662	6,084	50	22.8	22.5	27.1	934
1 (16 th Ave.) - Transit Only Lane	30	199	7	18	57	63	30	13	6	2	1	0	0	-	-	145	175	10	27.0	26.1	32.7	30
2 (21 st Ave.) - General Purpose Lane	30	5,335	244	1,027	2,451	1,277	259	59	12	3	2	1	1	-	-	4,999	5,258	77	23.0	22.9	27.3	800
2 (21 st Ave.) - Transit Only Lane	30	339	11	65	145	65	28	15	5	3	1	1	1	-	-	286	313	26	24.7	22.8	31.5	51
3 (30 th Ave.) - General Purpose Lane	25	5,255	179	1,174	2,523	1,070	213	49	19	11	9	2	3	1	3	3,876	4,946	96	22.8	22.3	27.0	788
3 (30 th Ave.) - Transit Only Lane	25	259	15	42	80	78	19	9	6	4	2	1	1	1	3	137	214	26	25.9	24.5	31.1	39
4 (34 th Ave.) - General Purpose Lane	25	5,180	799	1,577	1,660	587	191	95	63	41	36	19	25	10	76	4,037	4,624	365	22.4	20.5	27.0	777
4 (34 th Ave.) - Transit Only Lane	25	1,684	145	352	442	238	131	82	41	41	48	20	30	26	87	940	1,178	376	29.6	23.8	44.7	253
5 (37 th Ave.) - General Purpose Lane	25	3,787	950	993	1,020	532	175	61	18	10	9	3	6	3	7	2,963	3,495	117	20.9	20.2	27.2	568
5 (37 th Ave.) - Transit Only Lane	25	699	116	194	204	105	45	19	7	5	3	1	0	-	1	513	618	36	21.8	20.9	28.3	105
6 (40 th Ave.) - General Purpose Lane	25	7,220	735	1,660	2,329	1,554	656	194	51	18	9	4	3	3	4	4,724	6,278	286	22.9	22.5	29.3	1,083
6 (40 th Ave.) - Transit Only Lane	25	710	39	111	195	163	116	49	15	7	5	3	3	1	2	345	508	86	26.7	25.6	33.7	107
7 (48 th Ave.) - General Purpose Lane	25	3,444	142	528	1,453	938	295	56	15	8	1	-	3	1	4	2,124	3,062	87	24.6	24.3	29.1	517
7 (48 th Ave.) - Transit Only Lane	25	767	27	96	227	194	99	45	30	19	12	2	8	1	7	350	544	124	27.9	25.9	35.8	115
8 (58 th Ave.) - General Purpose Lane	30	6,127	177	495	1,654	2,175	1,137	317	77	31	23	8	8	6	19	4,502	5,638	489	26.9	26.5	32.1	919
8 (58 th Ave.) - Transit Only Lane	30	296	84	21	30	32	34	25	19	12	15	4	5	3	13	167	201	95	29.8	27.3	47.4	44
9 (64 th Ave.) - General Purpose Lane	30	6,760	283	592	1,482	2,197	1,419	517	144	64	26	8	11	5	13	4,554	5,973	269	27.4	27.1	33.7	1,014
9 (64 th Ave.) - Transit Only Lane	30	192	17	51	48	19	13	12	12	6	4	2	3	1	4	135	147	32	27.4	22.3	40.6	29
10 (75 th Ave.) - General Purpose Lane	30	7,380	757	1,391	2,135	1,801	850	260	75	36	19	10	11	5	31	6,083	6,932	448	24.1	23.7	30.5	1,107
10 (75 th Ave.) - Transit Only Lane	30	710	58	95	150	145	105	59	26	16	19	6	8	7	17	448	553	158	29.2	26.5	39.4	107
11 (82 nd Ave.) - General Purpose Lane	30	5,964	691	1,122	1,590	1,534	694	192	52	22	15	6	10	2	34	4,938	5,631	333	24.0	23.8	30.3	895
11 (82 nd Ave.) - Transit Only Lane	30	539	15	36	88	125	100	59	37	23	22	9	9	6	10	264	365	174	32.9	30.2	45.1	81
12 (88 th Ave.) - General Purpose Lane	30	6,293	107	411	1,933	2,244	1,065	334	88	40	21	9	12	8	22	4,694	5,759	534	27.1	26.3	32.3	944
12 (88 th Ave.) - Transit Only Lane	30	347	5	9	29	63	80	48	29	24	19	7	10	7	18	106	185	162	38.1	33.7	52.8	52
13 (96 th Ave.) - General Purpose Lane	30	6,168	597	1,642	2,271	1,085	387	120	37	13	7	2	2	2	3	5,595	5,983	185	16.7	21.7	27.7	925
13 (96 th Ave.) - Transit Only Lane	30	833	42	142	271	178	99	51	20	13	9	3	2	2	2	632	732	101	26.0	24.3	33.5	125
14 (102 nd Ave.) - General Purpose Lane	30	6,916	286	879	2,359	2,090	871	249	77	35	21	11	10	4	24	5,614	6,485	183	25.5	25.0	30.6	1,037
14 (102 nd Ave.) - Transit Only Lane	30	509	20	29	80	127	108	53	29	20	11	8	8	2	14	256	364	92	32.3	29.6	41.4	76

EB General Purpose and Transit Only Lane - After Data

Location	Posted Speed Limit	ADT	<15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	>70	Below speed limit	<5 mph over speed limit	>10 mph over speed limit	Weighted Average Speed	50th Percentile Speed	85th Percentile Speed	Volume above 85th percentile
16 th Ave.) - General Purpose Lane	25	9,376	925	2,865	3,664	1,432	356	80	25	11	6	2	2	1	7	8,886	9,241	55	21.4	21.1	26.2	1,406
16 th Ave.) - Transit Only Lane	25	130	5	19	41	35	15	6	4	3	1	0	1	-	2	99	114	10	26.7	25.1	32.3	19
21 st Ave.) - General Purpose Lane	25	6,862	995	1,998	2,560	1,046	204	42	11	4	2	0	0	-	-	6,598	6,802	60	20.7	20.7	25.7	1,029
21 st Ave.) - Transit Only Lane	25	116	40	53	9	5	4	2	2	0	-	0	-	-	-	107	112	4	17.8	16.0	21.6	17
30 th Ave.) - General Purpose Lane	25	4,928	1,584	1,655	1,218	381	71	13	4	2	1	-	-	-	-	4,457	4,838	20	18.1	17.6	23.5	739
30 th Ave.) - Transit Only Lane	25	116	6	24	48	21	9	3	2	1	1	-	0	-	-	79	100	7	23.7	22.7	29.3	17
34 th Ave.) - General Purpose Lane	25	4,028	1,428	1,165	920	372	110	25	5	3	1	-	0	-	-	3,513	3,885	34	18.2	17.3	24.4	604
34 th Ave.) - Transit Only Lane	25	121	15	41	37	19	6	1	1	1	-	-	-	-	-	94	113	3	21.2	20.5	26.1	18
37 th Ave.) - General Purpose Lane	25	5,864	854	2,012	2,075	720	157	31	9	3	2	0	-	-	-	4,941	5,661	46	20.3	20.0	25.1	880
37 th Ave.) - Transit Only Lane	25	84	1	5	26	31	16	3	1	0	-	-	-	0	0	32	63	5	27.2	26.3	31.6	13
40 th Ave.) - General Purpose Lane	25	6,805	252	1,466	2,749	1,553	565	162	35	13	3	1	2	1	2	4,467	6,020	220	23.5	22.9	28.8	1,021
40 th Ave.) - Transit Only Lane	25	115	5	5	26	49	21	5	3	0	1	-	-	-	-	36	85	9	27.2	26.9	31.2	17
48 th Ave.) - General Purpose Lane	25	5,214	304	842	1,741	1,384	627	222	63	18	7	1	4	0	1	2,886	4,270	316	24.6	24.3	30.5	782
48 th Ave.) - Transit Only Lane	25	108	2	4	25	46	25	4	2	1	0	-	0	-	-	31	76	7	27.8	27.4	32.3	16
58 th Ave.) - General Purpose Lane	25	4,938	936	1,426	1,473	774	247	61	13	5	2	-	1	-	-	3,835	4,609	82	20.6	20.3	26.6	741
58 th Ave.) - Transit Only Lane	25	95	21	54	10	2	2	1	1	1	1	1	-	-	-	86	87	5	18.9	17.0	20.9	14
64 th Ave.) - General Purpose Lane	25	7,236	424	1,629	2,893	1,600	513	126	33	10	4	1	2	1	1	4,946	6,545	51	23.0	22.5	28.2	1,085
64 th Ave.) - Transit Only Lane	25	145	21	33	68	7	4	3	3	2	2	0	1	-	1	121	128	10	22.2	21.0	25.3	22
(75 th Ave.) - General Purpose Lane	25	7,381	483	1,369	2,608	1,973	720	176	35	8	5	1	1	-	0	4,461	6,434	227	23.7	23.7	29.1	1,107
(75 th Ave.) - Transit Only Lane	25	95	4	4	18	42	19	5	2	1	0	-	-	0	0	26	68	9	27.9	27.9	32.1	14
(82 nd Ave.) - General Purpose Lane	25	5,831	181	1,206	2,871	1,238	263	56	12	3	1	0	-	-	-	4,258	5,496	72	22.8	22.5	27.0	875
(82 nd Ave.) - Transit Only Lane	25	102	3	10	34	45	2	3	2	1	0	0	-	-	-	48	93	7	25.3	25.2	27.5	15
(88 th Ave.) - General Purpose Lane	25	5,625	203	544	1,711	1,926	890	246	68	25	10	1	1	0	-	2,457	4,384	351	25.9	25.8	31.6	844
(88 th Ave.) - Transit Only Lane	25	104	1	4	17	43	28	3	3	2	2	1	0	-	-	22	65	11	29.2	28.6	32.3	16
(96 th Ave.) - General Purpose Lane	25	6,128	899	1,685	1,984	1,058	366	98	25	8	3	1	-	-	1	4,568	5,626	136	21.4	21.1	27.3	919
(96 th Ave.) - Transit Only Lane	25	121	8	25	52	24	6	3	2	1	-	0	-	-	-	85	109	6	23.2	23.0	27.5	18
(102 nd Ave.) - General Purpose Lane	25	5,601	253	916	1,960	1,631	642	153	32	9	2	1	0	-	1	4,760	5,402	45	24.4	24.2	29.7	840
(102 nd Ave.) - Transit Only Lane	25	89	2	2	16	38	24	5	1	-	0	-	-	-	-	59	83	1	27.9	27.8	32.7	13

WB General Purpose and Transit Only Lane - After Data

Location	Posted Speed Limit	ADT	<15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	>70	Below speed limit	<5 mph over speed limit	>10 mph over speed limit	Weighted Average Speed	50th Percentile Speed	85th Percentile Speed	Volume above 85th percentile
16 th Ave.) - General Purpose Lane	25	7,437	735	2,153	3,043	1,199	242	49	9	4	1	0	0	-	0	7,131	7,373	16	21.3	21.2	25.9	1,116
16 th Ave.) - Transit Only Lane	25	132	11	9	30	37	23	10	3	3	2	2	1	1	1	87	109	12	28.3	27.1	34.5	20
21 st Ave.) - General Purpose Lane	25	5,757	197	978	2,620	1,514	358	71	11	6	2	-	1	-	0	5,309	5,667	91	23.5	23.3	27.8	864
21 st Ave.) - Transit Only Lane	25	88	7	36	37	2	4	1	1	-	-	-	-	-	-	81	85	2	20.5	19.8	22.9	13
30 th Ave.) - General Purpose Lane	25	5,046	282	1,651	2,349	642	97	17	4	1	1	-	-	-	-	4,283	4,925	24	21.2	21.1	25.1	757
30 th Ave.) - Transit Only Lane	25	116	6	24	48	21	9	3	2	1	1	-	0	-	-	79	100	7	25.2	25.0	27.9	17
34 th Ave.) - General Purpose Lane	25	5,331	962	1,885	1,635	632	161	35	10	5	2	1	1	-	2	4,482	5,114	56	13.9	19.4	25.1	800
34 th Ave.) - Transit Only Lane	25	107	9	28	52	14	2	1	0	0	1	0	-	-	-	88	102	3	21.6	21.3	24.8	16
37 th Ave.) - General Purpose Lane	25	4,704	1,295	1,708	1,182	400	86	24	4	3	1	-	0	-	-	4,185	4,585	33	18.5	18.1	23.8	706
37 th Ave.) - Transit Only Lane	25	102	3	16	41	27	10	2	1	-	1	0	0	-	-	60	87	5	24.7	23.8	29.5	15
40 th Ave.) - General Purpose Lane	25	7,361	784	2,074	2,463	1,430	466	106	27	7	3	0	-	-	-	5,321	6,751	144	21.8	21.6	27.7	1,104
40 th Ave.) - Transit Only Lane	25	82	3	3	18	33	18	4	1	-	-	1	1	-	-	24	57	7	27.6	27.4	32.3	12
48 th Ave.) - General Purpose Lane	25	6,211	670	1,729	2,353	1,045	312	77	16	5	4	-	0	-	1	4,752	5,797	102	21.6	21.3	26.7	932
48 th Ave.) - Transit Only Lane	25	108	4	6	26	46	19	2	2	1	0	0	0	0	0	36	82	7	27.1	26.6	30.8	16
58 th Ave.) - General Purpose Lane	25	5,463	264	1,135	2,370	1,225	356	84	21	3	3	1	0	0	-	4,994	5,351	112	23.0	22.7	27.8	819
58 th Ave.) - Transit Only Lane	25	99	82	5	3	2	3	1	1	1	1	-	-	-	-	92	95	4	14.7	12.2	16.3	15
64 th Ave.) - General Purpose Lane	25	6,740	366	769	2,006	2,239	1,000	258	63	24	8	4	1	0	2	5,380	6,380	102	25.4	25.4	31.0	1,011
64 th Ave.) - Transit Only Lane	25	103	11	35	47	5	2	1	0	0	0	-	0	-	0	98	100	2	20.8	20.3	23.9	15
(75 th Ave.) - General Purpose Lane	25	7,432	450	1,352	2,577	1,978	809	198	44	12	6	1	1	2	2	6,358	7,166	266	23.9	23.9	29.6	1,115
(75 th Ave.) - Transit Only Lane	25	103	4	14	36	35	7	2	1	1	1	1	-	-	0	90	97	5	25.0	24.7	28.6	15
(82 nd Ave.) - General Purpose Lane	25	4,909	983	1,546	1,309	770	238	50	11	2	0	0	0	-	-	4,607	4,845	64	20.3	19.7	26.6	736
(82 nd Ave.) - Transit Only Lane	25	126	5	30	54	22	10	3	2	-	-	-	-	-	0	111	121	5	23.1	22.1	28.2	19
(88 th Ave.) - General Purpose Lane	25	5,928	69	344	1,565	2,028	1,243	470	132	45	21	5	4	1	2	4,006	5,249	679	27.8	27.1	33.7	889
(88 th Ave.) - Transit Only Lane	25	109	1	4	24	46	26	3	0	2	1	-	-	-	-	76	102	6	27.9	27.9	31.9	16
(96 th Ave.) - General Purpose Lane	25	6,085	922	1,806	1,930	942	346	97	26	9	4	0	1	1	1	5,600	5,946	139	21.1	20.7	27.0	913
(96 th Ave.) - Transit Only Lane	25	107	3	34	51	8	3	3	2	1	1	1	-	-	0	96	99	8	22.4	20.2	25.9	16
(102 nd Ave.) - General Purpose Lane	25	5,955	276	811	2,076	1,888	697	150	36	11	7	1	-	2	-	5,051	5,748	57	24.6	24.6	29.7	893
(102 nd Ave.) - Transit Only Lane	25	103	1	3	29	45	20	3	1	1	1	-	-	-	-	77	98	3	27.4	26.9	31.6	15

ATTACHMENT C

BEFORE NON-TRANSIT VEHICLES IN TRANSIT LANE (ADT) FIGURE

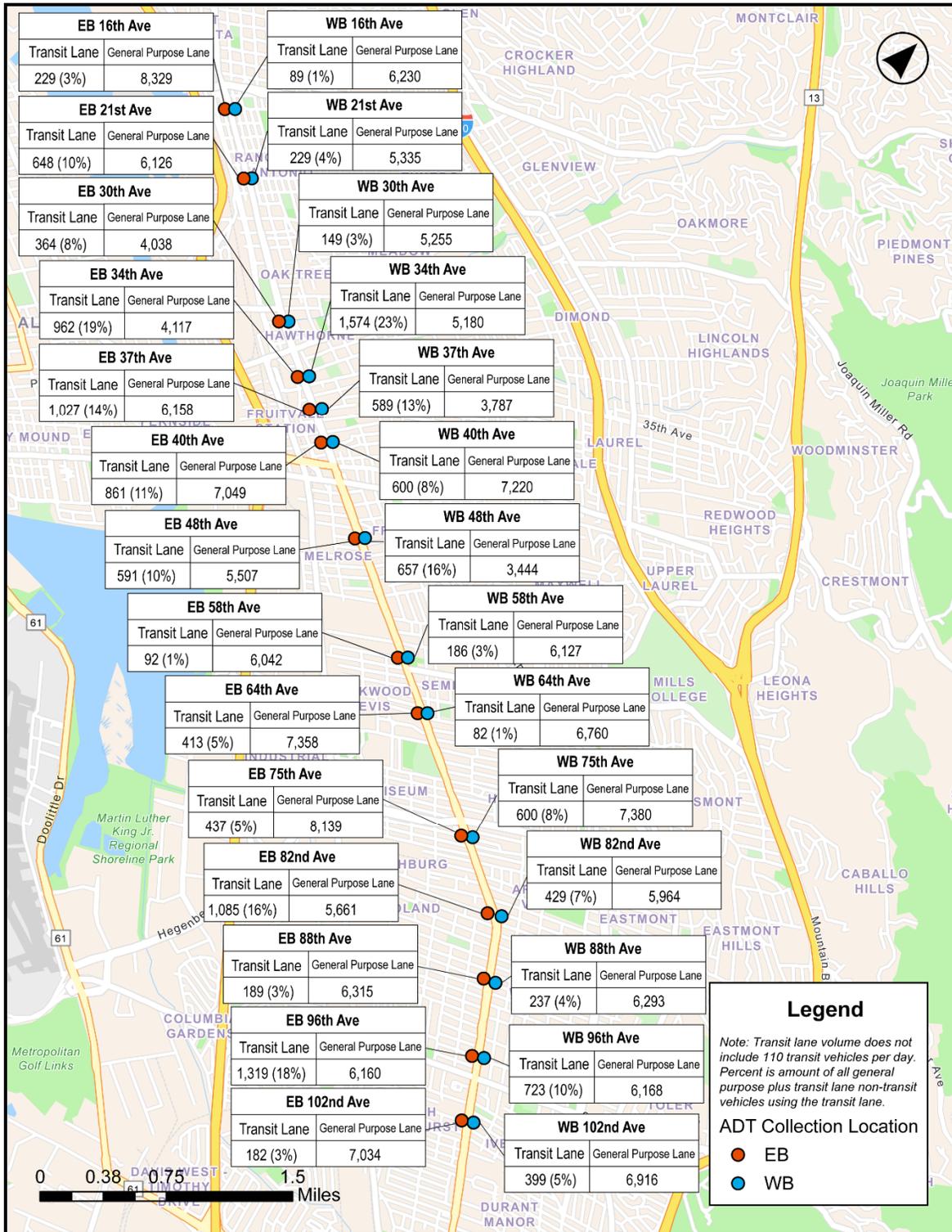


FIGURE C-1: BEFORE NON-TRANSIT VEHICLES IN TRANSIT LANE (ADT)

ATTACHMENT D

BEFORE GENERAL PURPOSE AND TRANSIT LANE SPEEDS FIGURES

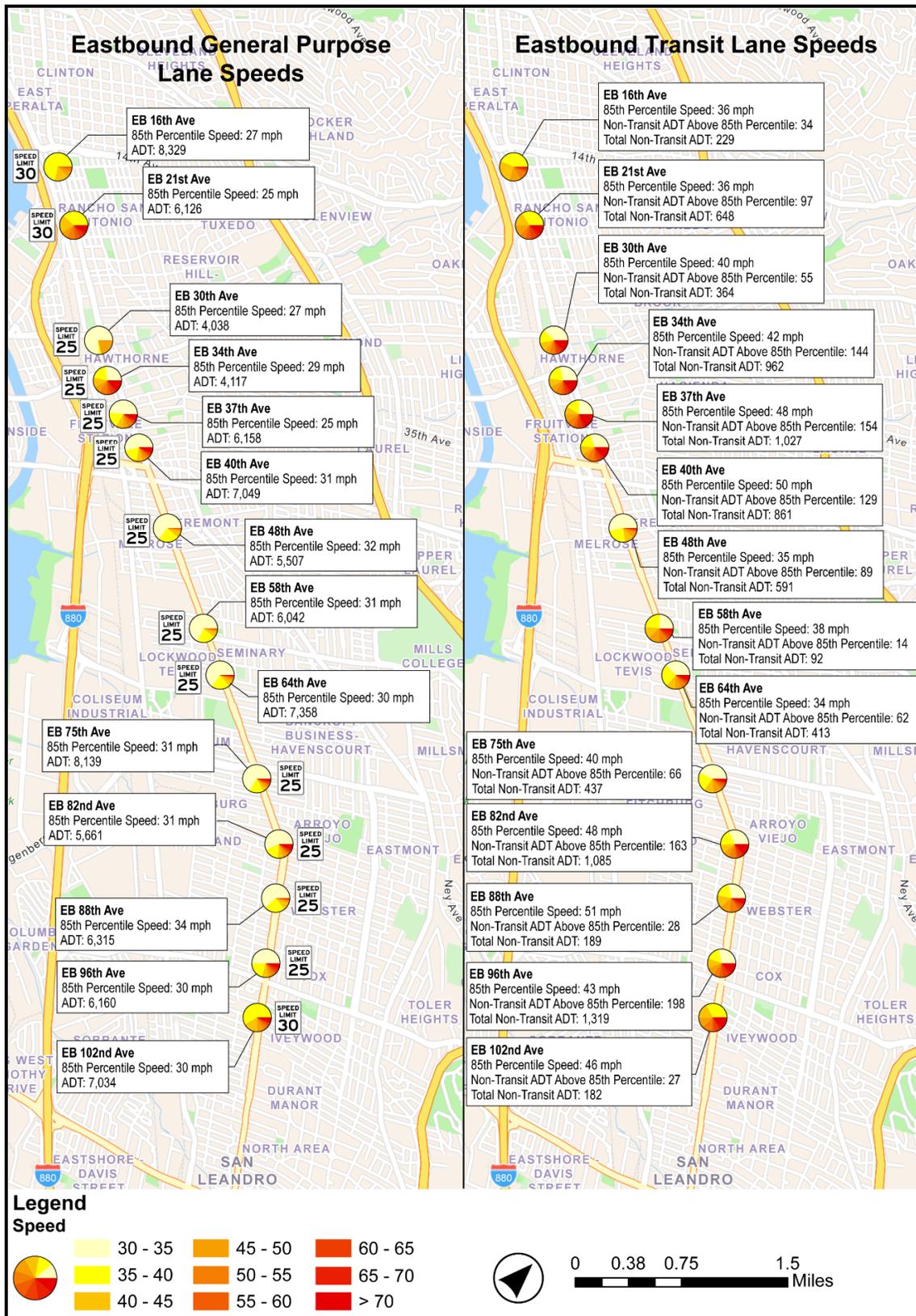


FIGURE D-1: BEFORE EB GENERAL PURPOSE AND TRANSIT LANE SPEEDS

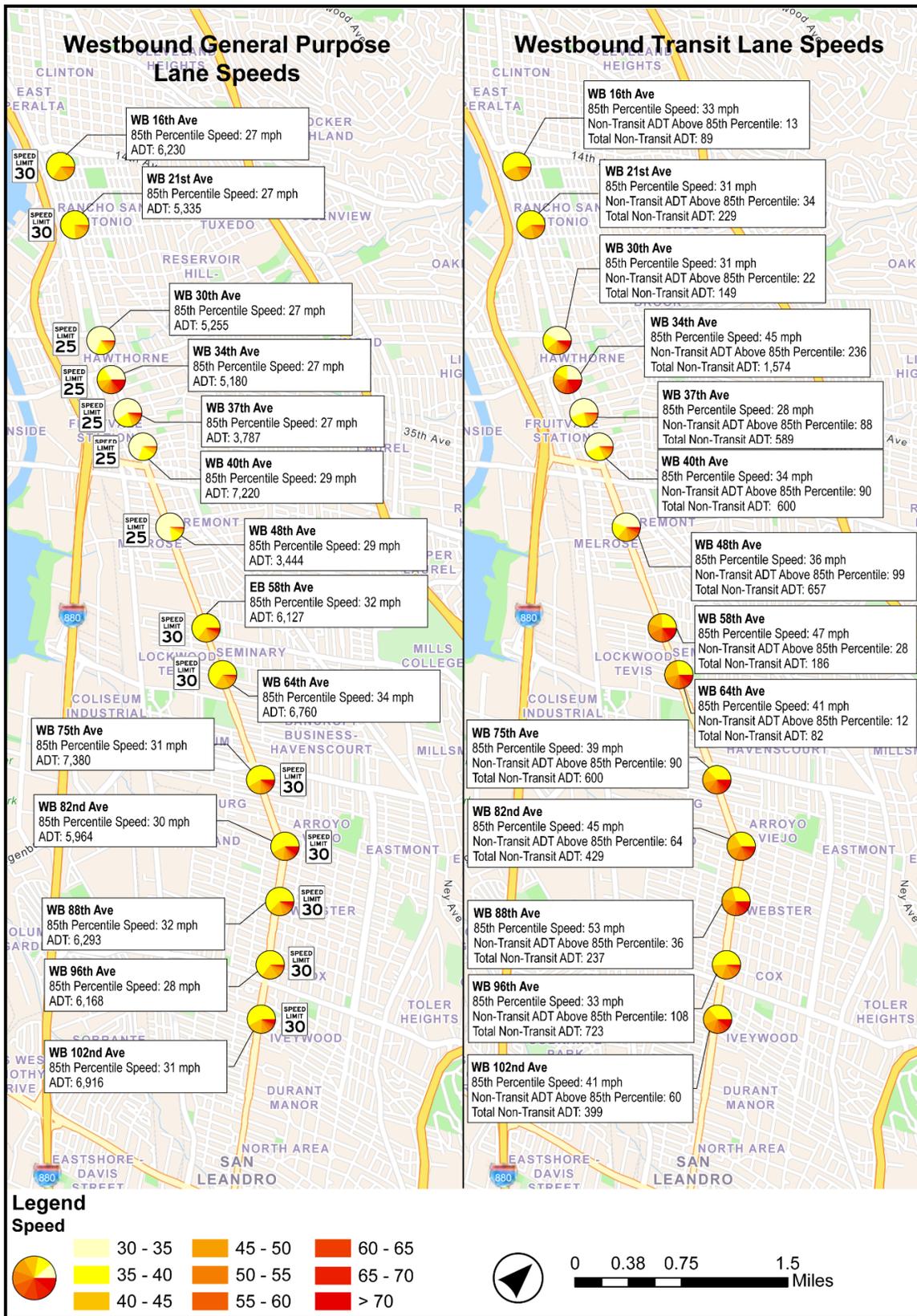


FIGURE D-2: BEFORE WB GENERAL PURPOSE AND TRANSIT LANE SPEEDS