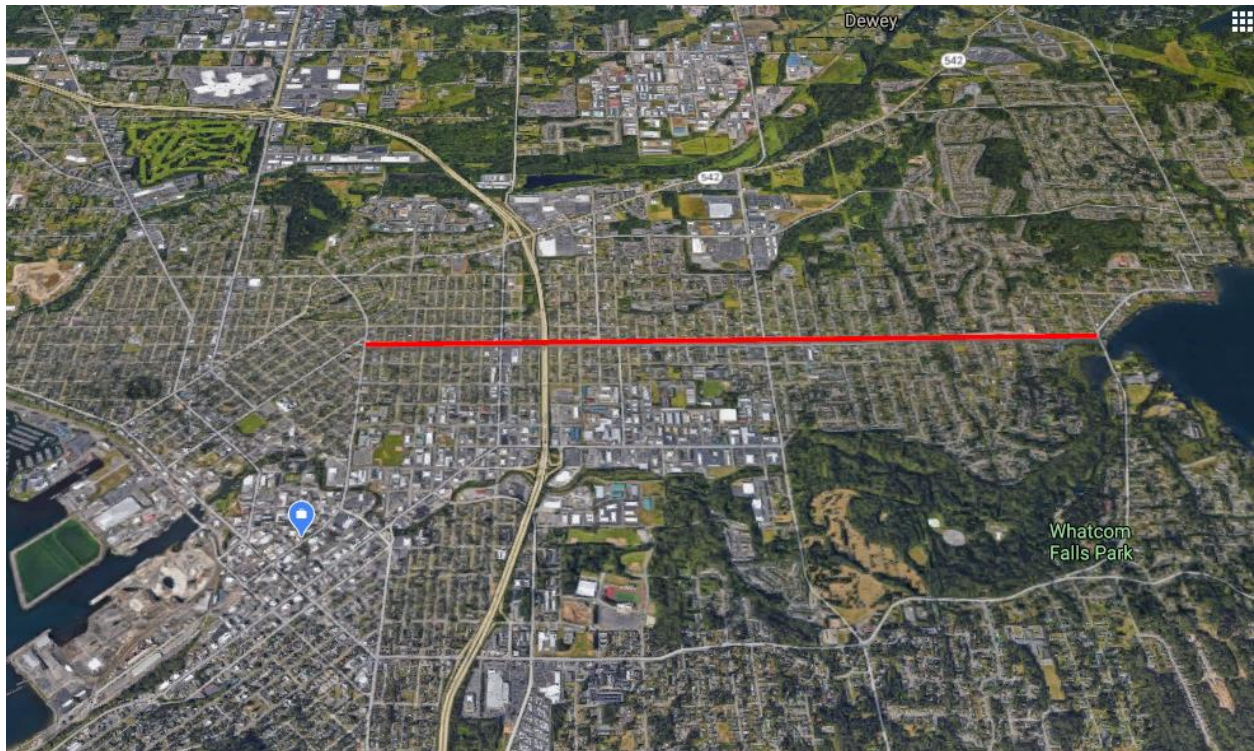


Alabama Street Multimodal Safety Improvements

Before & After Analysis of Vehicle Collisions, Traffic Volumes, and Speeds

October 2020 Update to the 2017 Report



Prepared by
Chris Comeau, AICP-CTP
Transportation Planner
Public Works Engineering
ccomeau@cob.org
or (360) 778-7946

Introduction

Alabama Street is an extremely important east-west transportation corridor connecting Lake Whatcom to Bellingham Bay and carries heavy automobile traffic volumes (13,000 to 20,000 vehicle per day) and high-frequency WTA transit buses. Historically, the corridor has bisected residential neighborhoods and had an unacceptably high vehicle collision and injury history. Over 10 years (2006 – 2015), there were 521 vehicle collisions with 195 injuries on Alabama Street, equating to annual averages of 52.1 vehicle collisions and 19.5 injuries, which represents an annual injury rate of 37.4%. This was the highest collision rate on any road in Whatcom County during this time period, with the exception of SR 539 Guide-Meridian, which carries about 50,000 vehicles per day between Bellingham and the international U.S.-Canada border.

In Spring 2011, Public Works identified Alabama Street as needing a “Feasibility Study for a Road Diet and Safety Improvements” ([Pedestrian Master Plan, page 3-14](#)) because the entire corridor divided neighborhoods and created a mobility barrier for pedestrians and transit riders. In Summer 2011, Bellingham was invited by WSDOT to apply for \$1.4 million in federal Highway Safety Improvement Program (HSIP) funding to reduce the high number of collisions on Alabama Street. In Spring 2012, the HSIP grant funding was awarded and four years (2012-2015) of multi-agency planning, neighborhood meetings, public open houses, misleading media coverage, and significant public controversy followed. In Autumn 2013, Alabama Street was also identified as both an important potential link in the citywide bicycle network, as well as a mobility barrier for bicyclists trying to cross Alabama Street ([Bicycle Master Plan, Chapter 3](#)).

In Autumn 2015, Bellingham constructed the [Alabama Street Multimodal Safety Improvements](#) along 1.75 miles from Cornwall Avenue to St. Clair Street in three distinct segments: West, Central, and East. No physical changes were made to the far east portion of the corridor between St. Clair and Electric Avenue, but the posted speed limit was lowered from 35 mph to 30 mph along the entire corridor from Cornwall Avenue to Electric Avenue.

In 2016, an in-depth case study of the Alabama Street Multimodal Safety Improvements was published in the March issue of the Institute of Transportation Engineers Journal titled [C-Curb Your Enthusiasm: A Road Diet, Safety Improvements, and Public Controversy in the U.S. Pacific Northwest](#) and the Alabama Street Multimodal Safety Improvements project won the following awards:

- 2016 Best Complete Street Project in U.S. – Institute of Transportation Engineers
- 2016 Best Smart Community Project – Washington Governor Jay Inslee
- 2016 Best Transportation Planning - American Planning Association, Washington Chapter

Before/After Analysis of Vehicle Collisions, Speeds, & Traffic Volumes

In 2017, Public Works published the first post-construction Before/After Analysis of Vehicle Collisions, Traffic Volumes, and Speeds on Alabama Street with data for 2016 collisions and 2016-2017 traffic counts. This 2020 report is the first update since then and uses 2017-2019 collision data and 2018 traffic counts and speed data. Public Works will continue to monitor all collisions, vehicle speeds, traffic volumes, and pedestrian, bicycle, and transit usage over time as data becomes available.

Summary of Key Findings in 2017

- **2016 - Post-Construction Analysis** (Using 2016-2017 traffic counts and 2016 collision data)
 - In 2016, there were 43 collisions, 14 of which were injury-related. This was a **17.3% collision reduction and a 28.2% injury reduction** below the annual average number of injury-related collisions experienced *prior to* the Alabama Street Multimodal Safety Improvements.
 - In 2016, compared to 2015 pre-construction speeds, there were generally **reductions in post-construction vehicle speeds ranging from 1% to 14.5%** for both eastbound and westbound traffic on Alabama Street. However, **it should be noted that 85th percentile vehicle speeds on all segments of Alabama Street have always been above the posted speed limit, both before and after the 2015 construction.**
 - In 2016, there were generally **reductions in traffic volumes ranging from 1% to 8.5%** for both eastbound and westbound traffic on Alabama Street.
 - In 2016, while there was no quantifiable before-after data on whether there had been an increase in walking and bicycling behavior, anecdotal information and observations indicate that **generally there were more walkers and bicyclists along Alabama Street** post-construction. This is especially true at the six new HAWK signals with crosswalks at Ellis Street, Grant Street, Moore Street, St. Paul Street, Undine Street, and Michigan Street, all of which are designated Bike Boulevards and important pedestrian crossings at bus shelters for the WTA high-frequency Gold GO Line (Route 331).

Summary of Key Findings in 2020

- **2020 - Post-Construction Analysis** (Using 2018 traffic counts and 2017-2019 collision data)
 - From 2017-2019, there were 126 collisions, 42 of which were injury-related. This equates to annual averages of 42 collisions and 14 injury-related collisions, which represents a **19.4% collision reduction and a 28.2% injury reduction** below the annual average experienced *prior to* the Alabama Street Multimodal Safety Improvements. **This demonstrates sustained safety benefits over time with a measurable reduction in both collisions and injuries, which was the intended purpose for the improvements constructed on Alabama Street.**
 - Alabama Street has an unresolved vehicle speeding problem. It should be noted that **85th percentile vehicle speeds on all segments of Alabama Street have always been above the posted speed limit, both before and after the 2015 construction.** However, in 2018, with few exceptions, **vehicle speeds for both eastbound and westbound traffic on Alabama Street have returned to and exceeded pre-construction speeds.**
 - In 2018, **there have been no substantial changes in how much traffic volume Alabama Street can carry.** After accounting for increases in general traffic due to a growing community, traffic volume maps also show that **there have not been major shifts to other nearby arterial streets** between 2012 and 2018 as a result of the Alabama Street Multimodal Safety Improvements.
 - From 2017-2019, while there is still no quantifiable before-after data on whether there has been an increase in walking and bicycling behavior, the City has continued to construct pedestrian and bicycle infrastructure in the Sunnyland and Roosevelt Neighborhoods, as depicted in Figures 2 and 3 below, and anecdotal information and observations indicate that **generally there are more walkers and bicyclists along Alabama Street** post-construction.

Recommendations (2020)

As documented in this report, and in the March 2016 case study in the Institute of Transportation Engineers Journal titled [C-Curb Your Enthusiasm: A Road Diet, Safety Improvements, and Public Controversy in the U.S. Pacific Northwest](#), the Alabama Street multimodal transportation safety improvements were planned to improve the quality of life for surrounding neighborhoods by making the corridor safer for people walking, biking, getting to WTA bus stops, as well as driving vehicles, while minimizing negative impacts to WTA high-frequency bus routes and emergency responders. The 2015 construction of these improvements have resulted in positive outcomes for reducing total collisions, reducing injury-related collisions, and increasing the crossing permeability of the corridor for people walking, biking, and getting to transit bus stops. Unfortunately, this hasn't slowed vehicles down.

In 2018, vehicle speeds recorded on Alabama Street were *significantly* higher than the posted **30 mph speed limit**, especially for eastbound traffic, which tends to be the afternoon/evening outbound commuter traffic. **The 85th percentile speed for the western segment is almost 35 mph, but all of the segments east of this are over 41 mph.** From Cornwall Avenue to Electric Avenue, Alabama Street is 2 miles long and arrow straight. While the 6 new HAWK signals, in addition to the existing 5 traffic signals, have significantly improved the crossing permeability of this long corridor, it is not feasible to alter the street design any further with additional road diet restrictions or physical traffic calming elements without creating significant negative impacts to WTA public transit operations and emergency medical response. **Law enforcement of the posted speed limit will be necessary to reduce vehicle speeds.**

The correlation between vehicle speed and severity of injuries to people is well documented in the transportation industry (Figure 1. below) and, even though there are fewer collisions and fewer injuries today as result of the 2015 safety improvements, higher vehicle speeds on Alabama Street have probably elevated the severity, and possibly the number, of injuries sustained in 2017-2019. If the 30 mph posted speed limit can successfully be enforced, it could lead to even fewer collisions and, perhaps, even fewer injuries, while also further improving quality of life for surrounding neighborhoods.

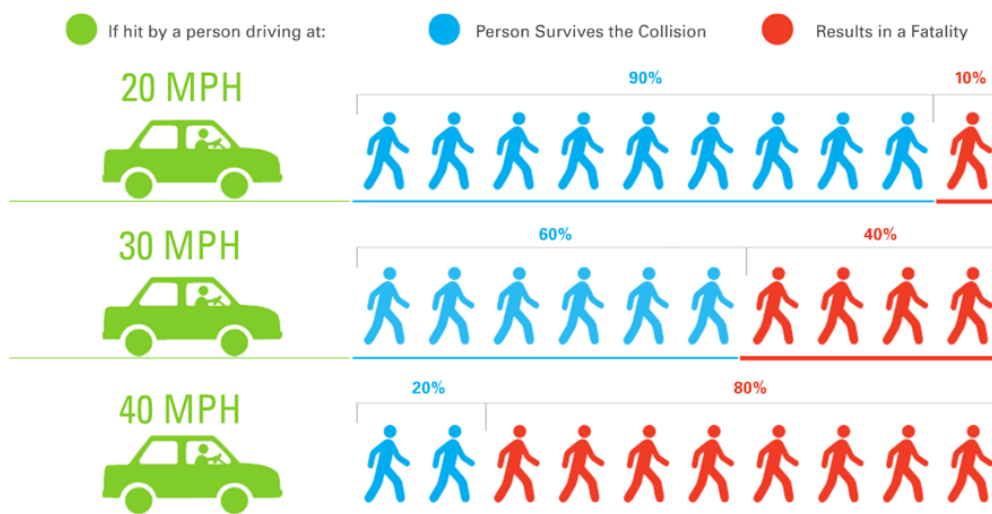


Figure 1. Severity of Collision Injuries Increases With Vehicle Speeds

2015 Alabama Street Multimodal Safety Improvements

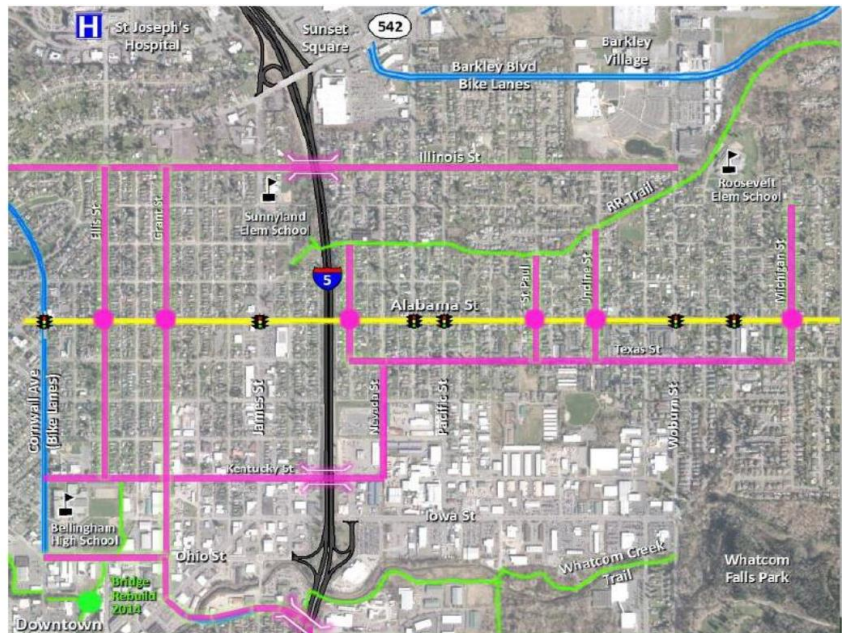
Pedestrian Crossing Permeability

Pedestrian safety and crossing opportunities should increase with urban density (Transect: Rural-Urban)

Alabama Street →
 ADT 21,000
 6 HAWK signals added (2015)
 At transit bus stops

Increased Pedestrian Crossing Permeability of Corridor

Reconnected Neighborhoods



Six New Pedestrian Crossing Signals Installed on Alabama Corridor in Bellingham, WA to Increase Pedestrian Crossing Permeability

Figure 2, above, shows how the 2015 construction of six user-activated pedestrian hybrid beacon (aka HAWK) signals helped to reconnect the Sunnyland and Roosevelt Neighborhoods, which are bisected by Alabama Street. Figure 3, below, shows the construction of well-connected bicycle facilities parallel to and across Alabama Street, which was an active transportation mobility barrier before the 2015 Alabama Street Multimodal Safety Improvements.



Before & After Analysis of Vehicle Collisions, Speeds, & Traffic Volumes

Pre-Construction Vehicle Collisions Increasing

As shown in Figure 4. and Table 1., below, from 2006 through 2011, there were 262 vehicle collisions on Alabama Street, 93 (35.5%) of which were injury-related. This was the second highest collision rate on any road in Whatcom County after Guide-Meridian (SR 539) north of Interstate 5, which carries approximately 50,000 vehicles per day between Bellingham and the U.S.-Canada international border. During the two years (2012-2013) of corridor analysis and feasibility study, there were 52 vehicle collisions on Alabama Street, 19 (36.5%) of which were injury-related.

During the two years (2014-2015) of project design, engineering, and construction, there were 127 vehicle collisions on Alabama Street, 45 (35.4%) of which were injury-related. In total, from 2006 through 2015, there were 521 vehicle collisions on Alabama Street, 195 (37.4%) of which were injury-related. **This equates to annual averages of 52.1 vehicle collisions with 19.5 collisions being injury-related.**

Post-Construction Vehicle Collision Reductions

As shown in Figure 3. and Table 1., below, in 2016, the first full year after the 2015 multimodal safety improvements were made, there were 43 collisions, 14 of which were injury-related (see below). This was a **17.3% collision reduction and a 28.2% injury reduction** below the pre-construction annual average listed above.

From 2017-2019, there were 126 collisions, 42 of which were injury-related. This equates to annual averages of 42 collisions and 14 injury-related collisions, which represents a **19.4% collision reduction and a 28.2% injury reduction** below the annual average experienced *prior to* the Alabama Street Multimodal Safety Improvements.

Conclusions To Date (2020)

The data above and shown in Figure 4. below demonstrate that as a result of the 2015 construction of the Alabama Street Multimodal Safety Improvements, **there have been sustained safety benefits over time (2016-2019) with measurable reductions in both total collisions and injury-related collisions**, which was the intended purpose for the improvements constructed on Alabama Street.

Room for Improvement (2020)

As documented throughout this report, Alabama has an on-going problem with vehicle speeding. It is possible that both total collisions and injury-related collision could be reduced further if 85th percentile vehicle speeds could be lowered through active and/or automated law enforcement of the posted 30 mph speed limit on Alabama Street. The Public Works Engineering Division will work with the Police Department on vehicle speeding issues and law enforcement on Alabama Street and will continue to monitor and report on speeds, volumes, and safety for all modes of transportation users over time.

Figure 4. Collisions & Injuries on Alabama Street Before & After 2015 Multimodal Safety Improvements

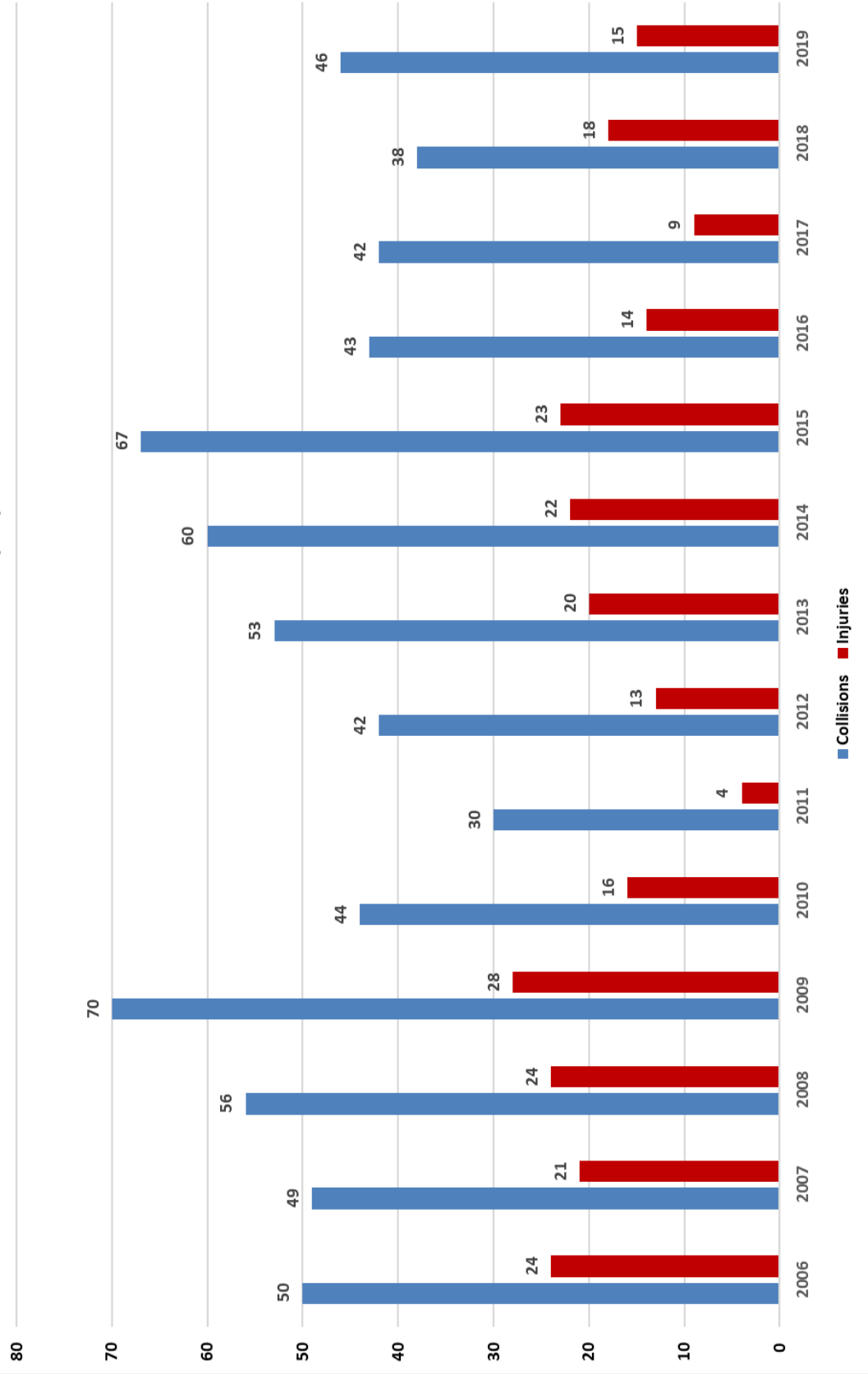


Table 1. Total and Injury-Related Collisions on Alabama Street, 2006-2019														
Year	Total	Property Damage	Possible Injury	Minor Injury	Serious Injury	Total Injuries	Fatal	Drugs & Alcohol	Fixed Object	Rear End	Side Swipe	Head-On & Angle	People Walking	People Biking
2006	50	32	12	4	2	24	0	4	3	15	7	25	1	0
2007	49	37	8	2	2	21	0	3	2	12	17	18	1	1
2008	56	37	12	6	1	24	0	0	2	22	1	17	0	4
2009	70	48	14	7	1	28	0	2	4	21	15	30	1	2
2010	44	28	8	8	0	16	0	1	2	17	11	14	2	2
2011	30	26	4	0	0	4	0	5	4	9	4	13	0	0
2012	42	29	6	4	3	13	0	2	3	15	10	14	2	1
2013	53	33	16	4	0	20	0	7	5	24	8	16	2	1
2014	60	38	15	6	0	22	1	5	5	19	14	22	2	4
2015	67	44	18	5	0	23	0	0	2	25	8	32	3	2
2016	43	29	9	5	0	14	0	3	2	17	3	15	1	2
2017	42	33	4	3	0	9	0	0	3	12	6	17	1	2
2018	38	20	13	3	0	18	0	1	4	11	1	16	3	2
2019	46	31	8	4	1	15	0	2	3	14	3	26	0	0
Totals	690	465	147	61	10	251	1	35	44	233	108	275	19	23

Source: Washington State Department of Transportation (WSDOT) Collision Database

Vehicle Traffic Volumes

Prior to 2015 (Figure 5.), vehicle speeds, heavy traffic volumes (13,000 – 19,000 vpd), multiple lanes, and lack of protected crosswalks made walking, biking, and crossing Alabama Street both inconvenient and uncomfortable for pedestrians, bicyclists, and transit riders trying to access WTA bus stops.

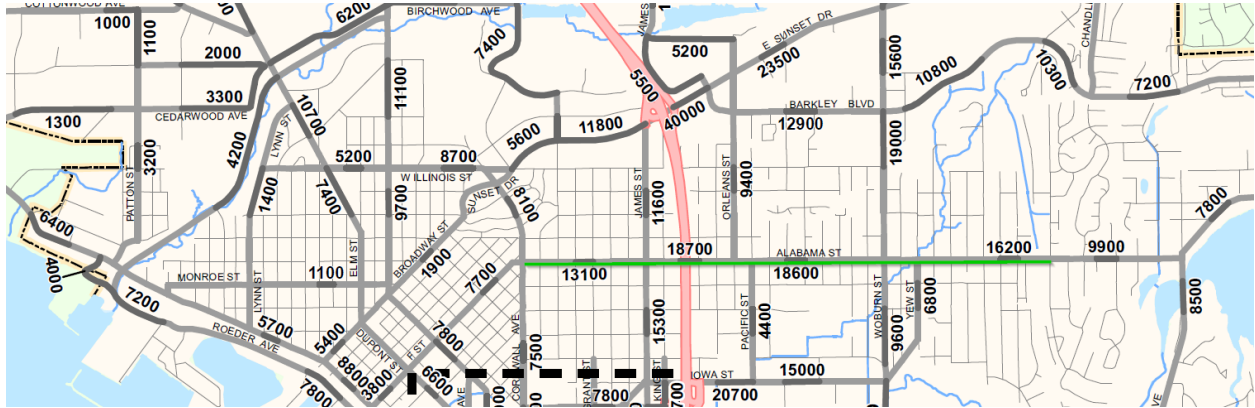


Figure 5. 2012 Traffic Volumes on Alabama Street from Cornwall Avenue to Vining Street



Figure 6. 2018 Traffic Volumes on Alabama Street from Cornwall Avenue to Vining Street

As can be seen in Figure 6., above, there have been no substantial changes in how much traffic volume Alabama Street can carry after the road diet and safety improvements. After accounting for increases in general traffic due to a growing community, the maps also show that there have not been major shifts to other nearby arterial streets between 2012 and 2018.

Vehicle Speeds

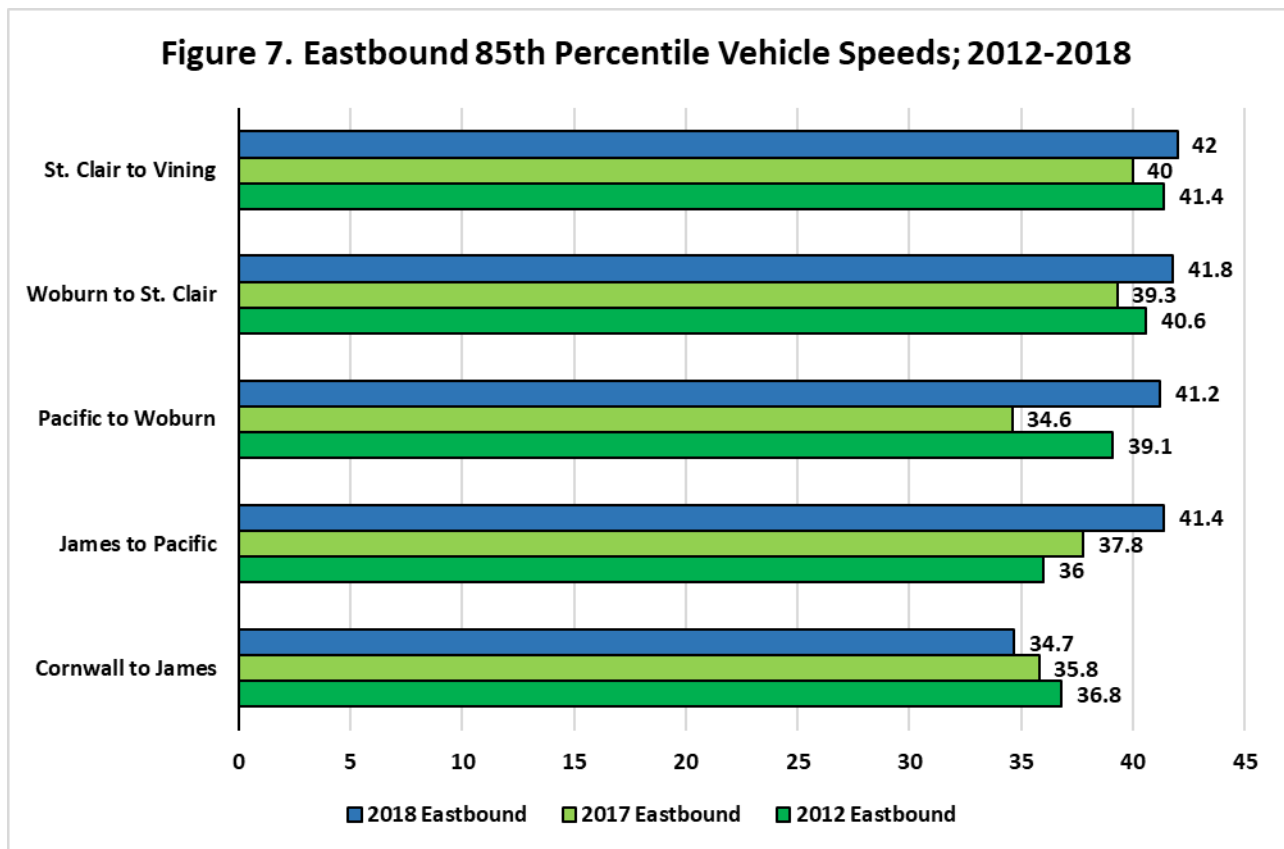
In 2015, Bellingham constructed safety improvements along 1.75 miles of Alabama Street from Cornwall Avenue to St. Clair Street in three distinct segments: West, Central, and East. No physical changes were made to the far east portion between St. Clair and Electric Avenue, but the posted speed limit was lowered from 35 mph to 30 mph along the entire corridor from Cornwall Avenue to Electric Avenue. It should be noted that **85th percentile vehicle speeds on all segments of Alabama Street have always been above the posted speed limit, both before and after the 2015 construction.**

As shown in the bar graphs below, in 2016-2017, there were generally post-construction reductions in 85th percentile vehicle speeds and traffic volumes. This may have been due to the introduction of new features on the roadway, such as 6 new HAWK signals, which may have created some uncertainty for drivers and leading them to drive at more cautious speeds.

Eastbound Vehicle Speeds

In 2018, with the exception of the western segment between Cornwall and James, **eastbound 85th percentile vehicle speeds on all other segments of Alabama Street exceeded pre-construction speeds** (Figure 7 below). This is likely due to drivers becoming familiar with the HAWK signals and the removal of left-turning vehicles in some 4-lane segments (James-Orleans and Woburn to Superior) due to the c-curb median, which eliminates vehicles stopping in the travel lane and reduces friction for traffic flow.

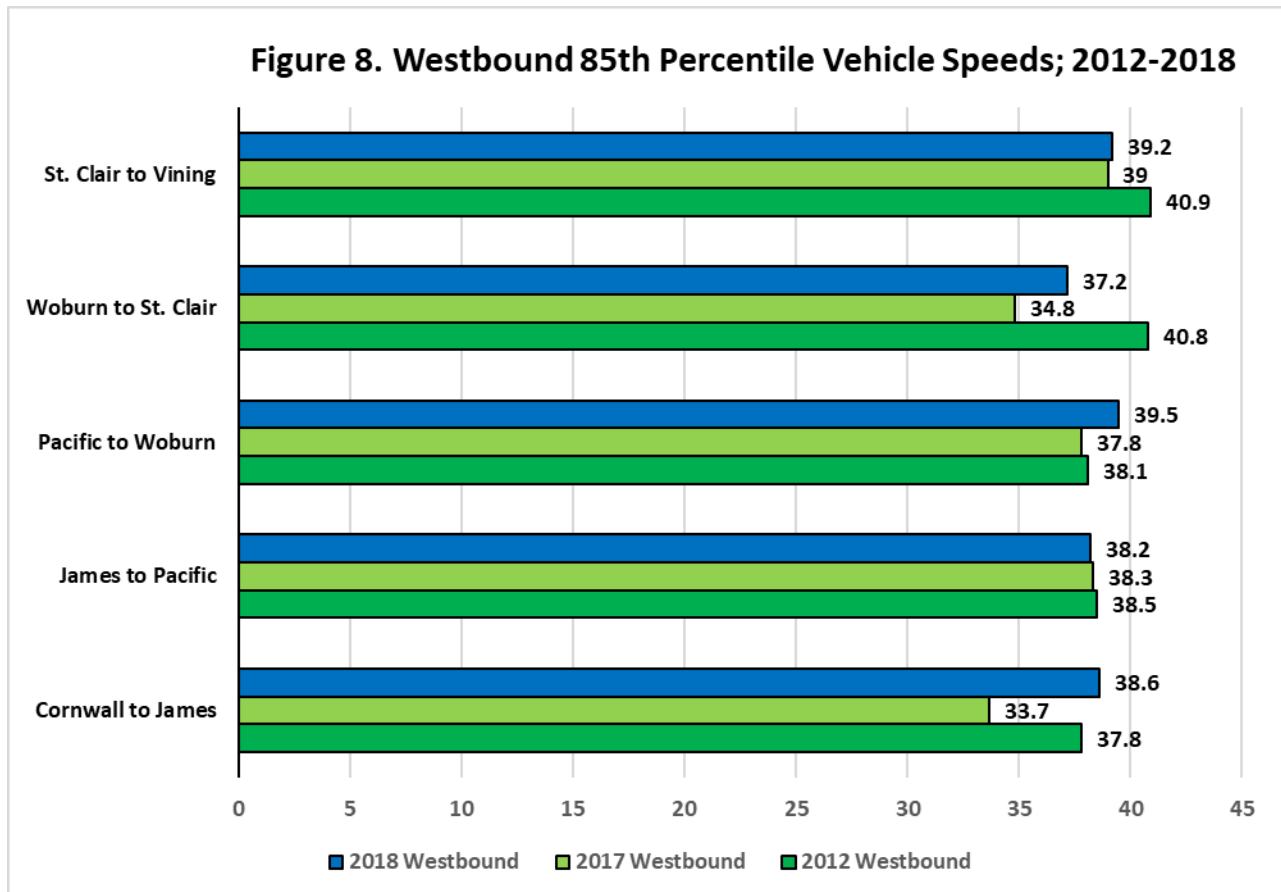
The consistently lower eastbound speeds on the western segment between Cornwall and James can be attributed to the traditional 4-lane to 3-lane road diet, which offers the inherent speed reduction benefit of vehicles only being able to travel as fast as the vehicle in front with no option to weave, pass, and speed. Vehicle speeds have also slowed on this segment during the evening commute due to eastbound traffic congestion, which has always been present, but now produces longer vehicle queues due to only one eastbound lane available. The traffic congestion and the longer vehicle queues both have relatively short durations, with the evening weekday commute usually lasting about 45 minutes.



Westbound Vehicle Speeds

In 2018, with the exception of the eastern segment between St. Clair to Vining, **westbound 85th percentile vehicle speeds on all other segments of Alabama Street met or exceeded pre-construction speeds** (Figure 8 below). This is likely due to drivers becoming familiar with the HAWK signals and the removal of left-turning vehicles in some 4-lane segments (James-Orleans and Woburn to Superior) due to the c-curb median, which eliminates vehicles stopping in the travel lane and reduces friction for traffic flow.

The consistently lower westbound speeds on the eastern segment between St. Clair to Vining can be attributed to the non-traditional road diet from 4-lanes to 1 westbound lane with a center turn lane and 2-eastbound lanes, which offers the inherent speed reduction benefit of vehicles only being able to travel as fast as the vehicle in front with no option to weave, pass, and speed. Vehicle speeds have also slowed on this segment during the morning commute due to westbound traffic congestion, which has always been present, but now produces longer vehicle queues due to only one westbound lane available. The traffic congestion and the longer vehicle queues both have relatively short durations, with the weekday morning commute peak usually lasting about 30-45 minutes.



West: Cornwall Avenue to James Street (Table 2.)

2015 safety improvements included a traditional 4-to-3-lane “road diet” with 5’ marked bike lanes and Pedestrian Hybrid Beacons (aka HAWK signals) installed at Ellis Street and Grant Street, both of which are Bike Boulevards, as well as consolidation of WTA bus stops, and ADA ramp upgrades.

Table 2. Eastbound (Cornwall to James):

- 2017 average speed for eastbound vehicles dropped by 2 mph, or 6.3%, and 85th percentile speed dropped by 1 mph, or 2.6%.
- 2017 Eastbound vehicle traffic volume dropped by 301 vehicles, or 4.6%.
- 2018 average speed for eastbound vehicles remained 2 mph below pre-construction conditions, but 85th percentile speed had dropped 7.3% to 34.7* mph. **It should be noted that this is 4.7 mph higher than the posted 30 mph speed limit.*
- 2018 eastbound traffic volume had increased slightly (1.2%) over pre-project volumes.

Table 2. Westbound (James to Cornwall):

- 2017 average speed for westbound vehicles dropped 3.5 mph, or 10.6%, and 85th percentile speed dropped by 4.1 mph, or 10.8%.
- 2017 westbound vehicle traffic volume dropped by 48 vehicles, or 0%.
- 2018 average speed for westbound vehicles increased to 1.0 mph above pre-project speed and 85th percentile speed increased by 0.8 mph above pre-project speed. *85th percentile speed was recorded as 38.6 mph, which is 8.6 mph over the 30 mph speed limit.*
- 2018 westbound traffic volume remained relatively unchanged from pre-project conditions.

Alabama Street Multimodal Safety Improvements

Pre- and Post-Project Vehicle Travel Speeds and Traffic Volumes

Table 2. West Portion of Corridor - Cornwall Avenue to James Street

Traditional Road Diet: 4 Vehicle Travel Lanes Reduced to 3; Bike Lanes Installed

Status According to Before/After Analysis =			Improved	Neutral	Unimproved	
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
East of Cornwall	6/12/2012	EB Lane 1	35	33	37.6	3,971
East of Cornwall	6/12/2012	EB Lane 2	35	31	35.9	2,603
<i>Pre-Project Eastbound Avg/Total 2012</i>			<i>35</i>	<i>32</i>	<i>36.8</i>	<i>6,574</i>
West of Ellis	3/27/2017	EB	30	31	37.7	5,961
East of Grant	3/27/2017	EB	30	29	33.8	6,585
<i>Post-Project Eastbound Avg/Total 2017</i>			<i>30</i>	<i>30</i>	<i>35.8</i>	<i>6,273</i>
<i>Post-Project Eastbound Change 2012-2017</i>			<i>(-5.0)</i>	<i>(-2.0)</i>	<i>(-1.0)</i>	<i>(-301)</i>
<i>Percent Change 2012-2017</i>				<i>(-6.3%)</i>	<i>(-2.6%)</i>	<i>(-4.6%)</i>
East of Cornwall	8/13/2018	EB	30	30	34.7	6,655
<i>Post-Project Eastbound Avg/Total 2018</i>			<i>30</i>	<i>30</i>	<i>34.7</i>	<i>6,655</i>
<i>Post-Project Eastbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>(-2.0)</i>	<i>(-2.7)</i>	<i>(+81)</i>
<i>Percent Change 2012-2018</i>				<i>(-6.3%)</i>	<i>(-7.3%)</i>	<i>(+1.2%)</i>
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
East of Cornwall	6/20/2012	WB Lane 1	35	34	38.7	4,548
East of Cornwall	6/20/2012	WB Lane 2	35	32	36.9	1,927
<i>Pre-Project Westbound Avg/Total 2012</i>			<i>35</i>	<i>33</i>	<i>37.8</i>	<i>6,475</i>
West of Ellis	4/11/2017	WB	30	31	34.7	6,427
East of Grant	3/27/2017	WB	30	28	32.7	6,426
<i>Post-Project Westbound Avg/Total 2017</i>			<i>30</i>	<i>29.5</i>	<i>33.7</i>	<i>6,427</i>
<i>Post-Project Westbound Change 2012-2017</i>			<i>(-5.0)</i>	<i>(-3.5)</i>	<i>(-4.1)</i>	<i>(-48)</i>
<i>Percent Change 2012-2017</i>				<i>(-10.6%)</i>	<i>(-10.8%)</i>	<i>(-0%)</i>
East of Cornwall	8/13/2018	WB	30	34	38.6	6,456
<i>Post-Project Westbound Avg/Total 2018</i>			<i>30</i>	<i>34</i>	<i>38.6</i>	<i>6,456</i>
<i>Post-Project Westbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>(+1)</i>	<i>(-0.8)</i>	<i>(-19)</i>
<i>Percent Change 2012-2018</i>				<i>(+3.0%)</i>	<i>(-0.2)</i>	<i>(-0%)</i>

Central: James Street to Interstate 5 to Woburn Street (Table 3. and Table 4.)

Due to heavy traffic volumes and negative impacts to WTA's most productive high-frequency transit route, a 4-to-3-lane road diet was not feasible on the central portion of Alabama Street. C-curb median was installed from James Street to Orleans Street and Pedestrian Hybrid Beacons (aka HAWK signals) were installed at Moore Street, St. Paul Street, and Undine Street. Alabama Street was widened from Undine Street to Woburn Street to allow a center two-way left-turn lane and ADA ramps were upgraded all along the central portion of Alabama Street.

Table 3. Eastbound (James to I-5):

- 2017 average speed for eastbound vehicles between James Street and Pacific Street dropped by 0.5 mph, or 1.6%, and 85th percentile speed dropped by 1.8 mph, or 5.0%.
- 2017 eastbound vehicle traffic volume between James Street and Pacific Street dropped by 144 vehicles, or 1.5%.
- 2018 average speed for eastbound vehicles increased significantly (17.7%) and 85th percentile speed increased significantly (15%) as well. *85th percentile speed was recorded as 41.4 mph, which is 11.4 mph over the 30 mph speed limit.*
- 2018 eastbound traffic volume increased very slightly (1.1%) above pre-project conditions.

Table 3. Westbound (I-5 to James):

- 2017 average speed for westbound vehicles between Pacific Street and James Street dropped by 1 mph, or 3%, and 85th percentile speed dropped by 0.2 mph, or 0.5%.
- 2017 westbound vehicle traffic volume between Pacific Street and James Street dropped by 34 vehicles, or 0%.
- 2018 average speed for westbound vehicles between Pacific Street and James Street did not change (33.5 mph), nor did 85th percentile speeds (38.2 mph) and both are similar to pre-project vehicle speeds. *85th percentile speed was recorded as 38.2 mph, which is 8.2 mph over the 30 mph speed limit.*
- 2018 westbound vehicle traffic volume between Pacific Street and James Street increased by 537 vehicles, or 5.9%.

Alabama Street Multimodal Safety Improvements Pre- and Post-Project Vehicle Travel Speeds and Traffic Volumes

Table 3. Central Portion of Corridor - James Street to Interstate 5
4 Vehicle Travel Lanes Retained, but C-Curb Median Installed - James to Interstate 5
New Transit Queue-Jump Lane Constructed at Alabama/James

Status According to Before/After Analysis =			Improved		Neutral	Unimproved
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
East of James (I-5)	6/27/2012	EB Lane 1	35	31	35.6	6,170
East of James (I-5)	6/27/2012	EB Lane 2	35	31	36.4	3,030
<i>Pre-Project Eastbound Avg/Total 2012</i>			<i>35</i>	<i>31</i>	<i>36</i>	<i>9,200</i>
East of James (I-5)	11/15/2016	EB Lane 1	30	31	35.6	5,866
East of James (I-5)	11/15/2016	EB Lane 2	30	32	39.9	3,190
<i>Post-Project Eastbound Avg/Total 2016</i>			<i>30</i>	<i>31.5</i>	<i>37.8</i>	<i>9,056</i>
<i>Post-Project Eastbound Change 2012-2016</i>			<i>(-5.0)</i>	<i>(+0.5)</i>	<i>(+1.8)</i>	<i>(-144)</i>
<i>Percent Change 2012-2016</i>				<i>(+1.6%)</i>	<i>(+5%)</i>	<i>(-1.5%)</i>
East of James (I-5)	8/13/2018	EB Lane 1	30	38	43	5,915
		EB Lane 2	30	35	39.7	3,395
<i>Post-Project Eastbound Avg/Total 2018</i>			<i>30</i>	<i>36.5</i>	<i>41.4</i>	<i>9,310</i>
<i>Post-Project Eastbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>(+5.5)</i>	<i>(+5.4)</i>	<i>(+110)</i>
<i>Percent Change 2012-2018</i>				<i>(+17.7%)</i>	<i>(+15%)</i>	<i>(+1.1%)</i>
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
East of James (I-5)	6/27/2012	WB Lane 1	35	34	38.7	6,360
East of James (I-5)	6/27/2012	WB Lane 2	35	33	38.2	2,708
<i>Pre-Project Westbound Avg/Total</i>			<i>35</i>	<i>33.5</i>	<i>38.5</i>	<i>9,068</i>
East of James (I-5)	11/15/2016	WB Lane 1	30	33	38.5	1,633
East of James (I-5)	11/15/2016	WB Lane 2	30	32	38.1	7,469
<i>Post-Project Westbound Avg/Total 2016</i>			<i>30</i>	<i>32.5</i>	<i>38.3</i>	<i>9,102</i>
<i>Post-Project Westbound Change 2012-2016</i>			<i>(-5.0)</i>	<i>(-1.0)</i>	<i>(-0.2)</i>	<i>(-34)</i>
<i>Percent Change 2012-2016</i>				<i>(-3.0%)</i>	<i>(-0.5%)</i>	<i>(-0%)</i>
East of James (I-5)	8/13/2018	WB Lane 1	30	33	38	8,050
		WB Lane 2	30	34	38.4	1,555
<i>Post-Project Westbound Avg/Total 2018</i>			<i>30</i>	<i>33.5</i>	<i>38.2</i>	<i>9,605</i>
<i>Post-Project Westbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>0</i>	<i>(-0.3)</i>	<i>(+537)</i>
<i>Percent Change 2012-2018</i>				<i>0</i>	<i>(-0.7)</i>	<i>(+5.9%)</i>

Table 4. Eastbound (Pacific to Woburn):

- 2017 average speed for eastbound vehicles between Pacific Street and Woburn Street dropped by 4.5 mph, or 13.2%, and 85th percentile speed dropped by 4.7 mph, or 12%.
- 2017 eastbound vehicle traffic volume between Pacific Street and Woburn Street dropped by 500 vehicles, or 5.6%.
- 2018 average speed for eastbound vehicles between Pacific Street and Woburn Street increased by 2.9% to 35 mph and the 85th percentile speed increased significantly by 4.8% to 41.2 mph. *85th percentile speed was recorded as 41.2 mph, which is 11.2 mph over the 30 mph speed limit.*
- 2018 eastbound vehicle traffic volume between Pacific Street and Woburn Street increased by 221 vehicles, or 2.5%.

Table 4. Westbound (Woburn to Pacific):

- 2017 average speed for eastbound vehicles between Woburn Street and Pacific Street dropped by 1 mph, or 3%, and 85th percentile speed dropped by 0.3 mph, or 0.8%.
- 2017 westbound vehicle traffic volume between Woburn Street and Pacific Street dropped by 339 vehicles, or 4.3%.
- 2018 average speed for eastbound vehicles between Woburn Street and Pacific Street increased significantly by 4.5% to 34.5 mph and 85th percentile speed increased significantly by 3.7%. *85th percentile speed was recorded as 39.5 mph, which is 9.5 mph over the 30 mph speed limit.*
- 2018 westbound vehicle traffic volume between Woburn Street and Pacific Street increased by 847 vehicles, or 10.8%.

Alabama Street Multimodal Safety Improvements Pre- and Post-Project Vehicle Travel Speeds and Traffic Volumes

Table 4. Central Portion of Corridor - Interstate 5 to Woburn Street
4 Vehicle Travel Lanes Retained, but C-Curb Median Installed - Interstate 5 to Orleans
New Center Turn Lane Constructed - Undine to Woburn

Status According to Before/After Analysis =			Improved		Neutral	Unimproved
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
West of St. Paul	6/27/2012	EB Lane 1	35	34	39.2	5,279
West of St. Paul	6/27/2012	EB Lane 2	35	34	39.3	3,636
<i>Pre-Project Eastbound Avg/Total 2012</i>			<i>35</i>	<i>34</i>	<i>39.3</i>	<i>8,915</i>
West of St. Paul	3/29/2017	EB Lane 1	30	29	34.5	4,991
West of St. Paul	3/29/2017	EB Lane 2	30	30	34.7	3,424
<i>Post-Project Eastbound Avg/Total 2017</i>			<i>30</i>	<i>29.5</i>	<i>34.6</i>	<i>8,415</i>
<i>Post-Project Eastbound Change 2012-2017</i>			<i>(-5.0)</i>	<i>(-4.5)</i>	<i>(-4.7)</i>	<i>(-500)</i>
<i>Percent Change 2012-2017</i>				<i>(-13.2%)</i>	<i>(-12%)</i>	<i>(-5.6%)</i>
West of St. Paul	8/13/2018	EB Lane 1	30	34	40	5,529
		EB Lane 2	30	36	42.3	3,855
<i>Post-Project Eastbound Avg/Total 2018</i>			<i>30</i>	<i>35</i>	<i>41.2</i>	<i>9,384</i>
<i>Post-Project Eastbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>(+1.0)</i>	<i>(+1.9)</i>	<i>(+221)</i>
<i>Percent Change 2012-2018</i>				<i>(+2.9%)</i>	<i>(+4.8%)</i>	<i>(+2.5%)</i>
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
West of St. Paul	6/27/2012	WB Lane 1	35	32	37.2	4,401
West of St. Paul	6/27/2012	WB Lane 2	35	34	39.1	3,436
<i>Pre-Project Westbound Avg/Total 2012</i>			<i>35</i>	<i>33</i>	<i>38.1</i>	<i>7,837</i>
West of St. Paul	3/29/2017	WB Lane 1	30	33	38.1	5,259
West of St. Paul	4/13/2017	WB Lane 2	30	31	37.5	2,917
<i>Post-Project Westbound Avg/Total 2017</i>			<i>30</i>	<i>32</i>	<i>37.8</i>	<i>8,176</i>
<i>Post-Project Westbound Change 2012-2017</i>			<i>(-5.0)</i>	<i>(-1.0)</i>	<i>(-0.3)</i>	<i>(+339)</i>
<i>Percent Change 2012-2017</i>				<i>(-3.0%)</i>	<i>(-0.8%)</i>	<i>(+4.3%)</i>
West of St. Paul	8/13/2018	WB Lane 1	30	35	39.6	5,536
		WB Lane 2	30	34	39.4	3,148
<i>Post-Project Westbound Avg/Total 2018</i>			<i>30</i>	<i>34.5</i>	<i>39.5</i>	<i>8,684</i>
<i>Post-Project Westbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>(+1.5)</i>	<i>(+1.4)</i>	<i>(+847)</i>
<i>Percent Change 2012-2018</i>				<i>(+4.5%)</i>	<i>(+3.7%)</i>	<i>(+10.8%)</i>

East: Woburn Street to St. Clair Street (Table 5.)

Table 5. Eastbound (Woburn to St. Clair):

- 2017 average speed for eastbound vehicles between Woburn Street and St. Clair Street dropped by 1.5 mph, or 4.3%, and 85th percentile speed dropped by 1.3 mph, or 3.2%.
- 2017 eastbound vehicle traffic volume between Woburn Street and St. Clair Street dropped by 708 vehicles, or 8.4%.
- 2018 average speed for eastbound vehicles between Woburn Street and St. Clair Street increased by 1.5 mph, or 4.3%, and 85th percentile speed increased by 1.2 mph, or 3.0%. *85th percentile speed was recorded as 41.8 mph, which is 11.8 mph over the 30 mph speed limit.*
- 2018 eastbound vehicle traffic volume between Woburn Street and St. Clair Street dropped by 611 vehicles, or 7.2%.

Table 5. Westbound (St. Clair to Woburn):

- 2017 average speed for westbound vehicles between St. Clair Street and Woburn Street dropped by 5 mph, or 14.3%, and 85th percentile speed dropped by 6 mph, or 14.7%.
- 2017 westbound vehicle traffic volume between St. Clair Street and Woburn Street dropped by 647 vehicles, or 8.2%.
- 2018 average speed for westbound vehicles between St. Clair Street and Woburn Street dropped by 3.0 mph, or 8.6% and 85th percentile speed dropped by 3.6 mph, or 8.8%. *85th percentile speed was recorded as 37.2 mph, which is 7.2 mph over the 30 mph speed limit.*
- 2018 westbound vehicle traffic volume between St. Clair Street and Woburn Street dropped by 347 vehicles, or 4.4%.

Alabama Street Multimodal Safety Improvements Pre- and Post-Project Vehicle Travel Speeds and Traffic Volumes

Table 5. East Portion of Corridor - Woburn Street to St. Clair Street
 4 Vehicle Travel Lanes Retained, but C-Curb Median Installed - Yew St to Superior
 4 Vehicle Travel Lanes Reduced to 3 Lanes (2 EB; 1 WB) with Center Turn Lane

Status According to Before/After Analysis =			Improved		Neutral	Unimproved
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
West of Michigan	7/11/2012	EB Lane 1	35	37	42.9	4,852
West of Michigan	7/11/2012	EB Lane 2	35	33	38.3	3,615
<i>Pre-Project Eastbound Avg/Total 2012</i>			<i>35</i>	<i>35</i>	<i>40.6</i>	<i>8,467</i>
West of Ontario	4/13/2017	EB Lane 1	30	36	40.6	4,538
West of Ontario	4/13/2017	EB Lane 2	30	33	38.3	3,221
<i>Post-Project Westbound Avg/Total 2017</i>			<i>30</i>	<i>34.5</i>	<i>39.3</i>	<i>7,759</i>
<i>Post-Project Westbound Change 2012-2017</i>			<i>(-5.0)</i>	<i>(-0.5)</i>	<i>(-1.3)</i>	<i>(-708)</i>
<i>Percent Change 2012-2017</i>				<i>(-1.4%)</i>	<i>(-3.2%)</i>	<i>(-8.4%)</i>
West of Michigan	7/11/2018	EB Lane 1	30	36	40.5	5,246
West of Michigan	7/11/2018	EB Lane 2	30	37	43.1	3,832
<i>Post-Project Eastbound Avg/Total 2018</i>			<i>30</i>	<i>36.5</i>	<i>41.8</i>	<i>9,078</i>
<i>Post-Project Eastbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>(+1.5)</i>	<i>(+1.2)</i>	<i>(+611)</i>
<i>Percent Change 2012-2018</i>				<i>(+4.3%)</i>	<i>(+3.0%)</i>	<i>(+7.2%)</i>
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
West of Michigan	7/11/2012	WB Lane 1	35	37	43.1	2,686
West of Michigan	7/11/2012	WB Lane 2	35	33	38.5	5,215
<i>Pre-Project Westbound Avg/Total 2012</i>			<i>35</i>	<i>35</i>	<i>40.8</i>	<i>7,901</i>
West of Ontario	5/2/2017	WB Lane	30	30	34.8	7,254
<i>Post-Project Westbound Avg/Total 2017</i>			<i>30</i>	<i>30</i>	<i>34.8</i>	<i>7,254</i>
<i>Post-Project Westbound Change 2012-2017</i>			<i>(-5.0)</i>	<i>(-5.0)</i>	<i>(-6.0)</i>	<i>(-647)</i>
<i>Percent Change 2012-2017</i>				<i>(-14.3%)</i>	<i>(-14.7%)</i>	<i>(-8.2%)</i>
West of Michigan	7/11/2018	WB Lane 1	30	32	37.2	8,248
<i>Post-Project Westbound Avg/Total 2018</i>			<i>30</i>	<i>32</i>	<i>37.2</i>	<i>8,248</i>
<i>Post-Project Westbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>(-3.0)</i>	<i>(-3.6)</i>	<i>(+347)</i>
<i>Percent Change 2012-2018</i>				<i>(-8.6%)</i>	<i>(-8.8%)</i>	<i>(+4.4%)</i>

Far East: St. Clair Street to Electric Avenue (Table 6.)

Table 6. Eastbound (St. Clair to Electric):

- 2017 average speed for eastbound vehicles between St. Clair Street and Electric Avenue dropped by 2.5 mph, or 6.8%, and 85th percentile speed dropped by 1.4 mph, or 3.4%.
- 2017 eastbound vehicle traffic volume between St. Clair Street and Electric Avenue dropped by 341 vehicles, or 4.7%.
- 2018 average speed for eastbound vehicles between St. Clair Street and Electric Avenue dropped by 1.0 mph, or 2.7%, but 85th percentile speed increased by 0.6 mph, or 1.4%. *85th percentile speed was recorded as 42.0 mph, which is 12.0 mph over the 30 mph speed limit.*
- 2018 eastbound vehicle traffic volume between St. Clair Street and Electric Avenue dropped significantly by 1,283 vehicles, or 21.3%.

Table 6. Westbound (Electric to St. Clair):

- 2017 average speed for westbound vehicles between Electric Avenue and St. Clair Street dropped by 2.0 mph, or 5.6%, and 85th percentile speed dropped by 1.9 mph, or 4.6%.
- 2017 westbound vehicle traffic volume between St. Clair Street and Woburn Street dropped by 482 vehicles, or 6.8%.
- 2018 average speed for westbound vehicles between Electric Avenue and St. Clair Street dropped by 2.0 mph, or 5.6% and 85th percentile speed dropped by 1.7 mph, or 4.2%. *85th percentile speed was recorded as 39.2 mph, which is 9.2 mph over the 30 mph speed limit.*
- 2018 westbound vehicle traffic volume between St. Clair Street and Woburn Street dropped significantly by 1,667 vehicles, or 23.6%.

Alabama Street Multimodal Safety Improvements Pre- and Post-Project Vehicle Travel Speeds and Traffic Volumes

Table 6. Far East Portion of Corridor - St. Clair Street to Electric Avenue
No Physical Changes - Speed Limit Lowered

Status According to Before/After Analysis =			Improved	Neutral	Unimproved	
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
West of Vining	7/11/2012	EB Lane 1	35	38	43	4,045
West of Vining	7/11/2012	EB Lane 2	35	35	39.7	3,241
<i>Pre-Project Westbound Avg/Total 2012</i>			<i>35</i>	<i>36.5</i>	<i>41.4</i>	<i>7,286</i>
West of Vining	5/9/2017	EB Lane 1	30	33	39.2	3,923
West of Vining	5/9/2017	EB Lane 2	30	35	40.9	3,022
<i>Post-Project Westbound Avg/Total 2017</i>			<i>30</i>	<i>34</i>	<i>40</i>	<i>6,945</i>
<i>Post-Project Westbound Change 2012-2017</i>			<i>(-5.0)</i>	<i>(-2.5)</i>	<i>(-1.4)</i>	<i>(-341)</i>
<i>Percent Change 2012-2017</i>				<i>(-6.8%)</i>	<i>(-3.4%)</i>	<i>(-4.7%)</i>
East of Fir St	7/12/2018	EB Lane 1	30	34	41.4	3,112
East of Fir St	7/12/2018	EB Lane 2	30	37	42.5	2,891
<i>Post-Project Eastbound Avg/Total 2018</i>			<i>30</i>	<i>35.5</i>	<i>42</i>	<i>6,003</i>
<i>Post-Project Eastbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>(-1.0)</i>	<i>(+0.6)</i>	<i>(-1,283)</i>
<i>Percent Change 2012-2018</i>				<i>(-2.7%)</i>	<i>(+1.4%)</i>	<i>(-21.3%)</i>
Alabama Street	Count Date	Travel Direction	Posted Speed mph	Avg Speed mph	85th% Speed mph	Daily Volume
West of Vining	7/11/2012	WB Lane	35	36	40.9	7,062
<i>Pre-Project Westbound Avg/Total 2012</i>			<i>35</i>	<i>36</i>	<i>40.9</i>	<i>7,062</i>
West of Vining	5/18/2017	WB Lane	30	34	39	6,580
<i>Post-Project Westbound Avg/Total 2017</i>			<i>30</i>	<i>34</i>	<i>39</i>	<i>6,580</i>
<i>Post-Project Westbound Change 2012-2017</i>			<i>(-5.0)</i>	<i>(-2.0)</i>	<i>(-1.9)</i>	<i>(-482)</i>
<i>Percent Change 2012-2017</i>				<i>(-5.6%)</i>	<i>(-4.6%)</i>	<i>(-6.8%)</i>
East of Fir St	7/12/2018	WB Lane 1	30	34	39.2	5,395
<i>Post-Project Westbound Avg/Total 2018</i>			<i>30</i>	<i>34</i>	<i>39.2</i>	<i>5,395</i>
<i>Post-Project Westbound Change 2012-2018</i>			<i>(-5.0)</i>	<i>(-2.0)</i>	<i>(-1.7)</i>	<i>(-1,667)</i>
<i>Percent Change 2012-2018</i>				<i>(-5.6%)</i>	<i>(-4.2%)</i>	<i>(-23.6%)</i>