



Alabama Street Multimodal Safety Improvements

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

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Introduction

In 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. Alabama Street is extremely important for moving heavy automobile traffic volumes (13,000 to 20,000 vehicle per day) and high-frequency WTA transit busses, but the corridor also had an unacceptably high vehicle collision history. From 2006 through 2015, there were 521 vehicle collisions with 195 injuries on Alabama Street. This equates to annual averages of 52.1 vehicle collisions and 19.5 injuries.

In 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, the project won the following awards:

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

An in-depth case study of the Alabama Street Multimodal Safety Improvements was published in the March 2016 issue of the Institute of Transportation Engineers Journal and is available at <https://www.cob.org/Documents/pw/transportation/tc-binder-items/bellingham-alabama-street-multimodal-trans-safety-imp.pdf>

Public Works will continue to monitor collisions, vehicle speeds, traffic volumes, and pedestrian, bicycle, and transit usage over time as data becomes available.

Summary of Key Findings in 2017

- In 2016, there were 43 collisions, 14 (37.0%) of which were injury-related (see below). This is a **17.3% collision reduction and a 28.2% injury reduction** below the annual average.
- Generally, there have been **reductions in vehicle speeds ranging from 1% to 14.5%** for both eastbound and westbound traffic on Alabama Street.
- Generally, there have been **reductions in traffic volumes ranging from 1% to 8.5%** for both eastbound and westbound traffic on Alabama Street.
- While there is no quantifiable before-after data on whether there has been an increase in walking and bicycling behavior, anecdotal information and observations indicate that **generally there are more walkers and bicyclists along Alabama Street**. This is especially true at the 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 crossings at bus shelters for the WTA high-frequency Gold GO Line (Route 331).

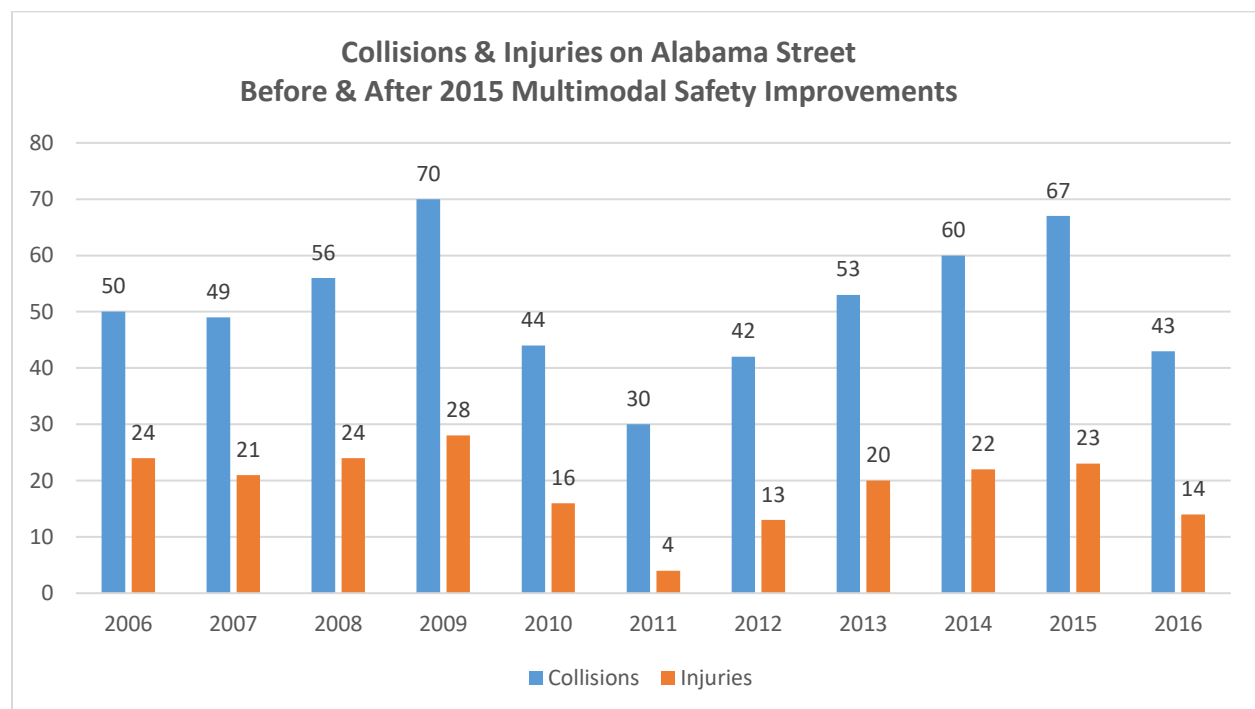
2015 Alabama Street Multimodal Safety Improvements

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

Vehicle Collisions

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. 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 and 19.5 injuries. In 2016, the first full year after the 2015 multimodal safety improvements were made, there were 43 collisions, 14 (37.0%) of which were injury-related (see below). This is a **17.3% collision reduction** and a **28.2% injury reduction** below the annual average.

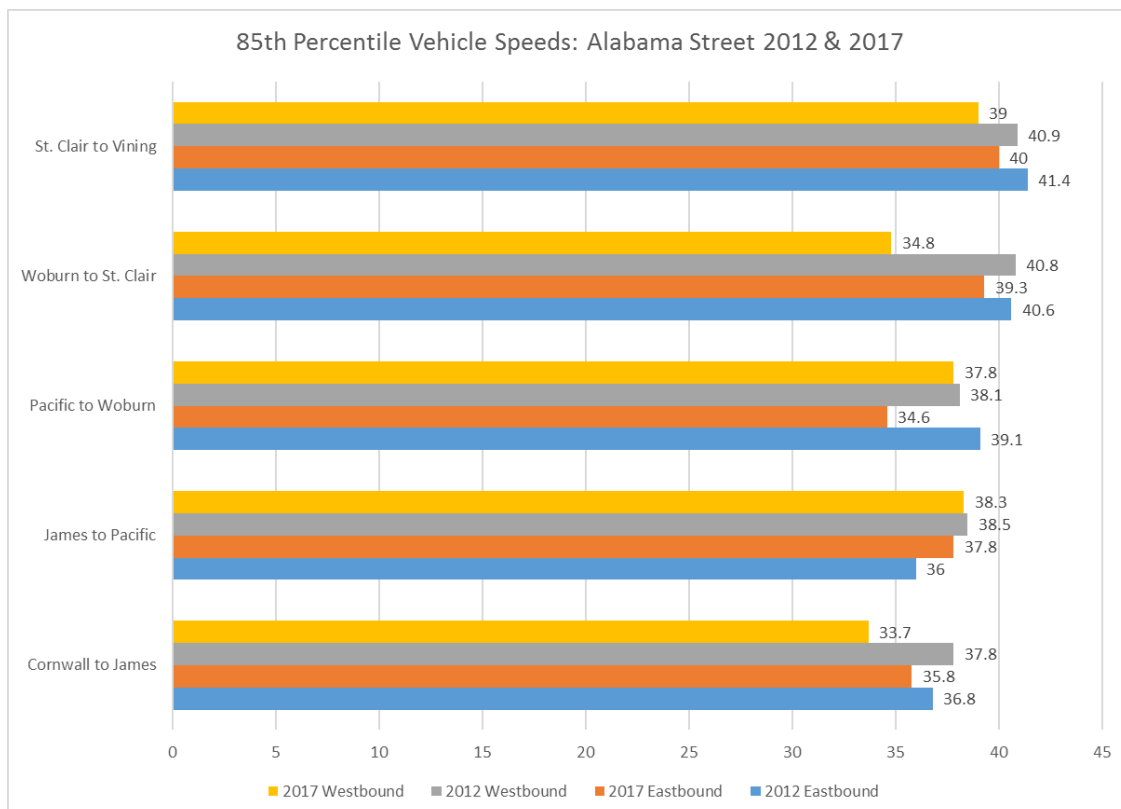


Vehicle Speeds and Traffic Volumes

Prior to 2015, vehicle speeds, heavy traffic volumes (13,000 – 20,000 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.



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. Generally, **there have been reductions in vehicle speeds and traffic volumes** (details below).



West: Cornwall Avenue to James Street

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.

Eastbound (Cornwall to James): Average speed for eastbound vehicles dropped by 2 mph, or 6.3%, and 85th percentile speed dropped by 1 mph, or 2.6%. Eastbound vehicle traffic volume dropped by 301 vehicles, or 4.6%.

Westbound (James to Cornwall): Average speed for westbound vehicles dropped 3.5 mph, or 10.6%, and 85th percentile speed dropped by 4.1 mph, or 10.8%. Westbound vehicle traffic volume dropped by 48 vehicles, or 0%.

Alabama Street Multimodal Safety Improvements						
Pre- and Post-Project Vehicle Travel Speeds and Traffic Volumes						
West Portion of Corridor - Cornwall Avenue to James Street						
Traditional Road Diet: 4 Vehicle Travel Lanes Reduced to 3; Bike Lanes Installed						
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</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</i>			<i>30</i>	<i>30</i>	<i>35.8</i>	<i>6,273</i>
<i>Post-Project Eastbound Change</i>			<i>(-5.0)</i>	<i>(-2.0)</i>	<i>(-1.0)</i>	<i>(-301)</i>
<i>Percent Change</i>				<i>(-6.3%)</i>	<i>(-2.6%)</i>	<i>(-4.6%)</i>
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</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</i>			<i>30</i>	<i>29.5</i>	<i>33.7</i>	<i>6,427</i>
<i>Post-Project Westbound Change</i>			<i>(-5.0)</i>	<i>(-3.5)</i>	<i>(-4.1)</i>	<i>(-48)</i>
<i>Percent Change</i>				<i>(-10.6%)</i>	<i>(-10.8%)</i>	<i>(-0%)</i>

While there is no quantifiable before-after data on whether there has been an increase in walking and bicycling behavior, anecdotal information and observations indicate that there are more walkers and bicyclists along Alabama Street, especially using the protected crossings at Ellis Street and Grant Street.

Central: James Street to Woburn Street

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.

Eastbound (James to I-5): 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%. Eastbound vehicle traffic volume between James Street and Pacific Street dropped by 144 vehicles, or 1.5%.

Westbound (I-5 to James): 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%. Westbound vehicle traffic volume between Pacific Street and James Street dropped by 34 vehicles, or 0%.

Eastbound (Pacific to Woburn): 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%. Eastbound vehicle traffic volume between Pacific Street and Woburn Street dropped by 500 vehicles, or 5.6%.

Westbound (Woburn to Pacific): 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%. Westbound vehicle traffic volume between Woburn Street and Pacific Street dropped by 339 vehicles, or 4.3%.

While there is no quantifiable before-after data on whether there has been an increase in walking and bicycling behavior, anecdotal information and observations indicate that there are more walkers and bicyclists along Alabama Street, especially using the protected crossings at St. Paul Street and Undine Street, where there is a daycare facility.

Alabama Street Multimodal Safety Improvements

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

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

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</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</i>			<i>30</i>	<i>31.5</i>	<i>37.8</i>	<i>9,056</i>
<i>Post-Project Eastbound Change</i>			<i>(-5.0)</i>	<i>(-0.5)</i>	<i>(+1.8)</i>	<i>(-144)</i>
<i>Percent Change</i>				<i>(-1.6%)</i>	<i>(+5%)</i>	<i>(-1.5%)</i>
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</i>			<i>30</i>	<i>32.5</i>	<i>38.3</i>	<i>9,102</i>
<i>Post-Project Westbound Change</i>			<i>(-5.0)</i>	<i>(-1.0)</i>	<i>(-0.2)</i>	<i>(-34)</i>
<i>Percent Change</i>				<i>(-3%)</i>	<i>(-0.5%)</i>	<i>(-0%)</i>
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</i>			<i>35</i>	<i>34</i>	<i>39.32</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</i>			<i>30</i>	<i>29.5</i>	<i>34.6</i>	<i>8,415</i>
<i>Post-Project Eastbound Change</i>			<i>(-5.0)</i>	<i>(-4.5)</i>	<i>(-4.7)</i>	<i>(-500)</i>
<i>Percent Change</i>				<i>(-13.2%)</i>	<i>(-12%)</i>	<i>(-5.6%)</i>
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</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</i>			<i>30</i>	<i>32</i>	<i>37.8</i>	<i>8,176</i>
<i>Post-Project Westbound Change</i>			<i>(-5.0)</i>	<i>(-1.0)</i>	<i>(-0.3)</i>	<i>(+339)</i>
<i>Percent Change</i>				<i>(-3%)</i>	<i>(-0.8%)</i>	<i>(+4.3%)</i>

East: Woburn Street to St. Clair Street

Eastbound (Woburn to St. Clair): 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%.

Eastbound vehicle traffic volume between Woburn Street and St. Clair Street dropped by 708 vehicles, or 8.4%.

Westbound (St. Clair to Woburn): 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%.

Westbound vehicle traffic volume between St. Clair Street and Woburn Street dropped by 647 vehicles, or 8.2%.

Alabama Street Multimodal Safety Improvements						
Pre- and Post-Project Vehicle Travel Speeds and Traffic Volumes						
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						
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</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 Eastbound Avg/Total</i>			<i>30</i>	<i>34.5</i>	<i>39.3</i>	<i>7,759</i>
<i>Post-Project Eastbound Change</i>			<i>(-5.0)</i>	<i>(+1.5)</i>	<i>(-1.3)</i>	<i>(-708)</i>
<i>Percent Change</i>				<i>(-4.3%)</i>	<i>(-3.2%)</i>	<i>(-8.4%)</i>
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</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</i>			<i>30</i>	<i>30</i>	<i>34.8</i>	<i>7,254</i>
<i>Post-Project Westbound Change</i>			<i>(-5.0)</i>	<i>(-5.0)</i>	<i>(-6.0)</i>	<i>(-647)</i>
<i>Percent Change</i>				<i>(-14.3%)</i>	<i>(-14.7%)</i>	<i>(-8.2%)</i>

While there is no quantifiable before-after data on whether there has been an increase in walking and bicycling behavior, anecdotal information and observations indicate that there are more walkers and bicyclists along Alabama Street, especially using the protected crossings at Michigan Street.

Far East: St. Clair Street to Electric Avenue

Eastbound (St. Clair to Electric): 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%. Eastbound vehicle traffic volume between St. Clair Street and Electric Avenue dropped by 341 vehicles, or 4.7%.

Westbound (Electric to St. Clair): 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%. Westbound vehicle traffic volume between St. Clair Street and Woburn Street dropped by 482 vehicles, or 6.8%.

Alabama Street Multimodal Safety Improvements						
Pre- and Post-Project Vehicle Travel Speeds and Traffic Volumes						
Far East Portion of Corridor - St. Clair Street to Electric Avenue						
No Physical Changes - Speed Limit Lowered						
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 Eastbound Avg/Total</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 Eastbound Avg/Total</i>			<i>30</i>	<i>34</i>	<i>40</i>	<i>6,945</i>
<i>Post-Project Eastbound Change</i>			<i>(-5.0)</i>	<i>(-2.5)</i>	<i>(-1.4)</i>	<i>(-341)</i>
<i>Percent Change</i>				<i>(-6.8%)</i>	<i>(-3.4%)</i>	<i>(-4.7%)</i>
West of Vining	7/11/2012	WB Lane	35	36	40.9	7,062
<i>Pre-Project Westbound Avg/Total</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</i>			<i>30</i>	<i>34</i>	<i>39</i>	<i>6,580</i>
<i>Post-Project Westbound Change</i>			<i>(-5.0)</i>	<i>(-2.0)</i>	<i>(-1.9)</i>	<i>(-482)</i>
<i>Percent Change</i>				<i>(-5.6%)</i>	<i>(-4.6%)</i>	<i>(-6.8%)</i>