

SR 539, Guide Meridian—I-5 to Horton Road Mobility Improvement Project



I-5 northbound off-ramp at SR 539



SR 539, north of Telegraph Road



SR 539, north of Bakerview Road

Interim report: Evaluation of improvement options July 13, 2011

Revised September 12, 2011

Produced by:



With support from:



Acknowledgements

Project team:

Brent Baldwin, City of Bellingham
Chris Comeau, City of Bellingham
Steve Haugen, City of Bellingham
Linda Stewart, City of Bellingham
Heather Higgins-Aanes, City of Bellingham
Rory Routhe, City of Bellingham
Andres Gomez, Whatcom Council of Governments
Todd Carlson, WSDOT
Dustin Terpening, WSDOT
Chris Damitio, WSDOT
Mike Koidal, WSDOT
Gus Deeter, WSDOT
Sonny Andrew, WSDOT
Dina Swires, WSDOT
Jay Drye, WSDOT
Kerri Woehler, WSDOT

Contact information:

Kerri Woehler, Planning Manager
Washington State Department of Transportation
Northwest Region/Mount Baker Area

1043 Goldenrod Road, Suite 101
Burlington, WA 98233-3415
360.757.5981 or woehlek@wsdot.wa.gov

Executive Summary

What is the problem?

SR 539/Guide Meridian is easily one of the busiest roads in Bellingham. It serves one of the region's most important retail centers and provides a key transportation link between I-5 and the Canadian border. Consequently, it can get quite congested, especially near the I-5 interchange. The problem on the Guide is that the combination of high traffic volumes and lots of turns is concentrated in a short section of highway. Essentially, there's just too much activity squeezed into too small a space. This results in long traffic delays and more than 700 collisions in the last five years. These conditions make it difficult to travel through the corridor, get in and out of businesses, and could pose a barrier to future economic development.

What can be done?

WSDOT has approximately \$3 million in federal border highway funds to make improvements on the highway between I-5 and Horton Road. It's not enough funding to rebuild the interchange or make dramatic changes to the highway, but we will improve traffic flow and safety. We are considering several types of improvements that have proved successful on similar corridors, such as restricting left turns, consolidating driveways and extending lanes.

How do we decide which improvements to construct?

We must weigh the public benefit provided by each improvement option against the cost and the disadvantages. Our assessment is based on a technical analysis that illustrates how each option would affect traffic delays and backups and the potential for collisions. However, that's only one side of the story. Our evaluation is also influenced by users' perspectives. We worked with community members to understand how the various options would affect travelers, property, businesses and the natural environment. This helps us weigh the pros and cons accurately and fairly.

What did we learn?

A lot, actually. We learned that although improvements can relieve congestion, none of the options we studied and can afford will *eliminate* delays. Even with the improvements we can afford to build, there will still be congestion on the Guide. We eliminated several improvement options from our study because their cost and disadvantages clearly outweighed potential benefits. The following options, we believe, could substantially improve traffic flow and safety, and will be considered for construction in 2013:

- **Restrict northbound left turns at Telegraph:** This option reduces the number of turning activities happening at the intersection to allow more time to move cars headed south on the Guide Meridian. Ultimately that will reduce backups - in fact, it is anticipated that this change would reduce southbound delays by 30 percent.

- **Add centerline curb with mid-block, left-in turns:** Traffic volumes on the Guide far exceed federal and state standards for a center turn lane. State law requires public agencies to manage access to improve safety and traffic flow on highways. These measures, such as installing centerline curb, have been shown to provide significant reduction in collisions and improvement in travel speed.
- **Extend northbound right lane between Bellis Fair Parkway and Bakerview Road:** Extending this lane would provide significant benefits for reducing wait times and backups, including on the I-5 northbound off-ramp.
- **Widen northbound off-ramp turning radius:** This would improve traffic flow at the I-5 northbound off-ramp.
- **Consolidate driveways:** Consolidating driveways can provide substantial benefit by improving predictability and reducing vehicle conflict points and distractions for drivers.
- **Install curb between I-5 and Telegraph:** This option would install curb between the right and middle lanes, resulting in the elimination of a right-turn opportunity onto Telegraph Road except for traffic exiting I-5. While some benefit is anticipated, it's possible the change would increase weaving movements and backups elsewhere, simply shifting the problem to a different location. Other improvement options would improve traffic flow and safety with less detriment to traffic circulation and access to businesses.
- **Additional minor improvements by city and WSDOT to compliment those implemented, including:** Analyze speed limit, modify signs, adjust traffic signal operations and adopt an access management plan.

What's next?

The purpose of this report is to explain how the options work and share the results of our evaluation. We hope community members will use this information to ask questions and share their perspectives to inform WSDOT's selection of projects for construction. Construction is scheduled to begin in spring 2013; in order to deliver the project on time and budget, we must determine which improvements we will implement by fall 2011.

Table of Contents

1. Introduction	1
2. Corridor profile.	3
3. Transportation needs.	9
4. Evaluation of improvement options.	13
5. Summary of results.	21
6. Key findings.	37
7. Next steps.	39

This page intentionally left blank.

1. Introduction

WSDOT has approximately \$3 million in federal border highway funds to make improvements on SR 539/Guide Meridian between I-5 and Horton Road. It's not enough funding to rebuild the interchange or make dramatic changes to the highway, but we will improve traffic flow and safety. Construction is slated for spring 2013; in order to deliver the project on time and budget, we must determine which improvements we will construct by fall 2011.

Why is WSDOT making improvements to traffic flow and safety on the Guide Meridian?

The Guide is easily one of the busiest roads in Bellingham. It serves one of the region's most important retail centers and provides a key transportation link between I-5 and the Canadian border. Consequently, it can get quite congested and there are collisions, especially near the I-5 interchange.

The high volume of traffic plus all the turning in and out of roads and driveways is a bad combination and a bit chaotic. The problem is that there's just too much activity squeezed into too small a space. This results in long traffic delays and more than 700 collisions in the last five years. These conditions make it difficult to travel through the corridor, get in and out of businesses, and could pose a barrier to future economic development.



Backups on SR 539 at the Telegraph Road intersection.

That is why WSDOT has secured funds from a federal border highway program to make improvements. There is about \$2.75 million available to construct a project that provides for "the safe movement of motor vehicles to and across land border crossings."

What are the improvement options?

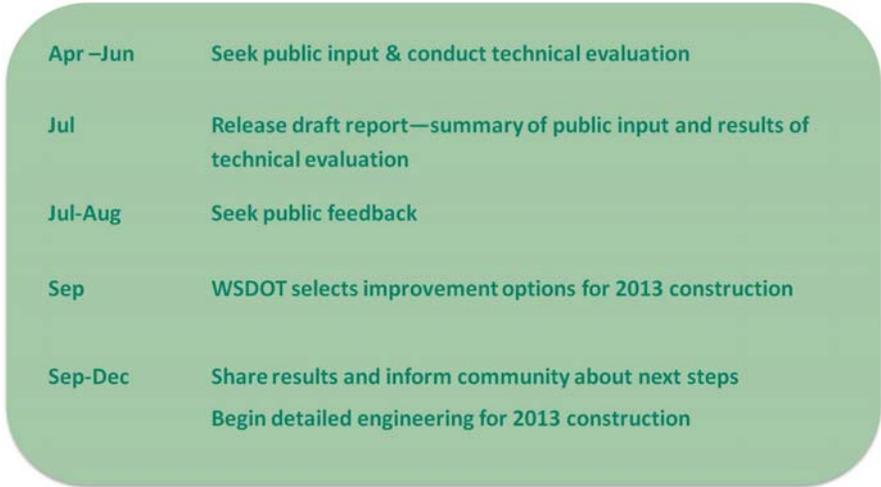
Our long-term plan calls for a full rebuild of the I-5/SR 539 interchange, a project that we currently cannot afford. The purpose of this effort is to determine what we can do with less than \$3 million available. There are several types of improvements that we've used on other highways with similar problems that have provided considerable benefit. We evaluated those options to determine how they might work on the Guide to address the problems we've identified.



Left-turn restrictions (left), centerline curb (top right) and dedicated turn lanes (bottom right) are among the improvement options we're considering for SR 539.

What is the process?

This is a pre-design analysis—a precursor to full engineering that gives us an opportunity to evaluate our options with a technical analysis and public input. It results in an implementation strategy based on the funding we have available. The pre-design process will extend through fall 2011. Full engineering will begin at that time, and construction will begin in 2013.



Apr–Jun	Seek public input & conduct technical evaluation
Jul	Release draft report—summary of public input and results of technical evaluation
Jul–Aug	Seek public feedback
Sep	WSDOT selects improvement options for 2013 construction
Sep–Dec	Share results and inform community about next steps Begin detailed engineering for 2013 construction

Pre-design timeline

Purpose of this report

This report provides a basis for informed public discussion about improvements on the Guide. The purpose is to explain what the options are and how they work and share performance results. This information will help community members ask questions and share their perspectives to inform WSDOT’s selection of projects for construction.

Our evaluation had two parts:

Technical: The purpose of this type of analysis is to determine how each improvement option would perform based on engineering analysis. How would the project affect traffic delays and backups? How is the option likely to affect the potential for collisions? What types of design and construction challenges are presented by each option?

Users’ Perspective: We understand that needed improvements to traffic flow and safety may come at a detriment to some individuals, and it is important for us to understand those effects in detail so we can weigh the pros and cons accurately and fairly. These results are based on feedback we received from the public via our website, at community briefings and small-group meetings with property owners and businesses.

What you’ll find in this report

- Corridor profile
- Transportation needs
- Evaluation of improvement options
- Summary of results
- Key findings
- Next steps

2. Corridor Profile

State Route 539/Guide Meridian is a Highway of Statewide Significance. The highway provides access to the Bellis Fair Mall and surrounding commercial areas, and provides a critical link between Interstate 5 and the US/Canada border.



The highway provides access to rapidly growing industrial and commercial areas:

Business district

The I-5/SR 539 interchange and the connecting roadway network serves commercial areas at Cordata and Bellis Fair affording access to rapidly growing industrial and commercial areas while simultaneously providing for regional and international traffic.

Border crossings

The highway is a key connection to the US/Canada border crossings at Aldergrove/Lynden and Abbotsford-Huntingdon/Sumas.



Source: Whatcom Council of Governments, *The International Mobility & Trade Corridor Project (IMTC) Resource Manual*.



SR 539 key facts:

- 2010 average daily traffic on SR 539 ranges from 50,000 vehicles at I-5 to 39,000 at Bellis Fair Parkway and 32,000 at Kellogg Road.
- Average daily truck volume: 1,700 vehicles
- 700 collisions in five years, 2006-2010
- Estimated population growth in Whatcom County is 90,000 additional residents by 2022. The city of Bellingham is expected to add 30,000 residents.
- Increases in the number of customers traveling from Canada are not included in that growth. A recent survey by a local business indicates that 22 percent of their shoppers are from Canada.



SR 539 (Guide Meridian) & Telegraph intersection; northbound.

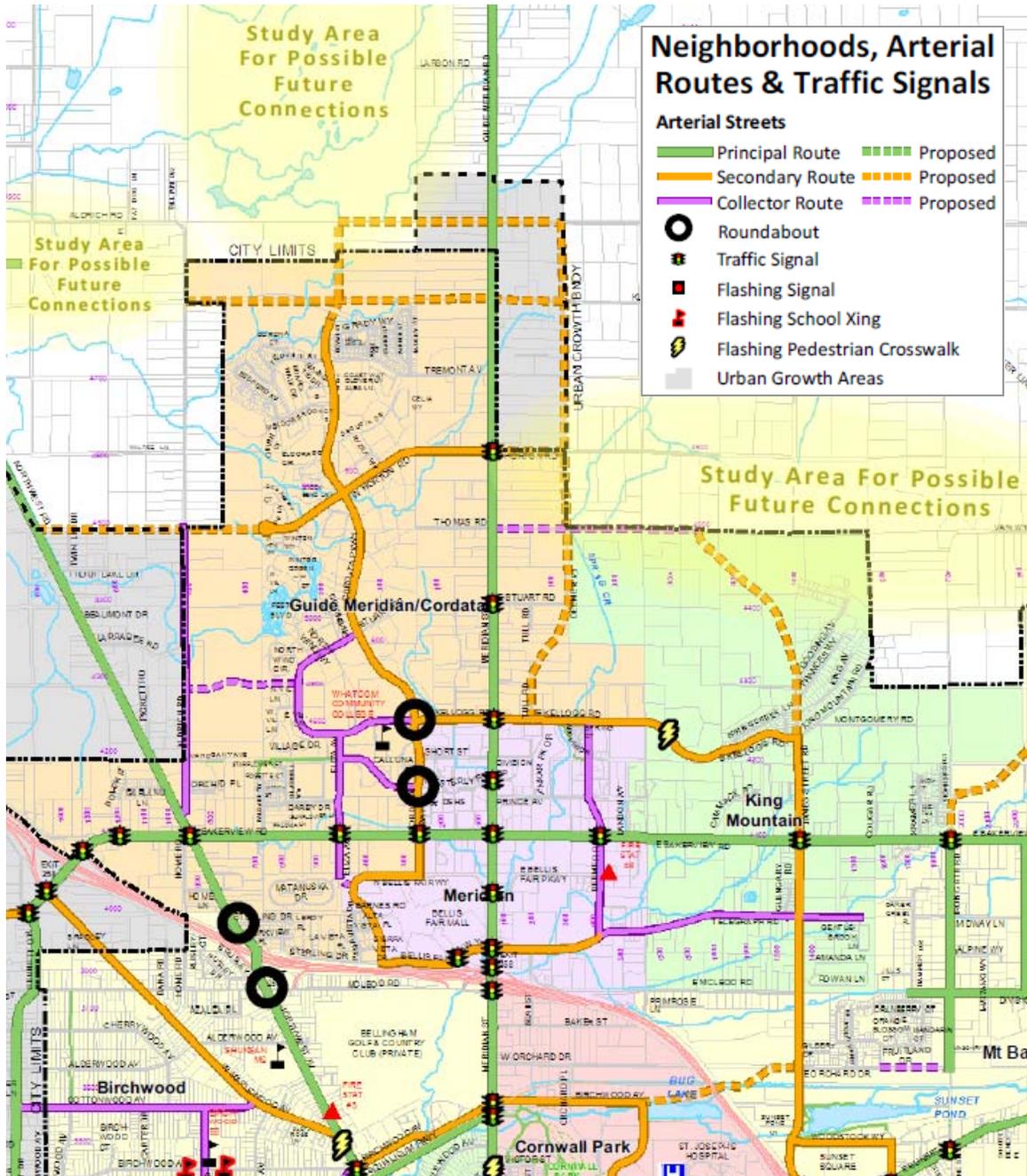
Existing transportation features

The SR 539 corridor consist of two lanes in each direction and a center-turn lane north of Telegraph Road to the Horton Road intersection.

- The center-turn lane has a number of breaks to allow for left-turn pockets at several intersections.
- The I-5/SR 539 interchange and the SR 539 (Guide Meridian) corridor are designated as Strategic Truck Routes with statewide significance on the state's Freight Goods Transportation System.
- Sidewalks and marked crosswalks at signalized intersections are available at most locations throughout the corridor.
- There are no bike lanes on the corridor. The city of Bellingham *Bicycle Route Map* identifies several parallel routes—including Northwest Avenue, Deemer Street, James Street and Hannegan Road—as preferred routes for bicycles through this part of the city.
- Whatcom Transit Authority runs buses along the SR 539 (Guide Meridian) corridor, connecting I-5, Bellis Fair Mall, neighboring businesses and communities in north Whatcom County. There are no bus stops on this part of the corridor.

Future changes in transportation and land use

Whatcom County population will grow from about 200,000 residents today to approximately 235,000 residents by the year 2022. Bellingham is expected to grow from approximately 80,000 residents today to 113,000 by 2022. The Bellingham urban growth area surrounding the Guide Meridian draws in trips due to its regionally significant commercial and employment center activity, so it is expected to see effects from this population increase. Substantial commercial development is also anticipated.



City of Bellingham, Existing and Proposed Transportation System.

Evolution of the Guide Meridian Highway

First established in the late 1800's, the Guide has evolved from a pathway for horse-drawn carriages to a busy commercial corridor. As the type and volume of traffic has changed, so has the infrastructure.



The Guide Meridian as a plank road in the early 1890s (Whatcom Museum)

1937:
Designated as a state highway

1979: I-5 to Kellogg Road widened to 5 lanes with center-turn lane



1979 (Jack Carver photo) The first traffic light installed at Guide Meridian and Telegraph Road - nearly a decade before Bellis Fair Mall opened. (Whatcom Museum)

1988: Kellogg to Horton Road widened to 5 lanes with center-turn lane

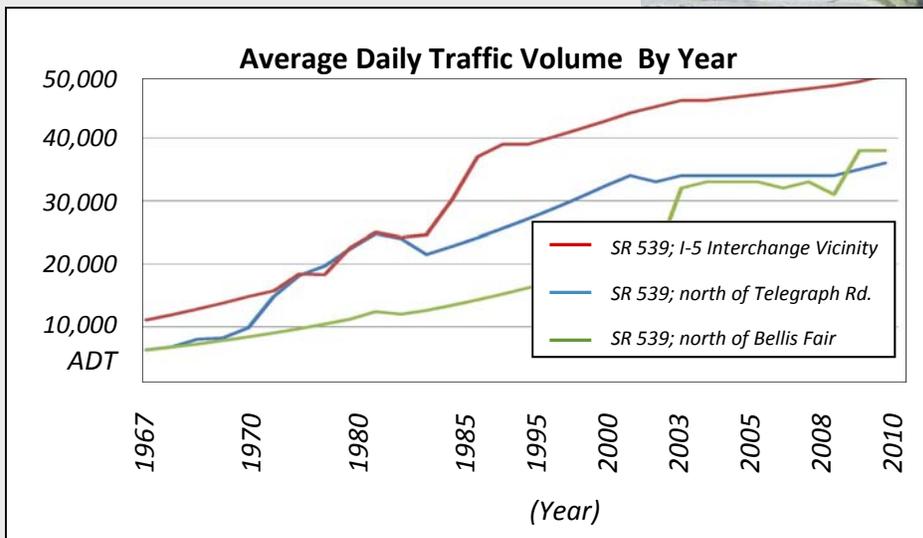
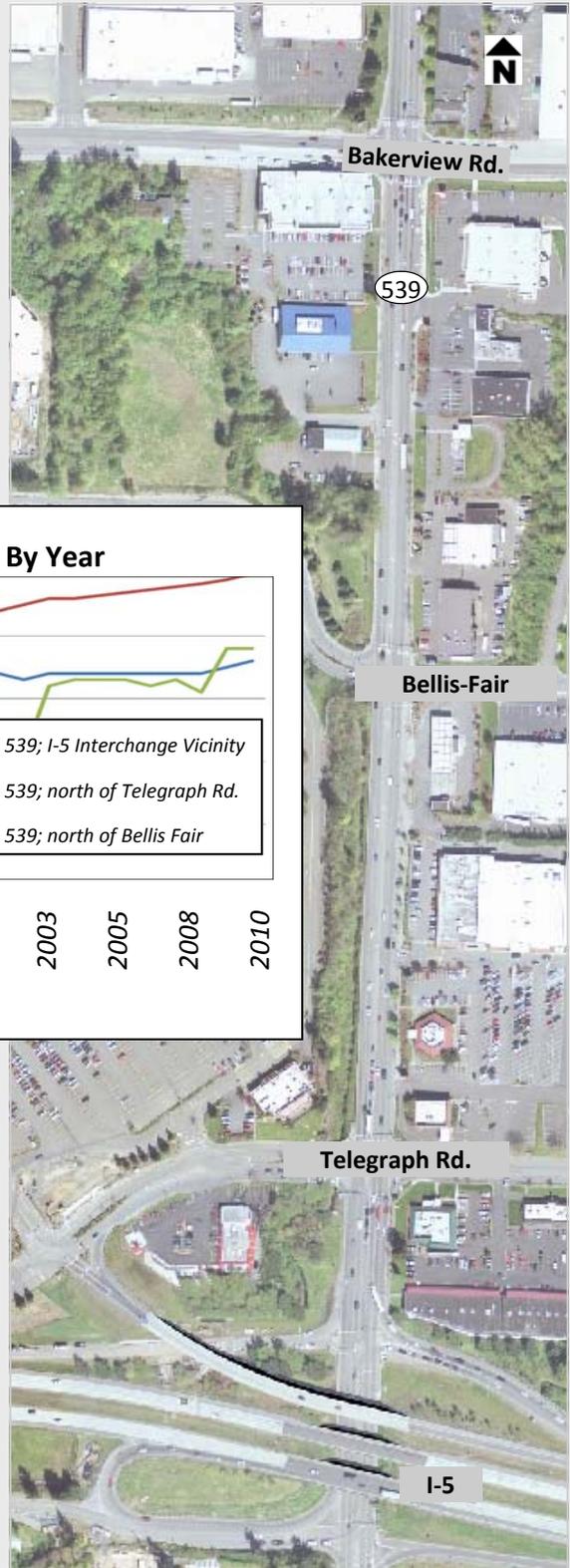
2006: Widening from Horton Road to Birch Bay/Lynden Road.

2013: Construct low-cost improvements between I-5 and Horton Road.



2010: SR 539 is a major corridor for local and regional commerce and international travel. The intersection at Telegraph Road has become one of Whatcom County's busiest.

Traffic volumes on the Guide have increased substantially since the center-turn lane was installed more than 30 years ago. In fact, if we were to build the road new today based on state design standards, we would not be allowed to construct a center-turn lane because the volumes are too high. Design standards state center-turn lanes “may be utilized where special conditions warrant and mainline traffic volumes are below 25,000 Average Daily Traffic.”



Average Daily Traffic is the average number of vehicles crossing a given point, in both directions, each day.

This project is an opportunity to update the southern portion of this highway so it is better aligned with today’s high traffic volumes and commercial activities.

Long-range plans for I-5

The *Interstate 5, Fairhaven to Slater Master Plan*, completed in 2008, analyzed current and future traffic conditions on I-5 and made recommendations for improvements to the interstate, including interchanges and connected local roads, from Fairhaven Parkway (exit 250) to Slater Road (exit 260) in Whatcom County. The plan includes a list of short- and long-term improvements to address safety problems, help relieve congestion and increase freight mobility through the year 2035. The plan recommends design and construction of a new single-point urban interchange at I-5/SR 539. We anticipate the new interchange would cost more than \$50 million.



While we can't currently afford our long-term plans, we continue to work with project partners and local agencies to move forward with design and construction of high-priority improvements as funding becomes available. For example, in 2011 we worked with city of Bellingham, port of Bellingham, Whatcom County, Whatcom Council of Governments and Whatcom Transit Authority to complete the *I-5/Bakerview Road Interchange Value Planning Study*. The Value Planning Study identified a lower-cost, high-benefit improvement option that will improve traffic flow and safety and delay the need for a brand-new interchange.



Subject to funding availability, future activities may include:

- Coordinate I-5 improvements with local land use and transportation plans.
- Partner with local agencies and private developments on funding improvements.
- Complete an Interchange Justification Report (IJR).
- Design and conduct environmental review.
- Obtain approvals from the Federal Highway Administration (FHWA).
- Construct improvements.

The *Interstate 5 Master Plan: Fairhaven to Slater* is available online at:

www.wsdot.wa.gov/projects/i5/fairhaventoslater/.

3. Transportation Needs

The first step in the corridor pre-design analysis process was to identify needs for SR 539 between I-5 and Horton Road. These are problems that WSDOT must address when planning for improvements because of their relationship to the state’s and city’s policies and standards. Six goals set by the Legislature and outlined in RCW 47.04.280 guide the state’s transportation planning and investments:

Economic Vitality – To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy.

Preservation – To maintain, preserve and extend the life and utility of prior investments in transportation systems and services.

Safety – To provide for and improve the safety and security of transportation customers and the transportation system.

Mobility – To improve the predictable movement of goods and people throughout Washington state.

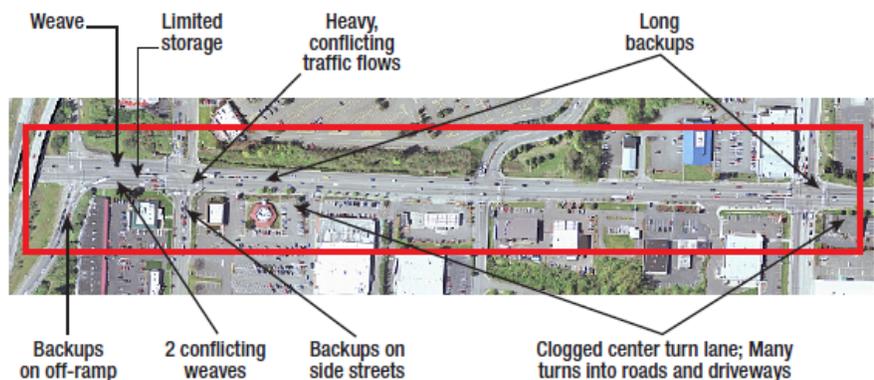
Environment – To enhance Washington citizens’ quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment.

Stewardship – To continuously improve the quality, effectiveness and efficiency of the transportation system.

The problem on the Guide: too much activity in a small space

SR 539 has high traffic volumes and lots of turns into and out of driveways and side streets. These are issues that, when considered individually, are not necessarily bad in a major retail area like the Guide. High volumes mean lots of people shopping and doing business on the Guide, and lots of turns mean there are many places people want to go. Those are characteristics of a vibrant retail center.

The problem on the Guide is that this combination of high traffic volumes and lots of turns is concentrated in a short section of highway. Essentially, there’s just too much activity squeezed into too small a space and it creates conditions that feel chaotic and decrease traffic flow and safety.



I-5 interchange on the far left; Bakerview Road intersection on the far right. This illustration highlights the problem of “too much activity in a small space.”

For example, heavy flows of traffic to and from I-5 often overwhelm the traffic signals. This is particularly true at Telegraph Road and Bakerview Road, because these intersections also have a heavy traffic volume from intersecting side streets. The poor levels of service regularly result in long backups and delays, particularly in the southbound direction. It is not unusual for backups to stretch from the I-5 interchange to north of Kellogg Road, a distance of approximately one mile.

Level of Service (LOS)	
Intersection	*2011 Afternoon Peak Hour LOS
I-5 Southbound Ramps	B
I-5 Northbound Ramps	E
Telegraph Road	F
Bellis Fair Parkway	C
Bakerview Road	F
Westerly Road	B
Kellogg Road	B
Stuart Road	B

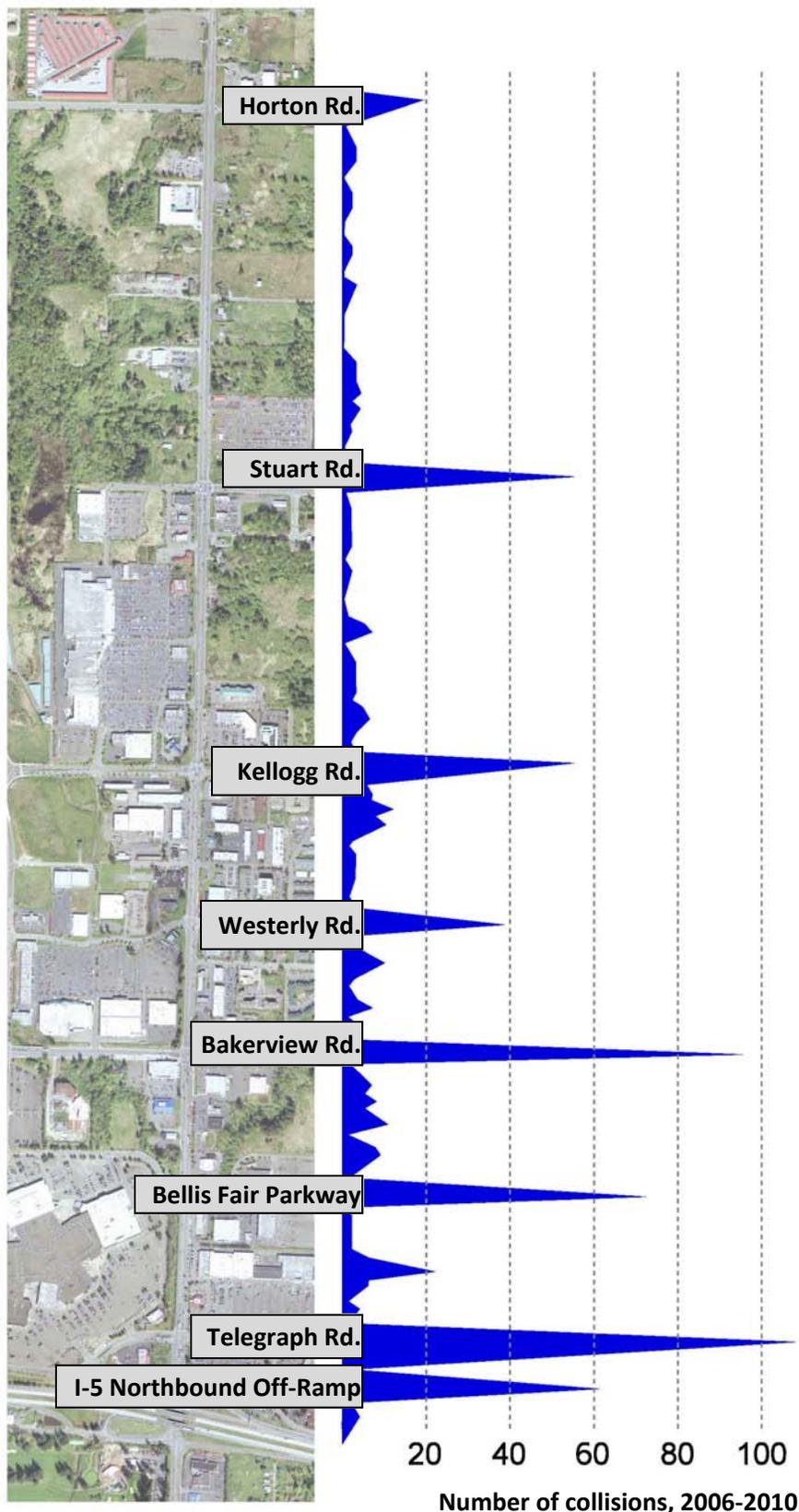
Level-Of-Service (LOS) standards for highways designated as Highways of Statewide Significance are set by WSDOT in consultation with local governments. For SR 539, the standard was set at LOS D in consultation with Whatcom Council of Governments (WCOG). Intersections that operate at LOS E or F are considered deficient.

Level-of-service definitions:

Highway Capacity Manual (Transportation Research Board, Special Report 209, 2000)

Level of Service	Average Control Delay (sec/veh)	General Description (Signalized Intersections)
A	≤10	Free Flow
B	>10 - 20	Stable Flow (slight delays)
C	>20 - 35	Stable flow (acceptable delays)
D	>35 - 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 - 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Collisions, January 2006—December 2010



What does this information tell us?

Traffic congestion at the intersections is a major contributor to collisions. This illustration shows clusters of collisions near each of the intersections. Many of those are rear-end collisions with long backups at traffic signals. Improvements that reduce backups should lead to a reduction in rear-end collisions.

Traffic congestion between I-5 and Kellogg Road contributes to collisions between signalized intersections.

Heavier traffic volumes and congestion between I-5 and Kellogg Road, compared with the north part of the corridor, contribute to more collisions at driveways and in the center-turn lane.

Several key problems were identified in our technical analysis and raised by members of the public:

- Backups on the I-5 northbound off-ramp contribute to conflicts between stopped vehicles and those traveling 60 mph on the Interstate.
- Merging traffic creates conflicting weaves between the I-5 northbound off-ramp and Telegraph: vehicles exiting the interstate merge left, while vehicles traveling north on Meridian cross lanes of traffic to turn right on Telegraph.



Backups on the northbound off-ramp

- Long delays at the traffic signals create long backups.
- Driveway entrances and the clogged center-turn lane create traffic backups onto the highway.
- Numerous driveways and an unrestricted center-turn lane create potential conflict points between turning vehicles throughout the corridor.

These problems have severe consequences:

- 700 collisions in 5 years.
- Conflicts at the northbound off-ramp between stopped vehicles and those traveling 60 mph on the Interstate.
- Difficult to get in and out of businesses.
- Driver impatience and increased risk-taking.
- Hard for pedestrians to predict drivers' movements.
- Increased greenhouse gas emissions from idling traffic.
- Wasted time for drivers, freight and transit passengers.
- Current and worsening traffic congestion could hurt existing businesses and stifle future development in the corridor.



Traffic congestion north of Telegraph Road

It's common sense that unrestricted access on a busy corridor is neither safe nor efficient.

4. Evaluation of improvement options

We considered a wide range of improvements and techniques used on highways with problems similar to those on the Guide. We also received ideas from public feedback which were taken into consideration.

The following pages describe each option, their projected performance, outline the benefits and disadvantages, identify some anticipated challenges and opportunities to final project delivery, and provide an estimated cost range.

Evaluation criteria

We considered the following questions in our evaluation of each improvement option:

- Is it eligible for the federal program providing funds for this project?
- Does it address the problems we identified in Chapter 3, particularly reducing the backups on the northbound off-ramp that extend onto I-5?
- Is it consistent with state laws requiring WSDOT and the city to implement access management?
- Does it support the transportation goals set by the Legislature?
- It is consistent with engineering design standards for state highways?
- Is it affordable (based on our budget for 2013 construction)?
- Do the benefits for traffic flow and safety outweigh the disadvantages for highway users, property owners and businesses?

Funding source for Guide improvements:

The **Coordinated Border Infrastructure Program** is a federal formula grant program whose purpose is to improve the safe movement of motor vehicles at and across our Nation's borders with Canada and Mexico. Funds may be used in a border region for projects that improve and facilitate/expedite cross border motor vehicle and cargo movements. Projects must be border related and improve the safety of, facilitate and /or expedite cross border traffic movements and include:

- Improvements in a border region to existing transportation and supporting infrastructure that facilitate cross-border motor vehicle and cargo movements;
- Construction of highways and related safety and safety enforcement facilities in a border region that facilitate motor vehicle and cargo movements related to international trade;
- Operational improvements in a border region, including improvements relating to electronic data interchange and use of telecommunications, to expedite cross border motor vehicle and cargo movement;
- Modifications to regulatory procedures to expedite safe and efficient cross border motor vehicle and cargo movements; and
- International coordination of transportation planning, programming, and border operation with Canada and Mexico relating to expediting cross border motor vehicle and cargo movements.

Statutory References: SAFETEA-LU Section(s): 1101 (a)(11), 1303

Low-cost efficiency improvements: access management

Over time, increasing traffic volumes and new driveways and traffic signals have eroded mobility along the Guide. If we were to build the highway new today, we would not be allowed to construct a center-turn lane. Why not? It's the combination of high traffic volumes and lots of turns. It's common sense that it's not safe or efficient to allow unlimited turns on a busy highway like the Guide.

What is access management?

Access management is conflict management: If you reduce the rate and severity of conflicts the motorist encounters, you will reduce the collision rate and injury rate and increase the smooth flow of traffic. The objective is to enable access to businesses and private property while maximizing roadway safety and mobility.

Without Access Management

- Increase in crashes
- More collisions involving pedestrians and cyclists
- Accelerated reduction in roadway efficiency
- Need for continuous road widening or bypasses
- Longer commute times
- Smaller market area for businesses and economic development
- Increased fuel consumption and emissions due to delay
- Poor appearance

ITF The University of South Florida

Williams, Kristine, AICP, Advanced access management for the transportation planner, Center for Urban Transportation Research University of South Florida, ITE Professional Development Program.

What happens if you don't manage access?

As congestion increases, so does delay, which is bad for the economy and frustrating to customers.

If collisions and congestion become frequent on the roadway, people will seek other routes.



(Indiana Statewide Access Management Implementation, Indiana DOT, www.in.gov/indot/files/AccessManagementTrainingPresentation.pdf)

Access management techniques:

- Limit the number of access points per property (RCW 47.50, WAC 468-51 and WAC 468-52)
- Consolidate access points and encourage shared driveways
- Establish standards for driveway width, etc. to move traffic smoothly off of the highway.
- Incorporate right and left-turn lanes into roadways.
- Replace a continuous center-turn lane with a median.
- Adopt a city access management plan to guide future development.

When is access management used?

Communities use access management tools to enhance traffic flow and safety along busy, growing corridors. The city of Bellingham and WSDOT are charged with following state law and design standards for access management to protect the safety of the traveling public. The law states that “Vehicular access and connections to or from the state highway system shall be regulated . . . in order to protect the public health, safety, and welfare (RCW 47.50.030).” With the increasing demands on the Guide, implementing access management is the logical next step needed to keep this corridor functioning.



Replacing a continuous center-turn lane with a median, as shown here on SR 542/Sunset Drive in Bellingham, is a common access management technique.

Access Management Requirements:

It's not just best practice, it's the law.

SR 539 from south of Telegraph Road to Hemmi Road is classified as Managed Access, Class 3:

- Governed by: RCW 47.50, WAC 468-51 and WAC 468-52
- Permitting process used; city is the approving authority for access permits in city limits.
- Highways in this class are typically distinguished by planned restrictive medians and minimum distances between public and private connections.
- Center-turn lanes may be utilized where special conditions warrant and mainline traffic volumes are below 25,000 ADT.
- Development of properties with internal road networks and joint access connections are encouraged.
- Minimum access spacing is 330 feet.

*Washington State Department of Transportation
Design Manual*

Benefits of access management:

(SAFE ACCESS IS GOOD FOR BUSINESS, FHWA, <http://www.accessmanagement.info/AM2006/PrimerWeb.pdf>)

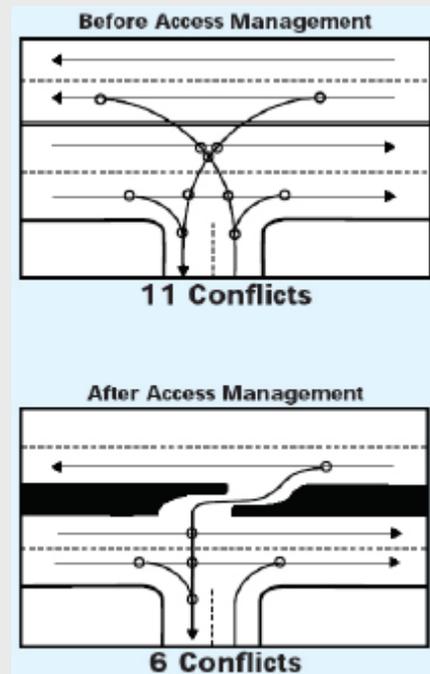
Access management improves safety by separating access points so turning and crossing movements occur at fewer locations. Managing access can result in better traffic flow, fewer collisions and a better experience for travelers and businesses.

Access management is critically important along roadways that are expected not only to accommodate the safe and efficient movement of through traffic but also to provide access to adjacent properties. The wide-ranging benefit of access management extends to a host of users and affected parties. These and other access management features can be expected to produce the following benefits:

- Improve roadway safety, by controlling some of the factors that contribute to roadway collisions;
- Enhance mobility, by reducing impediments to smooth flow of traffic;
- Protect the public investment in the roadway system, by greatly extending the functional life of arterials to move people and goods; and
- Reduce emissions and fuel consumption due to improved traffic flow.

Studies consistently show that well-managed arterials are often 40 to 50 percent safer than poorly-managed routes. For example, when a center-turn lane was replaced with a median on Atlanta's Memorial Drive, the collision rate was cut in half. **A recent project on SR 99 in Shoreline, Washington, reduced collisions by 64 percent. A project on SR 7 in Pierce County, Washington, significantly reduced the number of collisions during the afternoon peak period.**

Well-managed arterials can operate at speeds well above poorly-managed roadways – up to 15 to 20 miles per hour faster. This means more traffic through the corridor and better exposure for businesses. It also means a more convenient shopping experience for customers.



Using medians to reduce potential collisions

(SAFE ACCESS IS GOOD FOR BUSINESS, FHWA:

<http://>

www.accessmanagement.info/AM2006/PrimerWeb.pdf)

Key benefits:

VALUE & EFFICIENCY- When safety and capacity deteriorate, one of the ways to fix the problem is to add lanes. But adding lanes can have disadvantages, such as harm to the natural environment, expense, and the need to acquire private property. Good access management practices can delay the need to widen a road for many years.

SAFETY- Access management reduces conflicts that contribute to collisions. It also improves visibility and reduces distractions to make travel safer for drivers and pedestrians.

CONGESTION RELIEF- As traffic flow is made more efficient, the roadway can handle more traffic and congestion levels decrease. This results in exposing more motorists to businesses along the highway.

ECONOMIC VITALITY- A safe, efficient state highway system is critical to the economic prosperity of our state. Access management supports business by helping provide what customers want:

- Driveways unblocked by traffic backups;
- Easy access to neighboring businesses;
- Access to traffic signals and side streets to make left turns; and
- Safe driving conditions.

Benefits for business

Efforts by government agencies to manage access in site development and road projects can help businesses, especially those operating on older highway corridors with severe congestion. Here are some specific benefits to you and your customers:

- Fewer delays and better traffic flow, which will preserve and possibly even enhance the market reach of businesses in the corridor;
- Properly designed entrances shared by multiple businesses allow more site area for parking, more customer options to access your site and improved landscaping or other site amenities. It also provides better pedestrian safety by improving predictability and visibility.
- Service roads along the highway allow customers to enter and exit businesses conveniently and safely, away from faster-moving through-traffic;
- Internal connections between businesses allow customers to circulate easily without reentering a busy road; and
- Driveways and service road entrances farther away from signalized intersections allow easy access for customers, even during times of peak congestion.

Don't take our word for it . . .

- A recent access management project on SR 99 in **Shoreline, Washington**, reduced collisions by 64 percent. Tom Naski- SR 99, Shoreline Retail Strip Mall owner said he thought the access management project was a “big benefit.” Customers have remarked “it sure is nice now” and the improvements “made for happier tenants now that the chaos has been reduced and there is a proper flow of traffic.” He was very pleased the improvements were made and his tenants felt it was a benefit to their establishments to have a structured roadway.
- A project on SR 7 in **Pierce County, Washington**, significantly reduced the number of collisions during the afternoon peak period.
- In a 2004 interview with WSDOT, Brad Carpenter of Cutter’s Point Coffee shared his thoughts about an access management project in **University Place, Washington**:

“As it turned out along Bridgeport Way, access management solved some of the problems that we had all along. People were ingressing and egressing across our properties, making left-hand turns and pulling out across traffic. Once the changes were made, it was a lot safer to get into our properties, and that’s one of the major assets of good access. Sometimes we don’t give our residents and shoppers enough credit for figuring out that you plan your trip—you know where you’re going, and you’re looking for the safest way in and out. You’re hoping to go about your business to accomplish your purpose and get back home with the least amount of hassle. If there are clear markings and clear directions, and you don’t have to drive across traffic to get into the place you’re going, people figure that out, they really do.”

Resources

- *Safe Access is Good for Business* – Federal Highway Administration
Video: <http://www.youtube.com/watch?v=j58siSPT6S8>
Brochure: <http://www.accessmanagement.info/AM2006/PrimerWeb.pdf>
- *Access Management: Answers to your questions* – Florida DOT
<http://www.accessmanagement.info/pdf/Q&A%20FL.pdf>
- *Access Management Manual* – Transportation Research Board, 2003
<http://www.accessmanagement.info/manual.html>
- Indiana Statewide Access Management Implementation
www.in.gov/indot/files/AccessManagementTrainingPresentation.pdf

Options not analyzed as part of this report:

We received many suggestions about how to improve the Guide. While many were included in our final evaluation, the following describes several that were not considered because they would be too costly or otherwise not feasible.

Suggestion	Analysis	Assessment
Eliminate truck traffic on SR 539.	Highways are meant to be accessible for all users. We only impose restrictions when necessary to protect public safety and preserve facilities—for example, imposing weight restrictions on certain bridges. SR 539 is designated as a strategic truck route, and freight delivery is needed to serve businesses on the Guide.	Not to be considered for further analysis.
Add “through traffic keep left” sign on I-5 to avoid collisions with backups on the ramp.	These types of signs are used on the interstate where a lane ends. Adding one at this location could be confusing to drivers because the right lane continues past the interchange. This option was proven ineffective on I-5 near Puyallup, Washington.	Not to be considered for further analysis.
Eliminate all driveways and restrict turns to intersections only.	This is a private property issue. This can be accomplished with regulation of new development, but retrofit requires negotiation with each individual property owner – beyond the scope of our project.	Not to be considered for further analysis.
Encourage vehicles headed southbound on Guide to take left to use on-ramp for southbound I-5	A key purpose of our project is to reduce vehicle conflicts caused by crossing left turns. This suggestion would increase the number of vehicles making a left turn at the ramp, actually increasing conflicts.	Not to be considered for further analysis.
Remove the light at Bellis Fair Parkway.	This intersection spacing is adequate, and this intersection provides convenient and safe access to the local street system versus the center-turn lane which is unpredictable and clogged.	Not to be considered for further analysis.
Develop local street connections; i.e. provide more convenient connection to Northwest Avenue.	The city’s comprehensive plan identifies numerous local street connection projects that would provide alternatives for drivers currently using the Guide to access businesses. However, the funds we have available for this project must be focused in existing right-of-way.	Not practical as part of this project. May be considered by the city for future analysis and implementation.

Suggestion	Analysis	Assessment
Convert center-turn lane to additional travel lane(s).	Installation of a median does not allow remaining width sufficient for an additional travel lane. More importantly, converting the center turn lane to a travel lane would preclude all turns in and out of driveways.	Not to be considered for further analysis.
Add interchange at I-5/Smith Road.	Our 2005 report showed that over 50 percent of traffic on the Guide is local (begins and ends between I-5 and Smith Road). A new interchange at that location, while providing benefit for economic development, would not relieve congestion on the Guide Meridian.	Would require analysis required by Federal Highway Administration process. Not practical as part of this project. Could be considered for other purposes not related to congestion relief on the Guide Meridian.
Make SR 539 and Bakerview Road a grade-separated interchange.	Construction of a grade-separated interchange could cost \$10 million or more and have significant impacts on nearby businesses.	Not practical as part of this project. Could be considered for future analysis.
Reconfigure on- and off-ramps or add new ramps.	This is a major improvement that could cost more than \$10 million.	Would require analysis required by Federal Highway Administration process. Not practical as part of this project. Could be considered for future analysis if funding for interchange improvements is secured.
Dedicated left turn for northbound traffic on Guide at Horton Road.	Although there are delays at this intersection, our analysis has not revealed a level-of-service failure that would prioritize this improvement over other needs.	Not practical as part of the WSDOT project. The city of Bellingham has plans to add a dedicated left turn.

5. Summary of results

Our evaluation of the options examined the ability of each to address the problems we identified—too much activity in a small space—and weighed the benefits for traffic flow and safety versus the disadvantages, particularly for businesses and property owners. The results of our evaluation are presented in the following pages.

It is important to note that we have not made a final determination about which improvements will be constructed in 2013 as part of this project. This evaluation does two things:

1. It identifies improvements that definitely will not be considered for implementation at this time.
2. It identifies improvements that are affordable within the funding available where the benefits appear to outweigh the disadvantages.

We are sharing this evaluation so the community can provide feedback on our assessment. We invite you to ask questions about our technical analysis and identify additional benefits and disadvantages associated with the options.

Improvements that have been eliminated from further consideration are presented first, followed by improvement options that will be among those we select from this fall.

Options considered

- Purchase limited access rights (p 28).
- Add new southbound lane between Telegraph Road and Horton Road (p 28).
- Realign Telegraph Road intersection (p. 28).
- Add southbound right-turn pocket at Bakerview Road (p. 29).
- Construct bus pull-outs (p. 29).
- Incorporate transit signal priority (p. 29).
- Eliminate southbound left turns onto Telegraph Road (p. 29).
- Eliminate northbound turns onto Telegraph Road (p. 30).
- Remove center-turn lane and add curb to restrict left turns (p. 32).
- Extend northbound lane between Bellis Fair Parkway and Bakerview Road—Business Access Lane (p. 34).
- Widen turning radius at northbound off-ramp (p. 36).
- Consolidate business access/driveways (p. 38).
- Install curb between I-5 and Telegraph (p. 40).

Options not to be considered for implementation at this time:

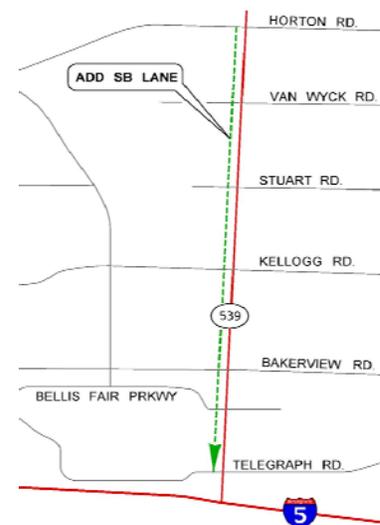
❌ Purchase limited access rights.

Modified limited access allows most existing access points to remain functional and is normally applied where commercial development potential is high, but most of the adjoining property to the state highway remains undeveloped, or there is a reasonable expectation that the adjoining property will be redeveloped to a more intensive land use. Neither situation is evidenced through this section of the route—it is mostly built out. Therefore, the purchase of modified limited access through this section of SR 539 is not recommended because it would result in no net benefit.



❌ Add new southbound lane between Telegraph Road and Horton Road.

This option proposes the construction of a new southbound lane between Telegraph and Horton roads. It requires significant widening and would affect all intersections. While this option provides significant reduction in traffic delay, it would require construction in close proximity to Spring Creek. The environmental process needed to investigate those impacts and determine mitigation requirements would exceed the budget and timeline available for this project.



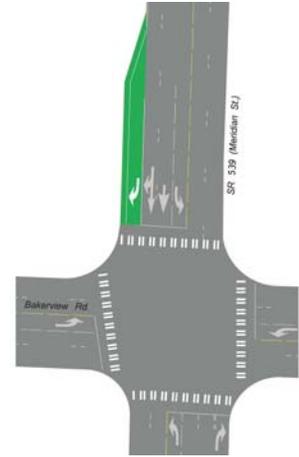
❌ Realign Telegraph Road intersection.

Due to the traffic flow patterns it is not feasible or beneficial to change the configuration of the intersection.



❌ Add southbound right-turn pocket onto Bakerview Road.

The benefit would be minimal because right-turn traffic is currently relatively light. Permitting and construction would be expensive because it requires acquisition of private property and construction of a retaining wall.



❌ Construct transit bus pull-outs along corridor.

WTA does not currently have bus stops in this section of the corridor (due to lack of space and heavy congestion), so there would be no benefit to providing pull-outs.



❌ Implement transit signal priority.

This corridor is not heavily used by transit vehicles, and the overall operation of the signalized intersections would be degraded with this type of treatment, causing worse delays and backups for the majority of traffic.



❌ Eliminate southbound left turns at Telegraph Road.

This change provides little to moderate improvements to traffic flow, but the lack of reasonable alternatives means traffic would be forced into long and circuitous re-routing.



Options we're still considering:

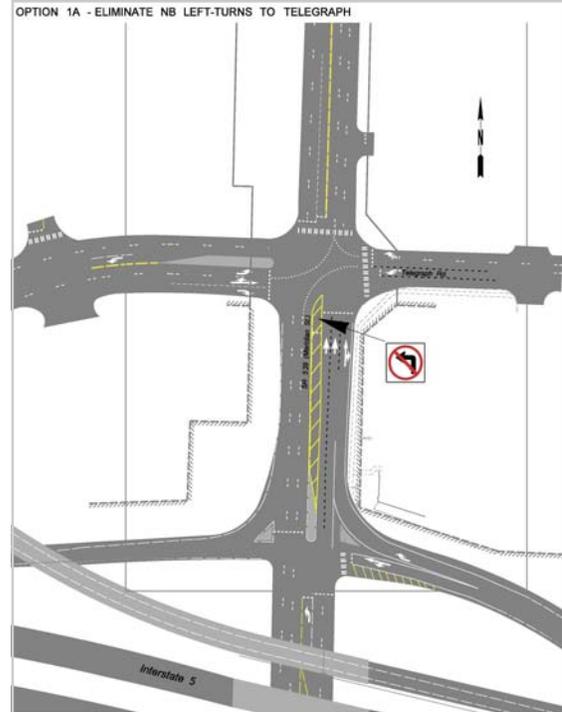
✔ Eliminate northbound left turns onto Telegraph Road

What is the proposed change?

In the existing configuration, left turns are permitted to and from all legs of this intersection. With this option, left turns from northbound SR 539 to westbound Telegraph Road would not be permitted. It would be necessary for drivers headed north on SR 539 to travel an additional 0.2 miles up to the next light and turn left at Bellis Fair Parkway. Drivers on northbound I-5 could use the Exit 256B ramp that goes directly to the mall parking lot.

How would it affect traffic flow and safety?

The SR 539/Telegraph Road intersection currently has long delays and backups that extend south past the interchange and north to Bellis Fair Parkway, Bakerview Road and beyond. The current availability of the northbound left turn to Telegraph Road encourages more vehicles to use this intersection rather than the less congested intersection at Bellis Fair Parkway. It also encourages vehicles to leave northbound I-5 via the Exit 256A ramp rather than use the Exit 256B ramp directly into the mall.



This change would provide improvements to traffic flow at the intersection and throughout the corridor. The overall delay will be reduced by approximately 9 percent; delays for southbound traffic will be reduced by 30 percent.

The predominant collisions that occur in this corridor are rear-end collisions, particularly in the vicinity of Telegraph Road. At this intersection, rear-end and sideswipe collisions account for approximately 70 percent of the collisions, and many of these can be attributed to congestion. This alternative will help reduce backups and congestion, which will in turn provide a safety benefit and reduce these types of collisions.

How much would it cost?

We expect it would cost less than \$100,000 to design and implement this improvement. No significant construction would be necessary.

✔	Less than \$100,000
	\$100,000 to \$500,000
	\$500,000 to \$1 million
	\$1 million to \$3 million
	More than \$3 million

Has this type of improvement been used elsewhere?

Yes. Restricting left turns at traffic signals is commonly used on high-volume corridors where the priority is to move through-traffic on the main thoroughfare.

What are the benefits of this improvement?

- Eliminating the left-turn movement for northbound traffic would allow signal phasing to process remaining intersection traffic more efficiently. We could move more vehicles through, freeing space to accommodate vehicles exiting the I-5 northbound off-ramp and helping reduce backups on the ramp.
- Additional benefit realized by eliminating northbound left-turn movement would minimize the traffic weave from the I-5 northbound off-ramp. This would also help alleviate the backups on the off-ramp.
- This option would be easy to implement with minimal traffic disruptions during construction.
- Restricting northbound left turns reduces wait times and backups.

What are the disadvantages of this improvement?

- Reduced convenience for shoppers and deliveries and longer driving distance to reach some businesses, especially Bellis Fair Mall.
- Eliminating northbound left turns at this intersection will push the turns to Bellis Fair Parkway. That will increase volumes at that intersection, but it is currently operating at an acceptable level-of-service so it can handle more traffic, and with changes in signal timing, additional collisions would not be anticipated.
- Moves mall traffic to the Bellis Fair Parkway entrance, which the mall considers inferior to the entrance at Telegraph Road because it is a “back door,” has less capacity and would be more difficult to drive during snow and ice storms.
- May change traffic circulation patterns on city streets and in private parking lots.

Our assessment:

There’s only so much time in a traffic signal cycle, and portions must be allocated to each different “activity” occurring at the intersection. This option reduces the number of turning activities happening at the intersection to allow more time to move cars headed south on the Guide Meridian. Ultimately, that will reduce backups - in fact, it is anticipated that this change would reduce southbound delays by 30 percent. The disadvantage is that drivers wanting to make those left turns will have to do so elsewhere, so it may mean a slightly longer trip and more left turns at the next intersection. New signs would be provided to guide drivers; for example, directing those exiting I-5 to utilize the direct-access ramp into Bellis Fair Mall.

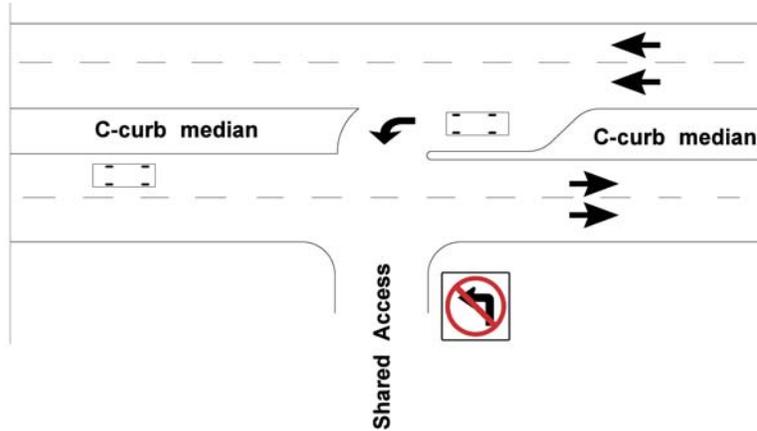


Options we're still considering:

✓ Remove center-turn lane and add curb to restrict left turns

What is the proposed change?

The existing configuration of SR 539 includes a center-turn lane down the center of the corridor. This option would replace the center-turn lane with a raised curb median. Left-turn movements would be created for specific, high-demand locations between intersections. Left-turn pockets would remain at each existing signalized intersection.



How would it affect traffic flow and safety?

This restriction would reduce the "friction" in the corridor, leading to smoother traffic flow, and increase safety by eliminating most conflict points associated with left-turning traffic. Access to businesses is accommodated by allowing left turns at high-demand locations. There will be some increase in traffic at the adjacent signalized intersections. Studies have shown that replacing a center-turn lane with a curbed median can reduce turning related collisions from 20 percent to 45 percent.

How much would it cost?

We expect the cost to be more than \$500,000 to design and implement this improvement. There will be disruptions to traffic and local businesses during construction of this improvement.

	Less than \$100,000
	\$100,000 to \$500,000
✓	\$500,000 to \$1 million
	\$1 million to \$3 million
	More than \$3 million

Has this type of improvement been used elsewhere?

Yes. SR 542/Sunset Drive in Bellingham, SR 20 in Oak Harbor, SR 538 in Mount Vernon, SR 99 in Shoreline, SR 7 in Pierce County.

What are the benefits of this improvement?

- Before and after studies (national and within Washington state) show significant reduction in collisions and improvement in travel speed following implementation of access management.
- The improvement would reduce turning conflicts within the corridor and increase safety.
- The locations at which left turns can and cannot be made would be clearly identifiable by drivers, thus reducing distractions and improving visibility and predictability.

What are the disadvantages of this improvement?

- Fewer opportunities to turn into businesses.
- Reduced convenience for customers and deliveries, resulting in longer driving distance to reach some businesses.
- Customers may be forced to use alternative entrances and exits that businesses consider inferior.
- May change traffic circulation patterns on city streets and in private parking lots.
- Eliminating left turns will push the turns to some other location. It would likely result in increased volumes at those intersections.

Our assessment:

Traffic volumes on the Guide far exceed federal and state standards for a center-turn lane. State law requires public agencies to manage access to improve safety and traffic flow on highways. Therefore, this project must support the city of Bellingham’s effort to initiate, implement and maintain an access management program for the Guide Meridian. These measures have been shown to provide significant reduction in collisions and improvement in travel speed. The specific design of the curb and location of left-in turns would be determined in close coordination with property owners and businesses.



Options we're still considering:

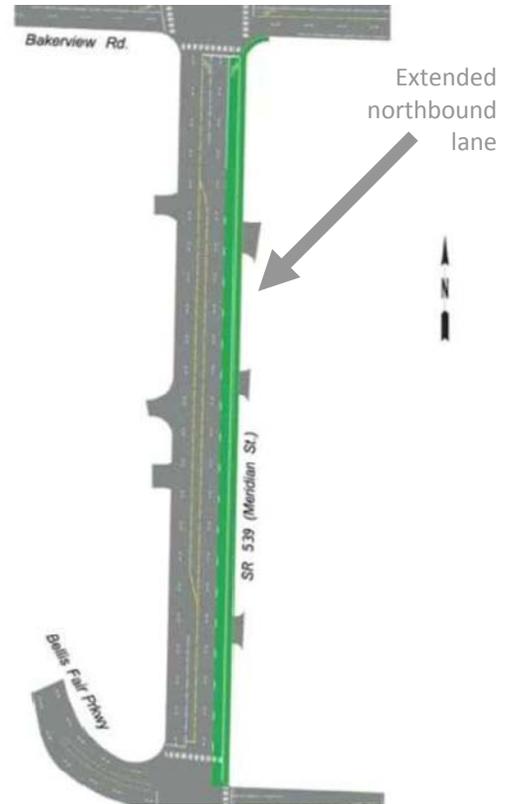
✔ Extend northbound lane between Bellis Fair Parkway and Bakerview Road—Business Access Lane

What is the proposed change?

The existing configuration of SR 539 south of the Bellis Fair Parkway intersection is a six-lane roadway section, two southbound general purpose (GP) lanes, a center-turn lane, two northbound GP lanes and a northbound GP lane (terminating in a right-turn pocket). The existing configuration on SR 539 north of the Bellis Fair Parkway intersection is a 5-lane roadway section, two southbound general purpose (GP) lanes, a center-turn lane and two northbound GP lanes. This proposal would add a third northbound lane by widening to the north of Bellis Fair Parkway for approximately 600 feet.



Although the right northbound lane currently extends from the northbound off-ramp to Bellis Fair Parkway, many drivers believe that it is “right-turn only” at Telegraph Road and merge into the left lane unnecessarily.



How much would it cost?

We expect it would cost more than \$500,000 to design and implement this improvement. Businesses and traffic would be affected during construction. Challenges that may contribute to cost are construction of stormwater facilities (e.g. a drainage vault) and utility relocation. Property acquisition is also an issue—there is some risk that the project width would exceed available public right-of-way.

	Less than \$100,000
	\$100,000 to \$500,000
✔	\$500,000 to \$1 million
	\$1 million to \$3 million
	More than \$3 million

How would it affect traffic flow and safety?

With this improvement, the overall delay at the Bellis Fair Parkway intersection is reduced by approximately 20 percent and the delay for northbound traffic is reduced by more than 50 percent. In addition to the delay reduction, this option would improve the lane utilization and would provide more space for vehicles weaving left to the two "main" northbound SR 539 lanes. It would support elimination of the northbound left turns at Telegraph Road, and it would help reduce backups on the I-5 northbound off-ramp. It would serve as a business access lane.

The predominant collisions that occur in this corridor are rear-end collisions, particularly in the vicinity of Bellis Fair Parkway. At this intersection, rear-end and sideswipe collisions account for approximately 65 percent of the collisions, and many of these can be attributed to congestion. This alternative will help to reduce queuing and congestion, which will in turn provide a safety benefit, and reduce these types of collisions. This alternative will also encourage drivers from the I-5 northbound off-ramp to stay in the outside lane as they travel north, reducing weaving conflicts. Off-ramp traffic will flow more smoothly, reducing ramp-related backups, delays and collisions.

What are the benefits of this improvement?

- This option would give traffic exiting from I-5 more room to weave into mainline lanes, which would reduce backups for I-5 northbound off-ramp traffic.
- The lane would serve as a Business Access Lane, reducing vehicle conflicts by allowing space for drivers to navigate into and out of driveways.

What are the disadvantages of this improvement?

- An added lane will affect the existing traffic signal, illumination and utilities, and landscaping improvements constructed on public right-of-way.
- Increased width of SR 539 introduces additional activity into the corridor.
- Without access management this option would force traffic turning to and from businesses to cross three lanes of traffic rather than the existing two.
- Any property acquisition required to construct this improvement would further reduce limited parking for adjacent businesses.

Our assessment:

Extending this lane would provide significant benefits for reducing wait times and backups, including on the I-5 northbound off-ramp. There is some risk that right-of-way acquisition and utility relocation would be required, which would increase the estimated cost. There is a low risk of impact to the Spring Creek culvert crossing and stream.

Options we're still considering:

Widen turning radius at northbound off-ramp

What is the proposed change?

Currently it is difficult for large trucks to negotiate the right turn movement from the northbound I-5 off-ramp onto Guide Meridian without encroaching into the adjacent mainline lane. A recent roadway survey along with a computer-generated model shows that widening this section of the ramp (connecting SR 539) would help trucks to negotiate this turn.



I-5 Northbound Off-Ramp

How would it affect traffic flow and safety?

Because there is a heavy conflict between the merging and diverging (weave) traffic movements between the northbound off-ramp traffic and northbound through (right-turners) trying to turn right onto Telegraph Road, this improvement would allow the I-5 northbound off-ramp traffic to flow freely onto the Guide Meridian, helping to reduce traffic backups on the off-ramp.

How much would it cost?

We expect it would cost more than \$100,000 to design and implement this improvement, although there is potential that right-of-way acquisition and proximity to a drainage system would increase the cost significantly. It is likely the project would require utility relocation and reconstruction of the pedestrian island to meet current ADA standards. There would be some inconvenience to traffic during construction of improvements.

	Less than \$100,000
✓	\$100,000 to \$500,000
	\$500,000 to \$1 million
	\$1 million to \$3 million
	More than \$3 million

Has this type of improvement been used elsewhere?

Yes. Updating facilities to meet the latest design guidelines is a commonly-used strategy to improve traffic flow and safety. Minor, low-cost modifications to the traffic “island” at this location were constructed in 2008.

What are the benefits of this improvement?

- I-5 northbound off-ramp traffic would be allowed to travel more freely thereby reducing backups on the off-ramp.
- Meridian Street traffic would not have to yield to off ramp truck traffic encroaching onto mainline lane thereby increasing driver safety and improving traffic flow.
- Would provide better sight distance for pedestrians crossing at the off-ramp area.

What are the disadvantages of this improvement?

- There would be some inconvenience to traffic during construction of improvements.

Our assessment:

This improvement would help reduce backups and improve sight distance. If it can be constructed without a need to acquire property and without affecting the nearby drainage system, it would be a sensible, low-cost strategy to improve traffic flow at the intersection.

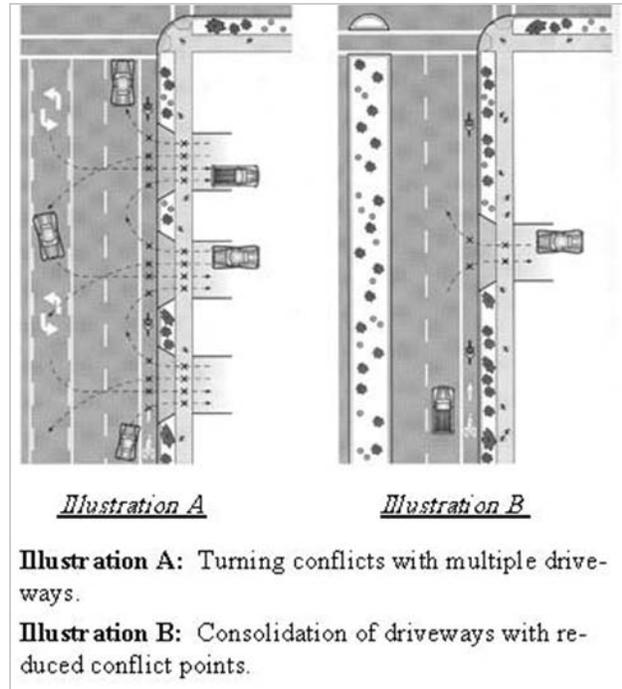


Options we're still considering:

✔ Consolidate business access/driveways

What is the proposed change?

Consolidation of access points along a state highway or busy urban arterial is a common access management tool. This tool is based on the principle that reducing access points reduces potential conflicts, which result, statistically, in fewer collisions. Simultaneously, by reducing the number of access points, you focus the number of turning movements to specific areas. This allows streaming traffic to better anticipate these turning movements and the end result is fewer distractions, causing fewer delays and increasing flow efficiency.



Source: Transportation Research Board, Access Management Manual

How would it affect traffic flow and safety?

Consolidation of driveways will be beneficial for the traffic flow and safety of the corridor by reducing the number of conflict points and reducing distractions that result from vehicles entering and exiting the highway. Each access point along the corridor adds points of conflict between the entering/exiting traffic and the main highway traffic stream, which results in higher potential for collisions and increased friction for the overall flow of traffic. If the access points can be minimized, the potential for collisions will go down and traffic will flow more smoothly.

How much would it cost?

We expect it would cost less than \$100,000 to design and implement this improvement. There will be some disruption to traffic and businesses during construction of this improvement.

✔	Less than \$100,000
	\$100,000 to \$500,000
	\$500,000 to \$1 million
	\$1 million to \$3 million
	More than \$3 million

Has this type of improvement been used elsewhere?

Yes. City of Shoreline incorporated driveway consolidation into their SR 99 Access Management project.

What are the benefits of this improvement?

- Improves traffic flow and safety by reducing the number of potential conflict points between vehicles.
- Better defines entry and exit points for businesses and helps direct drivers.
- Supports defensive driving by making it easier for drivers to track other cars and anticipate the actions of other drivers.

What are the disadvantages of this improvement?

- May contribute to backups and congestion on parking lots on private property.
- Results in fewer opportunities to turn into businesses.

Our assessment:

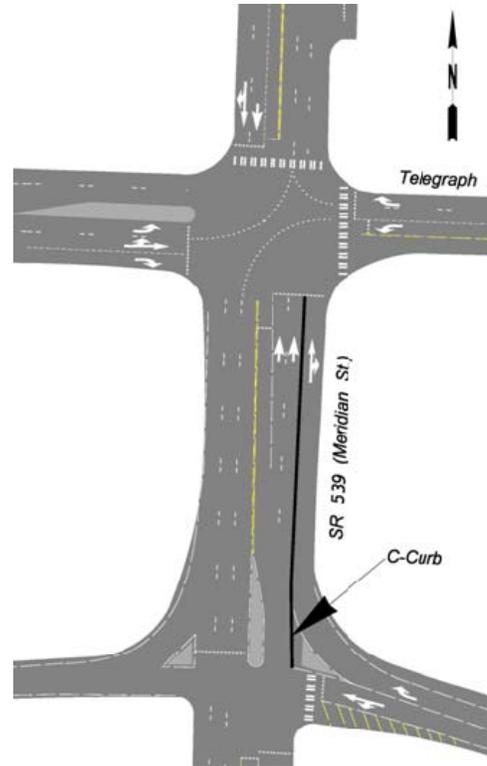
Consolidating driveways can provide substantial benefit by improving predictability and reducing conflict points along the highway. It results in fewer opportunities to turn into businesses, but remaining entry points are better defined and can be improved, if needed, to make them easier to get in and out of. It may generate backups and traffic circulation challenges in private parking lots. The specific design would be determined in close coordination with property owners and businesses.

Options we're still considering:

✔ Install curb between I-5 and Telegraph

What is the proposed change?

Currently the I-5 northbound off-ramp terminates at an intersection with SR 539. The northbound right turn from the northbound off-ramp directs traffic into a three lane (northbound) section of SR 539, which immediately turns into a four-lane section (northbound) at the Telegraph Road intersection. There is a heavy conflict between the merging and diverging (weave) traffic movements between the northbound off-ramp traffic desiring to either merge left or continue northbound through, and right-turners trying to turn right onto Telegraph Road. This option would install curb to separate these conflicting movements. This would result in the elimination of a right-turn opportunity onto Telegraph Road, except for traffic exiting I-5.



How would it affect traffic flow and safety?

There would be very minor changes in delay as a result of this option, but the primary benefit would be the elimination of the (northbound right-turn) weave from Meridian Street traffic. This would allow the I-5 northbound off-ramp traffic to flow freely onto the Guide Meridian, reducing traffic backups on the off-ramp.

How much would it cost?

We expect it would cost less than \$100,000 to design and implement this improvement. This improvement could only be constructed if done in conjunction with widening of the northbound off-ramp turning radius. There would be some inconvenience to traffic during construction of improvements.

✔	Less than \$100,000
	\$100,000 to \$500,000
	\$500,000 to \$1 million
	\$1 million to \$3 million
	More than \$3 million

Has this type of improvement been used elsewhere?

Yes. Limiting turns to reduce weaving movements, especially in close proximity to an interchange, is a very common approach to reducing conflicts to improve traffic flow and safety.

What are the benefits of this improvement?

- Eliminates weave thereby reducing vehicles conflicts between the I-5 northbound off-ramp and Guide Meridian through traffic.
- I-5 northbound off-ramp traffic would be allowed to travel more freely thereby reducing backups on the off-ramp.

What are the disadvantages of this improvement?

- Restricting the right turns at this location will push these right-turns to some other location, possibly increasing backups and collisions there.
- Less convenient access for businesses: Drivers headed north on Meridian from south of the I-5 interchange would not be able to turn right on Telegraph. They would be forced to turn at one of the Meridian Village driveways or turn right at Bellis Fair Parkway and travel along Deemer Road to reach businesses on Telegraph.

Our assessment:

The weave created by northbound vehicles crossing in front of northbound off-ramp traffic reduces mobility and contributes to backups that extend to I-5. While installing the curb is expected to provide some benefit at that particular location, it's possible the change would increase weaving movements and backups elsewhere, simply shifting the problem. In addition, the reduction in convenience for drivers using Telegraph Road and turning into businesses would be substantial.

Other improvement options—such as eliminating northbound left turns to Telegraph Road and extending the northbound right lane—would improve traffic flow and safety with less detriment to traffic circulation and access to businesses.



Options we're still considering:

✓ Additional minor improvements

There are several types of minor improvements that would be examined and implemented by the city and WSDOT to compliment projects selected for construction in 2013:

- Analyze speed limit between Kellogg and Horton Road.
- Adjust traffic signal operations to compliment implemented improvements.
- Modify signage to compliment implemented improvements.
- Develop and adopt an access management plan to set expectations for future redevelopment.



A motorist information sign south of the I-5/SR 539 interchange (milepost 255.49) seems to direct traffic to the congested northbound off-ramp to access restaurants located at Bellis Fair Mall. We will adjust signs to match highway improvements. For example, a modified sign could direct drivers on northbound I-5 to use Exit 256B, thereby avoiding the congested section of SR 539 between I-5 and Telegraph Road.

Setting speed limits

It is a standard practice for WSDOT to evaluate speed limits as part of any construction project, and we will do so for this project as well.

Setting speed limits is a technical science backed by many years of research and experience on what works and doesn't work to keep traffic moving safely. Research and experience have shown that effective speed limits are those that the majority of motorists naturally drive, and that raising and lowering speed limits doesn't substantially influence that speed. Speed limits are determined by what engineers call the "85th percentile speed," or the speed that 85 out of 100 vehicles travel at or below.

6. Key findings

- The options forwarded for further consideration address the key problem of too much activity in a small space. They reduce wait times and backups, which will improve traffic flow and reduce conflicts that contribute to collisions.
- Many of the options that provide substantial benefit for improving traffic flow and safety involve disadvantages. Key among them:
 - Reduced driver convenience: left-turn restrictions will change travel patterns and force some vehicles to take longer routes to reach their destinations.
 - Reduced turning opportunities into businesses: businesses may have fewer access points, and their driveways may be restricted to right turns in and right turns out.
- Reducing backups on the northbound off-ramp from I-5 is a top mobility and safety priority. Some turn restrictions at or near the Telegraph intersection will be required to accomplish the reductions in vehicle conflicts and improved traffic flow necessary to reduce backups on the northbound off-ramp. Other adjustments may be necessary so that moving traffic off the ramp is treated as a top priority as a reaction to backups.
- Access management improves safety by separating access points so that turning and crossing movements occur at fewer locations. Managing access can result in better traffic flow, fewer collisions, and a better shopping experience. Studies consistently show that well-managed arterials are often 40 to 50 percent safer than poorly-managed routes, and well-managed arterials can operate at speeds well above poorly-managed roadways – up to 15 to 20 miles per hour faster.
- Traffic volumes on the Guide far exceed state standards for a center-turn lane. State law requires public agencies to manage access to improve safety and traffic flow on highways. Therefore, this project must initiate an access management program for the Guide.
- None of the options we studied and can afford will *eliminate* delays. Even with the improvements we can afford to build, there will still be congestion on the Guide.

This page intentionally left blank.

7. Next steps

Construction of Guide Meridian improvements is scheduled to begin in spring 2013. In order to deliver the project on time and budget, we must make our selection and begin full engineering this fall. Before then, we welcome your feedback:

- Do you have questions about our technical analysis and how the improvement options are expected to improve traffic flow and safety?
- Did we miss any benefits or disadvantages?
- What else should we consider as we weigh the benefits and disadvantages?

Apr–Jun

Seek public input & conduct technical evaluation

Jul

Release draft report—summary of public input and results of technical evaluation

Jul-Aug

Seek public feedback

Sep

WSDOT selects improvement options for 2013 construction

Sep-Dec

**Share results and inform community about next steps
Begin detailed engineering for 2013 construction**