

# SR 539/I-5 Improved Access Project

## Supplemental Report

### *Final*



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## Purpose

In 2003 the Washington State Legislature provided funding for the SR 539 Guide Meridian Widening Project from Bellingham to Lynden. As part of the funding authorization, the City of Bellingham and the Washington State Department of Transportation (WSDOT) recognized the potential for attracting additional traffic to the SR 539 corridor and that this traffic would funnel into the already congested section of SR 539 between I-5 and Horton Road.

The purpose of this traffic analysis is to identify existing and future safety and congestion problems on the Guide Meridian (SR 539); to determine why these problems occur; and, if diverting traffic to one or more new east-west connectors in northern Whatcom County in the vicinity of the SR 539 corridor would reduce traffic volume on SR 539 in congested segments of the corridor.

The new east-west connection alternatives analyzed are as follows:

- A new interchange at Smith Road/I-5.
- The extension of Slater Road from Northwest Drive to SR 539 connecting with Kelly Road.
- The extension of Horton Road from Northwest Drive to Hannegan Road connecting to Van Wyck.

## Introduction

The SR 539 corridor begins at the I-5/Guide Meridian interchange in Bellingham, Washington and continues north through Whatcom County into Lynden, ending at the Washington/Canadian border crossing. This highway is designated as a Highway of Statewide Significance and provides a major north-south connection through Whatcom County serving freight, commercial and residential users.

Truckers use SR 539 to move freight from I-5 from the south, and Canada from the north, to various locations within Whatcom County. Residential users from neighborhoods located along the SR 539 corridor use the roadway to access shopping, jobs and commercial centers located in Bellingham and Lynden. Bellis Fair Mall and other big box retail attractions are located at the south end of the corridor adjacent to the I-5/SR 539 interchange. This retail center provides jobs, generates commercial trucking activity and attracts shoppers from all around the greater Whatcom County area and the British Columbia lower mainland.



Regional trips destined to Bellingham, Lynden and northern Whatcom County mix with local trips destined to retail outlets and commercial centers located along the SR 539 corridor resulting in a diverse mix of trip making within the corridor. The intense commercial and retail activity combined with truck traffic and commuters generates high volumes of traffic during the peak hour periods and during periods of high shopping activity (ex., Thanksgiving and Christmas Holidays). Closely spaced intersections along SR 539, and the need for additional access control, contribute to the congestion experienced from the I-5 Interchange to Smith Road.

To address the congestion, mobility and safety problems within the corridor, the Washington State Department of Transportation (WSDOT) in cooperation with the City of Bellingham and Whatcom County conducted an analysis of the SR 539 corridor. The SR 539/I-5 Improved Access Project examined existing causes of congestion and evaluated alternatives to reduce congestion, improve safety and enhance freight mobility. This Technical Memorandum summarizes the supplemental analysis completed by DKS Associates to complete the evaluation of potential local roadway network improvements that have been proposed to reduce congestion in the SR 539 corridor.

## **Key Traffic Characteristics of the SR 539 Corridor**

Prior analysis conducted by WSDOT identified key traffic and travel characteristics in the SR 539 corridor. These characteristics emerged from license plate surveys conducted by WSDOT for truck and auto trips in the corridor and included the following:

- Approximately 50% of truck traffic on SR 539 has a local trip purpose that begins or ends in the segment between I-5 and Smith Road.
- Approximately 65% of auto trips on SR 539 has a local trip purpose that begins or ends in the segment between I-5 and Smith Road.

## **Existing SR 539 Congestion Problems**

The examination of existing PM peak congestion on SR 539 between the I-5 interchange and Horton Road resulted in the following findings:

- Significant congestion (LOS E or F) occurs on SR 539 at the I-5 Northbound off-ramp, Telegraph Road and Bakerview intersections. Congestion at these intersections impact operations at other intersections in the corridor.
- Long delays (exceeding 80 seconds) and queues occur on the side streets. The long cycle length (224 seconds) used to coordinate the signals in the corridor contributes to the delay on the side streets. The longer cycle length provides greater capacity and throughput for north-south movements through the corridor but can have a negative impact on the freeway ramps and side streets.
- High volume turning movements occur at key intersections and entrances/exits to the mall and commercial centers along the corridor. The high volume turning movements require additional storage for left turn movements which is limited by the closely spaced intersections in the south end of the corridor. The long signal cycle results in a greater wait time for left turns which results in a need for longer left turn storage at signalized intersections. When left turns exceed the available storage capacity, through movements in the adjacent lane are blocked reducing throughput.
- The high volume turning movements conflict with high volume through movements and require longer green time at signalized intersections. This results in less throughput for mainline movements.

- The high volume of left turns and right turns at nonsignalized intersections creates congestion and reduces the throughput capacity of the corridor.
- There is a heavy northbound movement on SR 539 (coming from Bellingham and the I-5 southbound off-ramp) that weaves across I-5 Northbound off-ramp traffic and heads east on Telegraph Road. This movement causes considerable congestion between the I-5 interchange and Telegraph Road. There is also a corresponding heavy westbound left turn movement from Telegraph onto southbound SR 539.

## **New East-West Connector Roadway Findings**

The key findings from modeling potential east-west arterial improvements with the Whatcom Council of Government (WCOG) regional demand model are summarized below:

### **Smith Road Interchange**

The construction of a new freeway interchange at I-5/Smith Road would not reduce traffic volumes or congestion on SR 539 between I-5 and Axton Road. This result is due to the following factors:

- Modeling indicates that local trips on the southern half of the SR 539 corridor (Smith Road to I-5) are destined to and/or originate within the SR 539 corridor and/or close proximity to the corridor. Regional trips traveling north or south on SR 539 experience no travel advantage from the Smith Road interchange and are unlikely to divert from the SR 539 corridor.
- The Smith Interchange is too far north to have any impact on travel patterns and traffic volumes in the SR 539 corridor.

The Smith Road interchange did not result in a decrease in traffic volumes on I-5 (except locally around the Smith Road interchange area) or a decrease in traffic volumes on Sunset Drive.

### **Slater Road Extension**

The modeling of the extension of Slater Road from Northwest Drive to SR 539 (connecting with Kelly Road) resulted in a significant increase in traffic volume on Slater Road with a corresponding decrease in traffic on Smith Road. Some smaller decreases in traffic volume were evident on Bakerview Road from I-5 to Hannegan Road. On SR 539, traffic volumes remained the same south of the Kellogg Road intersection with a slight increase in northbound volumes on SR 539 between Kellogg and Slater Road. This result is likely due to the following factors:

- Some northbound trips on I-5 exit at the existing Slater Road interchange and then head west on Smith Road by using Northwest Drive and other local roads to travel from Slater to Smith Road. With the Slater Road extension, these trips would likely use Slater Road instead of Smith Road for east-west travel resulting in a decrease in trips on Smith Road.
- Some trips that currently use Bakerview Road would divert to Slater to avoid congestion in the Bakerview corridor.
- The Slater Road extension is located at the north edge of the Cordata development and provides access to residential, office and commercial activity in the Cordata Planned Unit Development (PUD). This north access to the Cordata PUD enhances the attractiveness of Slater as an east-west route and results in some changes in travel patterns on SR 539 between Smith Road and Bakerview.

Modeling of the Slater Road extension did not reduce traffic volumes on Sunset Drive. The modeling indicated minor changes in traffic volume may occur on I-5 between Main Street and

Bakerview due to some diversion of traffic to Slater Road but indicated that no change in volume is likely on I-5 south of the Bakerview Road interchange.

### **Horton Road Extension**

The modeling of the extension of Horton Road from Northwest to Hannegan Road (connecting to Van Wyck) resulted in significant reductions in traffic volumes on Bakerview Road, Northwest Drive, Smith Road and Cordata. Horton Road would likely experience a significant increase in volume from Northwest Drive to Hannegan with a moderate but significantly less increase in volume between Hannegan and Mount Baker Highway. These changes in travel pattern are likely caused by the following factors:

- The Horton Road extension provides direct access through the heart of the new Cordata development and this improved access results in better circulation and connectivity and a reduction of trips on SR-539.
- The Horton Road extension is far enough south that it becomes an attractive alternative for east-west trips that use Bakerview Road. Modeling indicates that many of these trips would divert to Horton Road reducing congestion on Bakerview and SR 539.
- Some trips that currently use Smith Road for east-west connectivity across northern Whatcom County would likely divert to Horton Road.

Modeling indicates that connecting Horton Road to Northwest Drive would significantly improve access and circulation to the Cordata PUD area. The regional model indicates that the Horton Road extension connecting with Van Wyck could reduce traffic volumes on the Sunset/Mount Baker Highway corridor. It does not appear that this reduction is significant but could warrant further study.

## **Prior Analysis Completed by Others**

This section provides a short summary of the findings from prior analysis completed by others.

### ***SR-539/I-5 Improved Access Project (October 2005)***

This analysis was conducted by David Evans & Associates for WSDOT in October 2005. The purpose of this analysis was to “determine methods for relieving congestion, enhancing safety, and improving mobility for freight in the SR 539 corridor between Milepost 0.0 (interchange at I-5) and Milepost 3.5 (Smith Road). Several alternatives were examined. These alternatives included:

- Construct a new interchange at I-5/Smith Road
- Widen SR 539
- Widen Sunset Drive and Hannegan Road

### **October 2005 Findings:**

**Smith Road Interchange:** Adding a new interchange at I-5/Smith Road would not reduce traffic volumes or congestion on SR 539.

**Widen SR 539:** Widening SR 539 would result in a substantial diversion of traffic from other parallel arterial routes (Everson-Goshen Road, Hannegan Road, Northwest Drive & Aldrich Road). The increase in capacity on SR 539 resulted in little or no reduction in congestion but decreased congestion on parallel arterials.

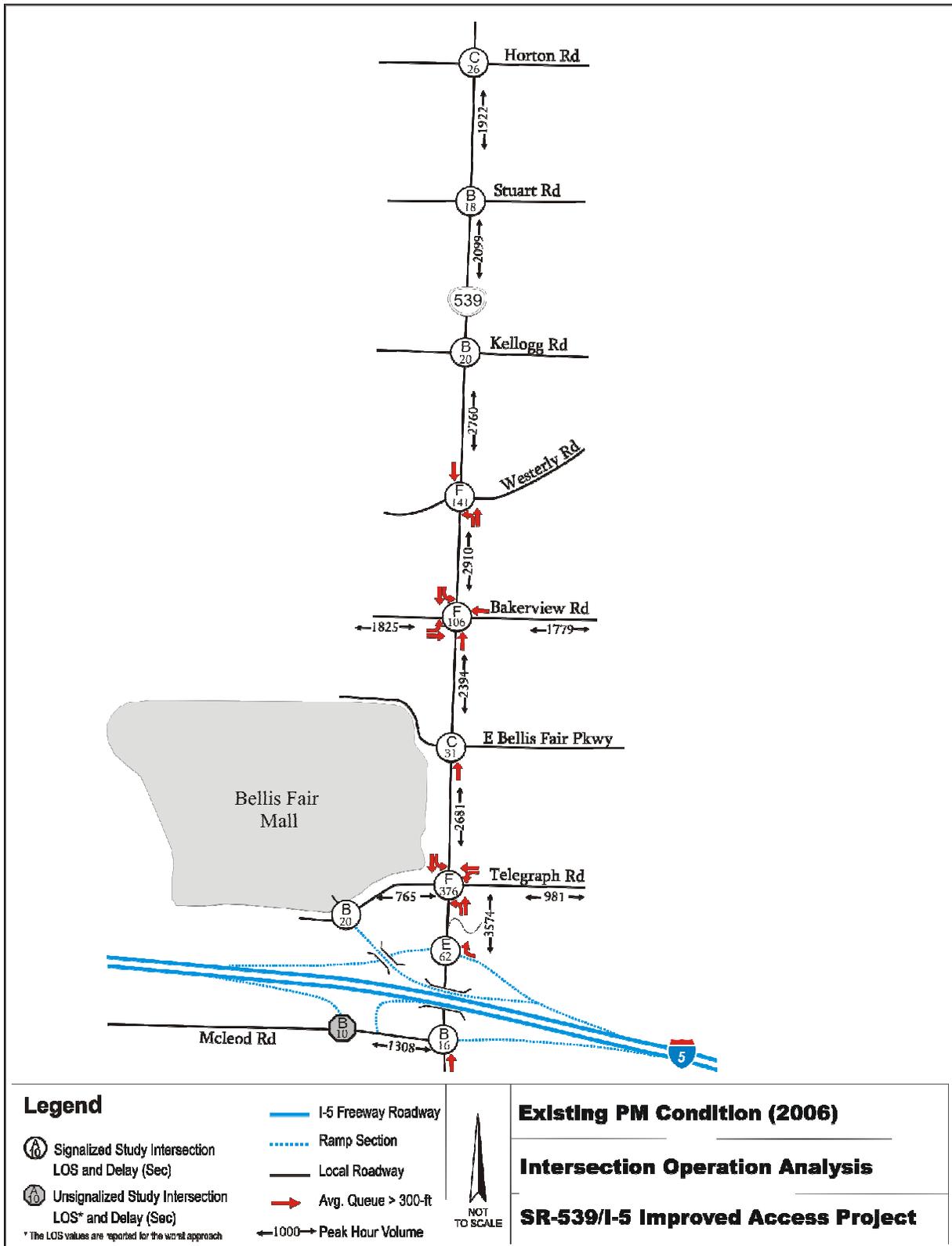
**Widen Sunset Drive and Hannegan Road:** These improvements to parallel north-south arterials resulted in decreased congestion on SR 539 north of Smith Road but no reduction in congestion south of Smith Road.

## **Existing Level-of-Service (2006 PM Peak)**

DKS developed a 2006 PM peak simulation model of the SR 539 corridor from the I-5 interchange to Horton Road using Synchro software to evaluate existing conditions in the corridor. Traffic counts for the model were provided by the WSDOT. Existing signal timing records were provided by the City of Bellingham. Field reviews were conducted by DKS to verify existing congestion levels, roadway geometrics, signal timing and existing roadway operations. The level of service (LOS) results from the Synchro analysis is summarized in **Figure 1**. The key findings from this analysis include:

- The highest levels of congestion occur at the I-5 Northbound Off-ramp (LOS E), Telegraph Road (LOS F) and Bakerview Road (LOS F) intersections. Although the Westerly Road intersection operates at LOS F this is due to the long delay experienced by side street movements on Westerly Road and does not represent the LOS experienced by through movements on SR 539.
- The PM peak volume is highest (3754 veh/hr two-way volume) between the I-5 Northbound Off-ramp and Telegraph Road. High volumes of traffic (2000 veh/hr or greater) occur on SR 539 from Telegraph Road to Stuart Road.

Significant queuing and backups occur within the SR 539 corridor with the longest queues at the Westerly Road, Bakerview Road, Telegraph Road and I-5 Northbound Off-ramp intersections (see Figure 1).



## Existing Operational Problems on SR 539

In addition to the Synchro analysis, DKS conducted field reviews to document existing operational problems and difficulties. Field observed problems on SR 539 include the following (see **Figure 2**):

- **Heavy northbound volumes and northbound weave between I-5 and Telegraph Road**

Heavy northbound traffic on SR 539 at the intersection of the I-5 northbound off ramp provided very few opportunities for right turn vehicles on the northbound off ramp to make right turns on red. This contributed to the formation of long queues on the northbound off ramp and excessive delay to the off ramp traffic.

A high percentage of northbound traffic on SR 539 is destined to Telegraph Road (i.e. eastbound on Telegraph). This traffic must weave across the traffic headed northbound on SR 539 from the I-5 Northbound Off-ramp causing congestion and reducing throughput.

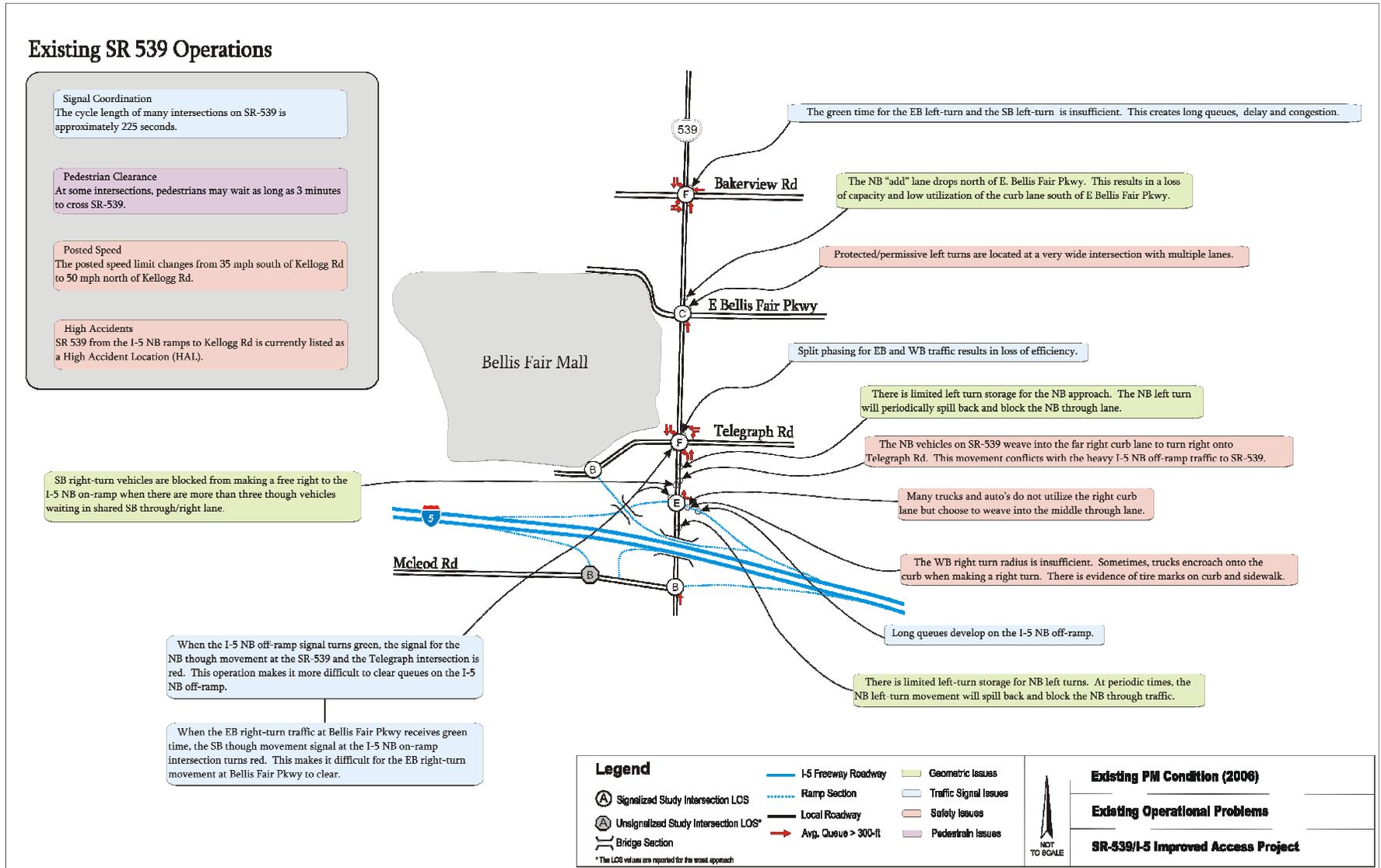
- **Limited left turn storage**

There is limited northbound left turn storage for left turn traffic on SR 539 at the northbound I-5 off ramp. At periodic times during the PM peak hour, the northbound left turn traffic from SR 539 to the I-5 northbound on-ramp spilled back and blocked the northbound through lane. When this happened the northbound traffic on SR 539 used only the northbound curb lane which further reduced the opportunities for right turn vehicles to make a right turn on red from the northbound off-ramp.

- **Long signal cycle on SR 539**

Based upon the signal timing cards and verified by field observation, the signal cycle on SR 539 is 224 seconds and most of the green time is given to the through movements on SR 539 which benefits the through traffic, allows easy progression through the corridor, and clears queues that build at the signalized intersections. The negative side effects of the long cycle length include:

- Long queues develop on the side streets and mainline approaches. With closely spaced intersections and limited storage between intersections and in turn pockets, the long cycle length causes spill back into adjacent intersections. Longer queues form on the side streets and freeway off ramps because they are not served as often. When the appropriate green phase returns it typically clears the approaches because of the long green phase. During the field observation, the only approach that did not clear regularly was the eastbound approach from Bellis Fair at Telegraph Road.
- With the longer cycle length there is a greater variability in the length of the queues. This is because traffic does not arrive uniformly and may arrive in platoons that cause greater congestion and/or queues if they are not served promptly. During the field observation, this phenomenon happened on both the I-5 northbound off-ramp and the westbound approach on Telegraph Road.
- Long pedestrian wait times. There were a modest number of pedestrians on SR 539. Some were crossing but most were moving north-south on SR 539. Pedestrians might have to wait for more than 3 minutes to cross SR 539 but typically waited less than that to cross the side streets.



**Figure 2 – Existing Operational Problems on SR 539**

- Loss of efficiency. The long cycle length is very efficient as long as there is demand on the movement(s) being served. However, there were numerous times during the field observation that the signal system held the green for the north-south through movements after demand had been served. This results in lost effective green time when there is demand on other movements that could be served more efficiently

- **Signal Coordination**

The existing signal timing and coordination favors north-south progression on SR 539. This is advantageous once vehicles enter the progression band on SR 539. However, coordination is not provided for freeway ramp and side street movements. The large volume of traffic, high turn movements, phase overlaps and closely spaced intersections make the signal timing and coordination difficult and complex. The City of Bellingham has dedicated significant time and resources examining different timing schemes for the SR 539 Corridor. Additional study and input is needed from the City to determine if potential changes to the existing signal timing scheme could benefit freeway ramp and side street movements without impairing through movement coordination. Some potential movements that could benefit from signal timing changes or revisions include:

- I-5 northbound off ramp right-turn movement. When the signal for the northbound off ramp traffic turns green, the signal for the northbound through movement on SR 539 at Telegraph Road is red. Therefore, once the storage between Telegraph Road and the I-5 northbound ramp is filled, nothing moves until the signal for northbound through movement turns green at Telegraph Road. This results in significant lost time and does not clear the I-5 northbound off ramp. The signal for northbound through movement needs to be green at Telegraph Road at the same time that green is given to the I-5 northbound off ramp. This would allow vehicles from the I-5 northbound off-ramp to enter SR 539 without weaving or conflicts and to maneuver into the desired lanes.
- Eastbound movement at Telegraph Road. There is a heavy eastbound right turn movement from Telegraph Road onto SR 539. This movement follows a heavy westbound left turn on Telegraph Road due to the split phasing. Usually the southbound through movement at the I-5 northbound on-ramp is red for some or all of this time. Because of southbound queues on SR 539 at the I-5 northbound ramps, it can make it difficult to clear the eastbound right turn movement.

- **Lane Channelization**

The existing channelization on the I-5 northbound off ramp provides a single right turn “add” lane onto SR 539. Theoretically, this should act as a “free” right. In practice, it does not as most of the right turns from the off ramp want to weave over one (1) lane because the “add” lane on SR 539 drops at the East Bellis Fair intersection (one block north of Telegraph Road). Even though the “add” lane may be empty, right turn vehicles will wait until they have a sufficient gap in the through lane before entering SR 539.

- **Accident History**

Sixty Seven (67) accidents were reported on the existing I-5 northbound off ramp to SR 539 for a three (3) year period from 2003 – 2005. The vast majority (about 90%) of these accidents were rear-end collisions that typically occur when there is congestion and queuing at the ramp terminus. The I-5 Northbound off-ramp to SR 539 is listed as a High Accident Location (HAL) by the WSDOT. The SR 539 Corridor from I-5 to Kellogg Road is listed as a High Accident Corridor (HAC).

- **Transit Service**

Whatcom Transportation Authority (WTA) provides regular transit service on SR 539. Fixed route service includes routes 15, 26 and 71X which provide service between downtown Bellingham, Cordata Station, Lynden, Everson, Nooksack and Sumas. WTA has had difficulty locating bus stops on SR 539 between I-5 and Kellogg Road due either to topographical constraints (such as the creek and vertical grades), lack of right-of-way and the inability of transit vehicles to reenter traffic once they pull out of the through lane to make a stop.

## Evaluation of East-West Connection Alternatives

DKS evaluated the potential benefits and impacts to the SR 539 corridor with additional east-west local roadway connections using the WCOG travel demand model. This analysis was conducted for the 2035 PM peak hour. Three alternatives were evaluated with the WCOG model:

- **Smith Road Interchange:** Construct a new interchange at I-5/Smith Road.
- **Slater Road Extension:** Extend Slater Road from Northwest Drive to SR 539 connecting with Kelly Road east of SR 539.
- **Horton Road Extension:** Extend Horton Road from Northwest to Hannegan Road connecting to Van Wyck east of Hannegan Road.

This section provides the background assumptions used in the WCOG model and summarizes the findings for each alternative.

### *WCOG Model Update*

The Whatcom COG model follows the traditional Urban Transportation Modeling System steps of sequentially predicting trip frequency, trip distribution, mode choice /vehicle occupancy, and route assignment (for auto trips). The model estimates travel on roadway links within Whatcom County. The model requires as inputs data from a bi-national model of truck and automobile flows that generates external entry or exit points for trip into, out of, or through Whatcom County.

A model update was undertaken by WCOG in October 2006 to improve the performance of the model. The update included a revision of the zone system to more accurately represent the way land uses are grouped in the county and the way they are associated with the roadway network. The network was revised to include only the links that the model system needs to represent travel on the freeway, the major and minor arterials and the collector roads. Finally the model was calibrated to 2005 roadway conditions to provide a more direct link to observed conditions.

New estimates of households were developed for 2005 WCOG base year model by increasing the number of households in 2000 with parcel-level data on new housing units constructed. This information was provided to the WCOG by local governments (cities and the county). Changes in the number, location and/or size of special generators were made by connections with agencies such as universities, hospitals and other organizations associated with special generators. In addition to calibrating to a more recent year, the WCOG model update also included a revision of the models zone system and network. The zone system was disaggregated to a finer-level system. The number of zones was increased from 246 zones to 408 internal zones. The zones were also realigned to provide a better loading of trips onto the network. Zones were designed to straddle collector streets rather than use them as borders.

## ***Calibration of the WCOG Model***

The new Whatcom COG model was calibrated to traffic counts designed to represent average weekday conditions in 2005. Traffic counts data was gathered from a variety of sources including the following:

- City of Bellingham counts
- WSDOT Count Database
- Whatcom County counts
- Counts conducted for this project

Whenever possible, counts were adjusted to represent an average weekday in June of 2005. The counts for I-5 mainline and ramps were also adjusted to provide a more consistent flow between interchanges. The updated WCOG model was calibrated by starting with the model coefficients used in the previous WCOG model except that no “K” factors were used to adjust specific zone-to-zone volumes in the trip distribution process. The results of the initial model application were compared to the traffic counts and adjustments were made to the freeway capacities and volume delay functions to produce a better match of model estimated link volumes with observed traffic counts. The freeway capacity was set at 2000 vplph and the on and off-ramp capacities were set at 1100 vplph. The model was also modified to capture the AM and PM peak periods as two hour intervals.

## ***2027 and 2035 Land Use Forecasts***

Forecasts were developed for this analysis by extrapolation of forecasts that had been developed by the COG for 2022. New 2022 forecasts for the updated WCOG model zone system were developed by reallocating the previous estimates of land use and special generators from the old WCOG model to the new WCOG model zone system, splitting old estimates into the new zones using the area of segments of the old zones when necessary. Once estimates for 2000 and 2022 land use were available for the new zone system, the growth per land use characteristic and special generator was added to the WCOG 2005 base model to obtain a 2027 forecast. Forecasts for 2035 for the new zone systems were developed by extrapolating an additional 8 years of growth from the 2027 estimates.

## ***Existing and Future Year Networks***

The WCOG 2005 model network is an update to the WCOG 2000 base year network, with the removal of many local streets from the roadway network. The WCOG 2005 base year network was updated to reflect roadway improvements that were constructed between 2000 and 2005. The following improvements to the roadway network were added into the 2005 WCOG model:

### **Updates to the WCOG 2005 Base Model**

| <b>Road</b>              | <b>Location</b>                                      | <b>Change</b>                      |
|--------------------------|--|------------------------------------|
| <b><i>Bellingham</i></b> |  |                                    |
| I-5 SB                   | Ohio on-ramp to Lakeway off-ramp                     | Widen to 3 lanes, upgrade capacity |
| I-5 SB                   | Lakeway off-ramp                                     | Widen to 2 lanes, upgrade capacity |
| I-5 SB                   | Auxiliary Lane between Bakerview and NW Interchanges | Widen to 3 lanes, upgrade capacity |
| I-5 SB                   | Auxiliary Lane between NW and SR 539 Interchanges    | Widen to 3 lanes, upgrade capacity |
| SR 542                   | Sunset Drive, I-5 to Orleans eastbound               | Widen to 3 lanes, upgrade capacity |

Based on the FHWA guidelines, the WCOG 2035 model was updated to include only funded roadway improvements. The following projects, funded for construction between 2005 and 2035, were added into the future 2035 model.

### Funded Projects Assumed in the 2035 WCOG Model

| Road                 | Location                              | Change                             |
|----------------------|---------------------------------------|------------------------------------|
| Sunset Drive         | Woburn to City Limits                 | Widen to 4 lanes                   |
| San Juan Boulevard   | Elwood Rd to San Juan Blvd            | New 2-lane Road                    |
| West Illinois Street | City Limits to Marine Drive           | New 2-lane Road                    |
| SR 539               | Horton Road to Tenmile Road           | Widen to 5 lanes                   |
| SR 539               | Tenmile Road to SR 546                | Widen to 4 lanes                   |
| SR 539               | SR 546 to International Boundary      | Widen to 4/5 lanes                 |
| SR 543               | I-5 to International Boundary         | Widen to 5 lanes                   |
| Lincoln Road         | Lincoln Rd/Birch Pt Connector         | New 2-lane Road                    |
| Lincoln Road         | Lincoln Rd/Blaine Rd Connector        | New 2-lane Road                    |
| Lincoln Road         | Harborview Rd to Blaine Rd            | Upgrade capacity                   |
| Drayton Street       | 2nd Street to Depot Road              | New 2-lane Road                    |
| 17th Street          | North of Village Drive to Main Street | New Construction                   |
| SR 9                 | E Badger Rd to Halverstick Rd         | Realign SR 9                       |
| Garrison Road        | E Badger Rd to Halverstick Rd         | Close road due to SR 9 realignment |

### Forecasted 2035 Volumes

Traffic volumes for 2035 were estimated using the existing (2005) traffic counts and the forecasts from the updated Whatcom COG models for 2005 and 2035. Projected traffic volumes for 2035 were developed by averaging the raw difference and the percent difference between the model link volumes and adding the average model growth between 2005 and 2035 to the 2005 counts. The raw forecast volumes were then hand balanced for each of the study intersections prior to analyzing the network in Synchro.

Existing traffic volumes on the roadway network in the study area are forecasted to increase by nearly 20% to almost 125% (see **Figure 3**). Lower growth is forecasted on some facilities such as I-5 and Sunset Drive due to the capacity constraints of the roadway. On SR 539 traffic volumes are forecasted to grow by 45-63% near the I-5 interchange and by as much as 124% in the vicinity of Horton Road.

**Bellingham - Forecasted Growth**  
**2006 and 2035 PM Peak hour Volume Comparison (BASE FREEWAY NETWORK)**



**Figure 3 – Forecasted Changes in Traffic Volumes (2035)**

### ***Model Results***

The WCOG model results for the three proposed east-west roadway connections are summarized graphically in **Figures 4, 5 and 6**. These figures show where 2035 traffic volume is forecasted to increase (green) or decrease (red) with each of the proposed alternatives. The size of the red and green bars indicates the magnitude of the predicted changes in traffic volume and travel patterns.

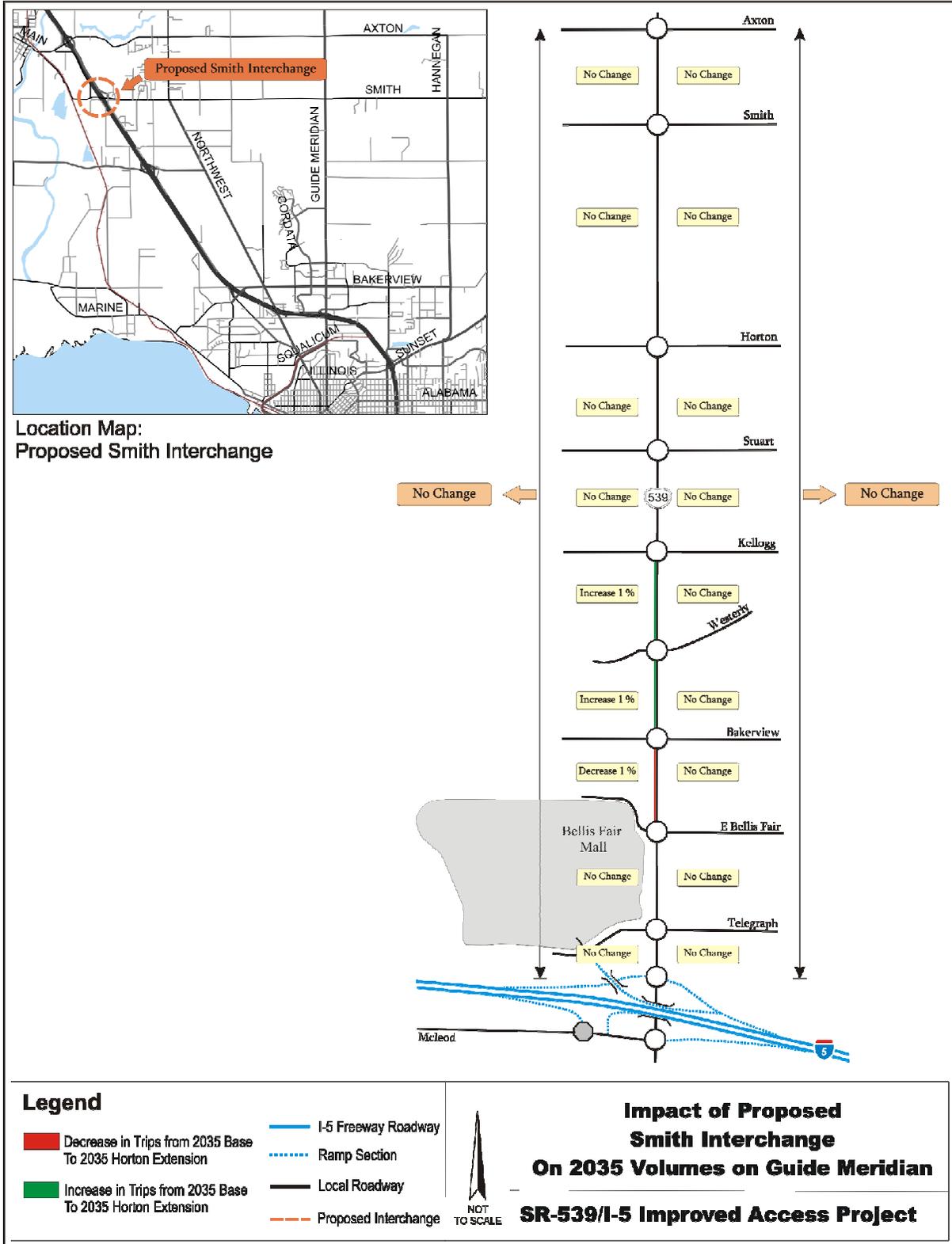


Figure 4 – Travel Pattern Shifts with the Proposed Smith Road Interchange

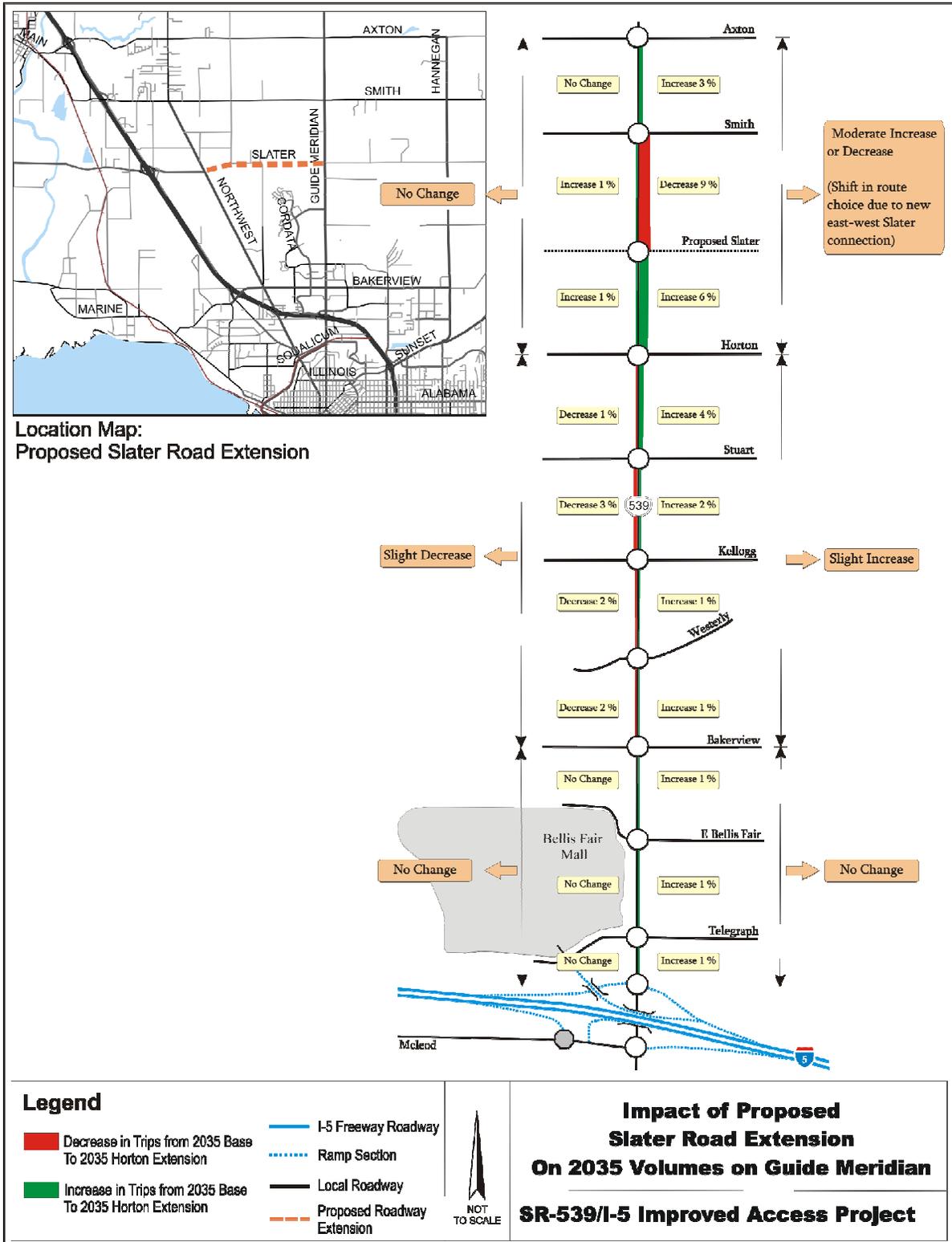


Figure 5 – Travel Pattern Shifts with the Proposed Slater Road Extension

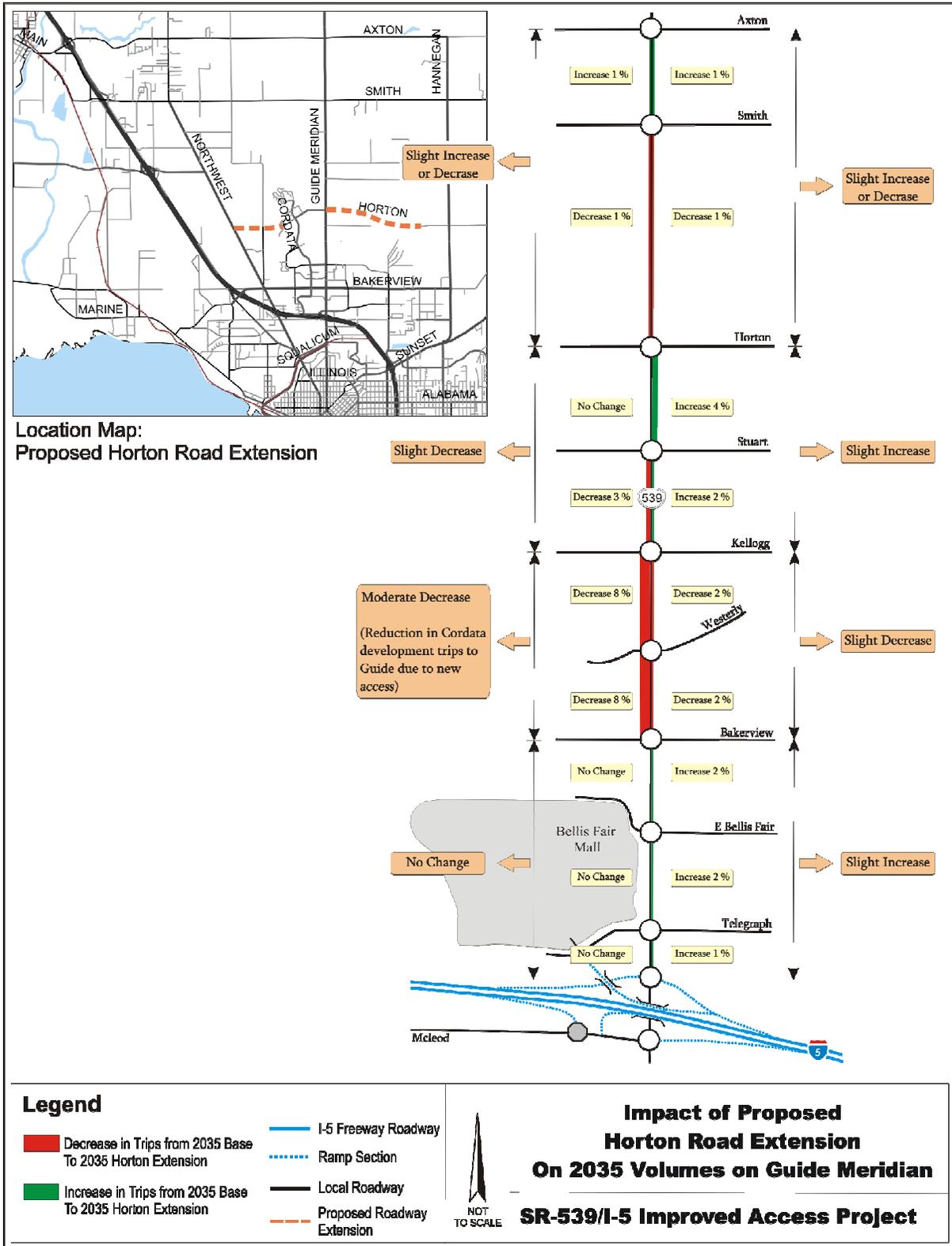


Figure 6 – Travel Pattern Shifts with the Proposed Horton Road Extension