SUMMARY OF CITY CENTER TRAFFIC CIRCULATION STUDIES

INTRODUCTION

The City Center has been the subject of several traffic circulation and transit studies over many years, the most recent included the City Center Master Plan (CCMP) in 2000, the WTA Strategic Plan in 2004 (WTA), a 2006 update to the CCMP 2000 circulation plan in conjunction with the travel demand forecasting conducted for the 2006 Bellingham Comprehensive Plan (Comp Plan), and again in 2009 in association with the transportation analysis conducted for the 2010 Waterfront District Final Environmental Impact Statement (FEIS).

All of these studies examined the existing City Center street and circulation system, including the one-way couplets of State-Forest; Champion-Magnolia; and Holly-Chestnut. The 2000 CCMP study examined the potential conversion of Holly from one-way to two-way and reversing flow on Magnolia while the 2006 CCMP study examined the potential conversion of Champion and Chestnut to two-way streets. Both the 2004 WTA Strategic Plan and the 2010 Waterfront District FEIS were based on the assumption that all existing one-way couplets currently serving downtown Bellingham would remain in service.

Discussion of pros/cons of two-way streets.

LAND USE AND EMPLOYMENT DATA FOR 2000 CCMP AND 2006 COMP PLAN STUDIES

The land use data used for the 2000 CCMP study was based on the 1995 Bellingham Comprehensive Plan while the 2006 Comp Plan analysis was consistent with the land use data used for travel demand modeling conducted for the Bellingham Comprehensive Plan adopted in June 2006. The 2000 CCMP study did not include redevelopment of the then-active Georgia Pacific Pulp Mill.

The 2006 Comp Plan land use data included early forecasts for the redevelopment of the 200-acre Waterfront District from heavy industrial uses to a high density mixed use neighborhood, but the employment forecast was significantly lower than the forecasts in the 2010 Waterfront District FEIS. The 2006 Comp Plan study included 2,000 Waterfront housing units, which is generally consistent with the 1,892 new housing units included in the 2010 Waterfront District FEIS, but the 893,000 square feet (SF) of commercial space accommodating 2,000 employees in the 2006 Comp Plan study is far less than the 3,730,000 SF commercial space and 8,354 employees included in the 2010 Waterfront District FEIS.

As stated above, both the 2004 WTA Strategic Plan and the 2010 Waterfront District FEIS assumed that all existing one-way couplets would remain in service and FEIS mitigating measures are based on that assumption.
2000 CITY CENTER MASTER PLAN (CCMP)
The 2000 CCMP study included two traffic flow alternatives for Holly and Magnolia.

2000 CCMP Alternative 1: Holly Street and Magnolia Conversions. Convert Holly from three one-way lanes to two lanes of two-way traffic flow between Lakeway and Bay St. One- way southbound traffic flow on Magnolia would also be reversed to northbound to function as a Magnolia-Chestnut one-way couplet. 2000 CCMP analysis findings include the following:

1. 60% increase in travel time delay on Holly between Lakeway and Bay St with the assumption that two-thirds of the traffic volume on Holly would re-route and utilize Magnolia.

2. 2-to-3 block vehicle queues (back-ups) at the intersection of Champion/Grand/Magnolia, creating public safety issues for pedestrians, bicyclists, transit users, and vehicles. (When traffic backs-up through intersections, pedestrians are forced to weave between cars to cross the street with an uncertainty as to when a car may or may not move in the traffic stream and whether the driver will see the pedestrian or not. Bicycle movement is also compromised and transit busses cannot move, which degrades on-time service and reduces the overall reliability of transit routes. Vehicle drivers can become impatient and aggressive and make bad choices which can increase collisions and possibly injuries to people.)

3. Downtown WTA Transit center operations would be adversely impacted due to congestion and because both Magnolia and Champion would be northbound, thus limiting access options to the transit center and creating additional transit circulation and out-of-direction travel. (It is important to note that the 2000 CCMP study was also conducted prior to WTA’s 2004 Strategic Plan, which completely re-allocated county-wide transit service hours and incorporated high-frequency (15 min) GO lines all centered on the downtown transit hub and all reliant on the one-way couplets to protect transit speed and reliability.)

4. Significant traffic congestion on Holly with northbound gridlock between Ellis/Lakeway/Holly and Forest/Holly and southbound gridlock between State/Holly and Ellis/Lakeway/Holly.

5. Calculated intersection level of service (LOS) at Champion/Grand/Magnolia becomes LOS F (gridlock) with significant increase in congestion and delay with 2-3 block long vehicle queues (back-ups) into upstream intersections. This can create public safety issues for pedestrians, bicyclists, transit users, and vehicles. (See #2, above)

6. Conversion of Holly from one-way to two-way does not improve access to the CBD from Lakeway during the PM peak hour. Queuing (vehicle back-ups) and congestion on Lakeway worsens due to changes to traffic signal operations at Lakeway/Ellis to accommodate the Holly Street revisions.
**Holly Congestion**

**2000 CCMP Alternative 2: Holly Street Conversion Only.** Convert Holly from three one-way lanes to four lanes of two-way traffic flow between Lakeway and State and two lanes of two-way traffic flow between State and Bay Street. 2000 CCMP study findings included the following:

1. All on-street parking and pedestrian bulb-outs on Holly Street would have to be removed to accommodate two lanes of traffic in each direction with turn lanes at intersections.

2. This scenario would promote higher speeds (about 5 mph) than the Alternative one scenario due to the improved progression (coordinated timing) of traffic signals.

3. When compared to existing conditions (one-way operation) pedestrians crossing Holly Street will experience longer crossing lengths due to removal of bulb-outs, longer delays due to longer signal cycle lengths/splits, and more points of pedestrian-vehicle conflict, due to increased intersection turning movements.

4. The existing congestion on Lakeway is compounded by this scenario because: 1) Holly’s physical capacity is reduced, and 2) the new conflicting movement from southbound Holly.
2006 CCMP and COMPREHENSIVE PLAN

The 2006 travel demand model analysis conducted for the Comprehensive Plan was also used to re-examine the circulation plan from the 2000 CCMP. Two alternatives were studied and included the following findings:

2006 CCMP Alternative 1: Improvements to Existing Roadway and Circulation Network. Identification of several specific intersection and roadway improvements (Table 8, below) to maintain a safe and efficient arterial system at a cost of $2,260,000 (2005 dollars).

Generally, 2006 Alternative 1 mitigation required:

2. Purchase of additional right-of-way for turn lanes at intersections.
3. Removal of pedestrian bulb-outs to add turn lanes at intersections.


<table>
<thead>
<tr>
<th>Int. #</th>
<th>Intersection</th>
<th>Description of Improvement</th>
<th>Estimated Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-A</td>
<td>F St. / Holly St.</td>
<td>Provide NEB left-turn lane. Revise NEB left-turn lane to protected/permissive phasing. Will require right-of-way.</td>
<td>$400,000</td>
<td>Will require right-of-way. Improvement over railroad tracks.</td>
</tr>
<tr>
<td>1-B</td>
<td>F St. / Roeder Ave.</td>
<td>Provide NWB right-turn lane. Revise SEB left-turn lane to protected/permissive signal phasing. Will require right-of-way.</td>
<td>$250,000</td>
<td></td>
</tr>
<tr>
<td>1-C</td>
<td>Chestnut St. / Bay St.</td>
<td>Install new traffic signal. Upgrade existing median to allow uninterrupted SEB movement.</td>
<td>$420,000</td>
<td>Allow SE through movement to run free separated by median.</td>
</tr>
<tr>
<td>1-D</td>
<td>Chestnut St. / Cornwall Ave</td>
<td>Provide NEB left-turn lane. Revise NEB left-turn lane to protected/permissive phasing. Provide SEB through lane. Will require right-of-way.</td>
<td>$590,000</td>
<td>Remove 14 on-street parking stalls.</td>
</tr>
<tr>
<td>1-E</td>
<td>Chestnut St. / Railroad Ave</td>
<td>Provide stripping and signage to restrict through movements on Railroad Ave.</td>
<td>$10,000</td>
<td></td>
</tr>
<tr>
<td>1-F</td>
<td>Holly St. / Cornwall Ave</td>
<td>Provide NEB left-turn lane. Revise NEB left-turn lane to protected/permissive phasing. Will require right-of-way.</td>
<td>$180,000</td>
<td>Remove 2 on-street parking stalls.</td>
</tr>
<tr>
<td>1-G</td>
<td>Magnolia St. / Cornwall Ave</td>
<td>Provide SWB left-turn lane. Will require right-of-way.</td>
<td>$140,000</td>
<td>Remove 3 on-street parking stalls.</td>
</tr>
<tr>
<td>1-H</td>
<td>State St. / York St.</td>
<td>Revise SEB and NWB left-turn lanes to protected/permissive phasing.</td>
<td>$56,000</td>
<td></td>
</tr>
<tr>
<td>1-I</td>
<td>Holly St. / Ellis St.</td>
<td>Revise NB and SB left-turns to protected/permissive phasing.</td>
<td>$56,000</td>
<td></td>
</tr>
<tr>
<td>1-J</td>
<td>Lakeway St. / 1-5 SB Ramps</td>
<td>Revise WB left-turn to protected/permissive phasing.</td>
<td>$70,000</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL $2,260,000

1. Costs based on City of Bellingham improvement projects.
2. Estimated cost is in 2005 dollars and includes costs for right-of-way.
2006 CCMP Alternative 2: Two-way Operations Along Chestnut and Champion. Assumed the conversion of one-way Champion and Chestnut to two-way streets, along with identification of several specific intersection and roadway improvements *(Table 9, below)* to maintain a safe and efficient arterial system at a cost of $4,400,000 (2005 dollars).

Generally, 2006 CCMP Alternative 2 mitigation required:

1. Removal of 60 on-street parking spaces.
2. Purchase of some additional right-of-way.
3. Removal of pedestrian bulb-outs to add turn lanes to some intersections.

### Table 9. Alternative 2 Intersection Improvements and Estimated Costs

<table>
<thead>
<tr>
<th>Improvement Projects</th>
<th>Description of Improvement</th>
<th>Estimated Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chestnut St</td>
<td>Upgrading from one-way to two-way street system including signals, striping, and signage.</td>
<td>$360,000</td>
<td>Upgrades to 6 signalized intersections and 4 unsignalized intersections.</td>
</tr>
<tr>
<td>Champion St</td>
<td>Upgrading from one-way to two-way street system including signals, striping, and signage.</td>
<td>$210,000</td>
<td>Upgrades to 3 signalized intersections and 4 unsignalized intersections.</td>
</tr>
<tr>
<td>2-A F St / Holly St</td>
<td>Provide NEB left-turn lane. Revise NEB left-turn lane to protected/permissive phasing. Will require right-of-way.</td>
<td>$400,000</td>
<td>Will require right-of-way. Improvement over railroad tracks.</td>
</tr>
<tr>
<td>2-B F St / Roeder Ave</td>
<td>Provide NWB right-turn lane. Revise SEB left-turn lane to protected/permissive signal phasing. Will require right-of-way.</td>
<td>$250,000</td>
<td></td>
</tr>
<tr>
<td>2-C Chestnut St / Bay St</td>
<td>Installation of a traffic signal. Upgrades to existing median to allow uninterrupted SEB movement.</td>
<td>$420,000</td>
<td></td>
</tr>
<tr>
<td>2-D Chestnut St / Cornwall Ave</td>
<td>Provide NWB and NEB left-turn lanes. Revise both left-turn lanes to protected/permissive phasing. Will require right-of-way.</td>
<td>$450,000</td>
<td>Remove 11 on-street parking stalls.</td>
</tr>
<tr>
<td>2-E Chestnut St / Railroad Ave</td>
<td>Provide striping and signage to restrict through and left-turn movements from Railroad Ave.</td>
<td>$10,000</td>
<td></td>
</tr>
<tr>
<td>2-F Chestnut St / State St</td>
<td>Provide SEB right-turn lane and NWB left-turn lane. Revise NWB left-turn lane to protected/permissive phasing. Will require right-of-way.</td>
<td>$510,000</td>
<td>Remove 16 on-street parking stalls.</td>
</tr>
<tr>
<td>2-G Chestnut St / Forest St</td>
<td>Provide SEB left-turn lane and NEB right-turn lane. Will require right-of-way.</td>
<td>$620,000</td>
<td>Remove 23 on-street parking stalls.</td>
</tr>
<tr>
<td>2-H Holy St / Cornwall Ave</td>
<td>Provide NEB left-turn lane. Will require right-of-way.</td>
<td>$130,000</td>
<td>Remove 8 on-street parking stalls.</td>
</tr>
<tr>
<td>2-I Magnolia St / Cornwall Ave</td>
<td>Provide SWB left-turn lane. Will require right-of-way.</td>
<td>$140,000</td>
<td>Remove 5 on-street parking stalls.</td>
</tr>
<tr>
<td>2-J Lakeway St - 5 SB Ramps</td>
<td>Provide EB right-turn lane. Will require right-of-way.</td>
<td>$300,000</td>
<td></td>
</tr>
<tr>
<td>2-K Ellis St / Chestnut St</td>
<td>Provide SEB right-turn lane. Will require right-of-way.</td>
<td>$440,000</td>
<td></td>
</tr>
<tr>
<td>1-L State St / York St</td>
<td>Revise SEB and NWB left-turn lanes to protected/permissive phasing.</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous changes to intersections outside study area</td>
<td></td>
<td>$100,000</td>
<td>TOTAL $4,400,000</td>
</tr>
</tbody>
</table>

1. Costs based on City of Bellingham improvement projects.
2. Estimated cost is in 2005 dollars and includes costs for right-of-way.
2004 WTA STRATEGIC PLAN

In September 2004, WTA published a six-year strategic plan that established a Primary Transit Network (PTN), centered on the downtown Bellingham Station and fundamentally altered the level and frequency of public transit service in downtown Bellingham. This plan required a full year of county-wide public process (2003-2004) and was completed in conjunction with the City’s update to the Bellingham Comprehensive Plan (2002-2006).

The 2004 WTA Strategic Plan recognized the importance of the one-way arterial couplet systems in downtown Bellingham to maintaining efficient transit frequency, speed, and on-time service, which is critical to the public’s perception of transit as a legitimate and convenient alternative to reliance single occupant vehicles, which is a fundamental goal of the Transportation Element of the Bellingham Comprehensive Plan. Bellingham Comprehensive Plan adopted Transportation Policy TP-11 to “Maintain average speed for WTA public transit service vehicles on arterial street transit routes in Bellingham,” which, in the downtown area, depends on the one-way couplet system.

2004 WTA’s “Primary Transit Initiative” [GO Line] Overview

Within Bellingham¹, the greatest ridership and citywide benefit will come from the Primary Transit Network – the network of routes that run every 15 minutes all day [Now branded and marketed by WTA as “GO Lines”]. The extent of these routes received considerable discussion in the short-range planning, and the financial constraint of the short term prevented implementation of Primary service on all the corridors that could support it. The most important Bellingham initiative in this plan is to complete the Primary Transit Network, not just in frequency but also as the foundation of a new joint commitment to urban transit which WTA and the City of Bellingham are equal partners.

The Primary Transit Network is several things at once:

- A joint commitment by both WTA and the City of Bellingham, to
  - Protect the speed and reliability of transit operations on these streets.
  - Sustain the basin 15-minute frequency all day, and for as much of the evening and weekend as can be afforded.
  - Market the network as the mobility solution for the dense parts of Bellingham.

- A policy tool to help focus transit-oriented development around corridors where transit can be provided cost-effectively.

- A basis for prioritizing physical amenities and other capital expenditures within the City of Bellingham, with the goal of creating physical infrastructure that
  - Supports the efforts to protect operating speeds and reliability.
  - Provides an appropriate level of amenity given the intensive ridership at most stops.

¹Bellingham is the focus because it is the only part of the County with sufficient density. If comparable densities were developed elsewhere, and other jurisdictions wished to make a similar commitment to protecting transit speed and reliability, the network could eventually be expanded.
Figure 5-2  Primary Transit Network (Bellingham)
2009 Waterfront District Final Environmental Impact Statement (FEIS)

Transportation Analysis

The Port of Bellingham purchased the former Georgia Pacific waterfront property and has been working in partnership with the City of Bellingham to develop a Waterfront District Master Plan to allow up to six million square feet of total development on the 220-acre site. In 2008-2009, as a requirement of the Environmental Impact Statement requirements, staff from the Port, City, and WTA worked with TranspoGroup, Inc. consultants to identify and analyze transportation impacts and mitigating measures to the existing City Center street system, including the one-way couplets of State-Forest; Champion-Magnolia; and Holly-Chestnut.

The EIS analysis assumed that all of these arterial streets would continue to serve the downtown area in their current traffic flow configuration and did not examine any of these one-way couplets converted to two-way streets. Based on the findings of the 2000 and 2006 CCMP circulation studies and the outcome of the EIS analysis, however, the transportation impact from build-out of the Waterfront District would be significantly magnified if downtown streets were converted from one-way to two-way traffic flow.

The relocation of the existing Burlington Northern Sante Fe (BNSF) railroad tracks through the former Georgia Pacific site has been a key piece of the redevelopment puzzle, but in order to achieve that, BNSF requires the City of Bellingham to close the at-grade crossing at Wharf Street by the year 2025, which is the only access to the southern end of the Waterfront site. This limits development and creates significant traffic congestion, both on the waterfront site and on arterial streets in downtown Bellingham (see graphics below), which compromises the ability to provide convenient transit service, on-street parking, and pedestrian safety. A southern access point would be required in order to achieve the desired 4.7 million square feet of development on the Waterfront. The cost of building a grade-separated “Wharf Street Flyover” (bridge) that would allow trains to pass underneath while still connecting to the Waterfront street system has been estimated in the $20 to $25 million-dollar range, similar to the cost of reconstructing the Cornwall Avenue bridge over BNSF tracks.

Alternatively, if a significant (30%) mode shift from vehicles to alternative modes could be achieved, it may allow full build-out. The EIS analysis shows that super-high-frequency (3-5 minute) transit would be required in order to realistically achieve a 30% mode-shift, but this level of frequency would also require dedicated bus lanes. There would be costs to achieve this and it would come with the negative effects of removal of desired on-street parking and widening of streets and intersections, which would lengthen pedestrian crossing distances and time requirements. Higher-frequency transit would also rely heavily on the City’s commitment to protect transit speed and reliability on the one-way couplet systems that serve downtown Bellingham and the primary WTA transit system hub downtown.
Access and Circulation Evaluation
Provided by: Central, Bloedel, Cornwall, Commercial, Bay Street Parking Garage, and Closure of Wharf

**Observations**
- Assumes 3.8 million square feet of development on main site.
- Even with a lesser amount of development, extensive congestion issues arise due to all primary access being oriented towards the Chestnut Street corridor.
- Maple Street not a viable corridor due to excessive vehicle queuing along Cornwall Street.
- On-site transit circulation significantly compromised.

**Definition of Congestion**
- Excessive Vehicle Queuing
- Waiting through Multiple Signal Cycles
- Limited driveway egress/ingress
- Stacking of vehicles across at-grade RR Crossing
- Transit Speed and Reliability Significantly Impacted

Access and Circulation Evaluation
Provided by: Central, Bloedel, Cornwall, Commercial, Bay Street Parking Garage, Closure of Wharf, and **Further Improvements**

**Observations**
- Assumes 4.7 million square feet of development on main site.
- Potential Improvements
  - Widen Cornwall Bridge (3/4 lanes)
  - Widen segment of Bloedel Avenue between Log Pond Drive and Cornwall Street
  - Provide traffic control at Maple/Cornwall & upgrade Maple Street corridor
  - Reconfigure Cornwall/Chestnut intersection
  - Additional On-site Connections

**Definition of Congestion**
- Excessive Vehicle Queuing
- Waiting through Multiple Signal Cycles
- Limited driveway egress/ingress
- Stacking of vehicles across at-grade RR Crossing
- Transit Speed and Reliability Significantly Impacted
CONCLUSIONS
The following general conclusions can be drawn from the multiple studies that have been conducted and plans that have been created based on the existing arterial street network in downtown Bellingham:

- All studies indicate that conversion of one-way to two-way flow results in significant increases to traffic congestion, traffic and transit delay, and public safety concerns for all users (pedestrians, bicyclists, transit users, and vehicle drivers) with vehicles backing up into upstream intersections. *(When traffic backs-up through intersections, pedestrians are forced to weave between cars to cross the street with an uncertainty as to when a car may or may not move in the traffic stream and whether the driver will see the pedestrian or not. Bicycle movement is also compromised and transit busses cannot move, which degrades on-time service and reduces the overall reliability of transit routes. Vehicle drivers can become impatient and aggressive and make bad choices which can increase collisions and possibly injuries to people.)*

- All studies indicate that conversion of one-way to two-way flow requires removal of pedestrian bulb-outs and on-street parking, both of which result in negative impacts to pedestrian safety, visibility, crossing time delay, and conflicts with vehicles due to increased turning movements.

- Public transit operations would be negatively impacted under all scenarios with significant delay and inability to maintain average speed and on-time service delivery for transit busses.

- Neither the 2000 CCMP or the 2006 Com Plan study examined the impacts or mitigation required for the conversion of the downtown State-Forest one-way couplet system to two-way flow, but it is reasonable to assume that this would result in similar transportation impacts with similar mitigation required at similar costs as those listed for 2006 Alternative 2 for the two-way conversion on Chestnut-Champion ($4,400,000 in 2005 dollars).

- The 2009 Waterfront District FEIS transportation analysis identified transportation impacts and mitigating measures to the existing City Center street system, including the one-way couplets of State-Forest; Champion-Magnolia; and Holly-Chestnut, but did not examine these same impacts with Chestnut and Champion converted to two-way streets. Based on the findings of the 2000 and 2006 CCMP circulation studies, the transportation impact from build-out of the Waterfront District would be significantly magnified if Chestnut, State, Forest, or Holly were converted from one-way to two-way traffic flow.

- The 2004 WTA Strategic Plan clearly points out that the implementation and success of WTA’s Primary Transit Network is dependent upon the ability of downtown Bellingham’s arterial street system to maintain average speed and on-time service so that the public will increasingly view transit as a viable and convenient option to the single occupant vehicle. Busses stuck in traffic on congested downtown streets would be a clear indicator to the public that transit is not any more convenient than a private automobile. The City of Bellingham has adopted a Comprehensive Plan policy commitment to protecting WTA’s average speed on arterial streets.