Chapter 1: Introduction and Summary of Findings and Recommendations

This report provides a review of the West Main Street Re-Alignment concept as documented in the SR 4/SR 411 Urban Area Congestion Mitigation Plan.[1] This review will focus on the following elements of the recommended concept plan:

- The location of the proposed re-alignment
- Vehicle circulation and redevelopment opportunities provided by concept plan
- Access management strategies for local properties along the proposed alignment

The SR 4/SR 411 Urban Area SR 4/SR 411 Urban Area Congestion Mitigation Plan[1] was initiated by the Cowlitz Wahkiakum Council of Governments (CWCOG) to identify and evaluate transportation improvement alternatives within the vicinity of the Cowlitz Way and Allen Street Bridges in West Kelso. The purpose of the plan was to provide a guide for transportation improvements to better accommodate existing and future travel demand and improve safety along the SR 4/SR 411 corridors. The Cowlitz Way and Allen Street bridges provide east-west connections across the Cowlitz River and the Allen Street Bridge also provides a connection to the Westside Highway (SR 411), a north-south route along the west side of the river.

This report evaluates four alternatives:

- ALTERNATIVE 1: West Main Street Re-Alignment Concept with 4th Avenue to 6th Avenue Shift

  The re-alignment would essentially be the same as documented in the SR 4/SR 411 Urban Area Congestion Mitigation Plan, but the concept includes additional improvements at the Ocean Beach Highway/Catlin Street intersection (see Figure 2).

- ALTERNATIVE 2: West Main Street Re-Alignment Concept with 3rd Avenue to 5th Avenue Shift

  A modified version of the West Main Street Re-Alignment concept with the West Main Street/Catlin Street transition shifted one block east. The concept supports a design speed of approximately 35 mph and includes additional improvements at the Ocean Beach Highway/Catlin Street intersection (see Figure 4).

- ALTERNATIVE 3: West Main Street/Catlin Street Modified Circulation on 4th/5th Avenues

  This alternative would preserve the street grid within West Kelso while providing an improved connection between Interstate 5 and Ocean Beach Hwy via the Allen Street Bridge. This concept includes modified traffic circulation around the block bound by West Main Street, Catlin Street and 4th and 5th Avenues. Four new traffic signals with coordinated signal timing would be installed at the intersections that border this block to

[1] *SR 4/SR 411 Urban Area Congestion Mitigation Plan*, The Transpo Group, November 30, 2000.

provide progression for eastbound and westbound traffic along the West Main Street and Catlin Street corridors (see Figure 5).

- ALTERNATIVE 4: West Main Street/Catlin Street Modified Circulation on 3rd/4th Avenues

  This alternative would be similar to Alternative 3, but the modified circulation would occur one block east (on 3rd and 4th Avenues). Four new traffic signals with coordinated signal timing would also be included to provide progression for eastbound and westbound traffic along the West Main Street and Catlin Street corridors (see Figure 6).

Findings and Recommendations

The analysis provided in the SR 4/SR 411 Urban Area Congestion Mitigation Plan[1] shows that a direct route between Interstate 5 and Ocean Beach Highway would improve existing and future traffic conditions along the SR 4/SR 411 corridors. The West Main Street Re-Alignment concept provides a direct connection via the Allen Street Bridge and also includes other transportation improvements that would benefit traffic operations in the study area. However, the recommended concept could be refined to address some issues that were identified as a result of this review. The following provides a summary of key findings and recommendations based on our review of the West Main Re-Alignment concept:

- The West Main Street/Catlin Street transition shown in Alternative 1 would support a design speed of approximately 30 mph, which is lower than the existing posted speed of 35 mph along Ocean Beach Highway and West Main Street. Alternative 1 also has some disadvantages in terms of vehicle circulation, which include the closure of 5th Avenue at the south side of the West Main Street/Catlin Street transition. The Cowlitz Way/5th Avenue intersection is a significant signalized intersection that provides a direct connection from SR 4 (Cowlitz Way) to the fairgrounds site to the south. Closing 5th Avenue at the transition would disrupt north-south traffic through the study area and cause a significant amount of traffic to travel out of direction.
- The West Main Street/Catlin Street transition shown in Alternative 2 would support a design speed of approximately 35 mph, which is equal to the existing posted speed along Ocean Beach Highway and West Main Street. Alternative 2 maintains connectivity along 5th Avenue and provides a direct connection between SR 4 (Cowlitz Way) and the fairgrounds site south of Washington Street. Alternative 2 has more significant right-of-way impacts as compared to Alternative 1, but it would have similar redevelopment opportunities.

- Alternatives 3 and 4 only partially meet the goals and objectives of SR 4/SR 411 Urban Area Congestion Mitigation Plan[1] in terms of improving and mobility along the SR 4 and SR 411 corridors. However, these alternatives would have significantly less right-of-way impacts as compared to Alternatives 1 and 2.
- The West Main Street Re-Alignment concept provided in the SR4/SR 411Urban Area Congestion Mitigation Plan[1] shows a significant offset of over 12 feet for eastbound vehicles at the Ocean Beach Highway/Catlin Street intersection. It is recommended that Catlin Street just east of the intersection be shifted south to line up with the lanes across the intersection. This roadway widening will significantly impact the existing Office Depot on the southeast corner of the intersection. The modified lane geometry for this intersection is shown in Figure 3. Split phase traffic signal phasing would be required to accommodate the shared left/through lanes on the east and west approaches.
- Access management strategies along the proposed West Main Street/Catlin Street transition and throughout the study area should be implemented to maintain safe and efficient traffic flow along the corridors. The alternatives developed in this study include some preliminary strategies, which include street closures, curbed medians and right-in/right-out only restrictions. However, it would take an effort of working with individual property owners on access management issues in order to develop and adopt a final plan.

Chapter 2: Background Transportation Information

Two previous studies were reviewed to gain an understanding and document the recent transportation issues in the West Kelso sub-area. The studies that were reviewed include:

- SR-4/SR-411 Urban Area Congestion Mitigation Plan, 2000 (The Transpo Group)
- Realizing The Possibilities: An Asset Based Plan For Revitalization of West Kelso, 2004 (Dept. of Urban and Regional Planning, Eastern Washington University)

The following sections summarize the studies and identify transportation assumptions and key findings and recommendations for each of the studies that were reviewed.

SR-4/SR-411 Urban Area Congestion Mitigation Plan

The Transpo Group, November 2000

The SR-4/SR-411 Urban Area Congestion Mitigation Plan summarizes the analysis and development of mitigation strategies to reduce existing and projected congestion and safety deficiencies in the vicinity of the Cowlitz Way and Allen Street Bridges in West Kelso. The purpose of the report was to provide a plan for street and intersection improvements to mitigate existing and future deficiencies within the study area. The study was prepared for the Cowlitz-Wahkiakum Council of Governments by The Transpo Group. A Technical Advisory Committee (TAC) comprised of staff from local and state agencies assisted in guiding the study effort.

Goals and Evaluation Criteria

The two primary goals that were identified in the plan were:

- Identify improvements that will reduce existing and future congestion through the SR 4 / SR 411 corridors; and
- Improve transportation safety and mobility for all travel modes within the SR 4 / SR 411 corridors.

The following categories were identified as the most significant criteria used to evaluate the mitigation plan:

- System wide capacity and operations;
- System wide support for alternative travel modes;
- Corridor travel speed, vehicle queuing and safety;
- Intersection operations and vehicle queuing; and
- Cost and feasibility of potential improvements.

Evaluation of Existing and Future Conditions

Existing and future traffic conditions were evaluated in order to develop transportation improvement alternatives within the study area. The CWGOG regional travel demand forecasting model, which had been calibrated for year 1995 conditions, was refined to in order analyze base year 1998 traffic conditions. Existing traffic volume data was collected from local agencies including the City of Kelso, the City of Longview and WSDOT. The 1998 base year model was calibrated by comparing the model output volumes with these traffic counts.

A 2017 travel demand forecast model was also developed based on CWCOG land use forecasts and several transportation improvements that were expected to be completed by the year 2017. The forecasted traffic volume projected by the model showed traffic increases throughout the study area. Traffic volume on Allen Street Bridge was expected to nearly double (93 percent increase) with approximately 3,000 vph during the PM peak hour. This shift in traffic was a result of the replacement and widening of the bridge. Traffic crossing the Cowlitz Way Bridge was shown to increase by 13 percent with more than 3,500 vph during the PM peak hour. The section of Cowlitz Way between Ocean Beach Highway and West Main Street was forecast to carry nearly 4,200 vph during the PM peak, which is nearly a 30 percent increase over the base year 1998 volumes. It was also shown that local collectors within the study are would carry more traffic due to spill over from congestion along arterials within the study area.

The new Lexington Bridge, one of the forecasted transportation improvements, which connects SR-411 with I-5 north of the study area, was shown to cause a slight decrease in traffic entering the study area on SR-411 north of Fishers Lane.

The results of the future conditions analysis showed that traffic operations and travel speed along corridors within the study are would degrade with the increases in traffic volumes. Six study area intersections were projected to operate at a LOS D (LOS D used as threshold for this study) or lower with the indentified baseline improvements in place. Queuing deficiencies would also exist at several study intersections. Travel speeds along Ocean Beach Hwy/Cowlitz Way Bridge were projected to be 6 to 8 mph by 2020 if no transportation improvements were implemented.

Crash data was reviewed as part of this study (1993 through 1998) to identify existing safety deficiencies within the study area. The study provides a summary of the crash data and shows several locations with a relatively high number of collisions. The study emphasized locations along the SR 4 corridor/Cowlitz Way and Ocean Beach Highway that had a high numbers of rear-end and angle collisions, which are typical along congested routes with several closely spaced access driveways.

Short-Term Alternatives

Four short-term alternatives were tested using 1997 traffic conditions. The following briefly summarizes the four alternatives:

- Alternative 1: Added Allen Street Bridge to existing traffic model; optimized traffic signal timing
- Alternative 2: Added Allen Street Bridge and Ostrander Bridge to existing traffic model; optimized traffic signal timing
- Alternative 3: Added Allen Street Bridge and West Main Street/Catlin Street connection via 4th Avenue and 5th Avenue couplet; no Ostrander Bridge included; optimized traffic signal timing
- Alternative 4: Added Allen Street Bridge, Ostrander Bridge and West Main Street/Catlin Street connection via 4th Avenue and 5th Avenue couplet; closed West Main Street at Cowlitz Way; optimized traffic signal timing

Near term solutions along SR 4 were recommended to consider access management programs to reduce the number of conflict points.

Long-Term Alternatives

Four long-term alternatives were tested using 2017 traffic conditions and expected roadway improvements. The following briefly summarizes the four alternatives:

- Alternative A: West Main Street/Catlin Street connection via a $4^{th}/5^{th}$ Avenue one-way couplet; close West Main Street at Cowlitz Way. Catlin Street widened to 4/5 lanes west of 4^{th} Avenue. Traffic control and intersection modifications. Significant modifications and widening of the intersection of Ocean Beach Hwy/Cowlitz Way/Catlin Street.
- Alternative B: Provide a direct connection between West Main Street and Catlin Street via new alignment in vicinity of 4^{th} to 6^{th} Avenue. New roadway and Catlin Street west to Ocean Beach Hwy would be 4/5 lanes. West Main Street would be closed east of Cowlitz Way. Modifications to the intersection of Ocean Beach Hwy/Cowlitz Way/Catlin Street would be made.
- Alternative C: Provide a direct extension of West Main Street to Ocean Beach Hwy through the existing shopping center. Ocean Beach Hwy would be closed west of Cowlitz Way. Roadway would be 4/5 lanes and provide access to remainder of shopping center and other properties along the route. 8^{th} Avenue would be upgraded between Ocean Beach Hwy and Washington Way to provide local access and circulation.

- Alternative D: Convert Cowlitz Way Bridge to one-way westbound and Allen Street Bridge to one-way eastbound. Eastbound traffic would still be permitted on Cowlitz Way west of Long Avenue. Local westbound traffic would also be accommodated on West Main Street between Cowlitz Way and 1st Avenue.

In addition, each alternative included spot improvements at other critical intersections.

Recommended Improvement Concept

The West Main Street Re-Alignment concept (Alternative B) was selected as the preferred alternative and is shown in Appendix A. This concept provides a direct connection between Interstate 5 and Ocean Beach highway. The re-alignment design includes an "s-curve" transition between West Main Street and Catlin, which is shown to occur between 4th and 6th Avenues. The study states that that the transition would support a posted speed of 30 to 35 mph. Medians would be included along the transition, restricting side street access to right-in/right-out only. The concept shows that 5th Avenue would not intersect the transition at a 90 degree angle, this was identified as a potential safety deficiency to the corridor, and therefore, the south approach of 5th Avenue is shown to be closed.

There are several other network modifications that are shown throughout the study area as part of this concept. Left turns would be prohibited at the intersection of Catlin Street/7th Avenue due to the vehicle queues, which would block intersection and delay through traffic. The intersection of West Main Street/4th Avenue would become a five-legged intersection with the addition of the transition. The study recommends limiting traffic flow on West Main Street to one-way westbound between 4th and 5th Avenues to help mitigate potential operational and safety impacts at this location. The study also recommends closing the West Main Street/Cowlitz Way intersection as part of this concept.

The re-alignment concept shows significant modifications at the Cowlitz Way/Ocean Beach Hwy/Washington Way/Catlin Street intersection. These improvements include widening Catlin Street to provide three westbound approach lanes (left turn lane and two through lanes) and two eastbound receiving lanes. Ocean Beach Highway would be widened to include three eastbound lanes (left turn, through-left and through-right) and two westbound receiving lanes. Acquisition of additional right-of-way would not be necessary for these improvements as they are shown in the concept plan.

Other network improvements that are shown as part of The West Main Street Re-Alignment concept (Alternative B) include removing the existing traffic signal at the West Main Street/5th Avenue intersection, installing a new traffic signal at the Catlin Street/6th Avenue intersection and closing the north leg of the Cowlitz Way/7th Avenue intersection.

Realizing the Possibilities: An Asset Based Plan for Revitalization of West Kelso

Department of Urban and Regional Planning, Eastern Washington University, December 2004

The Catlin-West Kelso Sub-Area Plan summarizes the efforts of a community supported strategy for future revitalization of commercial, residential and public land uses in the West Kelso sub-area. The purpose of the document is help guide planned community development to meet the goals and desires of the citizens of West Kelso. Several transportation elements are identified in the plan and include the following:

- Main Street realignment
- A traffic calming plan
- An access management plan
- Pedestrian enhancement and safety improvements
- A pedestrian/bike trail along the river
- Improving transit service
- Implementing green streets

The plan describes these transportation elements as key strategies to enhance land uses in the West Kelso sub-area. These strategies were created based on an assessment of existing conditions and are intended to help meet the community's goals and desires by guiding the future development process.

Chapter 3: Alternative Development and Evaluation

The primary purpose of this chapter is to provide an evaluation of the recommended concept for the West Main Street Re-Alignment as documented in the SR 4/SR 411 Urban Area Congestion Mitigation Plan.[1] In addition, other alternatives are presented and evaluated that strive to meet the goals of the SR 4/SR 411 Urban Area Congestion Mitigation Plan.[1] The evaluation focuses on these key elements of the recommended concept plan:

- The location of the proposed re-alignment
- Vehicle circulation and redevelopment opportunities provided by the concept plan
- Access management strategies for local properties along the alignment

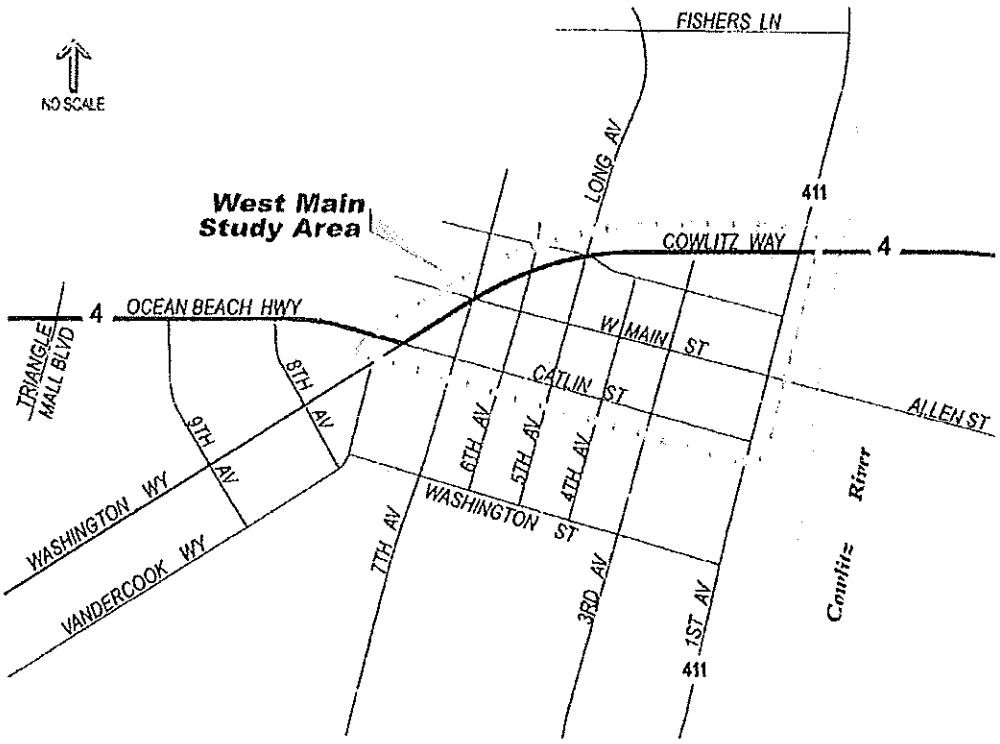
The SR 4/SR 411 Urban Area Congestion Mitigation Plan[1] was initiated by the Cowlitz Wahkiakum Council of Governments (CWCOG) to identify and evaluate transportation improvement alternatives within West Kelso. The objective was to alleviate existing and forecasted congestion and safety deficiencies within the vicinity of the Cowlitz Way and Allen Street Bridges. The bridges provide east-west connections across the Cowlitz River and also provide a connection to the Westside Highway (SR 411), which serves as a north-south route on the west side of the river.

Study Area

The study area included in the SR4/SR411 Urban Area Congestion Mitigation Plan[1] was bound by 15th Avenue to the west, Fishers Lane to the north, 5th Avenue to the east and Washington Street to the south. For the purposes of this review the focus will be on the area where the West Main Street Re-Alignment concept has been proposed. This includes West Main Street and Catlin Street between 3rd Avenue and Washington Way/SR 4. The key intersections include Cowlitz Way/Ocean Beach Highway/Washington Way/Catlin Street and the intersections within the concept re-alignment area along both West Main Street and Catlin Street between 4th and 7th Avenues. The land uses within this area are generally residential south of Catlin Street and commercial/retail along the north side of Catlin Street and along West Main Street. There are additional residential developments to the north, between West Main Street and Cowlitz Way. The study area is shown in Figure 1.

[1] *SR 4/SR 411 Urban Area Congestion Mitigation Plan*, The Transpo Group, November 30, 2000.

Figure 1: West Main Street Re-Alignment Study Area



Evaluation of Alternatives

The analysis provided in the SR4/SR411 Urban Area Congestion Mitigation Plan[1] was based on year 2017 traffic volume projections. For this review, year 2025 traffic volume projections were estimated and compared to year 2017 traffic volumes to identify any changes or shifts in traffic volumes or traffic patterns. A revised travel demand forecast model for the region is currently under development for CWCOG, but was not available for use during this study. Therefore, the existing travel demand model provided by the CWCOG was reviewed. The existing travel demand model indicated that there would be minimal (approximately 1%) growth within the region over the next 20 years. It is possible that there could be more growth within the region over this time period, and therefore, an annual growth rate of 0.5% was assumed. This annual rate would yield an overall 18 year growth rate of 10% that could be applied to existing 2007 traffic volumes to arrive at year 2025 traffic volume estimates. A detailed analysis was not included in the scope of services for this project although year 2025 volume projections were useful for comparison purposes, and evaluating additional alternatives.

Several short term and long term alternatives were developed as part of the SR4/SR411 Urban Area Congestion Mitigation Plan[1] and the Technical Advisory Committee established a

preference for the West Main Street Re-Alignment concept. The re-alignment concept was developed as a long term improvement to provide a direct east-west route between Interstate 5 (via the Allen Street Bridge) and Ocean Beach Highway. The concept includes a transition between West Main Street and Catlin Street, which occurs between 4th and 6th Avenues (see Appendix A).

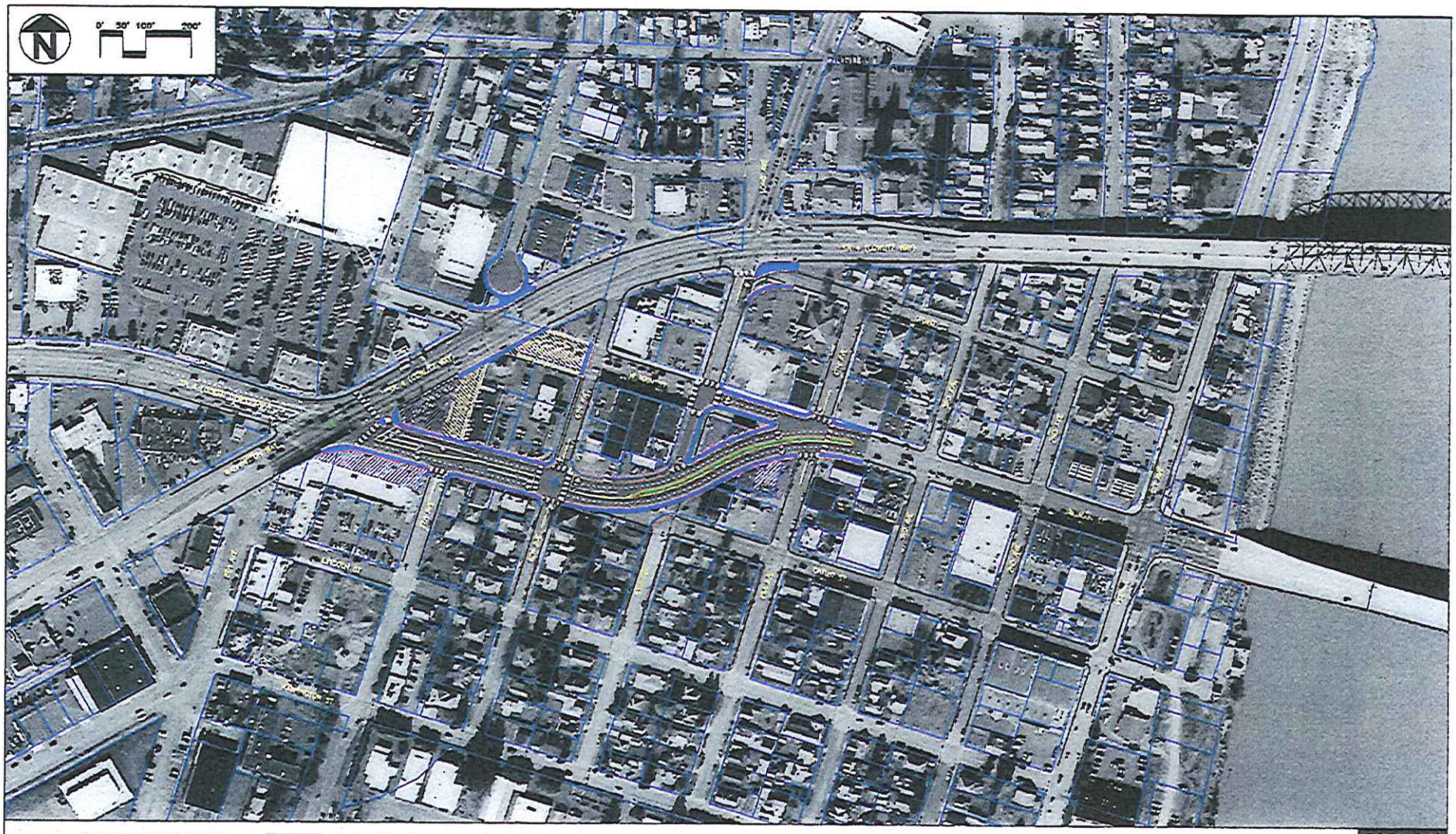
In addition to the West Main Street Re-Alignment alternative, three other alternatives were considered. Alternative 2 provides a West Main Street/Catlin Street transition similar to the West Main Street Re-Alignment concept although the transition is shifted one block east and has a higher design speed (35 mph). This alternative includes additional improvements throughout the study area. Alternative 3 includes modified circulation on 4th and 5th Avenues between West Main Street and Catlin Street to provide an improved connect to Ocean Beach Highway via the Allen Street Bridge. This alternative utilizes the existing street grid and has less property impacts. Alternative 4 is similar to Alternative 3 and includes modified circulation on 3rd and 4th Avenues between West Main Street and Catlin Street.

A summary of each alternative is provided below along with a listing of key issues for each alternative. The goal of the additional alternatives is to identify ways to improve the recommended concept while still accomplishing the objectives outlined in the Congestion Mitigation Plan.[1] The alternatives are:

- ALTERNATIVE 1: West Main Street Re-Alignment Concept with 4th Avenue to 6th Avenue Shift
- ALTERNATIVE 2: West Main Street Re-Alignment Concept with 3rd Avenue to 5th Avenue Shift
- ALTERNATIVE 3: West Main Street/Catlin Street Modified Circulation on 4th/5th Avenues
- ALTERNATIVE 4: West Main Street/Catlin Street Modified Circulation on 3rd/4th Avenues

ALTERNATIVE 1: West Main Street Re-Alignment Concept with 4th Avenue to 6th Avenue Shift

Alternative 1 (see Figure 2) essentially matches the recommended alternative from the SR4/SR411 Urban Area Congestion Mitigation Plan.[1] The alignment and design of the transition connecting West Main Street with Catlin Street is between 4th Avenue and 6th Avenue. It provides a direct route between Interstate 5 and Ocean Beach Highway via the Allen Street Bridge. The intersection geometry and alignment of the transition would support a design speed of approximately 30 mph, which is lower than the existing posted speed of 35 mph along Ocean Beach Highway and West Main Street. The transition is shown to occur between 4th and 6th Avenues and includes the closure of 5th Avenue on the south side, which would prohibit through traffic along 5th Avenue. The SR4/SR411 Urban Area Congestion Mitigation Plan[1] states that there are several reasons for restricting vehicle movements at this location including: safety impacts due to non-standard geometry at the new intersection of 5th Avenue and the transition



Alternative #1

West Main Street Re-Alignment Concept with 4th Avenue to 6th Avenue Shift

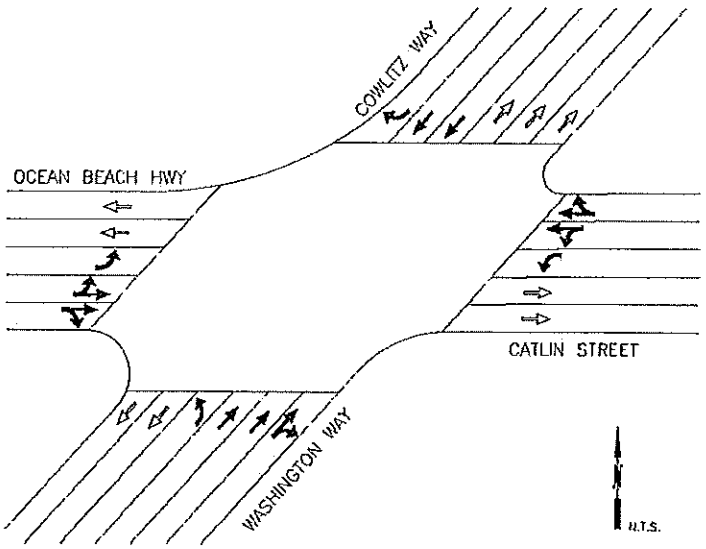
FIGURE 2

(5th Avenue does not intersect the transition at a 90-degree angle), and the need to reduce north-south traffic along 5th Avenue and at the Cowlitz Way/5th Avenue/Long Avenue intersection.

There are other roadway network modifications included in this alternative in addition to the transition between West Main Street and Catlin Street. These improvements include: the closure 7th Avenue and West Main Street at Cowlitz Way and closing 5th Avenue at the south approach to the transition. Other access restrictions include right-in/right-out at the West Main Street/4th Avenue intersection, and restricting access to right-turn in only at the Grant Street/5th Avenue intersection. The majority of the transition would include a curbed median, which would limit access to right-turns only. The concept plan also includes converting West Main Street to one-way westbound between 4th and 6th Avenues.

A preliminary review of the original West Main Street Re-Alignment concept (see Appendix A) shows a significant offset of over 12 feet for eastbound vehicles at the Ocean Beach Highway at the Cowlitz Way/Ocean Beach Highway/Washington Way/ Catlin Street intersection. Under this alternative the roadway alignment on the south side of Catlin Way immediately east of the intersection was shifted south to line up with the lanes on Ocean Beach Highway (west leg of the intersection). The modified lane geometry on the east and west legs of the intersection would be configured as shown in Figure 3. Split phase traffic signal phasing would be required to accommodate the shared left/through lanes on the east and west approaches.

Figure 3: Proposed Intersection Geometry for the Cowlitz Way/Ocean Beach Highway/Washington Way/ Catlin Street Intersection



Based on preliminary year 2025 traffic volume projections and using the lane configuration shown in Figure 3 at Cowlitz Way/Ocean Beach Highway/Washington Way/ Catlin Street, the intersection would operate at a level-of-service (LOS) D with a volume-to-capacity ratio (V/C) of 0.73.

Access management strategies along the proposed transition and throughout the study area should be implemented to maintain safe and efficient traffic flow along the corridors. The concept plan has identified some preliminary strategies, which include street closures, curbed medians and right-in/right-out only restrictions. However, it would likely take an effort of working with individual property owners on access management issues in order to develop and adopt a final concept.

Traffic signals along the West Main Street/Catlin Street corridor would be provided at Ocean Beach Highway and 6th Avenue.

KEY ISSUES (Alternative 1)

The following provides a summary of key issues associated with Alternative 1:

- The proposed location of the West Main Street/Catlin Street transition cuts off 5th Avenue access, which is the main access to SR 4 (Cowlitz Way).
- No direct connection between SR 4 (Cowlitz Way) and the fairgrounds site is provided in this alternative.
- Construction of the West Main Street/Catlin Street transition would impact the entire block bound by West Main Street/Catlin Street and 4th Avenue/5th Avenue, the southeast corner of West Main Street/4th Avenue and the northwest corner of Catlin Street/5th Avenue. Significant right-of-way acquisition would be required and the proposed alignment would result in irregular shaped parcels. This alternative has less right-of-way impacts that Alternative 2.
- Catlin Street just east of the Ocean Beach Highway/Catlin Street intersection has been shifted south (compared to the alignment shown in the West Main Street Re-Alignment concept) to line up directly with lanes across the intersection. The roadway widening will significantly impact the existing Office Depot on the southeast corner of the intersection.
- The Ocean Beach Highway/Catlin Street intersection skew is significant (approximately 45 degrees) and may require a design exception from WSDOT.
- The West Main Street/Catlin Street transition alignment supports a design speed of approximately 30 mph, which is less than the existing posted speed of 35 mph along Ocean Beach Highway and West Main Street.

- Alternative 1 supports the goals and objectives of the SR 4/SR 411 Urban Area Congestion Mitigation Plan.[1]
- The access management strategies shown in Figure 2 for Alternative 1 will support a safe and efficient traffic flow along the corridor. Driveway and intersection spacing along the West Main Street/Catlin Street corridors should be a minimum of 250 feet.

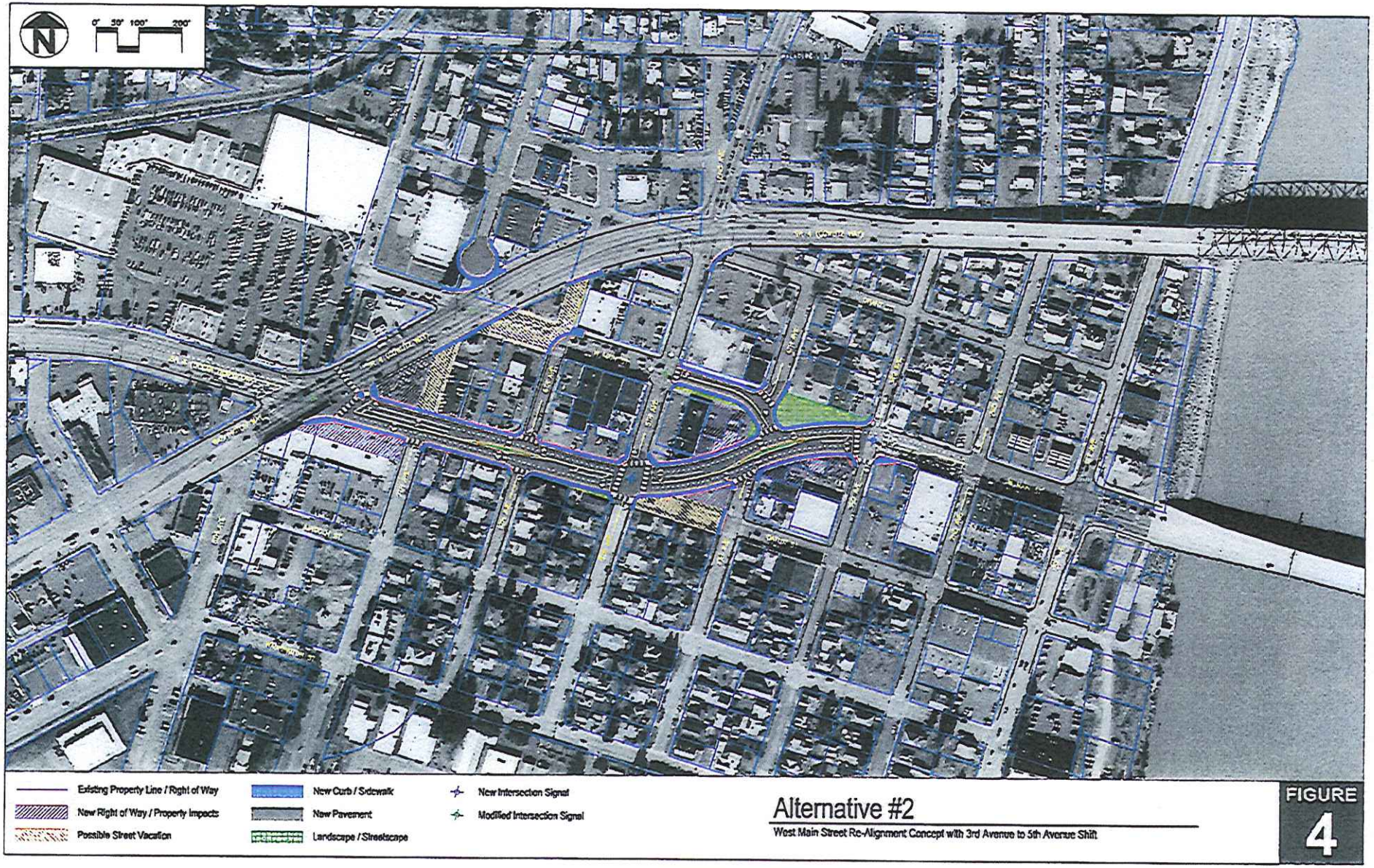
ALTERNATIVE 2: West Main Street Re-Alignment Concept with 3rd Avenue to 5th Avenue Shift

Alternative 2 (see Figure 4) is similar to the recommended concept in that provides a direct connection to Ocean Beach Highway via a transition between West Main Street and Catlin Street, although the transition is located between 3rd and 5th Avenues (one block east). The West Main Street/Catlin Street transition supports a design speed of approximately 35 mph, which meets the City of Kelso's design standard for major and minor arterials and is equal to the posted speeds along Ocean Beach Highway and West Main Street. The alternative includes a curbed median along the transition with side street access on both sides that is either signalized or right-in/right-out access only. Catlin Street would be closed and vacated between 5th and 4th Avenues to eliminate a five-legged intersection at 5th Avenue. This closure would improve traffic operations and safety of the intersection. New traffic signals would be installed at both ends of the transition (Catlin Street/5th Avenue and West Main Street/3rd Avenue intersections). Providing side street access along the transition (as opposed to Alternative 1, which closes 5th Avenue south of Catlin Street) and maintaining connectivity along 5th Avenue would improve overall circulation of impacted areas north and south of the West Main Street corridor. The new traffic signal at 5th Avenue supports connectivity to the fairgrounds site the south and SR 4 (Cowlitz Way) to the north.

Other improvements include the closure of 7th Avenue and West Main Street at Cowlitz Way. The section of 7th Avenue between Catlin Street and Cowlitz Way is vacated, as well as West Main Street between 6th and 7th Avenues. The same treatment occurs at 6th Avenue between West Main Street and Cowlitz Way. These access modifications would traffic improve operations and mobility by eliminating turn movements and access points along Cowlitz Way.

Other access modifications include the closure of 7th Avenue north of Cowlitz Way and Grant Street at 5th Avenue just south of the Cowlitz Way/5th Avenue intersection. This alternative includes the same improvements at the Ocean Beach Highway/Catlin Street intersection as described in Alternative 1 and shown in Figure 3. This includes shifting Catlin Street to the south, east of Ocean Beach Highway, which impacts the existing Office Depot on the southeast corner of the intersection.

Access management strategies along the proposed transition and throughout the study area should be implemented to maintain safe and efficient traffic flow along the corridors. This



Alternative #2

West Main Street Re-Alignment Concept with 3rd Avenue to 5th Avenue Shift

FIGURE 4

alternative includes strategies such as street closures, curbed medians and right-in/right-out only restrictions. However, it would likely take an effort of working with individual property owners on access management issues in order to develop and adopt a final concept.

Traffic signals along the West Main Street/Catlin Street corridor would be provided at Ocean Beach Highway and at 5th Avenue. A future traffic signal at 3rd Avenue coupled with the existing traffic signal at West Main Street/1st Avenue would create reasonable traffic signal spacing and good opportunities for safe pedestrian crossings along the corridor.

KEY ISSUES (Alternative 2)

The following provides a summary of key issues associated with Alternative 2:

- The re-alignment configuration including the traffic signal at 5th Avenue provides good connectivity between SR 4 (Cowlitz Way) and the fairgrounds site.
- Construction of the transition would impact the north half of the block between 3rd and 4th Avenue, the south half of the block between 4th and 5th Avenues and would likely require acquisition of approximately 50 to 75 percent of each block. The resulting parcels would be slightly larger than those under Alternative 1.
- Catlin Street just east of the Ocean Beach Highway/Catlin Street intersection has been shifted south (compared to the alignment shown in the West Main Street Re-Alignment concept) to line up directly with lanes across the intersection. The roadway widening will significantly impact the existing Office Depot on the southeast corner of the intersection.
- The Ocean Beach Highway/Catlin Street intersection skew is significant (approximately 45 degrees) and may require a design exception from WSDOT.
- The transition alignment supports design speed of approximately 35 mph, which is equal to the existing posted speed of 35 mph along Ocean Beach Highway and West Main Street.
- Traffic signals along the corridor located at Ocean Beach Highway, 5th Avenue, 3rd Avenue and 1st Avenue will provide reasonable traffic signal spacing and good opportunities for safe pedestrian crossings along the corridor.
- Alternative 1 supports the goals and objectives of the SR 4/SR 411 Urban Area Congestion Mitigation Plan.[1]
- The access management strategies shown in Figure 2 for Alternative 1 will support a safe and efficient traffic flow along the corridor. Driveway and intersection spacing along the West Main Street/Catlin Street corridors should be a minimum of 250 feet.

ALTERNATIVE 3: West Main Street/Catlin Street Modified Circulation on 4th/5th Avenues

Alternative 3 (see Figure 5) provides an improved connection between Interstate 5 and Ocean Beach Highway via the Allen Street Bridge by modifying the circulation around the block bound by West Main Street, Catlin Street and 4th and 5th Avenues. This alternative reduces property impacts and preserves the street grid by utilizing existing roadways. Westbound traffic is accommodated by adding capacity along West Main Street, 5th Avenue and Catlin Street. To accommodate eastbound traffic additional capacity is provided along West Main Street, 4th Avenue and Catlin Street. The red and green shaded areas shown in Figure 5 show the wheel paths for a WB-67 through the alignment.

New traffic signals are included at the following intersections:

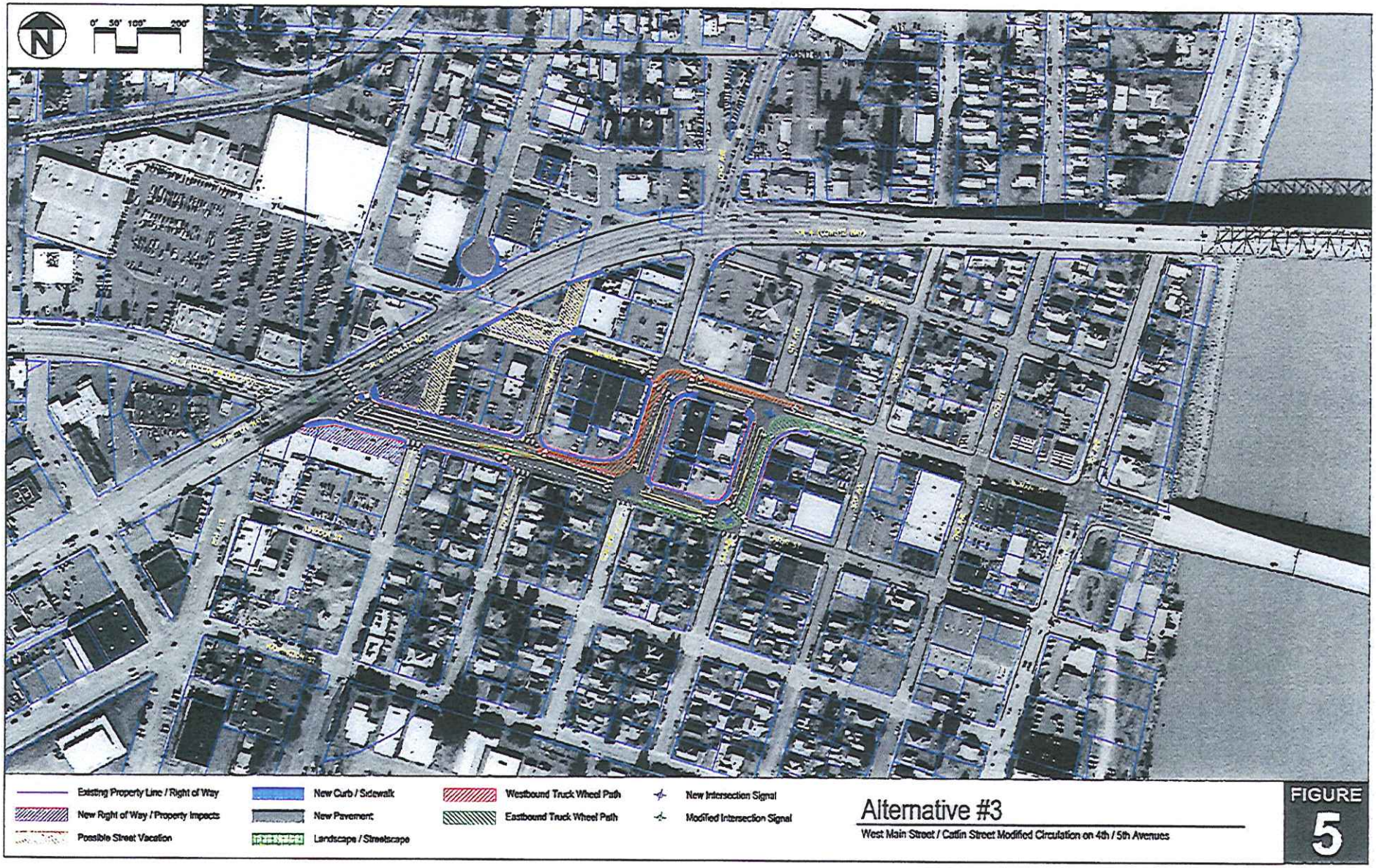
- West Main Street/5th Avenue
- West Main Street/4th Avenue
- Catlin Street/4th Avenue
- Catlin Street/5th Avenue

Coordinated signal timing would be implemented to provide progression for eastbound and westbound traffic along the West Main Street/Catlin Street corridors. The preliminary concept includes large turning radii at critical corners to accommodate large trucks (WB-67's). These large radii could be removed if freight vehicles were restricted along these corridors. Other improvements, outside of the 4th Avenue, 5th Avenue, West Main Street and Catlin Street block, would be the same as described in Alternative 2.

This concept is similar to the re-alignment concepts in that it provides an improved connection between Interstate 5 and Ocean Beach Highway via the Allen Street Bridge. It preserves the street grid in West Kelso and would have far less impacts to parcels within the study area.

A traffic operations analysis of the four signalized intersections resulted in V/C ratios that were under 0.70. Traffic signal progression would be optimized to provide reasonable traffic flow in both the eastbound and westbound directions.

Access management strategies throughout the study area would also need to be considered. This alternative includes some preliminary strategies, such as street closures, but it would likely take an effort of working with individual property owners on access management issues in order to develop and adopt a final concept.



Alternative #3

West Main Street / Catlin Street Modified Circulation on 4th / 5th Avenues

FIGURE 5

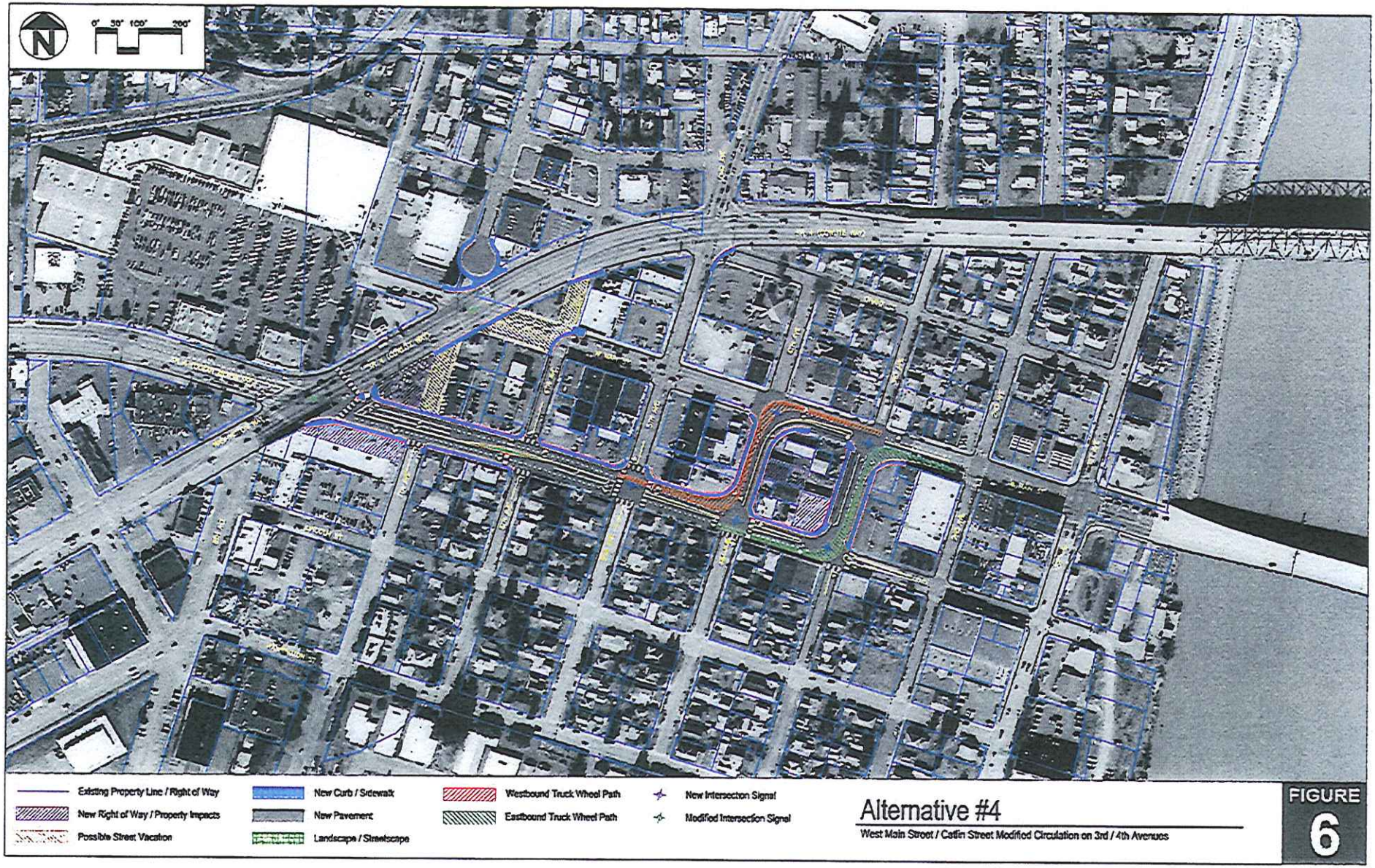
KEY ISSUES (Alternative 3)

The following provides a summary of key issues associated with Alternative 3:

- This alternative would impact properties at the northwest corner of Catlin Street/5th Avenue and the southeast corner of West Main Street/4th Avenue due to widening to accommodate large tuck turns. Overall, the right-of-way impact for this alternative is significantly less than Alternatives 1 and 2.
- Vehicle circulation in the study area is similar to today's condition.
- Dual left turns followed by dual right turns may result in conflict points from vehicles weaving to access local businesses.
- The intersection geometry requires right angles, which result in exaggerated off-tracking from large trucks.
- This alternative requires two additional traffic signals as compared to Alternatives 1 and 2.
- This alternative removes on-street parking along 4th and 5th Avenues between West Main Street and Catlin Street to accommodate additional travel lanes.
- Catlin Street just east of the Ocean Beach Highway/Catlin Street intersection has been shifted south (compared to the alignment shown in the West Main Street Re-Alignment concept) to line up directly with lanes across the intersection. The roadway widening will significantly impact the existing Office Depot on the southeast corner of the intersection.
- The Ocean Beach Highway/Catlin Street intersection skew is significant (approximately 45 degrees) and may require a design exception from WSDOT.
- The design speed for through movements is significantly less than the existing 35 mph posted speed along West Main Street and Ocean Beach Highway.
- Alternative 3 generally supports the goals and objectives of the SR 4/SR 411 Urban Area Congestion Mitigation Plan[1], but to a lesser extent than Alternatives 1 and 2.

ALTERNATIVE 4: West Main Street/Catlin Street Modified Circulation on 3rd/4th Avenues

Alternative 4 (see figure 6) is very similar to Alternative 3, but the modified circulation is located one block east (around the block bound by West Main Street, Catlin Street and 3rd and 4th Avenues). One benefit of shifting the modified circulation is that it would reduce the traffic volume on 5th Avenue as compared to Alternative 3. This would result in improved operations and better connectivity for traffic accessing the fairgrounds site south of the West Main Street corridor and SR 4 (Cowlitz Way) north of the study area.



Alternative #4

West Main Street / Catlin Street Modified Circulation on 3rd / 4th Avenues

FIGURE 6

A traffic operations analysis of the four signalized intersections resulted in V/C ratios that were under 0.70. Traffic signal progression would be optimized to provide reasonable traffic flow in both the eastbound and westbound directions.

Other improvements, outside of the 3rd Avenue, 4th Avenue, West Main Street and Catlin Street block, would be the same as described in Alternatives 2 and 3, including the Ocean Beach Highway/Catlin Street intersection. Property impacts would be similar to Alternative 3, and access management strategies would need to be approached as recommended in the previous alternatives.

KEY ISSUES (Alternative 4)

The following provides a summary of key issues associated with Alternative 4:

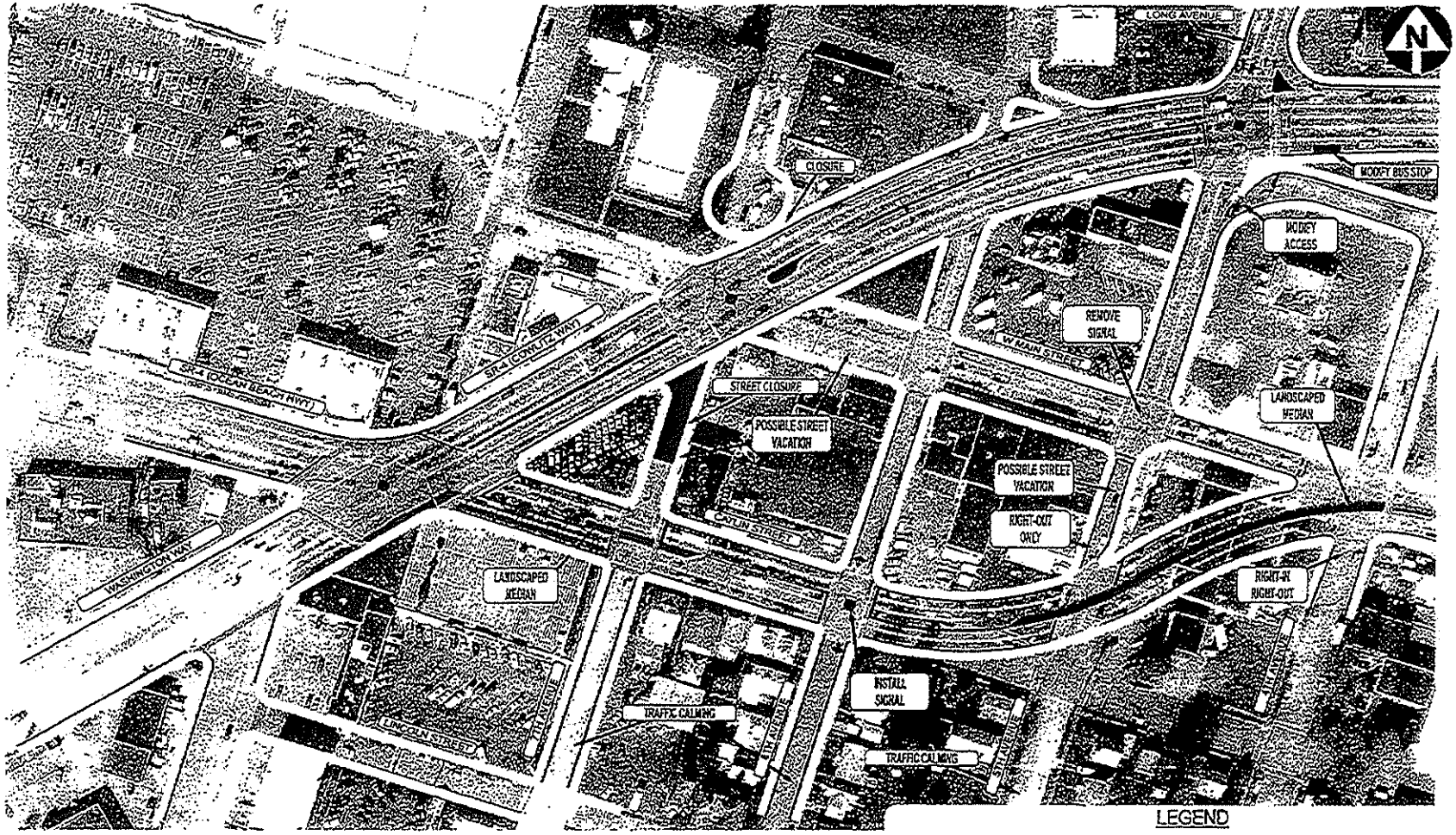
- This alternative would impact properties at the northwest corner of Catlin Street/4th Avenue and the southeast corner of West Main Street/3rd Avenue due to widening to accommodate large tuck turns. Overall, the right-of-way impact for this alternative is significantly less than Alternatives 1 and 2.
- Vehicle circulation in the study area is similar to today's condition.
- Dual left turns followed by dual right turns may result in conflict points from vehicles weaving to access local businesses.
- The intersection geometry requires right angles, which result in exaggerated off-tracking from large trucks.
- This alternative requires two additional traffic signals as compared to Alternatives 1 and 2.
- This alternative removes on-street parking along 3rd and 4th Avenues between West Main Street and Catlin Street to accommodate additional travel lanes.
- Catlin Street just east of the Ocean Beach Highway/Catlin Street intersection has been shifted south (compared to the alignment shown in the West Main Street Re-Alignment concept) to line up directly with lanes across the intersection. The roadway widening will significantly impact the existing Office Depot on the southeast corner of the intersection.
- The Ocean Beach Highway/Catlin Street intersection skew is significant (approximately 45 degrees) and may require a design exception from WSDOT.
- The design speed for through movements is significantly less than the existing 35 mph posted speed along West Main Street and Ocean Beach Highway.
- Alternative 4 generally supports the goals and objectives of the SR 4/SR 411 Urban Area Congestion Mitigation Plan[1], but to a lesser extent than Alternatives 1 and 2.

Alternatives Comparison

The key finding of the alternatives comparison is summarized below.

- The West Main Street/Catlin Street transition shown in Alternative 1 would support a design speed of approximately 30 mph, which is lower than the existing posted speed of 35 mph along Ocean Beach Highway and West Main Street. Alternative 1 also has some disadvantages in terms of vehicle circulation, which include the closure of 5th Avenue at the south side of the West Main Street/Catlin Street transition. The Cowlitz Way/5th Avenue intersection is a significant signalized intersection that provides a direct connection from SR 4 (Cowlitz Way) to the fairgrounds site to the south. Closing 5th Avenue at the transition would disrupt north-south traffic through the study area and cause a significant amount of traffic to travel out of direction.
- The West Main Street/Catlin Street transition shown in Alternative 2 would support a design speed of approximately 35 mph, which is equal to the existing posted speed along Ocean Beach Highway and West Main Street. Alternative 2 maintains connectivity along 5th Avenue and provides a direct connection between SR 4 (Cowlitz Way) and the fairgrounds site south of Washington Street. Alternative 2 has more significant right-of-way impacts as compared to Alternative 1, but it would have similar redevelopment opportunities.
- Alternatives 3 and 4 only partially meet the goals and objectives of SR 4/SR 411 Urban Area Congestion Mitigation Plan[1] in terms of improving and mobility along the SR 4 and SR 411 corridors. However, these alternatives would have significantly less right-of-way impacts as compared to Alternatives 1 and 2.

Appendix A



The Transpo Group

Figure 14
Recommended Concept: W. Main Street/ Catlin Street Direct Connection

SR 4/SR 411 Urban Area Congestion Mitigation Plan

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