

C117 FILE 509/12

Rocky
Point

SR 4/SR411 URBAN AREA CONGESTION MITIGATION PLAN SUMMARY REPORT

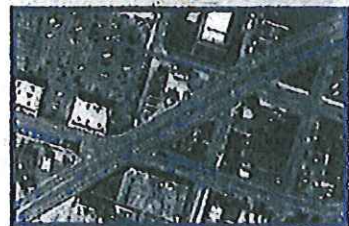
LONGVIEW

West
Kelso

Prepared for:
Cowlitz-Wahkiakum
Council of Governments

Prepared by:
The Transpo Group

November 30, 2000



Da
Te

The
Transpo
Group

*SR 4/SR 411
Urban Area
Congestion Mitigation Plan
Summary Report*

Prepared for:

Cowlitz-Wahkiakum Council of Governments

November 30, 2000

Prepared by:

*The Transpo Group, Inc.
11730 118th Avenue NE, Suite 600
Kirkland, WA 98034-7120
(425)821-3665
FAX: (425)825-8434*

TABLE OF CONTENTS

	<u>Page</u>
SUMMARY REPORT.....	1
Study Background.....	1
Study Goals.....	1
Agency and Public Interaction.....	1
Existing and Future Conditions	2
Short-Term Alternatives.....	3
Long-Term Alternatives.....	4
Recommended Improvement Concepts	6

FIGURES

S-1. Recommended Concept: W Main Street/Catlin Street Direction Connection ...	7
S-2. Recommended Concept: 9 th Street/Pine Street Route.....	9
S-3. Recommended Concept: Cowlitz Way/5 th Ave/Long Ave Improvements	11
S-4 Recommended Concept: Pedestrian System.....	13

TABLES

S-1. Long-term (2017) Alternatives	5
S-2. General Cost Estimates for Recommended Concept Improvements.....	17
S-3. Conceptual Phasing Program	18

SUMMARY REPORT

Study Background

The SR 4/SR 411 Urban Area Congestion Mitigation Plan was initiated by the Cowlitz-Wahkiakum Council of Governments (CWCOG) in July 1998. It explores a range of solutions to reduce existing and projected congestion and safety problem in the vicinity of the Cowlitz Way and Allen Street Bridges which connect Kelso and Longview. The two east-west routes also tie into the Westside Hwy which serves north-south traffic on the west side of the river. The resulting plan is intended to be a guide for street and intersection improvements to better accommodate existing and future travel in the corridors.

The need for a systematic approach for addressing congestion in the vicinity of the Cowlitz River bridges between Kelso and Longview was identified in the evaluation of options for replacing the Allen Street Bridge. The environmental studies for the bridge replacement were completed in 1996. The environmental analyses concluded that the replacement of the existing Allen Street Bridge with a 4/5-lane facility and other associated improvements would substantially improve conditions over a No-Build alternative. The study also noted that other, long-term, regional improvements would be necessary to address a range of transportation issues in the corridors connecting to the new Allen Street Bridge.

Possible regional solutions to address the corridor transportation issues were evaluated in the *Cowlitz River Crossing Study*. That study evaluated a range of options to determine; if, when, where, and how, to locate new bridge crossings of the Cowlitz River in the Kelso-Longview area. The Cowlitz River Crossing Study also identified that, as a minimum, additional operational improvements would be needed to reduce delays and improve safety on the west side of the Allen Street and Cowlitz Way Bridges. That study also found that the circuitous routing for traffic connecting between SR 4 and SR 411 also to lead to safety and congestion problems in the area.

Study Goals

The following two primary study goals were identified for the SR 4/SR 411 Congestion Mitigation Plan:

- To identify improvements that will reduce existing and future congestion through the SR 4/SR 411 corridors;
- Improve transportation safety and mobility for all travel modes (i.e. auto, truck, pedestrian, bicycle, transit, etc.) within the SR 4/SR 411 corridors.

Agency and Public Interaction

CWCOG staff and a Technical Advisory Committee (TAC) directed the study. The TAC consisted of staff from all of the affected local and state agencies:

Presentations were made to elected officials and to the public to report on study findings and to receive input on the plan concepts. CWCOG staff met with the Regional Policy Advisory Committee on Transportation (RPACT) several times during the course of the SR 4/SR 411 Congestion Mitigation Plan study effort. In November 1999, a more formal presentation was made to the RPACT. This meeting summarized key elements of the study and background information. It focused on the benefits and impacts of two of the most promising alternatives. The RPACT discussion provided additional direction for refining the alternatives and developing a preliminary recommended concept for presenting to the public.

On May 9, 2000, a public open house was held to present preliminary recommendations. There were a range of comments and questions. They included:

- Concerns over property access
- General support for the preliminary concepts
- Relationship to Kelso's land use plans
- Study assumptions on growth
- Pedestrian system needs
- Impacts on neighborhoods
- Impacts on businesses and property takes for right-of-way
- Potential property redevelopment in the area
- Status of new bridge crossings
- Impacts for access/egress from the Catlin School

Many of the comments and questions were at a level beyond that conducted for the study. These included issues related to specific property impacts and access restrictions. If the communities decide to pursue any of the conceptual solutions further, then more detailed engineering and environmental studies will need to be undertaken to address these and other issues.

Following the open house, a presentation was made at a special meeting of the Kelso City Council on May 30, 2000. Key issues raised by the Council included possible impacts on existing businesses and options for redevelopment. There was support for solving congestion in the corridor; this was tempered by the possible increase in traffic through West Kelso. Some of the Council members indicated that more work needs to be done to integrate the transportation solutions with the land use plans. In July 2000, the study results were presented to the City of Kelso Planning Commission. The Planning Commission had comments similar to these identified by the City Council.

(Additional meetings will be held prior to adoption of a final conceptual plan for the SR 4/SR 411 Congestion Mitigation Plan.)

Existing and Future Conditions

The initial technical steps of the study included obtaining and analyzing existing traffic data within the study area. The existing data were also used to update and refine the regional travel demand model to assist with analyzing future conditions. The analysis of existing and

future conditions provided insights into study issues and possible alternatives to help resolve the issues.

With anticipated growth in the region, traffic volumes in the study area are forecast to increase in most locations. By 2017, traffic volumes entering the study area are forecast to grow by nearly 40 percent on SR 4 near 15th Avenue. Traffic on Pacific Avenue, north of Cowlitz Way, are expected to grow by over 60 percent. The replacement and widening of the Allen Street Bridge results in a shift in traffic patterns by 2017. By 2017, the forecasts show an increase of 93 percent more traffic on the Allen Street Bridge compared to 1998 volumes. Traffic on the Cowlitz Way Bridge is expected to grow by only 13 percent.

A new Ostrander Bridge connecting SR 411 to I-5 north of the study area results in a slight decrease in traffic entering the study area on West Side Hwy north of Fishers Lane. Decreases in traffic from 1998 levels are also projected for the 4th/5th one-way couplet. Traffic that previously was routed to the Cowlitz Way Bridge will use the new Allen Street Bridge, resulting in substantially less traffic on the couplet.

Existing (1998) travel speeds along the Ocean Beach Hwy/Cowlitz Way Bridge route are approximately 14 mph in both directions. These are forecast to decrease to 6 to 8 mph by 2020 if no additional improvements are made. Travel speeds on the parallel Ocean Beach Hwy/Allen Street Bridge are expected to decline from 14 to 17 mph in 1998 to 9 mph by 2020. In 1998, travel speeds in the north-south study corridors were estimated at 20 to 24 mph. Northbound travel speeds were somewhat faster than those in the southbound direction. By 2020, PM peak hour speeds in the north-south routes would decrease to approximately 16 mph.

State and local data report a large number of accidents in the study area, especially along SR 4. A large number of the accidents were rear-end or angle-type collisions. These accident types are typical in congested areas. The number of access drives along SR 4 also leads to conflicting traffic movements and associated safety problems.

Short-Term Alternatives

Prior to defining alternatives, an assessment of future traffic conditions was completed. It showed that completion of the Allen Street Bridge will likely result in more congestion at Cowlitz Way/W Main Street in the short-term. As delays increase, traffic will seek alternative routes to access Washington Way and Ocean Beach Hwy. Construction of the Ostrander Bridge would provide some significant relief for traffic in the area, although congestion problems associated with traffic queues would still exist. The Ostrander Bridge and Allen Street Bridges will provide the most significant short-term benefit at Cowlitz Way/Pacific Avenue.

The initial focus of the study was on spot operational improvements to resolve the existing and forecast deficiencies. The improvements would be lower cost solutions that could be implemented in a relatively short time frame. Possible approaches included:

- Modification of signal timing and coordination of signals
- Intersection channelization (turn lanes)
- Access management
- Turn prohibitions.

Initial evaluation of the short-term alternatives indicated that congestion would still result along Cowlitz Way, especially between W Main Street and Ocean Beach Highway. Spot congestion problems also would remain.

Traffic operations at Cowlitz Way/5th Avenue/Long Avenue will be improved with the opening of the Allen Street Bridge and Ostrander Bridge. Extension of the storage pocket for the east-to-north left turns would reduce possible conflicts and improve traffic operations in the short-term at this intersection.

Traffic volumes on Ocean Beach Hwy west of Cowlitz Way are not expected to be significantly affected by the alternatives. Possible near term solutions along this section of SR 4 should consider access management programs to reduce the number of conflict points. In reviewing the corridor, the most reasonable short-term solutions would include consolidation of access drives and some restriction of left-turn access/egress from adjacent properties. Left-turns to/from these properties would be accommodated through designation and design of U-turn routes.

To resolve some of the congestion, but still maintain a low-cost solution, an alternative was developed to direct traffic to/from the Allen Street Bridge to Ocean Beach Highway via Catlin Street. Catlin Street would be improved at its intersection with Ocean Beach Highway to allow two westbound through lanes. As part of this concept, the east approach of W Main Street would be closed off at Cowlitz Way. This would eliminate major left-turn movements from W Main Street onto southbound Cowlitz Way, thereby reducing overall delays at the intersection. For purposes of testing the initial alternatives, it was assumed that traffic could connect between W Main Street and Catlin Street via a one-way couplet using 4th and 5th Avenues. The use of a one-way couplet was intended to help reduce the total delays at study intersections. Appropriate traffic signals and channelization would be provided at the intersections of 4th and 5th Avenues with W Main and Catlin Streets. Traffic calming measures would be used to reduce the volume of traffic on Catlin Street east of 4th Avenue.

Elimination of the W Main Street connection to Cowlitz Way and developing a connection to Catlin Street will reduce overall delays in the system. However, it cannot accommodate longer-term traffic volumes without additional widening. Closure of W Main Street will result in some changes in local access and circulation patterns.

Long-Term Alternatives

Four concepts were ultimately defined for the long-range evaluation, as summarized in Table S-1.

In addition to the primary elements noted in Table S-1, each of the alternatives included options for spot improvements at other critical intersections. In particular, different spot channelization or operational improvements were tested at the intersections of Cowlitz Way/Pacific Avenue and at Cowlitz Way/5th Avenue/Long Avenue. These types of improvements were evaluated after review of the traffic volumes and resulting levels of service.

Table S-1. Long-term (2017) Alternatives

Alternative	Description
A	W Main St/Callin St connection via a 4 th /5 th Ave one-way couplet close W Main St at Cowlitz Way. Callin St widened to 4/5 lanes west of 4 th Ave. Traffic controls and intersection modifications. Significant modifications/widening of the intersection of Ocean Beach Hwy/Cowlitz Way/Callin St.
B	Provide a direct connection between W Main St and Callin St via new alignment in vicinity of 4 th to 6 th Ave. New roadway and Callin St west to Ocean Beach Hwy would be 4/5 lanes. W Main St would be closed east of Cowlitz Way. Modifications to the intersection of Ocean Beach Hwy/Cowlitz Way/Callin St would be made.
C	Provide a direct extension of W Main St 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.
D	Convert Cowlitz Way Bridge to one-way westbound and Allen St Bridge to one-way eastbound. Eastbound traffic would still be permitted on Cowlitz Way west of Long Ave. Local westbound traffic would also be accommodated on W Main St between Cowlitz Way and 1 st Avenue.

The evaluation of long-range alternatives indicates that Alternative A could meet short-to-mid range traffic flows. It would require additional modifications at intersections along Catlin Street and W Main Street to accommodate 2017 traffic volumes. These modifications would begin to make the alternative more similar to Alternative B, except the connection via 4th/5th Avenue between Allen Street and Ocean Beach Hwy would be less direct than a new road alignment.

Alternatives B and C both provide a good direct connection between Ocean Beach Hwy and I-5 via Allen Street. They both eliminate one leg of the intersection along Cowlitz Way. This reduces significant congestion and traffic queues in and along Cowlitz Way. Alternative B requires some business displacement, but also would support redevelopment of the W Kelso business district. Major issues include changes in local access and circulation.

Alternative C would have significant impacts to a major shopping center. This would be very costly in both property acquisition and business relocation costs. Alternative C eliminates major movements at the Cowlitz Way/Ocean Beach Hwy intersection, which improves overall traffic operations in the corridor. However, the critical W Main Street intersection with Cowlitz Way is still relatively close to the major intersection of Cowlitz Way/5th Avenue/Long Avenue. This can result in some congestion due to traffic queues between the intersections.

Alternative D appears to be problematic for implementation. This type of concept was evaluated in detail as part of the Allen Street Bridge project. The one-way bridge system results in more circuitous travel and significant impacts to local circulation and access. It also would be very difficult to implement.

The evaluation indicates that additional improvements are needed at Cowlitz Way/5th Avenue/Long Avenue under any scenario. The high volume of east-to-north left turns could result in lower levels of service and significant queuing problems.

The intersection of Cowlitz Way/Pacific Avenue also needs some additional improvements to resolve capacity and safety deficiencies. The baseline condition included modifying the intersection to allow left-turns from two lanes. This would require widening Pacific Avenue north of Cowlitz Way to provide two receiving lanes.

Spot improvements also are needed to resolve capacity and/or safety deficiencies at Fishers Lane/Long Avenue/Columbia Heights and at 7th Avenue/Washington Street.

Recommended Improvement Concepts

Based on the review of the short and long range alternatives, the Technical Advisory Committee (TAC) established a preference for the Alternative B concept. It provides a direct for travel between Allen Street and Ocean Beach Highway. It also eliminates a critical traffic movement at Cowlitz Way with W Main Street, which was identified as a key factor in congestion and safety within the study area. Working with the TAC, the Alternative B concept was refined to address some of the remaining issues. These included local traffic access and circulation, impacts on the residential neighborhood south of Catlin Street, pedestrian system needs, and spot improvements, in the study area. These issues were further addressed in the public open house, RPACT meetings, and meetings with the City of Kelso City Council and Planning Commission.

The recommended improvement concept consists of the following primary elements:

- W Main Street/Catlin Street direct connection
- New 9th Street/Pine Street route
- Cowlitz Way/5th Avenue/Long Avenue improvements
- Cowlitz Way/Pacific Avenue improvements
- Pedestrian system enhancements
- Ocean Beach Hwy access management

The primary element of the recommended concept is the W Main Street/Catlin Street direct connection. Some of the other components, such as the 9th Street/Pine Street route and Cowlitz Way/5th Avenue/Long Avenue improvements tie together with the new connection. Other components are more isolated; however, they still serve the overall objectives of the plan to reduce congestion and improve safety in the study area.

W Main Street/Catlin Street Direct Connection

As shown in Figure S-1, this strategy provides a direct east-west route between the Allen Street Bridge (and I-5) and Ocean Beach Hwy. The new corridor would consist of two travel lanes in each direction. The alignment and designs for the direct connection are only preliminary and conceptual at this time. The transition between W Main Street and Catlin Street is shown to occur between 4th and 6th Avenues. This could be shifted to the east or to the west. The widening between Cowlitz Way and 6th Avenue would likely be all on the north side of the street to minimize the number of impacted properties. Left-turn lanes and a signal would be provided at 6th Avenue/Catlin Street to serve local access and circulation within W Kelso. Sidewalks would be built along both sides of the corridor.

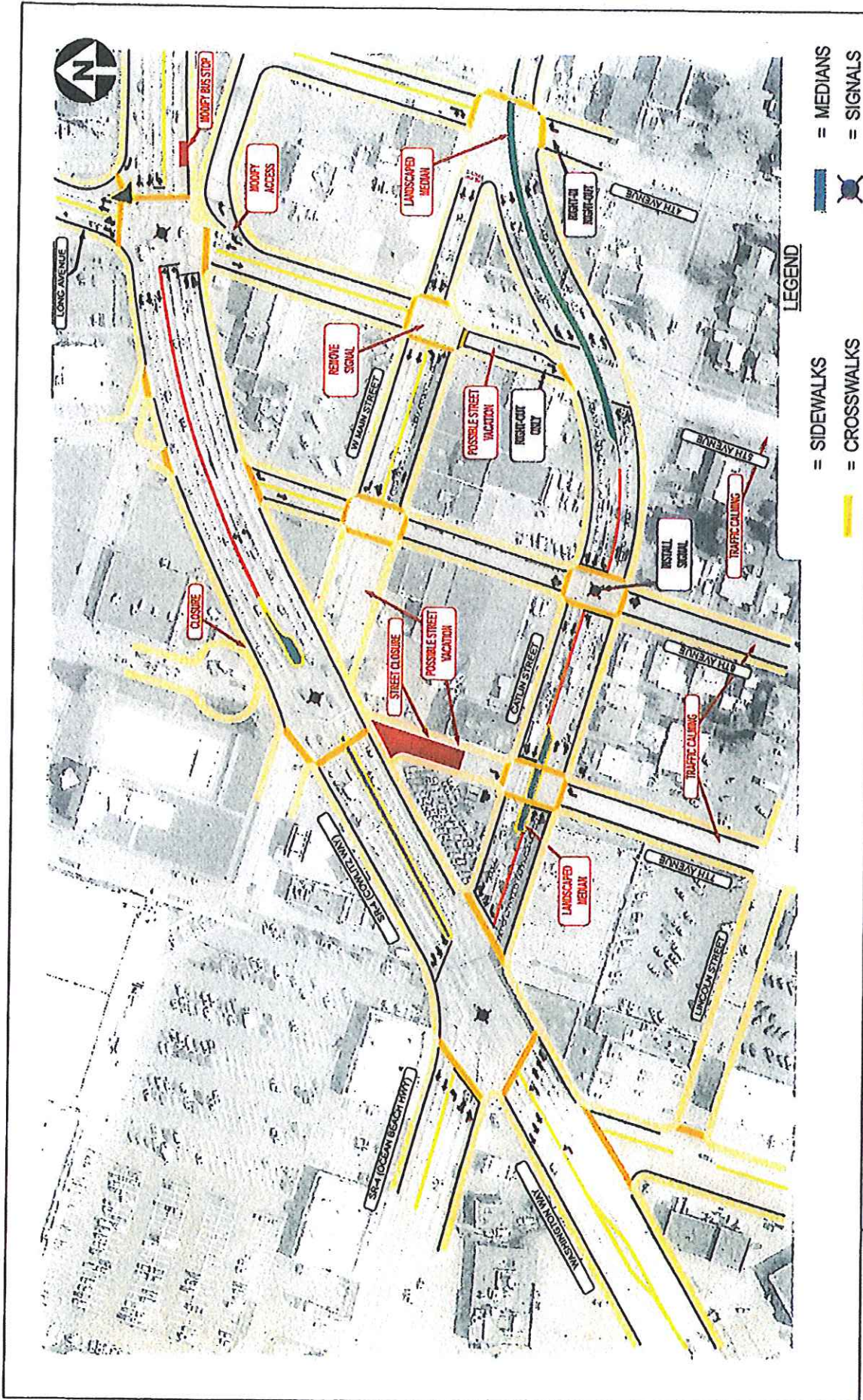


Figure S-1
 Recommended Concept: W. Main Street/ Catlin Street Direct Connection
 SR 4/SR 411 Urban Area Congestion Mitigation Plan

PRELIMINARY ONLY SUBJECT TO REVISION



The new corridor alignment would allow closure of W Main Street at Cowlitz Way. This would eliminate major turning movements at this high volume intersection, greatly reducing congestion along Cowlitz Way. The west approach of the intersection could be maintained to provide access to the shopping center and other properties. The intersection would be signalized to accommodate pedestrians and the east-to-north left turns exiting the shopping center and other properties west of the intersection.

Major improvements would be undertaken at the intersection of Cowlitz Way/Ocean Beach Hwy/Washington Way/Catlin Street. These would include widening Catlin Street (the east leg of the intersection) to provide three westbound approach lanes (including a left-turn lane) and two eastbound exit lanes. Ocean Beach Hwy (the west leg of the intersection) would be modified to include three eastbound approach lanes and two westbound lanes. This change requires elimination of the south-to-west free-flow right turn lane. This change can largely be implemented within the existing curb-to-curb pavement. The lane modifications will need to be properly aligned with the new lanes on Catlin Street.

Medians would be used to prohibit left-turns to/from the new corridor at 5th and 7th Avenues. North-south through movements are also prohibited at these two locations. The prohibitions reduce the volume of north-south through traffic in the corridor. High volumes of through traffic along 5th Avenue would negatively impact the existing residential land uses in the corridor. The increased traffic on 5th Avenue also has an adverse affect on the operations of Cowlitz Way/5th Avenue/Long Avenue. The traffic flow restrictions at 7th Avenue/Catlin Street are needed due to the length of potential westbound traffic queues on Catlin Street from the Cowlitz/Ocean Beach Hwy/ Washington Way intersection.

As conceptually configured, W Main Street/4th Avenue would become a five-legged intersection. To minimize safety and operation issues it is recommended that W Main Street would be limited to one-way (westbound) operations between 4th and 5th Avenues. Installation of a landscaped median also would improve safety and operations by eliminating turns at this intersection, which is located at the east end of the transition to Catlin Street.

Traffic calming measures south of Catlin Street would be desirable to minimize traffic shifting from 5th Avenue to other local access streets. Of particular concern is the possibility of traffic shifting to 6th Avenue, which would be signalized at Catlin Street. The proposed 9th Street/Pine Street route (described below) was added to the recommended concepts to accommodate traffic between 7th Avenue and Washington Way/Cowlitz Way instead of traffic going through the W Kelso residential and commercial district.

9th Street/Pine Street Route

The travel forecasting results indicated that without the restrictions on 5th Avenue between Catlin and W Main Streets significant volumes of through traffic (3 to 5 times higher than existing) would cut-through the W Kelso business district. As described above, the recommended plan is intended to significantly reduce this cut-through traffic. This requires an alternative route.

The proposed 9th Street/Pine Street route would connect 7th Avenue to Washington Way. As shown on Figure S-2, this route would be approximately 4 blocks south of Catlin Street. The road would be a two-to-three lane arterial providing a new route for traffic from 7th Avenue to/from the Washington Way/Cowlitz Way corridor. The improvements include

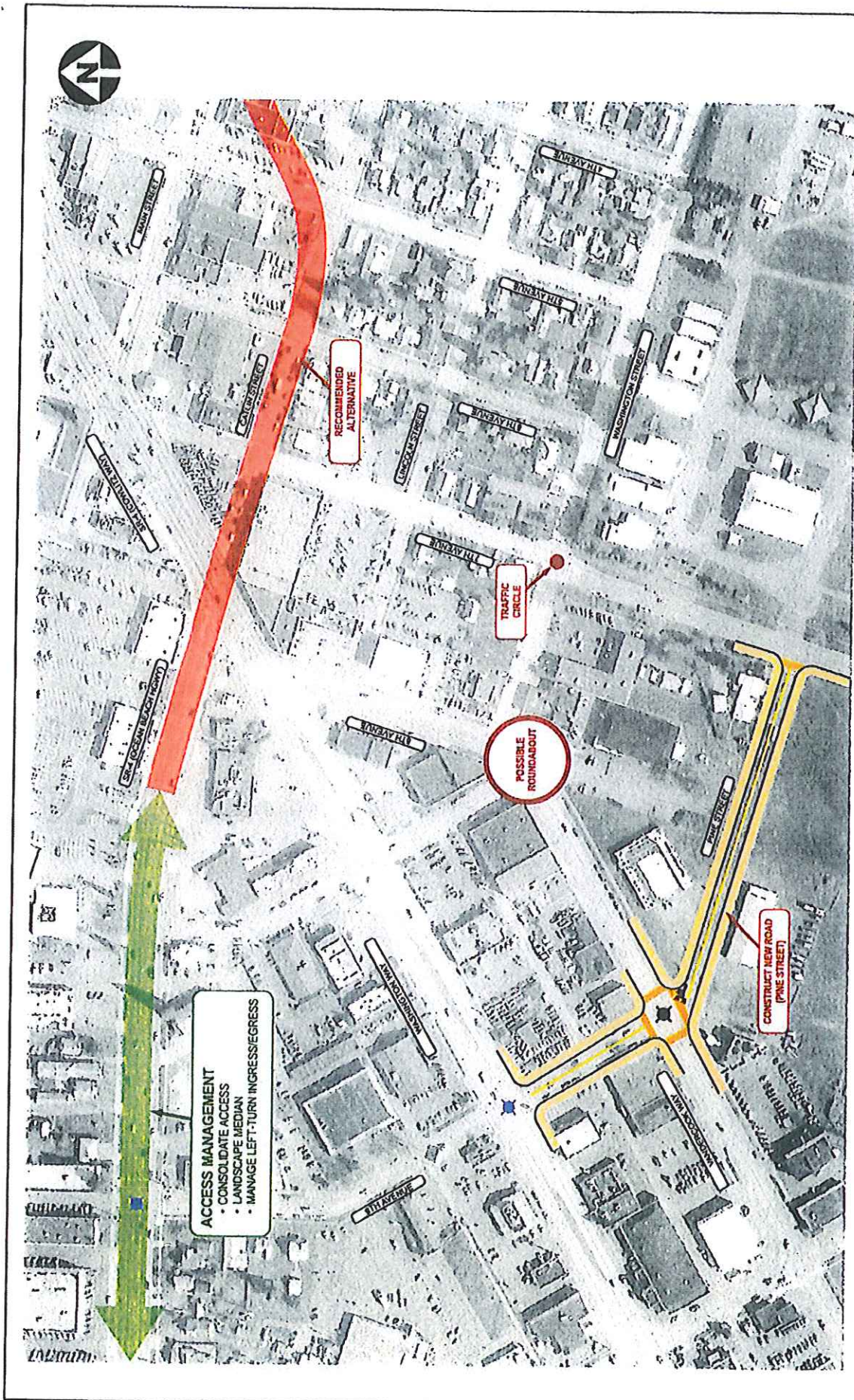


Figure S-2
 Recommended Concept: 9th Street/ Pine Street Route
 SR 4/SR 411 Urban Area Congestion Mitigation Plan

constructing a new road between 7th Avenue and Vandercook Way. Right-of-way for the road is already in place.

With this new route, northbound traffic on 7th Avenue would access the Cowlitz Way Bridge or Long Avenue via Pine Street/9th Avenue, Washington Way and Cowlitz Way. Southbound flows would be the reverse. Although the route is somewhat longer than cutting through 5th Avenue the reduced delays along Cowlitz Way will provide relatively comparable travel times.

The new route also will serve traffic between 7th Avenue and Ocean Beach Hwy. The intersections of Ocean Beach Hwy/9th Avenue and Washington Way/9th Avenue are already signalized and can accommodate the increase in traffic.

The new route also would provide access to/from the County fairgrounds and exhibition center. Although nothing is immediate, the County has considered redeveloping the property into more traffic intensive uses. The 9th Street/Pine Street route would help serve any increase in traffic associated with future redevelopment of the fairgrounds.

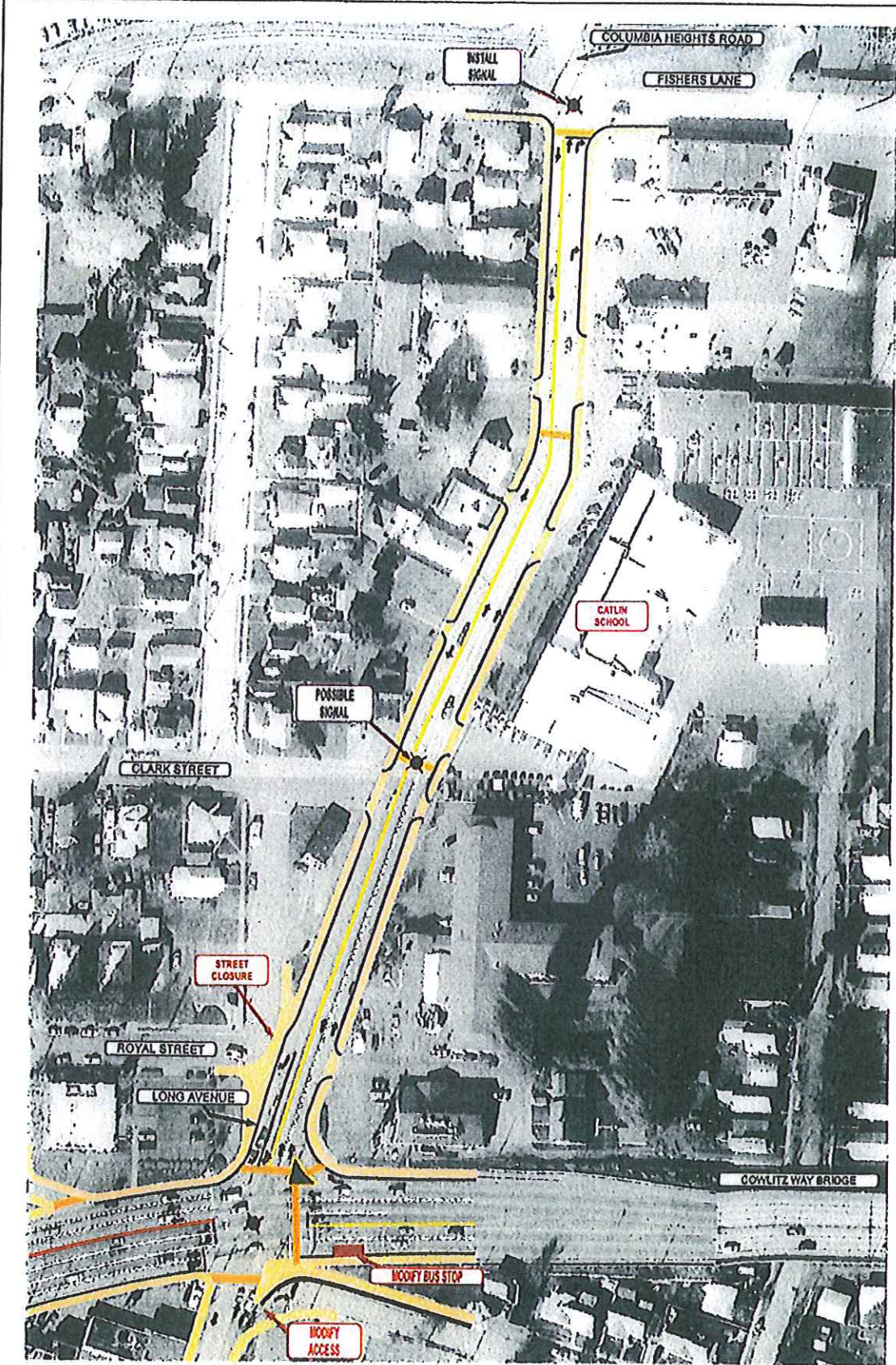
Cowlitz Way/5th Avenue/Long Avenue

The major deficiency at this intersection results from traffic backups associated with the east-to-north left turns. Analysis of existing and forecast volumes indicates a need for a second left turn lane from Cowlitz Way to Long Avenue. In order to minimize costs and impacts, it is recommended that the eastbound approach be modified by converting the existing through lane that is adjacent to the left turn into a second left turn lane (see Figure S-3). In order to maintain two eastbound through lanes to the Cowlitz Way Bridge the existing right-turn only lane would be converted to a shared through/right lane. The existing access to Grant Street from Cowlitz Way would be eliminated to improve safety and pedestrian connections.

Providing two left turn lanes on Cowlitz Way requires two northbound lanes on Long Avenue. Much of the improvement can be done by restriping the existing roadway. However, some minor widening (4-6 feet) may be required from the north side of the Catlin School to Fishers Lane. The added northbound lane on Long Avenue would become a right turn lane as it approaches Fishers Lane. A traffic signal (when warranted) could be installed at Long Avenue/Fishers Lane to reduce delays and to support pedestrian crossing at the intersection.

A traffic signal also could be installed to provide a pedestrian crossing in the vicinity of the Catlin School. Locating the signal at Clark Street would also facilitate access/circulation for the adjacent neighborhood.

Access to/from Royal Street would be closed. This intersection is located too close to Cowlitz Way. Southbound traffic on Long Avenue currently blocks the intersection. Traffic to/from Royal Street also impedes traffic flows on Long Avenue which can result in traffic blocking the Cowlitz Way intersection. Traffic would be able to access Royal Street via Clark Street.



**The
Transpo
Group**

Figure S-3
Recommended Concept: Cowlitz Way/ 5th Avenue/ Long Avenue Improvements

SR 4/SR 411 Urban Area Congestion Mitigation Plan

November 30, 2000
WSDOT priority array
of hazardous accident
locations

Cowlitz Way/Pacific Avenue Improvements

The *Cowlitz River Crossing Study* identified a need for adding capacity for left-turns from eastbound Cowlitz Way to northbound Pacific Avenue. This includes modifying the eastbound approach and signal operations to allow left-turns and through movements to be made from the center lane which currently only carries through traffic. This modification requires two northbound lanes on Pacific Avenue north of Cowlitz Way.

Review of the existing and forecast traffic volumes indicated that a relatively small volume of traffic making south-to-east left turn. Eliminating this left-turn movement would allow the two northbound lanes on Pacific Avenue to be provided within the existing width of the street. Minor modifications also would be needed north of the intersection to transition the two lanes back to a single lane near Columbia Street.

The prohibited southbound left-turns would be redirected to continue south on Pacific Avenue to Academy Street. The traffic could then use 4th or 5th Avenues to return to their desired travel path. Shifting this low volume of traffic should not adversely affect traffic operations on Academy Street or other local streets.

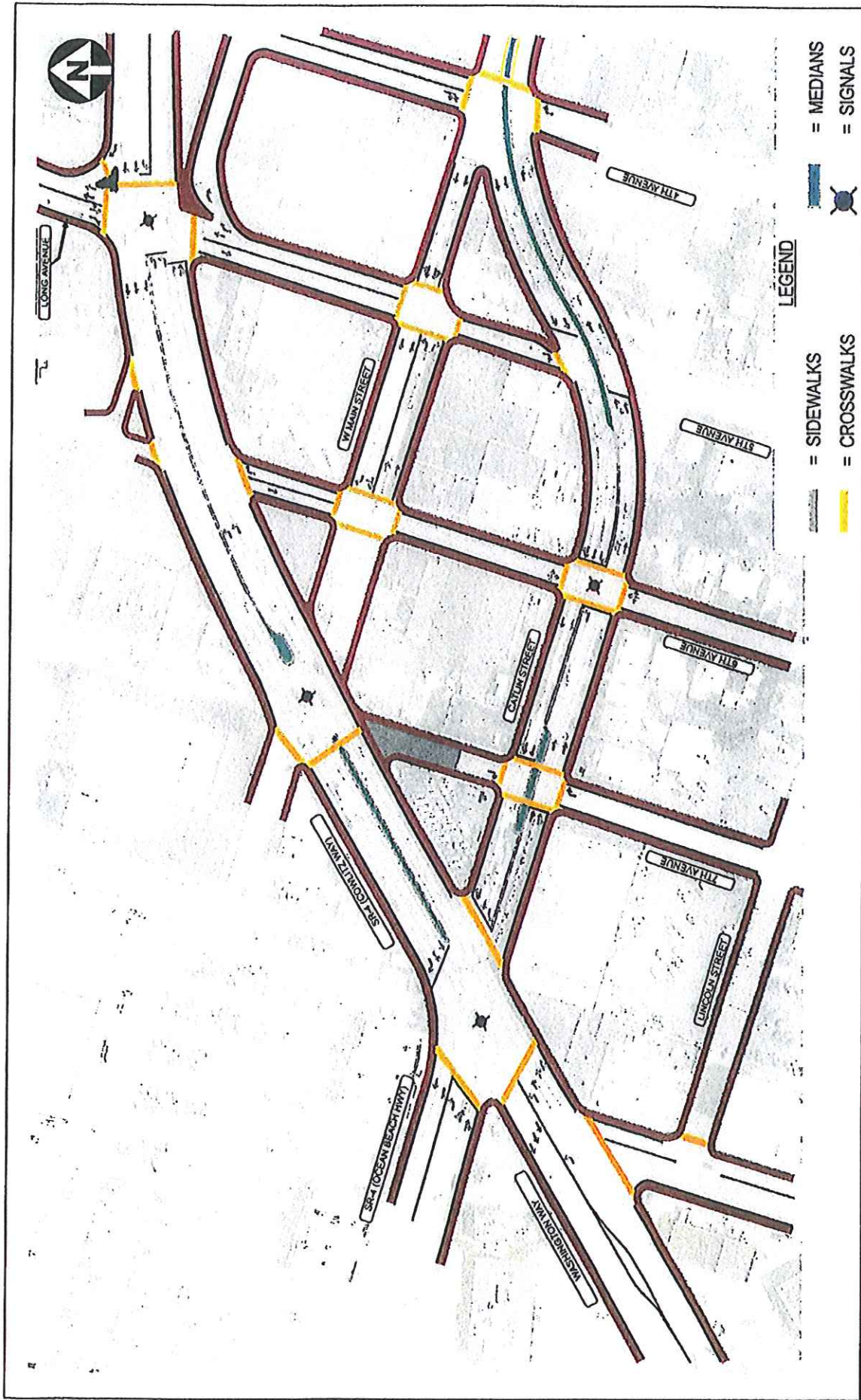
Ocean Beach Highway Access Management

The forecast traffic volumes and operations indicate that Ocean Beach Hwy between 15th Avenue and Cowlitz Way would not need to be widened to accommodate the 2017 traffic forecasts. However, the number of driveways and intersections reduces the available capacity and increases safety problems along this section of road. It is recommended that an access management program be initiated for this section of Ocean Beach Hwy. This would include consolidation of existing driveways to reduce the number of conflict points. Left-turn movements also would be restricted to/from Ocean Beach Hwy except at designated intersections. U-turn routes would be used to facilitate local access and circulation within the corridor. These types of strategies have proven to be successful in reducing the number of driveway and access related accidents. Reducing the number of locations for left-turns also improves the capacity of the corridor.

Pedestrian System Enhancements

Improvements to pedestrian facilities are included in all of the other recommended concepts. These include construction of sidewalks, revisions to crosswalks, and modification of traffic signals. Figure S-4 illustrates the pedestrian system improvements for the central part of the study area within the W Kelso business district. All streets within the W Kelso business district would have sidewalks. The closure of the east leg of the W Main Street/Cowlitz Way intersection and other streets will reduce possible conflicts between pedestrians and vehicles along Cowlitz and other streets.

Pedestrian crossings of the new W Main Street/ Catlin Street direct connection would be focused on the signalized intersection at 6th Avenue/Catlin Street. Pedestrian crossings



The Transpo Group

Figure S-4
 Recommended Concept: Pedestrian System
 SR 411 Urban Area Congestion Mitigation Plan

would also be provided at 7th and 4th Avenues. Landscaped medians could be used to provide a pedestrian refuge area and to alert motorists to the crossings.

The existing crosswalk on Cowlitz Way at W Main Street is located on the north leg of the intersection. This is reasonable given the heavy volume of traffic between the west leg of W Main Street and the south leg of Cowlitz Way. However, with closure of the west leg of the intersection it is recommended that the crosswalk be relocated to the south side of the intersection. This will provide a shorter crossing distance than currently exists and also eliminates conflicts with east-to-north left turns from the shopping center. A landscaped median also could be installed to provide a refuge area and to alert motorists to the crossing.

Modifications to the intersection at Cowlitz Way/5th Avenue/Long Avenue will result in improved pedestrian safety as well. The recommended modification to access to Grant Street allows the crosswalk to be located closer to Cowlitz Way, providing a shorter overall crossing distance.

The potential for a grade-separated pedestrian bridge over Cowlitz Way was also discussed. The recommended concept does not include the overcrossing due to its high cost. It is also uncertain how much an overcrossing may be used since the overall crossing distances would likely be significantly longer than those at a signalized at-grade crossing. The recommended concept does not prohibit future consideration of a grade separated crossing.

Traffic signals also could be provided along Long Avenue at Clark Street and Fishers Lane. These signals would improve safety for pedestrians in this corridor including children going to/from the Catlin School.

The consolidation of access drives and reduction of the number of left-turn access points along Ocean Beach Highway also will improve pedestrian safety. The new 9th Street/Pine Street route will provide a more direct pedestrian connection between 7th Avenue and Ocean Beach Highway. This would become more important if the fairgrounds are redeveloped into higher intensity uses.

Benefits and Impacts

The recommended improvement concepts result in improved traffic operations, both in terms of level of service and reducing the impacts of traffic queues. The recommended improvements also improves travel times over the 2017 conditions without improvements. Traffic safety would be enhanced through reduction of congestion, traffic queues, and major the number of conflict points. The overall pedestrian circulation system is also improved. The benefits of the improvements do not come without some impacts. These include impacts to individual properties, costs, and changes in access and circulation.

Traffic Operations. The recommended improvements would create a direct corridor between Allen Street and Ocean Beach Highway. This eliminates major traffic movements at Cowlitz Way/W Main Street, resulting in overall greater capacity in the corridor. Only 1 of the 20 study intersections would be forecasted to operate at LOS D or lower under the 2017 recommended concept. Cowlitz Way/Pacific Avenue would operate at LOS E an improvement over the LOS F condition without improvements.

Traffic queues can significantly affect traffic flows and operations in the study area. Three intersections were identified as key concerns for traffic queues. These were:

- Cowlitz Way/Ocean Beach Hwy/ Washington Way/ Catlin Street
- Cowlitz Way/5th Avenue/Long Avenue
- Cowlitz Way/Pacific Avenue

The addition of a third eastbound lane significantly reduces traffic queues along Ocean Beach Hwy. This results in more efficient traffic flows at this key intersection under the recommended concept. Under the 2017 baseline scenario, traffic on northbound Cowlitz Way approaching W Main St backs into the intersection and blocks traffic from Washington Way or Ocean Beach Hwy. These queues do not exist under the 2017 recommended concept with the closure of W Main Street.

Providing a second lane for the east-to-north left turn movement at Cowlitz Way/5th Avenue/Long Avenue reduces the impacts of traffic queues. Without the improvements the left-turn queues extend into the eastbound through lane resulting in delays and safety problems.

Extensive traffic queues will occur on the Cowlitz Way Bridge in the east-to-north left turn lane under the 2017 baseline forecasts if only a single left-turn lane is provided approaching Pacific Avenue. The left-turn queue will extend nearly across the bridge, blocking traffic in the adjacent through lane. Allowing left-turns from two lanes significantly reduces the queuing impacts.

The 2017 recommended concept improves east-west travel speeds along Ocean Beach Hwy/Cowlitz Way and Ocean Beach Hwy/Allen Street Bridge compared to the 2017 baseline condition. The resulting 2017 pm peak hour speeds in the westbound direction would be similar to 1998 conditions even with 20 years of traffic growth.

Overall travel speeds on the Westside Hwy do not change much with the recommended improvements. This would be expected since there are no specific capacity improvements identified for 1st Avenue S.

Safety. The reduction of congestion and traffic queues under the recommended concept should enhance overall traffic safety in the study area. Currently, much of Cowlitz Way between Ocean Beach Hwy and Pacific Avenue experiences a high percentage of rear end and angle accidents. These types of accidents generally decrease with improved levels of service and reduced traffic queues. Improvements in vehicular safety also would be expected along Ocean Beach Hwy with implementation of an access management program for the corridor.

The new W Main Street/Catlin Street direct connection would be constructed to current design standards. This would provide improved safety by restricting the number of access locations and some of the traffic movements.

Closing streets, consolidating driveways, and restricting some vehicular movements will enhance pedestrian safety. All of these factors will reduce the number of potential

vehicular/pedestrian conflicts. In addition, the identified upgraded signalized intersections will provide adequate crossing times of Cowlitz Way study area arterials.

Land Use. The recommended concept will impact existing developments along the new W Main Street/Catlin Street alignment. This will include some displacement of businesses and impacts to access and circulation. Since the plan is only conceptual at this time it is not possible to quantify the specific impacts. Discussions with some of the potentially impacted property owners indicated a willingness to vacate their properties. Others were concerned over the changes in access or being left with a portion of a parcel that was not as marketable for commercial development.

A major impact on properties would occur on Catlin Street between Cowlitz Way and 6th Avenue. The additional right-of-way needs (up to 40 feet) are proposed to come from the north side of the existing street. The adjacent properties are being assembled by a single owner to be developed. The owner and City are discussing the needs for the additional right-of-way.

The City of Kelso will be addressing potential land use concepts in the area in an upcoming study. The resulting land use plan would affect specific elements of the transportation concepts. Ultimately, the land use plan and the transportation improvements program need to be fully integrated.

Non-Motorized Travel. The recommended concept provides good connectivity for pedestrian travel throughout the study area. Direct pedestrian connections would be provided between various parts of the study area. The identified improvements would enhance pedestrian safety, especially crossings of Cowlitz Way. Bicycle travel could be supported by including bicycle lanes on the W Main Street/Catlin Street direct connection. This would connect with the bicycle lanes on the Allen Street Bridge. Lower traffic volumes on 5th Avenue also would improve bicycle safety within that corridor. Although bicycle lanes would not be added to Ocean Beach Highway, the recommended access management program would reduce conflicts with motorized vehicles.

Local Access And Circulation. Implementation of the W Main Street/ Catlin Street direct connection will affect access and circulation within W Kelso. Closure of W Main Street at Cowlitz Way will redirect some access to properties in the area to 6th Avenue via Catlin Street. The changes in 5th Avenue will also result in changes in local access. Traffic destined to the Allen Street Bridge from properties located north of the new route would be redirected to 6th Avenue. Traffic from the existing residential area south of Catlin Street will use either 1st Avenue or 6th Avenue for access/egress to the area to/from the north, east or west.

Additional impacts to individual properties would result from restricting driveway access to/from the W Main Street/Catlin Street route. This will result in a need for relocating driveways to the north-south streets. This restriction is recommended to enhance the safety and capacity of the new arterial route.

The construction of the new 9th Street/Pine Street route will improve circulation in the southern part of the study area. The new road will provide a direct route between 7th Avenue and Ocean Beach Highway. This will also support potential redevelopment of the County Fairgrounds.

Costs. Due to the conceptual level of the study, only planning level cost estimates were developed for the various improvements. These are summarized in Table S-2. Total costs for all of the improvements, exclusive of right-of-way and potential business displacements, are estimated at \$5.8 to \$10.3 million.

The element with the highest cost will be the new W Main Street/ Catlin Street connection. This project, as currently depicted, would cover 1,000 to 1,200 feet of new construction or widening. Based on general unit costs, construction of a four/ five lane arterial would be approximately \$3 to \$4 million. This cost does not include acquisition of right-of-way or costs associated with displacement of businesses.

Table S-2. General Cost Estimates for Recommended Concept Improvements

Improvements	Description	Estimated Costs (\$ millions) ¹
W Main St/Catlin St Route		
New Arterial Route	Construct 4/5 lane arterial with signals and sidewalks.	\$3.0-\$4.0
Cowlitz Way/Ocean Beach Hwy	Construct intersection modifications.	0.3-0.5
Closure of W Main St, 5 th Ave, 7 th Ave	Close side streets.	0.1-0.2
9th St/Pine St Route		
7 th Ave to Washington Wy	Construct new 2 lane arterial with signals and sidewalks; modify exiting arterial.	0.7-1.0
8 th Ave/Vandercook Wy	Construct roundabout.	0.3-0.5
W Kelso South Subarea		
Implement neighborhood traffic control program.		0.1-0.2
Ocean Beach Hwy		
15 th Avenue to Washington Wy	Implement access management plan.	0.2-2.0
Cowlitz Wy		
Pacific Ave to Ocean Beach Hwy	Interconnect traffic signals.	0.1-0.3
Cowlitz Wy/5th Ave/Long Ave		
Intersection	Construct intersection modifications.	0.3-0.5
Long Ave (Cowlitz to Fishers)	Modify to provide two northbound lanes.	0.3-0.5
Fishers Ln/Long Ave and Clark St/Long Ave	Install traffic signals.	0.3-0.4
Cowlitz Wy/Pacific Ave	Modify intersection.	0.1-0.2
Total Program⁽¹⁾		\$5.8-\$10.3
<i>(1). In 2000 dollars, exclusive of right-of-way acquisition, business displacement, or major utility relocation costs.</i>		

Implementation Strategy

The recommended concept will take several years to implement. All of the improvements are not needed in order to begin reducing congestion and improving safety in

the study area. Table S-3 identifies a conceptual program for phasing the improvements. It is based on an assessment of the ease of implementation, costs and funding options.

Prior to implementation, the improvements need to be adopted into local and regional plans. Environmental and preliminary design studies would be needed for the major improvements such as the new W Main/Catlin Street connection, construction of Pine Street, and improvements at Cowlitz Way/5th Avenue/Long Avenue. These studies would provide detailed evaluation of alternatives for the improvements, including review of impacts on properties. They also would provide detailed costs estimates for each project.

Funding will need to be acquired for all of the improvements. Some of the funding for minor improvements could come from existing City or WSDOT programs. WSDOT funding would only be directed along Cowlitz Way or Ocean Beach Hwy, which is SR 4. There has been some discussion of transferring the SR 4 designation to the Allen Street/W Main Street corridor. Such a transfer would be based on a route jurisdiction study and would require approval of the local agencies.

Funding for the W Main Street/ Catlin Street direct connection could be partially obtained as part of redevelopment of the properties along the route. This could include dedication of right-of-way and construction of frontage improvements. The new corridor also will likely require some funding through state or federal grants, similar to the Transportation Improvement Board (TIB) grant that was used to replace the Allen Street Bridge.

Table S-3. Conceptual Phasing Program

Time Frame and Location	Improvement
Short-term (0-5 yrs)	
Cowlitz Wy (Pacific Ave to Ocean Beach Hwy)	- interconnect traffic signals <i>WSDOT OWNS IN KELSO</i>
Cowlitz Wy/5 th Ave/Long Ave—Phase I	- extend existing east-to-north left turn storage lane <i>(Done 2005)</i> - close Royal Street
Cowlitz Wy/5 th Ave/Long Ave—Phase II	- modify intersection to provide dual east-to-north left turns - develop 2 northbound lanes on Long Ave - install signals
Ocean Beach Hwy (15 th Ave to Washington Wy)	- conduct design study for access management program
7 th Ave/Washington St	- Install traffic circle
W Main St/Catlin Wy Connection	- begin environmental and preliminary design phase
Mid-term (5-10 yrs)	
8 th Ave/Vandercook Wy	- construct roundabout or other traffic control
W Main St/Catlin Wy Connection	- complete designs, seek funding, acquire right-of-way
9 th St/Pine St	- design and construct new roadway, if fairgrounds are redeveloped
Ocean Beach Hwy	- implement access management plan
Long-term (10 or more yrs)	
W Main St/Catlin St Connection	- construct new route and close W Main St and modify other streets
9 th St/Pine St	- construct new arterial new roadway and modify 9 th Ave between Washington Way and Vandercook Way
W Kelso South Subarea (Callin St, 1 st Ave, Washington St, 8 th Ave)	- implement neighborhood traffic control measures

WS DOT
CLIENTS THIS

Over the next five years, spot improvements can likely be implemented at the intersections of Cowlitz Way with Pacific Avenue and Long Avenue. The Cowlitz Way/Pacific Avenue improvements would need to include elimination of the south-to-east left turn lane to minimize the need for widening the north leg of the intersection. The initial improvement at Cowlitz Way/5th Avenue/Long Avenue would include extending the left-turn lane on Cowlitz Way. This would help reduce the impacts of traffic queues blocking the through traffic lane. A second phase of the improvement would involve modifying the intersection to provide the dual east-to-north left turn lanes. This would require modifying Long Avenue to include two northbound lanes. Initial studies could begin for the W Main Street/Catlin Street connection and the Ocean Beach Hwy access Management Plan.

Longview
City limits
also involved

The mid-term (5 to 10 year) horizon would include completing designs and funding for the W Main Street/Catlin Street corridor and the 9th Street/ Pine Street route. The Ocean Beach Hwy access management plan could also be implemented during this time frame.

Construction of the W Main Street/Catlin Street corridor will likely not occur for 10 or more years. The Pine Street arterial also may slide to the long-term horizon.