

Glenmore Trail/Elbow Drive/5 Street SW Interchange – Managing Traffic on Calgary’s Largest Interchange Project

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ABSTRACT

The Glenmore Trail/Elbow Drive/5 Street SW Interchange has been on The City of Calgary's transportation improvements list for nearly 30 years. In late 2003, City Council approved funding for the design and construction of this project to reduce congestion and improve the movement of goods and services along one of Calgary's primary east/west transportation corridors.

This project, which is currently under construction, has a total capital budget of \$110.5 million and is scheduled for completion in the fall of 2007.

Being one of the most complex transportation projects ever undertaken by The City of Calgary, the project includes: four (4) new bridges; 26 retaining walls with a total area of over 13,000 m²; 11,000 m of sewers, sub-drains and water mains; 500,000 m³ of material to be excavated and removed from the site; 97,000 m³ of asphalt to be removed; 61,000 tonnes of asphalt and 15,000 m³ of concrete to be placed.

With over 85,000 vehicles per day using Glenmore Trail through the middle of the work zone, managing traffic in conjunction with the construction staging is a key element of this project.

A multi-faceted approach has been developed and implemented to manage traffic during the construction of this project. From the design of the detours, to the use of technology, to the managing of stakeholder expectations and public consultation, this paper will examine the challenges and solutions developed to manage traffic on this project that can be applied to other similar complex, urban transportation projects.

1.0 INTRODUCTION

The Glenmore Trail/Elbow Drive/5 Street SW Interchange has been on The City of Calgary's transportation improvements list for nearly 30 years. In the fall of 2001, The City of Calgary undertook a study to determine the long-term design and right-of-way requirements for the Glenmore Trail corridor between the west city limits and Deerfoot Trail (Provincial Highway #2) based on a future city population of 1.5 million.

This study consisted of two phases. The first phase, referred to as the Network Analysis, was to assess the range of road network options to accommodate a city population of 1.5 million. The recommendations of the Network Analysis were submitted to City Council in December 2002. City Council in turn, directed the City administration to proceed with the second phase, the Functional Planning and Preliminary Design, for the interchange on Glenmore Trail at Elbow Drive and 5 Street SW.

In late 2003, City Council approved capital funding for the design and construction of the Glenmore Trail/Elbow Drive/5 Street SW Interchange to reduce congestion and improve the movement of goods and services along one of Calgary's primary east/west transportation corridors.

The budget for this project is \$110.5 million and is scheduled for completion in the fall of 2007.

2.0 BACKGROUND

The Glenmore Trail/Elbow Drive/5 Street SW Interchange project, commonly referred to as GE5, is bounded on the west by a grade-separated interchange at 14 Street SW and on the east by a grade-separated interchange at Macleod Trail. There are two roadways that intersect Glenmore Trail within the project site, namely Elbow Drive and 5 Street SW. Both these roadways were controlled by at-grade signalized intersections at Glenmore Trail prior to the start of this project.

Glenmore Trail is designated as an expressway classification road and is the primary east/west traffic corridor south of the downtown. The average daily traffic is approximately 85,000 vehicles/day and is a heavily used truck route. Elbow Drive is classified as a collector roadway with an average daily traffic of approximately 23,000 vehicles/day and 5 Street SW carries approximately 13,000 vehicles/day and is designated a major roadway.

The plan for GE5 is to lower Glenmore Trail underneath Elbow Drive and 5 Street SW and to provide tight diamond interchanges at both these intersecting roadway locations. To accommodate this lowering of Glenmore Trail, over 500,000 m³ of material will have to be excavated and removed from the project site and over 13,000 m² of retaining walls, along with four (4) bridges, will have to be constructed. The project site is

bordered by residential, office, institutional, and commercial developments including one of the busiest shopping centres in western Canada.

Developing and implementing a traffic management plan to provide for a safe work site to allow construction of the project while maintaining access and accommodating the traveling public has been a challenging undertaking.

The challenges and solutions that have been developed, evaluated, implemented and monitored to manage traffic on this complex construction project are presented in the following sections.

3.0 GE5 TRAFFIC MANAGEMENT CHALLENGES

Construction of this project along 1.6 km on one of Calgary's key east-west transportation corridors has been a significant challenge from many perspectives. With average daily traffic of 85,000 vehicles/day traveling through the work zone, extensive planning and coordination of construction has been required to maintain traffic flow.

During the predesign phase of the project, it was recognized that the development of detour and construction staging plans would be critical to the successful implementation of this project. As it progressed into the design phase, these detour stages were developed, reviewed and refined to provide a workable solution to construct the project. Many factors were considered including utility relocations, retaining wall construction, bridge construction, roadworks, schedule constraints, access to surrounding development and the potential impacts that construction would have on the adjacent communities, businesses and the surrounding arterial road network.

As development of the project progressed, four key areas emerged related to the management of traffic that would need to be addressed, namely:

1. Managing traffic within the Work Zone;
2. Changing the perspective of Contractors regarding Traffic Management;
3. Managing traffic impacts outside the Work Zone; and
4. Communicating with and managing the expectations of stakeholders.

3.1 Managing traffic within the Work Zone

The project involves the excavation and removal of over 500,000 m³ of dirt along with the construction of 26 retaining walls with a combined area of over 13,000 m², four (4) bridges, 11,000 m of sewers, drains and waterlines, relocation of numerous third party utilities including over 22,000 telecommunications lines all with 85,000 vehicles/day traveling through the work zone. An important consideration was to provide ample working space for the contractor to safely build the infrastructure while minimizing the impacts on the traveling public and adjacent communities and businesses. Glenmore Trail was already experiencing traffic delays and congestion, however, significant additional travel time delays due to construction would not be considered acceptable by

citizens or City Council. Therefore, during detailed design, a significant effort was spent on examining how construction of this project could be undertaken while maintaining traffic flow and minimizing further travel time delays. A summary of the detour stages is provided in Section 4.1.

3.2 Changing the perspective of Contractors regarding Traffic Management

It was recognized that ways of motivating contractors to minimize the impacts on traffic in how they planned and executed the construction would be required. A summary of main methods employed to accomplish this are outlined in Section 4.2.

3.3 Managing Traffic Impacts outside of the Work Zone

As there are no alternate east-west routes across the entire city south of the downtown core, it was necessary to examine how traffic might impact the surrounding arterial road network and the adjacent communities during construction of the project. Some of the mitigations measures developed to address this matter are discussed in Section 4.3.

3.4 Communicating and Managing the Expectations of Stakeholders

Numerous stakeholders would be impacted by traffic during the construction of this project some of which included emergency services (fire, police, ambulance), commuters (vehicular, pedestrian and cyclists), trucking/transportation companies, public transit, adjacent communities and businesses and special interest groups such as tourist agencies and venues, the area hospital and motor vehicle association. Ways of communicating with and managing their expectations would be critical to the success of the project. The highlights of these efforts are presented in Section 4.4.

4.0 GE5 TRAFFIC MANAGEMENT SOLUTIONS

Development and implementation of strategies, plans and solutions for the above four key areas have been instrumental components for the traffic management plan for this project. Highlights from each of these key areas are outlined below.

4.1 Managing Traffic within the Work Zone

After much brainstorming, development and review by the design team, various City departments, and external stakeholders, the detour plans were refined to four (4) main stages.

4.1.1 Detour Pre-Stage 1

This first detour phase focused on the relocation of important utilities (municipal and third party) that were required to remain in service, but in their pre-construction location were in conflict with elements of the project. This stage also provided space to construct the detour roadways which traffic would be re-routed onto to permit

construction of the Elbow Drive, Basketweave Ramp and 5 Street Bridges along with excavation of Glenmore Trail and the construction of retaining walls. A significant component of this particular detour stage was the removal of the signalized intersection at 5 Street and Glenmore Trail along with the complete closure of 5 Street on the north side of Glenmore Trail and of the ramp from Macleod Trail to westbound Glenmore Trail for an extended period of several months. It was anticipated that this would be the most challenging detour stage, in terms of minimizing the travel time delay impacts because of the closure of some of these roads and ramps which would require traffic to be re-directed to other adjacent roadways. However, one of the big benefits in this stage was the removal of the traffic signals on Glenmore Trail at 5 Street which would reduce travel times on Glenmore Trail.

A figure of this detour stage referred to as “Glenmore Trail/Elbow Drive/5 Street SW Construction Staging – Pre-Stage 1” is attached.

4.1.2 Detour Stage 1

This next detour phase required the shifting of traffic from both Glenmore Trail, Elbow Drive and 5 Street onto detour roadways designed to accommodate their respective volumes but laid out in such a way so as to provide adequate space to allow for the excavation of Glenmore Trail, utility work, retaining wall and bridge construction to proceed. This stage required the rebuilding of Glenmore Trail to the north of the existing carriageways west of Elbow Drive and splitting the westbound carriageway to the north side with the eastbound carriageway to the south side of the existing Glenmore Trail, east of Elbow Drive. Elbow Drive was realigned to the east of its existing alignment and 5 Street access to Glenmore Trail was reopened again after closing it in Pre-Stage 1 but restricted to a right in/right out access. Also the ramp from Macleod Trail to westbound Glenmore Trail was also be re-opened in this stage.

A figure of this detour stage referred to as “Glenmore Trail/Elbow Drive/5 Street SW Construction Staging – Stage 1” is attached.

4.1.3 Detour Stage 2

This detour stage will continue to have Glenmore Trail operate on the detour roadway to the north of the existing carriageways west of Elbow Drive. The westbound carriageway, east of Elbow Drive will continue to be the same as Stage 1 but the eastbound carriageway will shift to the north and utilize a portion of the new permanent roadway and pass underneath the bridge for 5 Street. Traffic accessing Macleod Trail in this stage from eastbound Glenmore Trail will do so by using the 5 Street Bridge. Access to and from 5 Street will continue to operate as a right in/right out access to westbound Glenmore Trail similar to Stage 1. The detour for Elbow Drive will be removed with traffic being routed onto the new Elbow Drive Bridge to allow for the continued excavation of Glenmore Trail and construction of the associated retaining walls, utilities and roadworks.

Refer to the attached figure entitled “Glenmore Trail/Elbow Drive/5 Street SW Construction Staging - Stage 2”.

4.1.3 Detour Stage 3

This final detour stage realigns traffic back onto Glenmore Trail with free-flow conditions. The ramp from Macleod Trail to 5 Street and from Elbow Drive to westbound Glenmore Trail will be constructed to their final elevation and alignments during this stage and the Glenmore Trail detour will be removed.

Refer to the attached figure entitled “Glenmore Trail/Elbow Drive/5 Street SW Construction Staging - Stage 3”.

Consideration was also given to allow contractors the opportunity to close Glenmore Trail during the night to allow for less encumbered access of the site and with no traffic to contend with contractors could realize higher production rates therefore completing construction in a shorter timeframe. Detour routes were developed to facilitate the nighttime closures.

An existing feature at both the east and west ends of the work zone is that the configurations of the Macleod Trail and 14 Street interchanges along Glenmore Trail do provide the ability to make u-turns movements at these locations. This provides contractors with flexibility for accessing various points within the work zone and reduces travel time for construction traffic.

4.2 Changing the Perspective of Contractors regarding Traffic Management

The importance of maintaining traffic flow through the project site was identified as being a key issue to ensure that this project is a success. One of the challenges in the past has been to ensure that contractors plan and execute their work in a way that minimizes their impact on traffic.

One of the greatest traffic impacts experienced by motorists is lane closures. Provisions have been included in the construction contracts indicating times when lanes can be closed as well as the hourly rate per lane closure. The intent behind this is not to recover money from contractors but to ensure that only the necessary lanes are closed and that contractors coordinate their work so as to maximize the use of the closed lane. Experience has shown that the traveling public is accepting of some delays and inconvenience to improve the transportation network given that they can readily observe work progressing. Their frustration mounts rapidly when they are delayed or inconvenienced by lane closures that seem to be closed for no apparent reason.

The lane rental fee concept was extended to road closures. As the detour stages for the project were developed, it was realized that closure of some roadways or ramps would be required for periods of time in order to physically construct the project. The contract

included a schedule of roadways, which contractors can close for pre-determined periods of time without a rental fee being charged. However, if the contractor had the roadway closed for longer than the specified time period, then a rental fee per day would be applied for each day the roadway was closed until it was reopened. The intent was to provide contractors with space to construct the project and to provide motivation to reopen the road as soon as that work was completed.

To coordinate all these initiatives and to manage temporary traffic control set-ups a dedicated Traffic Management Coordinator was included on the project team. This position was charged with the responsibilities of planning and liaison with the engineering design team and the contractors in developing traffic management plans for construction of the project and coordinating the various traffic management initiatives for mitigation of traffic impacts on the surround arterial road network and communities.

Specific planning sessions have also been held with the contractors to discuss how traffic will be accommodated and managed, particularly during construction activities that will have a significant impact on the traveling public or stakeholders.

4.3 Managing Traffic outside of the Work Zone

As detailed design of the project and its detours was in progress it was determined that traffic modeling of the individual detour stages using The City of Calgary's regional transportation model would be beneficial in identifying potential problems that might occur on the surrounding road network during construction. Upon completion of the traffic modeling scenarios, an internal team of technical specialists from within The City of Calgary's transportation department was formed to examine traffic impacts and potential mitigation measures for the surrounding arterial road network.

This team comprised of representatives from various groups within The City of Calgary's Transportation Department including: Traffic Signals, Traffic Engineering, Transportation Infrastructure, Calgary Transit, Transportation Data, Network Planning, Transportation Optimization and Community Studies.

In its initial meeting in late 2004, the team was provided with an overview of the project by Transportation Infrastructure and then identified potential traffic issues or opportunities that might occur during the construction of the project.

In January 2005, the team prioritized these issues and opportunities and they were grouped into the following categories: Night Time Closures of Glenmore Trail, Chinook Centre (shopping centre) access, Community Traffic Strategies, Traffic Signal Corridor Reviews, Incident Management, Traveler Information, Traffic Control/Geometrics and Public Transit Operations.

The various issues and opportunities that were identified by the team were grouped into these categories and then subcommittees were charged with developing, reviewing,

evaluating the benefits, costs and feasibility of each issue or opportunity identified in their assigned category.

By March 2005, the subcommittees had completed their work and presented their findings and recommendations to the team. Numerous initiatives were recommended to be implemented. For the purposes of this paper, focus will be directed towards initiatives related to providing traveler information.

4.3.1 The Intelligent Work Zone System

The Intelligent Work Zone System has been developed to monitor traffic flow along Glenmore Trail to inform motorists of conditions in the work zone based on real-time information. This will allow motorists to choose to continue on through the work zone or select an alternate route. It will also serve to increase driver awareness by identifying the level of congestion, lane closures and speed restrictions.

The primary objectives of the Intelligent Work Zone System are:

1. To provide real-time traffic monitoring;
2. To detect changes in normal traffic flow that may be caused by incidents;
3. To provide traveler information regarding incidents and lane closures;
4. To provide traffic management opportunities to adjust traffic signal timings;
5. To improve safety, through early incident detection and response;
6. To reduce congestion during the construction of the project; and
7. To provide information to motorists on planned lane or road closures.

In developing the requirements for this system, one of the considerations was to ensure that its components could be redeployed for future construction projects throughout the city.

The Intelligent Work Zone is a wireless communications system linking four (4) pan-tilt-zoom cameras and eight (8) portable, solar/battery powered LED dynamic message signs to The City of Calgary's Traffic Management Centre (TMC). Images along Glenmore Trail are relayed to the TMC and are analyzed to determine vehicle speed, volume, and occupancy. Changes in speed and occupancy beyond threshold values will be used to alert Operators in the TMC of anomalies in the normal traffic flow. Operators in the TMC can then relay messages back to the portable dynamic message signs.

Three (3) of the portable dynamic message signs will be located within the work zone to provide information regarding construction activities, potential delays, incidents and general traffic conditions. The remaining five (5) portable dynamic message signs will be located on approaches to the work zone to provide information to motorists allowing them to make route choices prior to entering the work zone depending on the prevailing traffic conditions.

One of the measures of success for this system will be how many times the system will be used to provide information on delays and incidents. By monitoring traffic volumes, speeds, and headways, comparisons to baseline values can be made to determine if the system was effective in diverting traffic.

Additionally, feedback from the public may be available through The City of Calgary's 3-1-1 Call Centre that will provide information on how motorists perceived the effectiveness of the system.

Finally, review of collision data from the previous construction seasons can be compared with those that may occur during use of this system to determine if the implementation had a positive effect in reducing work zone collisions.

4.3.2 Traffic Cameras on the Web

Providing motorists with images of traffic conditions within the work zone on The City of Calgary's web site was another idea considered by the team. With a 20-storey apartment building located at the intersection of Glenmore Trail and Elbow Drive, which is situated approximately midway along the work zone, it was decided to install two (2) pan-tilt-zoom cameras with one looking west along Glenmore Trail and the other looking east and with the images being displayed on the City's web site.

Providing these images allows motorists who are planning to travel through the work zone to view conditions prior to starting their trip to determine if they still want to use this route or to select an alternate.

In addition to these two (2) traffic cameras, it is also planned to display images from the four (4) cameras that are part of the Intelligent Work Zone System.

4.3.3 Highway Advisory Radio

The Highway Advisory Radio (HAR) utilizes a local radio transmitter to broadcast information to motorists within the HAR's transmitting range regarding traffic restrictions and lane closures related to City of Calgary projects. It was decided to try a pilot project to determine if the use of this type of system would be beneficial to motorists.

For the purpose of the pilot project, the radio transmitter will be located in the southwest quadrant of the city to ensure that its 9 km transmitting radius would cover the GE5 work zone and surrounding arterial road network. Planned construction work in the southwest portion of the city, including this project, will be broadcasted to motorist with updates being provided on a daily basis.

Signage along key travel routes will advise motorists of the HAR's frequency so that they can tune in to receive traffic related information on projects in the area.

Feedback from the public gathered through The City of Calgary's 3-1-1 Call Centre and web site will provide information on how motorists perceived the effectiveness of the system.

4.4 Communicating and Managing the Expectations of Stakeholders

An extremely important part of any project is communicating and managing the expectations of stakeholders. From the beginning of this project, significant time and effort has been put into this.

With regards to traffic management, communicating with motorists and providing information to set their expectations is an on-going effort. Even in the very early stages of this project, efforts have been made to advise stakeholders and motorists that there will be delays and congestion during construction but that they should focus on the fact that at completion of the project, Glenmore Trail will have free-flow conditions. Numerous media campaigns have been used to communicate these key messages to the general public in addition to regular meetings with the Stakeholders Representative Committee, comprised of external stakeholders who represent communities, institutions and businesses adjacent to the project.

Meetings have also been held with emergency services (fire, police and ambulance) as well as special interest groups such as trucking associations, motor vehicle association, tourist attraction operators and even the area hospital located to the west of the work zone to provide information on the project and its detours.

With four (4) residential communities bordering the project site, it was decided to have each community establish traffic committees to work with The City of Calgary to address potential traffic impacts during construction of the project. Meetings were arranged to establish these committees and to discuss their respective issues or concerns. From the information gathered, specific temporary mitigation measures were implemented in the very early stages of the project in each of these communities to address some of their key concerns.

In addition to installation of these mitigation measures, a process was developed and implemented to handle traffic complaints or inquiries from residents within these communities. When a complaint is received from a resident from within one of these communities it is re-directed to their respective community traffic committee for review and investigation. The community traffic committee would in turn complete a form, designed to provide a reasonable level of information on the traffic concern, and submit it to the project team for review and consideration. The project team would review the concern and respond back to the community traffic committee advising them of what action will be undertaken to address the concern, if one is warranted. This process has worked well in keeping the community traffic committees informed of concerns from their respective residents and has reduced the time and effort of the project team in reviewing such matters.

5.0 KEY LESSONS LEARNED

Even though this project is still currently under construction, there are a few lessons that have been learned to date.

First, traffic management planning is an important step that should not be overlooked. Depending on the nature and complexity of the project, this may be straight forward or a very involved process but one that should be undertaken nonetheless. In traffic management planning, consider who the stakeholders are, what do they expect and determine how their expectations will be managed. It is important to rank stakeholders in terms of their priority, as some stakeholders can have competing interests. Know which stakeholders will determine whether your project is a success or not.

Second, you cannot communicate enough. When problems arise, they often can be traced back to a breakdown in communication somewhere. Providing appropriate information to stakeholders in a variety of forms and means will ensure you are getting your message to them so that they can be informed.

Finally, technology, particularly in regards to traveler information systems, is providing a variety of ways and tools for monitoring and managing traffic and enabling a range of methods for communicating to motorists and stakeholders.

6.0 CONCLUSION

Managing traffic on construction projects in a safe and effective manner so as to minimize impacts can be a challenging task. Often it requires a multi-faceted approach involving planning, engineering design, managing expectations and communicating with stakeholders. The ideas discussed in this paper can be used to develop a toolbox of plans and strategies for managing traffic on similar complex, urban transportation projects.

7.0 REFERENCES

Bain, Canace. (April 2005). *Intelligent Work Zone System for the Glenmore Trail Corridor Project*. Calgary, AB

Stantec Consulting Ltd. (August 2003). *Glenmore Trail Predesign Study*. Calgary, AB

The City of Calgary Transportation Planning (April 2005). *Glenmore-Elbow-5 Street Traffic Management Plan*. Calgary, AB

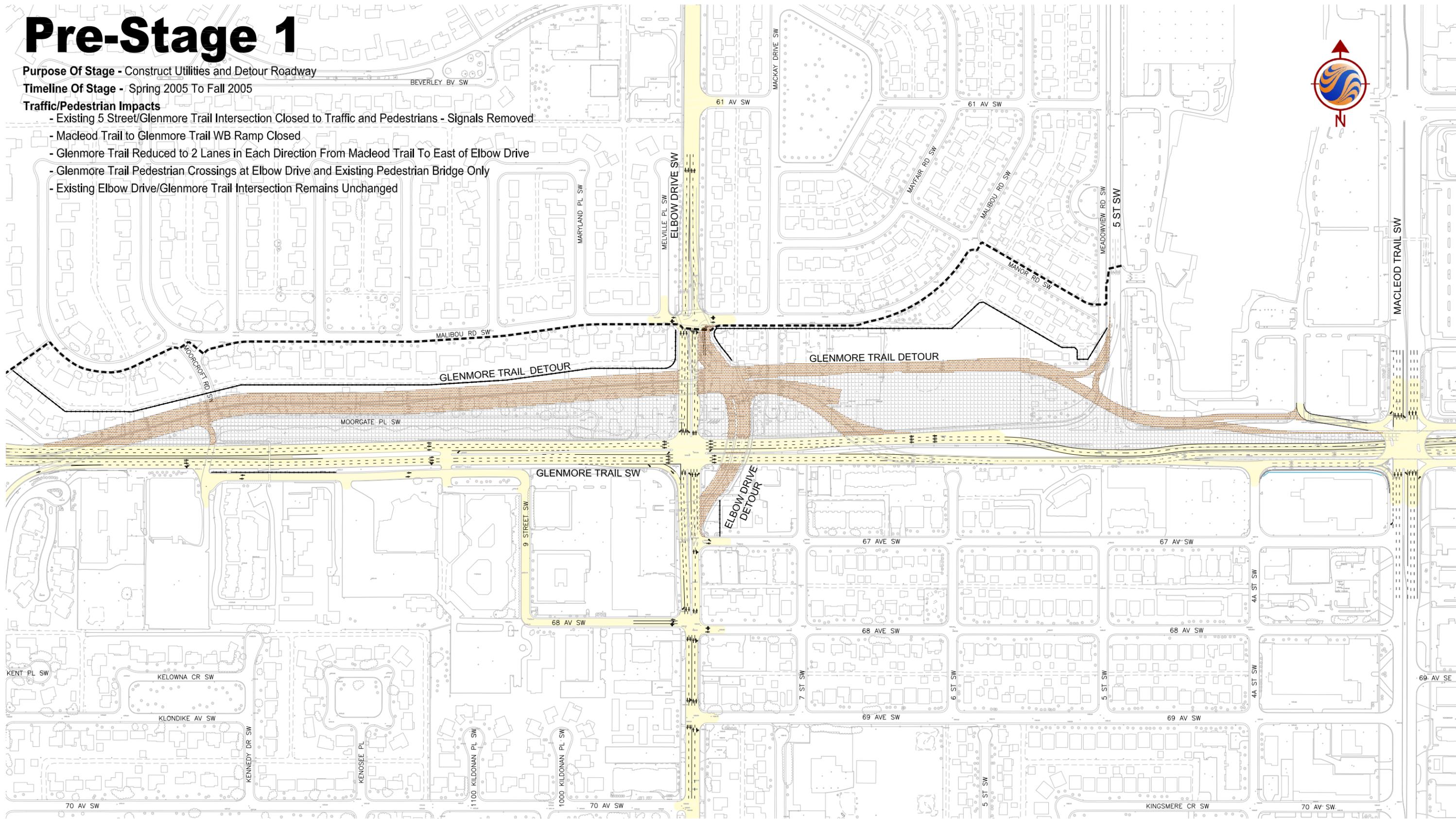
Pre-Stage 1

Purpose Of Stage - Construct Utilities and Detour Roadway

Timeline Of Stage - Spring 2005 To Fall 2005

Traffic/Pedestrian Impacts

- Existing 5 Street/Glenmore Trail Intersection Closed to Traffic and Pedestrians - Signals Removed
- Macleod Trail to Glenmore Trail WB Ramp Closed
- Glenmore Trail Reduced to 2 Lanes in Each Direction From Macleod Trail To East of Elbow Drive
- Glenmore Trail Pedestrian Crossings at Elbow Drive and Existing Pedestrian Bridge Only
- Existing Elbow Drive/Glenmore Trail Intersection Remains Unchanged



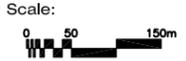
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Legend:

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| | Traffic Signals |
| | Open To Traffic |
| | Road Construction For Next Stage |
| | Available For Construction |
| | Temporary Pedestrian Route |



Glenmore Trail/Elbow Drive/5 Street SW Construction Staging



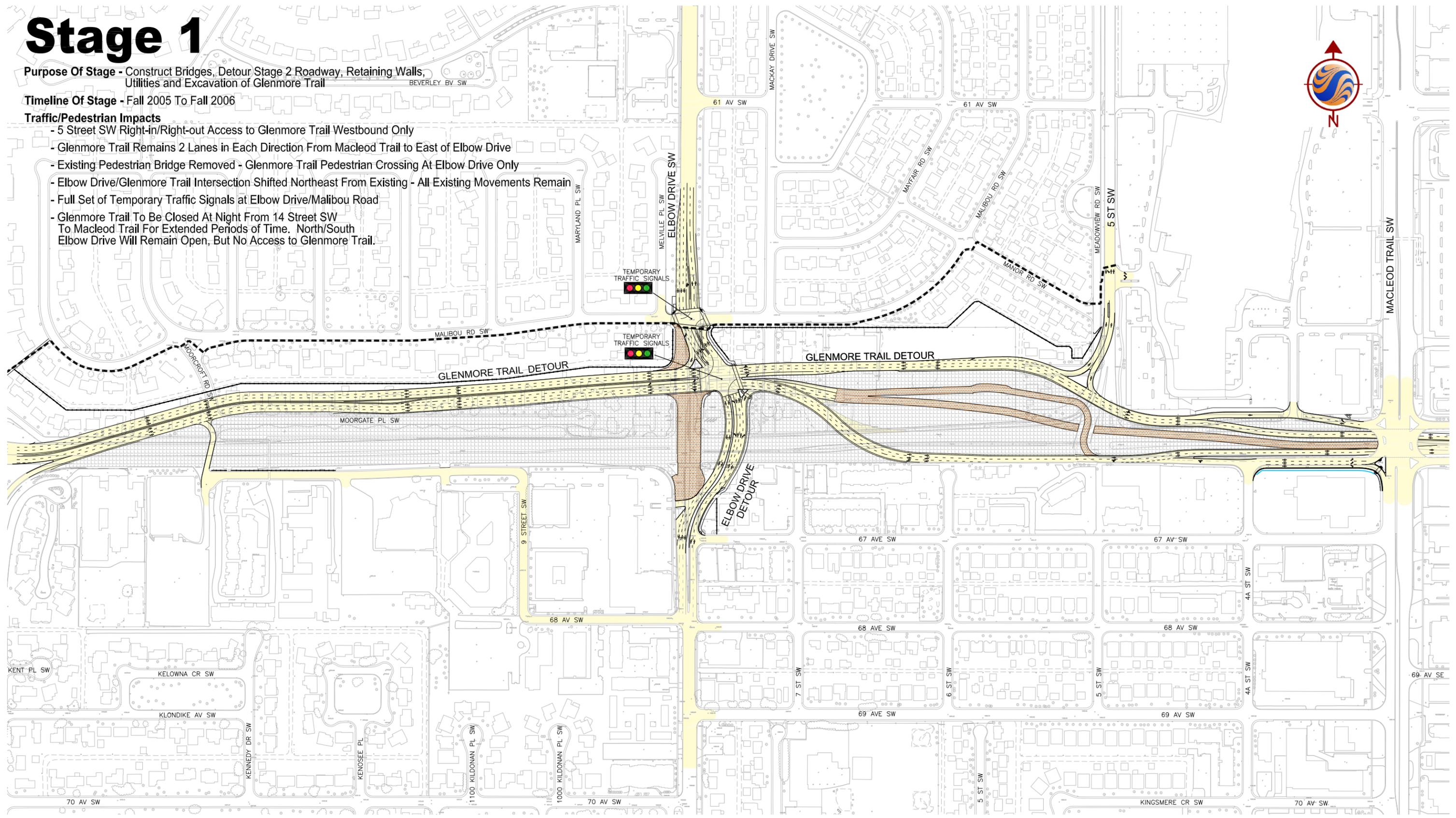
Stage 1

Purpose Of Stage - Construct Bridges, Detour Stage 2 Roadway, Retaining Walls, Utilities and Excavation of Glenmore Trail

Timeline Of Stage - Fall 2005 To Fall 2006

Traffic/Pedestrian Impacts

- 5 Street SW Right-in/Right-out Access to Glenmore Trail Westbound Only
- Glenmore Trail Remains 2 Lanes in Each Direction From Macleod Trail to East of Elbow Drive
- Existing Pedestrian Bridge Removed - Glenmore Trail Pedestrian Crossing At Elbow Drive Only
- Elbow Drive/Glenmore Trail Intersection Shifted Northeast From Existing - All Existing Movements Remain
- Full Set of Temporary Traffic Signals at Elbow Drive/Malibou Road
- Glenmore Trail To Be Closed At Night From 14 Street SW To Macleod Trail For Extended Periods of Time. North/South Elbow Drive Will Remain Open, But No Access to Glenmore Trail.



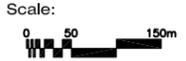
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Glenmore Trail/Elbow Drive/5 Street SW Construction Staging



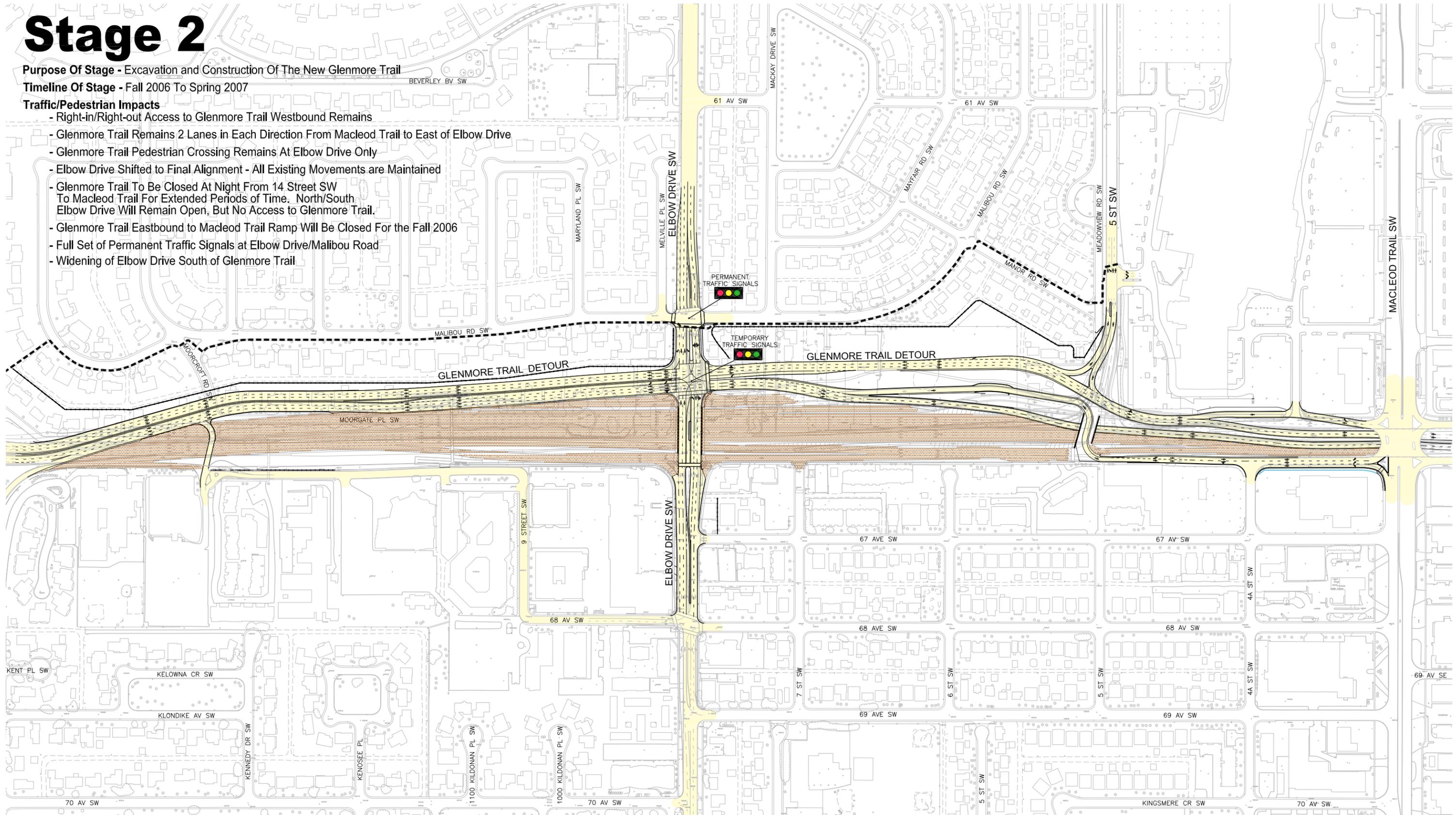
Stage 2

Purpose Of Stage - Excavation and Construction Of The New Glenmore Trail

Timeline Of Stage - Fall 2006 To Spring 2007

Traffic/Pedestrian Impacts

- Right-in/Right-out Access to Glenmore Trail Westbound Remains
- Glenmore Trail Remains 2 Lanes in Each Direction From Macleod Trail to East of Elbow Drive
- Glenmore Trail Pedestrian Crossing Remains At Elbow Drive Only
- Elbow Drive Shifted to Final Alignment - All Existing Movements are Maintained
- Glenmore Trail To Be Closed At Night From 14 Street SW To Macleod Trail For Extended Periods of Time. North/South Elbow Drive Will Remain Open, But No Access to Glenmore Trail.
- Glenmore Trail Eastbound to Macleod Trail Ramp Will Be Closed For the Fall 2006
- Full Set of Permanent Traffic Signals at Elbow Drive/Malibou Road
- Widening of Elbow Drive South of Glenmore Trail



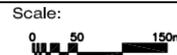
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| | Road Construction For Next Stage |
| | Available For Construction |
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Glenmore Trail/Elbow Drive/5 Street SW Construction Staging



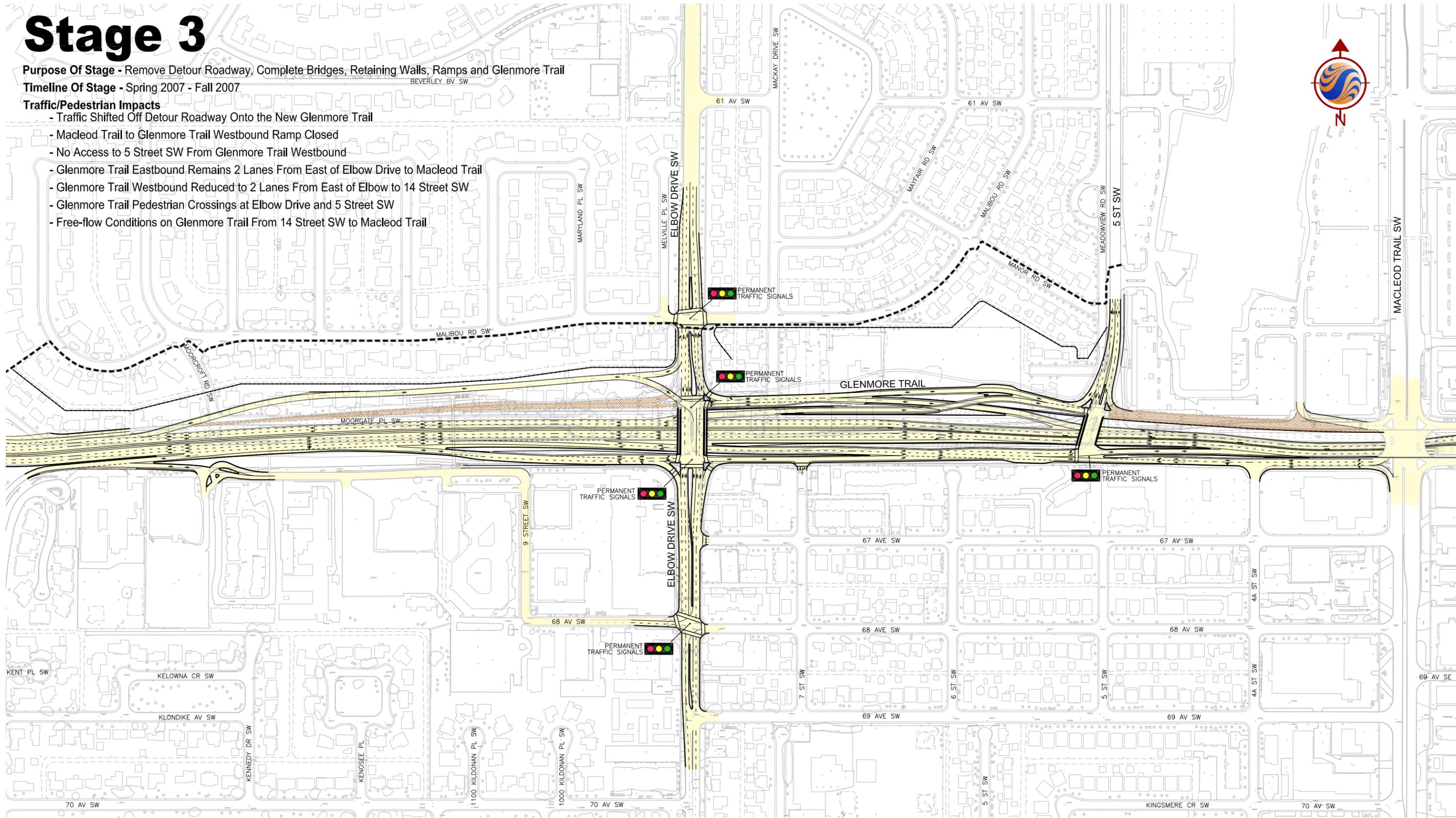
Stage 3

Purpose Of Stage - Remove Detour Roadway, Complete Bridges, Retaining Walls, Ramps and Glenmore Trail

Timeline Of Stage - Spring 2007 - Fall 2007

Traffic/Pedestrian Impacts

- Traffic Shifted Off Detour Roadway Onto the New Glenmore Trail
- Macleod Trail to Glenmore Trail Westbound Ramp Closed
- No Access to 5 Street SW From Glenmore Trail Westbound
- Glenmore Trail Eastbound Remains 2 Lanes From East of Elbow Drive to Macleod Trail
- Glenmore Trail Westbound Reduced to 2 Lanes From East of Elbow to 14 Street SW
- Glenmore Trail Pedestrian Crossings at Elbow Drive and 5 Street SW
- Free-flow Conditions on Glenmore Trail From 14 Street SW to Macleod Trail



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Legend:

- Traffic Signals
- Open To Traffic
- Road Construction For Next Stage
- Available For Construction
- Temporary Pedestrian Route

Scale:



Glenmore Trail/Elbow Drive/5 Street SW Construction Staging

