

Appendix B: Construction Mitigation Approach

WSDOT's approach to construction mitigation

With the advent of the 2003 Nickel Program and the 2005 Transportation Partnership Act, WSDOT began to develop a scalable construction mitigation program that keeps people moving during construction. This will be done largely through transportation demand management (TDM), and, in certain corridors, increased transit service.

WSDOT developed a computer model to identify mitigation needs for transportation construction projects. Factors used to determine the need include speed and volume of traffic on affected corridors, the availability of public transportation, the origin and destination of trips, single occupant vehicle ratio on the corridor, and land uses surrounding the corridor.

In WSDOT's methodology, new corridors will not require mitigation.

For the corridors requiring construction mitigation, WSDOT uses the best available data to estimate the impact of construction on overall travel, including the number of trips affected and needing to be mitigated. The best estimates on the timing and duration of construction, the number of lanes to be closed by time of day and direction of travel, whether or not HOV lanes will remain open or be available, whether or not lanes will be narrowed, and other construction impacts as well as policy directives will also be factors. WSDOT uses this data and these factors to model the best estimate of the number of trips that will be impacted by construction, as well as the impacts that can be managed or mitigated.

Of those impacts that can be mitigated, WSDOT will determine how best to mitigate through maintaining or replacing roadway capacity, or through shifting the trip (geographically, temporally, modally). Public information and outreach will be provided to the travelers in that area about the best strategy mix for maintaining mobility.

WSDOT has also assigned costs to various types of replacement trips. Generally speaking, TDM measures are less costly on a per-trip basis than the provision of additional transit service. Specific costs will vary by corridor.

WSDOT proposes to use these TDM strategies to affect travel choice:

- Maintain roadway capacity with increased bus service, maximize HOV use, and enhance incident response.
- Shift trips to transit and HOV with park & ride enhancements, as well as through efforts to affect when and where travel occurs.
- Engage and inform the public through expanded highway real-time travel information.
- Target outreach to specific geographic and trip markets to ensure the most people have good information about the situation and their travel options.

Sizing transit service for construction mitigation projects

The transit mitigation program should be sized to meet anticipated demand. Individual services should be sized to remain cost-effective, and the total program should not exceed transit capacity limits. Additionally, public information and outreach, as well as the approach taken to managing project construction, will impact demand for transit service during the construction period.

The following factors provide a basis for determining the proper size of a transit mitigation program:

- Severity and duration of construction–related congestion.
- Strength of underlying transit market—the success of transit as a mitigation strategy will be proportionate to the underlying fit and attractiveness of transit in the corridor.
- Change in relative travel time between transit and driving—in some corridors, if travel time for single-occupant vehicles erodes, and travel time for transit remains the same or improves, incremental transit ridership will rise.
- Likely effectiveness of cost and incentive programs— marketing and transit incentive programs may provide incremental increases in transit ridership. Data from other mitigation programs should be used to determine effectiveness.
- Capacity constraints—recognize that there are reasonable limits to the amount of transit service that can be added to an existing system or within a specific time period.

Transit's effectiveness as a mitigation strategy improves when the following conditions are met:

- Speed and reliability—transit provides a faster and more reliable trip than driving. HOV lanes must remain available and managed, or an alternate route provided for transit.
- Incentives—rider incentives should include subsidized transit passes, parking management, and tolls
- Fleet and base capacity—both must be sufficient and commensurate with the anticipated service growth.
- Funding and capacity—for operating additional transit service hours, as well as for fleet and base expansion that may be necessary.

Transit mitigation service principles

The general principles guiding transit service as a construction mitigation strategy are identified below:

- **Enhance existing service.** Enhancing existing services will be more effective and will have longer lasting benefits than new services. It takes time to build ridership on any transit route, and to build awareness of the service among potential customers. It is also faster to implement an increase in existing service rather than establishing a new service or route, since customer service information and driver training materials exist, facilities are in place, and there is already a knowledgeable customer base from which to build additional ridership. Customers gained on existing transit services during the mitigation period are more likely to continue riding transit once the construction period is over.
- **Increase the use of existing capacity.** Beginning in 2009 with the opening of Sound Transit light rail, there will be significant added capacity in the transit system. Timing project construction to take advantage of this added transit capacity in commuter rail and light rail will place transit in a better position to play a large role in construction mitigation. To be successful, feeder bus routes and park & ride access must already be in place and sufficient to allow potential riders to access the system. Where capacity also exists on the local and express bus system, it can be used more effectively if targeted marketing and incentive programs are implemented.
- **Keep transit mitigation service and programs simple.** Additional services should be simple to understand for potential riders. Short and direct services to well-known sites will be more effective than complicated, customized services.

Constraints on transit capacity for mitigation

- **Growth in service hours.** New transit service can only be added incrementally. The rate of service growth is limited by the ability to hire and train drivers. For King County Metro, this is estimated to be an additional 100,000 to 125,000 hours per year maximum.
- **Availability of fleet.** A determination must be made early in the mitigation planning process whether to purchase new buses for transit service. A new bus is a twelve-year investment for a transit operator, so it must be decided whether the investment is worth the added service needed for mitigation. Alternately, extending the service life of the existing fleet is another option. Both of these strategies will have capital and operating costs to the operator.
- **Base capacity.** The most significant capacity constraint for the transit operators is at the operating bases. Providing transit mitigation service will likely require an investment in additional capacity at several existing operating bases, either temporarily or permanently.

The above constraints for transit service must be kept in mind as construction schedules and mitigation programs are developed. One concern that transit operators have expressed is the potential for significant spikes and troughs in the construction program, where overlapping construction projects could overwhelm transit's ability to provide sufficient fleet, operators, and base capacity for the demand in the spike periods.

Construction mitigation costs and financing

Determining costs. As part of its needs identification, WSDOT determines the number of trips that will be impacted by a specific construction project, and then determines how many of those trips can reasonably be mitigated. WSDOT assigns costs for each trip to be mitigated, depending on the type of mitigation provided, typically transit or demand management. The percentage targets that WSDOT assigns for transit and demand management mitigation will depend both on the presumed effectiveness of that measure, as well as the cost per trip to mitigate. Transit service tends to be more productive (and less costly) when the service carries passengers in both directions, and there is frequent passenger turnover. Long-haul, single-direction, single-seat passenger trips are the most costly to deliver.

Construction mitigation allotments in project budgets and RTID finance. There is no requirement for, and thus no plan for, a certain percentage of RTID funds to be allocated for mitigation. RTID estimates for mitigation have been determined at the corridor level for planning purposes, and are included in the proposed RTID budget for each county, and not on a project-by-project basis. This will allow flexibility in the program and an ability to optimize resources, as mitigation needs will vary by corridor, and may change as project scopes are resolved, and project construction schedules are determined.

Sample corridor mitigation program: I-405

WSDOT has performed a sample analysis for mitigation by examining one segment of southbound I-405 during the 7 am – 8 am morning rush period, during the proposed period of construction of this project. WSDOT's model has determined that throughput in the general-purpose lanes, normally at 2200 cars for this one-hour period, would be reduced to 1720. The HOV lanes, however, would have capacity for an additional 170 vehicles per hour. WSDOT's mitigation goal would be to shift the people traveling in at least 375 vehicles per hour from the general-purpose lanes to other means.

The mitigation strategies in this example include:

- Expanded real-time travel information along the corridor for personal vehicles and transit.
- Increased incident response services.
- Increased use of vanpool and carpools.
- Increased use of van sharing.
- Coordinated communications with employers, business organizations, property managers, transportation coordinators, and residential communities.

Transit's role in mitigation in this corridor could be significant, as long as HOV lane performance is maintained throughout the construction period. Transit could carry a large share of commuters heading toward activity centers, especially Bellevue, Renton, and Overlake. For example, some I-405 routes from the Renton Highlands could be re-routed to use the Sunset Highway and I-5 instead of I-405 and I-90.

Transit operators could also do the following:

- Expand existing Sound Transit regional express service.
- Provide express services targeted to corridor activity centers.
- Provide additional service on Coal Creek Parkway.
- Add feeder bus service to enhance access to Sounder commuter rail.