

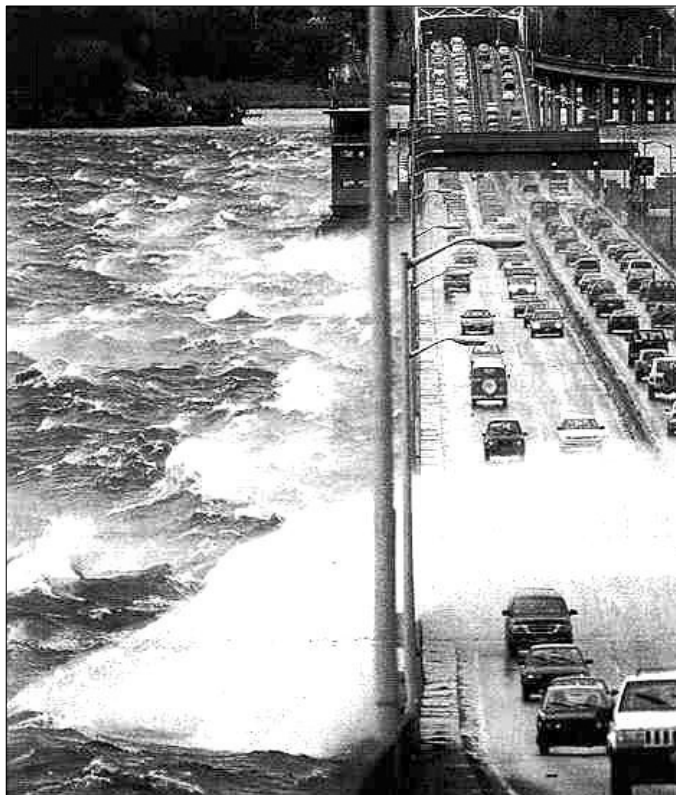


**Washington State
Department of Transportation**

SR 520

Catastrophic Failure Plan

Summer 2008



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Executive Summary

The SR 520 bridge and approaches are vulnerable to both windstorms and earthquakes, and are nearing the end of their useful lives. The SR 520 floating bridge currently carries approximately 160,000 people and 115,000 vehicles per day. As one of only two Lake Washington crossings, it is a vital regional corridor for transportation of both people and goods. If the SR 520 bridge were to fail, the effects to regional and statewide travel and economy would be significant.

The Washington State Department of Transportation (WSDOT) is committed to catastrophic failure planning to ensure public safety and a speedy recovery in the event of a catastrophic loss of the SR 520 bridge. In coordination with transportation, communications and emergency response professionals from regional jurisdictions, transit agencies, businesses and community organizations, WSDOT has developed this plan to lay out steps state and local agencies may take to manage traffic and communications should such an event occur. This plan consists of a transportation management plan and a communications plan.

Keeping Puget Sound moving

The overarching goal of the catastrophic failure plan is to identify strategies to keep people and commerce moving in and around the central Puget Sound region in the event of a SR 520 bridge failure. The catastrophic failure plan builds upon established WSDOT SR 520 emergency management procedures. It represents a toolbox of strategies that can be implemented to keep central Puget Sound drivers and commerce moving during a long-term recovery from a SR 520 bridge failure.

The transportation management plan provides WSDOT, local jurisdictions and transit agencies with transportation strategies designed to ease traffic congestion resulting from the failure of the SR 520 bridge. The communications plan will support emergency response, bridge recovery and bridge restoration efforts through development, coordination and dissemination of emergency public information.

Current activities that support the catastrophic failure plan

Some elements of the SR 520 Bridge Replacement and HOV Project support the catastrophic failure plan. These include:

- **SR 520 Pontoon Construction Project**—This project advances pontoon construction in hopes of restoring the floating section of the SR 520 bridge before a catastrophic failure event occurs.
- **Accelerated SR 520 project schedule**—In response to Gov. Gregoire's request, WSDOT identified ways to reduce the overall project schedule. The acceleration will result in opening the new bridge to traffic in 2014—

four years earlier than previously planned. This will result in a significant cost savings.

Several proposed projects identified in WSDOT's "Moving Washington" mobility and anti-congestion program could support early actions of the catastrophic failure plan.

Building on past work

Preliminary catastrophic failure planning was completed in fall 2006. It identified the emergency procedures currently in place throughout the region. These procedures were combined and summarized for easier reference in the event of a short-term response to a catastrophic event (i.e., a windstorm or an earthquake) that would result in the failure of the SR 520 bridge. The catastrophic failure plan builds on current strategies that have been implemented when unplanned, short-term closures have occurred in the past (e.g., during several recent winter windstorms).

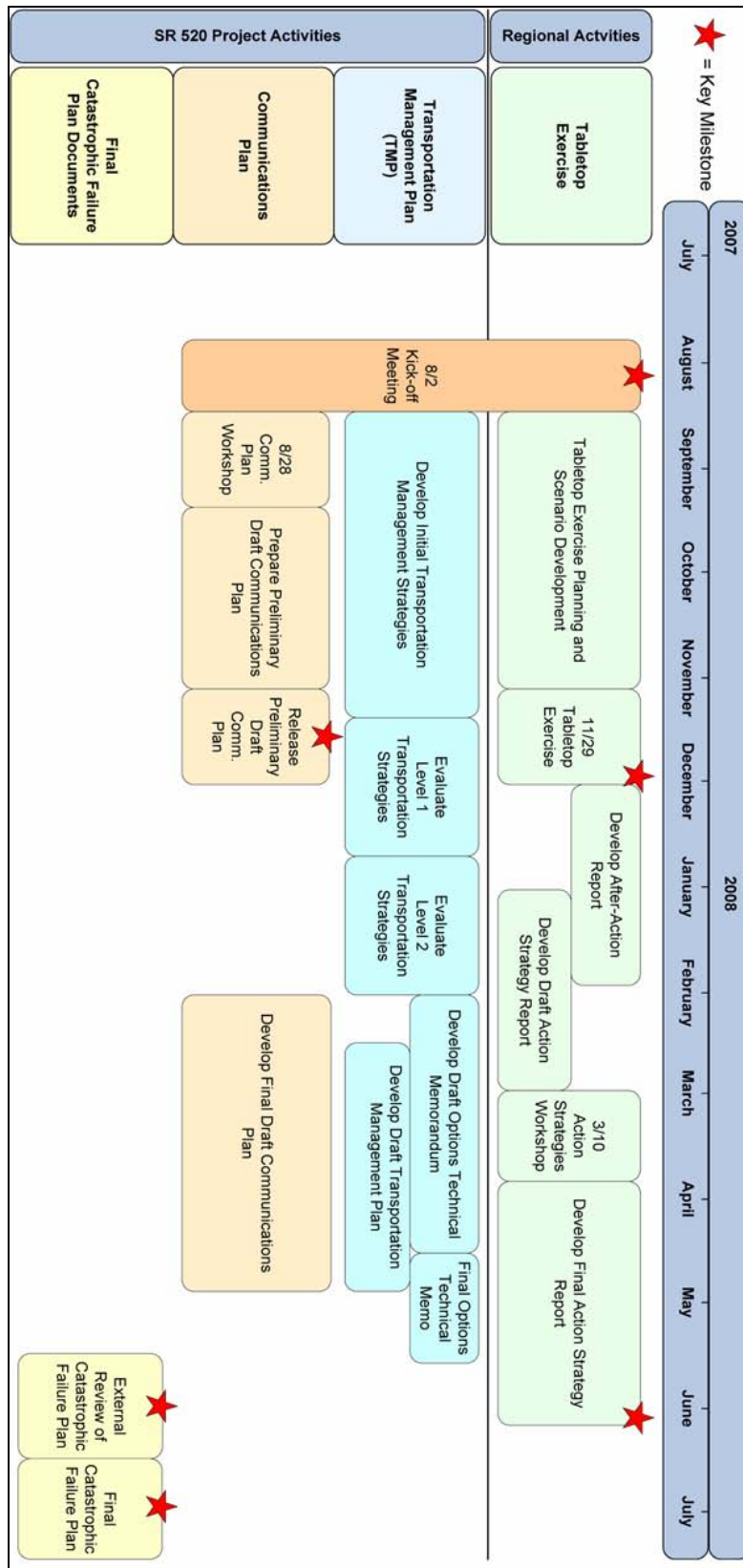
Developing the catastrophic failure plan

Subsequent to preliminary catastrophic planning, the SR 520 Bridge Replacement and HOV Project team continued to work with jurisdictions and transit agencies to facilitate a coordinated response to a potential SR 520 bridge failure. The intent was to develop a comprehensive list of potential strategies and improvements for WSDOT highway facilities that could get the central Puget Sound region moving again and could aid in the long-term recovery process. The SR 520 project team developed a three-pronged approach to prepare a catastrophic failure plan:

- Conduct a tabletop exercise.
- Develop a transportation management plan.
- Develop a communications plan.

In a final step, the transportation management plan and the communications plan were merged into the catastrophic failure plan. The overall process for development of the catastrophic failure plan is shown in *Exhibit ES-1* and includes the development process for each of these elements.

Exhibit ES-1. 2007 to 2008 Catastrophic Failure Planning Process with Key Milestones



Tabletop exercise and action strategy workshop

The SR 520 project team prepared plans for a tabletop exercise that would help inform a catastrophic failure plan. The resulting transportation management plan and communications plan seek to address findings of the tabletop exercise action strategy workshop. These plans also summarize and build upon key findings from the preliminary planning effort. They ultimately provide WSDOT, local jurisdictions and transit agencies with a toolbox of possible strategies to manage traffic congestion that would result from a SR 520 bridge failure.

Tabletop exercise

On Nov. 29, 2007, WSDOT hosted a tabletop exercise with local jurisdictions, businesses and other key stakeholder organizations to examine preparedness, response and longer-term recovery issues associated with a SR 520 bridge failure. The goals of the exercise were to:

- Raise awareness of vulnerabilities and risks to the bridge.
- Identify response and longer-term restoration needs in the event of a SR 520 bridge failure.
- Develop “lessons-learned” that could be incorporated into future plans and activities.
- Obtain information from participants that could be used to develop a transportation management plan and a communications plan to be implemented in the event of a SR 520 bridge failure.

The day-long tabletop exercise focused on emergency management, transportation management and communications before and after failure of the SR 520 floating bridge in a major windstorm. The exercise also addressed longer-term consequences and challenges associated with the resilience of the regional economy and moving people and freight.

Action strategy workshop

Tabletop exercise participants met for a follow-up action strategy workshop on March 10, 2008. The goal of the workshop was to discuss and prioritize transportation management activities on the basis of findings and recommendations from the tabletop exercise.

Specific action strategies were developed in these areas:

- Communications.
- Emergency management.
- Economic issues.
- Freight issues.

- Mobility.

The workshop allowed stakeholders to identify issues and potential long-term transportation and economic impacts resulting from the loss of the SR 520 bridge. Participants also had the opportunity to hear from representatives from the Minnesota Department of Transportation about response, recovery and replacement activities associated with the I-35W bridge collapse that occurred on Aug. 1, 2007.

Transportation Management Plan

Assumptions

Bridge failure scenario

Of the failure scenarios considered during preliminary catastrophic failure planning, the final transportation management plan assumed only a windstorm-caused loss of the SR 520 bridge. In this scenario, it was assumed that the Portage Bay viaduct would remain operational.

An earthquake scenario could result in significantly more infrastructure damage than just the SR 520 bridge and its approaches, possibly affecting facilities such as the Alaskan Way Viaduct, I-90 bridge and other regional structures. Because of the broad-scale damage that could result from such a disaster, evaluation of an earthquake scenario was determined to be beyond the scope of the transportation management plan. However, most of the conclusions and recommendations outlined in this document—while focused on the loss of the SR 520 floating bridge structure only—are intended to be useful in a variety of bridge failure and other emergency scenarios.

The transportation management plan includes a list of potential capacity improvements that can be implemented within a relatively short timeframe following a SR 520 bridge failure.

WSDOT's priorities for managing regional highway facilities in the event of a SR 520 bridge failure

The strategies described in the transportation management plan were developed to move people and goods as safely and efficiently as possible in the event of a SR 520 bridge failure. Given the already congested highway system, a transit and transportation demand management response will be vital to keeping traffic moving on the regional highway system. This approach allows movement of the most people in the fewest number of vehicles. Therefore, the roadway improvements described here were identified to prioritize efficient transit and high occupancy vehicle (HOV) travel, and to maintain reliability and travel time as much as possible without compromising safety.

Evaluated facilities

The SR 520 project team reviewed the results from the SR 520 travel demand model used during preliminary catastrophic failure planning which estimated potential changes in traffic patterns with the loss of the SR 520 bridge. Based on these results and additional analysis, the project team focused its analysis on the following state routes that would be expected to carry the majority of the displaced bridge traffic (*Exhibit 1-2*):

- SR 520.
- I-90 between I-5 and 150th Avenue SE.
- I-5 between Boeing Access Road and NE 175th Street.
- SR 522 between I-5 and I-405.
- SR 523 between I-5 and SR 522.
- I-405 between Coal Creek Parkway and SR 522.

A broader area was evaluated for the transit component of the transportation management plan, which included a review and evaluation of service and infrastructure improvements beyond WSDOT facilities. Review elements included locations for more bus stops, park-and-ride facilities and transit centers.

Key outreach participants

Local jurisdictions

The SR 520 project team met with transportation managers and public information officers from local jurisdictions in a series of meetings. These meetings were important because they allowed jurisdictional staff to share their respective concerns and to collaborate on the development of initial transportation management and communications strategies.

Transit agencies

The SR 520 project team worked with King County Metro and Sound Transit representatives throughout the transportation management plan development process. Representatives from these agencies and Community Transit also actively participated in other agency and jurisdictional outreach activities conducted by the project team, in the tabletop exercise and in the action strategy workshop.

WSDOT Public Transportation Division

The SR 520 project team met with representatives from WSDOT's Public Transportation Division in January 2008. They helped determine which of the transportation demand management strategies identified during preliminary

catastrophic failure planning should be further analyzed for inclusion in the final transportation management plan.

WSDOT Freight Systems Division

The SR 520 project team met with representatives of WSDOT's Freight Systems Division in January 2008 to discuss WSDOT's approach to addressing freight transportation issues in the transportation management plan. WSDOT freight representatives described their key concerns and some of the related efforts that were already underway.

Key transportation management strategies

In the event of a SR 520 bridge failure, WSDOT will act quickly to ensure the maximum safety and efficiency of the regional highway system. Detailed response strategies and transportation demand management tactics listed in the transportation management plan describe how WSDOT will approach this.

Strategies for the central Puget Sound region's major corridors

The transportation management plan further details a series of suggested transportation management packages that could be implemented as first steps to keep the region moving after a SR 520 bridge failure. These packages are described in Chapter 5, and are intended to be used as an initial starting point for traffic mitigation. The strategies are expected to be temporary in nature, and not intended as longer-term solutions. They can be implemented within one month of a catastrophic bridge failure; other packages described in the transportation management plan are designed for implementation within a longer timeframe.

Some of the packages are temporary in nature and are intended to be in service under emergency conditions while the SR 520 structures are being replaced. Design standards, such as speed and lane width, would be evaluated when implementing the temporary strategies to determine whether design deviations should be considered. Some of the packages build upon plans that are already in design or are programmed for construction. In the event of a SR 520 bridge failure, WSDOT would determine which of these packages would be accelerated or delayed based on the changed traffic conditions.

Transit agencies' role in addressing mobility

In the event of a SR 520 bridge failure, transit service would play a key role in maintaining mobility throughout the region, particularly across Lake Washington. There are three major considerations regarding the role of transit agencies in addressing mobility following a SR 520 bridge failure:

- Transit will need fast and reliable paths to be an effective transportation mode, requiring commitment to transit priority.

- Public awareness and rider incentives will be needed to ensure that people take maximum advantage of available transit service.
- Availability of equipment, personnel and particularly funding will constrain how quickly new transit service can be added and the total amount of additional transit service that will be possible.

The nature of the modifications that can be made to transit service following a SR 520 bridge failure are described in Chapter 6. This includes discussion of how service would likely be modified to provide connections between major centers on the west and east sides of Lake Washington. Rider incentives—such as the provision of free bus service, options for increasing the supply of bus coaches and vehicles and identification of potential locations for additional park-and-ride capacity—are also discussed as strategies for increasing the effectiveness of transit following a SR 520 bridge failure.

Managing transportation demand

Transportation demand management (TDM) uses existing infrastructure as efficiently as possible and implements programs to reduce demand for transportation facilities. In the event of a SR 520 bridge failure, it will be critical to make the best use of the available infrastructure by increasing the use of alternative travel modes and work arrangements.

TDM strategies are discussed in Chapter 7. Longer-term strategies such as expanded employer-sponsored commuter benefits programs and new demonstration programs are also described in the transportation management plan.

Freight considerations

For freight traffic, the return of traffic operations on I-405 and I-90 as close to pre-failure conditions as soon as possible will be critical. This is consistent with the transportation management plan goal of maintaining reliability and travel times, as described in the plan. Towards this end, the planned regional projects and recommended traffic management strategies focus on improving overall traffic operations on I-90, I-5, I-405 and SR 522 in the event of a SR 520 bridge failure. While many of the recommended improvements would benefit freight movement, the transportation management plan does not provide specific strategies for improving freight movement in the event of a bridge failure. Such strategies would require regional policy deliberations and additional coordination with local agencies that were not part of the scope of this planning effort. Chapter 8 discusses freight strategies and policy considerations.

Transportation management next steps

The transportation management plan provides a starting point in identifying a range of possible strategies to manage the regional transportation system in the

event of a SR 520 bridge failure. Chapter 9 suggests a process for implementing appropriate strategies in a timely manner following a bridge failure. It also suggests early actions and strategies that could be advanced to enhance regional preparedness.

Communications Plan

To prepare for a possible SR 520 bridge failure, the WSDOT, in collaboration with regional jurisdictions and agencies, has developed a communications plan. In the event of a bridge failure, the plan will support emergency response, bridge recovery and bridge restoration efforts through development, coordination and dissemination of emergency public information.

The plan will serve as a guide for WSDOT communicators to use if a catastrophic failure were to occur. The plan builds on current communications strategies that have been implemented when unplanned, short-term closures have occurred in the past (e.g., during several recent winter windstorms) and identifies specific tools and strategies to utilize if SR 520 is closed for a longer period of time.

Purpose

- Emphasize public safety as WSDOT's first priority in the event of a SR 520 bridge failure.
- Ensure public confidence in WSDOT as a credible and accountable organization.
- Provide effective guidelines, strategies and tools for WSDOT communications staff in the event of a SR 520 bridge failure.
- Outline suggested guidelines, strategies and tools for jurisdictions and agencies to effectively disseminate critical, core information to their constituencies.
- Establish clear and effective communication lines between WSDOT and local, regional, state and, if needed, federal personnel.
- Provide a communications framework that ensures consistent messaging across agencies.

Assumptions

Incident command system and emergency operations centers

In the event of a SR 520 bridge failure, it is assumed that the incident command system, under the National Incident Management System, would be utilized. It is also assumed that the emergency operations center at WSDOT's Northwest Region Dayton office in Shoreline would be activated.

It is also likely that other state and regional emergency operations centers would activate, depending on the event severity and its regional effects.

Bridge failure scenario

The communications plan does not specify a particular SR 520 bridge failure scenario. It assumes that the strategies and tools identified may be universally applied in any medium- to long-term closure of the SR 520 corridor, including the Evergreen Point floating bridge, the Portage Bay viaduct, and the surrounding roadways or approaches.

In either an earthquake or severe windstorm event, it is assumed that a failure of SR 520 would be part of a larger regional situation. To view simulated visualizations of how the SR 520 bridge may fail in either an earthquake or a windstorm, visit www.youtube.com/wsdot.

Timeframe

The communications plan outlines activities and strategies for different phases of a potential catastrophic failure:

- **Pre-storm**—Activities that may take place prior to a windstorm or other potentially catastrophic event that can be forecasted or predicted.
- **Response**—Activities that will take place in the immediate aftermath of a catastrophic event, and last until the transition from response to recovery.
- **Recovery and restoration**—Activities limited to recovery and restoration of the SR 520 corridor.

The official transition between the response and the restoration occurs when the incident command post is dismantled.

Key players and resources

WSDOT is the lead agency in communicating and disseminating information about the SR 520 bridge. WSDOT will work closely with King County and local municipalities and assist with other regional transportation agencies.

WSDOT will rely on a variety of communications outlets and resources to help communicate messages during a SR 520 closure.

These resources include:

- WSDOT Web site.
- 5-1-1 CARS hotline system.
- Television, radio and print media.
- Regional Public Information Network: www.rpin.org.
- Northwest Warning, Alert, Response Network (NW-WARN): www.nwwarn.org.

- Other regional, state and local emergency operations centers:
 - WSDOT Dayton office emergency operations center (Shoreline).
 - King County Regional Communications and Emergency Coordination Center (Renton).
 - Seattle emergency operations center (downtown Seattle).
 - State of Washington emergency operations center (Camp Murray).
- Public information officers and communications staff from coordinating jurisdictions and agencies.

Communication strategies

The following key strategies will be implemented during a SR 520 closure:

- No surprises.
- Coordinate messaging.
- Manage expectations.
- Lead with the Web,
- Utilize the 5-1-1 CARS hotline system.
- Establish innovative means of communication when power and telephone lines are out.
- Choose spokespeople strategically.
- Show and tell the response and recovery story.

These strategies are explained in further detail in Chapter 10.

Objectives

WSDOT's overall objectives for communications during a catastrophic event will be to:

- Provide information to travelers, freight, neighbors and others who are affected so they can make informed decisions.
- Keep public trust.
- Minimize on-scene disruptions during the immediate response and recovery phases to allow emergency responders to do their work effectively.

Key audiences

In the immediate response phase, and when the SR 520 bridge is closed during the recovery phase, there are many key audiences to be considered. Due to the regional significance of SR 520, the critical audiences are broad and wide-reaching. They include:

- Emergency service providers.
- Local, regional, state and federal transportation decision-makers.
- Media.
- Transit agencies.
- Utilities.
- Local jurisdictions, neighbors and community organizations.
- Drivers and commuters.
- Freight carriers.
- School districts and higher education institutions.
- Businesses and employers.
- Traditionally under-represented and special needs groups.
- Tribal nations.
- Regulatory agencies.

Conclusion

WSDOT already has established SR 520 emergency management procedures. Appendix A contains the current SR 520 traffic control plans. Also referenced in Appendix A is the WSDOT bridge inspection manual which documents the procedures for closing the SR 520 bridge during emergencies and nonemergencies. WSDOT Northwest Region prepared a guide for SR 520 bridge closures that identifies traffic control plans and provides suggestions for operating highway advisory radio and variable message signs during such closures. The catastrophic failure plan goes a step further. It represents a toolbox of strategies that can be implemented to keep central Puget Sound drivers and commerce moving during a long-term recovery from a SR 520 bridge failure.

The catastrophic failure plan, composed of a transportation management plan and a communications plan, outlines options to ensure safety, efficiency and effective public relations in the event of a SR 520 bridge failure. The transportation management plan describes practical traffic mitigation solutions to keep Puget Sound moving in the event of a catastrophic SR 520 bridge failure.

Keeping drivers and transit riders informed about current roadway conditions and ongoing traffic restoration efforts will be essential to the success of this plan. To achieve this, WSDOT has also developed a communications plan. Communication will support emergency response, bridge recovery and bridge restoration efforts through the development, coordination and dissemination of emergency public information.