

1.0 Introduction and Overview

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1.1: Introduction

The Alaskan Way Viaduct (AWV) is a 2.1-mile, double-decked reinforced concrete structure which carries SR 99 along the shoreline of Elliott Bay to and through downtown Seattle. It is a vital part of the region's transportation system, carrying over 100,000 vehicles per day. Built in the 1950s, the Viaduct does not meet modern standards for earthquake-resistant design, which quickly became apparent when the February 28, 2001 Nisqually earthquake shook the Puget Sound region. This magnitude 6.8 earthquake necessitated closure of the Alaskan Way Viaduct for emergency repairs and the first of many inspections.

The SR 99 Alaskan Way Viaduct and Seawall were damaged by the 2001 Nisqually earthquake. The urgency to replace the Alaskan Way Viaduct and Seawall is clear. What has also been increasingly apparent is that our region would benefit from a well-considered plan to move people through the region should the Viaduct fail or be restricted at some point between now and when the replacement project is complete. Any closure of the Viaduct facility would result in the rerouting of significant traffic to the surface streets. During the past several years, we have seen high volumes of traffic flood the surface roadway network when crash incidents temporarily close the Viaduct. If unexpectedly closed in the future due to an emergency, there will certainly be significant congestion for all traffic, whether on a signed detour or not, since any available detours will not be able to replace the capacity the Viaduct.

1.2: Emergency Traffic Management Plan

This Emergency Traffic Management and Closure Plan for the Alaskan Way Viaduct (i.e., Emergency Traffic Management Plan – ETMP; or, the Plan) is a collection of scenario-based Action Plans and Contingency Detour Routing Plans designed to address the many scenarios that could affect the viability of the Alaskan Way Viaduct as a critical element of the City and the State's transportation infrastructure. This Plan has been developed with collaboration from many other organizations – Washington State Department of Transportation (WSDOT), Seattle Police Department (SPD), Seattle Fire Department (SFD), Seattle Public Utilities (SPU), and Seattle City Light (SCL), as well as King County Metro Transit, the United States Coast Guard, and the Port of Seattle.

While not all scenarios can be anticipated, this Plan provides the framework and details for traffic management following an event that could close the SR 99 Viaduct facility. This Plan addresses both short-term emergency closures for incidents, and unexpected long-term closures. It is intended to provide some fundamental information and guidance should an unanticipated closure be necessary. The location and characteristics of a specific event, whether man-made or natural, the areas of damage to the structure, and likely duration of the closure are only several of countless possibilities. This plan is intended to provide a useful framework for decision-makers to make quick, informed, and confident decisions regarding emergency traffic management and to provide the means to implement effective traffic management changes safely and efficiently.

This Plan is intended to make the best possible use of the remaining transportation infrastructure and network in the event of an unexpected partial or full loss of the Alaskan Way Viaduct. The focus of this effort relates to moving people, traffic operations, and protocol and communications guidelines consistent with traffic and emergency management. The information contained here should complement emergency preparedness and response documents and protocols already established that address broader emergency management issues. This plan is specifically oriented toward dealing with the need to effectively move travelers within and through Seattle, while keeping a region-wide transportation perspective.

The goals for the Plan:

- Communicate key messages to the public via Intelligent Transportation Systems (ITS) tools available, variable message signs, highway advisory radio, as well as via the internet, commercial and public radio, and the media.
- Provide information to the traveling public to enable them to alter routes or time of travel to avoid the impacts of the closure.
- In worst-case scenarios, designate and establish a 1-2 lane detour through the Seattle downtown in each direction for auto and truck traffic connecting the severed links of SR 99.
- Redirect traffic to use the major freeway facilities – I-5, I-90 – via all effective routes.
- Establish lines of communication should an event occur.
- Identify the traffic control changes necessary to quickly and efficiently implement the detours.
- Identify reroutes for effective and reliable transit under high-traffic conditions.
- Establish life safety emergency response activities for disaster-related closures of the Viaduct.
- Clarify roles and responsibilities among the various agencies.

While we can plan for a number of scenarios, there is one message that should be clear: this Plan does not represent itself as a replacement of capacity or travel conditions of the Alaskan Way Viaduct. A full or partial closure of the Viaduct will mean moving high volumes of vehicles to alternate routes, many of which are not designed for nor have significant additional capacity to absorb that traffic. Currently, there is not an available detour through Seattle or through the Puget Sound area designed or capable of providing the equivalent speeds and travel times. In spite of everyone's best efforts, if the Viaduct is not available, the alternate routes will experience higher levels of congestion than they currently do.

Detour routes identified in the Plan have been chosen according to a variety of factors, including

their connectivity to the severed SR 99 facility, the available number of travel lanes, and their ability to accommodate large trucks and transit. Of course, these are not the only routes available for use under Viaduct closure conditions and all available routes should be considered. However, for route continuity and to guide unfamiliar motorists through the city, these specific detours will be signed and marked for SR 99 use.

1.3: Background

On February 28, 2001, the Nisqually earthquake shook the Puget Sound region. This magnitude 6.8 earthquake required a needed closure of the SR 99 Alaskan Way Viaduct for the first of many inspections. Bridge inspectors found damage near South Washington Street and near South Royal Brougham Way. In 2001, WSDOT bridge crews and contractors completed numerous inspections and repairs on the Viaduct. This included repairing expansion joints, and shoring up columns and support beams.

The inspection and repair-related closures of 2001 contributed to serious transportation impacts in the Seattle Metropolitan corridor. When the Viaduct was closed, traffic was stop-and-go on I-5 from the south near Tukwila, through downtown Seattle, and north to the Snohomish County line. In addition, many of Seattle's most heavily used arterials (such as 1st Avenue South, 4th Avenue South, and South Spokane Street) were virtually gridlocked. Traffic on I-405 was stop-and-go throughout most of the day.

Immediately after the earthquake, the Washington State Department of Transportation and the City of Seattle joined forces to accelerate the study and design of options to rebuild or replace the Alaskan Way Viaduct and the Seawall. The proposed actions would provide a facility with improved earthquake resistance that maintains or improves mobility for people and goods along the existing SR 99 corridor.

1.4: Vulnerabilities

There are a number of natural and technological (man-made) hazards that could impact the viability of the Alaskan Way Viaduct. Some of these are:

- Seismic event
- Major traffic incident
- Terrorist act
- Structural failure

Seismic Event

When initially constructed, the Viaduct met the design standards of the 1950's. Compared to current standards, the seismic codes used during the construction of the Viaduct were less than 30% as stringent. The seismic vulnerability of the Seawall and the Viaduct became more apparent after the Nisqually Earthquake of 2001. In the months following the earthquake, the Viaduct was comprehensively evaluated by structural engineers. Engineers estimate that the structure has a one in 20 chance of failing in the next ten years during a large earthquake, or an earthquake with a

slightly longer duration.

Significant portions of the Seawall have also been damaged and are also vulnerable in an earthquake. The seawall along the Seattle waterfront upon which the Viaduct was built was constructed in the 1930's. This 70-year old structure is made of steel pilings supported by a relieving platform of untreated timber. It has suffered significant damage as a result of marine borers, rust, corrosion, and the 2001 Nisqually earthquake. The relieving platform, which is the part of the seawall structure constructed with untreated timber and buried in fill beneath Alaskan Way, has experienced significant damage and deterioration. This timber supports both the Seawall and Alaskan Way. In an earthquake, it is likely that movement and subsequent failure of the Seawall could occur, causing lateral spreading, which would result in damage to Alaskan Way, waterfront piers, and underground utilities, as well as portions of the Viaduct where the foundations are supported by the Seawall fill.

While environmental review and design of the preferred option for replacement continues, a pressing concern involves the Viaduct and Seawall vulnerabilities to earthquakes in their present-day conditions before the implementation of a replacement. If the SR 99 project proceeds as scheduled, major construction would most likely not occur before 2009. This leaves at least four years of seismic vulnerability in which the Viaduct will be exposed to a chance of failing during an earthquake. A system loss of this magnitude would result in major traffic disruptions within the region.

Major Traffic Incident

Occasionally there are incidents on the Alaskan Way Viaduct that severely impact the flow of traffic. These can be collisions, medical emergencies, fire or hazardous materials incidents, or police actions. Though usually relatively brief in duration (typically no more than 2 to 6 hours) these incidents can be extremely disruptive to the smooth flow of traffic on both the Viaduct and on the City streets used by traffic diverted off the Viaduct.

Terrorist Act

While the Alaskan Way Viaduct does not appear to be a likely target of a planned terrorist attack, it could be disabled for a protracted period of time by a well-placed improvised explosive device.

Structural Failure

A future WSDOT inspection could provide evidence that the Viaduct can no longer accommodate vehicles of heavier weight (such as buses or large trucks). While these findings would likely not precipitate what we normally think of as an "emergency response," such a scenario would be relatively unexpected and call for the rapid implementation of alternative routing plans.

1.5: Document Organization

This document consists of several sections that make up the Emergency Traffic Management and Closure Plan, providing both the background for the Plan as well as the step-by-step actions to be implemented for a range of scenarios. These include scenarios ranging from a full facility failure of the Viaduct and resultant longer-term closure of SR 99, to a short-term traffic crash closure for 2-6

hours. The ideas and information contained in this document provide a toolbox of possible transportation alternatives designed to mitigate resultant traffic congestion.

This report expands upon the 2001 recommendations produced by a joint-agency committee represented by the Washington State Department of Transportation, Seattle Department of Transportation, King County Metro, and the Washington State Ferries. SDOT and these agencies are prepared today to act in the event of a necessary unexpected closure of the Viaduct, but this Plan will be continually evolving and updated. Implementation of the detour alternatives presented may be impacted by technical, political, budgetary, or social factors not anticipated during their development.

The report that follows focuses on detour strategies for four damage scenarios:

- 1) Alaskan Way Viaduct is unusable *and* the seawall fails to a degree that necessitates closure of surface Alaskan Way.**
- 2) Alaskan Way Viaduct is rendered unusable for all traffic. Surface Alaskan Way remains viable as a north-south arterial.**
- 3) Alaskan Way Viaduct is shut down due to a traffic incident, and is expected to be re-opened within 2-6 hours. The Alaskan Way surface street remains open for all traffic.**
- 4) Alaskan Way Viaduct is damaged and usable, but only for lower-weight auto traffic, not for trucks or transit; surface Alaskan Way remains viable for all traffic.**