Report to the Legislature: Virtual Coordination Center

This report is in response to language in SSB 5165, Section 308 (2) which directed WSDOT to "provide a progress report on (the Challenge Seattle project) to the transportation committees of the Legislature by January 15, 2022."

The Challenge Seattle project funding has been allocated towards designing and building a proof of concept for the Virtual Coordination Center (VCC). This cloud-based system will pull in real-time data from public agencies responsible for transportation management in the greater Seattle area. The data will be shared in a common dashboard that will allow responders across eight public agencies to see incidents as they happen, make more informed decisions, and collaborate in real time to coordinate response and distribute a unified public message. The system is expected to be complete and ready for use in October 2023.

BACKGROUND

At approximately 10 a.m. on Tuesday, Feb. 28, 2017, a fully loaded propane tanker truck collided with several vehicles and rolled over on southbound Interstate 5 near the Interstate 90 interchange just south of downtown Seattle.

Out of an abundance of caution, the Seattle Fire Department closed both directions of I-5 and I-90 while the propane was offloaded from the damaged tanker truck to mitigate the risk of a potential explosion. Both highways remained closed for eight hours as emergency response personnel worked to clear the crash. With two critical highways closed, congestion in the Seattle area quickly reached gridlock conditions on highways and city streets. The gridlock remained through the afternoon and evening commutes.

In the months that followed, the Washington State Department of Transportation (WDSOT), Seattle Department of Transportation (SDOT), King County Metro (KC Metro), Seattle Police Department (SPD), Seattle Fire Department (SFD) and Washington State Patrol (WSP) participated in multiple after-action review sessions. The sessions were facilitated by the University of Washington and Challenge Seattle, an alliance of CEOs from 21 of the region's largest employers led by former Governor Christine Gregoire. The after-action review sessions focused on both the emergency response at the scene and the management of congestion caused by the crash.

The recommendations for the interagency team were captured by the University of Washington's Center for Collaborative Systems for Security, Safety and Regional Resilience in a March 2018 report titled "Beyond Incident Response: Mitigating Impacts of Major Traffic Incidents in the Seattle I-5 Corridor." The report included several recommendations and findings including that:

- Emergency response efforts at the scene of the crash followed best practices.

- Communication and collaboration between WSDOT, SDOT, KC Metro, SPD, SFD and WSP needs to improve to allow for better management of the congestion caused by major incidents.
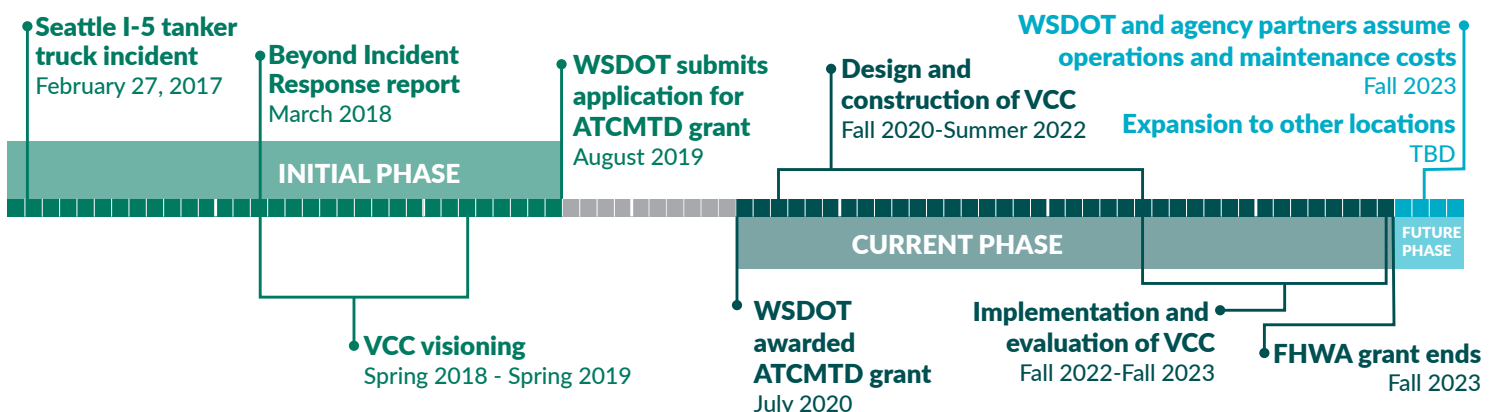
Following the publication of the "Beyond Incident Response" report, WSDOT and Challenge Seattle funded researchers at the University of Washington to begin working with key agency representatives from WSDOT, SDOT, SPD, SFD, WSP and KC Metro to further develop how communication and coordination could be enhanced by the agencies during major incidents. The goal of this effort was to develop a conceptual software program that could help facilitate real-time communication and collaboration between agencies during a major incident. This conceptual system would come to be known as the Virtual Coordination Center (VCC).

The goal of the VCC is to provide a cloud-based system that will pull in real-time data from the public agencies responsible for transportation management in the greater Seattle area. The data will be shared in a common dashboard that will allow responders across all agencies to see incidents as they happen, make more informed decisions, and collaborate in real time to coordinate response and distribute a unified public message.

In 2019, WSDOT applied for a $3.4 million grant from the United States Department of Transportation's (USDOT) Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Program to fund design and construction of the VCC as well as expand its use to other parts of Washington state. In addition to the $3.4 million from USDOT, cash matches from WSDOT and Challenge Seattle as well as in-kind matches from the City of Seattle, King County, Washington State Patrol, Sound Transit and 11 private sector partners would be needed to successfully design and build the VCC. WSDOT would serve as lead administrator of the project with UW providing day-to-day project management. The project schedule allowed for two years for design and construction followed by a year-long implementation and evaluation period.

In July 2020, USDOT notified WSDOT that the VCC project was selected and would receive the full $3.4 million request. After the grant was awarded, the Port of Seattle and Northwest Seaport Alliance joined the VCC project as formal partners. WSDOT and its partners officially started work to build the VCC in September 2020. The federal grant will support program activities through September 2023.

TIMELINE OF VCC EFFORT

Seattle I-5 tanker truck incident
February 27, 2017

Beyond Incident Response report
March 2018

INITIAL PHASE

VCC visioning
Spring 2018 - Spring 2019

WSDOT submits application for ATCMTD grant
August 2019

WSDOT awarded ATCMTD grant
July 2020

Design and construction of VCC
Fall 2020-Summer 2022

CURRENT PHASE

Implementation and evaluation of VCC
Fall 2022-Fall 2023

WSDOT and agency partners assume operations and maintenance costs
Fall 2023

Expansion to other locations
TBD

FHWA grant ends
Fall 2023

FUTURE PHASE

OVERVIEW OF PLANNED VCC FUNCTIONALITIES

The VCC will be a coordination environment that allows agency users to access and share information about traffic incidents in real time. The initial goal is to support agency staff who are responsible for managing congestion along the Seattle I-5 corridor. The infrastructure will be cloud-based, assuring that public agency partners have a mechanism for equal access to VCC data and capabilities. The VCC interface will be a secure web application that integrates data from partner agencies in support of collaborative awareness and operations. The VCC is not meant to replace existing public agency partners' systems; partners will decide how the VCC fits into their existing systems and processes.

The specific objectives of the grant-funded portion of the VCC include:

- Integrated dispatch data from relevant agency systems such as Washington State Patrol, Seattle Fire, Seattle Police and King County Metro

- A map-based situational awareness component with multiple layers to aid in information understanding

- A real-time incident alerting system customizable for individual needs

- Tools that allow for coordinated public communications

- A shared framework that supports development and implementation of regional incident response and congestion management plans

- Augmentation for regional response and management plans via predictive analysis

- Information Technology infrastructure that provides appropriate security and privacy protection

- Policies and contractual agreements for long-term sustainability

- Portability and extensibility to other regional and national areas
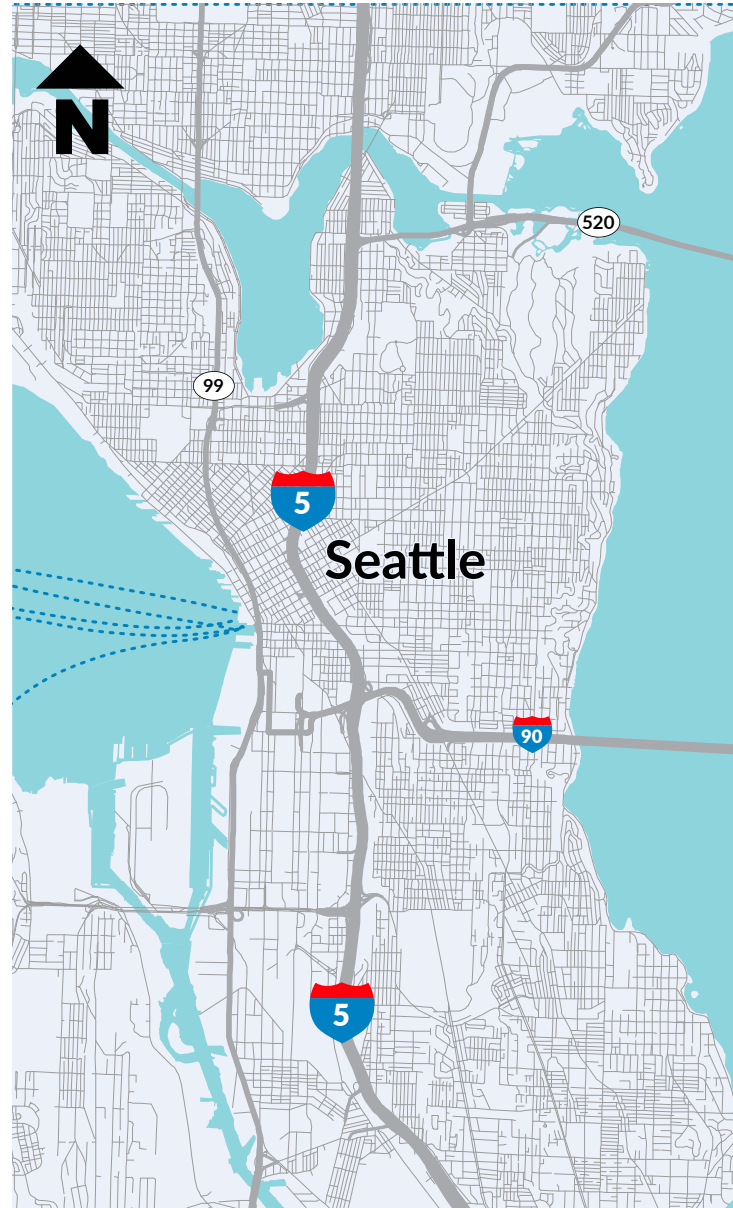
The Virtual Coordination Center will help manage incident related congestion in the Seattle area.

VCC ELEMENTS

The VCC is composed of three elements: Incident Management, Congestion Management, and Population Movement.

The VCC's Incident Management tools will automatically combine and display information from multiple computer-aided dispatch sources to provide information about incidents that affect traffic. The application will also enable agency staff to share updates as the situation evolves. An alert system will notify key agencies of major incidents.

The VCC's Congestion Management tools will create a shared system to allow agencies to deploy these tools in concert and jointly monitor and manage congestion, improving safety by clearing roadways quickly, guiding first responders to incident sites more efficiently, and ensuring regional mobility continues during incidents. During an incident, different agencies have jurisdiction over different tools that could be used to mitigate traffic impacts. For example, WSDOT controls ramp metering and on-highway electronic message boards, King County Metro can adjust buses to alternate routes, and Seattle Police can send traffic police to key intersections. The VCC will also provide augmentation for regional response and management plans via predictive analysis methods to support the development and refinement of regional response and traffic/transit management plans.
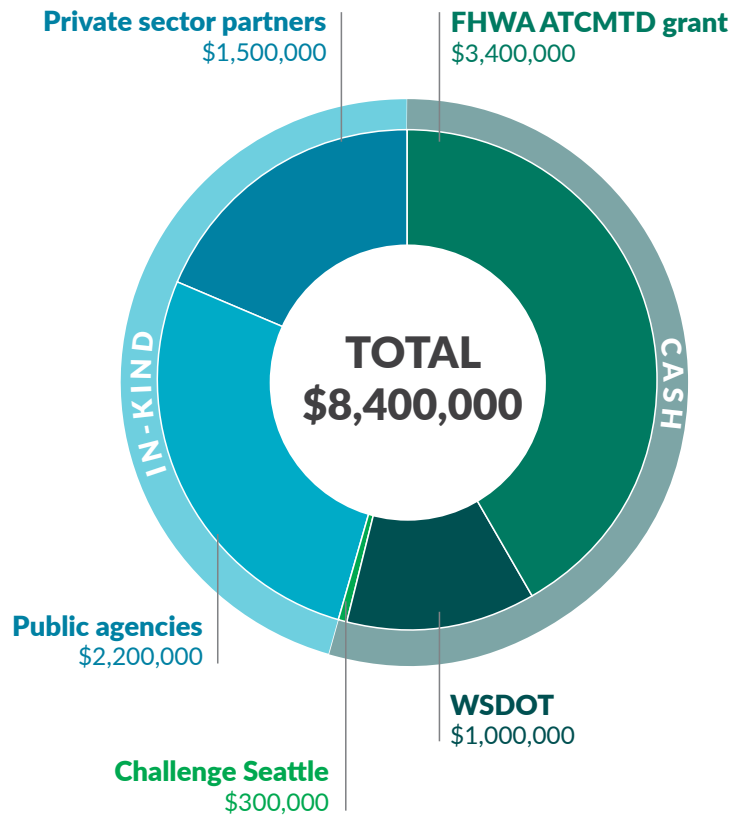
The VCC's Population Movement tools will support secure interagency communication and trusted information sharing to coordinate communication with the public, major employers, and private-sector mobility providers. These tools will allow agencies to craft timely, unified messages that can be shared with the public, major employers, and private-sector mobility providers.

PROGRESS AS OF NOVEMBER 2021

Since receiving the FHWA grant, the project team has been hard at work delivering the first iteration of the VCC. This initial iteration contained several tools to aid in creating a common operational picture across the agencies and included an integrated dispatch feed which contains computer-aided dispatch events from SFD, SPD and KCM, and a map display that plots those events and shows other information such as traffic cameras. It also allows agencies to share information regarding the incident such as established detours, transit re-routes, etc.

Future iterations of the VCC produced over the life of the federal grant will include increased situational awareness tools such as the integration of additional real-time data like travel times, traffic flow data, weather; automatic alerts to designated agency personnel when a major incident occurs; and coordinated regional response plans such as pre-planned detour routes. Construction of the VCC will be complete by September 2022. Once complete, teams from the University of Washington will evaluate the success of the new system from October 2022 to September 2023 as outlined in the federal grant agreement.

CURRENT PHASE PROJECT BUDGET

Private sector partners
$1,500,000

FHWA ATCMTD grant
$3,400,000

IN-KIND

CASH

TOTAL
$8,400,000

Public agencies
$2,200,000

WSDOT
$1,000,000

Challenge Seattle
$300,000

LOOKING TO THE FUTURE

By Fall 2023 the Virtual Coordination Center will be deployed in the Seattle area. When the federal grant funds end in September 2023, WSDOT and its partners will assume on-going operations costs for the system. The current assumption is that on-going operations and maintenance costs for the VCC will be shared by participating agencies, although detailed costs and cost-sharing have yet to be worked out. WSDOT will likely seek state funding for on-going maintenance and operations of the system starting in the 2023-25 biennium. Assuming a successful deployment in the Seattle area, there could be a desire to expand the system both within King County and to other parts of the state such as Spokane or Vancouver or even across state and international borders with Idaho, Oregon and British Columbia.

MORE INFORMATION:

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