What is a Concept of Operations?
It is a document that provides answers to the following questions:

**WHY**—What is the problem or opportunity addressed by the system?

**WHO**—Who are the stakeholders involved with the system?

**WHAT**—What are the elements and the high-level capabilities of the system?

**HOW**—How will the system be developed, operated, and/or maintained?

**WHERE**—What is the geographic and physical extent of the system?

**WHEN**—What is the sequence of activities that will be performed?

The Texas Freight Network Technology and Operations Plan (FNTOP) developed by the Texas Department of Transportation (TxDOT) Freight Planning Branch builds upon the goals introduced in the 2018 Texas Freight Mobility Plan (TFMP) and outlines identified strategies to guide technology and operations-related investments on the Texas Multimodal Freight Network (TMFN). The FNTOP engaged key public and private sector stakeholders throughout the development of the strategies to obtain feedback, suggest refinements, and evaluate priority levels. The establishment of priorities informed TxDOT’s selection of six strategies for Concept of Operations development, which is the next critical step to the implementation of the FNTOP.

A Concept of Operations document provides a high-level overview of a proposed technology concept that is traceable to stakeholder needs. The Statewide Traffic Operations Center (STOC) Concept of Operations that was developed as part of the FNTOP follows both Federal Highway Administration (FHWA) guidance as well as approved standards developed by the International Council on Systems Engineering (INCOSE). This document will be accessible to public and private stakeholders as a starting point for the future deployment of this technology concept.

**Overview**
At a high level, the STOC would monitor traffic operations in areas of the Texas Highway Freight Network (THFN) not currently supported by a regional Traffic Management Center (TMC), coordinate on statewide freight movement and, among other efforts, support regional TMCs when requested.
**WHY** What is the problem or opportunity addressed by the system?

- **HELP** manage statewide and large-scale traffic management efforts.
- **SUPPORT** traffic operations surrounding incidents and events in rural areas of the THFN that are not currently supported by a regional TMC.
- **COORDINATE** statewide freight operational strategies and other statewide initiatives.
- **HELP** establish an interoperable Advanced Traffic Management System (ATMS) platform and data-sharing protocols between remote Intelligent Transportation System (ITS) assets, the TxDOT Districts, and the STOC.
- **SUPPORT** regional TMCs when requested.
- **COORDINATE** planned work zones between TxDOT Districts.

**WHO** Who are the stakeholders involved with the system?

**Owner**
- TxDOT Divisions

**Key Stakeholders**
- TxDOT TMCs, TxDOT Districts, Texas Department of Public Safety, Other non-TxDOT TMCs

**End-Users**
- TxDOT TMCs, Texas Department of Emergency Management, Other non-TxDOT TMCs, Truckers, Trucking Companies/Dispatchers, Emergency Responders, Other Roadway Users

**WHAT** What are the elements and the high-level capabilities of the system?

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>MAIN FUNCTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated ATMS</td>
<td>The platform would allow shared control of TxDOT’s existing (and future) ITS devices, facilitate data sharing among all TxDOT Districts and the STOC, and encourage use of the same software applications across all TMCs.</td>
</tr>
<tr>
<td>Rural Traffic Operations Capabilities</td>
<td>The STOC would provide operational coverage in areas not currently covered by regional TMCs, primarily the rural parts of Texas. The STOC could employ working relationships with local traffic manager groups in cities and counties to employ incident mitigation response plans when rural roads are disrupted by incidents.</td>
</tr>
<tr>
<td>Consistent Statewide Messaging</td>
<td>The STOC would serve statewide goals by being a single point for statewide messaging campaigns, such as public safety notices like “#EndTheStreakTX”. Through collaborative systems, the STOC could deploy these messages to TxDOT assets across the system and work with regional TMCs to make sure consistent messages are shown.</td>
</tr>
<tr>
<td>Coordination on Sequential and Parallel Work Zone Deployments</td>
<td>The STOC would serve statewide goals of reviewing closure information between multiple TxDOT Districts on a given segment of roadway. The STOC would identify if there were sequential or parallel work zones planned across multiple TxDOT Districts and coordinate with District staff to explore mitigation options in an effort to improve customer service to roadway users.</td>
</tr>
<tr>
<td>Operate Statewide Traffic Operations Priorities</td>
<td>The STOC would deploy and operate statewide priorities for traffic operations. Hurricane evacuation efforts on primary and secondary routes would be coordinated from the STOC. Efforts to prioritize freight movements during certain demand periods would be coordinated from the STOC, such as requesting prioritized traffic signal timings on popular freight routes when the STOC detects high freight traffic volumes.</td>
</tr>
</tbody>
</table>
CONCEPT OF OPERATIONS: STATEWIDE TRAFFIC OPERATIONS CENTER

The main anticipated benefits of the system include:

► The STOC would add coverage to rural areas and increase coverage time in all areas.
► The STOC would position TxDOT to be a new leader in rural ITS.
► The STOC would position TxDOT to be more of a real-time traffic operations stakeholder for rural parts of the THFN, which would increase efficiencies for collaborating with local and regional traffic managers and law enforcement.
► The STOC would further bridge a gap between TxDOT’s statewide initiatives and the actual devices on the road by operating as the real-time delivery system for statewide messaging.
► The STOC would increase TxDOT capabilities to manage statewide work zone planning and minimize sequential and parallel work zones.
► The STOC would introduce opportunities to obtain reports that help analyze past highway events to find ways to optimize operations.

HOW How will the system be developed, operated, and/or maintained?

The STOC could adopt one of the following TMC deployment models: 1) Centralized TMC Model, with all TMC systems and supporting ITS services centralized into one location/datacenter, typically contained within the TMC; 2) Decentralized TMC Model, with TMC systems and supporting ITS services located in multiple locations and shared between TMCs through communications networks; 3) Virtual TMC Model, with TMC systems and supporting ITS services hosted at any location (or in the cloud), but no physical traffic operations center is used to manage the transportation system; or 4) Hybrid TMC Model, utilizing a combination of two or more models.

WHERE What is the geographic and physical extent of the system?

The STOC would cover the entire geographic area of the State. The STOC could adopt many different roles depending on the culture of the sponsoring agency; roles could include managing rural ITS assets, standardizing statewide initiatives, and supporting regional TMC partners. There is the potential to achieve many efficiencies in cost by consolidating responsibilities—which may include state police and other traffic management groups—into one facility, but requires extensive network communications to support a large number of remote assets and many interagency agreements to demarcate jurisdictional responsibilities, both internal and external to the agency.

WHEN What is the sequence of activities that will be performed?

The table below outlines a time-phased series of activities that are needed to accomplish the planning, implementation, and eventual full deployment of the Statewide Traffic Operations Center.

<table>
<thead>
<tr>
<th></th>
<th>Near-Term Actions (0-2 years)</th>
<th>Medium-Term Actions (2-5 years)</th>
<th>Long-Term Actions (5-7 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing TxDOT Program/Initial Next Steps</td>
<td></td>
<td></td>
<td>Facility Implementation/Incremental Strategy Expansion</td>
</tr>
<tr>
<td>No: Coordinate with regional partners to establish STOC vision</td>
<td>✔</td>
<td></td>
<td>STOC Facility Implementation</td>
</tr>
</tbody>
</table>

Legend

✓ Completed
☐ Need to do
OPERATIONAL SCENARIO
Accommodating Remote Management during a Major Health Crisis

THE PROBLEM

FIRST WEEKS OF THE HEALTH CRISIS
A Transportation Management Center (TMC) in an urban county in central Texas

As health concerns increase, the county goes under a stay-at-home order

THE APPROACH

FIRST MONTH OF THE HEALTH CRISIS
The local TMC begins to transition to working from home

In the meantime, the Statewide Traffic Operations Center (STOC) – located in a county without a stay-at-home order – takes over operating and managing the county’s transportation network

THE SOLUTION

FIRST 2 MONTHS OF THE HEALTH CRISIS
With a unified ATMS platform, operators can access the ITS program and manage the network remotely

They can view cameras...

...manage DMS signs, and collaborate with one another

With health concerns continuing to increase, the STOC faces a stay-at-home order as well and will also be able to work from home successfully