

**TEAM
KENTUCKY**
TRANSPORTATION
CABINET



Keep Kentuckians moving through life...safely.

Transportation Systems Management and Operations

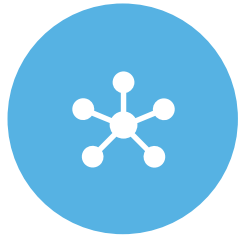
Purpose

The goal of TSMO is to promote the safe mobility of people by compiling a toolbox of strategies.

What is TSMO?



Performance



Technology



Network



Partnership



Safe Mobility

For **All** Road Users

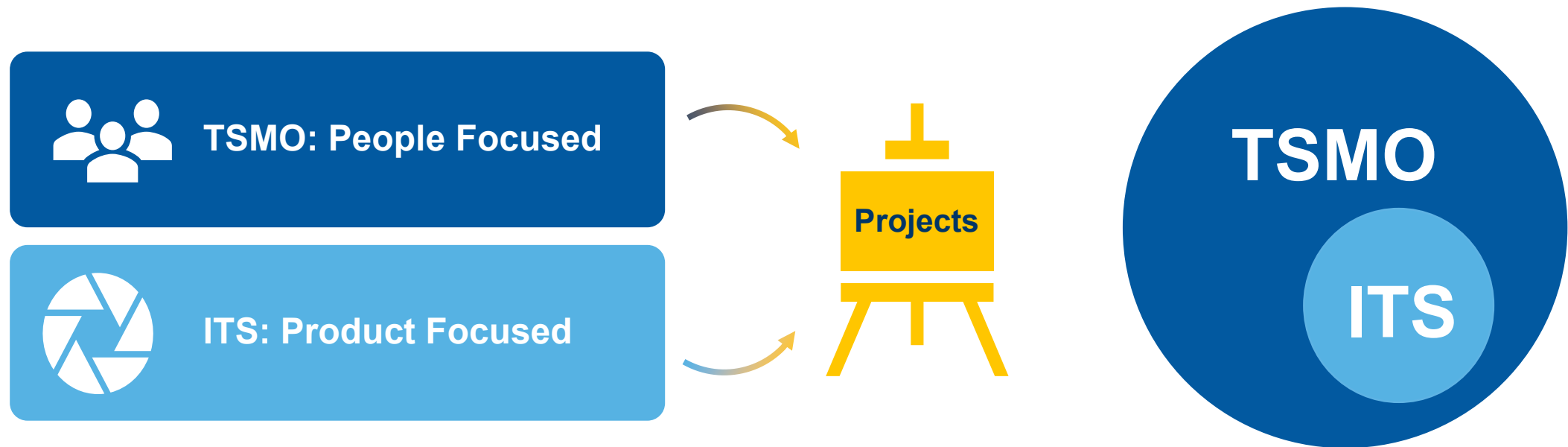
What is TSMO?

TSMO is not new. You've seen it everywhere!



TSMO vs ITS

I thought these things were ITS...



Safety

**Safe
Systems
Approach**



Where does TSMO fit into KYTC?



KYTC TSMO Program and Project Timeline

“Advancing TSMO
in Kentucky”
Workshop

Program

2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025

Projects

KYTC TSMO Program and Project Timeline

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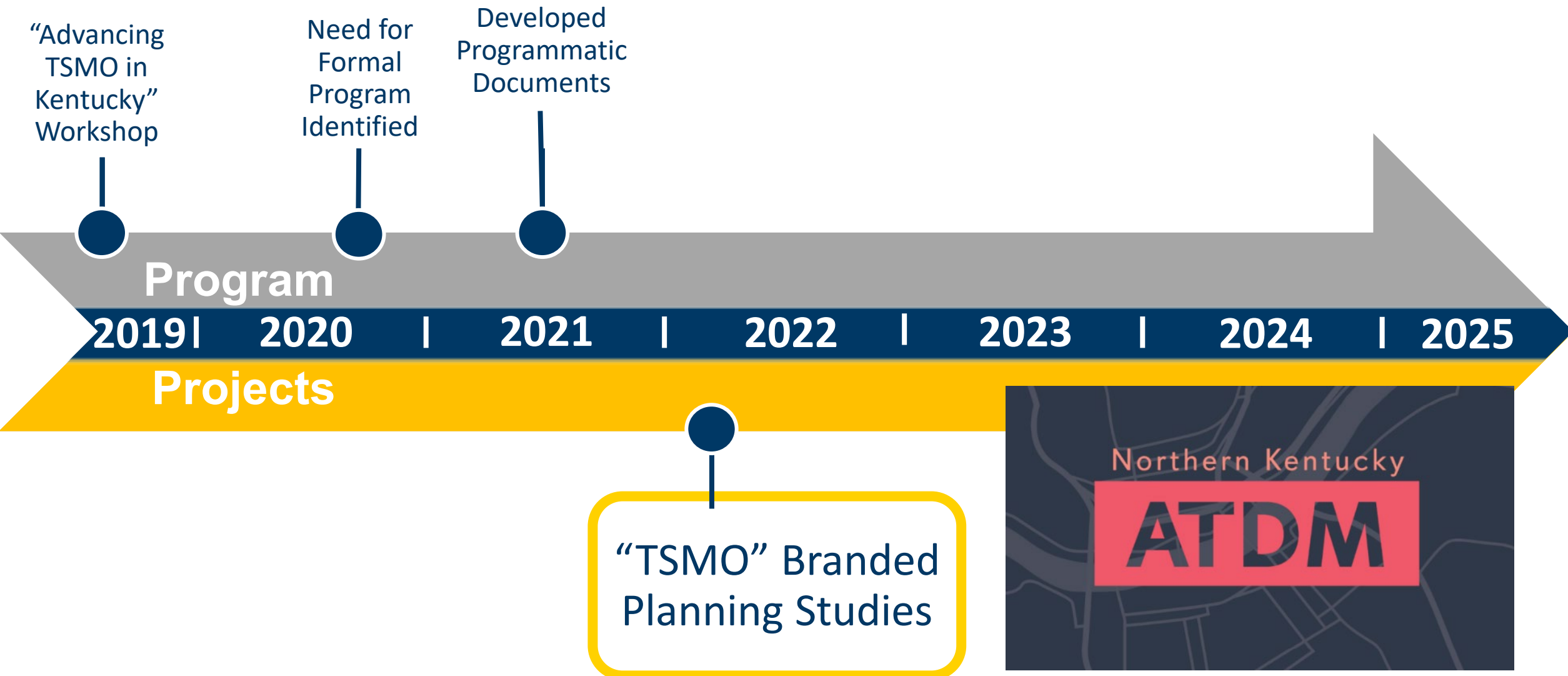
2024

2025

Projects

“TSMO” Branded
Planning Studies

KYTC TSMO Program and Project Timeline



KYTC TSMO Program and Project Timeline

“Advancing TSMO in Kentucky” Workshop

Need for Formal Program Identified

Developed Programmatic Documents

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Projects

“TSMO” Branded Planning Studies



KENTUCKY TRANSPORTATION CABINET
KY 44 PROGRAMMING STUDY
Final Report, March 2023



KYTC TSMO Program and Project Timeline



KYTC TSMO Program and Project Timeline

“Advancing TSMO in Kentucky” Workshop

Need for Formal Program Identified

Developed Programmatic Documents

Formalized TSMO Program

“TSMO” Branded Planning Studies

Detection Upgrades on Congested Corridors

Program

Projects

2019

2020

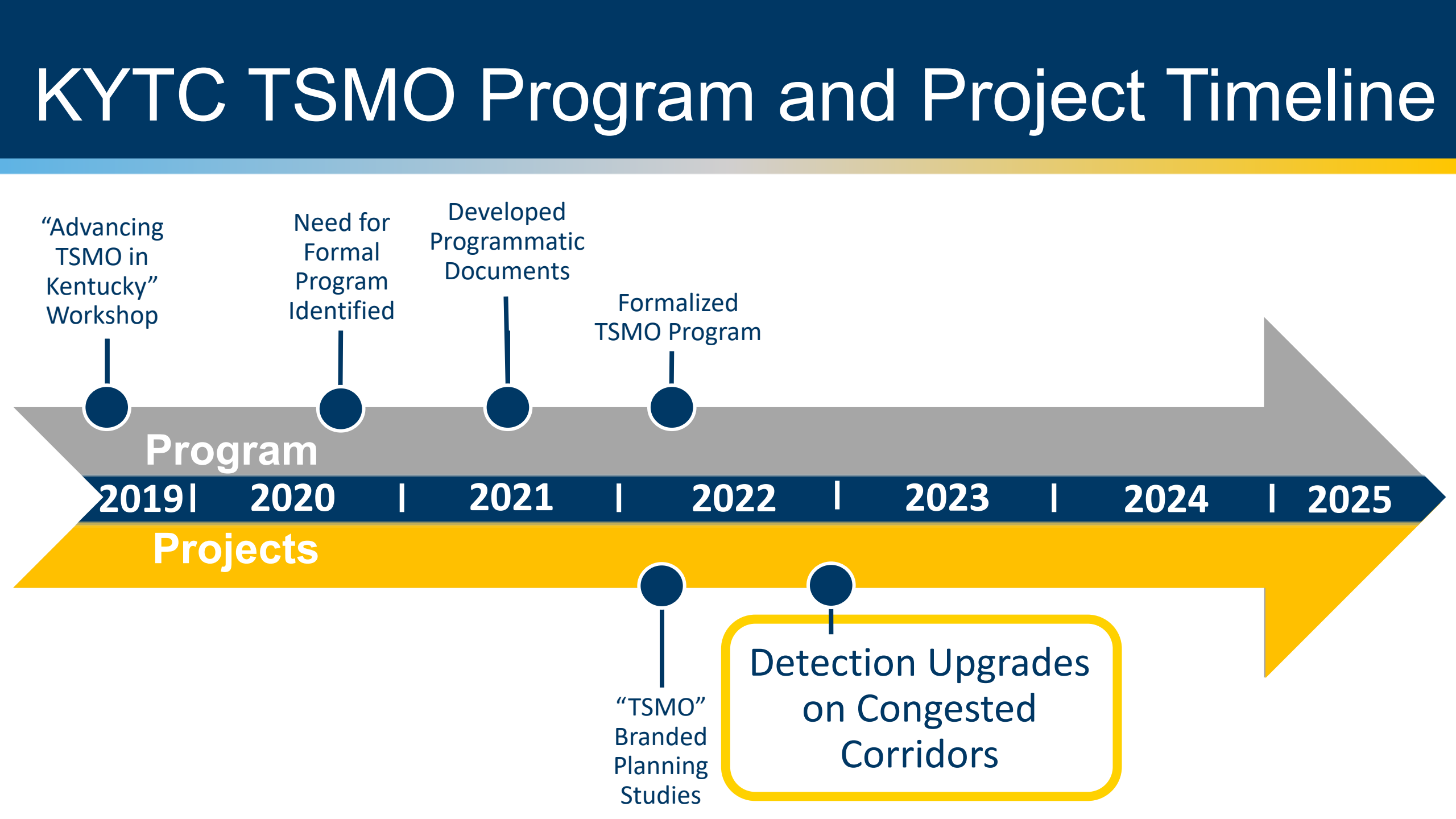
2021

2022

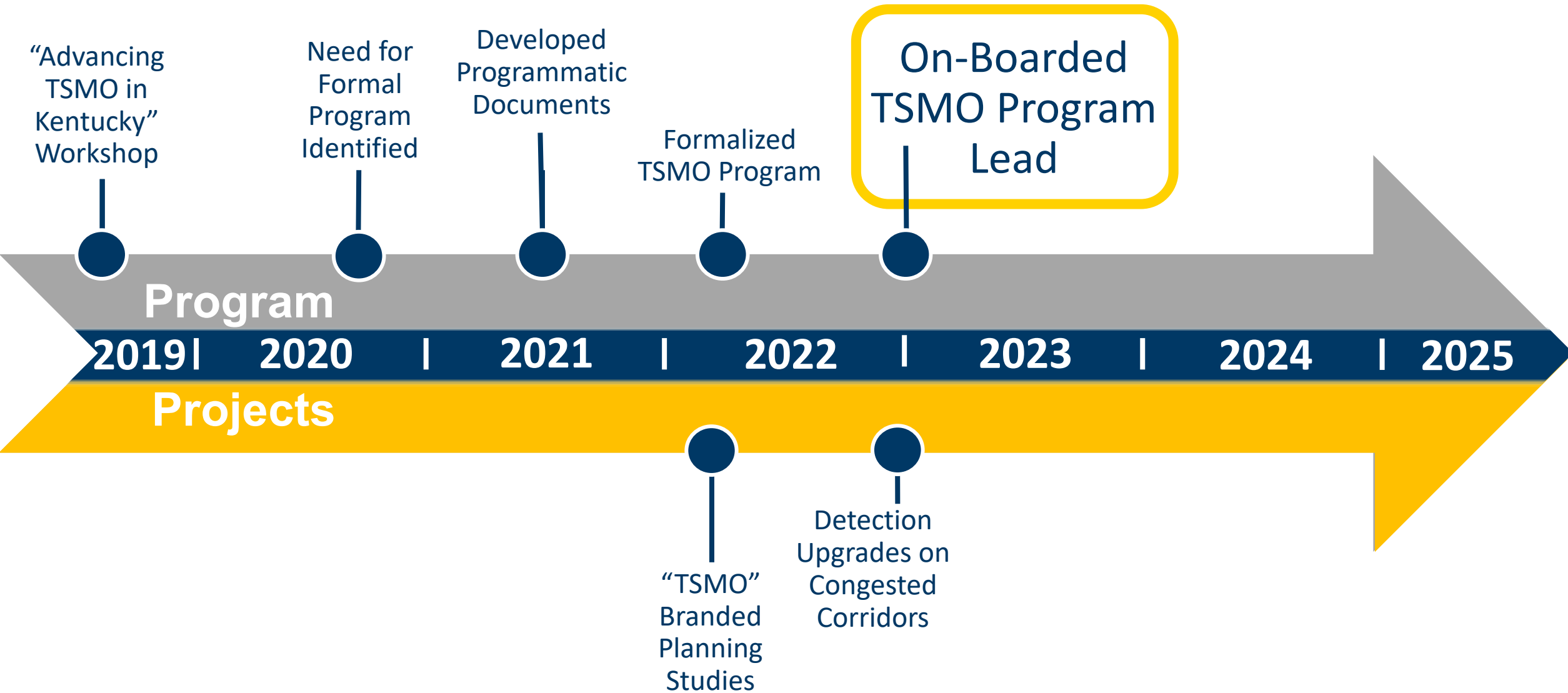
2023

2024

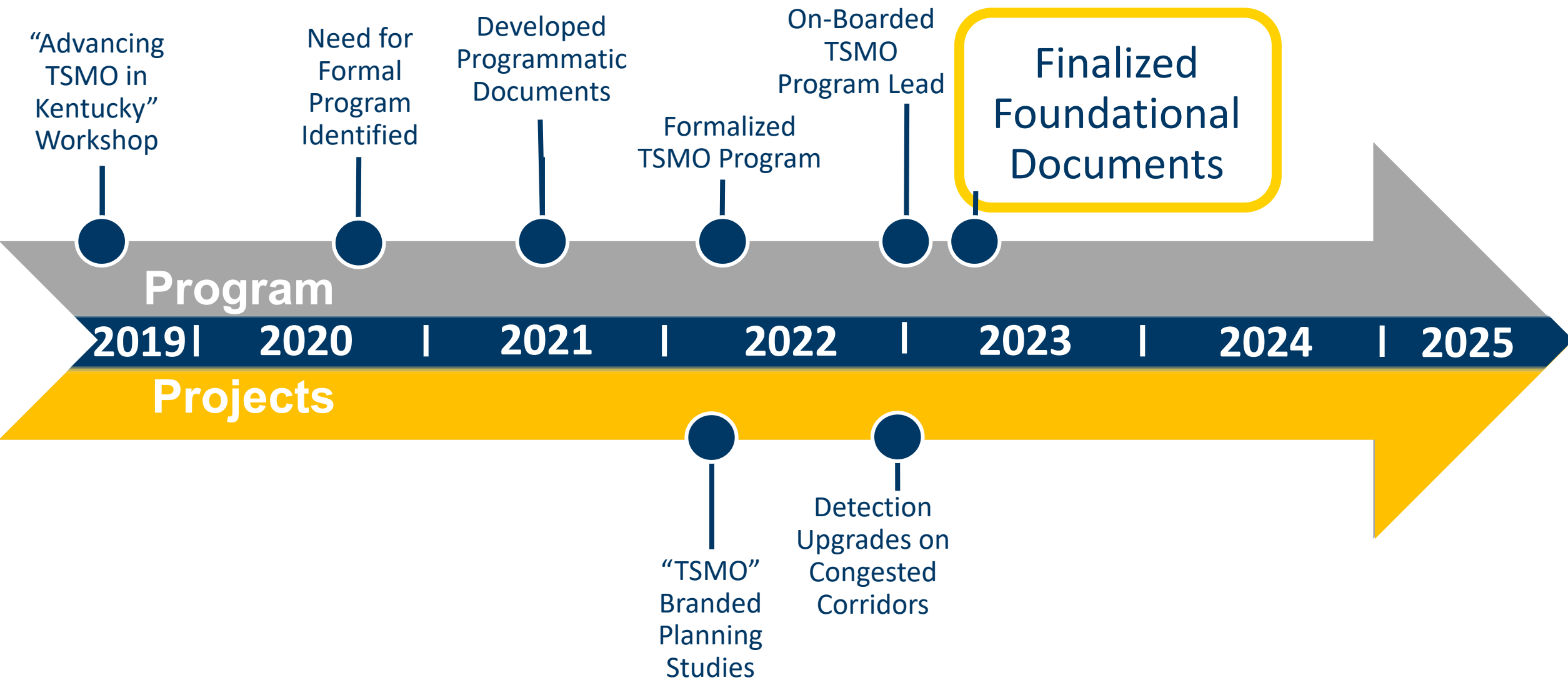
2025



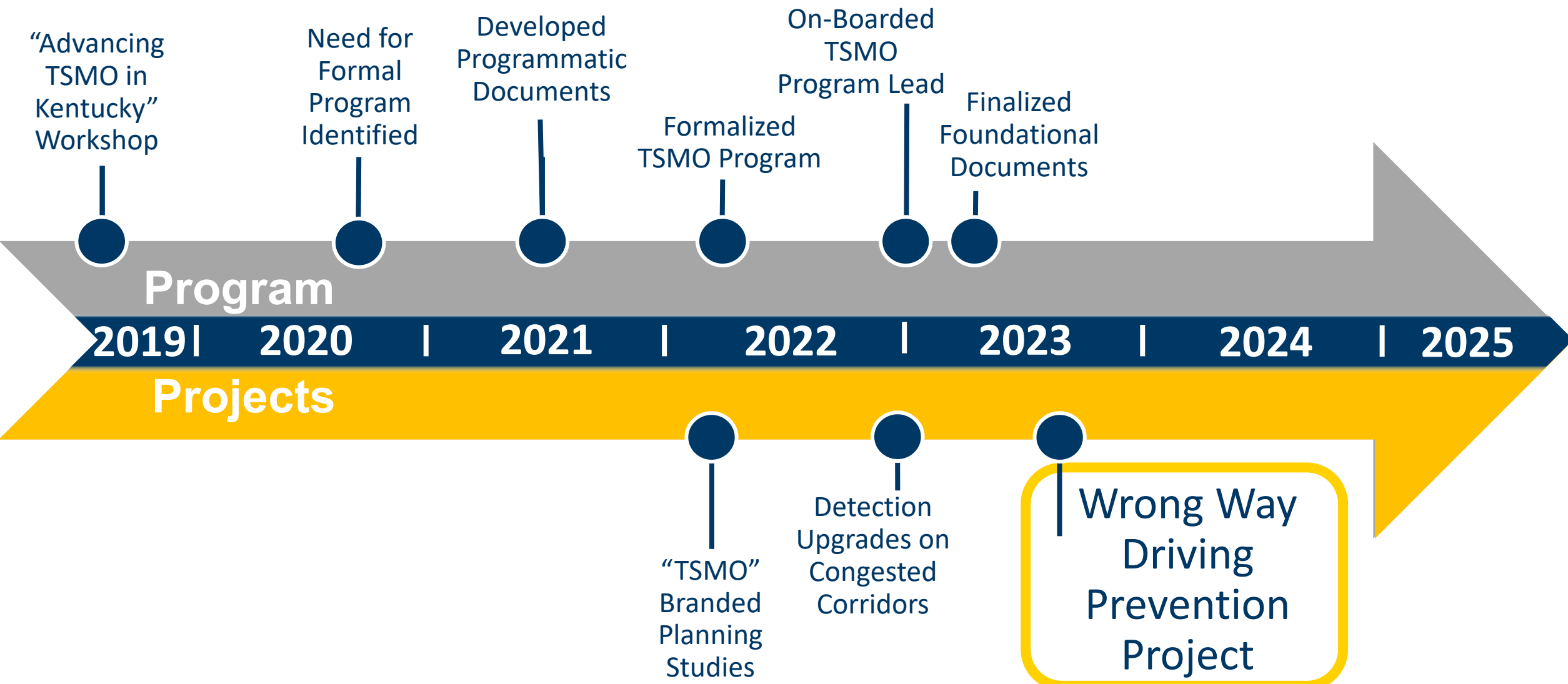
KYTC TSMO Program and Project Timeline



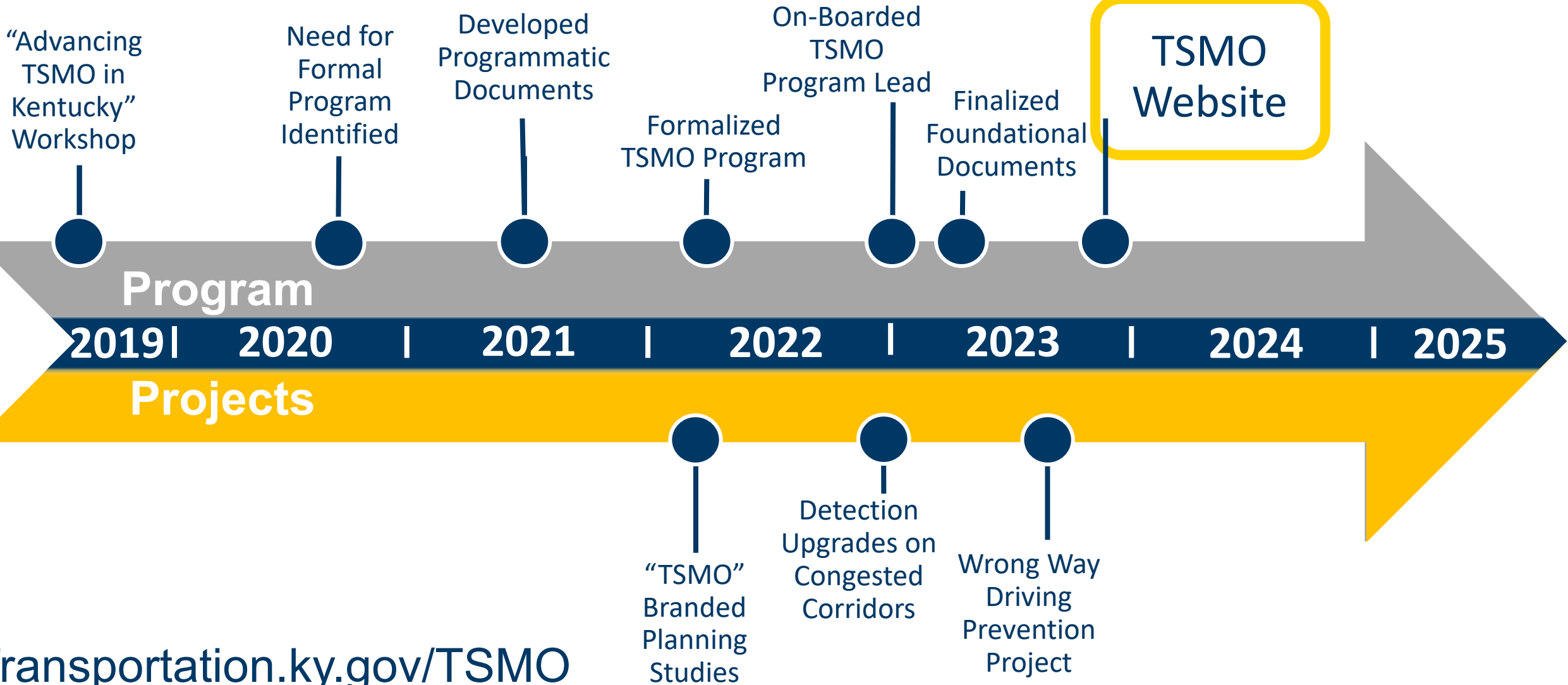
KYTC TSMO Program and Project Timeline



KYTC TSMO Program and Project Timeline



KYTC TSMO Program and Project Timeline





Our Vision:

The transportation industry is always evolving as the needs of travelers and challenges change over time. TSMO, which stands for Transportation Systems Management and Operations, is an adaptive approach that is a big on collaboration to improve safety and mobility. It's not a "one size fits all" solution but rather a framework to encourage project-specific strategies that enhance existing and upcoming transportation performance. This is often accomplished with the help of technology. New dynamic digital signs that inform truck drivers of available parking spaces at upcoming rest areas, or implementing transportation solutions, like using queue jumping vehicles near work zones to reduce creative. TSMO promotes safe and reliable travel options on our roadways for drivers and encourages effective, relatively quick and practical solutions to existing infrastructure challenges for practitioners.

What is TSMO?

TSMO encompasses a broad set of strategies that aim to optimize the safe, efficient, and reliable use of existing and planned transportation infrastructure for all modes. It is a toolbox used to get the most out of the investments KYTC has already made and will make in the future. The TSMO program aims to improve the performance of the highway and transit transportation systems by implementing systems, services, and projects. TSMO includes all the things needed to maximize the benefits of ITS applications.

Benefits of TSMO

Understanding the benefits of TSMO solutions and how they incorporate into our existing Design Development and Project Delivery and Innovation work gives the Transportation Cabinet access to a baseline set of tools to assist project teams in making informed decisions that align with the Cabinet's vision for Kentucky.

Featured Resources

<p>TSMO Plans There are three plans:</p> <ul style="list-style-type: none"> TSMO Plan TSMO Plan - Supplement TSMO Plan - The Vision 	<p>Other Documents Include TSMO strategies in your transportation planning to improve safety and mobility!</p> <p>Here are a few of the case studies and success examples:</p> <ul style="list-style-type: none"> US 27 Bypass Project Sheet US 440 Project Sheet KY 875 Bypass Project Sheet 	<p>Projects & Case Studies As we develop new strategies we can measure the success of traffic flow and safety by adjusting parameters to improve the efficiency of traffic lights and signs.</p> <p>Here are a few of the case studies and success examples:</p> <ul style="list-style-type: none"> US 27 Bypass Project Sheet US 440 Project Sheet KY 875 Bypass Project Sheet 	<p>TSMO Fact Sheets Learn, generate & get ideas to explain how TSMO relates to various transportation programs:</p> <ul style="list-style-type: none"> TSMO & Safety TSMO & Construction TSMO & Design TSMO & Environmental TSMO & Traffic Operations TSMO & Transportation Management TSMO & Maintenance TSMO & Planning TSMO & System



Other Links



TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS

CONSTRUCTION

ENHANCING TRANSPORTATION: CONNECTING TSMO AND CONSTRUCTION



Photo Source: Getty Images

As our existing transportation infrastructure ages and demand for travel and moving goods increases, more major rehabilitation and new capacity projects are required. This means that there are more work zones that trigger network disruptions and unexpected travel delays. These delays reduce the reliability of travel and can have a major impact on emergency responders and freight mobility.

TSMO is integral to effective work zone management. For example, TSMO strategies can encourage travelers to use alternate routes during construction, enhancing the safety and efficiency of construction crews by reducing the number of vehicles traveling through an active work zone. More specifically, TSMO strategies can:

- Provide road users with more "up front" information about planned work that will reduce capacity while offering mobility alternatives to help drivers avoid delays due to work zones (e.g., alternate routes, modes, or travel times).
 - Improve traffic flow through work zones by using dynamic traffic management technologies and providing real-time data and traveler information to transportation agencies and system users.
 - Assist construction crews, heavy equipment operators, and delivery vehicles to enter and exit construction sites safely and efficiently.
- Construction staff also need to consider TSMO both when a project includes the installation of intelligent transportation systems (ITS) or when ITS is already installed and needs to be kept operational during construction.

TSMO can increase the available capacity of transportation facilities through better management of demand and flow disruptions. This can delay the need to construct new lanes or roadways. While these decisions are generally made during planning, construction personnel should be aware of this important connection to TSMO.

TRAVELER INFORMATION AND PUBLIC INFORMATION CAMPAIGNS

Encountering an active work zone with no prior warning about travel delays is a major cause of driver frustration. Timely and accurate traveler information is a core function of TSMO programs. Information campaigns include notifying and engaging those who might be affected by route diversions, such as business districts and nearby neighborhoods. Transportation management centers (TMC) send lane closure information

WHAT IS TSMO?

Transportation systems management and operations (TSMO) is the use of strategies, technologies, mobility services, and programs to optimize the safety, mobility, and reliability of the existing and planned transportation system. A significant cause of congestion and unreliable travel is non-recurring events, such as crashes, and transportation network disruptions, such as bad weather, and special events. TSMO enables agencies to target the underlying operational causes of congestion and unreliable travel through innovative solutions that typically cost less and are quicker to implement than adding capacity. TSMO expands the range of mobility choices available to system users, including shared mobility and non-motorized options.

This Fact Sheet is part of a series that explains how TSMO relates to other State and local transportation agency functions and offices. Other Fact Sheets focus on how TSMO relates to: asset management, performance management, maintenance, design, environment, planning, human resources, and safety.

TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS

MAINTENANCE

ENHANCING TRANSPORTATION: CONNECTING TSMO AND MAINTENANCE



Photo Source: Getty Images

TSMO strategies help make road and bridge maintenance activities safer for workers and traffic and less disruptive to travelers by managing traffic during maintenance activities and alerting drivers to the presence of work crews and lane closures.

Maintenance is vital to preserving the mobility and safety of transportation facilities, but road work activities often temporarily disrupt mobility and constrain the available capacity of the system. By incorporating TSMO strategies into planned and unplanned maintenance activities and making use of existing TSMO resources, maintenance staff can alleviate some of the congestion caused by a temporary lane closure or other capacity reduction and increase safety for travelers and workers.

TSMO strategies that are helpful in increasing safety and mobility around maintenance activities include the following:

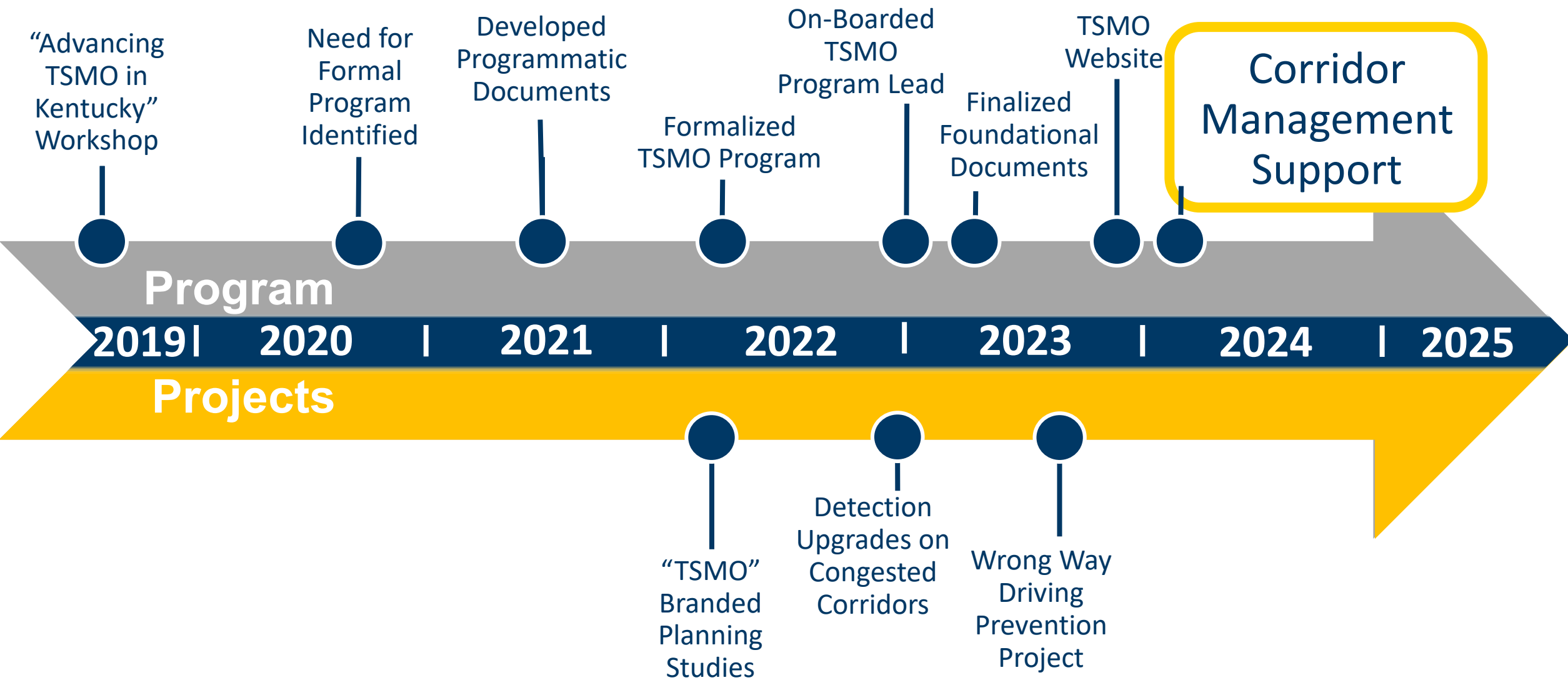
- Posting messages to variable message signs about maintenance work ahead enables drivers to be more alert as they drive by workers or to divert to another facility and avoid the work area. Operators at transportation management centers (TMCs) in the area are important partners in communicating alerts to travelers.
- Disseminating traveler information prior to maintenance activities alerts travelers to the time and location of traffic disruptions. By getting this information out early to potential travelers, departments of transportation (DOTs) can avoid or lessen demand on the facilities where maintenance work is occurring.
- Activating existing active traffic management strategies manages traffic on the facility dynamically. Examples include variable speed limits to smooth traffic flow and reduce collisions, dynamic shoulder use to add capacity when needed, queue warning systems to prevent incidents, and lane control to indicate which lanes are closed ahead.
- Coordinating with operators of potentially impacted jurisdictions to plan for and activate detours, signal timing, and ramp meter changes, or to change signal timing smooths the flow of traffic when maintenance work impacts lanes and traffic flow near intersections.

WHAT IS TSMO?

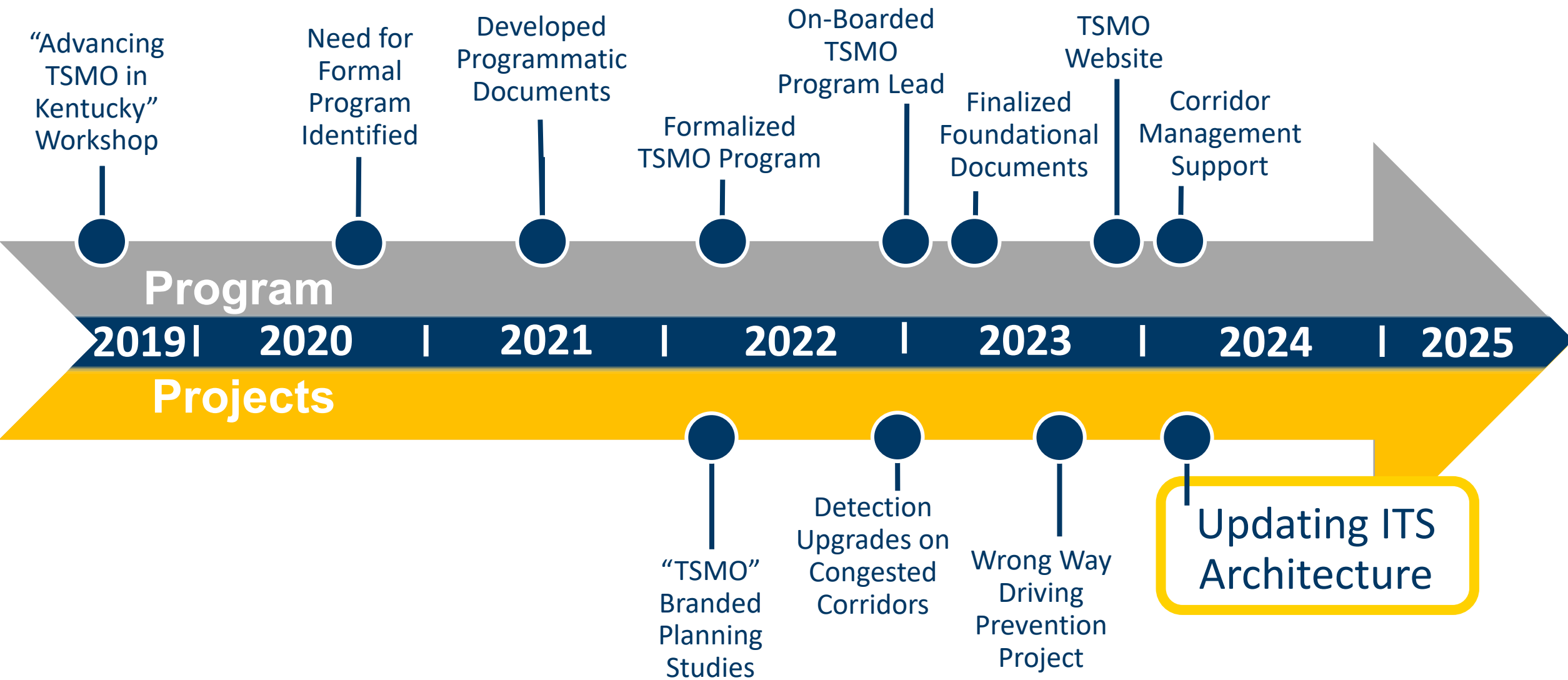
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KYTC TSMO Program and Project Timeline



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“Advancing TSMO in Kentucky” Workshop

Need for Formal Program Identified

Developed Programmatic Documents

Formalized TSMO Program

On-Boarded TSMO Program Lead

Finalized Foundational Documents

TSMO Website

Corridor Management Support

Program

2019

2020

2021

2022

2023

2024

2025

Projects

“TSMO” Branded Planning Studies

Detection Upgrades on Congested Corridors

Wrong Way Driving Prevention Project

Updating ITS Architecture

TSMO 101 Sessions



Register NOW!



Why TSMO?



Safety



Information



Equity



Reliability



Mobility/Access



Environmental
Impact



Improved
Quality of
Life



Equity



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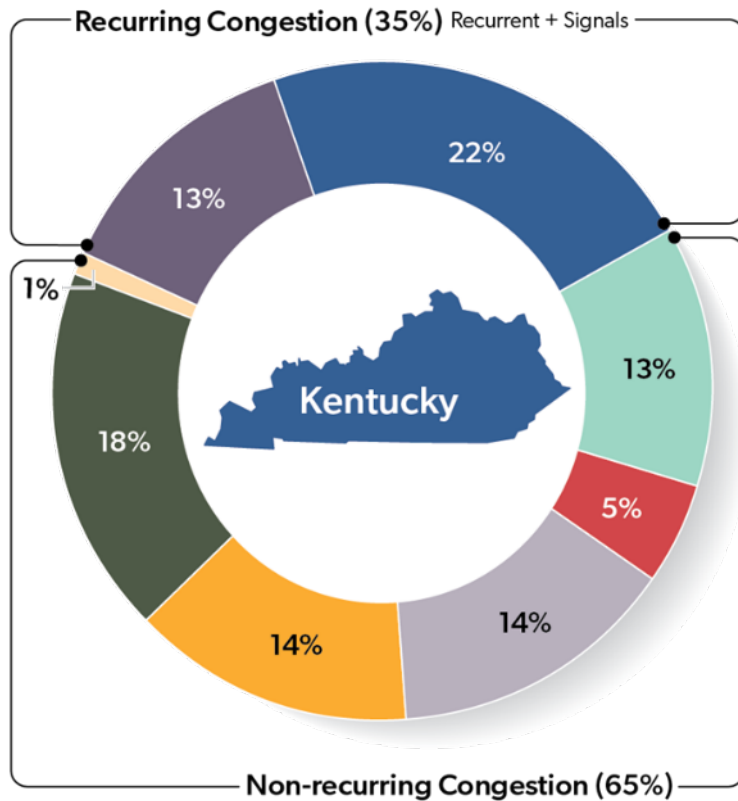


Equity is not merely balancing users and modes but going above and beyond for those who have previously been underserved.

Balance isn't providing equal services, but equally providing opportunities for all to use.



Reliability



- Recurrent
- Signals
- Weather
- Work Zone
- Incident
- Other Multiple Causes
- Unclassified
- Holiday

Source: RITIS

Targeted solutions to congestion causes.

Helps users understand what to expect more often in their trips and commutes.

Recurring Congestion: Occurs repeatedly and predictably.

Non-recurring Congestion: Occurs unpredictably and/or unexpectedly.



TSMO is for Everyone



Personal Vehicles



Freight



Emergency
Vehicles



Vulnerable Road
Users



Transit

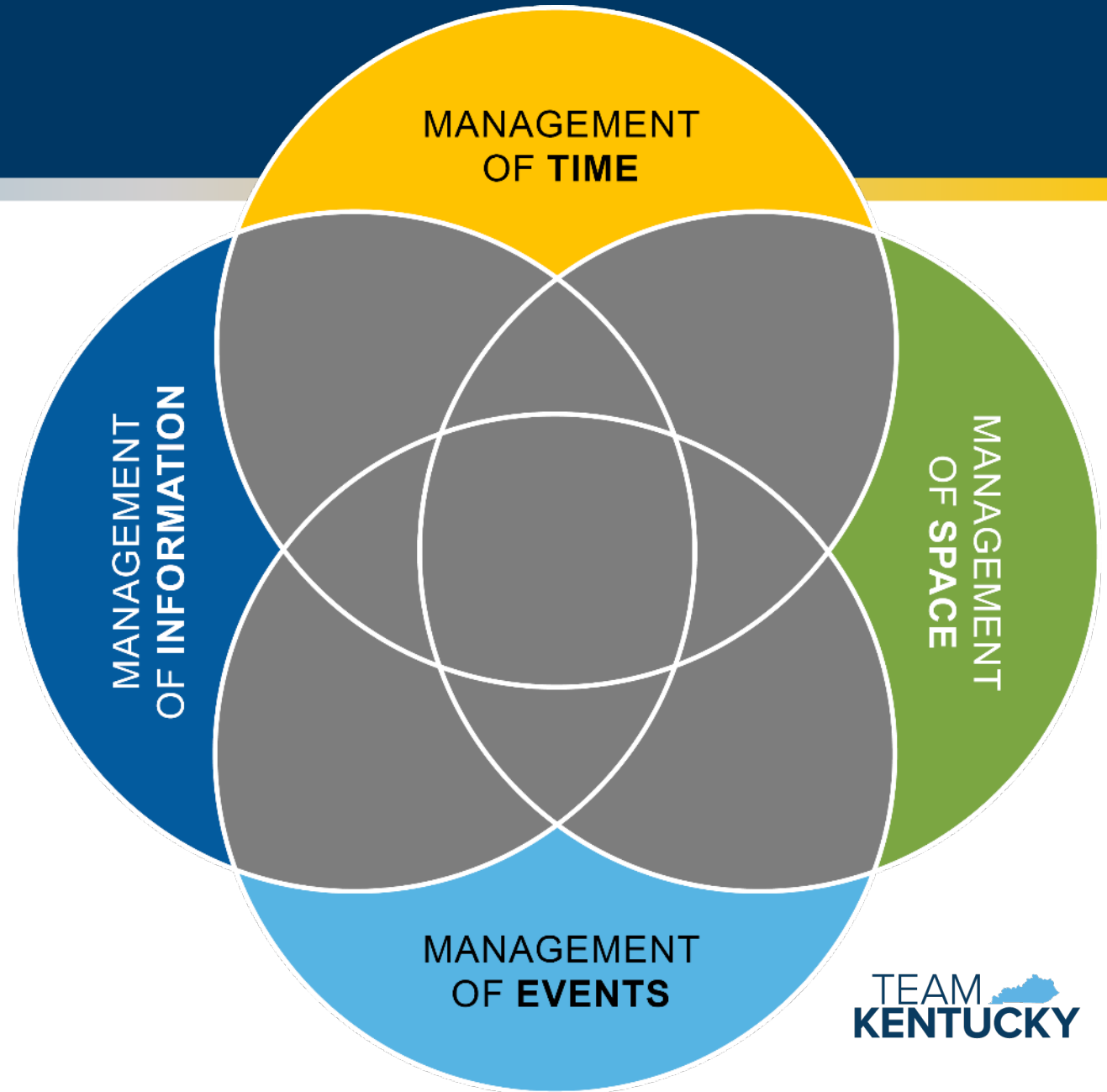


Roadway
Workers

Implementation

How?

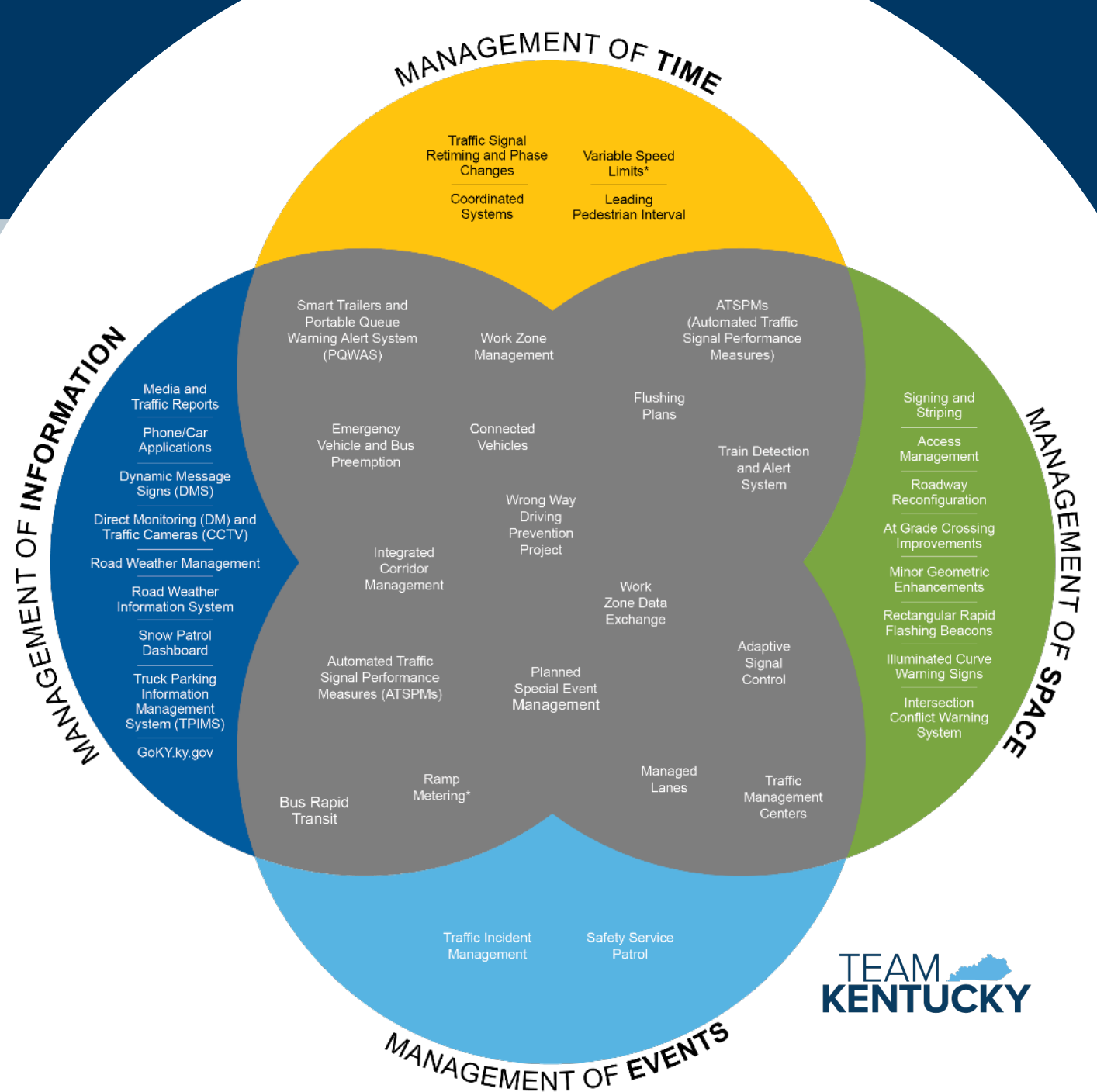
Using one or more strategies for the management of Space, Information, Time, and Events (SITE).



Implementation

How?

Using one or more strategies for the management of Space, Information, Time, and Events (SITE).

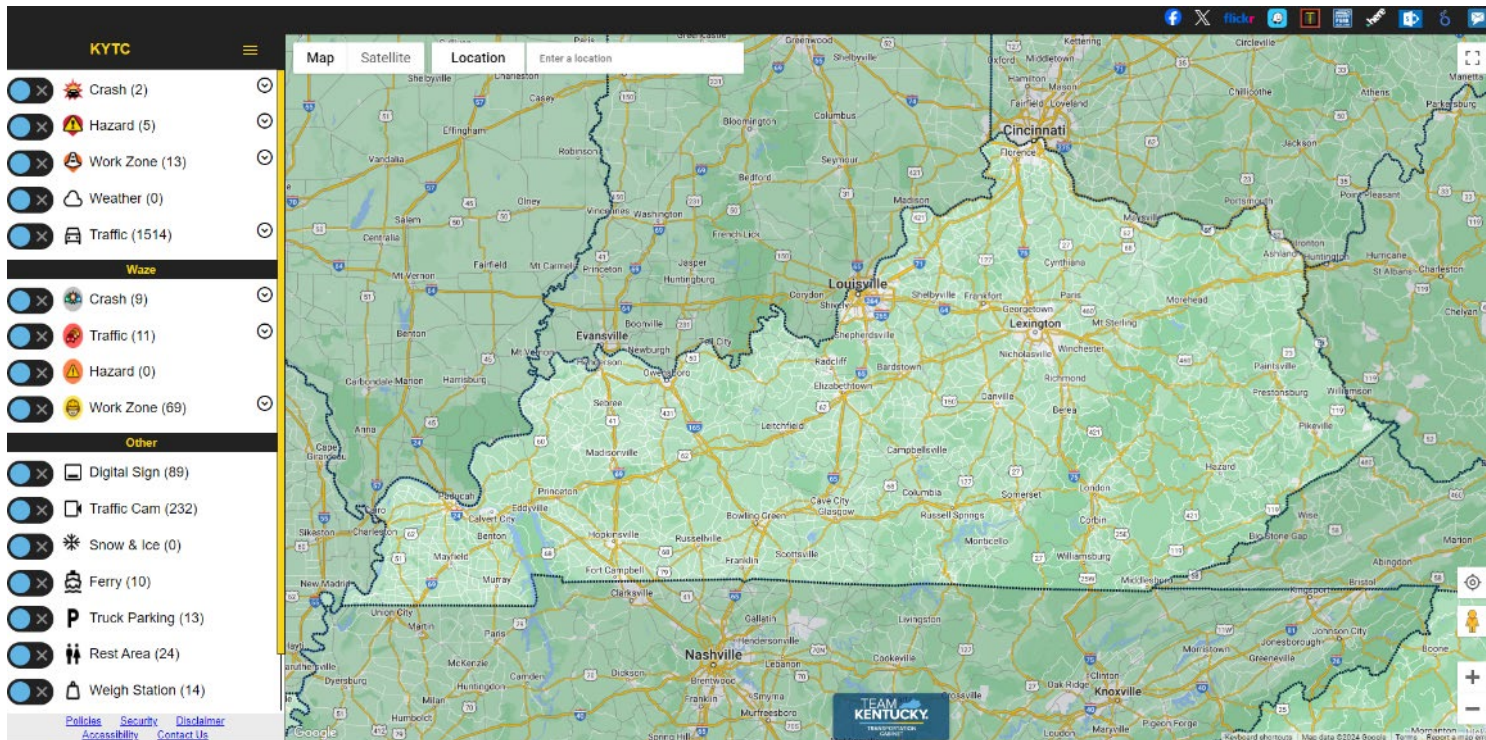


Management of Space

Roadway Reconfiguration



Management of Information



GoKY.ky.gov



Management of Time



Leading
Pedestrian
Interval



Management of Events

Traffic Incident Management



Implementation



Strategies that center on a combination of the management of space, information, time, and events

Media and Traffic Reports

Phone/Car Applications

Dynamic Message Signs (DMS)

Monitoring (DM) and Cameras (CCTV)

Weather Management

Road Weather Information System

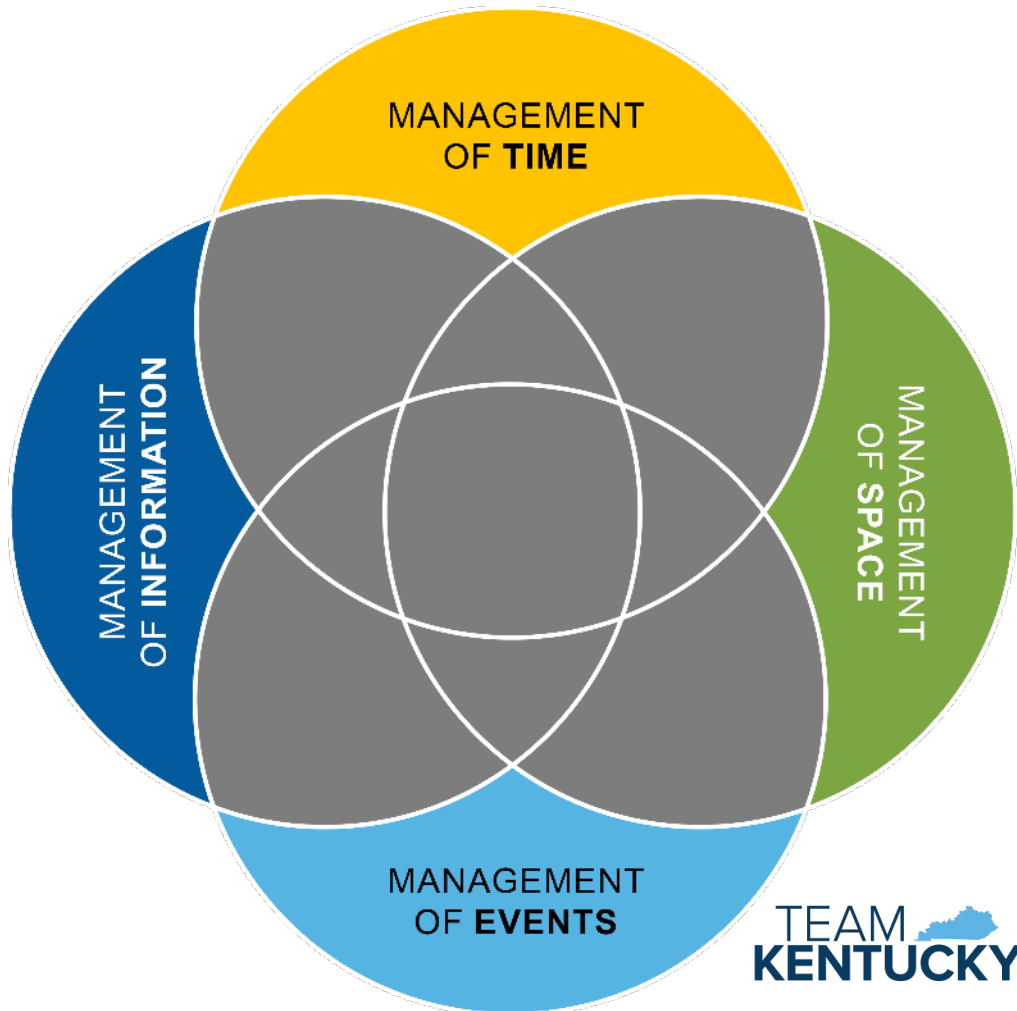
Snow Patrol Dashboard

Truck Parking Information Management System (TPIMS)

oKY.ky.gov

Sign
S
A
Man
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Recor
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Impro
Minor
Enhan
Rectang
Flashin
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Strategies Overlapping in SITE



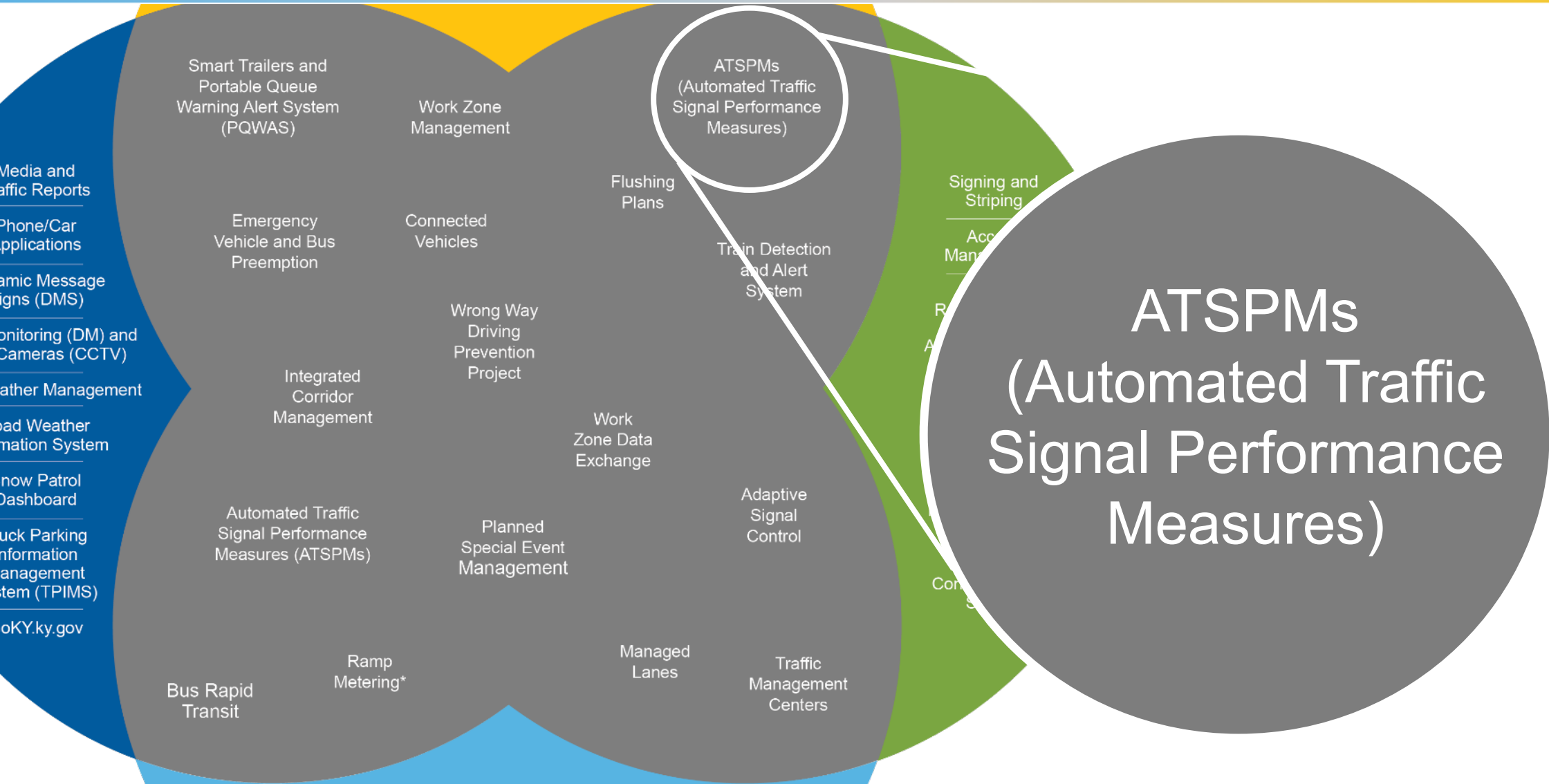
Collect Data

Analyze Data

Optimize Operations

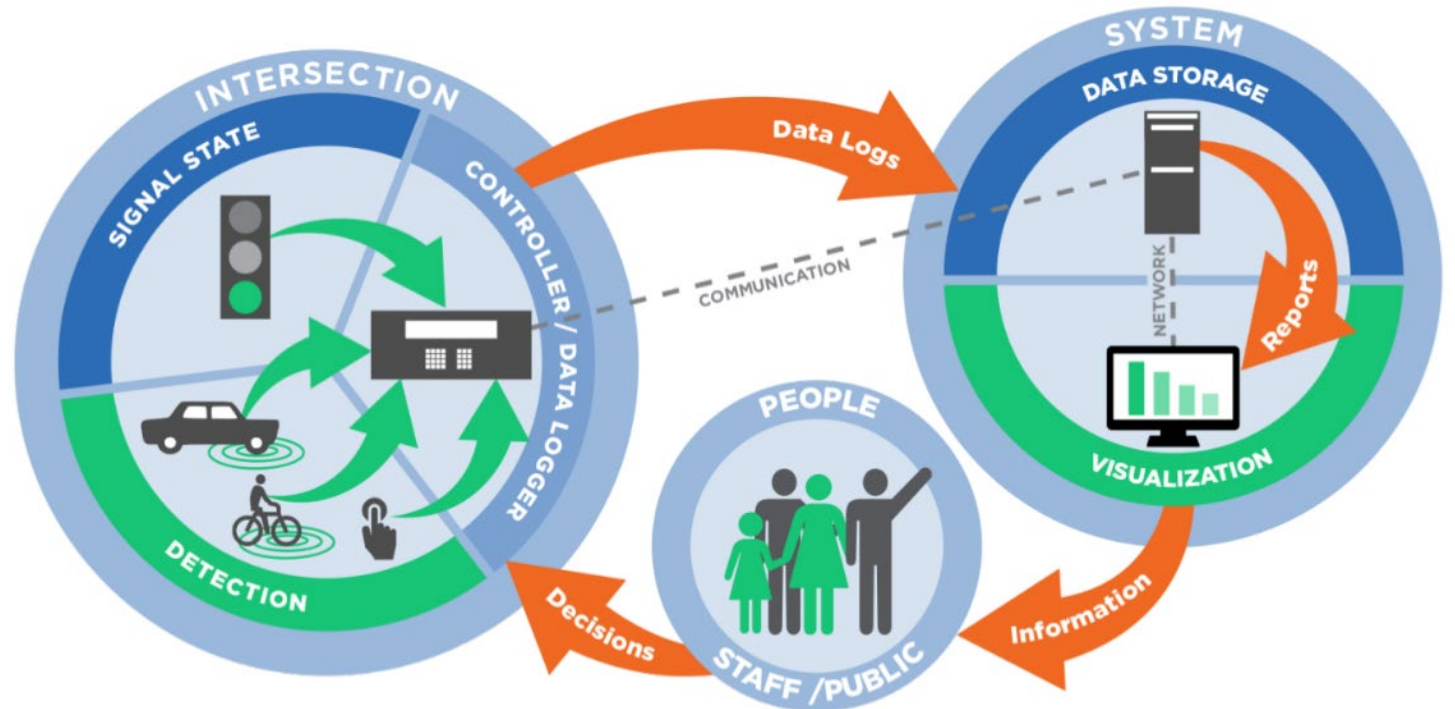
Inform Public

Implementation

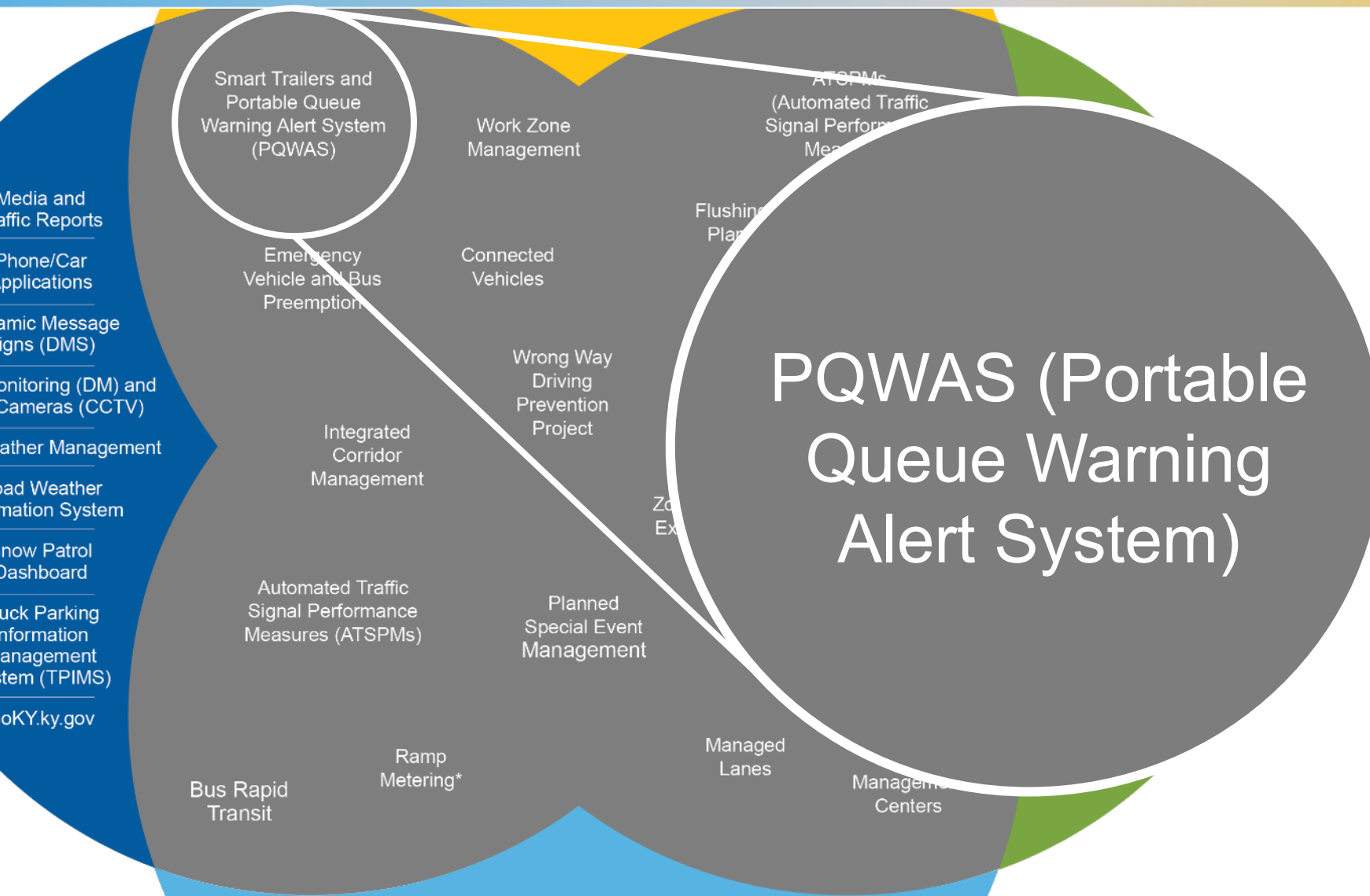


Strategies Overlapping in SITE

Automated Traffic
Signal Performance
Measures
(ATSPMs)



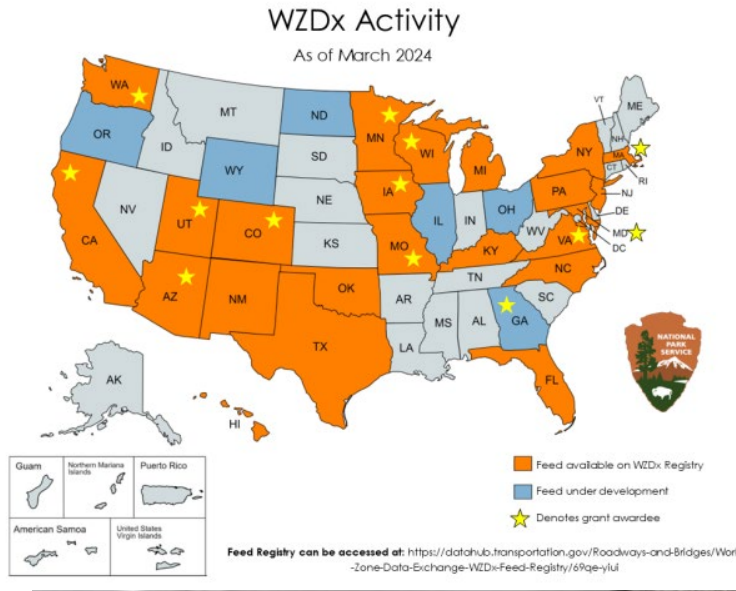
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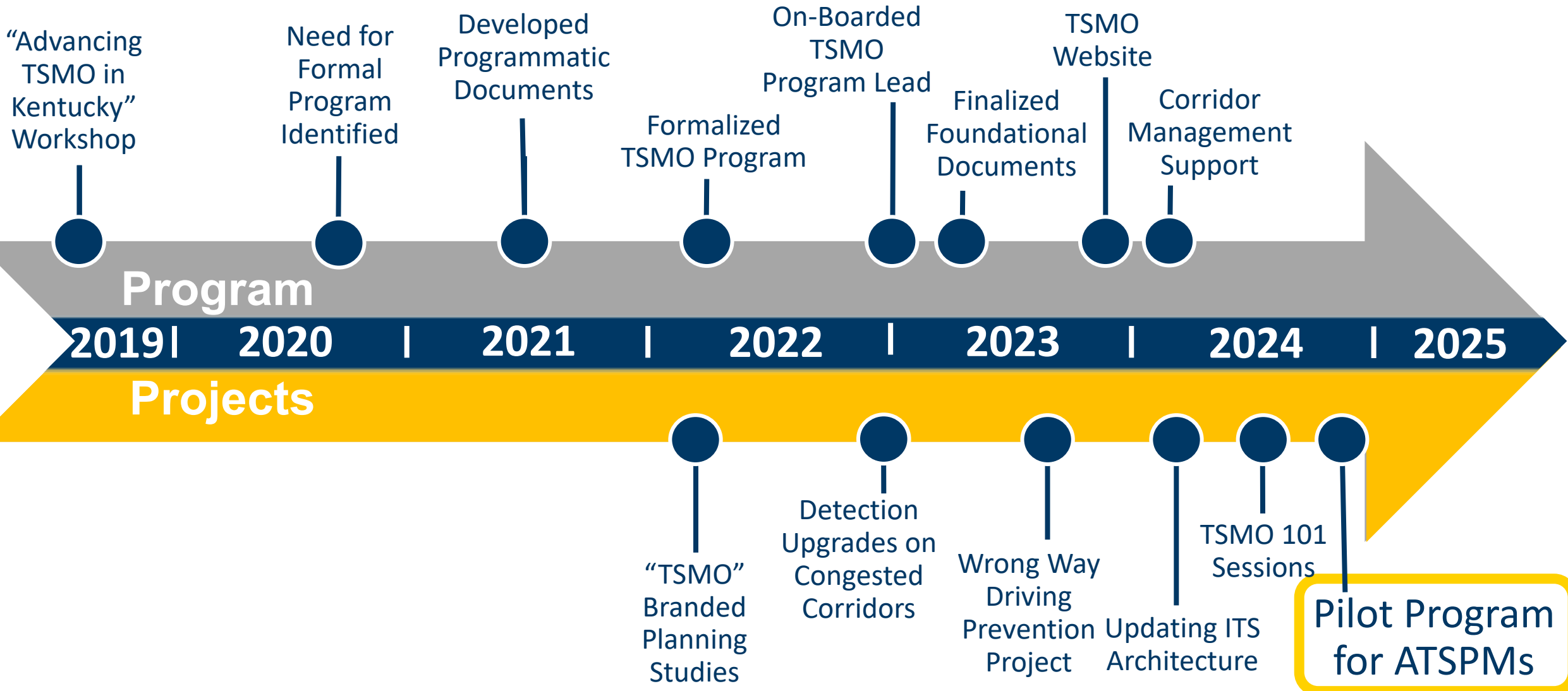
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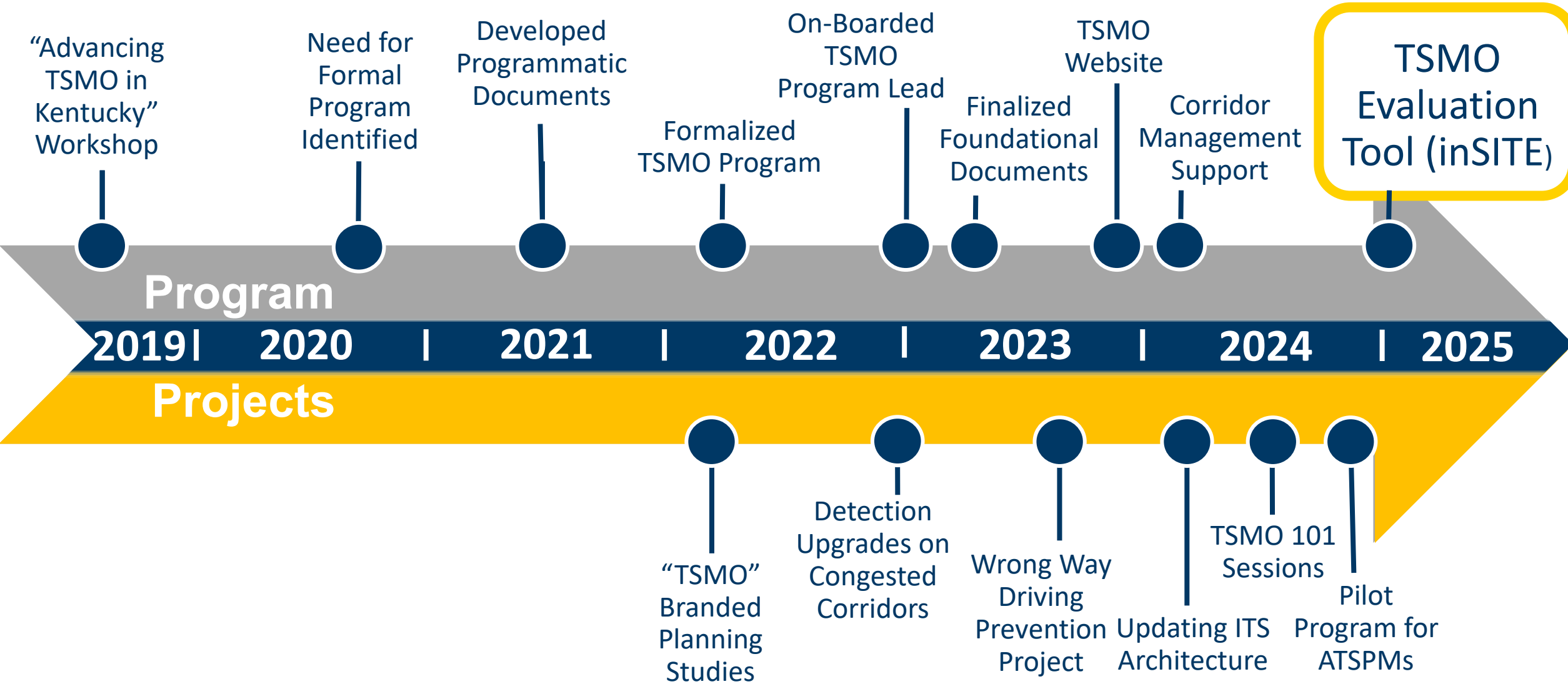
Work Zone Management Strategies



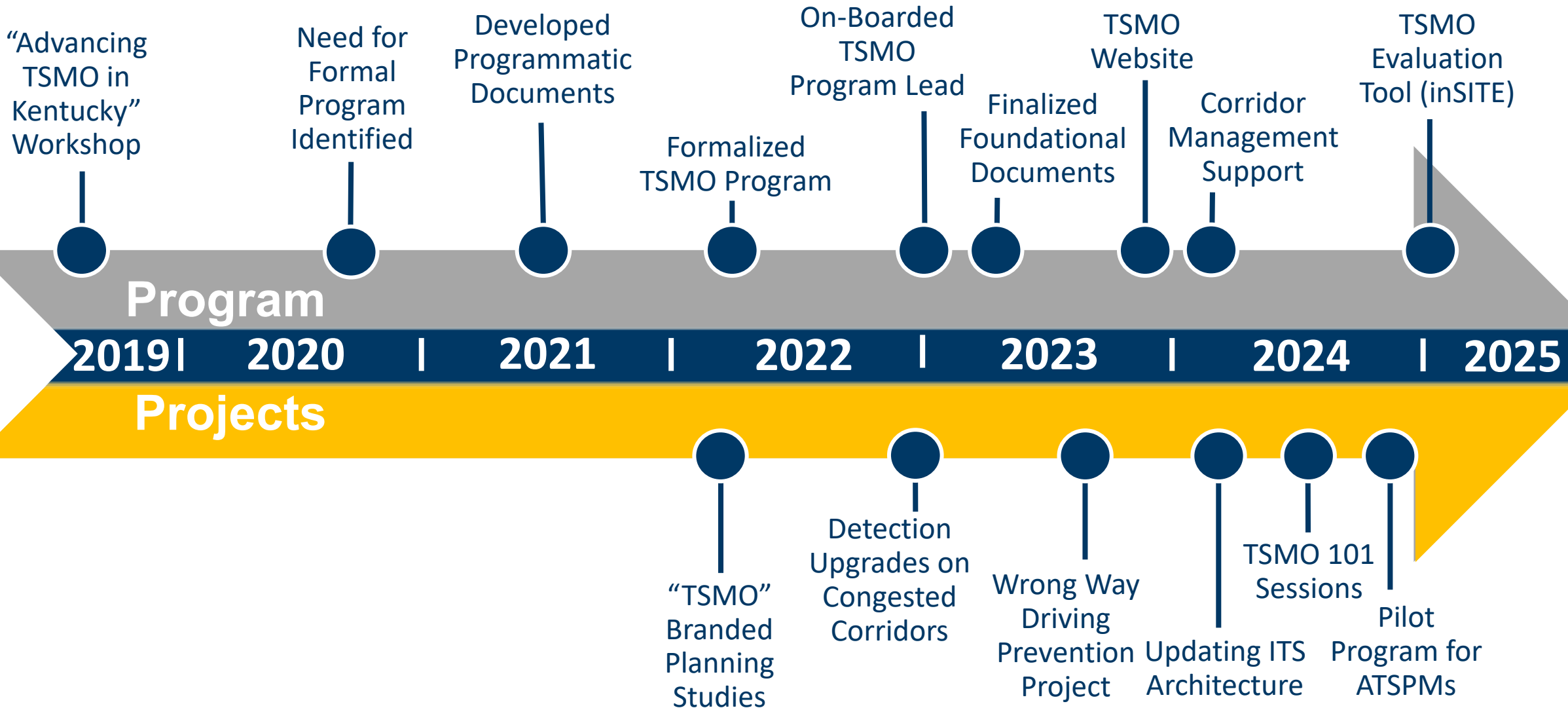
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The TSMO “Takeaway”





When? Now!

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KYTC TSMO Program Lead

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(502) 764-0526

TSMO 101 Registration



transportation.ky.gov

TSMO: Leveraging Technology to Support People

10:50 am

