

“Transferring knowledge about the TSMO practice around the country”

2019 Transportation Engineering and Safety Conference

December 11-13, 2019

Penn State University

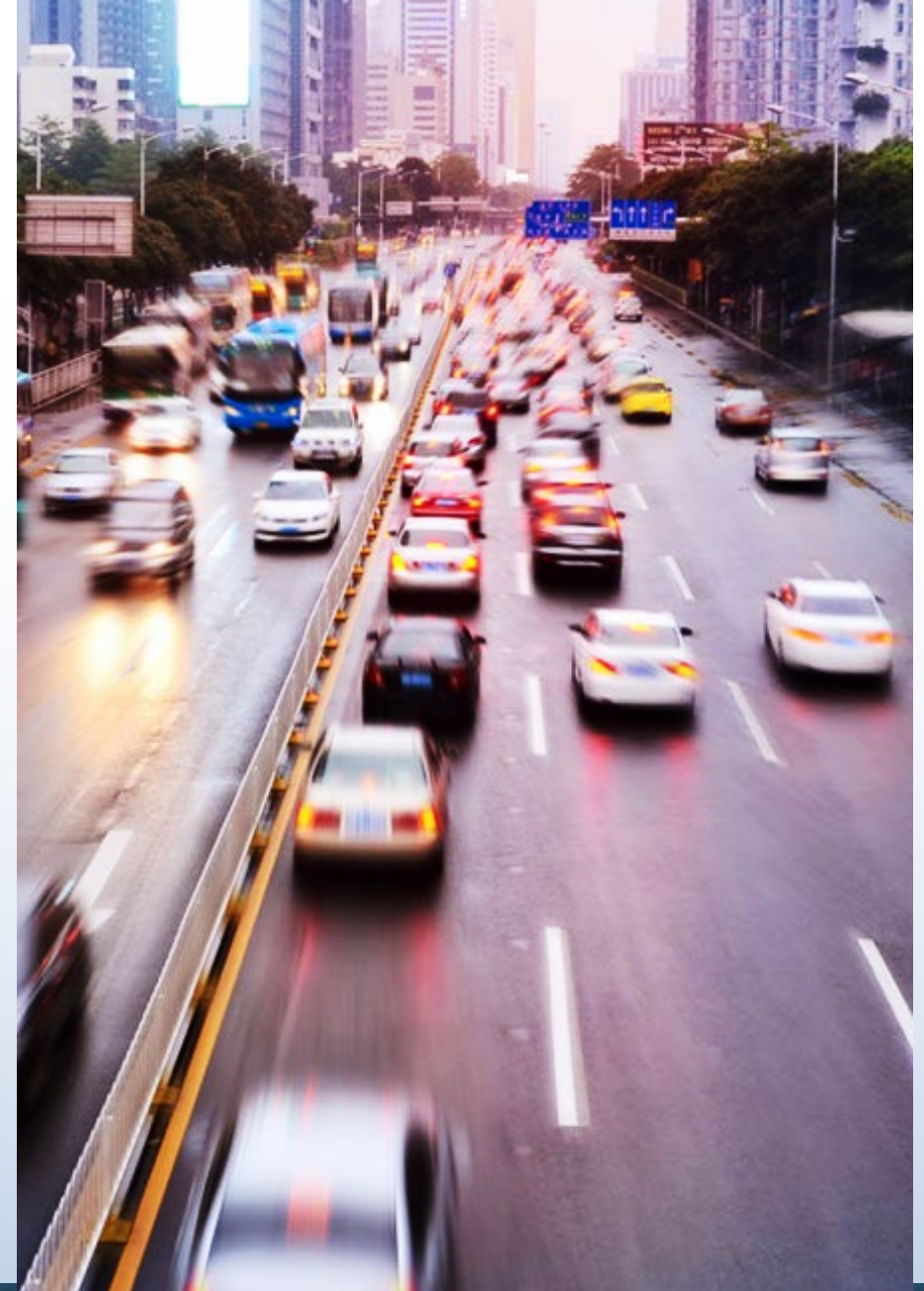
NOCoE

National Operations Center of Excellence

**Presented by:
Thomas E. Kern**

VISION: Provide exceptional services to the TSMO community to save lives, reduce congestion, and enhance economic vitality

MISSION: Empower the TSMO community to succeed by enhancing knowledge, skills, and abilities





**2nd Annual Transportation Technology Tournament (TTT)
ITE Austin**



TTT – ITE Austin

- NOCoE Partnership with U.S. DOT ITS JPO
- Each team paired with agency to solve real-world DOT problem
- Focus on soft skills for students



NOCoE Fellowship Program

Purpose:

To provide opportunities for early career, or career switching TSMO professionals to develop knowledge, skills, and abilities (KSAs) that can be applied on the job and in support of their long term career growth.



**Courtney Sell – WSDOT
NOCoE's First Fellow**

TSMO Workforce Development Guidebook

PART 1

Understand
Guidebook
Materials

PART 2

Building Blocks
for Your
TSMO Team

PART 3

Develop
Your TSMO
Team

TSMO Workforce Guidebook: Overview

- Funded by NCHRP 20-07/Task 408
- To provide practitioners with a tool to understand what is needed for and how to develop a strong TSMO workforce.
- The Guidebook focuses on workforce development practices rather than the specific details of TSMO, so readers without a background in TSMO will find the information useful.
- The hoped for outcome: A Strategic Management Framework for identifying new positions, recruiting and retaining TSMO staff.

Part 1

Understand Guidebook Materials

The Workforce Development Guidebook



PURPOSE:

Assist agencies in creating meaningful TSMO-related positions that will help advance the organization's maturity

Who is this for?



- People at transportation agencies looking to begin or advance a TSMO program **GET GUIDANCE**
- People involved in recruiting, hiring, or training in the transportation operations field **GET ADVICE**
- Consultants working with TSMO programs **UNDERSTAND CHANGING ROLES**
- Educators at the undergraduate and graduate levels **KNOW HOW TO PREPARE TOMORROW'S WORKFORCE**

So where do I find?



Recruiting a TSMO Workforce

Model TSMO Position Descriptions

NOCoE Website

Developing a TSMO Workforce

TSMO Workforce Retention

A nighttime city street scene with light trails from vehicles and illuminated skyscrapers in the background. Two large overlapping circles, one green and one blue, are overlaid on the image. The green circle is on the left and the blue circle is on the right. A dashed white line forms a semi-circle on the right side of the blue circle.

Part 2

**Building
Blocks for your
TSMO Team**

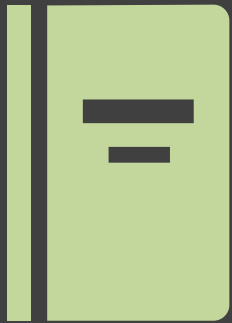
What will be useful to me in my job?



	WHICH PART OF THIS RINGS TRUE WITH YOU NOW?
Recruiting a TSMO Workforce	1. Understand evolving skillsets needed for success and innovation
	2. Understand when an agency is ready to hire TSMO personnel
	3. Recommendations, best practices for hiring TSMO positions

	WHICH PART OF THIS DO YOU NEED TO UNDERSTAND BETTER?
Model TSMO Position Descriptions	1. Descriptions of 19 different TSMO-related positions
	2. KSAs that may be required for the positions
	3. When, where, and how to recruit for each of the positions

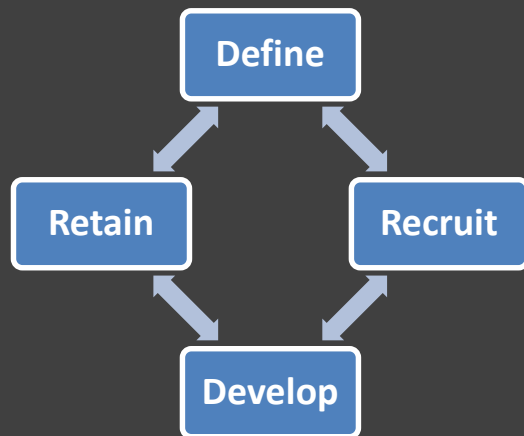
What will be useful to me in my job?



	WHICH PART OF THIS WILL BE MOST USEFUL TO YOU?
Developing a TSMO Workforce	1. Crafting a professional development plan
	2. TSMO-related undergraduate and graduate programs
	3. TSMO-related professional development courses
	4. Investments in strengthening a TSMO workforce

	WHICH PART OF THIS NEVER WORKED HERE BEFORE?
TSMO Workforce Retention	1. Improving training and professional development
	2. Understanding the importance of human resource benefits
	3. Creating a workplace culture that encourages longevity

What will be useful to me in my job?



	WHERE TO START YOUR SEARCH TO BUILD YOUR WORKFORCE?
Model TSMO Position Descriptions	1. List of known TSMO-related undergraduate, graduate programs
	2. List of known professional development and training opportunities
	3. TSMO-related position descriptions

- **UNDERSTAND** where you fit into this cycle
- **DETERMINE** how others fit into the cycle
- **USE** the resources to help guide you

Searchable Training Database

Workforce Training

Workforce Training Database

Below is a comprehensive and searchable database of TSMO industry trainings and courses. Please use the keyword and/or category searches below to find courses to advance your TSMO knowledge or to help empower your organization.

For more information on NOCoE's Workforce Development efforts, including workforce development training and our fellowships for state DOTs, please contact [Patrick Son](#).

Keyword Search

Advanced Search

Use the Search Filters to narrow the list of records displayed.

Organization



Category



Has fees



Delivery Method




Mode



Research converted to online database

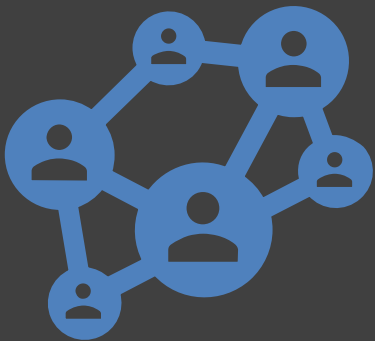
<https://transportationops.org/training>

Please send new training to NOCoE

A person with long, light-colored hair is seen from behind, sitting at a desk in a modern office. They are looking at several computer monitors displaying various data and charts. The office environment includes desk lamps, a telephone, and a filing cabinet. A large, semi-transparent blue and green overlay covers the right side of the image, containing white text.

**What are the jobs?
Knowledge, Skills,
Abilities?**

What are the positions?



- 19 different positions identified
- Identified by literature review, backed by stakeholder interviews and panel recommendations
- Some exist, but not widespread or can be expected to exist in future
- Developed to include:
 - When position might be needed – “Triggers”
 - How it relates to CMM improvement
 - Knowledge, Skills Abilities for position
- Use positions descriptions as starting point – Modify to fit your needs

Traffic Data Scientist/Statistician	Cyber Security Engineer
TSMO Manager/Chief/Bureau Director	Transportation Data Ethicist
TSMO Program Manager	Surface Weather Specialist
Computer Engineer	Systems Engineer
Artificial Intelligence Scientist	TSMO Modeling Specialist
Telecommunications Engineer	Emerging Technologies Industry Liaison
Data Management Specialist	Transportation Systems Performance Manager
Visualization Specialist	Integrated Corridor Management Manager
Connected and Automated Vehicles (CAV) Program Manager	Transportation Management Center Manager
Traffic Incident Management (TIM) Program Manager	

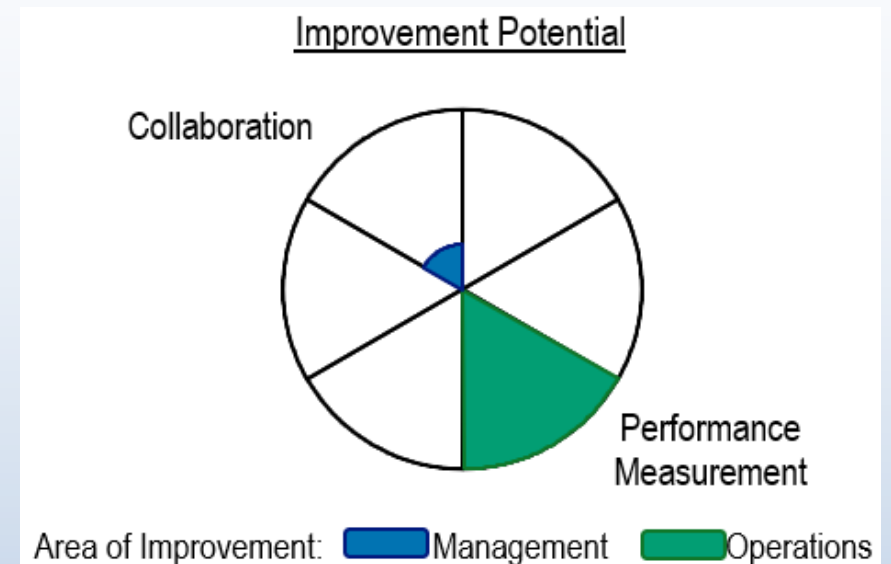
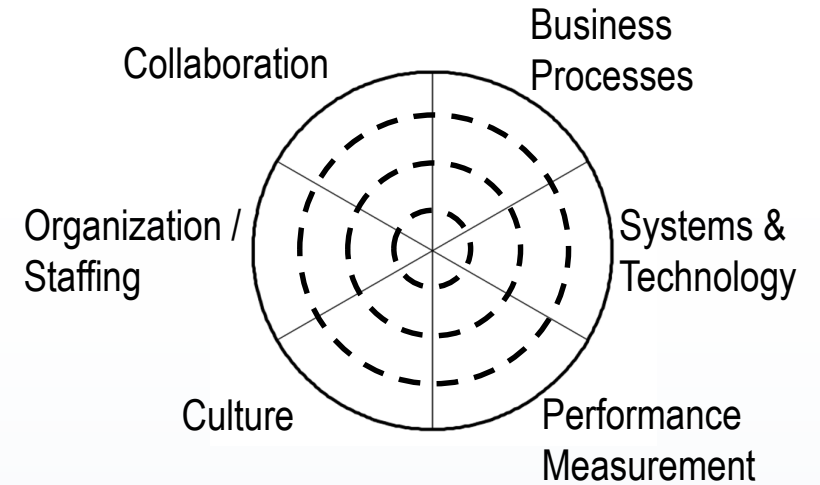
<https://transportationops.org/workforce/model-tsmo-position-descriptions>

What motivates your organization to change its face(s)?

Position	Motivations
Traffic Data Scientist / Statistician	<ul style="list-style-type: none">• TSMO relies on effective extraction and manipulation of “big data”• Growing opportunity and expectation for data-driven decision-making, including advanced pattern recognition and statistical methods• Spatial data requires combining expertise in geographic information systems (GIS), statistics, data science, visualization, and web applications

Illustrating CMM Improvement Potential

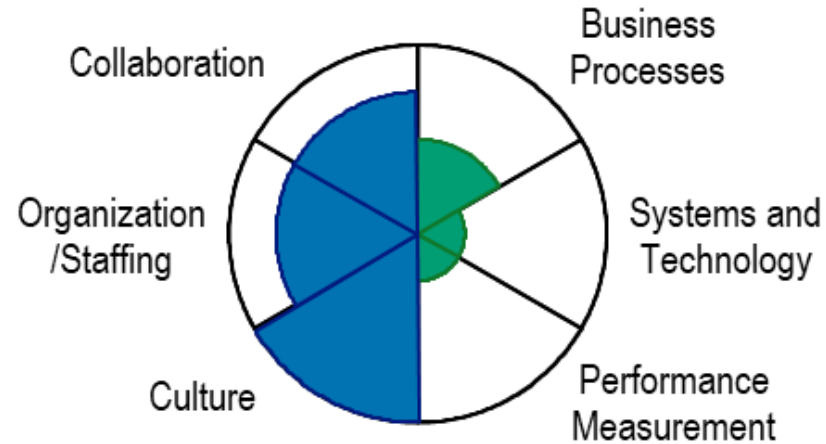
- Developed Concept Analogous to Right vs Left Brain
- Right Brain (Management) – More Creative and Artistic
 - Collaboration
 - Organization/Staffing
 - Culture
- Left Brain (Operations) – More Analytical
 - Business Processes
 - Systems and Technology
 - Performance Management
- The more the radial graphs are filled out the higher potential to improve CMM category



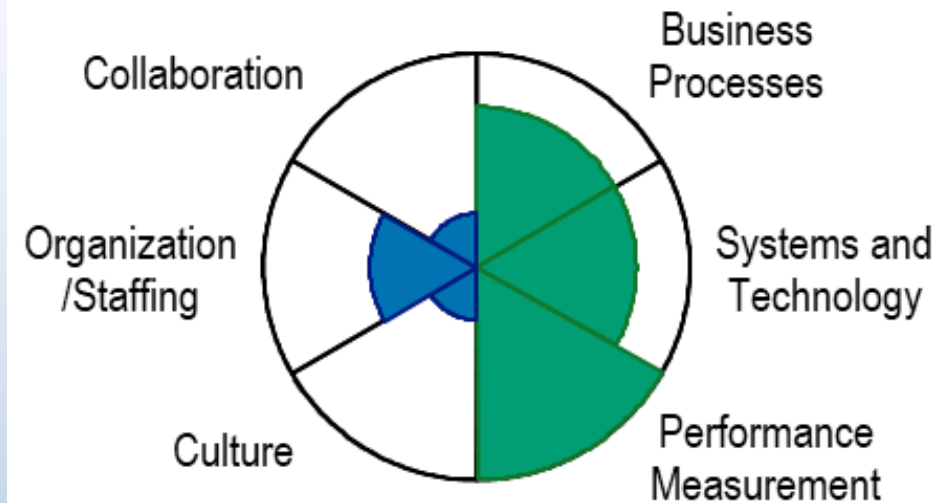
Example Operations vs. Management Positions



TSMO Manager/Chief/Bureau Director



Traffic Data Scientist/Statistician

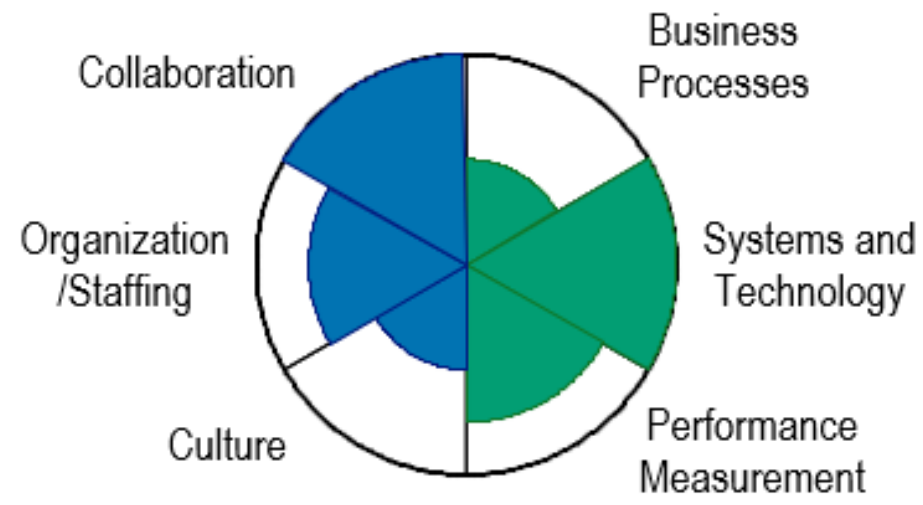


Capability Maturity Model Improvement Potential

Integrated Corridor Management Manager

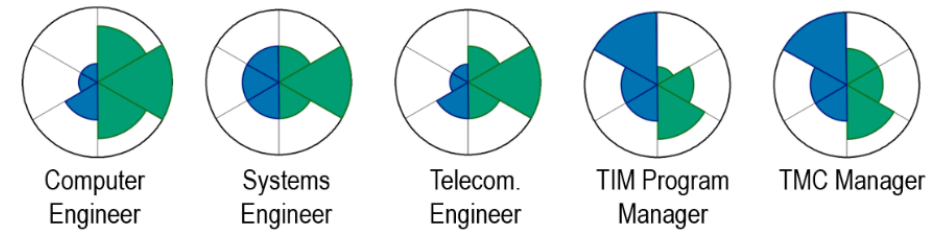
Typical TSMO Program CMM Level: 2-3

Improvement Potential

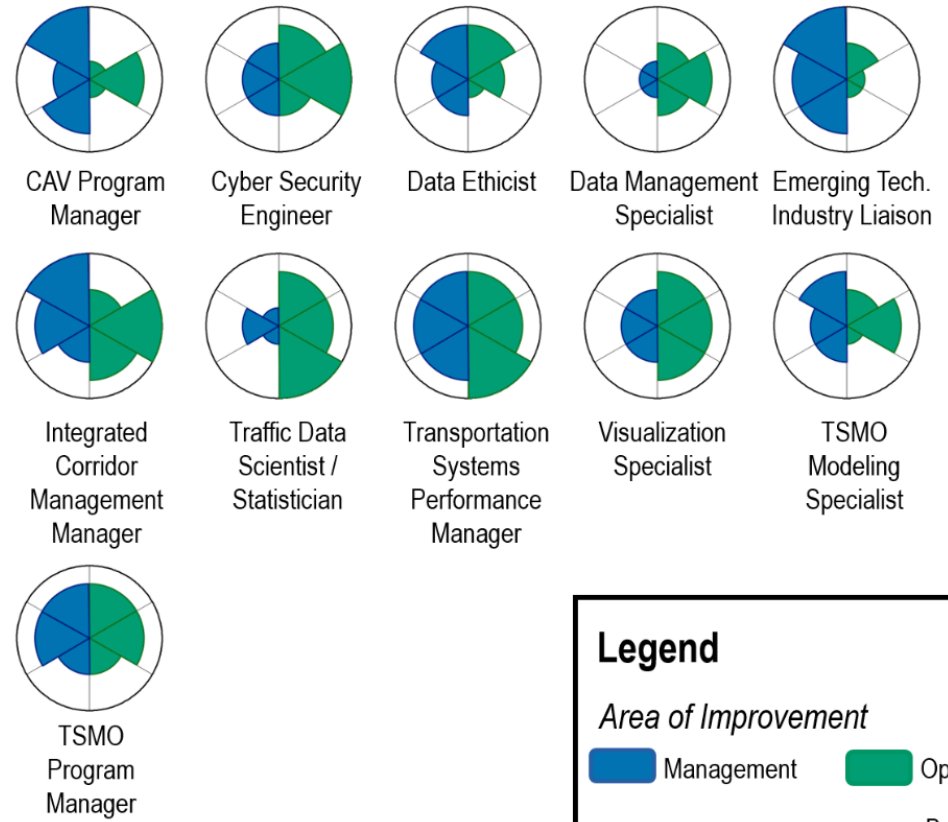


Area of Improvement: ■ Management ■ Operations

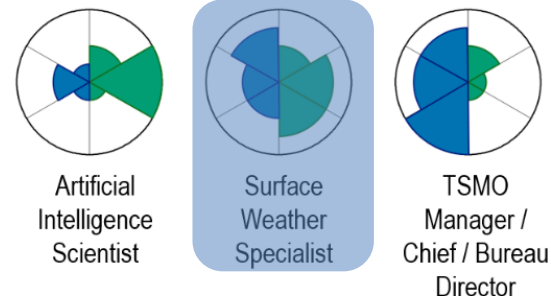
CMM Levels 1-2



CMM Levels 2-3



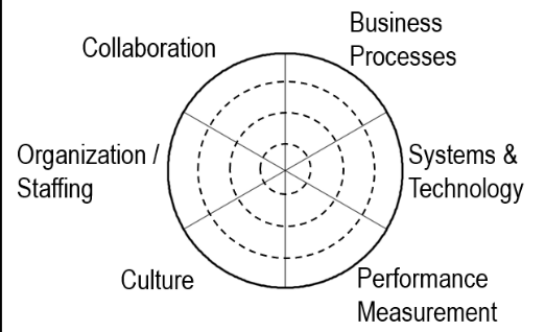
CMM Levels 3-4



Legend

Area of Improvement

■ Management ■ Operations

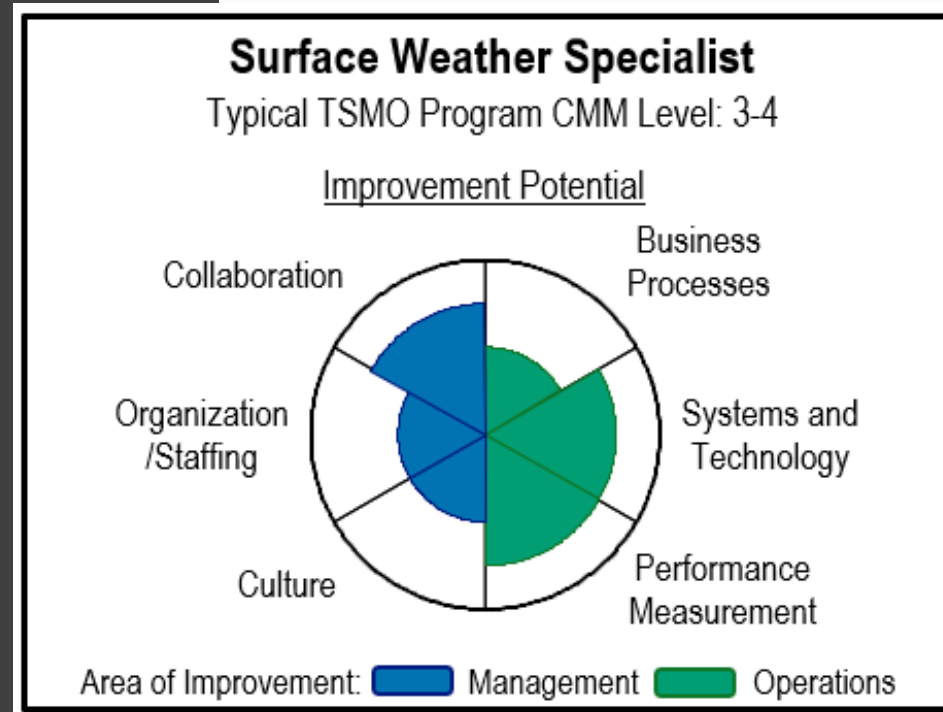


Beyond just what the jobs are



EXAMPLE - WHEN AND WHY TO HIRE?

- The agency is looking to enhance their TSMO program by improved weather condition connectivity
- Weather data needs integration with other TSMO activities for performance assessment and improvement
- Interest in improving TSMO applications by adapting to real-time and predictive weather effects



Greatest potential to impact CMM is on collaboration, systems, performance improvement

Part 3

**Recruit,
Retain,
Develop your
TSMO Team**

UPCOMING RESOURCES AND WKFC ACTIVITIES

WHITE PAPER

Para-professional

(TMC operations & TSMO Field operations)

REGIONAL AND LOCAL WORKSHOPS

Workshops to go in depth on the resources, approaches and understanding the information

<https://transportationops.org/workforce>

Engage Us:
Online or
Social



www.transportationops.org



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