# TSMO Workforce Development: Future Workforce Requirements and Descriptions

## Session Presentation:

**Pathways: Leadership/Management, Operations**
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# Acknowledgements

- AZTech Strategic Steering Committee
- Project Champions
  - Nicolaas Swart, P.E., Maricopa County DOT
  - Reza Karimvand, P.E., Arizona DOT
- AZTech Partner Agencies
  - Transportation Operations and Management
  - Human Resources participants

# Project Background and Need

- AZTech partnership recognizes that agency roles for system operations will continue to evolve and change
- Traditional roles are shifting to ones that are more complex, technology-driven and collaborative
- Influences on transportation agency staffing and workforce:
  - Technical skills
  - Training needs
  - Types of roles needed to support the transportation system of the future
  - ***How can AZTech partners address this need?***
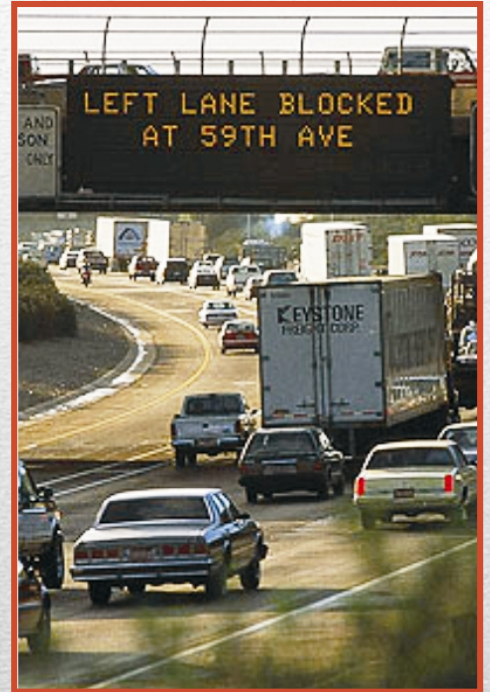
# The Transportation Environment is Changing

- Operations is 24/7/365
- We rely more on information and technology
- Increasing customer needs and expectations
- Growing emphasis on measuring performance and how well investments are paying off
- Reduced financial resources
- Opportunities to integrate technologies across agencies, modes

# Local Innovations in System Operations

- Smarter Corridors
  - Managing freeways and street operations during freeway closures (ICM focus)
  - Sharing data across agency boundaries
- Expanding our ability to monitor what is happening on roads with new partnerships

- Systems are advancing
  - Bell Road Adaptive Corridor
  - Real-time traffic alerts for agencies
  - Social media and mobile apps to provide traveler information
- Increasing collaboration among agencies
  - Traffic Incident Management Coalition
  - Large scale special events
- Connected and Automated Vehicles

# What This Means for Agency Staff Resources

- Traditional staff roles and responsibilities are changing
- Advanced operations strategies and systems require new skill sets
- We are getting asked to do more with fewer resources
- More focus on managing the network as a region, not just the streets within individual jurisdiction boundaries
- Increased need for training for operations and maintenance on new technologies
- New focus on business processes and analytics require skill sets outside of traffic engineering

# National Focus on Workforce Development

- Federal Highway Administration and the National Operations Center of Excellence
- 2016 TSMO Workforce National Summit
- Key themes:
  - How we define specific skill sets for transportation operations
  - How can we make sure the talent pipeline can meet our needs – universities, community colleges, vocational schools
  - How can we acquire and sustain these unique skills sets (training, recruiting, career paths)
- NCHRP study on state DOT TSMO workforce needs

# Project: TSMO Job Description Templates

- AZTech partners collaborated on identifying future workforce needs – technical skills, training, types of staff resources needed
- Challenges:
  - Agency Human Resources processes
  - Leadership support for changing/modifying job duties and descriptions
  - Recruiting for specialized technical positions, retaining key staff
  - Aligning job descriptions with actual duties and expectations
  - Ongoing evolution of technology
- Preliminary survey and follow-up workshop with transportation operations and agency HR departments
- New TSMO roles, training needs, certifications
- Templates to develop agency-specific job descriptions

# What Skill Sets Do Operations Staff Need?

- **Engineering**
  - Traffic, civil, electrical, systems, computer

- **Computer Science**
  - Programming, database management, hardware

- **Planning**

- **Telecommunications**
  - Wireless, networking

- **Business/Data Analysis**
  - Data management, predictive analysis, performance management

- **Operations**
  - Incident and event response, advanced corridor operations (ICM)
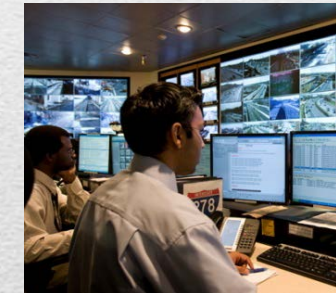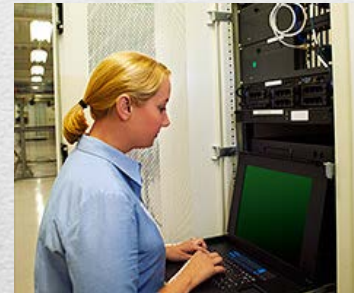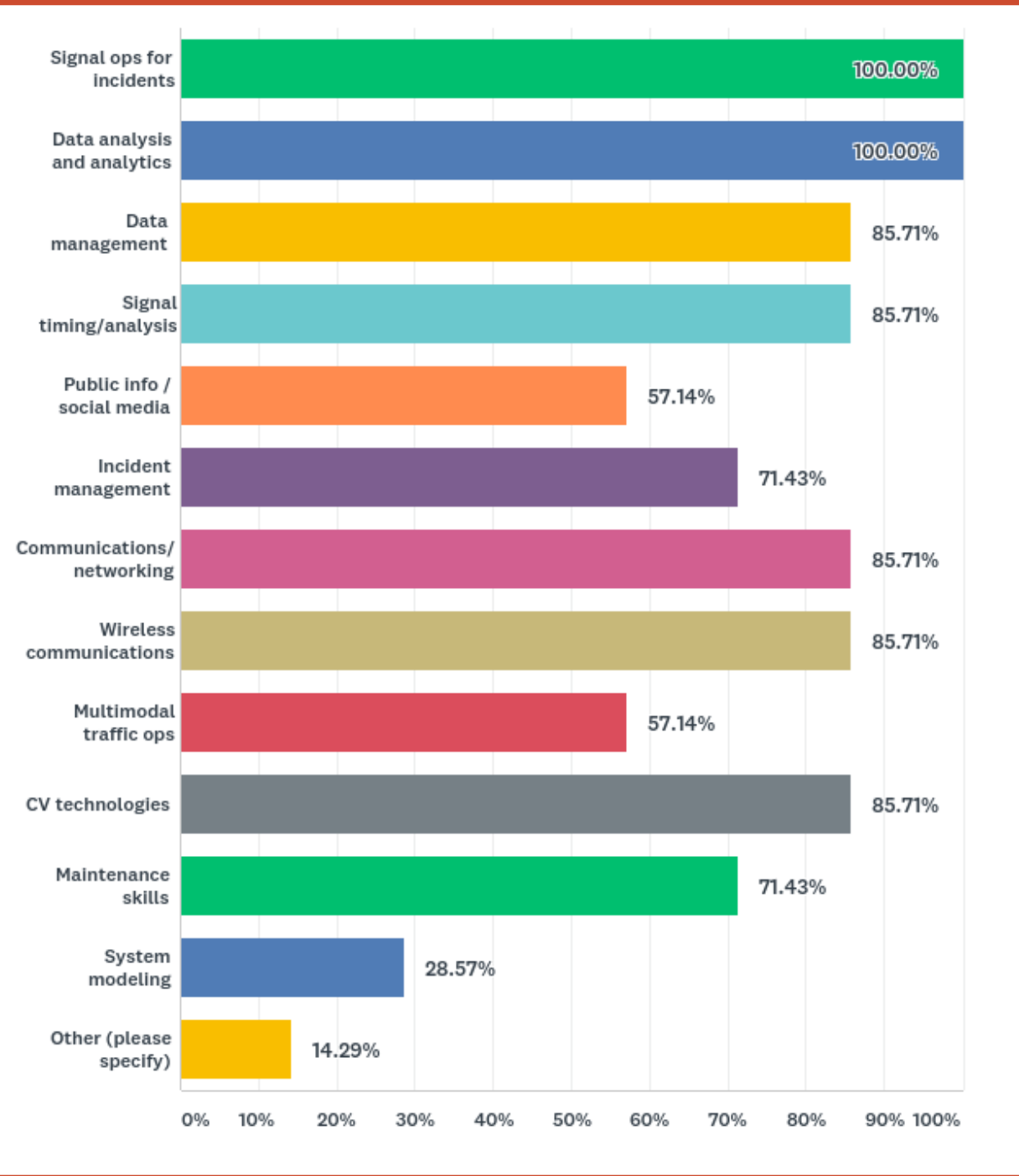
# Other Skills for Operations

- Project Management

- Public Policy

- Communications and Public Information

- Organizing and delivering training

- Understanding new procurement models and processes

- System and Equipment Maintenance

# Priorities for AZTech Partner Agencies

# Future Skill Sets



Signal ops for incidents — 100.00%
Data analysis and analytics — 100.00%
Data management — 85.71%
Signal timing/analysis — 85.71%
Public info / social media — 57.14%
Incident management — 71.43%
Communications/ networking — 85.71%
Wireless communications — 85.71%
Multimodal traffic ops — 57.14%
CV technologies — 85.71%
Maintenance skills — 71.43%
System modeling — 28.57%
Other (please specify) — 14.29%

# Workshop with HR and Transportation

- Held a half-day workshop with transportation operations and agency HR representatives
- Objectives:
  - Better understand HR perspective and processes
  - Identify some common workforce needs, issues and challenges
  - Understand agency-specific processes and requirements
  - Identify what tools would be of most benefit for AZTech partners
  - Set the stage for ongoing discussion and collaboration with HR

# Developing New Job Descriptions and Roles – Processes and Challenges

# Challenges

- Defining specific skill sets
- Frequency of job description reviews/updates
- Specific requirements at different agencies
  - Example: who can go into the cabinet to make changes?
- Cross-cutting roles (combining technology, IT, systems, communications, etc.) and impact on salary/requirements
- Modifying existing roles vs. creating new roles
- New types of skills (analytics, business processes, hardware)
- Preferences vs. requirements
- Career paths for unique skill sets – impact on staff retention

# Templates to Generate Job Descriptions

## Operations "Job Family"

| General Role | Functional Role | Example Titles | Education | Experience | Salary Range | Roles & Duties |
|---|---|---|---|---|---|---|
| TMC Manager | Brief, general description | ITS Supervisor ITS Engineer TMC Manager Sr. Traffic Analyst | "Preferred" vs. Required | "Preferred" vs. Required | Varies by experience, supervisor responsibility, agency salary ranges | Select from list of key duties |
| TMC Operator | | | | | | |
| Data Analyst | | | | | | |
| IT/Network Admin | | | | | | |

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# Templates, continued

- Job Description Generator
- Certification Resources
  - Types of available certifications
  - Applicability to different TSMO roles
  - Time/cost requirements and prerequisites
  - Agency to determine applicability to their staff
- Training Resources
  - National resources available through NHI, CITE, ATSSA
  - Course type (online, in-person)
  - Time/cost requirements and prerequisites

# Future Steps

- Assess how agencies are using the TSMO job description templates
- Update periodically to reflect new duties, expanded position requirements, titles, etc.
- Keep workforce as an AZTech Strategic Steering Committee priority initiative
- Keep the dialogue going with agency HR representatives
  - Their staff changes over time too!
  - Value in hearing these needs from partners, not just their own agencies
- Ongoing need to keep agency leadership apprised of staffing needs, technical skill set needs, and build champions at the leadership levels

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