

ACHIEVING BETTER COORDINATION BETWEEN OPERATIONS TECHNOLOGY AND INFORMATION TECHNOLOGY

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Achieving the missions set out by IT and OT support the realization of a shared vision for Technology

TECHNOLOGY VISION

To be recognized as an industry leader, by leveraging technology to drive value for our transportation stakeholders and the travelling public. Our people, processes, and practices aspire to be world class.



IT MISSION

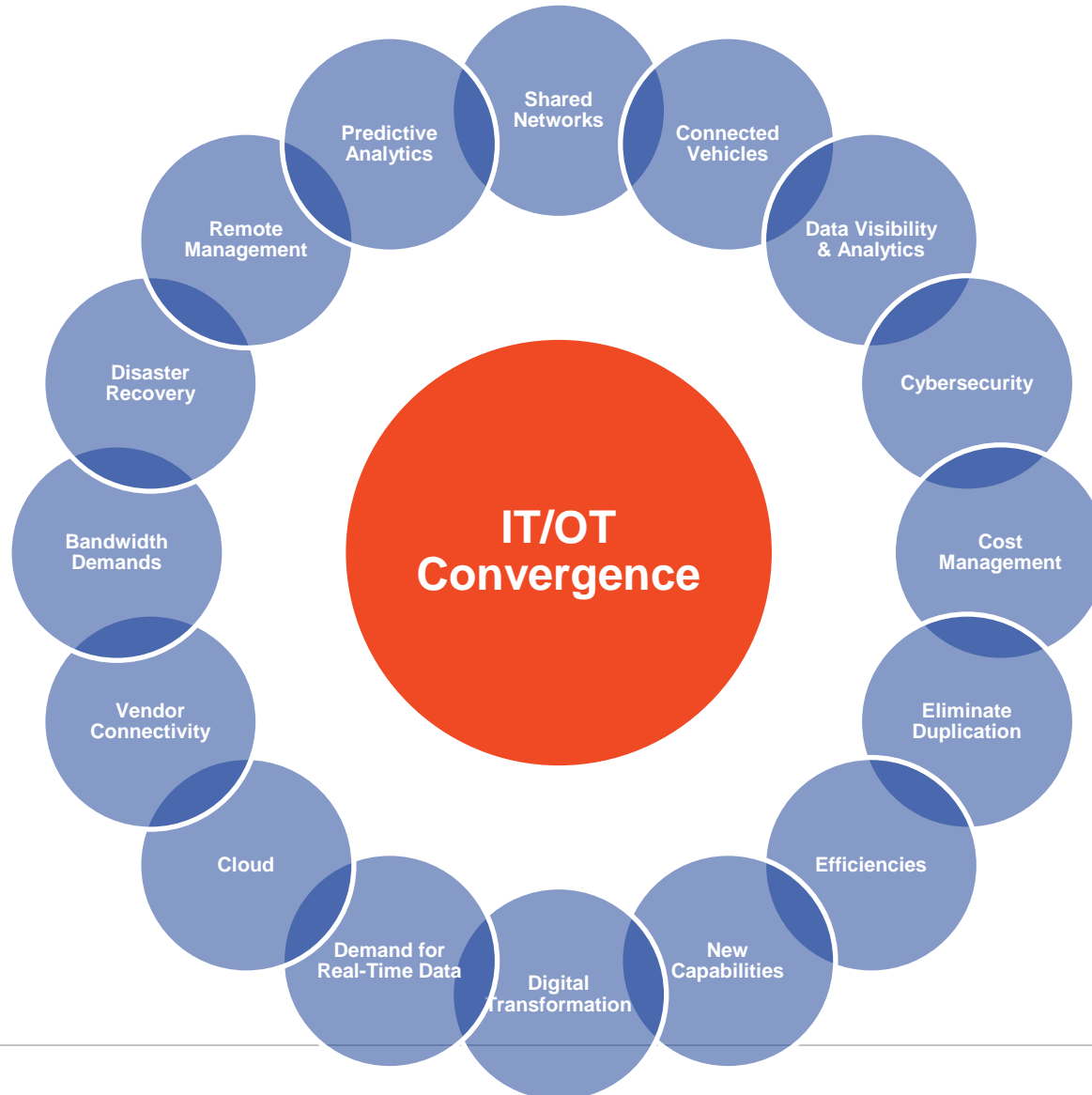
We keep Virginia moving by proactively partnering with our stakeholders to enable technology solutions that serve as a force multiplier for their work. Because of our contributions, the people of VDOT are able to work better.



OT MISSION

We enhance the quality of life of every traveler in Virginia by efficiently operating the roadway systems with technology solutions and processes that move people and goods safely and effectively.

Numerous factors and advancements in technology are driving the IT/OT convergence



Operations Technology

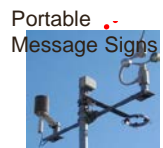
- Field Devices
- Cameras
- Message Boards
- Mobile signs
- Weather Stations
- Traffic Detectors
- Traffic Controllers
- Traffic Signals
- ITS cabinets
- Ramp meters
- HOV gate systems
- HARs
- Overhead detectors
- Fog detection/alert systems
- Tolling gantries
- Tolling technologies
- LPRs



Cameras



Message Signs



Portable Message Signs



Shoulder/Lane Control



Traffic Detectors



Ramp Meters



HOV Gates



Overheight Detection



Highway Advisory Radio (HAR)

- ATMS
- ATM
- Traffic Signals & systems
- Lane Control
- Ramp Metering
- Fog Lights
- Tolling Systems
- Hardware/ Software
- Communications Equipment
- Field Devices
- etc.

10,000+ field devices
 75,000 ip addresses
 6,500 control cabinets
 Several hundred servers
 Network switches
 2 tier-3 data centers
 5 communication hubs
 4,600 miles of fiber

Information Technology



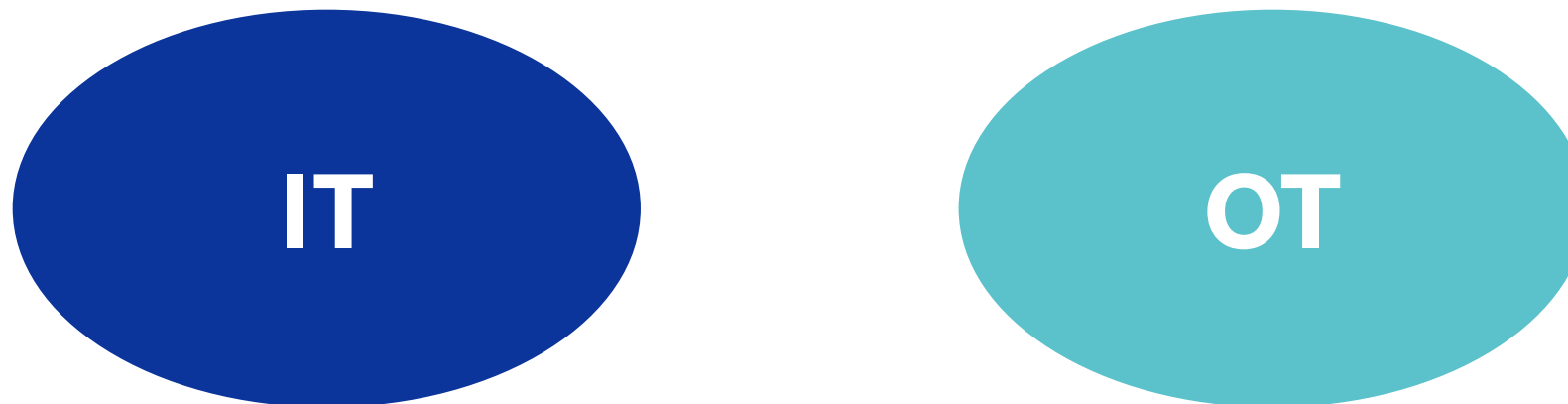
Various Flavors of Cloud Services



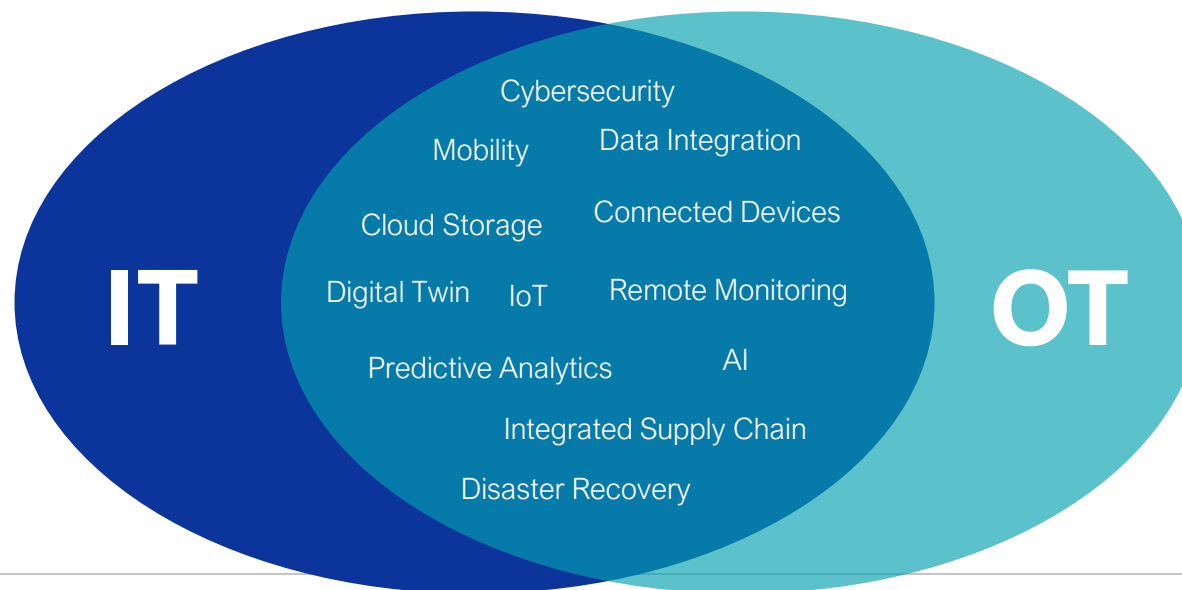
Various Flavors of End User Devices + Hundreds of Applications, Data Services, Networks

Unlike the past, many new technologies fall under both IT and OT, further driving the need for convergence between the two

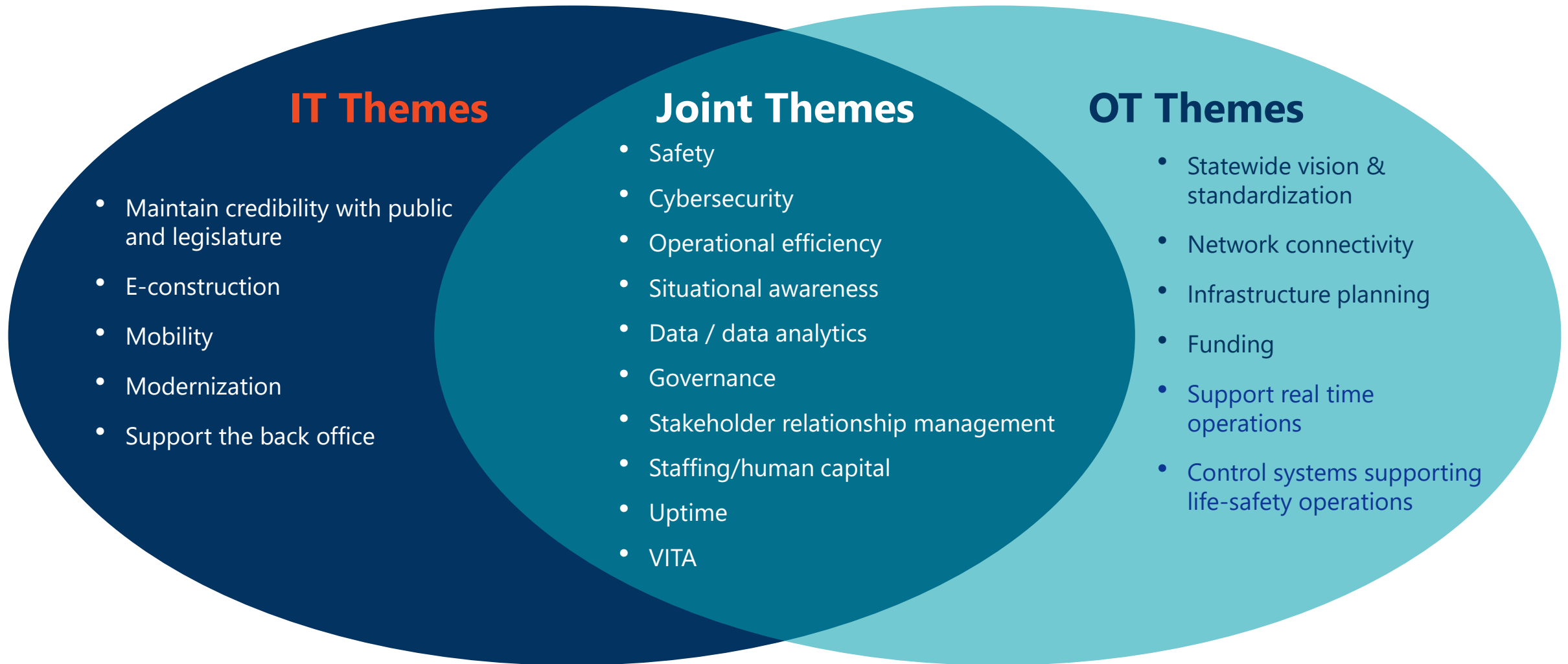
The Past



The Future



OT and IT share many of the same priorities



Understanding IT and OT priorities



What IT professionals need to know about the TSMO environment and processes

1. Risk management is considered more from a safety and operational integrity than technology perspective
2. OT has three main domains that must work together
 - a. Transportation Operations Center data/technology
 - b. Field devices on roadside and intersections
 - c. Communications from the edge device to the TOC, office, public, and external connections
3. TSMO must adhere to MUTCD and Work Area Safety Manual
4. Traffic flow restrictions must be considered while attempting to service a technology component on the road
5. Roadside issues include:
 - a. Physical access constraints
 - b. Vegetation control
 - c. Rodent and pest control
6. Equipment is hardened industrial controls
7. Often dealing with high voltage 240v/480v circuits
8. Most technicians need IMSA certification
9. Technologies include:
 - a. Old legacy systems that has limited capabilities but are ultra-reliable
 - b. Include analog, digital, and mixed environments
 - c. Electro-mechanical systems and actuators
 - d. Require specialized training

What OT professionals need to know about the IT environment and processes

1. IT Governance processes are designed to support operations and must be followed
2. Project and portfolio management disciplines must be practiced
3. Cybersecurity must be as important as worker/traveler safety
4. Data management practices and standards are designed to simplify analytics, reporting and operations
5. Identity and access management for people and devices must be well understood
6. Enterprise management services like Active Directory must be implemented
7. Network engineering must consider several factors including security, risk, redundancy, and resiliency
8. Configuration management and change management protocols must be established and practiced
9. System patch management and upkeep must be integrated into routine operations
10. Technology asset management processes, obsolescence management, and software license management processes must be documented and practiced
11. IT procurement rules and processes are specific and must be followed

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