

ARTERIAL AND SIGNAL COORDINATION

Definition: **Arterial & Signals Management** focuses on signalized arterial routes which play a significant role in the performance of SCDOT's comprehensive transportation network. Some of these arterial networks are managed through centralized signal systems that span signalized intersections on multiple corridors, but an even greater number are managed by interconnected coordinated signal systems located on a single corridor. Arterial management emphasizes signal operations, timing strategies, and performance measures.

	What is placing us in our current tier?		What is keeping us from advancing to the next level?	
	- Multiple agencies have a program for signal maintenance. - Before and after travel time runs assess signal timing project implementations (considers emissions, delay, and travel times). - Extension of staff expands the resources available to perform traffic signal coordination. - Standard practices exist for design and operations within each agency. - Some adaptive signal systems in place.		- Limited collaboration between freeway and arterial management. - Funding and staffing constraints limit the effectiveness of achieving optimal signal coordination, management, and performance. - SCDOT and maintaining agencies are currently unable to remotely manage traffic signal systems. - Local funding primarily focused to expanding roadway capacity. - No routine updates for signal plans - Limited signal timing projects are coordinated for routes that cross multiple jurisdictions.	
	Level 1 (Ad-hoc)	Level 2 (Managed)	Level 3 (Proactive)	Level 4 (Fully Collaborative)
Business Processes	Traffic signal management program business decisions and resource allocations are ad hoc and/or compliant driven. Allocation of resources is focused primarily on keeping the traffic signal system functioning, but not necessarily at its optimum level of performance.	Traffic signal management planning, design, operations, and maintenance decision-making generally operate in silos and are not well integrated. Resource allocation decisions are focus primarily on maintaining reliability of infrastructure.	Traffic signal management decision-making is objective-based. The region has business processes that are flexible to adjust and trade-off resource allocations to extend good basic service beyond traditional operating conditions.	Traffic signal management decision-making is performance-based and multimodal. The region has the ability to replace equipment and systems technologies based on end-of-life predictions.
Systems and Technology	Traffic signal systems and technologies limit the region's ability to provide good basic service. Systems and technologies have limited capabilities to remotely manage, operate, and maintain the system. Limited use of system engineering concepts has resulted in the procurement of an array of systems and technologies with incompatible features and functions. Management and maintenance of systems and technologies is primarily complaint-driven.	The region has the capability to identify malfunctions and manage operations limited to specific intersections or corridors. The region can achieve consistency in design and operations through standard practice. The region routinely deploys advanced signal timing concepts (such a volume density, traffic responsive, actuated coordination, etc.) to achieve operational objectives and can implement pre-planned responses to planned and unplanned events. Tracking of assets and work items performed primarily through spreadsheets.	Traffic signal infrastructure is connected to a management system which can alert operators to equipment malfunctions as assist with managing timing plans. The region has capability to remotely manage that system, but management decisions are operator-driven with little automated decision support. Consistency in design and operations is achieved through the use of standard designs and hardware specifications. Systems and technology can support pre-planned responses and advanced concepts such as transit signal priority, work zone management, etc.	The region has the capability to dynamically respond to changing operational conditions to support the needs of all stakeholders to meet operational objectives. The region is able to automatically identify and respond to service disruptions and can reestablish continuity of service remotely. Procurement policies and practices support the procurement products and technologies that represent "best value" for achieving design and functional consistency. Consistency of design and operations is achieved the application of system engineering processes.
Performance Measurement	Performance measures are not connected to regional goals and objectives. Instead, use of performance measures is limited to special studies (upon request by administration or confirm reported operational deficiency). Performance measures are not used to proactively locate where operations and maintenance issues exist. Productivity is evaluated by tracking activities (e.g. number of maintenance call received, number of signals retimed, etc.)	The region has defined performance measures to assess project implementations (such as before/after evaluations). The region may collect output-oriented performance measures for operations and maintenance activities. Operational and management decisions are based on periodic manual observations in the field.	The region has defined performance measures to assess project implementations. The region uses outcome-oriented performance measures for operations and maintenance activities. Operational and management decisions are based on real-time, high-quality data accessible from remote locations.	Region has defined performance measures to assess system performance. System performance is monitored on regular, on-going basis. Automated systems are often used to collect and assess system performance. Performance data is used to identify performance and efficiency trends. The region uses performance to better allocate resources, identify maintenance deficiencies, and equipment failures, etc.

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Culture	Traffic signal management does not have a champion or core group within the region that can promote traffic signal operations and maintenance concerns and priorities. Leaders have shared responsibilities with other core agency functions. Outreach to stakeholders and media occurs on an ad hoc basis. Region does not any have standardized approaches for communicating with public and policy makers	Traffic signal management is recognized as one of many functions within the region, but no special emphasis placed on performance. The region supports teams dedicated traffic management functions, but no broad acknowledgement or awareness by leadership as to what they do. Outreach to the public and policy maker regarding traffic signal operations occurs on an as needed basis, primarily related to projects.	Traffic signal management acknowledged as important function by regional decisions makers. Traffic signal management champion resides at decision-making level. Regular outreach occurs to communicate with policy-makers regarding traffic signal operations through traditional means (reports, fact sheets, etc.).	Region viewed as a progression region by peers and the entire program staff can serve as a champion for the traffic signal operations issues and concerns. Regional staff is unified as to the goals, objectives, and priorities of the region and uses them to drive decision-making. Programs can still function at high level, even with the departure of key leaders. The region seeks opportunities to proactively promote region's mission, goals, and objectives in person before advisory groups, citizenry, and policymakers through both traditional and non-traditional (social media, dashboards, etc.) communications media.
Organization and Staffing	Staff maintains minimum level capabilities necessary to do the job. This limits the agencies to assign staffing resources only to limited number of activities. Often, engineering and technical staff have other responsibilities other than traffic signal operations.	Key staff is well versed on basic signal timing design and operational concepts. Work force development efforts are focused on raising the level of competency of the staff. Programs within agencies reside in structured silos (planning, design, maintenance, operations, etc.) with limited coordination between silos.	Staff is well versed in both basic and advanced traffic signal control and management concepts and can execute solutions on existing technologies. Workforce development efforts focus on expanding breadth of competencies and providing redundancy in core competencies. The agencies can dedicate staff resources to high priority corridors/areas on a limited basis.	Staff is highly motivated and qualified and has the capability to develop and deploy innovative solutions to complex operational situations. Workforce development efforts focus on providing a nimble workforce that has the ability to adapt to different situations, depending on the needs of the region. The region uses a matrix approach to managing traffic signal operations. Staff has capability to perform activities across network and across functional units.
Collaboration	No data sharing exists between regional partners. Collaboration with internal and external stakeholders is rare, often forced upon agencies by policymakers or administrators.	Information and data are archived internally and shared upon request with other stakeholders. The agency collaborates with internal and external stakeholders on a case-by-case or project basis, but these collaborations are not sustained over time.	Formal and well-documented archiving system is used to store collected data. Data can be quickly and easily accessed through well-documented and standardized electronic format, easy to use by all partners. The regional agencies seek collaborations with other transportation stakeholders that to capitalize on opportunities to satisfy needs of operational objectives.	The regional agencies routinely collaborate with internal and external stakeholders (e.g., fire, police, transit, advocacy groups, etc.) that allow them to capitalize on opportunities to satisfy needs of multiple stakeholder objectives. Data is shared in real-time with regional operating partners and is used to support numerous regional activities (such as regional planning models, support real-time traveler information displays, etc.).
Service Layer Actions to Advance to Next Level				