Data and Performance Management

The intent of System Layers is to define in further detail recommendations that would serve toward the goals of how ADOT should be operating and managing their network. This System Layer Plan is focused on:

- **Data and Performance Management** – Systems that support the process of organizing, maintaining and analyzing of data collected to support productivity, efficiency and decision making.

Context of Existing Capabilities

ADOT uses a number of systems to collect and distribute data from its various ITS systems, as most ITS devices are capable of generating some kind of data. Some, like RADS and Flux, collect data on ADOT servers with varying levels of automatic input. Others, like INRIX, are third party data providers to which ADOT has access. Different data sources have different tools for access including SQL queries, APIs, or Web UIs. ADOT already has in place robust Phoenix Freeway Management System data, cloud services for TSMO functions, data quality initiatives to support ITS assets statewide, utilizing analytical tools such as Tableau, ESRI, PowerBI, Python, etc., and while data is not fully accurate, there are processes in place to make this happen. The data is also connected to various tools and dashboards for performance measures and monitoring. Some are more specialized tools such as the SMART Tool or PDA Suite, whereas others are implemented in Tableau, ArcGIS, or spreadsheets. As with the data recording itself, these trackers and visuals can require various amounts of manual effort to keep up to date. ADOT is working to acquire the Regional Integrated Transportation Information System (RITIS), which would provide additional performance management capabilities and tie some of the existing data and systems together. However, this will require additional staffing and training to manage.

While there is a solid foundation of data available for collecting, there is a significant need to be able to utilize that data to turn it into information for monitoring, assessing, determining future investments, and reporting on that drive the recommendations outlined in this System Layer Plan.

Challenges and Gaps

Through a variety of meetings, workshops, and review of existing conditions and applications utilized by the state, current issues were uncovered that provide insight into the direction that ADOT should focus on addressing. The following are some of the current issues identified as related to Data and Performance Management:

- Generated data continuous to increase significantly; lack of connected data platform to enhance its data collection, aggregation, and usage capabilities.
- Data are not always available/timely because of different formats.
- Existing agency-wide data governance process is not well known.
- Standards and guidance are needed for items such as edge compute vs centralized computing, network bandwidth limitations and scalability.

Future Direction

The project team conducted a series of individual workshops with ADOT for each System Layer Plan to identify the perceived existing readiness and future direction within the functional areas. The workshops included an interactive, online (JamBoard) activity in which ADOT staff provided specific feedback following a similar structure to the TSMO Capability Maturity Model (CMM) Framework. For Data and Performance Management, the workshop was held on June 17, 2022.

CMM levels for consideration of ADOT staff for their current capabilities, where they see progress in the next 5 years, and where there is desire to move toward in the next 10 years.

- **Level 1 – Ad-Hoc** – Activities are ad-hoc, informal, champion-driven
- **Level 2 – Managed** – Basic strategy application is understood with limited internal accountability or coordination
- **Level 3 – Integrated** – Standardized strategy applications that are managed for performance and aligned
- **Level 4 – Optimized** – Full and sustainable program based on prioritized data-driven process of continuous improvement

A summary of the feedback for the state is that the current capabilities are at the ad-hoc Level 1 state and in the future can be moved toward the Level 2 managed state.

ADOT has an abundance of data coming in from various types of ITS devices such as loop detectors and CCTV cameras, inter-departmental data including DPS crash data, and even third-party data from INRIX and others. However, data is not always easily accessible or readily analyzed by the various groups. ADOT

needs to re-emphasize the performance management program. ADOT needs to decide what answers are needed, what targets exist, determine the available data, the quality of the data and then sort out the approach. Also, ADOT needs to focus on measuring outcomes rather than outputs.

Recommendations

This section provides a summary of important steps that can be used as building blocks for achieving the ultimate vision that extends to the five- to 10-year horizon. Because ADOT is looking at the three- to five-year horizon for implementation, these recommendations will focus on investments that are foundational technologies needed to support ADOT's future. The remaining gaps between what ADOT has today and where ADOT needs to be in the future becomes the recommended changes/additions that are needed.

ADOT desires to look at potential recommendations in the following areas:

- Integration with Regional Archived Data System (RADS)
- Data portals and dashboards
- Decision Support Systems (DSS)
- Performance Measures (PMs), Reporting and Countermeasures
- Platform as a Service (PaaS)
- Asset Management
- Shared/Integrate Data (Data Governance)

Table 1 provides recommendations that can assist ADOT in improving their current readiness level to move toward Level 2 capabilities for Data and Performance Management on a statewide basis. While many of the recommendations are independent and can be accomplished in a short timeframe, ADOT should focus on a few key recommended activities (denoted in bold) to ensure adequate resources are available and generate the greatest benefits in progressing their readiness level.

Table 1 – Data and Performance Management System Layer Plan Recommendation Summary (STIP level information)

PROCESS Recommendation Title	Description	Steps and Outcomes	Context for Recommendation	Recommended Champion	Recommended Stakeholder Involvement in Implementation	Total Funding Required	Annual Funding Required	Contracting Mechanism
DATA MANAGEMENT								
Develop TSMO Data Governance and Management Plan	Develop a data governance and management plan consistent with the agencywide data governance implementation plan to better govern TSMO data already utilized as well as prepare for increased data from other sources in the future that may not already be utilized such as connected vehicles and third-party data providers. The plan should address data sharing, storage, management, and cybersecurity along with roles and responsibilities for each.	**Steps:** Develop a separate data governance and management plan from the data engineering perspective and the data science perspective. The plan should evaluate current processes and establishes documented standards, identifies priority TSMO data needs. The plan should evaluate TSMO data and implement best data governance practices consistent with the agency data governance program. This is both for current data as well as future potential data sources. Develop formal coordination protocol for staff to efficiently access, view, and manipulate real-time count information (traffic counts, peak hour information). Develop processes to reduce time to decision through basic automation framework to ingest and scrub data before analysis. Seek to minimize or eliminate multiple data sources to improve data quality and accuracy, identify primary data feeds (which are used for decisions). Develop processes to support data accuracy review, improving data quality, and standardizing terminologies. A data governance model should include methods for and processes to support data definitions, analysis, and dissemination. This should include evaluating ADOT data management/retention systems with ITG for upgrades, cloud-based migration, and integration with RADS. Identify staffing resources and job descriptions associated with potentially new positions that would be required to support a robust data management plan. Develop a data service catalog of data available. **Outcomes:** Document informing of data engineering and data science plan as well as software acquisitions or changes and completion of a data services catalog.	TSMO has several data repositories - FMS loop detection, crash data, TOC incidents, etc. Each has a separate environment and additional sources are being added without integration such as INRIX and RITIS. There is a need to focus on TSMO data management to be able to incorporate TSMO data into ADOT data governance sets as a whole.	ADOT TSMO Director	Coordinate with ITG for inclusion into their Data Governance and Management Planning efforts, Assistant State Engineer TSMO, TSMO Systems Technology Manager, TSMO Group Managers	$250K for implementing data governance	-	Out-source – either RFP or TSMO On-Call assignment

PROCESS Recommendation Title	Description	Steps and Outcomes	Context for Recommendation	Recommended Champion	Recommended Stakeholder Involvement in Implementation	Total Funding Required	Annual Funding Required	Contracting Mechanism
DATA MANAGEMENT								
Develop Standards for ADOT Data Sharing	Data compatibility should be accomplished by setting standards that all new technology and data sources must adhere to, ensuring compatibility with existing and future systems. This also expands to any third-party data agreements to provide real-time traffic conditions to other groups within ADOT TSMO, such as the ADOT TOC, as well as other ADOT groups beyond TSMO. ADOT should be cognizant to ensure the data being provided is in a format that will integrate into existing systems and be easily utilized by the end-users.	**Steps:** Work internally within ADOT TSMO to define data that can and should be standardized in coordination with the Data Management Plan as recommended in the Data System Layer Plan. Work internally to broaden use of third-party data and update agreements reflecting the updated use for sharing with other TSMO functions beyond the limited analysis and performance reporting purposes it is used for today. Data sharing should rely on the resources and training as described in the Data Management Plan and should be part of the large data governance process.\n\n**Outcomes:** Data standards and broadened data agreements managed by ADOT TSMO internally.	Proper data management is critical to maintain an orderly system and utilize investments to their full potential. Data already in ERS / 511 / RITIS / INRIX is already available to partner agencies. There needs to be compatibility within the system to integrate devices and the data obtained to allow use by different end-users. This supports the ability to streamline software use across different types of devices and different vendors. Technology standards should make sure that existing and new infrastructure is compatible with ADOT software. Agreements are put in place at the permission of the data owners.	TSMO Systems Technology Group Manager	TSMO data users	-	-	In-house

PROCESS Recommendation Title	Description	Steps and Outcomes	Context for Recommendation	Recommended Champion	Recommended Stakeholder Involvement in Implementation	Total Funding Required	Annual Funding Required	Contracting Mechanism
DATA MANAGEMENT								
Continue Evaluating Third Party Data Use	Explore opportunities for the ADOT TOC to use third party data (Waze, INRIX, RITIS) to better monitor statewide road and travel conditions, slowdowns, and recurring safety hazard locations including incident management. TOC should use third-party data for incident detection/notifications to have TOC verify and get information to traveling public sooner than they learn about it on the road.	**Steps:** Complete the procurement of RITIS. Establish third party data access on all TOC operator workstations. Train on access and use of third party data for insights on real-time condition reporting. If needed, work with Waze, INRIX, or RITIS directly to develop specific reporting alerts that could serve as triggers for the ADOT TOC to not need to monitor reporting continuously. Include TOC personnel for implementation. **Outcomes:** Access to third party systems by ADOT TOC and training on how to use for incident response support.	ADOT has limited real-time detection capabilities outside of the metro area freeways. Third party providers can generate data to show atypical conditions (such as bottlenecks, slowdowns, decreases in travel time) to alert ADOT of potential crashes or incidents on the state highway system. Other state DOTs have found this incredibly valuable for incident notifications and awareness of potential incidents in areas where ADOT currently does not have detectors, cameras, or other real-time monitoring infrastructure.	TSMO Systems Technology Group Manager	Traffic Management Group Manager, ADOT TOC operators, other TSMO staff as needed, TSMO RTEs, District TEs, new ATDM Coordinators as identified in the ATDM System Layer Plan	Third party data has already been acquired by the state	On average $500K for each third party data agreement statewide (currently INRIX is $650K per year and RITIS is $275K per year)	Out-source – either RFP or TSMO On-Call assignment

PROCESS Recommendation Title	Description	Steps and Outcomes	Context for Recommendation	Recommended Champion	Recommended Stakeholder Involvement in Implementation	Total Funding Required	Annual Funding Required	Contracting Mechanism
DATA MANAGEMENT								
Maintain and Enhance AZ511 Public Data Feed to External Users	After the **TSMO Performance Measure Platform** is developed, ADOT should make certain data available to external users. This activity precedes the implementation of the Develop Formal Data Training Program recommendation. Improve processes for pushing critical alerts / closures / incidents / planned events to broaden information sharing (through APIs) with third-party providers to get ADOT data (events, work zones) onto publicly available apps and platforms (in-vehicle nav systems, commercially available mobile apps, mobile devices).	**Steps:** Capture best practices/approaches from peer agencies for making data available to third parties and what kinds of data is beneficial to make available. Obtain lessons learned on making data available through APIs, token-based systems, and other strategies. MTC in the San Francisco Bay Area, Iowa DOT and others can share their strategies for establishing data portals for the private sector. Evaluate and identify types of data to be shared. Engage appropriate IT staff to provide input and policy guidance to the data sharing strategy. Develop and pilot an open data portal – potentially accessible from ADOT's 511 website or separate portal developed. Leverage the portal exposed through the 511 site today. Develop terms of use, strategy, method for tracking who is accessing data, and frequency of requests. ADOT should determine what additional enhancements are needed to improve the information being provided to third-party providers (through ERS or 511.gov) which will help to improve accuracy and timeliness current and future data feeds going directly to vehicle systems. Apply the Arizona Management System (AMS) Problem Solving Tool to determine solution. Leverage standardized messages developed or being developed such as for signal data or work zone data. **Outcomes:** Standardized processes for proactively sharing data with third parties. Open data portal and process for sharing ADOT's data with third parties.	ADOT makes information available to third party providers such as Google/Waze. There is a current initiative underway to develop a Work Zone Data Exchange feed from ERS will help to standardize work zone information that will be consumed by private sector/third-party mobile providers. There will be a growing need to partner with the private sector to get data to travelers through a broad range of mobile and in-vehicle apps. Making quality, relevant and accurate data available to data aggregators and suppliers will help to expand the reach of ADOT's data. Several agencies have implemented open data portals, and ADOT can learn from these experiences. This manner of sharing information does not require ADOT to format data in any particular way for the user to access which is less cumbersome to manage.	TSMO Traffic Management Group Manager	ADOT IT IBI (511 contractor), Public Record and Litigation Support Manager	$160K - $200K	$25K best practices synthesis $80K - $125K develop data portal $15K annual update / maintenance	On-call support for synthesis Use 511 contract to develop data portal
Develop a Digital Twin of ADOT ITS Infrastructure	Develop a digital twin of ITS infrastructure to support the asset management program containing project information and studies, including CAD, GIS, and KMZ files.	**Steps:** ADOT is already underway with establishing a Digital Twin of ITS infrastructure to support an asset management program. This process should include ITS infrastructure already in place as well as a process for including new ITS infrastructure design files into the Digital Twin. **Outcomes:** Digital Twin of ITS infrastructure in a central location accessible by all ADOT staff that participate in ITS activities.	There is no current digital archive of ITS infrastructure in a centrally accessible location that would support the types of design and construction activities desired by a Digital Twin file. The current process for record drawings is cumbersome for ADOT personnel, designers, and contractors. Creating a Digital Twin has been undertaken in some other states and is quickly becoming important in all future design activities.	ADOT GIS Group	Assistant State Engineer TSMO, TSMO RTEs	Funding established by separate ADOT group	Funding established by separate ADOT group	Contracting mechanism will come out of separate ADOT group

PERFORMANCE MEASURES								
Develop and Utilize TSMO Performance Measure Platform	Develop a centralized data platform that provides systems monitoring and dashboarding for use by all ADOT subgroups for different purposes. The platform should have a specific interface, data, and reports for the following uses: - Traffic Incident Management - Work Zone - Real-Time Operations - Signals - ITS Device Management TSMO is most effective when it is based on real-time or near real-time data such as: detection data, signal controller data (and other traffic management systems, such as ramp meters), construction and closure information, weather data, etc.	**Steps:** Develop a performance measure platform (i.e., ATSPM) across all TSMO elements that includes data collection and dashboards to easily communicate TSMO performance. May need to consider one dashboard for operations and a separate platform for maintenance. Develop the performance measures that should be reported on within this platform. Evaluate what is being reported on today from the data sources they are coming from. Include such data efforts as (among many others): - The evaluation of VSL operations and compliance with DPS. - Reliability of equipment communications of traffic management systems. - Work zone delay and queue information. - Incident monitoring for prioritizing or supporting decisions during response to incidents/events. - Monitor speed, travel time, user delay, bottleneck. Establish performance measures and thresholds for TSMO strategies at corridor levels, generic location levels, or TSMO group functions. Begin with the recommended performance measures from each of the System Layer Plans. Incorporate a variety of data sources both internal from assets and groups as well as external from INRIX, RITIS, or Google/Waze. Leverage existing ADOT work on RITIS procurement and deployment plan. The platform should have automatic performance report generation to identify recurring issues and systems performance issues. Focus on different uses of dashboard: quarterly/annual reporting, operations focus, etc. Performance reports should be established for individual TSMO groups as well as to report on performance by each of the System Layer Plans. Provide access to this platform to all TSMO groups including individual users such as the TOC, directors, other departments (where applicable), and publicly accessible for ADOT reporting (if desired). ADOT should consider the development of the platform in a cloud-based program supported by ADOT, such as Tableau, PowerBI, Google Analytics, ESRI, etc. to reduce ongoing maintenance needed from a third party provider. Consider mobile capabilities and user-friendly design. **Outcomes:** Central data performance monitoring and reporting platform.	ADOT is doing some performance reporting today at an executive level. However, much of the reporting does not trickle down to staff and is not granular in nature to determine needs for remedy or confirmation of successes. This recommended reporting and dashboarding platform is a common, connected data platform to unify different data sources and permits the overlay of various data, improve visibility of data and decisions, to improve operations, mobility, and safety. Many System Layer Plans are calling for this to be a priority for TSMO. It will be important to re-assess the program of reporting on performance metrics based on the definitions in the ITS Master Plan including what level of aggregation, what audience, and what frequency as well as reassess how best to communicate results/data. Automating the data collection, viewing, and reporting processes through a single platform that all TSMO groups can utilize will provide more successful and accurate centralized management of how ADOT is performing and where to put resources to remedy issues or invest further into developing. Traffic signals today are challenging to report on. A single platform would offer the ability to incorporate other types of data such as pump stations, tunnels, etc. ADOT should be flexible with the outcome because there are a number of potential solutions that could achieve this recommendation strategy.	ADOT TSMO Director and Operational Traffic & Safety Manager	ADOT ITG to assist in database / software development, all TSMO Group managers to contribute	$400K for developing platform and dashboards with the various groups that will utilize the platform	$50K per year of maintenance (if any is needed once it is initially established)	Out-source – either RFP or TSMO On-Call assignment

PROCESS Recommendation Title	Description	Steps and Outcomes	Context for Recommendation	Recommended Champion	Recommended Stakeholder Involvement in Implementation	Total Funding Required	Annual Funding Required	Contracting Mechanism
STAFFING STRUCTURE								
Develop Formal Training Program	As a follow up to the development of the **Data Governance and Management Plan** is the formal training program for use of data department wide as well as how data should be and will be shared with those external to ADOT.	**Steps:** TSMO Group Managers should identify key data users within each TSMO group and establish an internal group that can coordinate resources/skills related to data analysis. Training Program should be defined by each groups needs and related to the 'Standard Work' definition for ADOT. Hold quarterly meetings to discuss training opportunities and share efforts. Internal to ADOT, develop use cases and standard practice guides and support regular training on use. This process can be incorporated into the training of new staff and leveraged for existing staff similar to the SLATE training matrix. Include in this training program developing data management SOPs for divisional hand-offs and information dissemination to establish communication protocol internally and between districts, and TSMO groups/subgroups. This also includes developing agreements and processes for across state line data and information sharing and integration. Need to establish processes to hold people accountable for following processes involved in data usage. Consider extending training program to be utilized by universities for educating students as an external potential future user. External to ADOT, formalize support agreements and support access to data with standardized guidelines as to how data formats are set up and suggestions as to how to use data. The goal of this program for users external to ADOT is to not train each individual external partner, but to make sure to provide ADOT personnel for questions, if needed. Support staffing training for existing training as well. Include in formal TSMO Committee meetings. Apply the Arizona Management System (AMS) Problem Solving Tool to determine solution. **Outcomes:** Formal Data Training Program and follow on training activities outlined in the program.	ADOT has a lot of generalized training – not always are necessarily specific to use cases. Need to bolster regular coordination. ADOT has purchased statewide INRIX data and is evaluating RITIS for additional performance measures. In addition, there are increased data efforts within the MAG region related to work zones and CAV. There is a lot of data being utilized by ADOT and based on the outcomes of the **Data Governance and Management Plan**, there will need to be action to get existing staff up to speed on how to utilize data to support day to day functions. There is a continued desire for data that ADOT owns, particularly as a state entity that purchases licenses for use anywhere within the state. It is incumbent upon ADOT to take ownership of the sharing of that data and support the use of data external to the agency. While not needing to formally train external users, as a sharer of data, ADOT should provide a point of contact for external users.	Assistant State Engineer TSMO	TSMO Group Managers	-	-	In-house

PROCESS Recommendation Title	Description	Steps and Outcomes	Context for Recommendation	Recommended Champion	Recommended Stakeholder Involvement in Implementation	Total Funding Required	Annual Funding Required	Contracting Mechanism
PROCESS STRUCTURE								
Establish TOC Message Automation	Implement an automated alert process at the ADOT TOC that notifies of data received by the **Automatic Performance System Monitoring and Reporting Platform** that is important for TOC operators and dispatchers to be alerted of for immediate response.	**Steps:** Set up in the performance reporting system automatic alerts for incident notifications, incident type, updates of date/time and lane status for incidents, and any other information that warrants ADOT TOC action. This should be linked to the **Establish DMS Message Automation** activity in the **Traveler Information Messages System Layer Plan** programming for planned events for automation of DMS messaging as a result of TOC alerts. **Outcomes:** Automated alerting process from performance reporting system.	Currently the ADOT TOC relies upon coordination with DPS for information on incidents and events. With other systems being put in place to develop centralized data, there is a potential for increasing the ability for automation to support more proactive incident response and event management.	Traffic Management Group Manager	TSMO Systems Maintenance Engineering Manager, Assistant State Engineer TSMO	-	-	In-house built from the **Automatic Performance System Monitoring and Reporting Platform**

INFRASTRUCTURE DEPLOYMENT Recommendation Title	Description	Steps and Outcomes	Context for Recommendation	Recommended Champion	Recommended Stakeholder Involvement in Implementation	Total Capital Cost	Total O&M Cost	Contracting Mechanism
LIFECYCLE REPLACEMENT								
None								
EXPANSION OF ADOT TECHNOLOGY DEPLOYMENT								
Further Integration of Existing Data Platform	Increased connections between existing data sources and data platforms like RITIS and Tableau for better availability and utilization of the data.	**Steps:** 1. Identify the business requirements for the integration (near real-time data, transform non-relational data into relational format, need for heavy computation, multiple formats, ML/AI application, etc.) 2. Inventory available data. 3. Address data ownership. 4. Assess security risk, correlation, and aggregation. 5. Identify the deployment option (on-premises or cloud). 6. Determine query, accessibility, and integration requirements. 7. Decouple hardware/software. 8. Identify the advantages and disadvantages of centralizing versus dispersing storage. 9. Translate functional and technical requirements into detailed architecture designs and models. 10. Prepare an estimate for testing, migration, and implementation. 11. Fund the project, design it, and build it. **Outcomes:** Increased availability and utilization of data sets.	Effective data management helps the agency leverage accurate, updated data to make better strategic decisions. As the amount of structured, semi-structured, and unstructured data increases, the challenge of processing it in machine learning applications, predictive modeling, and other advanced analytics increases. By integrating big data from different platforms, users can access and analyze data without having to use manual entry or duplication. This allows one to create more dynamic and interactive reports or presentations with data that changes automatically as the source changes.	Assistant State Engineer TSMO	ADOT, MCDOT, MAG, and local agencies	$200K	$50K	In-House and Out-Source

INFRASTRUCTURE DEPLOYMENT Recommendation Title	Description	Steps and Outcomes	Context for Recommendation	Recommended Champion	Recommended Stakeholder Involvement in Implementation	Total Capital Cost	Total O&M Cost	Contracting Mechanism
EXPANSION OF ADOT TECHNOLOGY DEPLOYMENT								
Customize Visualization Tools for Day-to-Day Operation	Customize existing tools to more efficiently visualize and present the data needed to understand the scenario and make informed decisions quickly.	**Steps:** 1. Identify the problem or challenge for visualization/presentation with the current tools. 2. Draw a flowchart of metrics to develop the tool. 3. Define the features, functions, or capabilities to be considered to solve the problem. 4. Identify the data sources that are easily accessible and formattable. 5. Define a pathway to structure, organize, or integrate the data, logic, or interface. 6. Define a model to make the tool user-friendly, efficient, and scalable. 7. Complete your coding with the preferred language to develop the tool to visualize the data. **Outcomes:** Tools that efficiently present needed data for review and decision making.	Most of the agency uses software applications or systems (SAAS, PAAS, ATMS) that help to automate, streamline, and optimize business processes and workflows. Unfortunately, the applications the agency personnel use are not always user-friendly or easy to pull and visualize the data for specific needs. By customizing existing tools, one has more control of the presentation and can focus on the specific need depending on the data and preferences. It increases process reliability, improves efficiency, and reduces cost by reducing the time spent compiling and analyzing data from various sources and helping to visualize the data for business leaders to make decisions quickly.	Assistant State Engineer TSMO	ADOT, MCDOT, MAG, and local agencies	$200K	$50K	In-House and Out-Source

DEMONSTRATED TECHNOLOGIES FOR ADOT DEPLOYMENT	
None	ADOT needs to focus on getting the data management structure solidified in order for data ingestion, use, and metric evaluation prior to diving into deploying new types of data investments not already used within ADOT.
PILOTING	
None	ADOT needs to focus on getting the data management structure solidified in order for data ingestion, use, and metric evaluation prior to diving into piloting of data innovations such as predictive analytics.

Performance Measures

As part of each of the System Layer Plans, performance measures are recommended to cover the specific topic areas. The performance measures recommendation as part of this Data and Performance Management System Layer Plan is to focus on developing the Data Governance and Management Plan and establish the TSMO Performance Measure Platform that are recommended to begin to turn data into information for tracking trending, outputs, outcomes, and investments against existing situations. Some data specific performance measures such as data quality, data accessibility, data timeliness, and data validity could be applied to the types of data that ADOT is responsible to ingest. Specific metrics should be defined as part of the Data Governance and Management Plan developed for TSMO data.