Appendix B:
Collect Data
Element-Level
Response Templates

This Appendix offers element-level response templates for Area B: Collect Data.

Note: Use of the TAM Data Assistant is recommended however these templates are provided for informal use or pen and paper assessment.

Date: **Participating Members:**   **Assessment Context:**

B-Collect Data
1-Inventory, Condition, and Performance

B.1.a – Inventory, Condition, & Performance Coverage

Element Description	Coverage and level of detail for asset inventory, condition, and/or performance data aligned with current and anticipated business needs and established data models.

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Data are not collected.	Inventory, condition and/or performance data collected to meet a one-time need and not aligned with ongoing data needs.	Established inventory, condition and/or performance data collection practices, but not fully in line with business needs (coverage is either insufficient or overly detailed) and/or not aligned with the established data model.	Established inventory, condition and/or performance data collection practices in line with current business needs and data model.	Regular strategic planning process to anticipate emerging needs and adjustment of data collection scope to meet these new needs.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Determine whether asset inventory, condition, and/or performance data collection is warranted (establish the business case).	☐ Work with stakeholders to understand data requirements to meet decision support needs.	☐ Review existing data collection plans and assess whether the data are being used as intended and providing value and whether there are remaining gaps to consider. Confirm the business case and value of new data collection with key stakeholders.	☐ Conduct an annual or bi-annual review of data collection plans to ensure alignment with current and emerging business needs.	
☐ Examine existing data and data collection programs for potential efficiencies.	☐ Confirm the business case for new data collection and establish a "best practical" collection scope based on current capabilities and funding.	☐ Review existing data collection plans for consistency with established data model. Consider modifications to achieve consistency.	☐ Examine opportunities to "optimize" collection scope. If warranted, engage stakeholders to adjust data model for future needs.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

Date: **Participating Members:**   **Assessment Context:**

B-Collect Data
1-Inventory, Condition, and Performance

B.1.b – Inventory, Condition, and Performance Automation

Element Description: Efficient and effective use of technology for asset data collection (such as sensing technology, video, LiDAR, field collection tools)

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Primarily pen/paper collection.	Collection in digital form but through largely manual processes that could be further automated (e.g. stand-alone, electronic forms or spreadsheets).	Data collection using primarily automated/semi-automated techniques. (e.g. custom applications with GPS location detection, voice recognition, bar codes / QR codes)	Data collection using primarily automated / semi-automated techniques with capabilities to efficiently adapt tools to meet varied data collection requirements across multiple data collection business processes or asset types.	Application of state-of-the-art computer vision and change-detection techniques for data extraction and efficient updating.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Document business cases for automation through internal practice, peer agency, and best practice reviews.	☐ Pilot and implement a vehicle-based data collection solution for individual assets (e.g. video imagery extraction)	☐ Pilot and implement vehicle-based data collection solutions for multiple assets (e.g. video image collection / LiDAR)	☐ Use change detection to automate and/or focus collection. Leverage changes in base inventory, work accomplishments, condition forecasting, and other techniques to eliminate or reduce collection in low value areas.	
☐ Implement simple solutions to move away from pen & paper collection (e.g. digital forms or spreadsheet tools)	☐ Pilot and implement semi-automated field collection tools (e.g. mobile data collection applications)	☐ Pilot and implement field collection tools useful for multiple data collections (e.g. standardized apps or enterprise asset management system tools)	☐ Conduct periodic evaluation and pilot testing of cutting-edge applications or capabilities to asset data collection programs. Implement identified collection solutions as appropriate.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

B-Collect Data
1-Inventory, Condition, and Performance

B.1.c – Inventory, Condition, and Performance Quality

Element Description Established processes to assess and improve asset inventory, condition and performance data quality.

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Quality is not defined.	Expectations for data accuracy, valid values and completeness are established.	A plan has been produced including activities and roles for data quality management before, during and after data collection.	Formal data collector certification and data acceptance criteria and processes are in place.	Data collection and quality management processes are regularly reviewed and revised based on prior experience.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Establish general data collection requirements (e.g. conditions appropriate for collection)	☐ Develop a data quality management plan, including documented quality management activities and roles.	☐ Establish formal data collection training and collector certification processes.	☐ Automate data quality checks to streamline quality management process and ensure consistency of quality review.	
☐ Document business rules for evaluation of accuracy, completeness, and validity of collected data.	☐ Evaluate data collection best practices and lessons learned from other internal and external data collection programs.	☐ Document a comprehensive collection business process with clear data acceptance criteria and error resolution procedures.	☐ Incorporate outcomes from quality control and assurance processes and routine evaluation of lessons learned to prevent systemic errors and improve ongoing collection processes.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

Date: **Participating Members:** **Assessment Context:**

B-Collect Data 2-Project Information	B.2.a – Project Information Coverage

Element Description Processes to capture project work accomplishment information in a manner consistent with the project data model and with sufficient coverage to meet asset management analysis, decision-making, reporting, and communications needs.

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Project work accomplishment data is not available in a useful form for asset management.	Project work accomplishment data is collected to support non-asset management purposes (e.g. contract payment) in a manner that is only useful to asset management for aggregate, network-level summary reporting.	Project work accomplishment data is collected in a manner that provides an understanding of what types of work have been completed at particular locations.	Project work accomplishment data collection includes associated asset information in a format that is useful to management and upkeep of the asset inventory or condition history.	Project work accomplishment data collection includes detailed asset related information (e.g. products / component models or standards, specific treatment materials) useful for detailed asset management decision-making and project design improvement.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Evaluate and implement opportunities to summarize general project information useful to high-level asset decision-making or reporting (e.g. annual investment levels or quantities).	☐ Implement a data collection plan to capture project locations and general activities performed within those limits (e.g. preventative maintenance, rehabilitation, or replacement).	☐ Implement a data collection plan to capture individual asset locations/IDs and associated work activities, accomplishments and results.	☐ Implement a data collection plan which captures detailed asset information from work activities / accomplishments (e.g. specific materials, products, or applications).	
☐ Document general asset management use cases for project information.	☐ Establish a "best practical" collection scope based on current capabilities and funding.	☐ Examine current practices to "right size" collection scope to meet current needs and established data model.	☐ Examine best practices to "optimize" collection scope. If warranted, engage stakeholders to adjust data model for future needs.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

Date: **Participating Members:**   **Assessment Context:**

B-Collect Data 2-Project Information	B.2.b – Project Information Automation

Element Description	Processes and technologies used to automate collection and processing of project work accomplishment data.

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Pen/paper collection	Stand-alone, standardized electronic forms or spreadsheets are used to facilitate collection. Data are not automatically populated into the source system of record.	Data collection using primarily automated/semi-automated techniques through specialized solutions (e.g. custom applications with GPS location detection, voice recognition, bar codes / QR codes).	Data collection using primarily automated / semi-automated techniques with capabilities to efficiently adapt tools to meet varied data collection requirements across multiple data collection business processes or asset types.	Application of state-of-the-art computer vision and change-detection techniques for data extraction and efficient updating.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Document business cases for project data collection automation through internal practice, peer agency, and best practice reviews.	☐ Pilot and implement semi-automated field collection tools (e.g. mobile data collection applications) for project data.	☐ Pilot and implement field collection tools useful for multiple data collections (e.g. standardized apps or enterprise asset management system tools)	☐ Use change detection to automate and/or focus collection of project work accomplishment data	
☐ Implement simple solutions to move away from pen & paper collection of project data (e.g. digital forms or spreadsheet tools).	☐ Evaluate opportunities to pre-populate high-level activity or asset information based on contract or design information.	☐ Evaluate opportunities to pre-populate detail asset or work accomplishment data based on contract or design information.	☐ Conduct periodic evaluation and pilot testing of cutting edge project data collection applications or capabilities. Implement solutions as appropriate.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

Date: **Participating Members:**   **Assessment Context:**

B-Collect Data 2-Project Information	B.2.c – Project Information Quality

Element Description Established processes to assess and improve project data quality

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Quality is not defined.	Expectations for data accuracy, valid values and completeness are established.	A plan has been produced including activities and roles for data quality management before, during and after data collection.	Formal data collector certification and data acceptance criteria and processes are in place.	Data collection and quality management processes are regularly reviewed and revised based on prior experience.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Establish general project data collection requirements (e.g. conditions appropriate for collection).	☐ Develop a data quality management plan, including documented quality management activities and roles for project data.	☐ Establish formal project data collection training and collector certification processes.	☐ Automate data quality checks to streamline quality management process and ensure consistency of quality review of project data.	
☐ Document business rules for evaluation of accuracy, completeness, and validity of collected project data.	☐ Evaluate project data collection best practices and lessons learned from other internal and external data collection programs.	☐ Document comprehensive collection business processes with clear data acceptance criteria and error resolution procedures for project data.	☐ Incorporate outcomes from quality control and assurance processes and routine evaluation of lessons learned to prevent systemic errors and improve ongoing collection processes.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

Date: **Participating Members:**   **Assessment Context:**

B-Collect Data
3-Maintenance Information

B.3.a – Maintenance Information Coverage

Element Description   Processes to capture maintenance activity information in a manner consistent with the work order data model and with sufficient coverage to meet asset management analysis, decision-making, reporting, and communications needs.

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Data on work orders is not consistently available and/or is not collected in a standardized fashion.	Work order and maintenance contract data are collected to support non-asset management purposes (e.g. contract payment) in a manner that is only useful to asset management for aggregate, network-level summary reporting.	Work order and maintenance contract data are collected in a manner supporting understanding of activities performed at individual work locations.	Work order and maintenance contract data collection includes associated asset information in a format that is useful to management and upkeep of the asset inventory or condition history.	Work order and maintenance contract data collection includes detailed asset related information (e.g. products / component models or standards, specific treatment materials) useful for detailed asset management decision-making and project design improvement.
Current: ☐ **Desired:** ☐	**Current:** ☐ **Desired:** ☐	**Current:** ☐ **Desired:** ☐	**Current:** ☐ **Desired:** ☐	**Current:** ☐ **Desired:** ☐
☐ Evaluate and implement opportunities to summarize work order information useful to high-level asset decision-making or reporting (e.g. annual investment levels or quantities).	☐ Implement a data collection plan to capture work order locations and general activities performed within those limits (e.g. preventive maintenance, minor repairs)	☐ Implement a data collection plan which captures individual asset locations/IDs and associated work activities and accomplishments.	☐ Implement a data collection plan which captures detailed asset information from work activities / accomplishments (e.g. specific materials, products, or applications).	
☐ Document general needs and uses for work order information.	☐ Establish a "best practical" collection scope based on current capabilities and funding for work order collection.	☐ Examine current practices to "right size" collection scope to meet current needs and established data model.	☐ Examine best practices to "optimize" work order collection scope. If warranted, engage stakeholders to adjust data model for future needs.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

B-Collect Data
3- Maintenance Information

B.3.b – Maintenance Information Automation

Element Description — Processes and technologies used to automate collection and processing of maintenance activities, work orders, and work accomplishment data.

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Pen/paper collection	Stand-alone, standardized electronic forms or spreadsheets are used to facilitate collection. Data are not automatically populated into the source system of record.	Data collection using primarily automated/semi-automated techniques through specialized solutions (e.g. custom applications with GPS location detection voice recognition, bar codes / QR codes).	Data collection using primarily automated / semi-automated techniques with capabilities to efficiently adapt tools to meet varied data collection requirements across multiple data collection business processes or asset types.	Application of state-of-the-art computer vision and change-detection techniques for data extraction and efficient updating.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Document business cases for automation of work order data collection through internal practice, peer agency, and best practice reviews.	☐ Pilot and implement semi-automated field collection tools (e.g. mobile data collection applications) for work order data collection.	☐ Pilot and implement field collection tools useful for multiple data collections (e.g. standardized apps or enterprise asset management system tools).	☐ Use change detection to automate and/or focus collection of work order and/or maintenance work accomplishment data.	
☐ Implement simple solutions to move away from pen & paper collection (e.g. digital forms or spreadsheet tools) for work order data collection.	☐ Evaluate opportunities to pre-populate high-level activity or asset information based on work order or contract/task information.	☐ Evaluate opportunities to pre-populate detailed asset or work accomplishment data based on work order or contract/task information.	☐ Conduct periodic evaluation and pilot testing of cutting-edge data collection applications or capabilities. Implement solutions as appropriate.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

B.3.c – Maintenance Information Quality

B-Collect Data
3-Maintenance Information

Element Description Processes to assess and improve maintenance activity and cost data quality.

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Quality is not defined.	Expectations for data accuracy, valid values and completeness are established.	A plan has been produced including activities and roles for data quality management before, during and after data collection.	Formal data collector certification and data acceptance criteria and processes are in place.	Data collection and quality management processes are regularly reviewed and revised based on prior experience.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Establish general data collection requirements (e.g. conditions appropriate for collection) for maintenance.	☐ Develop a data quality management plan, including documented quality management activities and roles for maintenance data.	☐ Establish formal data collection training and collector certification processes for maintenance data.	☐ Automate data quality checks to streamline quality management process and ensure consistency of quality review of maintenance data.	
☐ Document business rules for evaluation of accuracy, completeness, and validity of collected maintenance data.	☐ Evaluate maintenance data collection best practices and lessons learned from other internal and external data collection programs.	☐ Document a comprehensive collection business process with clear data acceptance criteria and error resolution procedures for maintenance data.	☐ Incorporate outcomes from quality control and assurance processes and routine evaluation of lessons learned to prevent systemic errors and improve ongoing collection processes.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

Date: **Participating Members:** **Assessment Context:**

B-Collect Data 4-Priority Criteria and Values	B.4.a – Public Perception

Element Description Capture and use of information about how the public perceives different conditions, treatment options, or other TAM related factors.

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
Public perception data is not captured.	Public perception is generally evaluated against internal thresholds established through expert opinion (e.g. minimum program or service standards set based on internal DOT input).	Customer complaints or requests related to asset condition and service are compiled, but there is no specific guidance on how this information should be used.	Public perception information is gathered through proactive methods, and there are clear expectations for how this input will be used.	Public perception information is gathered through proactive methods that are coordinated across assets and program areas. Processes for considering and resolving conflicting perspectives are in place.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Define customer-oriented service levels and minimum expectations for asset related programs and services through expert opinion.	☐ Implement a data collection plan to track complaints, work requests, or other reactive metrics of public perception.	☐ Implement a data collection plan to use proactive methods of gathering general public perceptions of asset condition and service (e.g. surveys or opinion polls.)	☐ Implement a data collection plan to capture detailed information (e.g. thru focus groups) to expand upon general public perception data.	
☐ Evaluate asset related program and service levels against expectations. Flag if minimum levels are not met.	☐ Develop agency or program-level guidance on approaches to capturing public perceptions to support asset-related decision-making.	☐ Define how public perception data will be incorporated into asset-related decision-making.	☐ Document processes to resolve conflicting perspectives or input received through public engagement.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes:

Date: **Participating Members:**   **Assessment Context:**

B-Collect Data 4-Priority Criteria and Values	B.4.b – Decision Maker Values

Element Description	Capture and use of information about how DOT decision-makers (at both program and executive levels) perceive and value different asset performance levels, management strategies, or other factors.

Benchmark Level 0	Benchmark Level 1	Benchmark Level 2	Benchmark Level 3	Benchmark Level 4
DOT asset program managers and executives don't engage in discussions about the impacts of different asset performance levels.	DOT asset program managers and executives informally discuss impacts of different asset performance levels.	DOT asset program managers and executives have regular (annual or quarterly) meetings to review current and projected asset performance levels and discuss funding priorities.	DOT asset program manager and executive values and preferences are captured in a quantitative fashion (e.g. through stated preference or scoring methods).	Decision-maker values are captured in a quantitative fashion that supports cross-asset / cross-program resource distribution and/or investment prioritization.
Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐	Current: ☐ Desired: ☐
☐ Organize informal meetings to discuss impacts of different asset performance levels.	☐ Set up regular meetings to review asset performance and discuss priorities.	☐ Research alternative methods for quantifying decision maker values and preferences.	☐ Research alternative methods for cross-asset / cross program resource allocation or investment prioritization.	
☐ Identify and document key decision maker concerns and tradeoffs.	☐ Compile data that helps decision makers assess the implications of different performance levels (e.g. pavement roughness impacts on vehicle operating costs)	☐ Set up peer-to-peer discussions with agencies that have successfully applied methods for quantifying decision maker values and preferences.	☐ Pilot test available tools for cross-asset /cross-program resource allocation or investment prioritization.	
☐ Other:	☐ Other:	☐ Other:	☐ Other:	

Assessment Notes:

Improvement Notes: