

Appendix C: Store, Integrate, and Access Data Element-Level Response Templates

This Appendix offers element-level response templates for Area C: Store, Integrate, and Access 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:

C-Store, Integrate, and Access Data

1-Databases

C.1.a – Efficient Storage

Element Description Data storage methods that enable and facilitate efficient data access, analysis and transformation.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|---|---|---|---|--|
| Asset inventory, condition and work information are primarily in paper form - not digitized. | Asset inventory, condition and work information is digital but stored in disparate database types and locations. | Most databases with asset inventory, condition and work information are stored on a server and can be accessed and managed centrally. | Materialized views and automated transformations are used to provide efficient access to data of interest. | Information is stored for efficient access by leveraging cloud-based options (as appropriate). |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Work with information technology staff to examine current practices and identify database solutions aligned with business need and agency recommended practices. | <input type="checkbox"/> Identify and implement source systems of record for storage of asset inventory, condition, and work data. | <input type="checkbox"/> Eliminate duplicate data by providing curated authoritative data for analysis and reporting. | <input type="checkbox"/> Work with information technology staff to identify needs and solutions for cloud-based data storage. | |
| <input type="checkbox"/> Migrate asset data from paper to simple database formats. Store locally or on central servers if no formal system of record is available. | <input type="checkbox"/> Develop and execute a migration plan for paper, decentralized, and/or locally stored data desired for ongoing retention and use. | <input type="checkbox"/> Work with information technology staff to incorporate anticipated future asset data, systems, and analysis tools in the enterprise architecture. | <input type="checkbox"/> Implement cloud data storage solutions as appropriate to provide optimized and efficient access for internal and external users. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

Assessment Notes:

Improvement Notes:

Date:

Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data

1-Databases

C.1.b – Database Linkages

Element Description Data integration to facilitate analysis and reporting requiring use of multiple data sources.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|---|--|---|---|---|
| There are no established linkages across different databases that store asset information. | Data across different databases can be linked based on standard location references. | Data across different databases can be linked based on shared asset, project, and/or work order identifiers. | Processes are in place to update location references and IDs as changes occur to the agency's authoritative sources for these data elements. | Roles and responsibilities have been established to ensure that databases are designed to enable efficient integration to support analysis and reporting. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Standardize location referencing within asset databases. | <input type="checkbox"/> Review existing location, asset, project, and work order identifiers with asset SMEs. Flag inconsistencies across programs and processes. | <input type="checkbox"/> Integrate authoritative sources for location, asset, project, and work order information with asset databases. | <input type="checkbox"/> Assign roles and responsibilities for identifying and updating integration requirements for asset databases, systems, and tools. | |
| <input type="checkbox"/> Review existing location, asset, project, and work order identifiers with asset subject matter experts (SMEs). Flag inconsistencies within individual programs or processes. | <input type="checkbox"/> Standardize use of asset, project, and work order unique identifiers within asset databases. | <input type="checkbox"/> Develop processes to ensure location referencing and unique identifiers are maintained against authoritative data sources. | <input type="checkbox"/> Proactively identify asset management business needs for data integration and translate these needs into data, application and technology architecture requirements. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

Assessment Notes:

Improvement Notes:

Date:

Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data

1-Databases

C.1.c – Document Linkages

Element Description Processes and technologies for linking documents to assets, projects, and locations.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|--|---|--|--|--|
| Documents related to specific assets or projects may be filed in folders for the asset or project but are not directly linked through metadata or other methods. | Selected document types can be linked to associated assets, projects, and locations. Approaches may vary across document types or systems. | Standardized approaches are used to connect documents to assets, projects, locations but there are no established business processes or roles to ensure execution. | An electronic document management system is integrated with asset management, project management, location referencing systems and tools. Business processes and roles for document management are documented, but may not be monitored. | An electronic document management system is integrated with asset management, project management, location referencing systems and tools. Business processes are documented and monitored to ensure application. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Review existing document standards and metadata with asset Subject Matter Experts (SMEs). Flag opportunities to incorporate linkages to assets, projects and locations within individual processes. | <input type="checkbox"/> Review existing document standards and metadata with asset SMEs. Flag opportunities to incorporate linkages across processes and programs. | <input type="checkbox"/> Develop an electronic document management system with defined metadata providing linkages for priority documentation. | <input type="checkbox"/> Document and apply detailed document metadata business rules useful in flagging documentation that has been improperly tagged. | |
| <input type="checkbox"/> Take advantage of available document management systems to establish metadata elements for asset ID, project ID and location. | <input type="checkbox"/> Standardize use of asset, project, work order unique identifiers and location referencing within key asset related documentation. | <input type="checkbox"/> Document business processes, roles and responsibilities for applying standard metadata during document creation and/or update. | <input type="checkbox"/> Routinely evaluate document metadata practices to ensure they are meeting business needs. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

Assessment Notes:

Improvement Notes:

Date:

Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data
1-Databases

C.1.d – Data Storage Capacity

Element Description Processes to provide sufficient storage capacity to meet current and likely future needs, considering collection of imagery, LiDAR, backups, archiving, and other data storage requirements.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|--|---|---|---|---|
| Data storage needs are not systematically assessed, and requests for additional storage are not reliably met. | Data storage requirements are evaluated as part of new information system development processes, but space requirements are not routinely reassessed after initial system deployment. | A process exists for business areas to request additional storage to meet needs related to growth in data or new data collection efforts. | The organization has a data storage management strategy that includes considerations of retention, backup requirements, structured and unstructured data, disaster recovery, etc. based on current needs. | The organization has a forward-looking data storage management strategy that includes considerations of retention, backup requirements, structured and unstructured data, disaster recovery, etc. based on current and future needs. Strategy includes tactics to manage costs in alignment with needs (e.g. tiered storage, appropriate use of cloud vs. on premise). Strategy is aligned with and actively managed in coordination with the business. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Establish requirements for data storage requirement evaluation as part of new IT system planning & development. | <input type="checkbox"/> Establish process for system owners and/or business leads to request additional storage capacity. | <input type="checkbox"/> Create a five year, forward looking data storage plan in collaboration with IT and business leads. | <input type="checkbox"/> Develop a data storage management strategy that examines and quantifies risks and identifies data storage solutions aligned with risk tolerance and budget. | |
| <input type="checkbox"/> Examine and document IT process for securing additional storage capacity. | <input type="checkbox"/> Communicate lead time required for IT to reliably meet legitimate requests for additional data storage. | <input type="checkbox"/> Investigate and incorporate targeted cloud storage applications. | <input type="checkbox"/> Document a comprehensive cloud storage policy and associated storage solutions. Integrate cloud storage tactics in broader strategy. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

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Date:

Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data
2-Asset Life-Cycle Data Integration Workflows

C.2.a – Asset Management Data to Project or Work Order

Element Description Established data flows from asset management systems to maintenance work order systems or project development systems.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|---|--|--|--|--|
| No defined data flow between asset management systems and/or scoping and project development. | Data views are defined to facilitate access to, and review of, asset inventory, condition, and analysis information. This data is presented in a manner intended for use in downstream project scoping activities. | Simple data flows are implemented, allowing pre-population of key administrative and project-level information (e.g. asset identifiers, recommended project/activity, project limits) into base project scoping documents. | More detailed data flows are implemented, allowing individual assets and/or activity details to be pre-populated into the project scoping documents. | Asset management system information automatically flows into maintenance management/ project planning systems. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Develop standard views or reports to expose asset inventory, condition, and analysis information for use in project scoping processes. | <input type="checkbox"/> Transform key data stored in asset systems to support direct integration of information into project scoping products. | <input type="checkbox"/> Transform detailed data stored in asset systems to support direct integration of asset and activity details into project scoping products. | <input type="checkbox"/> Transform detail data stored in asset systems to support direct and complete integration into project scoping products. | |
| <input type="checkbox"/> Engage Subject Matter Experts (SMEs) from asset management and project planning and scoping to identify opportunities for improved coordination. | <input type="checkbox"/> Pilot test and implement simple, manual or semi-automated data integrations. Provide quality assessment tools to support informed data use. | <input type="checkbox"/> Pilot test and implement batch processes to transfer data. Integrate quality assessment tools to ensure appropriate data use. | <input type="checkbox"/> Pilot test and implement fully automated processes to transfer data. Integrate quality assessment tools to ensure appropriate data use. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

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Date:

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Assessment Context:

C-Store, Integrate, and Access Data
2-Asset Life-Cycle Data Integration Workflows

C.2.b – Project Planning to Project Development

Element Description Established data flows from project planning (scoping) to project development. Consider both maintenance/operations activities and construction projects.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|--|--|--|---|---|
| No defined data flow between project planning and/or scoping and project development. | Data views are defined to facilitate access to, and review of, planning and scoping information. This data is presented in a manner intended for use in downstream design and/or project development activities. | Simple data flows are implemented, allowing pre-population of key administrative and project-level information (e.g. project identifiers, project/activity type, project limits) into base project, work order, or design documents. | More detailed data flows are implemented, allowing individual assets and/or activity details (such as work location, scope, estimated cost, and schedule milestones) to be pre-populated into the project, work order, and/or design documents. | Planning/scoping information automatically populates contract and design documents. Project development activities, participants, and/or documentation are automatically populated as appropriate to the scope. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Develop standard views or reports to expose planning and scoping information for use in project development activities. | <input type="checkbox"/> Transform key data stored in scoping and planning systems to support integration of data into project development products. | <input type="checkbox"/> Transform detailed data stored in scoping and planning systems to support integration of information into project development products. | <input type="checkbox"/> Assess and refine existing data flows to include additional detail (or reduce detail). Develop specifications for direct and complete integration of planning / scoping details into project development products. | |
| <input type="checkbox"/> Engage Subject Matter Experts (SMEs) from planning and development to identify opportunities for improved coordination. | <input type="checkbox"/> Pilot test and implement simple, manual or semi-automated data integrations. Provide quality assessment tools to support informed data use. | <input type="checkbox"/> Pilot test and implement batch processes to transfer data. Integrate quality assessment tools to ensure appropriate data use. | <input type="checkbox"/> Pilot test and implement fully automated processes to transfer data. Integrate quality assessment tools to ensure appropriate data use. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

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Assessment Context:

C-Store, Integrate, and Access Data
2-Asset Life-Cycle Data Integration Workflows

C.2.c – Project Development to Project Delivery

Element Description Established data flows from project development to project delivery. Consider both maintenance/operations activities and construction projects.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|--|---|---|---|---|
| No defined data flow between project development and project delivery/construction. | Data views are defined to facilitate access to, and review of, project development information. This data is presented in a manner intended for use in downstream project delivery / construction activities. | Simple data flows are implemented, allowing pre-population of key administrative and project-level information (e.g. project identifiers and limits, bid items and charge codes, general work activities) into base project delivery tools and systems. | More detailed data flows are implemented, allowing individual assets and/or activity details to be pre-populated into the project delivery tools and systems, including asset acceptance inspection systems and work accomplishment tracking tools. | Design information automatically populates delivery/construction information. Work accomplishment information is largely pre-populated based on design documents to facilitate direct acceptance or modification with limited data entry. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Develop standard views or reports to expose design information for use in project delivery (e.g. acceptance inspection or payment). | <input type="checkbox"/> Transform key data stored in design systems/documents to support integration into project delivery processes. | <input type="checkbox"/> Transform detailed data stored in design systems/documents to support integration into project delivery processes. | <input type="checkbox"/> Assess and refine existing data flows to include additional detail (or reduce detail). Develop specifications for direct and complete integration into project delivery processes. | |
| <input type="checkbox"/> Engage Subject Matter Experts (SMEs) from project development and delivery to identify opportunities for improved coordination. | <input type="checkbox"/> Pilot test and implement simple, manual or semi-automated data integrations. Provide quality assessment tools to support informed data use. | <input type="checkbox"/> Pilot test and implement batch processes to transfer data. Integrate quality assessment tools to ensure appropriate data use. | <input type="checkbox"/> Pilot test and implement fully automated processes to transfer data. Integrate quality assessment tools to ensure appropriate data use. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

Date:

Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data

2-Asset Life-Cycle Data Integration Workflows

C.2.d Project Delivery to Asset Management Data

Element Established data flows from project delivery to asset management systems to ensure up-to-date, accurate inventory, condition, and work history information. Consider both maintenance/operations activities and construction projects.

Description

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|---|---|--|--|--|
| No defined data flow between project delivery/construction and asset inventory, condition, performance and work history databases. | Data views are defined to facilitate access to, and review of, as-built or inspection information. This data is presented in a manner intended for easier review and update into asset management systems and/or databases. | Simple data flows are implemented, allowing pre-population of key administrative and project-level information (e.g. project identifiers and limits, asset identifiers, general work activities) into asset databases for more detailed attribution or update. | More detailed data flows are implemented, allowing individual assets and/or activity details to be pre-populated into the asset databases, allowing most data to be pre-populated prior to finalization. | Delivery/construction information automatically flows to asset management systems. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Develop standard views or reports to expose project delivery (e.g. acceptance inspection) information for review in asset data update. | <input type="checkbox"/> Transform key data stored in as-built or inspection systems / documents to support integration into asset databases. | <input type="checkbox"/> Transform detailed data stored in as-built or inspection systems / documents to support integration into asset databases. | <input type="checkbox"/> Assess and refine existing data flows to include additional detail (or reduce detail). Develop specifications for direct and complete integration into asset databases. | |
| <input type="checkbox"/> Engage Subject Matter Experts (SMEs) from project delivery and asset management to identify opportunities for improved coordination. | <input type="checkbox"/> Pilot test and implement simple, manual or semi-automated data integrations. Provide quality assessment tools to support informed data use. | <input type="checkbox"/> Pilot test and implement batch processes to transfer data. Integrate quality assessment tools to ensure appropriate data use. | <input type="checkbox"/> Pilot test and implement fully automated processes to transfer data. Integrate quality assessment tools to ensure appropriate data use. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

Assessment Notes:

Improvement Notes:

Date:

Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data
3-Other Data Integration Workflows

C.3.a – Financial (Revenue, Budget, Expenditure) Data

Element Description Established data flows from financial systems to systems used for asset management, work planning and tracking.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|---|---|--|---|---|
| No defined data flow between asset management systems and financial systems. | Data views are defined to facilitate access to, and review of, financial data supporting asset management decision-making. This data is presented in a manner intended for use in asset improvement optimization and selection, work planning and tracking. | Simple data flows are implemented, allowing pre-population of current budget limits into asset management optimization analysis and/or work planning tools. | More detailed data flows are implemented, allowing current budget limits, total expenditures, remaining funds, and future funding forecasts to be pre-populated by discrete fund, project, or work categories into asset management optimization analysis and/or work planning tools. | Budget and expenditure information automatically flows to systems used for asset management, work planning and tracking. Updated information is available in real time or updated on a daily basis. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Develop standard views or reports to expose financial data for use in asset management processes. | <input type="checkbox"/> Summarize data stored in financial systems to support integration into optimization and work planning tools. | <input type="checkbox"/> Transform detailed financial system data to support integration into optimization and work planning tools. | <input type="checkbox"/> Assess existing data flows and identify refinements to include additional detail (or reduce detail). Develop specifications for direct integration into optimization and work planning tools. | |
| <input type="checkbox"/> Engage Subject Matter Experts (SMEs) from asset management and financial business units to identify opportunities for improved coordination. | <input type="checkbox"/> Pilot test and implement simple, manual or semi-automated financial data integrations. Provide quality assessment tools to support informed data use. | <input type="checkbox"/> Pilot test and implement batch processes to transfer financial data. Integrate quality assessment tools to ensure appropriate data use. | <input type="checkbox"/> Pilot test and implement fully automated processes to transfer financial data. Integrate quality assessment tools to ensure appropriate data use. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

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Improvement Notes:

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Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data

3-Other Data Integration Workflows

C.3.b – Demand and/or Utilization Data

Element Description Established data flows from travel demand, travel monitoring systems, or other systems quantifying demand or utilization to systems used for asset management decision support.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|---|---|---|---|--|
| No defined data flow between asset management systems and travel demand or utilization data systems. | Data views are defined to facilitate access to, and review of, demand/utilization data supporting asset management decision-making. This data is presented in a manner intended for use in asset improvement optimization, prioritization, and planning, and asset communication and reporting. | Simple data flows are implemented, allowing processing of current demand or utilization against specific assets or network segments. | More detailed data flows are implemented, facilitating useful prioritization and/or risk evaluation within asset management decision-making systems, tools, and analysis. | Travel demand and utilization information automatically flows to systems used for asset management decision support. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Identify travel demand or facility/service utilization data useful to asset management. Develop standard views or reports. | <input type="checkbox"/> Summarize demand and/or utilization data to support asset prioritization and improvement decision. Directly integrate these into asset systems / tools. | <input type="checkbox"/> Examine asset risk and prioritization evaluation needs. Transform key demand / utilization data and directly integrate for these purposes. | <input type="checkbox"/> Examine real-time decision-making priorities and needs. Transform detailed demand / utilization data and directly integrate for these purposes. | |
| <input type="checkbox"/> Engage Subject Matter Experts (SMEs) from asset management and travel demand or facility / service utilization data producers to identify opportunities for improved coordination. | <input type="checkbox"/> Pilot test and implement manual or semi-automated demand data / utilization integrations. Provide quality assessment tools to support informed data use. | <input type="checkbox"/> Pilot test and implement batch processes to transfer demand / utilization data. Integrate quality assessment tools to ensure appropriate data use. | <input type="checkbox"/> Pilot test and implement fully automated processes to transfer demand / utilization data. Integrate quality assessment tools to ensure appropriate data use. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

Assessment Notes:

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Date:

Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data

3-Other Data Integration Workflows

C.3.c – Environmental Data

Element Description Established data flows from environmental information systems to systems used for asset management decision support

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|--|---|--|--|--|
| No defined data flow from environmental data systems to asset management and project development systems. | Data views are defined to facilitate access to, and review of, environmental data supporting asset management and project development. Data is presented for use in asset improvement optimization and selection, work planning, and project scoping and development. | Simple data flows are implemented, allowing processing of available environmental data against specific assets or network segments in a manner that is useful to asset improvement selection and/or project scoping and development. | More detailed data flows are implemented, facilitating prioritization and/or risk evaluation within asset management decision-making systems, tools, and analysis. | Detailed environmental data automatically flows to systems used for asset management and/or project scoping and development. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Identify environmental data useful to asset management. Develop standard views or reports. | <input type="checkbox"/> Summarize environmental data to support improvement selection and project development. Directly integrate into asset systems / tools. | <input type="checkbox"/> Examine detailed project development and asset management process and risk evaluation needs. Transform key environmental and directly integrate for this purposes. | <input type="checkbox"/> Examine real-time decision-making priorities and needs. Transform detailed environmental data and directly integrate for these purposes. | |
| <input type="checkbox"/> Engage Subject Matter Experts (SMEs) from asset management, project development, and environmental units to identify opportunities for improved coordination. | <input type="checkbox"/> Pilot test and implement manual or semi-automated environmental data integrations. Provide quality assessment tools to support informed data use. | <input type="checkbox"/> Pilot test and implement batch processes to transfer environmental data. Integrate quality assessment tools to ensure appropriate data use. | <input type="checkbox"/> Pilot test and implement fully automated processes to transfer environmental data. Integrate quality assessment tools to ensure appropriate data use. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

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Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data

4-Data Access

C.4.a – Field Access to Data

Element Description Technologies, data structures and processes to enable access to agency asset and work management system data from the field.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|--|--|---|---|--|
| Field staff are not equipped with mobile technology. | Field staff are equipped with laptops and can bring copies of needed files to the field - no data connectivity. | Field staff are equipped with mobile devices with data connections capable of retrieval only. | Field staff are equipped with mobile devices capable of two-way connectivity with the ability to retrieve and send information to office systems. | Next generation technology is used in field business processes. Examples include tools allowing hands free retrieval and sending of data, real-time remote assistance, 3D/4D/5D visualization of data, or visualization as part of an Augmented or Virtual Reality (AR/VR) experience. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Provide basic computer and internet access at base field offices or locations. | <input type="checkbox"/> Identify positions requiring mobile computing. Provide smart phones, tablets, and/or laptops (consider mobile data plans as appropriate). | <input type="checkbox"/> Identify positions requiring mobile computing with data connectivity. Provide smart phones, tablets, and/or laptops (include mobile data plans, if data connectivity is needed). | <input type="checkbox"/> Provide seamless access across firewall and in the field for all asset (and related) data, systems, and tools. | |
| <input type="checkbox"/> Develop budget for supplying mobile devices to field staff. Consider Bring-Your-Own-Device (BYOD) policies. | <input type="checkbox"/> Develop mobile friendly views of key asset information (e.g. asset inventory, work recommendations or history). | <input type="checkbox"/> Develop comprehensive mobile solutions for key systems, tools, analysis, and information. Support real-time field data update and creation. | <input type="checkbox"/> Explore and pilot next generation mobile tools that can support asset business processes. Implement as appropriate. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

Assessment Notes:

Improvement Notes:

Date:

Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data

4-Data Access

C.4.b – Public Access to Data

Element Description Technologies, data structures and processes to enable public access to agency condition and asset performance information and planned projects.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|--|--|---|--|---|
| A publicly accessible repository of asset/project information does not exist. | A website is available with contact information. | A website is available with summary data and some downloadable data, reports, or reference materials. | A website with a dashboard is available to reflect project level performance metrics and comparison to project goals, updated periodically. | A website with a dashboard is available to reflect performance metrics and comparison to organization goals, updated in near real time. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Develop public facing website providing general overview of asset related programs and contacts. | <input type="checkbox"/> Provide access to public facing data, reports, and supporting materials through program website(s). | <input type="checkbox"/> Develop and share asset performance metrics, targets, and other information through a public facing dashboard. | <input type="checkbox"/> Implement data and system integrations to provide near real time updates of asset data shared in the public dashboard. | |
| <input type="checkbox"/> Examine agency public facing website and identify appropriate locations to share or link asset specific website(s). | <input type="checkbox"/> Develop a public data portal where curated data and reports can be uploaded for public access. | <input type="checkbox"/> Develop messaging and materials to share context for asset performance with public. Upload to public website(s). | <input type="checkbox"/> Develop messaging and materials to relate asset performance with overarching organization goals. Upload to public website(s). | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

Assessment Notes:

Improvement Notes:

Date:

Participating Members:

Assessment Context:

C-Store, Integrate, and Access Data

4-Data Access

C.4.c – Access Security

Element

Description

Management of access to asset and project data to ensure data security and the proper flow of information.

| Benchmark Level 0 | Benchmark Level 1 | Benchmark Level 2 | Benchmark Level 3 | Benchmark Level 4 |
|---|---|--|---|---|
| Available digital data is not access-restricted. | Access is managed on an ad-hoc basis, with no designated responsibilities or accountability. | Roles and accountabilities for granting access have been established, but without clear policies or guidance. | Access is managed based on established roles and documented policies and protocols. | Access is managed using role-based authentication within business systems. Single sign on is used to minimize separate logins and centralize management of credentials. |
| Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> | Current: <input type="checkbox"/> Desired: <input type="checkbox"/> |
| <input type="checkbox"/> Audit access controls in place for key asset data, systems, and tools. Identify system improvements. | <input type="checkbox"/> Document general processes and procedures for authorizing access to key asset data, systems, and tools. | <input type="checkbox"/> Document clear procedures and associated responsibilities for authorizing access to asset data, systems, and tools. | <input type="checkbox"/> Develop an access request / management system to support efficient processing and tracking of access requests. | |
| <input type="checkbox"/> Conduct a risk assessment to prioritize implementation of access controls. | <input type="checkbox"/> Identify typical system roles and users. Document general roles and responsibilities for authorizing access. | <input type="checkbox"/> Designate and train individuals who will be responsible for managing access. | <input type="checkbox"/> Provide single sign on functionality for asset related data, systems, and tools. | |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | |

Assessment Notes:

Blank area for assessment notes.

Improvement Notes:

Blank area for improvement notes.