# *Quarterly Progress Report (QPR)*

# *Applications of Enterprise GIS in Transportation*

**Progress Report for Quarter 1 [Jan 1st, 2023 – March 31st, 2023]**

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Map

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Background

The Pooled Fund Study (PFS) on Applications of Enterprise GIS in Transportation (AEGIST) was initiated by FHWA in 2018. During Phase 1 of this study a guidebook was developed for transportation agencies in the United States, with the primary objective of documenting guidance on how spatial and linear referenced data should be managed by States. Phase 2 of this PFS was initiated in October 2019. This phase will span over 5 years (October 2019 – September 2024), during which the objectives outlined below would be accomplished.

Objectives

* Establish a standard for managing and governing data in spatial and linear referencing systems at transportation agencies, including but not limited to routes, intersections, interchanges, roundabouts, road segments, roadway characteristics, infrastructure assets, model inventory of roadway elements (MIRE), HPMS data items and ARNOLD road network.
* Develop guidance for States for modeling spatial transportation data, especially linear referencing system (LRS) data. Importing, exporting & conflating road network and roadway characteristics data across DOT LRS and Federal, State and Local data systems.
* Conduct a series of webinars, workshops, peer exchange meetings and provide consulting services to the States participating in the pooled fund to develop national standards in data modeling and management; enhance existing enterprise GIS systems at these agencies.
* Update the AEGIST Guidebook that was prepared in Phase 1 by documenting best practices, patterns and similarities across agencies in managing spatial data using enterprise data systems, including but not limited to Asset Management Systems, Traffic and Safety Systems, Project Planning and Programming Systems, Design and Construction Systems, and GIS and Linear Referencing Systems (LRS).
* Collaborate with States to enhance and develop spatial data management systems, processes, platforms to establish a structured and systematic approach for management of spatial data. This would involve establishing spatial data governance systems, business rules, applications, tools and platforms for:
  + Spatial Data Modeling
  + Spatial Data Integration and Engineering
  + Spatial Data Analytics

Completion Status and Summary

Time Frame: October 1, 2019 to September 30, 2024

Total Time, months: 60

Time Expended, months: 42

Percent Calendar Time Expended: 70%

Percent Complete for Tasks & Sub-Tasks:

|  |  |  |
| --- | --- | --- |
| **Base Period** | | |
| **Tasks** | **Sub-Tasks** | **Percent Complete** |
| Task 1: Project Management | 1.  Quarterly Meetings & Technical Tasks Planning | **100%** |
| 2.  Quarterly Status Reports |
| Task 2: Technical Services | 1.   Connecticut - **77%** | **81%** |
| 2.   Idaho - **93%** |
| 3.   Tennessee - **69%** |
| 4. California - **85%** |
| 5. Pennsylvania - **96%** |
| 6. Ohio - **62%** |
| Cross-Agency Activities: Guidebook Development - **75%** |
| Task 3: Workshops, Webinars, Presentations | 1. Webinar 1: Data Governance 2. Workshops: GIS-T 2019 and GIS-T 2021 3. Presentations 2020 and 2021 4. Flyers, Events Site Updates | **79%** |
| Task 4: Member State Meetings | 1.  Member State Meeting 1 – 2019  2. Member State Meeting 2 – 2020 | **100%** |
| Task 5: HPMS 9.0 Recommendations | Road Network Data Architecture  Data Modeling Standards, Use Cases, Topology | **100%** |

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| --- | --- | --- |
| **Performance Period 1** | | |
| **Tasks** | **Sub-Tasks** | **Percent Complete** |
| Task 1: Project Management | 1.  Quarterly Meetings & Technical Tasks Planning | **55%** |
| 2.  Quarterly Status Reports |
| Task 2: Technical Services | 1.   New Mexico – **0%** | **15%** |
| 2.   Washington – 9**%** |
| 3.   Florida – 2**%** |
| 4. North Carolina **– 23%** |
| 5. Kansas **– 28%** |
| 6. Georgia **– 40%** |
| 7. Massachusetts **– 6%** |
| Cross-Agency Activities: Guidebook Development **- 0%** |
| Task 3: Workshops, Webinars, Presentations | 1. Workshops: GIS-T 2022 and GIS-T-2023 2. Presentations 2022 and 2023 3. Flyers, Events Site Updates | **43%** |
| Task 4: Member State Meetings | 1.  Member State Meeting 1 – 2022  2. Member State Meeting 2 – 2023 | **50%** |

Work Accomplished This Reporting Period: January – March, 2023

**Task 1: Project Management**

**Task Objective**: Perform project management activities, which include conducting monthly status meetings, developing quarterly status reports, creating project work plan, managing project resources, schedule, deliverables and communication with all stakeholders.

**Activities**:

1. Prepared and delivered AEGIST Quarterly Report #13 for the period October – December 2022.
2. Technical services tasks managed for following PFS States: Pennsylvania, Ohio, Washington, North Carolina, Kansas, Georgia, Massachusetts, and California. Details provided in the section below on Task 2.

**Task 2: Technical Services**

**Task Objective:** Provide technical services associated to PFS States by completing various agency-specific and cross-agency activities identified in the work plan.

**Activities**:

1. **Pennsylvania**
   * A status update on the completion of Base Period of Technical Services for PennDOT was provided for the following tasks, including any completed deliverables:
     + Task 2.PA.10: NG-911/e911 and PennDOT RMS Road Network Data Modeling Alignment
     + Task 2.PA.15: Pavement Construction History
     + Task 2.PA.16: Trends with Integrating GIS and Roadway Management Systems
   * Additionally, remaining items and closure of the technical services work for Pennsylvania were discussed.
   * Provided an update on intersection modeling best practices, and status/readiness of software tools like Bentley, Esri, Rizing for modeling of Intersections.

* For **Task 2.PA.6**, the report on PennDOT asset information requirements for design system was delivered.
* For **Task 2.PA.10**, the report on PennDOT Roads dataset integration with PEMA NG911 Roads Dataset was updated by adding additional conclusions and recommendations. This report was delivered to the PennDOT team.
* For **Task 2.PA.15**, PennDOT comments were addressed in the Pavement Construction History data modeling report using LRS. The technical report on “Trends and Practices in LRS system implementation and LRS-based pavement construction history modeling” was updated, including the addition of a section on typical challenges in implementing LRS systems. This report was delivered to the PennDOT team.
* The **Task 2.PA.16** report on GIS-based linear referencing system trends, use cases and data/system management was submitted to the PennDOT team.

1. **Ohio**

**[Task 2.OH.1] Strategic Roadmap for Road Network Data Modeling**

* + Discussion on Roadmap Deliverable timeline, roadmap activities identified and information needs. Identified follow-up discussions with the following stakeholders for roadmap planning: OGRIP, ODOT Data Governance, Digital Delivery, ODOT Travel Demand Modeling, ODOT Traffic and Safety. Stakeholder meetings were hosted to wrap up the work on the strategic roadmap.
  + Prepared plan for completing remaining Ohio DOT Technical Services work involving development of Strategic Plan
  + Established how inputs and review comments on the Strategic Plan from Ohio will be used to update the Strategic Plan

1. **Washington**

**Task 2.WS.1: Road Network Data Modernization Report**

* + Published draft of the Road Network Data Modernization report and discussed next steps for updates to contents in the report
  + Requested WSDOT to provide information about enterprise systems that maintain external events and would need to be integrated with Roads and Highways for management of external events
  + Discussed next steps on engaging with digital delivery/engineering team

**Task 2.WS.2 LRS Configuration Practices Review and Recommendations**

* + Kickoff meeting held to initiate the work on review of WSDOTs Roads and Highways LRS pilot
  + Reviewed Washington’s LRS data and Linear Referencing Methods and discussed next steps and plan for workshops and discussions with Washington’s LRS/GIS team
  + Reviewed LRS pilot data from WSDOT Esri Roads and Highways
  + Established the checklist of LRS review items and LRS configuration checks that will be considered during WSDOTs LRS assessment
  + Established business user/stakeholders requirements that drive LRS configuration (to ensure that LRS is architected keeping enterprise needs in mind)
  + Review of the GIS-based LRS data from Washington DOT and development of follow-up/discussion questions on LRS configuration for Washington DOT meeting
  + Review and comparison of WV, CA and WSDOT LRS R&Hs configuration was done and continues to be work in progress, with the goal of helping WSDOT assess where it is with its LRS configuration and where it could consider going next. Compiled information on LRS configuration requirements from California and West Virginia for Washington State
  + WSDOT LRS workshop planning, with focus on identifying workshop presentation items, questions, attendees and key outcomes. Presented the agenda for Workshop 1 on Linear Referencing System (LRS) configuration. Established detailed discussion items for Workshop as follows: (a) Station Equations data modeling (b) Line Network Configuration in Roads & Highways (c) Roads Data Modeling Rules for State and Local roads (d) management of events referenced using LRS/LRMs. For each of these discussion items, Washingtons current state-of-practice will be assessed and compared with practices in other States, particularly California and West Virginia.

1. **North Carolina**

**Task 2.NC.2: LRS Data Governance**

* + Discussed FHWAs Data Governance Framework. Requested NCDOT to review the data governance report and framework
  + Developed the scope writeup for NCDOT data governance technical services. Scope of work development based on LRS data governance requirements and use cases
  + Held workshops with LRS data governance to discuss the framework, requirements, use cases and approach for delivering governance. Workshops included discussions on linear referencing system data governance activities that need to be done at NCDOT
  + Discussed use cases that NCDOT has for LRS data governance and requested NCDOT to develop additional/comprehensive set of requirements and use cases for data governance from LRS perspective
  + Discussed NCDOT requirements for road network data governance were mapped to the data governance framework that was developed for FHWA as part of the Identifying Data Frameworks for Building Information Modeling
  + Started development of the NCDOT Data Governance System, Tools and Applications based on discussion on use cases and requirements in workshop 1
  + Discussed (a) LRS data catalog development approach (b) LRS data governance roles and responsibilities documentation approach and (c) LRS data life cycle development requirements
  + Reviewed data quality checks being done by NCDOT and established the need to review the data quality assessment criteria in more details for development of an enterprise level data quality rules catalog
  + Discussion on LRS Data Quality Governance. Identified the 15 LRS data items (feature classes) for which data quality assessment will be done from the perspective of accuracy, completeness, comprehensiveness, timeliness, and validity.
  + Developed plan for upcoming workshops on LRS data governance. The plan involved establishing a schedule for how data catalog will be created, data life cycle diagrams will be created, and data quality work will be carried out.
  + Developed the draft data life cycle for Routes to NCDOT and requested NCDOT for inputs. Discussed how Roads Data Life Cycle is being created using the information being compiled by NCDOT
  + Discussion on LRS data assets catalog development and use for driving LRS data governance program and decisions. Discussed how data catalog, application catalog and application communication diagram can be built to capture information about the US/Interstate routes, and, how data governance backlog can be tied to data assets in the data catalog and applications in the application catalog
  + Discussed need for capturing the following actions in the LRS Data Governance System backlog (a) integrating project management system with LRS system (b) integrating design and construction systems with linear referencing system to receive updates to road centerlines (routes) and roadway events in LRS
  + Presented how data quality rules and dashboards being maintained by NCDOT will be captured in the data governance system, and what types of decisions related to these dashboards will be made using the information in the governance system.

1. **Kansas**

**Task 2.KS.1: Intersection Data Modeling**

* + Developed repeatable automated process for intersection data integration and engineering. The process would integrate intersection data from Cyclomedia Lidar dataset, Safety System and Intersection Manager
  + Delivered multiple updates to Junctions, Intersection Points, Road Segments and Intersection Leg feature classes. Each time, addressed different issues in intersection data model and incrementally added features in the data engineered. For example, Performed intersection data model development at three resolution levels: 30m, 40m, 50m
  + Conducted multiple review checkpoint discussions to go over intersection data model delivered, data issues and resolution strategies
  + Discussed work that will be accomplished in 2023 for intersection and other roadway characteristics data modeling and management

1. **Georgia**

**Task 2.GA.1**: **Statewide Road Data Management and Data Supply Chain**

* + Conducted three-day site visit with Georgia DOT, University of Georgia, Information Technology Outreach Services (UGA ITOS), and the Georgia Association of Regional Commissions (GARC) to collect information on Georgia’s statewide road data management system and data supply chain for the report.
  + Reviewed and documented the process steps executed by Southern Regional Commission to model roadway characteristics data as part of the Georgia REVAMP program. Additionally, attended the monthly GARC meeting to present technical report draft and collect feedback from all 12 Regional Commissions to better capture additional REVAMP processes.
  + Prepared backlog of activities that need to be completed during the next sprint to advance the road network data management report
  + Developed Roads Data Management report for presentation and publication as end-of-sprint 3 draft by incorporating information from site-visits and GARC meeting.
  + Reviewed online materials and video resources from the Southern Georgia Regional Commission (SGRC) to draft base understanding of Regional Commission (RC) REVAMP processes.
  + Scheduled meeting with the Atlanta Regional Commission (ARC) (on Monday, Feb 13th) to discuss the tools, techniques and approaches used by the commission during the REVAMP program. Gained information supplemented information from the SGRC.
  + Slides were developed based on SGRC and ARC processes for a presentation (on Wednesday, March 22nd) to the Georgia Association of Regional Commissions (GARC) on AEGIST Data Supply Chain efforts and the Georgia Roads Data Management Technical Manual.
  + Meeting Pulse was used to collect feedback on the manual draft. Survey questions were also used to ask RCs about their roadway inventory data collection and management processes to be incorporated in the manual. These materials were also made accessible to RCs following the meeting for their continued review and feedback.

1. **Massachusetts**

* Analysis of Interchange data modeling practices from North Carolina, Arizona, Connecticut, California, Ohio and Washington
* Review of Interchange modeling practice at Massachusetts
* Comparison of Massachusetts modeling practice with States to determining next steps on recommendations and approach for interchange modeling in Massachusetts and in general across States.

1. **California**

**Task 2.CA.1: California Roads Data Sharing (CaRS) report**

* Reviewed Arizona Statewide Data Supply Chain
  + Documented findings from review of Arizona data supply chain research and analysis to provide an example a successful roads data sharing implementation with 1Integrate
  + Met with ADOT team to discuss Arizona’s 1Integrate process and workflows for data validation and integration.
  + Information on Arizona’s 1Integrate process and workflows was used to make updates to the California CaRS document
* Provided an update on status of the California Roads Data Sharing (CaRS) technical services work and scheduled a call with Caltrans to discuss next steps.
* Updated CaRS Report on integrating local agency roads data with Caltrans Roads and Highways using 1Integrate and ArcGIS Enterprise
* Scheduled status update and research findings presentation call with California to discuss progress in development of CaRS report

1. **All States: AEGIST Guidebook**

* Compared v1 of the guidebook with draft v2 and determined the next course of action for how Guidebook v2 will be prepared using the AEGIST Interim Report, Guidebook v1.0 and the content from Phase 2 AEGIST activities
* Prepared outline of Guidebook v2 and discussed content for Chapters 1 (AEGIST Goals, Vision, Objectives and Scope), 2 (Routes and Centerlines) and 3 (Intersection Modeling).
* Compiled content from Interim Report and Guidebook v1 to prepare the first draft of Guidebook v2, Chapter 1 – Enterprise GIS
* Reviewed the enterprise GIS business use cases and geospatial road network data modeling requirements to determine what information will be included in Guidebook Chapter 1, and what information is available from DOTs for analysis and ingestion into Guidebook v2
* Established timeline for development of Guidebook v2, Chapter 1.
* Discussion on Chapter 1 content: Enterprise GIS and Business Use Cases
* Review of the business use cases information from NCDOT and analysis of road network data modeling requirements associated with use case. Comparison of these modeling requirements with the AEGIST research findings and the use case to requirements mapping from GIS-T workshop.
* Documentation of Chapter 1 content, focusing on: (a) Establishing enterprise GIS framework, (b) Defining Enterprise Data (c) Identifying data models and data assets that will be in scope of AEGIST Guidebook v2

**Task 3: Marketing and Communication**

**Task Objective:** Webinars and Workshops will be held, and Articles will be presented in conferences and other industry forums to communicate information about the activities of the project, especially the technical work products developed as part of the project.

**Activities**

1. **Task 3.1.x – AEGIST Articles:** 
   * **Task 3.1.5 – Article 4:** Road Network Data Supply Chain
     + Gathering information onpractices in Arizona, Massachusetts and Georgia
     + Review of Data Supply Chain workflows and digital tools in Arizona and Georgia. Reviewed and discussed white paper on ADOTs data supply chain process and GDOTs REVAMP data sharing process to set expectations on how Statewide Road network data modeling white paper is being developed based on information from Arizona and Georgia.
     + Documentation of digital data supply chain workflows, templates and data rules
     + Digital Workflow and Data Supply Chain Coordination: Developed and discussed Digital workflow and application communication diagram for the State DOT and Local agencies roads data supply chain.
     + Reviewed Arizona’s Road Centerline Change Proposal Development Process
       - Identified next steps and questions for discussion with Arizona on their comparative analysis of road networks and subsequent development of change proposals.
       - Documented roadway geometry data quality assessment rules being used to assess quality of local roads data in Arizona’s AZGeo Platform.
     + Continued discussion with Arizona on its Statewide Data Supply Chain process to collect additional information about data flow and systems.
     + Discussed next steps and follow-up meeting agenda to establish direction for the white paper being developed and the type of information that needs to be reviewed in the coming weeks.
     + Incorporated the findings from the interview with Arizona on its data supply chain.
     + Met with Arizona to discuss the action items and next steps that need to be completed to prepare the white paper on Arizona’s data supply chain.
   * **Task 3.1.5 - Article 5:** LRS Administration Levels and Maturity Model
     + Updated checklist and criteria for maturity levels associated with LRS administration based on features and functionalities available in LRS software systems
     + Evaluation of LRS administration model with Washington DOT technical services to develop recommendations and actions for LRS management
2. **Task 3.2.x: Workshops and Presentations** 
   * **January 2023 - TRB AED-40 Presentation:** Developed presentation slides on AEGIST project for TRB AED-40 Committee Meeting
   * **February and March 2023 - AEGIST GIS-T Workshop Preparation**
     + Conducted the first planning meeting for AEGIST GIS-T workshop to discuss workshop goals and objectives, presentation topics, facilitation, and discussion approach. Also determined next steps and cadence for future meetings on GIS-T workshop preparation.
     + Conducted 2nd planning meeting with GIS-T Workshop Presenters and Volunteers. Discussed following presentation and breakout template/outline - (a) Purpose and need for standardizing data modeling for the key topics of interest (e.g., intersections). (b) Variations in practice across the US, (c) Key challenges and issues related to standardizing, (d) Best practice recommendations, (e) Implementation considerations
       - Established how breakout sessions will be organized, facilitated and what questions/content will be discussed.
       - Identified business use cases that would be used in the facilitation sessions for discussion on road network data modeling requirements
       - Consolidated road network data modeling approaches from various AEGIST States so that presenters could use this information as the starting point to facilitate discussion on road network modeling and potentially build consensus on modeling approach based on use case
     + Slides were developed on Divided/Undivided Highways and Interchanges for discussion on modeling best practice during the GIS-T workshop.
       - Additional slides were incorporated on practices of different State DOTs for modeling of Intersection.
       - Additional slides were introduced at the end of each major section to survey the workshop participants and to encourage discussion.
     + In the immediate weeks before the workshop, a readiness assessment and rehearsal for the AEGIST GIS-T workshop presenters (from Arizona, Georgia, Oklahoma, Connecticut, Washington, and North Carolina), moderators, and volunteers was held to ensure comfort and confidence with the material. Individual support was offered to presenters, if requested.
       - Reviewed Interchange Data Modeling guidelines with Washington (Elizabeth Lanzer) and discussed how Elizabeth can present these AEGIST findings at GIS-T to gather inputs and feedback from peer States.
       - Communicated key messages to Georgia (Eric Conklin) on slides associated with divided/undivided highways modeling
       - Coordinated with presenters to prepare bios, and presentation summary for GIS-T workshop.
   * **February and March 2023 - GIS-T Data Supply Chain Workshop Preparation**
     + Coordination with Georgia for presentation at GIS-T workshop on Data Supply Chain.
       - Prepared preliminary slides to be used by Georgia presenters and met routinely with presenters ahead of the workshop to discuss objectives and review material.
       - Created Meeting Pulse panel and survey to engage workshop attendees with the material and Georgia presenters.
     + Coordination with Arizona for presentation at GIS-T workshop on Data Supply Chain
     + Conducted a planning session with Arizona and Georgia to discuss how they can plan and deliver the GIS-T workshop on Data Supply Chain.
     + Prepared preliminary slides for the Georgia and Arizona teams to use based on the data supply chain case studies research already conducted.
       - Worked with Georgia and Arizona teams to update and adjust slides as needed.
       - Incorporated panel slide to collect questions from the workshop participants. Also included survey slides to prompt further discussion and to collect feedback.
     + Met individually with Georgia team to review and practice presentation material and to introduce new material.

**Complete List of AEGIST Deliverables**

**Note:** Deliverables on which work is complete (in green) and work is in progress (in light yellow).

| Task | D# | Deliverable Name | Due Date | Status |
| --- | --- | --- | --- | --- |
| Task 1\* | 1.1.0 | Kick-off Meeting | 10/30/19 | Completed. |
| Task 1\* | 1.2.0 | Work Plan Version 1: Cross-Agency Tasks, Deliverables & Schedule | 4/30/20 | Completed. Submitted to FHWA and PFS States. |
| Task 1\* | 1.3.1 | Quarterly Progress Report - 1 (incl. 3 monthly reports and quarterly meetings) | 12/31/19 | Completed. Submitted to FHWA. Email sent to PFS States. |
| Task 1\* | 1.3.2 | Quarterly Progress Report - 2 (incl. 3 monthly reports and quarterly meetings) | 3/31/20 | Completed. Submitted to FHWA.  Email sent to PFS States. |
| Task 1\* | 1.3.3 | Quarterly Progress Report - 3 (incl. 3 monthly reports and quarterly meetings) | 6/30/20 | MPR for April, May, June published.  QPR-3 (April-June) published. |
| Task 1\* | 1.3.4 | Quarterly Progress Report - 4 (incl. 3 monthly reports and quarterly meetings) | 9/30/20 | MPR for July and August prepared. QPR-4 Prepared. |
| Task 1\* | 1.3.5 | Quarterly Progress Report - 5 (incl. quarterly meetings) | 12/31/20 | QPR-5 report prepared. QTR meeting held in Dec 2020 |
| Task 1\* | 1.3.6 | Quarterly Progress Report - 6: Jan-Apr 2021 (incl. quarterly meet) | 4/31/21 | QPR-6 prepared. QTR Meeting (Mar 2021) |
| Task 1\* | 1.3.7 | Quarterly Progress Report - 7: May-July 2021 (incl. quarterly meet) | 7/30/21 | QPR-7 Completed and Submitted.  Quarterly meeting held. |
| Task 1\*\* | 1.3.8 | Quarterly Progress Report - 8: Aug-Sept 2021 (incl. quarterly meet) | 9/30/21 | QPR-8 Completed and Submitted.  Quarterly meeting held. |
| Task 1\*\* | 1.3.9 | Quarterly Progress Report - 9: Oct-Dec 2021 (incl. quarterly meet) | 12/30/21 | QPR-9 Completed and Submitted.  Quarterly meeting held. |
| Task 1\*\* | 1.3.10 | Quarterly Progress Report - 10: Jan-Mar 2022 (incl. quarterly meet) | 3/31/22 | QPR-10 Completed and Submitted.  Quarterly meeting held. |
| Task 1\*\* | 1.3.11 | Quarterly Progress Report - 11: Apr-Jun 2022 (incl. quarterly meet) | 6/30/22 | QPR-11 Completed and Submitted.  Quarterly meeting to be held in July 2022. |
| Task 2\* | 2.1 | TASK 2 Technical Services (incl. Work Plan v1.1 with State Tasks) - MONTH 8 - MAY 2020 | 5/30/20 | Work Plan v1.1 has Caltrans Tasks.  May 29th PFS States Presentation. |
| Task 2\* | 2.2 | TASK 2 Technical Services (incl. Work Plan v1.2 with State Tasks) - MONTH 9 - JUN 2020 | 6/30/20 | Work Plan v1.2 has CA, GA, ID Tasks.  June 16th PFS States Presentation. |
| Task 2\* | 2.3 | TASK 2 Base Period Technical Services (incl. Work Plan v1.3 with State Tasks) - MONTH 10 - JUL 2020 | 7/30/20 | Work Plan v1.3 with ID Task updates. Weekly work planning with Idaho. |
| Task 2\* | 2.4 | TASK 2 Technical Services (incl. Work Plan v1.4 with State Tasks) - MONTH 11 - AUG 2020 | 8/30/20 | Work Plan v1.4. Tasks 2.1, 2.2, 2.ID.1 |
| Task 2\* | 2.5 | TASK 2 Technical Services (incl. Work Plan v1.5 with State Tasks) - MONTH 12 - SEP 2020 | 9/30/20 | Work Plan v1.5 with ID Task updates.  Tasks 2.1, 2.2, 2.ID.2 and 2.ID.3 |
| Task 2\* | 2.6 | TASK 2 Technical Services - MONTH 13 - OCT 2020 | 10/30/20 | Work plan activities at ID, TN, CA and Tasks 2.1 and 2.2. |
| Task 2\* | 2.7 | TASK 2 Technical Services - MONTH 14 - NOV 2020 | 11/30/20 | Work plan activities at ID, TN, CA and Tasks 2.1 and 2.2. |
| Task 2\* | 2.8 | TASK 2 Technical Services (incl. Work Plan v1.6 with State Tasks) - MONTH 15 - DEC 2020 | 12/30/20 | Work Plan v1.6 with updates for ID, CT, TN and CA. Continued Tasks 2.1 and 2.2 |
| Task 2\* | 2.9 | TASK 2 Technical Services - MONTH 16 - JAN 2021 | 1/20/21 | Technical Services to ID, TN, CA, PA, CT, OH and Cross-agency Tasks 2.1 & 2.2. |
| Task 2\* | 2.10 | TASK 2 Technical Services - MONTH 17 - FEB 2021 | 2/28/21 | Technical Services to ID, TN, CA, PA, CT, OH and Cross-agency Tasks 2.1 & 2.2. |
| Task 2\* | 2.11 | TASK 2 Technical Services - MONTH 18 - MAR 2021 | 3/20/21 | Technical Services to ID, TN, CA, PA, CT, OH and Cross-agency Tasks 2.1 & 2.2. |
| Task 2\* | 2.12 | TASK 2 Technical Services - MONTH 19 - APR 2021 | 4/30/21 | Technical Services to ID, TN, CA, PA, CT, OH and Cross-agency Tasks 2.1 & 2.2. |
| Task 2\* | 2.13 | TASK 2 Technical Services - MONTH 20 - MAY 2021 | 5/30/21 | Technical services to PFS States and for Cross-agency Tasks 2.1 & 2.2. |
| Task 2\* | 2.14 | TASK 2 Technical Services - MONTH 21 - JUN 2021 | 6/30/21 | Technical services to PFS States and for Cross-agency Tasks 2.1 & 2.2. |
| Task 2\* | 2.15 | TASK 2 Technical Services - MONTH 22 - JUL 2021 | 7/30/21 | Technical services to PFS States and for Cross-agency Tasks 2.1 & 2.2. |
| Task 2\* | 2.16.1 | TASK 2 Technical Services - MONTH 23 - AUG 2021 | 8/30/21 | Technical Services to 8 States as listed in the quarterly report. |
| Task 2\*\* | 2.16.2 | TASK 2 Technical Services - MONTH 23 - AUG 2021 | 8/30/21 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2\* | 2.17.1 | TASK 2 Technical Services - MONTH 24 - SEP 2021 | 9/30/21 | Technical Services to 6 Base Period States as listed in the quarterly report. |
| Task 2\*\* | 2.17.2 | TASK 2 Technical Services - MONTH 24 - SEP 2021 | 9/30/21 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2\* | 2.18.1 | TASK 2 Technical Services - MONTH 25 - OCT 2021 | 10/30/21 | Technical Services to ID, PA, CA and OH. |
| Task 2\*\* | 2.18.2 | TASK 2 Technical Services - MONTH 25 - OCT 2021 | 10/30/21 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2\* | 2.19.1 | TASK 2 Technical Services - MONTH 26 - NOV 2021 | 11/30/21 | Technical Services to ID, PA, CA, NC, KS and OH, as summarized in this report. |
| Task 2\*\* | 2.19.2 | TASK 2 Technical Services - MONTH 26 - NOV 2021 | 11/30/21 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2\* | 2.20.1 | TASK 2 Technical Services - MONTH 27 - DEC2021 | 12/30/21 | Technical Services to ID, PA, CA, NC, KS and OH, as summarized in this report. |
| Task 2\*\* | 2.20.2 | TASK 2 Technical Services - MONTH 27 - DEC2021 | 12/30/21 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2 | 2.21.1 | TASK 2 Technical Services - MONTH 28 - JAN2022 | 1/30/22 | Technical Services to PFS States in Base Period as listed in QTR Report #10. |
| Task 2\*\* | 2.21.2 | TASK 2 Technical Services - MONTH 28 - JAN2022 | 1/30/22 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2 | 2.22.1 | TASK 2 Technical Services - MONTH 29 - FEB2022 | 2/30/22 | Technical Services to PFS States in Base Period as listed in QTR Report #10. |
| Task 2\*\* | 2.22.2 | TASK 2 Technical Services - MONTH 29 - FEB2022 | 2/30/22 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2 | 2.23.1 | TASK 2 Technical Services - MONTH 30 - MAR 2022 | 3/30/22 | Technical Services to PFS States in Base Period as listed in QTR Report #10. |
| Task 2\*\* | 2.23.2 | TASK 2 Technical Services - MONTH 30 - MAR 2022 | 3/30/22 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2 | 2.24.1 | TASK 2 Technical Services - MONTH 31 - APR 2022 | 4/30/22 | Technical Services to PFS States in Base Period as listed in QTR Report #11. |
| Task 2\*\* | 2.24.2 | TASK 2 Technical Services - MONTH 31 - APR 2022 | 4/30/22 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2 | 2.25.1 | TASK 2 Technical Services - MONTH 32 - MAY 2022 | 5/30/22 | Technical Services to PFS States in Base Period as listed in QTR Report #11. |
| Task 2\*\* | 2.25.2 | TASK 2 Technical Services - MONTH 32 - MAY 2022 | 5/30/22 | Technical Services to NC and KS, with FL, NM requirements considered as well. |
| Task 2 | 2.26.1 | TASK 2 Technical Services - MONTH 33 - JUN 2022 | 6/30/22 | Technical Services to ID, TN, CA, PA |
| Task 2\*\* | 2.26.2 | TASK 2 Technical Services - MONTH 33 - JUN 2022 | 6/30/22 | Technical Services to NC, KS, GA, WA, NM, MA |
| Task 2 | 2.27.1 | TASK 2 Technical Services - MONTH 34 – JUL 2022 | 7/30/22 | Technical Services to ID, TN, CA, PA |
| Task 2\*\* | 2.27.2 | TASK 2 Technical Services - MONTH 34 – JUL 2022 | 7/30/22 | Technical Services to NC, KS, GA, WA, NM, MA |
| Task 2 | 2.28.1 | TASK 2 Technical Services - MONTH 35 – AUG 2022 | 8/30/22 | Technical Services to ID, TN, CA, PA |
| Task 2\*\* | 2.28.2 | TASK 2 Technical Services - MONTH 35 – AUG 2022 | 8/30/22 | Technical Services to NC, KS, GA, WA, NM, MA |
| Task 2 | 2.29.1 | TASK 2 Technical Services - MONTH 36 - SEPT 2022 | 9/30/22 | Technical Services to ID, TN, CA, PA |
| Task 2\*\* | 2.29.2 | TASK 2 Technical Services - MONTH 35 – AUG 2022 | 8/30/22 | Technical Services to NC, KS, GA, WA, NM, MA |
| Task 2 | 2.30 | TASK 2 Technical Services - MONTH 37 - OCT 2022 | 10/30/22 | Technical Services to ID, TN, CA, PA |
| Task 2\*\* | 2.30 | TASK 2 Technical Services - MONTH 37 - OCT 2022 | 10/30/22 | Technical Services to NC, KS, GA, WA, MA |
| Task 2 | 2.31 | TASK 2 Technical Services - MONTH 38 - NOV 2022 | 11/30/22 | Technical Services to ID, TN, CA, PA |
| Task 2\*\* | 2.31 | TASK 2 Technical Services - MONTH 38 - NOV 2022 | 11/30/22 | Technical Services to NC, KS, GA, WA, MA |
| Task 2 | 2.32 | TASK 2 Technical Services - MONTH 39 - DEC 2022 | 12/30/22 | Technical Services to ID, TN, CA, PA |
| Task 2\*\* | 2.32 | TASK 2 Technical Services - MONTH 39 - DEC 2022 | 12/30/22 | Technical Services to NC, KS, GA, WA, MA |
| Task 2 | 2.33 | TASK 2 Technical Services - MONTH 40 - JAN 2023 | 1/30/23 | Provided technical services to States listed in this report. |
| Task 2\*\* | 2.33 | TASK 2 Technical Services - MONTH 40 - JAN 2023 | 1/30/23 | Provided technical services to States listed in this report. |
| Task 2 | 2.34 | TASK 2 Technical Services - MONTH 41 - FEB 2023 | 2/30/23 | Provided technical services to States listed in this report. |
| Task 2\*\* | 2.34 | TASK 2 Technical Services - MONTH 41 - FEB 2023 | 2/30/23 | Provided technical services to States listed in this report. |
| Task 2 | 2.35 | TASK 2 Technical Services - MONTH 42 - MAR 2023 | 3/30/23 | Provided technical services to States listed in this report. |
| Task 2\*\* | 2.35 | TASK 2 Technical Services - MONTH 42 - MAR 2023 | 3/30/23 | Provided technical services to States listed in this report. |
| Task 2 | 2.36 | TASK 2 Technical Services - MONTH 43 - APR 2023 | 4/30/23 | Not Started |
| Task 2\*\* | 2.36 | TASK 2 Technical Services - MONTH 43 - APR 2023 | 4/30/23 | Not Started |
| Task 2 | 2.37 | TASK 2 Technical Services - MONTH 44 - MAY 2023 | 5/30/23 | Not Started |
| Task 2\*\* | 2.37 | TASK 2 Technical Services - MONTH 44 - MAY 2023 | 5/30/23 | Not Started |
| Task 3\*\* | 3.1.1 | **Article 1**: Road Network Publication Data Model with Topology, Temporality, Routable Network Rule | 5/30/21 | In-Progress |
| Task 3\*\* | 3.1.2 | **Article 2:** Enterprise GIS Application for Spatial Safety Performance Functions Calibration and HSM-based Safety Analysis | 5/30/22 | In-Progress |
| Task 3\*\* | 3.1.3 | **Article 3:** Engineering, processing and integrating spatial Traffic and Safety Data using Cloud | 12/30/22 | In-Progress |
| Task 3\*\* | 3.1.4 | **Article 4:** Enterprise GIS Application forModeling and Conflating Federal Lands Management Agency, DOT LRS and Local Agency Roads data | 12/30/23 | In-Progress |
| Task 3\*\* | 3.1.5 | **Article 5:** LRS Administration Levels and Maturity Mode | 9/30/24 | In-Progress |
| Task 3 | 3.2.1 | Workshop 1 - GIS-T 2021 | 4/30/21 | GIS-T Workshop 2021 Delivered |
| Task 3\* | 3.2.2 | AEGIST Presentations (2020) | 12/30/20 | **Following Presentations Delivered:**  NY (Apr); TRF (Aug); KS (Jun); National Roads Symposium (Sep); Esri RHUG (Oct), AEGIST Modeling & Standards (Dec). |
| Task 3\*\* | 3.2.3 | Workshop 2 – GIS-T 2022 | 5/30/22 | Delivered Workshop in April 2022. |
| Task 3\* | 3.2.4 | AEGIST Presentations (2021) | 12/30/21 | Completed delivery of following 2021 Presentations:   1. USDOT Presentation on April 2nd. 2. Presentations to new PFS States: WV, DC 3. Provided AEGIST Overview to Colorado.Presentation at NaTMEC on Jun 23rd. FHWA NRN Presentation on Aug 31st. 4. Presentation Slides for FHWA Safety Group on AEGIST-MIRE activities. 5. FLMA Presentation on Nov 9th. |
| Task 3\*\* | 3.2.5 | AEGIST Presentations (2022) | 12/30/22 | Following presentations have been delivered in 2022, as of this quarter:   1. TRB AEGIST Update at AED40 Committee Meetings 2. USDOT Mobility Plan Business Group Update (Feb 1st) 3. AASHTO GIS-T Conference – AEGIST Updates (April 21st) 4. Presentation for Gloria Shepherd 5. Spatial Data Governance presentation to NC, TN, ID, PA (April 1st, 2022) 6. RDIP Conference in Rhode Island (April. 2022) 7. NaTMEC 2022 in June, 2022 8. CTPP Conference in June, 2022 9. RDIP Conference in West Virginia (June 2022) 10. IHEEP Conference Presentation Preparation (Sept 2022) |
| Task 3 | 3.2.6 | GIS-T Workshop 2023 | 4/10/23 | Workshop on April 10th, 2023. Georgia and Arizona teams presented their data supply chain processes. |
| Task 3 | 3.3.1 | Webinar 1: Data Governance | 2/11/21 | Webinar delivered on Feb 11th, 2021 |
| Task 3 | 3.3.2 | Webinar 2: AEGIST Activities associated with Spatial Data Modeling, Integration and Analysis | TBD | TBD |
| Task 4 | 4.1.0 | Peer-Exchange 1 - 2019 | 12/30/19 | Completed. |
| Task 4 | 4.2.0 | Peer-Exchange 2 - 2020 | 12/30/20 | Aug 25th-26th Peer Exchange Conducted. |
| Task 4 | 4.3.0 | Peer-Exchange 3 – 2022 | 08/30/22 | Conducted Santa Fe Peer Exchange Meeting |
| Task 5 | 5.0 | HPMS 9.0 Remodeling Report/Article Database Design | 5/30/21 | Delivered report on Road Network Publication Data Model for FHWA and PFS States Review completed between July-Sept. Comments Addressed.  Coordinate with FHWA to determine next Steps on publication to be determined. |

\* Tasks in Base/Original Period (CLIN 0001)

\*\*Tasks in Performance Period 1 (CLIN 0002)