# *Quarterly Progress Report (QPR)*

# *Applications of Enterprise GIS in Transportation*

**Progress Report for Quarter 1 [July 1st, 2023 – September 30th, 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: 51

Percent Calendar Time Expended: 85%

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.   Washington **- 100%** | **100%** |
| 2.   Georgia **- 100%** |
| 3.   Tennessee - **100%** |
| 4. California - **100%** |
| 5. Pennsylvania **- 100%** |
| 6. Ohio - **100%** |
| Cross-Agency Activities: Guidebook Development - **100%** |
| 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 | **100%** |
| 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%** | **30%** |
| 2.   Connecticut – 60**%** |
| 3.   Florida – 2**%** |
| 4. North Carolina **– 15%** |
| 5. Kansas **– 7%** |
| 6. Idaho **– 61%** |
| 7. Massachusetts **– 7%** |
| 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 | **100%** |
| Task 4: Member State Meetings | 1.  Member State Meeting 1 – 2022  2. Member State Meeting 2 – 2023 | **100%** |

Work Accomplished This Reporting Period: July– Sept, 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 #15 for the period April – June 2023.
2. Technical services tasks managed for following PFS States: Washington, Georgia, California, Ohio, Connecticut, North Carolina, Tennessee, Idaho. 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**:

* **Washington**

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

* Conducted workshop 2 on LRS Configuration in Roads & Highways.
* Collected and integrated WSDOT input and comments into draft (a) Roads Data Management Modernization Report and (b) Roads Data Configuration reports.
* Delivered both the Roads Data Management Modernization report and Roads Data Configuration reports with updates for final deliverable review.
* **Georgia**

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

* Delivered (a) technical report on Statewide Roads Data Management (REVAMP program) and (b) Executive Summary report on Statewide Roads Data Management for final review.
* Collected and integrated Georgia input and comments into final reports.
* **California**

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

* Updated CaRS report to include information about the Caltrans linear referencing methods (LRMs) and roads data architecture, and 1Integrate tools.
* Collected and integrated Caltrans input and comments into report.
* Delivered CaRS Data and Application Architecture report and updated CaRS flyer to Caltrans.
* Coordinated with Caltrans to review final documents and discuss next steps for completing technical services.
* **Ohio**

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

* Completed development of strategic roadmap report and updated sections on (a) intersection modeling and bike network modeling to document strategic roadmap actions and maturity levels, (b) divided-undivided highways modeling, (c) network gaps, (d) concurrencies, and (e) topology.
* Added information on modeling assets which do not align with the road centerline including guardrails, sidewalks, crosswalks, signs, and signals in alignment with AEGIST Guidebook v2 guidelines.
* Incorporated recent advances in BIM-GIS integration by updating strategic roadmap recommendations for importing data into LRS from digital delivery.
* Provided recommendations on integrating road network data from multiple sources including using AI/ML techniques. Recommendations were aligned with AEGIST guidelines in Guidebook v2.
* Started development of executive summary report on work accomplished for Ohio as part of AEGIST Technical Services.
* **Tennessee**

**[Task 1 – Strategic Roadmap for Geospatial Information Systems]**

* + Updated Strategic roadmap on enterprise data management and governance based on ongoing TDOT activities.
  + Published the data management strategic roadmap for Tennessee and scheduled a meeting to discuss updates to the roadmap.

**[Task 2 – BIM – GIS Integration using IFC proof of concept]**

* + Developed Python scripts to extract roadway geometry information from IFC design files using IFC OpenShell python library.
  + Utilized Artificial Intelligence and ChatGPT to develop data engineering tools for extracting road characteristics data from design files.
  + Configured iTwin platform to test how design data models can be integrated with GIS-based LRS system and initiated steps for deployment of development environment for Tennessee ITwin Platform.
  + Developed data schema for design workspaces for modeling of Digital Design/Delivery models using LRS information requirements.
  + Implemented latest versions of software from Bentley and Esri for demonstrating BIM-GIS data integration pilot.
  + Reviewed practices in Florida and Connecticut on BIM-GIS integration pilots for setting up digital as-builts data for migration to GIS.
  + Developed the python tool to extract alignment data from CAD design files, transform them to IFC format and load the alignment information into LRS as centerline feature class.
* **Connecticut**

**[Task 2.CT.1] Road Data Quality Assessment Tool**

* + Updated the FME workspace for data quality checks and prepared it for presentation and discussion with Connecticut.
* **North Carolina**

**[Task 2.NC.2] LRS Data Governance**

* Continued development of NCDOT LRS Data Governance system by integrating NCDOT documentation and requested updates.
* Updated data catalog by integrating NCDOT asset inventory and asset information from LRS, P6 and the TEAAS application.
* Updated use patterns catalog by integrating information on departments, roles, actors, and business to correspond with each user story/use pattern.
* Updated LRS data dictionary documenting feature layers and mapping them to data assets.
* Continued development of data life cycle for Routes in Lucidchart.
* Conducted work sessions with NCDOT team on LRS data governance and discussed LRS data catalog, LRS data stewards, data owners (departments/business unit) and data users for updates to LRS Data Governance System.
* Conducted work session with Idaho, North Carolina and FHWA to discuss AEGIST practices and guidelines associated with Data Governance.
* **Idaho**
  + Continued development of data conflation geoprocessing tool for pulling together DOT and Federal lands roads dataset
  + Summarized the data governance deliverables and accomplishments in a technical memo report and developed presentation with information on conflation results for discussion with Idaho.
* **All States: AEGIST Guidebook**
  + Updated chapter 1 ‘Enterprise GIS’ based on LRS business use cases.
  + Updated chapter 2 ‘Route Network’ by adding a section on using Deep Neural Network models (AI/ML) for creating road maps from imagery.
  + Updated chapter 6 ‘Multi-modal Road Network’.
  + Researched information on asset information models for chapter 4.
  + Reviewed data-driven approaches for modeling, collection/acquisition of MIRE elements data for the intersection data modeling chapter
  + Developed sections on (a) multimodal network data management and governance, (b) geospatial data modeling administration levels for routes, centerlines, network gaps, divided-undivided highways, intersections, (c) asset and project data modeling.

**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 3.2.x: Workshops and Presentations** 
   * **AEGIST Meeting of the Pooled Fund States**
     + Planned for AEGIST Meeting of the pooled fund states by reviewing budgets, developing agendas, and organizing other workshop logistics including handouts for round table discussions.
     + Coordinated with meeting attendees to plan travel and accommodations.
     + Finalized detailed agenda based on sections in AEGIST Guidebook v2 was provided to all attendees.
     + Identified facilitators for conducting the round table discussions the list of attendees. Handouts were developed for use during round table discussions.
     + Held orientation call for all participants on September 5 to coordinate and review the agenda. Session handouts were also released at this time to set expectations for what Guidebook content would be reviewed and how agencies could prepare ahead of the meeting.
     + Held session facilitation and delivery meetings with State DOT Presenters and FHWA Moderators.
     + Reviewed AEGIST Guidebook Chapters 1-6 on Enterprise GIS, Road Network Data Model, Intersection Data Model, Multi-modal Road Network Data Model, Project and Asset Information Model.
     + Validated 20 key messages associated with linear and spatially referenced data models, spatial data management and enterprise geospatial information systems that have been documented in the guidebook.
     + Identified and reviewed adoption of open data modeling standards for road network data modeling, Intersection modeling, multimodal bike, pedestrian, trial and rail network modeling
     + Discussed roads data quality assessment rules, roads data modeling administration levels (levels 1-3) and validated information documented in AEGIST guidebook.
     + Identified following topics for additional discussion and consensus building – Nodes definition and modeling approach, temporal data modeling, road network publication model for internal and external stakeholders, intersection approach/departure segments modeling, small motor vehicles (ATVs, Golf carts, Snow Mobiles) network modeling, traffic circles/calming circles modeling, slip lanes and slip ramps modeling, traffic circle and roundabouts modeling pros/cons.
     + Established the need to integrate with local agency roads datasets (including NG911 roads dataset, but also above and beyond the roadway data in NG911 associated with road attributes.
     + Established next steps for AEGIST PFS States to review guidebook over next six months, before presenting to other States and external stakeholders in the US during 2024.
   * **JCTEES AEGIST Update**
     + Introduced the JTCEES committee on what the AEGIST pooled fund is and how it functions alongside the other FHWA pooled funds BIM for Infrastructure, and BIM for Bridges and Structures.
     + Presented the work AEGIST is doing to develop guidance on road network data modeling, geospatial asset information modeling, enterprise geospatial systems management and BIM-GIS integration.
     + Proposed that AEGIST pooled fund is on JTCEES radar for coordination, alongside the other FHWA pooled funds.

**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 | Provided technical services to Ohio, Washington, Georgia, California, |
| Task 2\*\* | 2.36 | TASK 2 Technical Services - MONTH 43 - APR 2023 | 4/30/23 | Provided technical services work for Connecticut and North Carolina. |
| Task 2 | 2.37 | TASK 2 Technical Services - MONTH 44 - MAY 2023 | 5/30/23 | Provided technical services to Ohio, Washington, Georgia, California, |
| Task 2\*\* | 2.37 | TASK 2 Technical Services - MONTH 44 - MAY 2023 | 5/30/23 | Provided technical services work for Connecticut and North Carolina. |
| Task 2 | 2.38 | TASK 2 Technical Services - MONTH 44 - JUNE 2023 | 6/30/23 | Provided technical services to Ohio, Washington, Georgia, California, |
| Task 2\*\* | 2.38 | TASK 2 Technical Services - MONTH 44 - JUNE 2023 | 6/30/23 | Provided technical services work for Connecticut and North Carolina. |
| Task 2 | 2.39 | TASK 2 Technical Services - MONTH 44 - JULY 2023 | 6/30/23 | Provided technical services to Ohio, Washington, Georgia, California, |
| Task 2\*\* | 2.39 | TASK 2 Technical Services - MONTH 44 - JULY 2023 | 6/30/23 | Provided technical services work for Connecticut and North Carolina. |
| Task 2 | 2.40 | TASK 2 Technical Services - MONTH 44 - AUG 2023 | 6/30/23 | Provided technical services to Ohio, Washington, Georgia, California, |
| Task 2\*\* | 2.40 | TASK 2 Technical Services - MONTH 44 - AUG 2023 | 6/30/23 | Provided technical services work for Connecticut and North Carolina. |
| Task 2 | 2.41 | TASK 2 Technical Services - MONTH 44 - SEPT 2023 | 6/30/23 | Provided technical services to Ohio, Washington, Georgia, California, |
| Task 2\*\* | 2. | TASK 2 Technical Services - MONTH 44 - SEPT 2023 | 6/30/23 | Provided technical services work for Connecticut and North Carolina. |
| Task 3\*\* | 3.1.1 | **Article 1**: Road Network Publication Data Model with Topology, Temporality, Routable Network Rule | 5/30/21 | No longer in scope. Information prepared for this article to be merged in Guidebook. |
| Task 3\*\* | 3.1.2 | **Article 2:** Enterprise GIS Application for Spatial Safety Performance Functions Calibration and HSM-based Safety Analysis | 5/30/22 | No longer in scope. Information prepared for this article to be merged in Guidebook. |
| Task 3\*\* | 3.1.3 | **Article 3:** Engineering, processing and integrating spatial Traffic and Safety Data using Cloud | 12/30/22 | No longer in scope. Information prepared for this article to be merged in Guidebook. |
| 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 | No longer in scope. Information prepared for this article to be merged in Guidebook. |
| Task 3\*\* | 3.1.5 | **Article 5:** LRS Administration Levels and Maturity Mode | 9/30/24 | No longer in scope. Information prepared for this article to be merged in Guidebook. |
| 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 11th, 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 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)