

**RESEARCH ADMINISTRATION
QUARTERLY REPORT**

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| REPORT FOR QUARTER ENDING 12/31/2021 | | DATE SUBMITTED 1/11/2022 | |
| PROJECT TITLE Evaluating New Technologies for Roads Program Initiatives in Safety and Efficiency (ENTERPRISE) - Phase II | | | |
| RESEARCH AGENCY Athey Creek Consultants, LLC | | | |
| PRINCIPAL INVESTIGATOR Dean Deeter | | | |
| PROJECT MANAGER Elise Feldpausch | | | |
| RESEARCH MANAGER Andre Clover | | | |
| CONTRACT/AUTHORIZATION NO. | 2019-0045 | PROJECT START DATE | 11/7/2018 |
| PROJECT NO. | 204724 | PROJECT COMPLETION DATE (Original) | 9/30/2020 |
| OR NO. | OR17-101a | PROJECT COMPLETION DATE (Revised) | 2/28/2022 |
| BUDGET STATUS | | | |
| CONTRACT FUNDS APPROVED | \$868,292.59 | % PERCENT COMPLETE (By Budget) | 97% |
| | | % PERCENT COMPLETE (By Work) | 98% |
| TOTAL FUNDS EXPENDED TO DATE | \$842,556.24 | % PERCENT OF TIME EXPIRED: | 95% |

PLEASE LIST THE TECHNICAL LIAISONS AND OTHER INDIVIDUALS WHO SHOULD RECEIVE A COPY OF THIS REPORT

SUMMARY OF PROGRESS FOR THIS QUARTER

Attach a progress schedule consisting of graphical information depicting a schedule of research activities tied to **each task** defined in the proposal.

Monthly ENTERPRISE Board meetings occurred in July, August, and September. Athey Creek completed and presented work progress for the following projects.

-Project 10: Potential Approaches for Wrong-Way Driving Applications

--Task 3 Technical Memorandum. Completed the final deliverables, including technical memorandum summarizing work completed and key findings included in the ENTERPRISE Program overall final report, and a project overview document posted to the project page of the ENTERPRISE website. – Task complete.

-Project 13: Traveler Information Collaboration – Phase 1

--Task 4: Host Virtual Workshop with Community of Practice – Supported AASHTO in the launch of the Traveler Information Community of Practice by preparing discussion slides and content to support the Traveler Information CoP discussion during the CTSO annual meeting and AASHTO annual meeting – Task Complete.

-- Task 5: Draft Report: Developed the draft report to conclude the project and as input to the AASHTO continuation of the Community of Practice, circulated to the Project Champion and AASHTO CTSO representatives – Task Complete.

-Project 14: Establishing a Framework for Communication of Map Updates to Mapping Companies

--Task 4: Draft Report – Completed draft report and distributed draft report to ENTERPRISE members, webinar, interview, and survey project participants for review. – Task Complete

-Project 15: State of Practice for Automated Incident Detection (AID)

--Task 3: Draft Report – Finalized the draft report and made updates per comments received during review by project champions. Routed the draft report to project participants, including vendors that presented product demonstration webinars and representatives from agencies that presented during the peer exchange webinar. Task Complete.

-Project 16: Traffic Operations Responses to the COVID-19 Pandemic

-- Task 4: Final Report – Updated the draft report to reflect comments received during process and prepare the final report. – Task Complete

-Project 17: Best Practices for Future Proofing for Emerging Technologies

-- Task 1: Synthesis of Planning Activities – Completed initial draft synthesis report and have incorporated comments from Project Champion. Task Complete.

- Task 2: Targeted Extract summaries – Incorporated comments and feedback from members and incorporated the summaries into the Final Report. – Task complete.

-- Task 3: Draft Report – Drafted overall report including synthesis and Targeted Extract Summaries. Will circulate final Draft during the January Board meeting.

-Project 18: Pedestrian Detection for Safety at Signalized Intersections

-- Task 3: Draft Report – Completed the draft report and routed it for review by the project champion and individuals from agencies that participated in project interviews. – Task complete.

Project 19: Patented and Proprietary Products Waiver Impact on ITS Procurements

Task 4: Draft Report – Finalized the draft report and routed it for review by the project champion and those who participated in project interviews. Task Complete.

Task 5: Final Report – Completed the final report and finalized it for publication. – Task complete.

-Project 20: Understanding Infrastructure Impacts Based on AV Demos

-- Task 3: Draft Final Report – Prepared the draft final report and routed it for review by project champions and those who provided input during project interviews. – Task complete.

-- Task 4: Final Report – Incorporated comments as received from the draft report review and finalized the report for publication. Will remain open to additional comments.

COMPLETED PROJECTS

Projects completed under this TPF number are listed below and final deliverables are available on the ENTERPRISE Program website at: <https://enterprise.prog.org/research-projects/>

- Project 16: Traffic Operations Responses to the COVID-19 Pandemic (10/7/21)
- Project 19: Patented and Proprietary Products Waiver Impact on ITS Procurements (12/27/21)
- Project 20: Understanding Infrastructure Impacts Based on AV Demos (12/27/21)
- Project 10: Potential Approaches for Wrong-Way Driving Applications (11/1/21)
- Project 12: Synthesis of the Use of Speed Data from Probes for Arterial Operations (2/17/21)
- Project 11: Procurement Practices for Partnering with Emerging Technology Providers (10/28/20)
- Project 9: Volumes from Probe Data (11/24/20)
- Project 6: Emerging Practices for Communications Infrastructure (10/9/20)
- Project 7: Automated Classification of Winter Road Conditions-Phase 2 (9/25/20)
- Project 1: Evolution of ITS in Asset Management (5/6/20)
- Project 8: Use Cases and Benefits of Active Traffic Management (ATM) Strategies (4/20/20)
- Project 5: ITS Infrastructure Integration of Digital Mobility as a Service (MaaS) (2/3/20)
- Project 3: Real-Time Integration of Arrow Board Messages into Traveler Information Systems - Phase III (1/21/20)
- Project 2: Evolving and Phasing Out Legacy ITS Device and Systems (10/25/19)
- Project 4: Roadmap for Next Generation Intersection Conflict Warning Systems (10/2/19)

PROPOSED WORK FOR NEXT QUARTER

Research projects - Athey Creek - (Project updates are presented at each monthly Board meeting.)

-Project 13: Traveler Information Collaboration – Phase 1

-- Task 6: Final Report: Will incorporate feedback from ENTERPRISE members and AASHTO Traveler Information Community of Practice leaders.

-Project 14: Establishing a Framework for Communication of Map Updates to Mapping Companies

--Task 5: Final Report – Update the draft report to reflect comments received during the review and prepare the final report.

-Project 15: State of Practice for Automated Incident Detection

--Task 4: Final Report – Update the draft report to reflect comments received during the review and prepare the final report.

-Project 17: Best Practices for Future Proofing for Emerging Technologies

-- Task 3: Draft Report – Will continue to edit draft and prepare a second draft before the January Board Meeting.

-- Task 4: Final Report – Will incorporate comments during the January Board meeting and email comments following from both members and the Project Champion and finalize report before end of contract.

-Project 18: Pedestrian Detection for Safety at Signalized Intersections

--Task 4: Final Report – Update the draft report to reflect comments received during the review and prepare the final report.

-Project 20: Understanding Infrastructure Impacts Based on AV Demos

-- Task 4: Final Report – Will incorporate any additional comments received.

IMPLEMENTATION (if any)

To be determined as individual projects progress.

PROBLEMS AND RECOMMENDED SOLUTIONS (if applicable)

Describe any problems encountered or anticipated that might affect the completion of the project within the time, scope, and fiscal constraints set forth in the contract. Describe recommended solutions. NOTING DIFFICULTIES IN THIS SECTION DOES NOT CONSTITUTE A REQUEST OR AUTHORITY TO MODIFY THE PROJECT. Any requests for additional time, money, or scope revisions must be submitted in a separate letter to the Engineer of Research.

We suggested a time extension to allow ENTERPRISE board members additional time to review, comment on, and benefit from final reports before finalization. We understand this is being pursued.

EQUIPMENT PURCHASED (if any)

No equipment purchased.

CONTACTS AND MEETINGS

(Describe any meetings or contact with MDOT technical liaisons and other pertinent individuals relative to this project.)

Monthly webinar updates were conducted in July, August, and September.

ENTERPRISE - Phase II

Schedule of Current Projects

December 31, 2021

| Project | 2020 | | | | | | | | | | | | 2021 | | | | | | | | |
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| | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S |
| Project 10: Potential Approaches for Wrong-Way Driving Applications | | | | | | | | | | | | | | | | | | | | | |
| Task 1: Summarize Wrong-Way Driving Issues and Challenges | | | | | | | | | | | | | | | | | | | | | |
| Task 2: Describe Concept for Navigation Applications for Wrong-Way Driving | | | | | | | | | | | | | | | | | | | | | |
| Task 3: Technical Memorandum | | | | | | | | | | | | | | | | | | | | | |

■ Task underway, ■ Task not yet started, ■ Task complete

| Project | 2020 | | | | 2021 | | | | | | | | | | | | 2022 | | | | |
|---|------|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|------|---|--|--|--|
| | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | | | |
| Project 13: Traveler Information Collaboration – Phase 1 | | | | | | | | | | | | | | | | | | | | | |
| Task 1: Summarize Relevant Work and Findings | | | | | | | | | | | | | | | | | | | | | |
| Task 2: Identify and Gather Practice from Other States | | | | | | | | | | | | | | | | | | | | | |
| Task 3: Establish Initial Community of Practice | | | | | | | | | | | | | | | | | | | | | |
| Task 4: Host Virtual Workshop with Community of Practice | | | | | | | | | | | | | | | | | | | | | |
| Task 5: Draft Report | | | | | | | | | | | | | | | | | | | | | |
| Task 6: Final Report | | | | | | | | | | | | | | | | | | | | | |
| Project 14: Establishing a Framework for Communication of Map Updates to Mapping Companies | | | | | | | | | | | | | | | | | | | | | |
| Task 1: Outreach to DOTs Providing Mapping Companies | | | | | | | | | | | | | | | | | | | | | |
| Task 2: Outreach to Mapping Companies | | | | | | | | | | | | | | | | | | | | | |
| Task 3: Guidance for Communicating Map Updates | | | | | | | | | | | | | | | | | | | | | |
| Task 4: Draft Report | | | | | | | | | | | | | | | | | | | | | |
| Task 5: Final Report | | | | | | | | | | | | | | | | | | | | | |
| Detection Project 15: State of Practice for Automated Incident Detection | | | | | | | | | | | | | | | | | | | | | |
| Task 1: Industry Scan | | | | | | | | | | | | | | | | | | | | | |
| Task 2: Define Common Needs and Gaps | | | | | | | | | | | | | | | | | | | | | |
| Task 3: Draft Report | | | | | | | | | | | | | | | | | | | | | |
| Task 4: Final Report | | | | | | | | | | | | | | | | | | | | | |
| Project 16: Traffic Operations Responses to the COVID-19 Pandemic | | | | | | | | | | | | | | | | | | | | | |
| Task 1: Phone Interviews with ENTERPRISE Members | | | | | | | | | | | | | | | | | | | | | |
| Task 2: Peer Exchange Webinar | | | | | | | | | | | | | | | | | | | | | |
| Task 3: Draft Report | | | | | | | | | | | | | | | | | | | | | |
| Task 4: Final Report | | | | | | | | | | | | | | | | | | | | | |

■ Task underway, ■ Task not yet started, ■ Task complete

| Project | 2020 | | | | 2021 | | | | | | | | | | | | 2022 | |
|--|------|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|------|---|
| | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F |
| Project 17: Best Practices in Future proofing for Emerging Technologies | | | | | | | | | | | | | | | | | | |
| Task 1: Synthesis of Planning Activities | | | | | | | | | | | | | | | | | | |
| Task 2: Targeted Extract Summaries | | | | | | | | | | | | | | | | | | |
| Task 3: Draft Report | | | | | | | | | | | | | | | | | | |
| Task 4: Final Report | | | | | | | | | | | | | | | | | | |
| Project 18: Pedestrian Detection for Safety at Signalized Intersections | | | | | | | | | | | | | | | | | | |
| Task 1: Understand Pedestrian Issues | | | | | | | | | | | | | | | | | | |
| Task 2: Scan of Safety Approaches | | | | | | | | | | | | | | | | | | |
| Task 3: Draft Report | | | | | | | | | | | | | | | | | | |
| Task 4: Final Report | | | | | | | | | | | | | | | | | | |
| Project 19: Patented and Proprietary Products Waiver Impact on ITS Procurements | | | | | | | | | | | | | | | | | | |
| Task 1: Summarize 23 CFR 635.411 Waiver | | | | | | | | | | | | | | | | | | |
| Task 2: Gather Implementation Insight from FHWA Division Staff | | | | | | | | | | | | | | | | | | |
| Task 3: Discuss Waiver with Agency Contracting/Procurement Staff | | | | | | | | | | | | | | | | | | |
| Task 4: Draft Report | | | | | | | | | | | | | | | | | | |
| Task 5: Final Report | | | | | | | | | | | | | | | | | | |
| Project 20: Understanding Infrastructure Impacts Based on AV Demos | | | | | | | | | | | | | | | | | | |
| Task 1: Research Findings from AV Demonstrations | | | | | | | | | | | | | | | | | | |
| Task 2: Synthesize Findings and Identify Likely Operations Impacts | | | | | | | | | | | | | | | | | | |
| Task 3: Draft Report | | | | | | | | | | | | | | | | | | |
| Task 4: Final Report | | | | | | | | | | | | | | | | | | |

■ Task underway, ■ Task not yet started, ■ Task complete