TPF Success Story

TPF-5(231) Evaluating New Technologies for Roads Program Initiatives in Safety and Efficiency (ENTERPRISE)

June 2024

Currently led by the Michigan Department of Transportation (MDOT), the ENTERPRISE program enables partners to address common transportation challenges through intelligent transportation system (ITS) solutions.

Example of an ATMS in use on a highway.
Source: U.S. Department of Transportation.

The transportation sector is constantly evolving with new technologies and practices to improve safety and mobility on our roads and highways. Many of these improvements have come from using ITSs to enhance transportation management, efficiency, and overall performance.

The Transportation Pooled Fund (TPF) Program has helped promote such cutting-edge technology through the ENTERPRISE TPF study. Beginning as an interagency agreement between four States in 1991, the ENTERPRISE TPF study has grown into a leading international consortium for the development and application of collaborative ITS innovations, prioritizing research collaboration, knowledge transfer, and cost sharing between State agencies, Federal agencies, and private-sector partners. Currently led by MDOT, the ENTERPRISE program enables partners to address common transportation challenges through ITS solutions, with focus areas such as connected and automated vehicles, mobility on demand, and smart infrastructure.

Through collaboration and knowledge sharing, the ENTERPRISE TPF study has successfully deployed several innovative transportation technologies and practices. Phase I, TPF-5(231), of the ENTERPRISE program saw innovations—like the deployment of an advanced traffic management system (ATMS) in Arizona—as early as 1991.[1]

Other innovations include automated traffic signal performance measures; vehicle probe speed data; the automated sharing of commercial vehicle data; and agency traveler information systems, such as 511 Travel Information Telephone Services. (See references 2–6.)

Phase II of the ENTERPRISE TPF study, TPF-5(359), has produced three studies that highlight the successes of the consortium's efforts.[7] First, the Deployment Strategy for Rural Connected Vehicle Systems study (2014), led by MDOT, produced novel findings for the deployment, application, constraints, and recommended strategies for a complex rural connected vehicle system.[8]

Since it began, ENTERPRISE has produced more than 80 research products advancing highway operations.

ENTERPRISE TPF Study Phases

- **Phase I**

  Saw innovations—like the deployment of an ATMS in Arizona—as early as 1991. Other innovations include the development and implementation of automated traffic signal performance measures, vehicle probe speed data, automated sharing of commercial vehicle data, and agency traveler information systems.

- **Phase II**

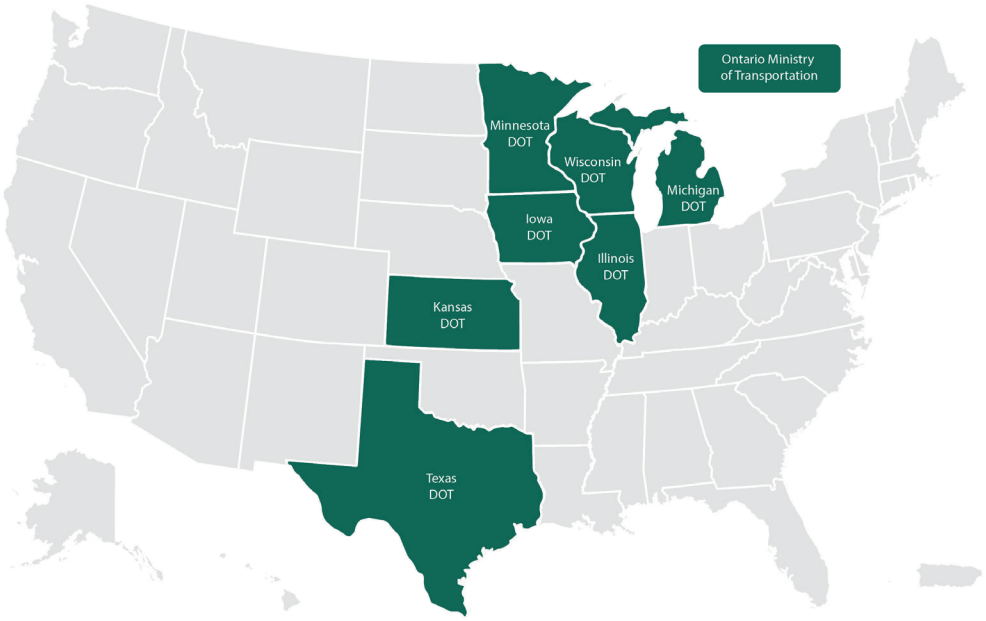
  Produced three major studies:

  - Deployment Strategy for Rural Connected Vehicle Systems.
  - Synthesis of Intelligent Work Zone Practices.
  - Model ATMS Concept of Operations and Requirements.

- **Phase III**

  Current phase of the ENTERPRISE TPF study. Individuals interested in further research or collaborating with the ENTERPRISE TPF study partners can participate.

ENTERPRISE TPF study members



DOT = department of transportation.
Source: FHWA.

Second, the Synthesis of Intelligent Work Zone Practices study (2014), also led by MDOT, produced a comprehensive report on the development, availability, and efficacy of four major work zone technologies: queue warning systems, dynamic merge systems, alternate routes, and variable speed limits.[9]

Third, the ATMS Concept of Operations and Requirements study (2017), led by the Kansas DOT, documented capabilities that support member agencies' systems engineering process and ATMS procurement, including a model ATMS concept of operations.[10] As the products of partnerships between the Federal Highway Administration, State and local governments, private firms, and international partners, these studies demonstrate the benefits of working together to pilot, test, research, and develop emergent ITS technologies.

U.S. Department of Transportation
Federal Highway Administration
TPF TRANSPORTATION POOLED FUND
Turner-Fairbank Highway Research Center

By fostering collaboration and resource sharing among multiple transportation agencies, the TPF Program enables the critical development, evaluation, and deployment of innovative ITS solutions. These solutions have significantly enhanced road safety, mobility, efficiency, and overall transportation system performance.

Together, ENTERPRISE members take on the complex issues gaining attention in ITS communities of practice, like those represented by the American Association of State Highway and Transportation Officials committees and the Transportation Research Board.[11,12] As new technologies and challenges continue to emerge, the TPF Program's collaborative approach will remain indispensable in shaping a brighter, more connected, and safer future for our roads and highways. By working together and pooling resources, transportation agencies can develop and implement groundbreaking ITS solutions that leave a lasting impact on the safety, efficiency, and overall performance of transportation networks.

Individuals interested in further research or collaborating with the ENTERPRISE TPF study partners can participate in the ENTERPRISE Phase III TPF study (TPF-5(490)).[13] Membership is open to Federal, State, local, and foreign agencies as well as private-sector firms.

For more information, please visit the TPF study's web page at https://www.pooledfund.org/Details/Study/720.[13]

Make an Impact Through a TPF Study!

The TPF Program is a great resource to combine limited funds to address important transportation issues. Learn more about initiating a TPF study and browse the list of open solicitations on the TPF website at https://www.pooledfund.org/.

U.S. Department of Transportation
Federal Highway Administration
TPF TRANSPORTATION POOLED FUND
Turner-Fairbank Highway Research Center

References

1. Hill, C., and N. Emmott. 1991. *The Enterprise Program: Evaluating New Technologies for Roads Program Initiatives in Safety and Efficiency*. Report No. FHWA-AZ-94-356-2. Phoenix, AZ: Arizona Department of Transportation. https://apps.azdot.gov/ADOTLibrary/publications/project_reports/PDF/AZ356(2).pdf, last accessed December 27, 2023.
2. Federal Highway Administration. 2023. "Automated Traffic Signal Performance Measures" (web page). https://ops.fhwa.dot.gov/arterial_mgmt/performance_measures.htm, last accessed December 27, 2023.
3. Roelofs, T., and L. Preisen. 2021. *Synthesis of Probe Speed Data for Arterial Operations*. Report No. ENT-2020-9. Lansing, MI: Michigan Department of Transportation. https://enterprise.prog.org/wp-content/uploads/speed-data-probes.pdf, last accessed December 27, 2023.
4. Federal Motor Carrier Safety Administration. 2023. "Innovative Technology Deployment (ITD) Program" (web page). https://www.fmcsa.dot.gov/itd, last accessed December 27, 2023.
5. Athey Creek Consultants. n.d. "Traveler Information Projects" (web page). https://www.acconsultants.org/traveler-information, last accessed December 27, 2023.
6. Federal Highway Administration. 2023. "511 Travel Information Telephone Services" (web page). https://ops.fhwa.dot.gov/511/index.htm, last accessed December 27, 2023.
7. The ENTERPRISE Program. 2023. "ENTERPRISE" (web page). https://enterprise.prog.org/, last accessed December 27, 2023.
8. Andrews, S., and Cogenia Partners. 2014. *Deployment Strategy for Rural Connected Vehicle Systems*. Report No. ENT-2014-3. https://enterprise.prog.org/wp-content/uploads/ENT-Rural-Connected-Vehicle-Deployment-FINAL-9-23-2014.pdf, last accessed December 27, 2023.
9. Roelofs, T., and C. Brookes. 2014. *Synthesis of Intelligent Work Zone Practices*. Report No. ENT-2014-1. https://enterprise.prog.org/Projects/2010_Present/iwz/ENT_SynthesisofIWZPractices_FINALReport_June2014.pdf, last accessed December 27, 2023.
10. Athey Creek Consultants. 2017. *Model Advanced Transportation Management System (ATMS) Concept of Operation and Requirements*. https://enterprise.prog.org/wp-content/uploads/ENT_Model_ATMS_ConOps_Req_FINAL_092917.pdf, last accessed December 27, 2023.
11. American Association of State Highway and Transportation Officials. 2023. "Committee on Transportation System Operations (CTSO)" (web page). https://transportation.org/systemoperations/, last accessed December 27, 2023.
12. Noblis Inc., ICF International, Inc., and Neaera Consulting. 2021. *Initiating the Systems Engineering Process for Rural Connected Vehicle Corridors, Volume 2: Model Concept of Operations*. Washington, DC: National Academies Press. https://nap.nationalacademies.org/catalog/26388/initiating-the-systems-engineering-process-for-rural-connected-vehicle-corridors-volume-2-model-concept-of-operations, last accessed December 27, 2023.
13. National Cooperative Highway Research Program. 2023. "ENTERPRISE—Phase III (Phase II Continuation)" (web page). https://www.pooled-fund.org/Details/Study/720, last accessed December 27, 2023.

For More Information, Contact:

Tricia Sergeson
TPF Program Manager
(202) 493-3166
patricia.sergeson@dot.gov

Publication No.: FHWA-HRT-24-060
HRTM-10/06-24(Web)E
https://doi.org/10.21949/1521495

U.S. Department of Transportation
Federal Highway Administration
TPF TRANSPORTATION POOLED FUND
Turner-Fairbank Highway Research Center