

**2024**  
**State**  
**Planning and**  
**Research**  
**Program II**

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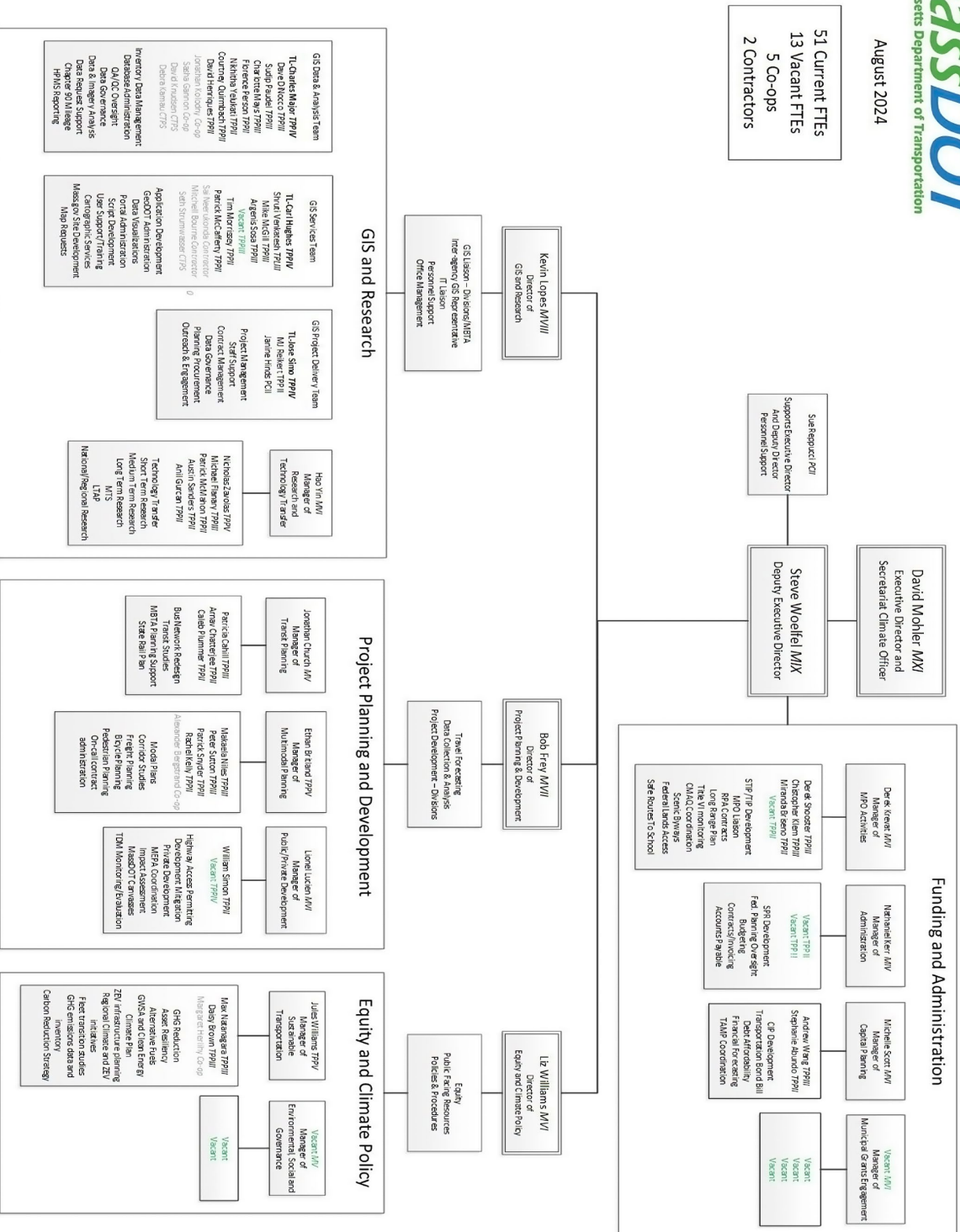
# Office of Transportation Planning



August 2024

51 Current FTEs  
13 Vacant FTEs  
5 Co-ops  
2 Contractors

## OFFICE OF TRANSPORTATION PLANNING – ORGANIZATIONAL CHART





# Research

## A. Program Development, Administration, and Implementation

**Task Lead:** Hao Yin

### **Task Purpose:**

To provide oversight and administration of the research program, conduct internal and external outreach activities, and manage associated contracts. The Research Section's work includes conducting research problem statement (RPS) solicitations; organizing RPS evaluation and selection; procuring and administering research contracts; and tracking project performance and implementation efforts and impacts.

### **Accomplishments in prior year:**

- Engaged in scoping and contracting coordination efforts between research project principal investigators (PI) and project champions (PC).
- Procured and/or administered all SPRII-funded research agreements (and/or contracts) with research entities.
- Performed project development and management for all SPRII-funded research projects.
- Coordinated the review and prioritization of statements for new FFY25 projects.
- Coordinated initial scope discussion and PI identification approach with agency technical leads for the FFY25 research projects.
- Produced FFY23 Research & Tech Transfer Annual Report.
- Produced four MassDOT Research Quarterly Newsletters.
- Updated MassDOT research website with new contents regularly.
- Conducted web-based project completion survey with project champions, principal investigators and project managers for thirteen projects completed in 2023 to collect feedback and information on how the research process can be improved and research results have been/are to be utilized and implemented.
- Prepared quarterly reports on the status of research and training programs.

### **Proposed activities for next year:**

- Continue oversight of research contracts and agreements.
- Continue research project management.
- Prepare quarterly reports on the status of research and training programs.
- Update MassDOT Research Section website regularly.
- Produce FFY24 Research & Tech Transfer Annual Report.
- Delivery of other research services as requested by the MassDOT Research Section.
- Produce MassDOT Research Quarterly Newsletters.
- Continue tracking research project performance, implementation and impacts.

**Anticipated products:**

- Executed ISAs and contracts.
- Quarterly reports.
- Regular updating of the Research & Technology Transfer website.
- FFY24 Research & Tech Transfer Annual Report.
- Research Quarterly Newsletters.

**Estimated task completion:** 09-30-2025

*Estimated staff salaries and benefits:* **\$123,436.91**

**Estimated task budget: \$123,436.91**

MassDOT staff members	% Time to task
Michael Flanary	20.0
Patrick McMahon	20.0
Nicholas Zavolas	20.0
Anil Gurcan	20.0
Austin Sanders	20.0
Hao Yin	20.0
Staff Inflation FFY25	None

*Other costs:*

## B. Research

**Task Lead:** Hao Yin

### **Task Purpose:**

Subtasks:

#### MCRP

In addition to the following items, coordinates and oversees the emerging agency needs across the Department.

- Perform literature searches and reviews
- Conduct 2025 research problem statement solicitation
- Update Transportation Research International Documentation (TRID), National Transportation Library and other national transportation research record repositories
- Maintain and expand MassDOT research network
- Schedule and host MassDOT transportation research and innovation webinar series

#### On-going Projects

To perform the research contained within this task, MassDOT contracts directly with universities, research institutes and/or private companies. There may be occasions when a project actual duration doesn't align with the anticipated duration due to challenges arising during research investigation and beyond the project team's control. Under such circumstances, additional time may be granted pending FHWA's approval, and the project shall remain within the original category for fiscal tracking purpose. The Research Section conducts annual research problem statement (RPS) solicitations to collect research needs from agency staff. The submitted problem statements are then prioritized based on MassDOT Division/Shared-Service Office Senior Leaders' rankings, MassDOT overall priorities, and research funding eligibility and availability. The Research Section assists MassDOT project champions with literature searches; the drafting of scopes of work; identification and selection of principal investigators, and the administration of project agreements/contracts, deliverables, final report reviews and publication, and coordination with FHWA.

### **Accomplishments in prior year:**



1. Completed "Implementing the AASHTO Mechanistic-Empirical Pavement Design Guide Phase III" project.
2. Completed "Methods to Identify Problematic Carriers and Prevent Infrastructure Damage" project.
3. Completed "Feasibility Study of 3D Printing Applications for Bridge Elements in MA" project.
4. Completed "Data-Driven Approach for Transit Capital Planning" project.
5. Completed "Using Traffic Signals to Limit Speeding Opportunities on Arterial Roads" project.
6. Completed "Using Grip Sensors to Control a Salt Spreader Application Rate" project.
7. Completed "Smart work zone control and performance evaluation based on trajectory data" project.
8. Completed "Effectiveness of Two-stage Turn Queue Boxes in Massachusetts: A Comparison with Bike Boxes" project.
9. Completed "Energy-Focused Decision-making Framework for MBTA Operations and Planning" project.
10. Completed "Accessible Bus Stop Design in the Presence of Bike Lanes" project.
11. Completed "Cross-Modal Impact Assessment for Sustainable Transportation Networks " project.
12. Completed "LIMMS Gap Analysis and Development Plan" project.
13. Completed "Complete Streets v.2: Respecting the Roots" project.
14. Completed "Development of Improved Inspection Techniques using LiDAR for Deteriorated Steel Beam Ends" project.

**Proposed activities for next year:**

On-going research projects:

To perform the research contained within this task, MassDOT contracts with universities, research institutes and/or private companies. There may be occasions when a project actual duration doesn't align with the anticipated duration due to challenges arising during research investigation and beyond the project team's control. Under such circumstances, additional time may be granted pending FHWA's approval, and the project shall remain within the original category for fiscal tracking purpose.

In addition, MassDOT research personnel will provide the following services:

- Update Transportation Research International Documentation (TRID),
  - National Transportation Library and other national transportation research record repositories
  - Perform literature searches and reviews
  - Maintain and expand MassDOT research network
  - Schedule and host MassDOT transportation research and innovation webinar series
1. Complete "Measuring Fare Payment Compliance on MBTA Buses and Light Rails" project.
  2. Complete "Post-Fire Damage Inspection of Concrete Structures Phase III Field Verification Phase" project.
  3. Complete "Developing a Visualization, Sharing and Processing Platform for Large-Scale Highway Asset Point Cloud Data" Project.
  4. Complete "Method for Pavement Marking Inventory and Retroreflectivity Condition Assessment Using Mobile Lidar" project.
  5. Complete "3D-Printed Lattice-based Structures for Next Gen Bridge Bearings" project.
  6. Complete "Measuring Accessibility to Improve Public Health Phase II" project.
  7. Complete "Recycled Ground-Glass Pozzolan (RGGP) for Use in Cement Concrete" project.

8. Complete "Field Study to Determine Salt Usage Efficiency on Two Pavement Types" project.
9. Complete "Effects of Asphalt Binder Source in Asphalt Mixture Performance" project.
10. Complete "Evaluating Driver Education Modules on Safety" project.

**Anticipated products:**

- Interim deliverables and final reports for all on-going research projects.
- Initiate and manage new research projects.

**Estimated task completion:** 09-30-2025

*Estimated staff salaries and benefits:* **\$270,491.50**

**Estimated task budget: \$2,314,231.50**

MassDOT staff members	% Time to task
Michael Flanary	80.0
Patrick McMahon	75.0
Nicholas Zavolas	60.0
Anil Gurcan	55.0
Austin Sanders	55.0
Hao Yin	30.0
Staff Inflator FFY25	None



*Estimated consultant costs: \$2,043,740.00*

Subtask / contract #	Total cost:	Pre-FFY 2025:	FFY 2025:	Post-FFY 2025:	Consultant/Contractor Name:	Consultant NTP:	Contract End Date:
<b>MCRP / 109600</b>	\$0.00	\$0.00	\$598,798.00	\$0.00	UMTC	None	None
<b>On-going Research projects</b>	\$1,444,942.00		\$1,444,942.00				

*Consultant notes:*, \$598,798 is allocated to UMTC, Subtask SPRST-08-16-2024-342 MCRP.



## C. Technology Transfer

**Task Lead:** Hao Yin

### **Task Purpose:**

Baystate Roads is the longstanding program name for Massachusetts LTAP, and it serves as a conduit for information transfer on technologies, best practices, and methodologies for operating, maintaining, and managing municipal departments of public works and highway departments throughout the Commonwealth. The program also serves as an efficient communications network, by which MassDOT transfers policy information, engineering directives, program funding, and other updates to the 351 municipalities in Massachusetts. Please see Appendix C.1 for FFY25 LTAP Training Plan.

Subtasks:

#### LTAP

Baystate Roads is the longstanding program name for Massachusetts LTAP, and it serves as a conduit for information transfer on technologies, best practices, and methodologies for operating, maintaining, and managing municipal departments of public works and highway departments throughout the Commonwealth. The program also serves as an efficient communications network, by which MassDOT transfers policy information, engineering directives, program funding, and other updates to the 351 municipalities in Massachusetts. Please see Appendix C.1 for FFY25 LTAP Training Plan.

#### MTS

MassDOT Training Services (MTS) assist MassDOT in developing and implementing an annual plan to provide essential and high-quality technical training to MassDOT employees with a focus on the Highway Division. Through this component, MassDOT coordinates, directs, and oversees the UMTC training team as it provides training classes requested by MassDOT's Highway Division to its staff throughout the state. Please see Appendix C.2 for FFY25 MTS Training Plan.

#### Conferences

MassDOT convenes two transportation technology transfer conferences each year: a one-day Moving Together Conference in the fall and a two-day Transportation Innovation Conference in the spring.

Through the comprehensive MassDOT-UMass Amherst Interdepartmental Service Agreement (ISA #109600), UMTc provides services to MassDOT including conference program planning, coordinating with speakers and moderators, managing event registration and exhibitors, contracting with venue and event support services, managing conference logistics, and delivering the conferences.

#### Construction Management Certificate Program

Continue implementing the new 4-year partnership agreement with the Wentworth Institute of Technology (WIT).

Deliver the Construction Management Certification Program to 30 participants representing all Highway districts. The annual expense is set at \$63,000, which covers the delivery of the 7-week curriculum.

#### Accomplishments in prior year:

#### Proposed activities for next year:

#### Anticipated products:

**Estimated task completion:** 09-30-2025

*Estimated staff salaries and benefits:* **\$20,125.36**

**Estimated task budget: \$3,598,526.36**

MassDOT staff members	% Time to task
Hao Yin	25.0
Anil Gurcan	10.0
Austin Sanders	10.0
Staff Inflation FFY25	None



*Estimated consultant costs: \$3,578,401.00*

Subtask / contract #	Total cost:	Pre-FFY 2025:	FFY 2025:	Post-FFY 2025:	Consultant/Contractor Name:	Consultant NTP:	Contract End Date:
<b>LTAP / 109600</b>	\$7,420,807.00	\$5,412,846.45	\$1,131,076.00	\$876,884.55	UMTC	10-01-2022	09-30-2025
<b>Conferences / 109600</b>	\$2,553,823.00	\$1,687,098.00	\$866,725.00	\$0.00	UMTC	10-01-2022	09-30-2025
<b>Construction Management Certificate Program / TBD</b>	\$189,000.00	\$0.00	\$63,000.00	\$126,000.00	Wentworth	TBD	TBD
<b>MTS/109600</b>	\$8,106,771.00	\$5,707,988.28	\$1,517,600.00	\$881,182.72	UMTC	10-01-2022	09-30-2025

*Consultant notes:*

*Other costs:*



## D. Regional and National Collaboration

**Task Lead:** Hao Yin

### **Task Purpose:**

To coordinate MassDOT's participation in national and regional transportation research activities, including the research committees, research statement submission and reviews, project panels, technical working groups, and task forces; to disseminate MassDOT's research efforts, products, program management and delivery approaches both nationally and regionally; and to distribute research results and activities of the Transportation Research Board (TRB), American Association of State Highway and Transportation Officials (AASHTO) and other state DOTs within MassDOT.

Subtasks:

Peer Exchange

AASHTO TSP

Pooled Fund Studies

In FFY25, MassDOT intends to the following Transportation Pooled Fund studies.

5(422) National Cooperative Highway Research Program 5(447) Traffic Control Device (TCD) Consortium 5(455) National Accessibility Evaluation Phase II 5(465) Consortium for Asphalt Pavement Research and Implementation (CAPRI) 5(479) Clear Roads Phase III

5(481) In-Service Performance Evaluation (ISPE) of Roadside Safety Features 5(482) Development and Evaluation of Roadside Safety Systems for Motorcyclists 5(501) Roadside Safety Research for MASH Implementation Phase III

5(511) TRB Core Support Services 5(516) Highway Safety Manual 2nd Edition (HSM2) Implementation Phase III

Solicitation 1612\* Designing Transportation Infrastructure for Electric Vehicles (TPF project number yet to be assigned)

**Accomplishments in prior year:**

- Coordinated with MassDOT Highway Divisions and Planning Office to establish participation in transportation pooled fund (TPF) projects funded through SPR II.
- Participated in and contributed to AASHTO RAC activities.
- Coordinated the TRB National Cooperative Highway Research Program (NCHRP) problem statement review process.
- Disseminated TRB research reports, technical webinars and NCHRP project panel member solicitations to appropriate MassDOT staff.
- Participated in and contributed to New England Transportation Consortium (NETC) program management and technical activities.
- Participated in and contributed to AASHTO's RAC Regional 1 activities including preparation activities for the RAC 2024 winter meeting.
- Applied for AASHTO RAC Committee High Value Research Projects Award and received Sweet-16 Award.
- Updated MassDOT research projects in the TRB Research-In-Progress database.
- Disseminated MassDOT research reports through the TRB E-Newsletter.

**Proposed activities for next year:**

- Coordinate within MassDOT to establish participation in pooled fund programs, and support AASHTO RAC activities, NCHRP research statement reviews, NCHRP technical panel participation, and TRB representative's visit.
- Participate in other State DOT's Research Peer Exchanges when appropriate.
- Execute MassDOT Research Peer Exchange.

**Anticipated products:**

- Distribution of research products and information from TRB, TPF and other state DOTs.
- Communication of MassDOT research reports through TRB E-Newsletter.
- Participation in AASHTO RAC activities.
- Delivery of MassDOT Research Peer Exchange.
- Identification of MassDOT's position on problem statements for the annual NCHRP project cycle.

**Estimated task completion:** 09-30-2025

*Estimated staff salaries and benefits: **\$152,928.03***

*Estimated Other costs: \$300,000.00*

**Estimated task budget: \$1,093,655.03**

MassDOT staff members	% Time to task
Hao Yin	25.0
Nicholas Zavolas	20.0
Anil Gurcan	15.0
Austin Sanders	15.0
Patrick McMahon	5.0
Staff Inflator FFY25	None



*Estimated consultant costs: \$640,727.00*

Subtask / contract #	Total cost:	Pre-FFY 2025:	FFY 2025:	Post-FFY 2025:	Consultant/Contractor Name:	Consultant NTP:	Contract End Date:
<b>Peer Exchange / 126725</b>	\$0.00	\$0.00	\$140,727.00	\$0.00	VOLPE	None	None
<b>AASHTO TSP / TBD</b>	\$0.00	\$0.00	\$500,000.00	\$0.00		None	None

*Consultant notes:*

*Other cost notes:* Memberships/subscriptions, training and travel





# SPR II Financial Table

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## Totals

	Staff cost	Consultant cost	Other cost	Total cost
<b>SPR I (A+B) total</b>	\$9,753,394.46	\$5,653,610.00	\$1,964,000.00	\$17,371,004.46
<b>SPR II</b>	\$566,981.81	\$6,562,868.00	\$300,000.00	\$7,129,849.81
<b>SPR I &amp; II total</b>	\$10,320,376.27	\$12,216,478.00	\$2,264,000.00	\$24,500,854.27

The SPR will be monitored throughout the year to determine if an amendment to the STIP is necessary to ensure adequate funding. The SPR II is 29% of the overall program, meeting the 25% minimum threshold.