



Data-Exchange Platform to Support Regional Multi-Modal Safety, Reliability, and Mobility



ITS DC 2023 Annual Conference
Optimizing Mobility Through Data-Driven Innovations



“Optimizing Mobility Through Data-Driven Innovations” is exactly what RM3P strives to achieve!

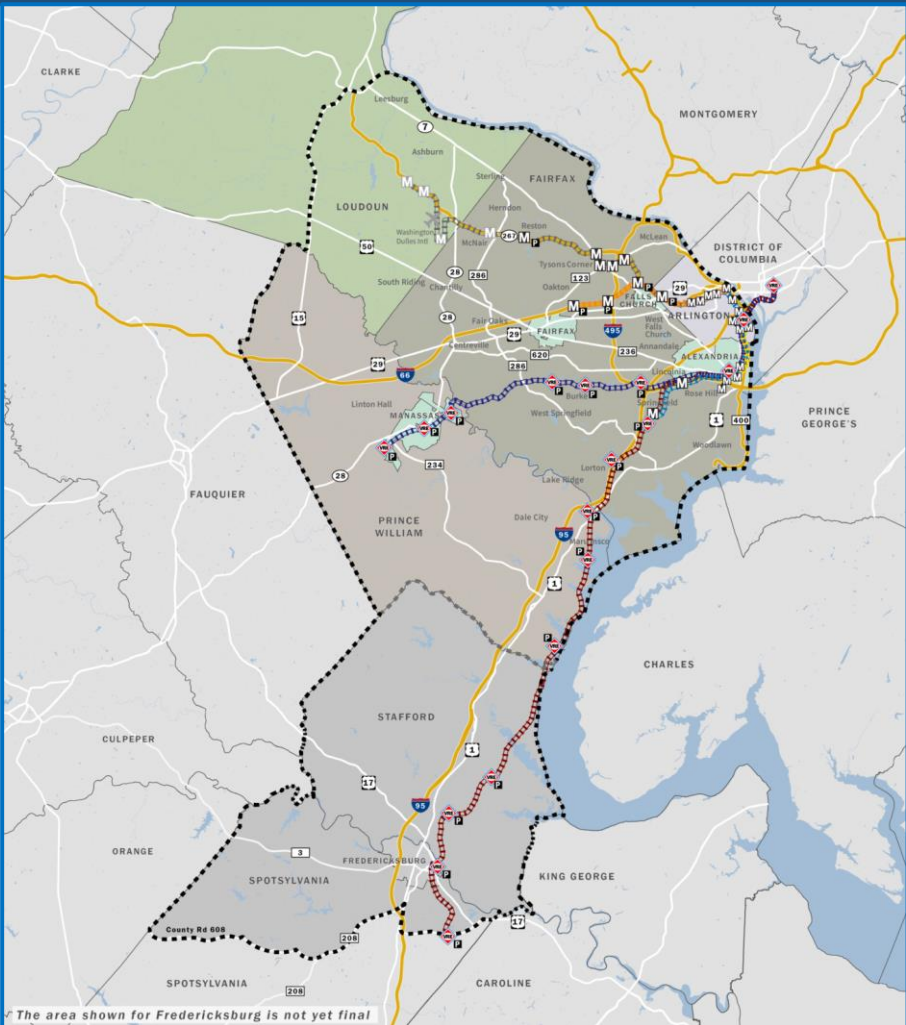
OPTIMIZING MOBILITY THROUGH DATA-DRIVEN INNOVATIONS

ITS DC 2023 ANNUAL CONFERENCE



September 28, 2023
250 M St, SE Washington DC

Virginia Regional Multi-Modal Mobility Program (RM3P)



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Program Manager
VDOT Office of Strategic Innovation
Visit us at: RM3PVirginia.org



Partners:



Commuter Parking Information System (CPIS)



AI-Based Decision Support System (AI-DSS)

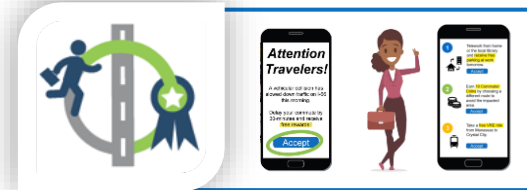


Data-Exchange Platform (DEP)

AI-DSS + DI ≈ **Cohesive TSMO**



Multi-Modal Analytical Planner (MMA) System



Dynamic Incentivization (DI) System

CONCEPT

- ❖ Empowering Commuters
- ❖ Real-Time Information Sharing
- ❖ Rapid Response to Changing Conditions
- ❖ Structured Decision-Making
- ❖ Multi-Modalism
- ❖ Innovative Technology
- ❖ Incentivizing Positive Traveler Behavior
- ❖ Agile Development

MISSION

Collaborative use of real-time data to improve travel safety, reliability, and mobility



Optimization, Reliability, Traveler's Choice

Innovation Sets RM3P Apart



Technology

- Data-driven solutions.
- **DSS:** Promotes coordinated region responses to incidents, leverages AI and ML, and predicts future conditions.
- **DI:** Emphasizes behavioral-based approaches, flexibility in adjusting to travel conditions, and long-term reinforcement of changed behaviors.
- **CPIS:** Uses infrastructure-light approaches that can be implemented efficiently and inexpensively.
- Utilizes crowd-sourcing approaches in new, creative ways.
- Offers commuters flexibility on how information is accessed.
- Scalable.

Methodology

- Systems Engineering/Agile Hybrid development.
- Cloud-based solutions.
- Strong multi-agency partnerships built into management structure.
- Supports/encourages multi-modal travel.
- Proactive plans for long-term sustainability.
- Encourages third parties to package, market, and redistribute data.
- Empowers commuters to be part of the solution.

Procurement

- SaaS -Software/Solution as-a-Service.
- Turnkey deployments.
- DaaS - Data-as-a-Service with adaptable data-use license.
- Parking Cooperative Purchases - Enables agency partners to purchase off pre-negotiated schedule.
- Helping set the standard for innovative technology procurements in the Commonwealth.

DEP Overview



Background

- Reliable, continuously updated, cloud-based data storage and exchange system.
- Used by regional partners and third-party providers to capture, process, and exchange information on real-time and historic multi-modal travel conditions.
- Feeds necessary data to other RM3P program elements and disseminates value-added and full-grown data produced by these elements.
- Leverages the powerful Regional Integrated Transportation Information System (RITIS).

Available Data

Traffic Events and Incidents

Work Zones

Parking

Public Transit

Traffic Signal Status

Road Weather Stations

Traffic Detectors

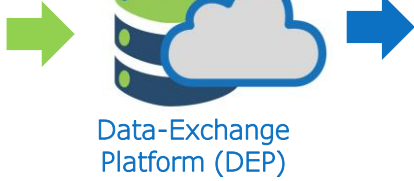
Probe Vehicle Speeds & Travel Times

Others

DEP Highlights



Data Sources



Data Consumers

- ✓ Expandable data ingestion system
- ✓ Automated data consolidation and storage system
- ✓ Powerful API for real-time and near real-time data distribution
- ✓ Core data exchange platform supporting all other RM3P systems

Misconceptions About DEP

X It is an analytical tool

X It is designed for mega project download

X It is designed for users to open files using MS Office suites

X It is a document storage system

X All data is available to all

Who may Access DEP and When?

NOW

- VDOT Users
- Affiliate Agency Users (federal, state, regional and local public transportation agencies)

Support Public Agencies

RM3P Procurement Awards

- AI-DSS Vendors upon award
- DI Vendors upon award
- Smart Parking Vendors upon award

Support RM3P

After RM3P Procurements End

- RM3P Targeted 3rd Party Vendors
- Contractors that use data from DEP to benefit VDOT's projects with proven use case
- Contractors that use data from DEP to benefit affiliate agencies' projects with proven use case
- Other App developers with proven use case
- University research personnel with proven use case

Support repackaging of pertinent data for delivery to travelers. Support researchers and planners.

Data-Exchange Platform is open incrementally to data users

What Sets DEP Apart?



Provides a variety of prioritized data sets supporting key use cases

Efficient structure with a **powerful API**, raw data download and associated tools

Built to be flexible, **scalable**, and evolving – no rigid constraints

No lengthy approval, data discovery, and curation process – only easy access to data analytics

Innovations sets DEP apart from other platforms

Enhances **business processes** with improved transportation system performance and services

Easy access to data in machine-readable format to aid decision-making

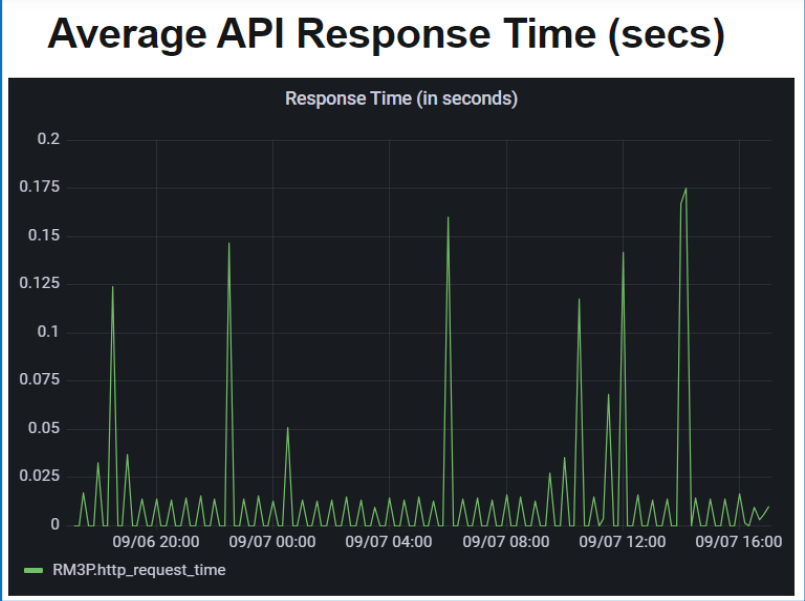
Bridges the gap between data and data science to conduct analytics and predictions

One stop-shop for all RM3P data needs

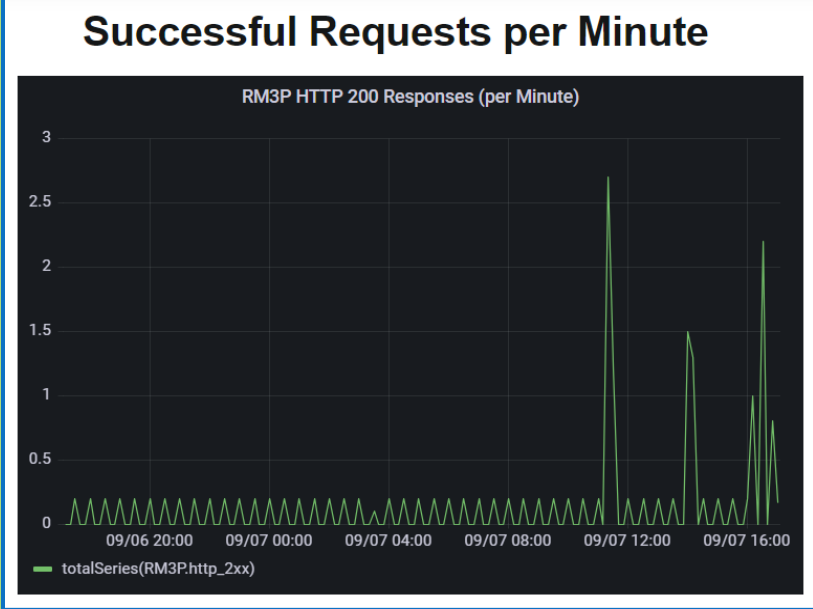
DEP Performance



~ 54,000 API requests in 2023



Avg. 0.25 seconds
50+% less than 0.1 seconds



DEP Users Said

“DEP is a great resource.”

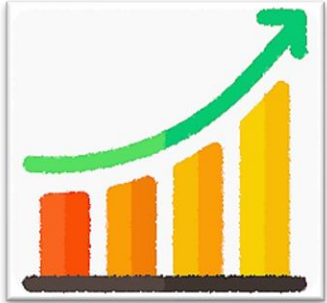
- M. Zhao

“DEP is a platform to get data for our major projects. We look forward to seeing DEP become a one stop-shop for the data sources it includes.”

- B. Wang

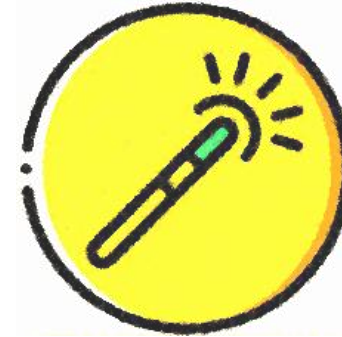
“The DEP API is easy to use. Support staff are very helpful to get us started for our analysis on the impact of I-95 Fredericksburg Extension (FredEx).”

- S Babiceanu



DEP Keeps Enhancing

A rolling stone gathers no moss



DEP is in the process of integrating additional data sources. These include:

VDOT KITS Traffic
Signal Data

RITIS Enhanced
Weather Data

VRE Simple Delays and
Disruption Data

WMATA and VDOT
Haymarket Real-Time
Parking Occupancy Data
(Wish List)

NoVA Locality Traffic
Signal Data (Wish List)

Looking Forward: DEP Sustainability



Sustain DEP and other RM3P program elements post-deployment by determining agency stewardship, identifying funding, and establishing a suitable program infrastructure.



Technical Sustainability

DEP is the foundation of RM3P that supports other program elements and so its sustainability is critical in keeping RM3P running.



Stewardship Sustainability

Current Project Manager(s)

Amy McElwain
Office of Strategic Innovation (OSI), VDOT

Future Steward

John Shaw
Administrator, Operations Technology Division (OTD), VDOT



Funding Sustainability

DEP is fully funded through 2027 but sustaining it over the long-term will require mainstreaming the sources of funding.



Travel Decisions Powered by Data



Thank You!

<https://rm3p.ritis.org/>

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