



Information! Collaboration! Incentivization!

Let's Talk About Virginia's "RM3P" Innovations



2024 ITSVA 30th Annual Conference

A G E N D A

1. RM3P Introductions & Overview
2. Data-Exchange Platform
3. AI-Based Decision Support System
4. Dynamic Incentivization
5. Commuter Parking Information System
6. What RM3P Means for You
7. RM3P Sustainability
8. Questions & Answers
9. Closing

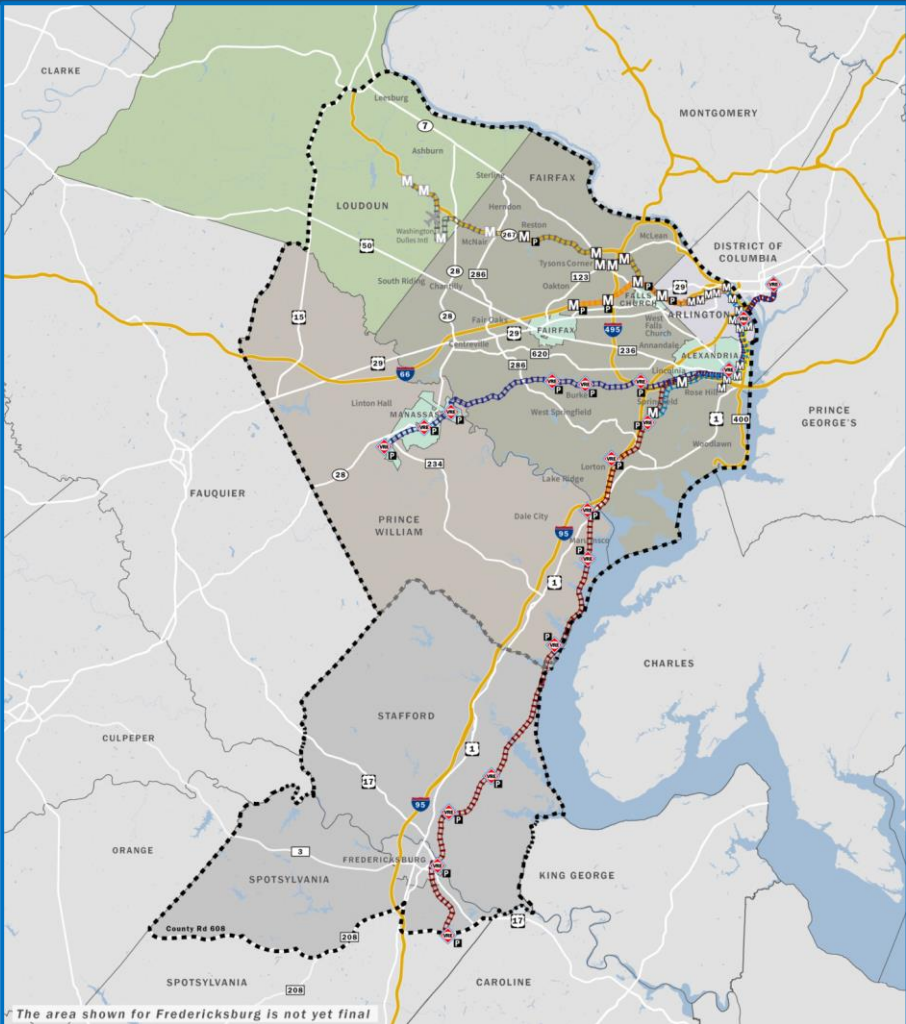


RM3P Introductions & Overview

Joel Ticatch, Kapsch TrafficCom



Virginia Regional Multi-Modal Mobility Program (RM3P)



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



Partners:

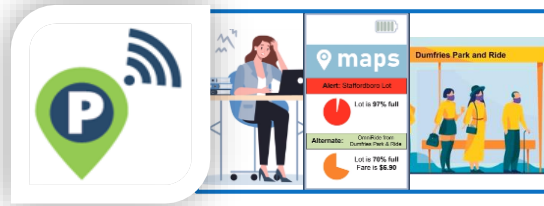


CONCEPT

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

MISSION

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



Commuter Parking Information System (CPIS)



AI-Based Decision Support System (AI-DSS)

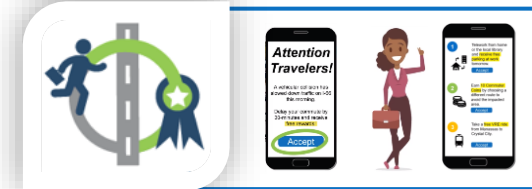


Data-Exchange Platform (DEP)

AI-DSS + DI ≈ **Cohesive TSMO**



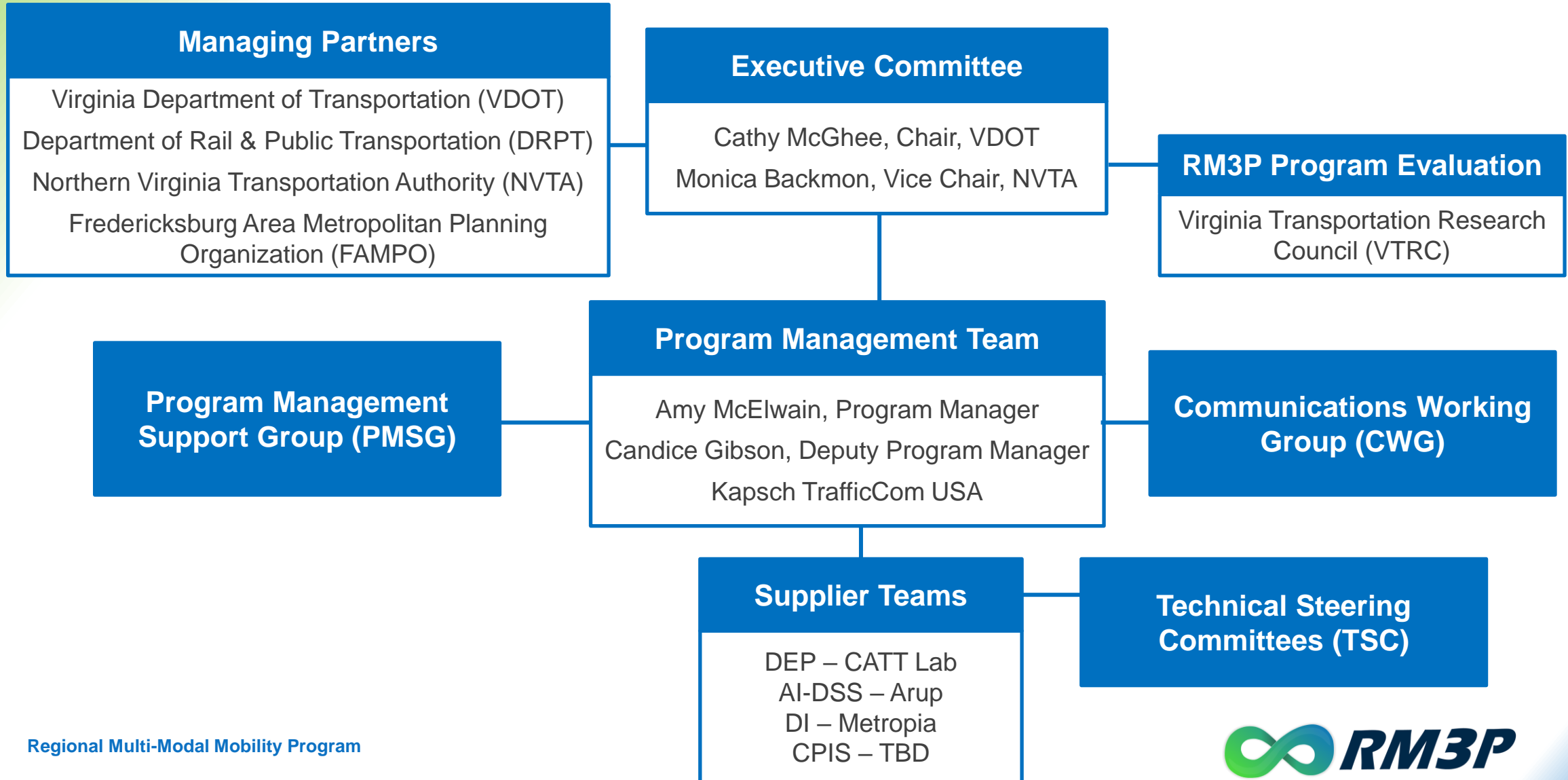
Multi-Modal Analytical Planner (MMA) System



Dynamic Incentivization (DI) System

Optimization, Reliability, Traveler's Choice

RM3P High-Level Organization Structure





Data-Exchange Platform

Nikola Ivanov, CATT Lab

What is the Data-Exchange Platform (DEP)

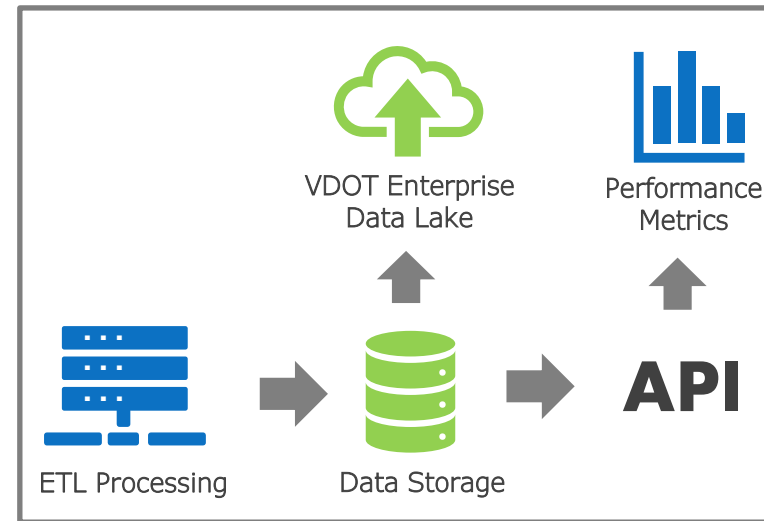


- ✓ Expandable data ingestion system.
- ✓ Automated data consolidation and storage system.
- ✓ Powerful API for real-time and near real-time data distribution.
- ✓ Core data-exchange platform supporting all other RM3P systems.

DEP Architecture



Data Sources



Data Consumers

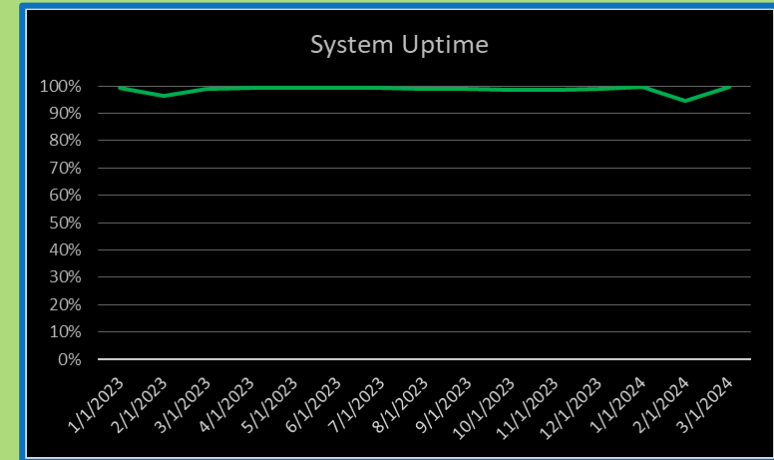
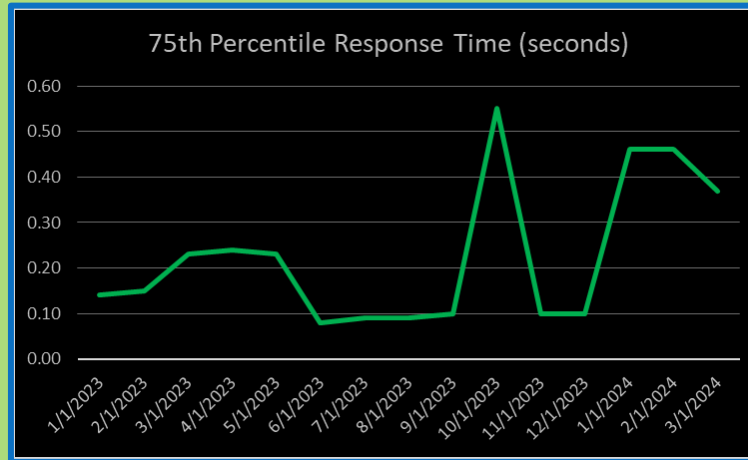
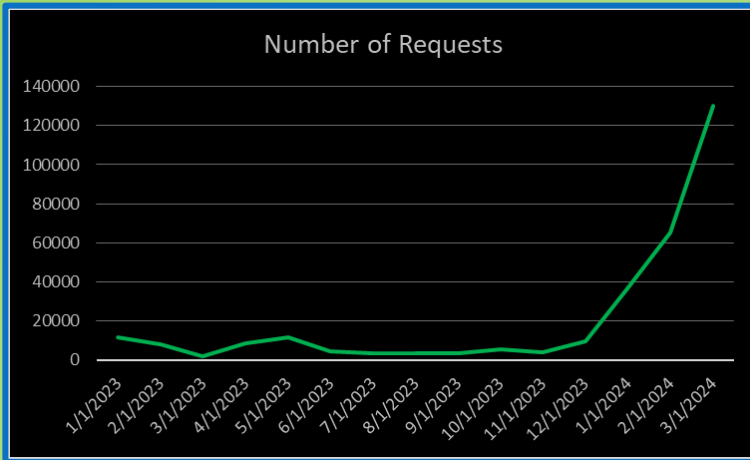


Data-Exchange Platform (DEP)

What Sets DEP Apart?



DEP Performance



RM3P DEP

Variety of prioritized data sets supporting key use cases

Powerful API, raw data download, and associated tools

Flexible, expandable, and evolving

Other DEPs

Either overly focused on one use case, or so broad that may not be useful to any.

Either a data “dumping ground” or too human-oriented requiring manual effort to use effectively

Either “one-and-done” deployment, or overly constrained by standards or specific use cases

Pop-Quiz!





Artificial Intelligence - Based Decision Support System

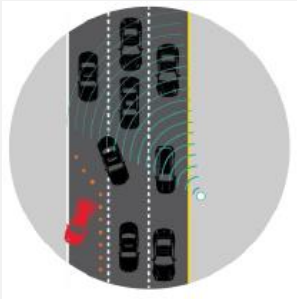
Candice Gibson, VDOT

AI-Based Decision Support System (AI-DSS)

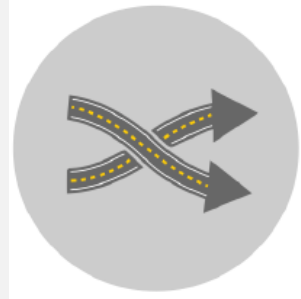


The AI-DSS is a tool for transportation operators that will use travel data to monitor emerging conditions and recommend plans for **coordinated, multi-agency multi-modal responses** to congestion, incidents, and events.

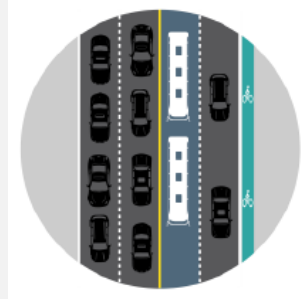
AI-DSS Response Measures:



Traffic & Incident Management



Traffic Re-Routing



Mode-Shift Incentivization

The AI-DSS will help predict disruptions to the transportation network and the impact of those disruptions and provide coordinated response options to agencies.

AI-DSS Key Highlights



Software-as-a-Service (SaaS)

Predict congestion

Functionality to evaluate current travel conditions

Make recommendations on the actions to be taken to respond **optimally** to the **transportation disruptions** and the **impact of those disruptions** on the region.

Leveraging real-time and historical **data** from:

- RM3P Data-Exchange Platform (DEP)
- Additional data

Help transportation agency operators **make informed decisions** in managing:

- Recurring, and
- Non-recurring congestion that affects their respective transportation networks
 - Transit
 - Arterial
 - Freeway conditions
 - Parking availability

AI-DSS Key Functions



Rules Engine

Rules and logic to select multi-modal response plans based on current and future incident and congestion conditions.

Response Plans

KPI thresholds and data to trigger alerts and recommend response plans to agencies.

Prediction Engine

Predict occurrence and impact of incidents, congestion, commuter parking availability, and potentially transit crowdedness.

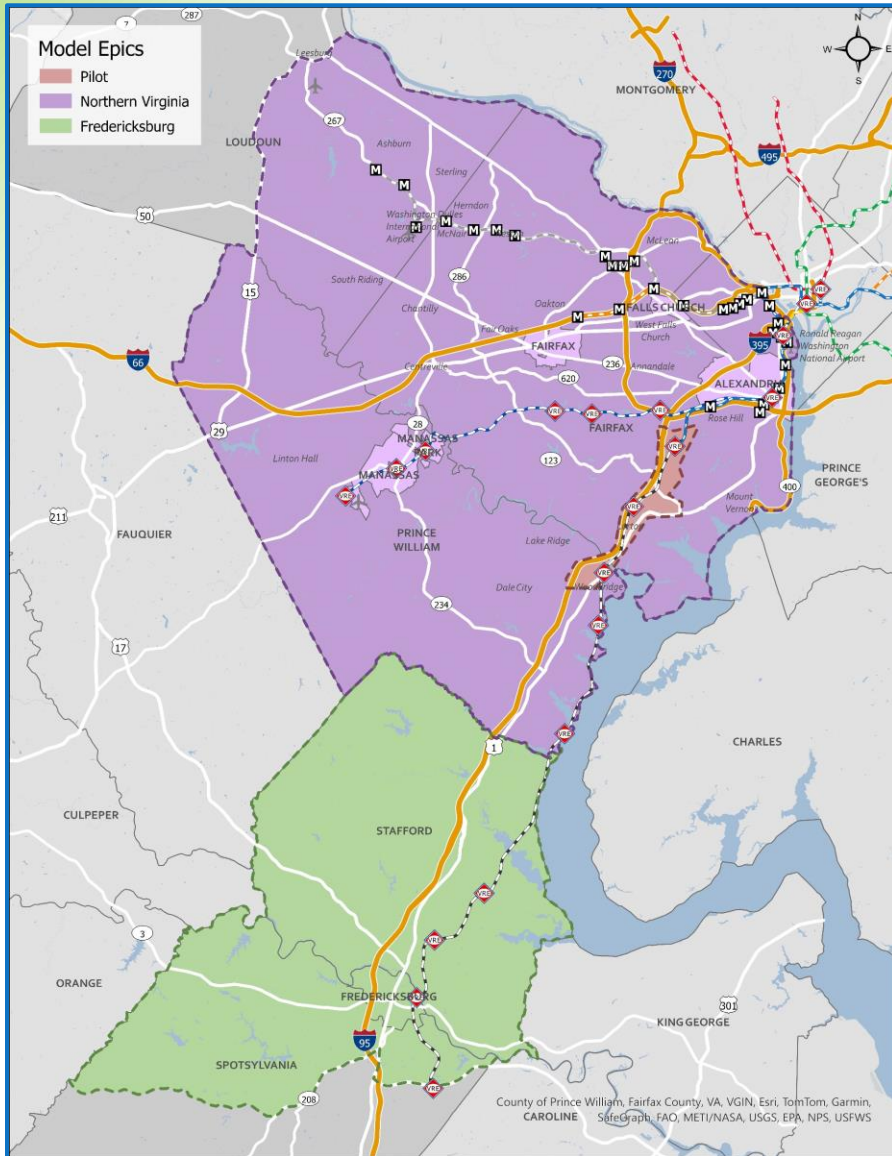
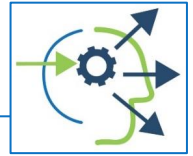
Modeling Engine

A tool to build offline (but also online, real-time simulation models) to assess the impacts of events and response plans.

Graphical User Interface

An online interactive application that agencies can log in to view maps, alerts, response plans, data visualizations and dashboards, etc.

AI-DSS Progression Plan



I-95 Polygon Area

South of Springfield Interchange through Lorton, Occoquan, and Woodbridge extending from I-95 Exits 158 to 169A.



Core System Development
Winter 2024/2025

Deployment to NoVA
Fall 2025

Deployment to Metropolitan Fredericksburg
Winter 2025/2026

Responding to Events Collaboratively with AI-DSS



Participating Regional Agencies



- Each agency will be notified when there's an event that requires their participation.
- Each agency will integrate AI-DSS into their operations.
- Two-way communications to:
 - i. Accept response plan
 - ii. Modify suggested response plan
 - iii. Confirm implementation

How will system operators co-manage responses to events with AI-DSS?

Pop-Quiz!





Dynamic Incentivization

Chris Arabia, DRPT

Dynamic Incentivization



Does this sound familiar?



Hmm..

- You get up and get ready to go to the office just like any other day.
- You head out of your neighborhood.
- You get on the highway and ...scrrrreeeeetch!!! You are stopped and not going anywhere.
- What is going on? How long will this backup last?
- You wish you knew before you started out.
- You wish you had another way to get there!



You'll never get to work on time! HAHA!!

Solution: The Dynamic Incentivization App

Provides alternatives, options, and incentives to travelers to change travel behavior – don't drive, use transit, carpool, vanpool, bike, travel later

- ✓ Technology-Enabled
- ✓ Multi-Modal
- ✓ Traveler-Focused
- ✓ Partnership-Centered



- ✓ MaaS Platform
- ✓ Travel Behavior
- ✓ Data Integration
- ✓ Sustainable Business Model



DI Incentive Tools



Loyalty Program

Objectives: Establish brand trust and grow program participation. Attract and retain customers/participants.

Strategy: Personalized, customized program and user experience that offers meaningful rewards for desired travel behaviors.

Challenge Programs

Objectives: Goal-seeking, achievement, familiarity with new options, behavior change foundation. Funnel to the engagement phase - loyalty program.

Strategy: Offer a timely/attention-grabbing invitation, with an appealing reward component that moves users from “contemplation” to “action”.

Dynamic Incentive

Objectives: Behavior change due to real-time events.

Strategy: Event-based user segmentation, offering personalized options and incentives.

What Sets DI Apart?



Behavior Change
Tailors incentives to travelers' preferences

Diverse Approach
Engages travelers for single, short-term, and long-term trips

Fully Multi-Modal
Provides info for all modes and multi-modal trips

Data Integration
Traffic data, incidents, closures, transit data

Innovation and Integration sets DI apart from Traditional TDM Apps

Customized Incentives & Rewards
Special incentives/rewards can be added from stakeholders, employers, transit agencies, private sector, etc.

Service Integration
Open to integration with other apps to enhance customers choices and experience

Real-Time Incentives
Provides incentives dynamically

Scalable
Can be expanded to other parts of Virginia

Pop-Quiz!





Commuter Parking Information System

Amy McElwain, VDOT

Commuter Parking Information System (CPIS)



Current State-of-Practice

- ❑ Park-and-Ride (P&R) Lots:
 - Many along I-95 and I-66 corridors for easy access.
 - Typically Lots are not gated, free of charge, and not monitored.
- ❑ Significant investment on building commuter parking capacity.
- ❑ Real-time parking information systems in the region include:
 - Lots at VRE stations.
 - Lots at for 44 Metrorail stations.

P	
Backlick Road Station	0/250
6900 Hechinger Dr, Springfield, VA 22151, USA	Update Time 11:26 am
Broad Run Station	212/1065
10637 Piper Ln, Bristow, VA 20136, USA	Update Time 11:26 am
Brooke Station	179/700
1721 Brooke Rd, Stafford, VA 22554, USA	Update Time 11:26 am
Burke Centre Station	72/1504
10399 Premier Ct, Burke, VA 22015, USA	Update Time 11:26 am
Fredericksburg Station	124/561
Prince Edward St, Fredericksburg, VA 22401, USA	Update Time 11:26 am
Leeland Road Station	283/842
275 Leeland Road, Falmouth, VA 22405, USA	Update Time 11:26 am
Lorton Station	188/567
8990 Lorton Station Blvd, Lorton, VA 22079, USA	Update Time 11:26 am
Manassas Park Station	163/616
9300 Manassas Dr, Manassas Park, VA 20111, USA	Update Time 11:26 am
Manassas Station	191/564
9451 West St, Manassas, VA 20110, USA	Update Time 11:26 am
Quantico Station	1/120
550 Railroad Ave, Quantico, VA 22134, USA	Update Time 11:26 am
Rippon Station	177/676
15511 Farm Creek Dr, Woodbridge, VA 22191, USA	Update Time 11:26 am
Rolling Road Station	246/368
9016 Burke Rd, Burke, VA 22015, USA	Update Time 11:26 am
Spotsylvania Station	402/1500
9442 Crossroads Pkwy, Fredericksburg, VA 22408, USA	Update Time 11:26 am
Woodbridge Station	221/738
1040 Express Way, Woodbridge, VA 22191, USA	Update Time 11:26 am

Virginia Railway Express (VRE)



Current Parking Availability

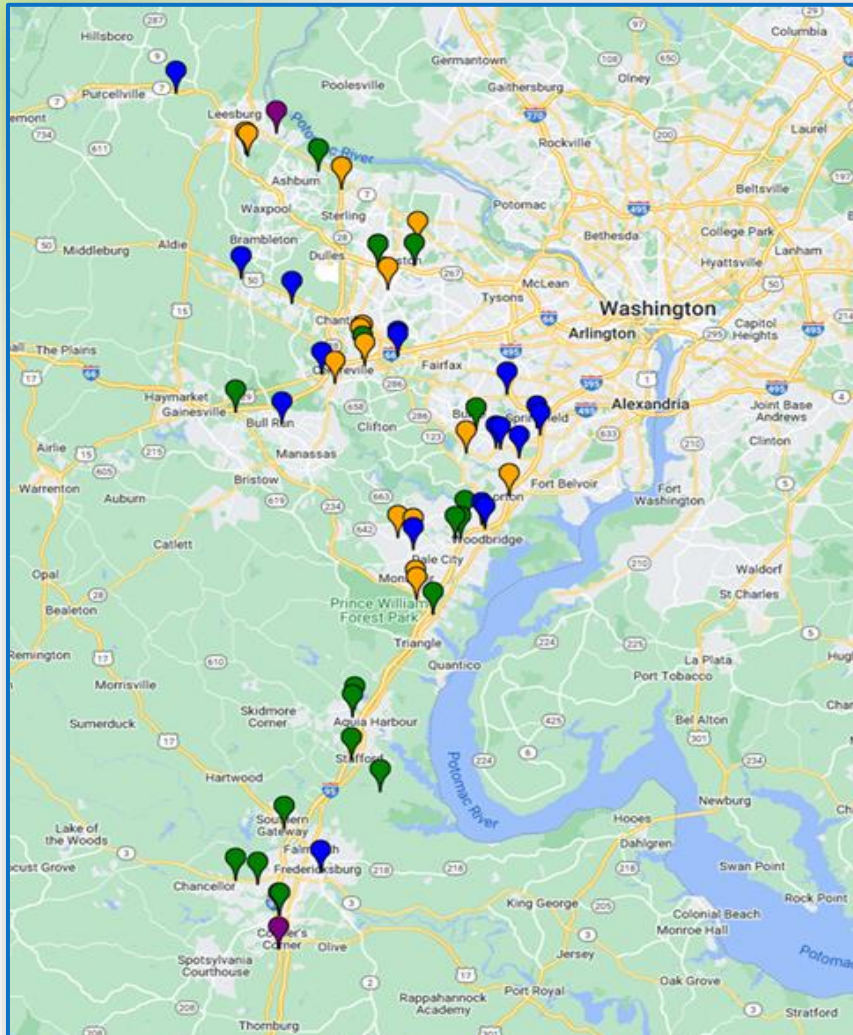
Parking availability status is based on the real-time entry and exit at Metro lots or garages. It does not reflect where the cars park (spaces for reserved, paid, accessible, etc.). The status feature provides customers with an estimate of available spaces, not an exact count.

- **Available** - ample parking spaces are available.
- **Limited** - a limited number of parking spaces are available.
- **Full** - no parking spaces are available.

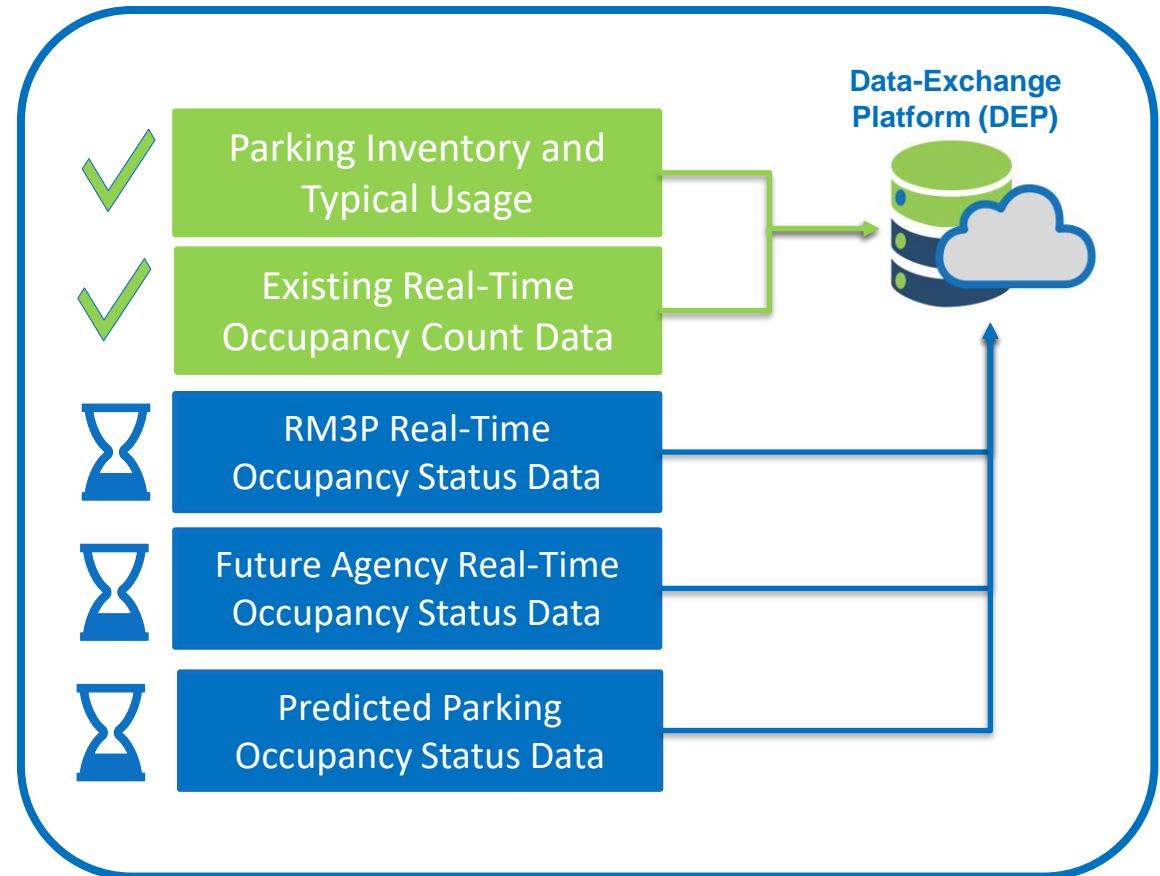


Washington Metropolitan Area Transit Authority (WMATA)

CPIS Highlights & Progression



CPIS - 52 Priority P&R lots in NoVA and Metropolitan Fredericksburg.



CPIS Goals & Strategy



Goals

- Reduce single-occupancy vehicle trips.
- Facilitate multi-modal trips.
- Maximize P&R lots usage and investment.

Couldn't find a parking spot? You're not going to work. You're going home! Hehe!!



Strategy

- Partner with 3rd party providers to:
 - Help commuters plan trips with transfers from personal vehicles to transit or shared-use vehicles.
 - Help commuters choose among multiple options to park and transfer.
- Encourage drivers – and give them confidence – to park their vehicles and switch modes during segments of their trips

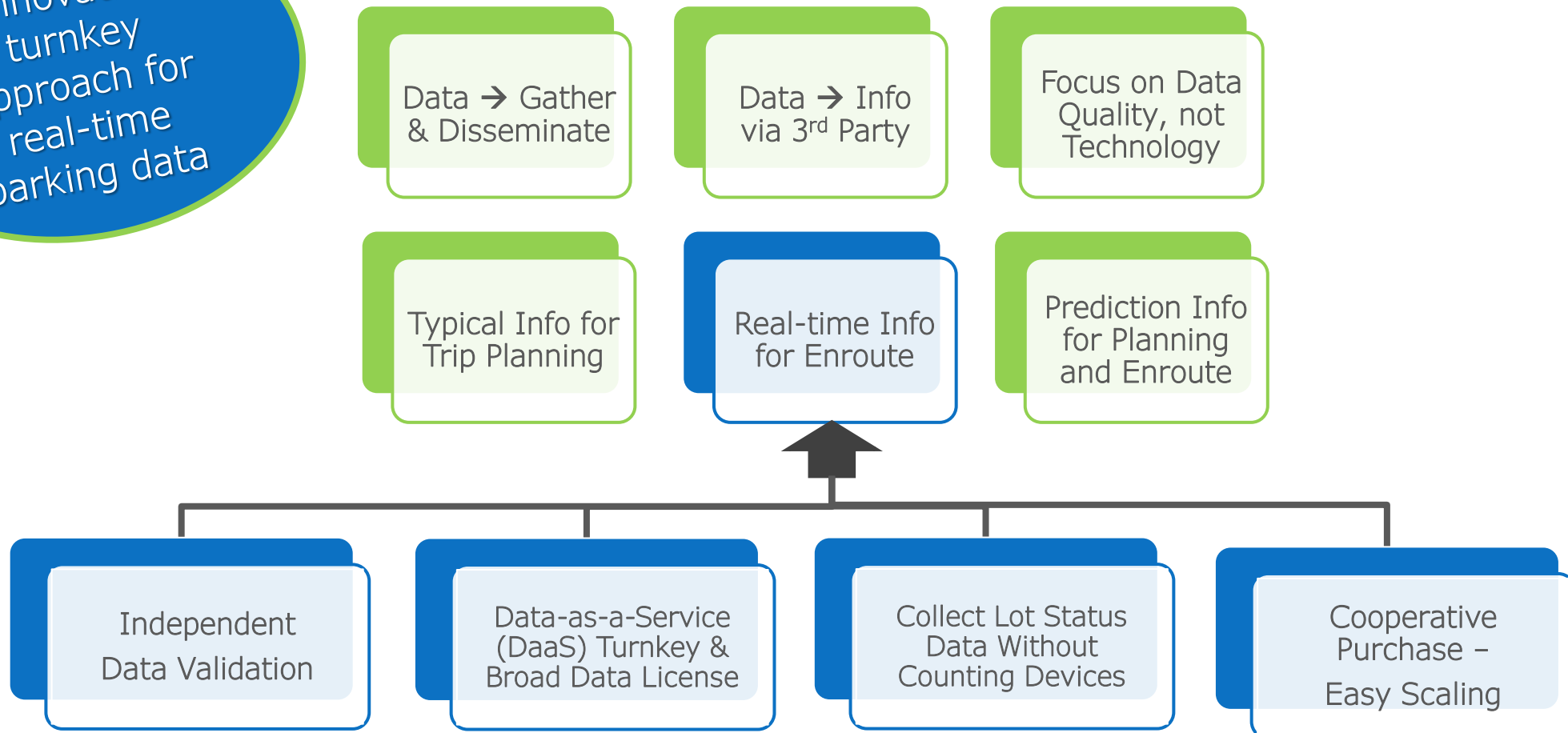
Broad Data License –
Cost effective due to *data commercialization*

Infrastructure Light/Free –
Reduces risk of O&M challenges and high costs

CPIS Approach



Innovative turnkey approach for real-time parking data



Pop-Quiz!





What RM3P Means for You?

Representative Benefits

Amy McElwain, VDOT

Public Agencies



Data

- Share your data with others.
- Access data gathered by fellow regional partners.
- Support research, analysis, and application development by agency data scientists and others.
- Access additional data streams to assist agencies in monitoring commuter parking lot activity and usage.

Operations

- Be promptly notified of significant incidents, events, and conditions – including predicted conditions.
- Receive timely Decision Support System guidance and recommendations.
- Work proactively and collaboratively with fellow regional partners to manage and mitigate adverse conditions and improve travel.
- Empower MATOC with expanded information and insights to improve coordinated agency responses.

Flexible Solutions

- Contract mechanism allowing agencies to purchase real-time occupancy data on parking lots not covered by RM3P.
- Tool enabling agencies to:
 - Disseminate information to commuter parking lot users.
 - Easily incentivize targeted commuters to modify travel behaviors and habits.

Industry

RM3P offers you one-stop access to archived and real-time data that can be:

- ❑ Either used as is or repackaged as valuable information for the general public.
- ❑ Analyzed to identify patterns, develop insights, and support research, planning, operations, and applications development.
- ❑ Used to support other VDOT projects.

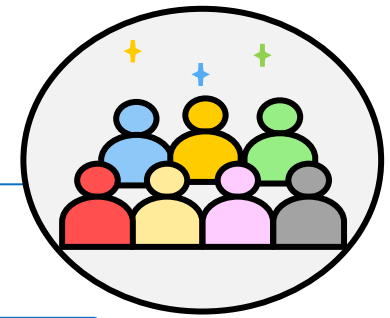


Additionally, some of you are members of the Supplier teams already supporting RM3P program element development.



As RM3P development continues, new details and guidance on RM3P 3rd-party dissemination opportunities will be released.

General Public



RM3P offers you the opportunity to:

Benefit from rapid actions taken by transportation operators in response to incidents, events, and other adverse travel circumstances.

Access guidance on real-time and predicted space availability at specific parking lots in advance of arriving at those lots.

Be rewarded for efficiency and flexibility in your travel activities.

Become part of a community of commuters committed to leveraging information to improve the traveling experience.

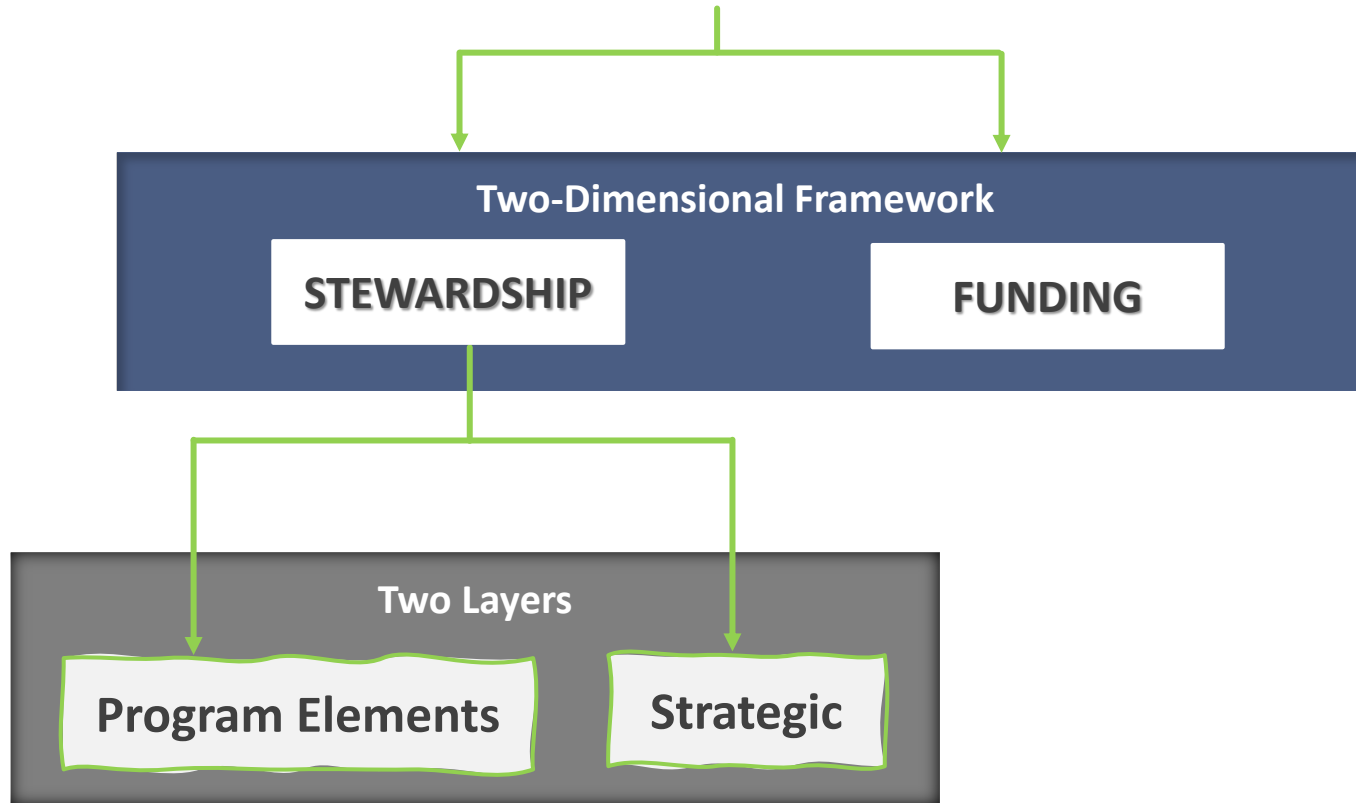
RM3P SUSTAINABILITY

Joel Ticatch, Kapsch TrafficCom



RM3P Sustainability Framework

RM3P SUSTAINABILITY



SUSTAINABILITY IS ABOUT MAINSTREAMING RM3P!

Taking the actions necessary to ensure that RM3P will be able to continue, in the future, functioning cohesively as an integrated program unit.

This assumes, of course, that the effectiveness of RM3P is adequately demonstrated.

	DEP	AI-DSS	CPIS	DI
Future Stewardship Plan	Traffic Operations Division (TOD), VDOT	Traffic Operations Division (TOD), VDOT	Traffic Operations Division (TOD), VDOT	Public Transportation, DRPT

Program-Element Stewardship



Organizational entities assuming *ownership/responsibility* for the RM3P program elements.

DEP, AI-DSS, and CPIS will all transfer to future stewards at *VDOT*.

Each program element has an *existing steward*.

Future stewardship for *DI* will reside at *DRPT*.

Later, each program element will *transition to a future steward*.

Transition to the future stewards: Predominantly in 2026 and 2027. However, full transition to DRPT is scheduled for 2031.

Strategic Stewardship



- ❖ *Overarching organizational infrastructure* for RM3P.
- ❖ Strategic stewardship is about managing RM3P at the *program* level.
- ❖ VDOT is the current strategic steward and may remain so in the future.
- ❖ The *permanent steward* will be designated by 2026.
- ❖ *Transition* to the permanent steward will occur in 2027 or 2028.

Q & A Discussion



Closing



Please join us on this exciting ride, as we work together to make RM3P a reality!





Thank You!

rm3pvirginia.org