COMBINATION AMH SYSTEM (CAMH)

Unique Advantages for Avoiding Recurring Congestion

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Congestion Avoidance Benefits by Diversion

- Congestion Delays Annually Cost Over $ 170 Billion
- Avoiding Lost Time from Congestion Would Potentially be a Major Market Driver for Reliable Transportation by Marine Highways

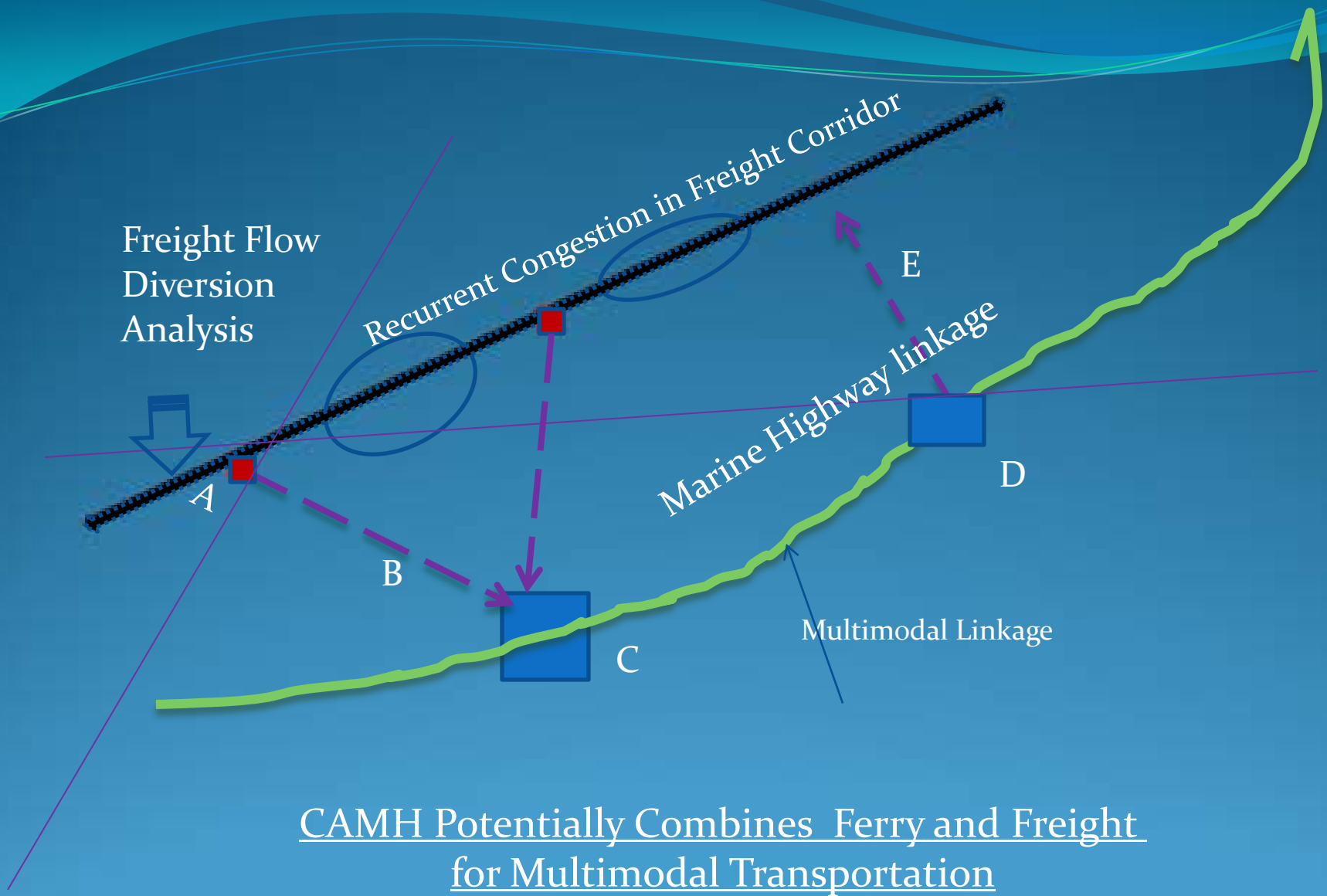
Combination AMH System (CAMH)

- Over 90 Percent of U.S. waterways remain under used

- Marine highway infrastructure can be implemented in available waterways at much lower cost (by about a magnitude) compared with expanding highway or rail infrastructure.

- CAMH diverts freight and transit systems in congested corridors

- The diversion offers a much safer, more economical, and more secure alternative transportation with significant reduction of congestion cost, highway maintenance cost , reduced fuel use and emissions



CAMH Potentially Combines Ferry and Freight for Multimodal Transportation

Marketing CAMH

Driving Factors for A Business Case

Reliability and cost savings by avoiding congestion delays
Benefits of Freight Diversion
HAZMAT transportation market
Low cost infrastructure investment and reduced road maintenance
Utilizing available water assets
Rejuvenation of smaller ports and less used waterways

Enabling Faster Assessment of Freight Diversion to Marine Highway

The Consortium Study Results Resulted in Tools for Examining Unique Advantages and Benefits for Marine Highway Freight Transportation For First Line Decision Making

- A scalable model that quantifies benefits of a Marine highway system in available waterways , for first-line decision making
- Remote sensing and geospatial information technologies to speed marine highway and infrastructure planning

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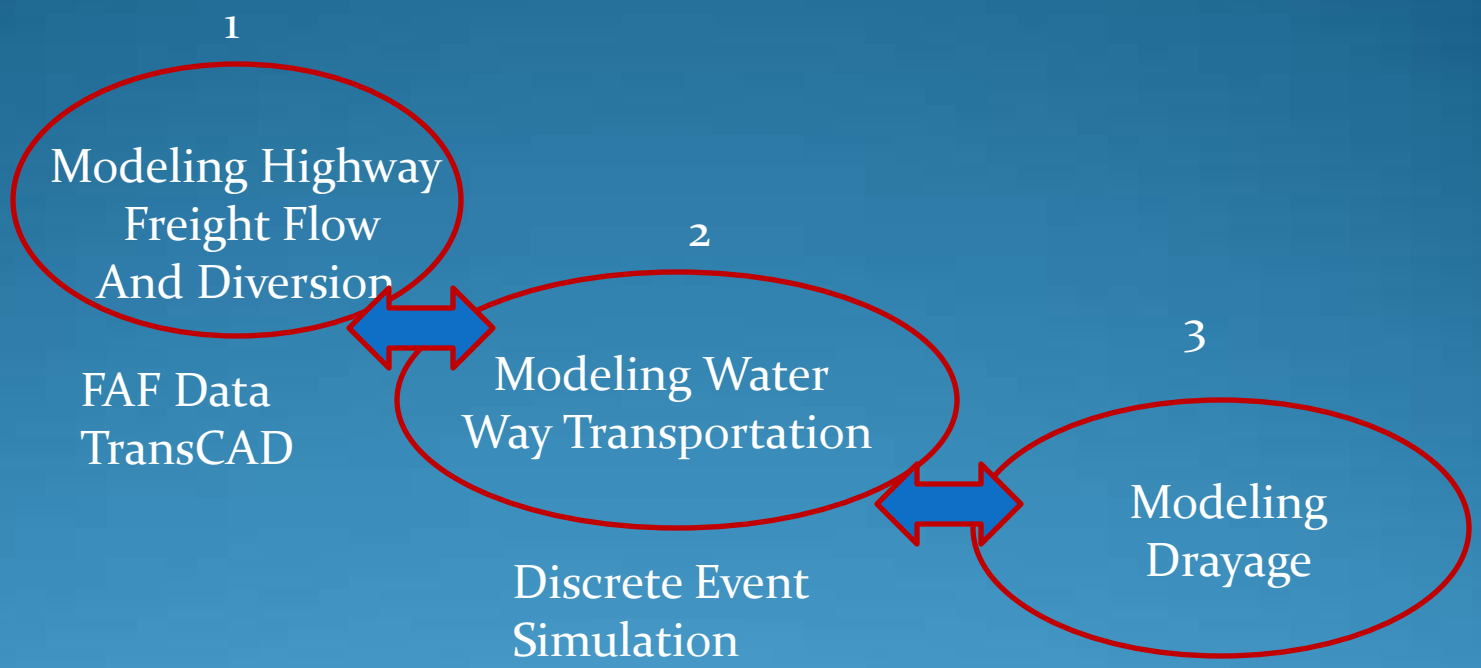
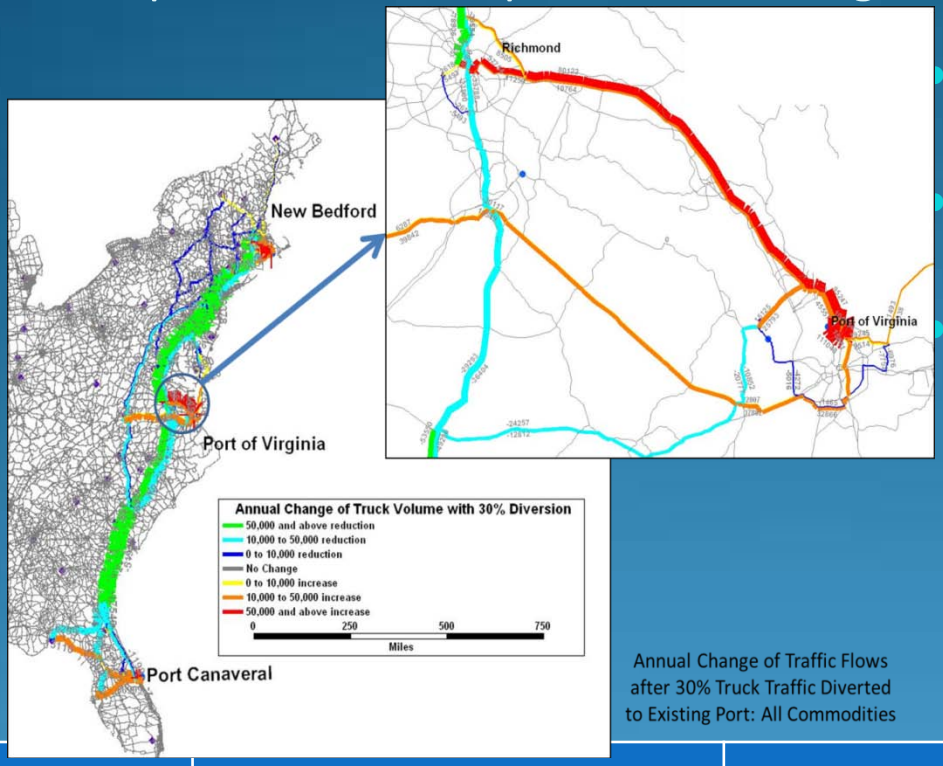
Developing Scalable Models for Freight Diversion



Quantifying Diversion Scenarios

Example: Potential Impact of 30% Freight Diversion to the Port of Virginia



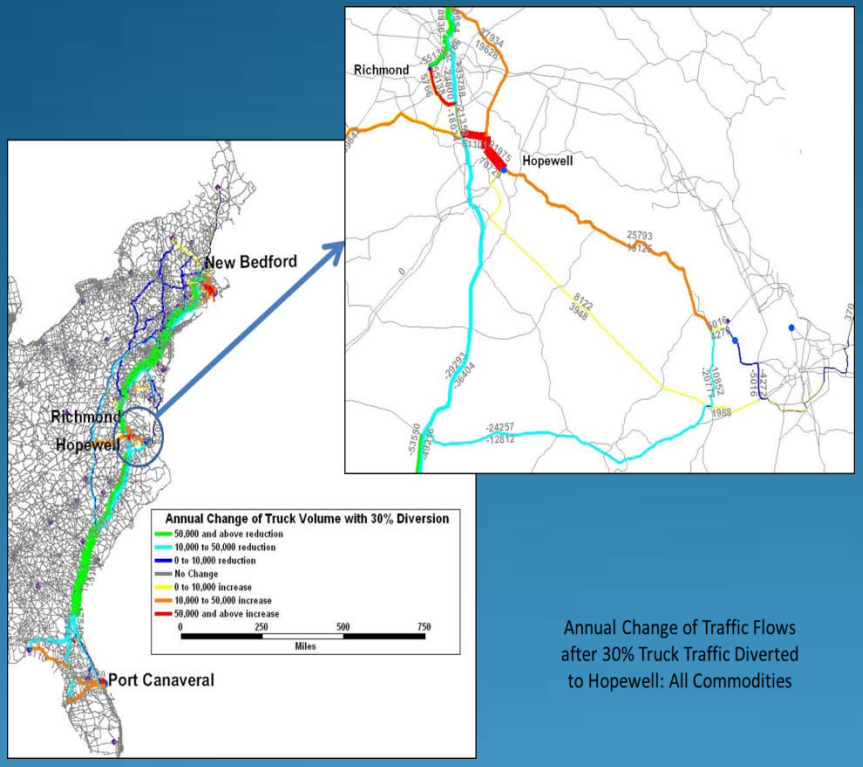
Annual Change of Traffic Flows after 30% Truck Traffic Diverted to Existing Port: All Commodities

- Significant Reduction in Freight in I-95 and most of other major roads
- Increase in truck flows adjacent to the port
- I-64 gets no relief

Corridor	Existing Condition		30% Diversion			
	Truck Flows	Vehicle Miles Traveled (VMT)	Truck Flows	Percentage Change	VMT	Percentage Change
I-95	450,283,166	590,011,030	386,056,400	-14.26%	502,020,167	-14.91%
I-64 (Partial)	39,650,835	39,561,648	48,315,005	21.85%	47,571,287	20.25%

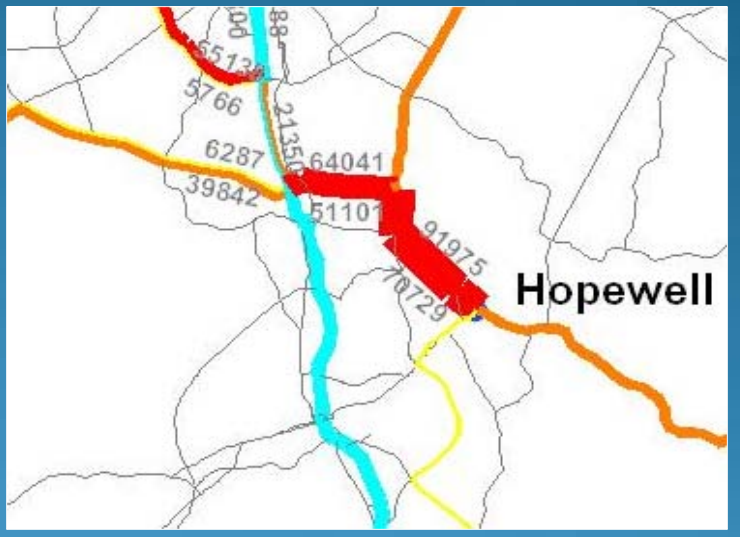
*For I-64, only the segment between Richmond and Port of Virginia is computed

Example for Rejuvenating Smaller Ports
Exploring Freight Diversion to Hopewell Port



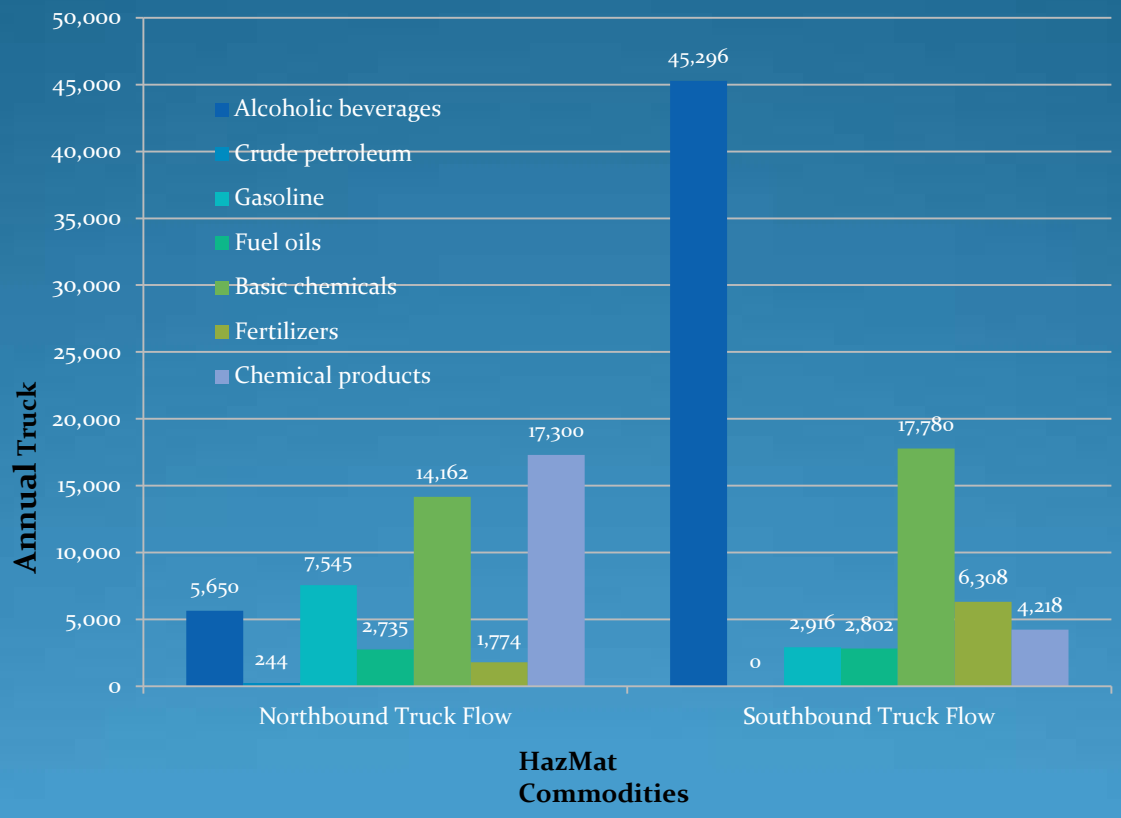
Annual Change of Traffic Flows after 30% Truck Traffic Diverted to Hopewell: All Commodities

- Similar reduction on I-95
- Avoid I-64
- Increase truck volumes on local roads



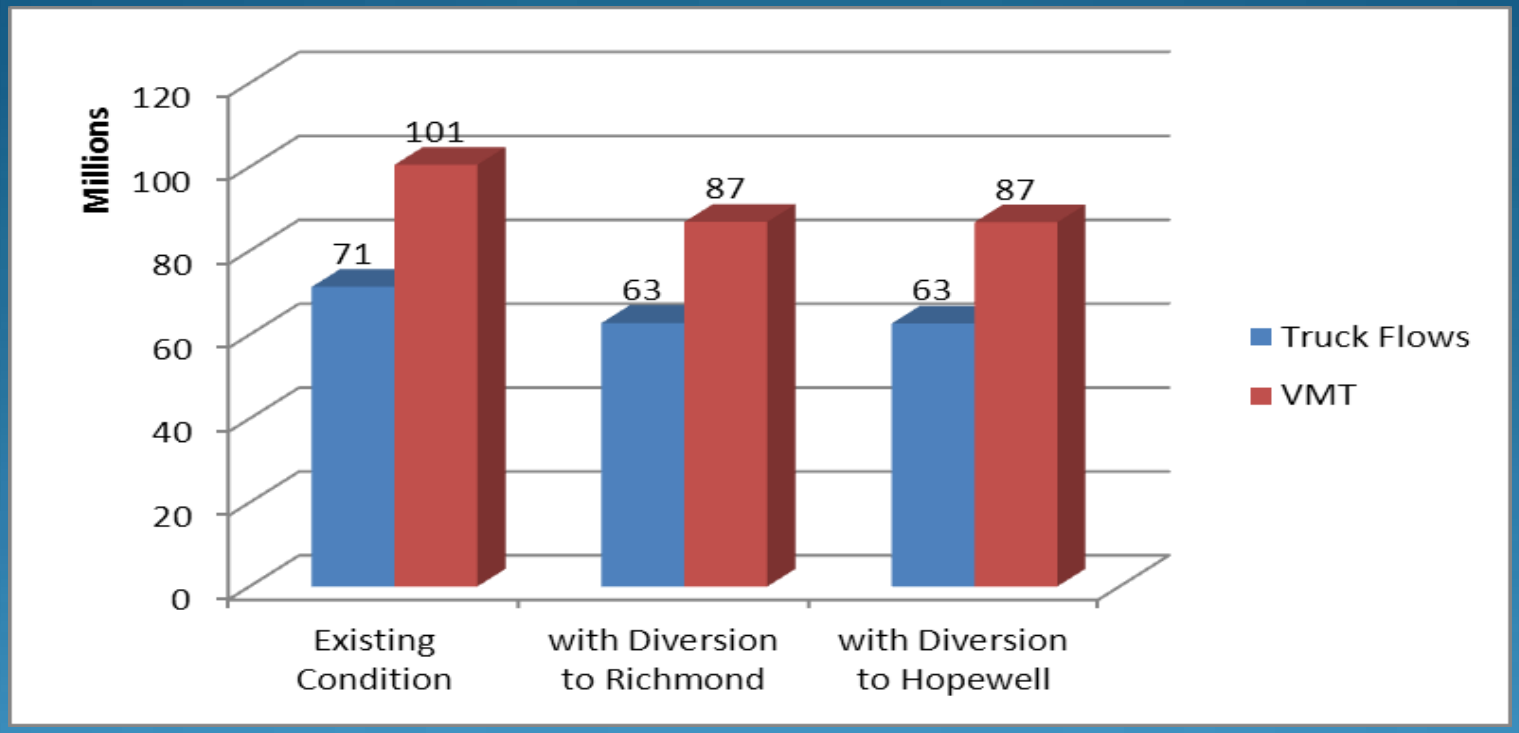
Corridor	Existing Condition		30% Diversion			
	Truck Flows	Vehicle Miles Traveled (VMT)	Truck Flows	Percentage Change	VMT	Percentage Change
I-95	450,283,166	590,011,030	386,597,172	-14.14%	503,286,250	-14.70%
I-64 (Partial)	39,650,835	39,561,648	39,093,363	-1.415	39,336,392	-0.57%

*For I-64, only the segment between Richmond and Port of Virginia is computed



Determining Truck Flows of HazMat

Comparisons of HAZMAT Flow Reduction by Freight Diversion in Virginia



HAZMAT Flows Reduction on I-95

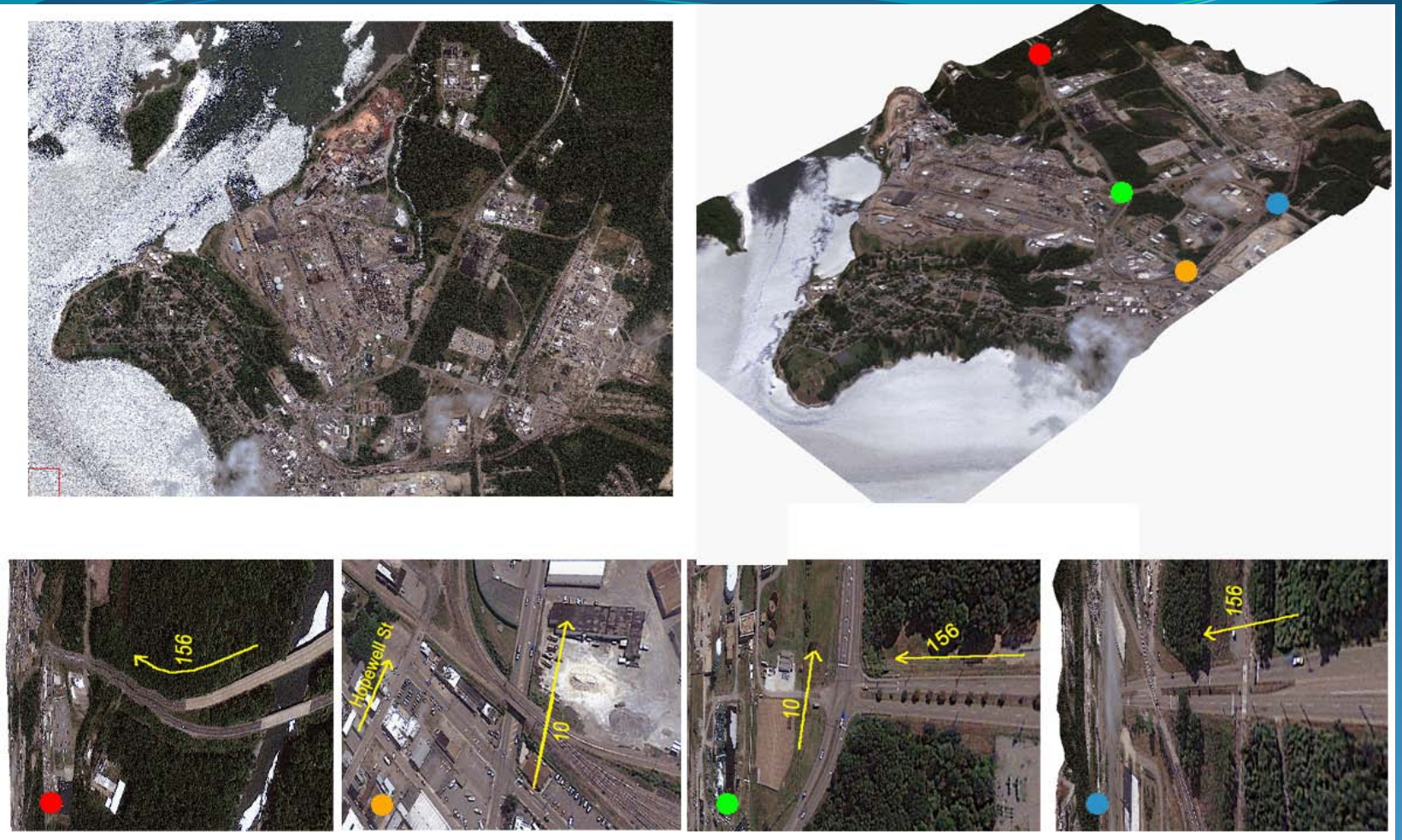
	Richmond	Hopewell
Truck Volumes	-12.01%	-12.25%
VMT	-13.55%	-13.65%

- Both truck volume and VMT decrease with diversion
- More reduction with diversion to Hopewell

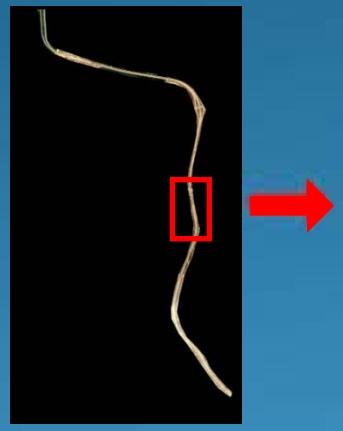
Application of High Resolution Remote Sensing Imagery Tools

Analysis of satellite imagery data for identifying critical factors for rejuvenating smaller ports

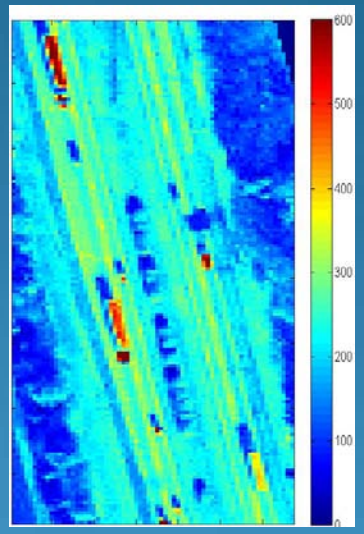
- Identifying location for diverting freight traffic
- Planning of port infrastructure in existing or new ports
- Planning of intermodal linkage



Example of Imagery Analysis Process Used for Exploring Port Suitability (Hopewell Port)



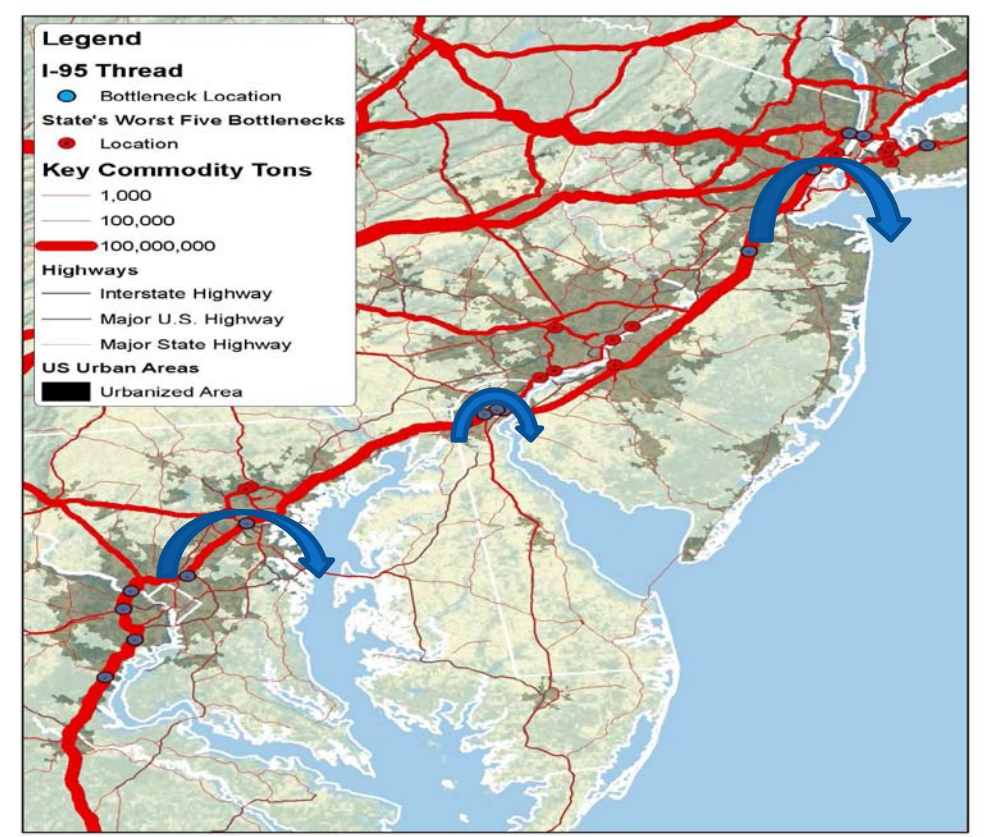
Gray scaled study area



Histogram expanded image

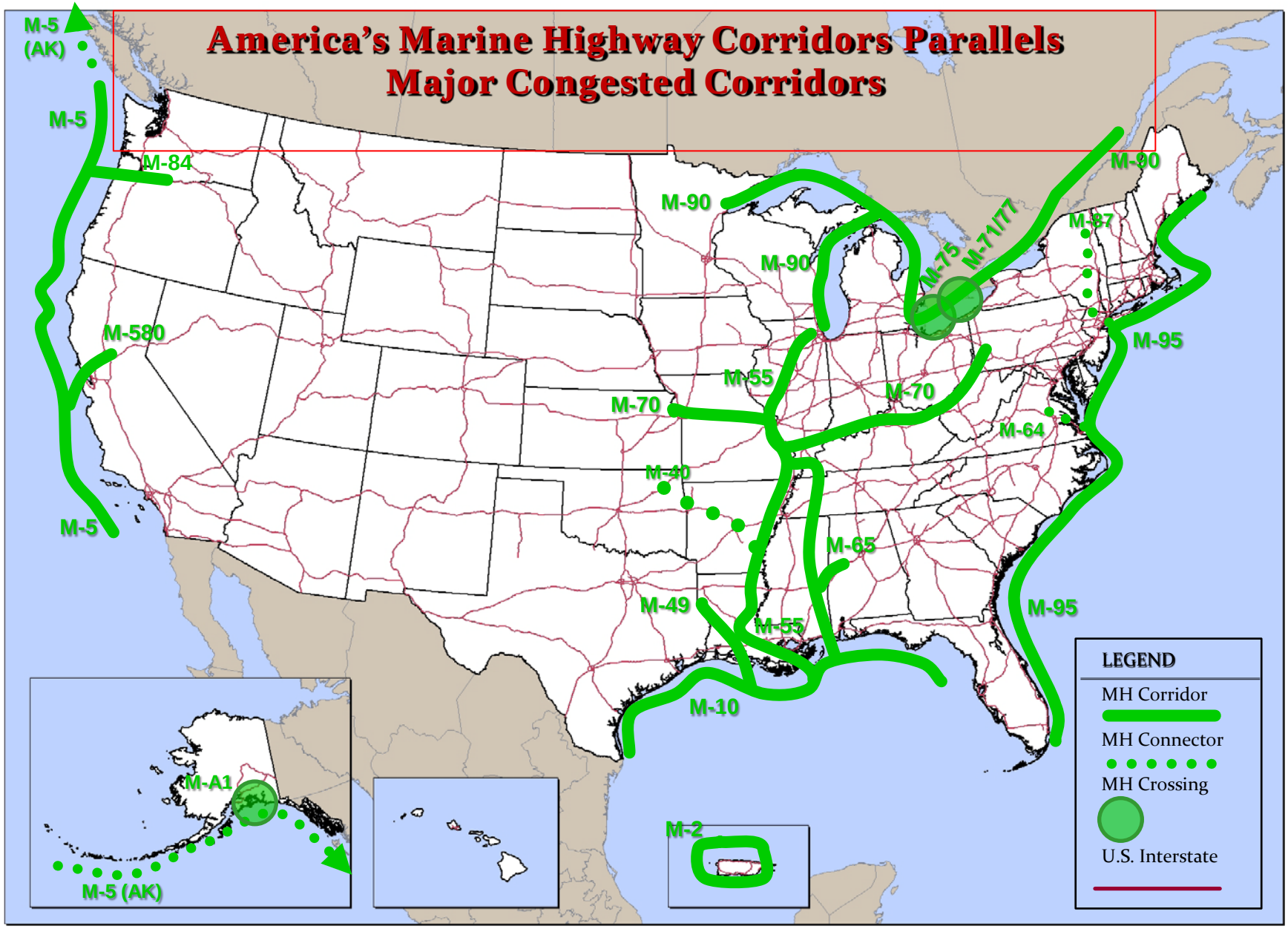
Sample of generating histogram for Evaluating On-Road Freight Traffic

Diversion of Freight for Avoiding Congestion Strings and Freight Bottlenecks in I-95 Corridor

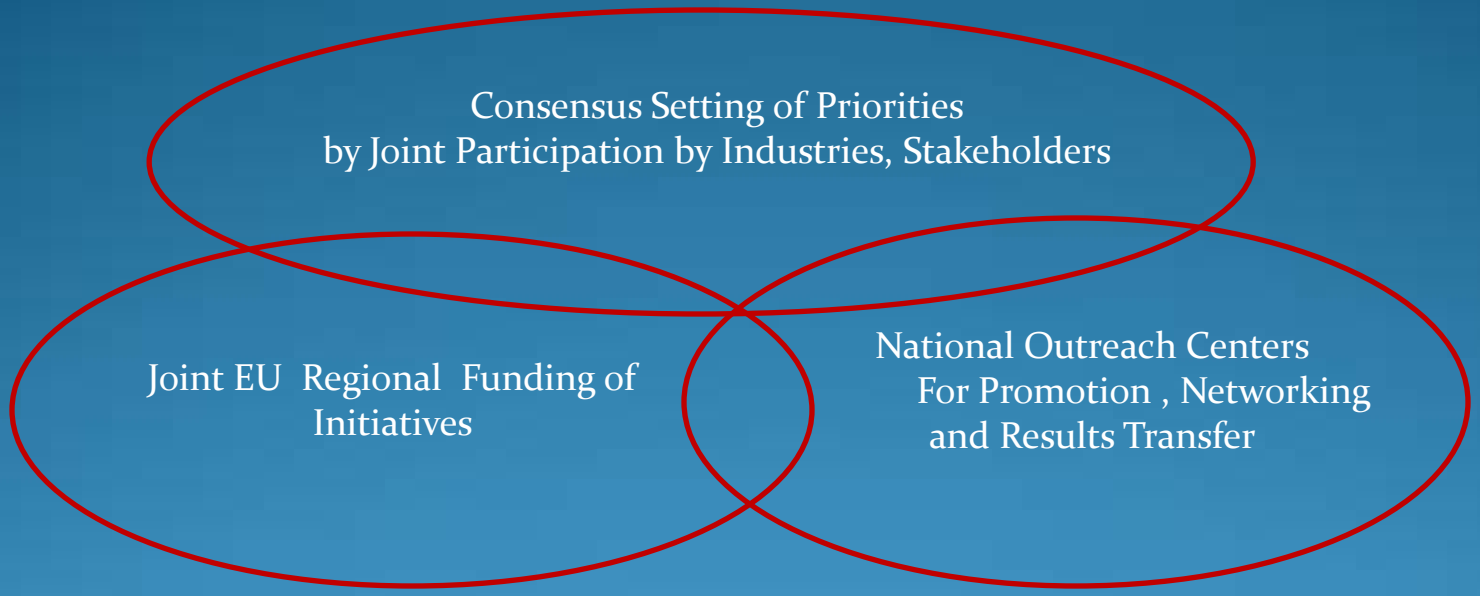


Annual Loss Caused by Congestion Within 30 Freight Miles in Urban New Jersey Exceed Over $170 Million Dollars . Congestion in I-95 Freight Corridor Could Potentially be Avoided by Diverting Freight to Marine Highways Using Several Ports Available in I-95 Corridor

Similar potential exist in reducing the cost of congestion in Virginia (I-95 I-64 between Richmond and Norfolk)


America's Marine Highway Corridors Parallels
Major Congested Corridors
M-5 (AK)
M-5
M-84
M-580
M-5
M-90
M-90
M-75
M-71/77
M-87
M-90
M-95
M-55
M-70
M-70
M-64
M-40
M-65
M-49
M-55
M-95
M-10
M-A1
M-5 (AK)
M-2
LEGEND
MH Corridor
MH Connector
MH Crossing
U.S. Interstate

SUCCESSFUL PARTNERSHIP PROCESS USED BY THE EUROPEAN UNION RO-RO OPERATIONS FOR MODAL MARKET SHIFT



Examples of Major EU -R&D Initiatives

The Macro Polo
Motorways of the Sea
Maritime Space Without Barriers
Blue Belt Pilot Projects

Examples of National Outreach Centers in Europe

Germany, Netherlands, France, Italy, Greece, Croatia, Baltic Countries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PUBLIC PRIVATE PARTNERSHIP MODELS

A successful public-private partnership has one or more federal agencies working together and sharing R&D investment with industry

Examples of Successful Public-Private Research Partnership Models

- DOE- US CAR (Currently US DRIVE) Partnership- A voluntary government industry partnership for advancing automobile technologies
- DOE- 21st Century Truck Partnerships – A Government DOD- DOT- EPA and Industry partnership for advancing truck technology to reduce fuel consumption and emissions
- US DOT-NASA Program Partnership- A partnership for Advancing Technology Application to Transportation
- USDOT- Industry- State Partnerships- A sustained partnership for ITS technology application to transportation
- NSF University- Industry Collaborative Programs and Partnerships in S&T

All successful partnerships are guided by a national committee of experts representing agencies and industry

CAMH

WAY FORWARD

ESTABLISH BUSINESS CASE IN SELECTED CORRIDORS

PROMOTE PUBLIC PRIVATE PARTNERSHIPS

NATIONAL OUTREACH AND MARKETING