

MTS/NAV 2020 FOCUS AREA # 3

MTS

Integration & Management



TEAM MEMBERS

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Guiding FOC

2. **Capability to provide new system components that offer:
INTEGRATED NAVIGATION SYSTEM DESIGN AND MANAGEMENT for the NAV/MTS 2020 Vision -- a safe, efficient, effective, reliable, and environmentally sustainable system.**



The MTS of 2020 should have....

- Tracking network for all floating components and cargo monitoring (air traffic control system for the waterways) (Commercial and recreational) (T,S)
 - ID of security and safety risks for improved inspection
- Route planning system for existing and changing conditions (ETA, routes, alternatives) (T,S)
- Centralized reporting and query system for accessing information on system condition. (T,S)
- Short-term forecasting of changing conditions (T,S)
 - (pool depths, currents, ice-cover, waves)
- Real-time monitoring system wide of hydrologic conditions (instrumentation, channel depths) (T, E)



The MTS of 2020 should have....

- System-scale protocols for transiting constriction points (inland and coastal) (T)
- System alternatives for various classes of vessels (recreational routes) (T,E,S)
- Improve flow conditions at lockage and channel constriction points to improve throughput (T,E)
- All-season navigation and alternatives (ice condition management, flows and water levels) (T,E)
- Bigger capacity, but more environmentally-friendly vessels (E, T)
- More draft capacity in system (T, E)
- Handle More vessels (T,E)
- Improved efficiency, but with no net adverse impact on environment. (E)
- Better linking of MTS and Land-based system (physical, economic, and managerial) (T,E)



OBJECTIVES/GOALS

- 1. Collect and exchange real-time traffic and system condition information between waterway authorities and users for improved transportation efficiency and security.**
- 2. Collect, process, and exchange hydrologic and channel condition information to allow for real-time condition assessment and forecasting (depths, currents, ice-cover, waves).**
- 3. Identify components in the physical system (such as constriction points and seasonal conditions) that compromise system capacity and operation and develop innovative solutions (ice mitigation, alternative routing for various classes of vessels).**
- 4. Optimize trade-off analysis to maintain economic viability and environmental sustainability for system management and changing fleet characteristics.**
- 5. Improve nation-wide economic and policy protocols for transiting constriction points, linking MTS with land system, and prioritizing actions (inland and coastal).**



GENERAL APPROACH/PRODUCTS

- 1. Collect and exchange real-time traffic and system condition information between waterway authorities and users for improved transportation efficiency and security.**
 - Automated data collection and transmission system on every vessel
 - Channel and harbor status monitoring
 - Central processing network
 - Reporting and communication network
 - Data Prioritization and Standards
 - User needs assessment
 - Interagency coordination, protocols, and collaboration.
- 2. Collect, process, and exchange hydrologic and channel condition information to allow for real-time condition assessment and forecasting (depths, currents, ice-cover, waves).**
 - Automated collection capabilities (equipment, technology)
 - Critical-condition reporting system
 - Data transmission & exchange
 - Data standards & protocols & archiving
 - Near real-time surveying & dissemination
 - Data integration with nowcast – forecast models
 - User query system & warning system



GENERAL APPROACH/PRODUCTS

3. Identify components in the physical system (such as constriction points and seasonal conditions) that compromise system capacity and operation and develop innovative solutions (ice mitigation, alternative routing for various classes of vessels).

- Query MTS users (tow operators, ship masters, port authorities) and review historical data (i.e, ice jam data base, USCG incident reports, etc.) to ID constriction point and problem conditions.
- Operational changes to improve flow conditions for navigation for system sectors.
- Demonstrations of technology for cost-savings and improved operational efficiencies at constriction points...tie in to alternative traffic routing options and real-time warning system.
- System-wide analysis tools....develop combined models (1-D, 2-D, and 3-D) including navigation simulations that cross District and Project boundaries.
- Pilot Study(ies) to demonstrate potential improved efficiencies (tie traffic data with waterway condition models).



GENERAL APPROACH/PRODUCTS

- 4. Optimize trade-off analysis to maintain economic viability and environmental sustainability for system management and changing fleet characteristics.**
 - Tools for assessing the correlation between navigation efficiency and environmental effects.
 - System-wide analysis demonstrations to include interdisciplinary assessments.
 - Nation-wide consistent standards for developing trade-off analyses.
 - Integration of interagency data and prioritization.
 - Analysis of future fleet and system demands.
- 5. Improve nation-wide economic and policy protocols for transiting constriction points, linking MTS with land system, and prioritizing actions (inland and coastal).**
 - Demonstrations of technology for cost-savings and improved operational efficiencies at constriction points.
 - Develop Nation-wide consistent standards for assessing system performance and project need.
 - Interagency coordination to define transportation network performance and needs (rail, road, nav).



PRIMARY PRODUCTS

- 1. Real-time traffic and condition monitoring and reporting network.**
- 2. System-wide, integrated navigation, hydraulic, economic and environmental assessment models.**
- 3. Nation-wide evaluation standards.**
- 4. Interagency and User Data Exchange for system operation and future decision-making.**
- 5. USACE participation in interagency forums to evaluate and improve transportation network performance (rail, road, nav).**
- 6. National Demonstration/Pilot Study Program.**



SUB-TASK #1

- **Description:** Navigation Traffic Control System
- **Approach:** Collect and exchange real-time traffic and system condition information between waterway authorities and users for improved transportation efficiency and security.
- **Products:**
 - Automated data collection and transmission system on every vessel
 - Channel and harbor status monitoring
 - Central processing network
 - Reporting and communication network
 - Data Prioritization and Standards
 - User needs assessment
 - Interagency coordination, protocols, and collaboration



SUB-TASK #2

- **Description:** Navigation Condition Status Reporting Network
- **Approach:** Collect, process, and exchange hydrologic and channel condition information to allow for real-time condition assessment and forecasting (depths, currents, ice-cover, waves).
- **Products:**
 - Automated collection capabilities (equipment, technology)
 - Critical-condition reporting system
 - Data transmission & exchange
 - Data standards & protocols & archiving
 - Near real-time surveying & dissemination
 - Data integration with nowcast – forecast models
 - User query system & warning system



SUB-TASK #3

- **Description:** Component Assessment for System Improvement.
- **Approach:** Identify components in the physical system (such as constriction points and seasonal conditions) that compromise system capacity and operation and develop innovative solutions (ice mitigation, alternative routing scenarios).
- **Products:**
 - MTS user assessment (tow operators, ship masters, port authorities) and historical data review (i.e, ice jam data base, USCG incident reports, etc.) to ID constriction point and problem conditions.
 - Operational changes to improve flow conditions for navigation for system sectors.
 - Demonstrations of technology for cost-savings and improved operational efficiencies at constriction points...tie in to alternative traffic routing options and real-time warning system.
 - System-wide analysis tools....develop combined models (1-D, 2-D, and 3-D) including navigation simulations that cross District and Project boundaries.
 - Pilot Study(ies) to demonstrate potential improved efficiencies (tie traffic data with waterway condition models).



SUB-TASK #4

- **Description:** System Requirements & Performance Balance.
- **Approach:** Optimize trade-off analysis to maintain economic viability and environmental sustainability for system management and changing fleet characteristics.
- **Products:**
 - Tools for assessing the correlation between navigation efficiency and environmental effects.
 - System-wide analysis demonstrations to include interdisciplinary assessments.
 - Nation-wide consistent standards for developing trade-off analyses.
 - Integration of interagency data and prioritization.
 - Analysis of future fleet and system demands.



SUB-TASK #5

- **Description:** Nation-wide Evaluation Standards.
- **Approach:** Improve nation-wide economic and policy protocols for transiting constriction points, linking MTS with land system, and prioritizing actions (inland and coastal).
- **Products**
 - Demonstrations of technology for cost-savings and improved operational efficiencies at constriction points.
 - Nation-wide consistent standards for assessing system performance and project need.
 - Interagency coordination to define transportation network performance and needs (rail, road, nav).



PRODUCT BENEFITS

MORE.....

- **EFFICIENT AND EFFECTIVE**
- **SAFE**
- **SECURE**
- **ENVIRONMENTALLY COMPLIANT**
- **SUSTAINABLE**

**.....INTEGRATED NAVIGATION SYSTEM
OPERATION REQUIRING LESS NEW PROJECT SPECIFIC
CONSTRUCTION**

