FREIGHT DATA

STATE AND MEGAREGIONS

Rickey Fitzgerald, *Florida Department of Transportation*
(Moderator)

TRANSPORTATION DATA SYMPOSIUM

FDOT

Freight Advanced Traveler Information System (FRATIS)

Background and Overview

Dr. Sam Fayez, Productivity Apex

TRANSPORTATION DATA SYMPOSIUM

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DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA

PRODUCTIVITY APEX INC

Current Freight Operations Environment

Road Congestion

Poor Efficiency

Carbon Foot Print

Long Lines

Energy Consumption

Driver Utilization

Negative Impact

Safety

Public Assets

TRANSPORTATION DATA SYMPOSIUM

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Current Freight Operations Practices

Pure Chance

Advanced Data Driven Planning & Execution

TRANSPORTATION DATA SYMPOSIUM

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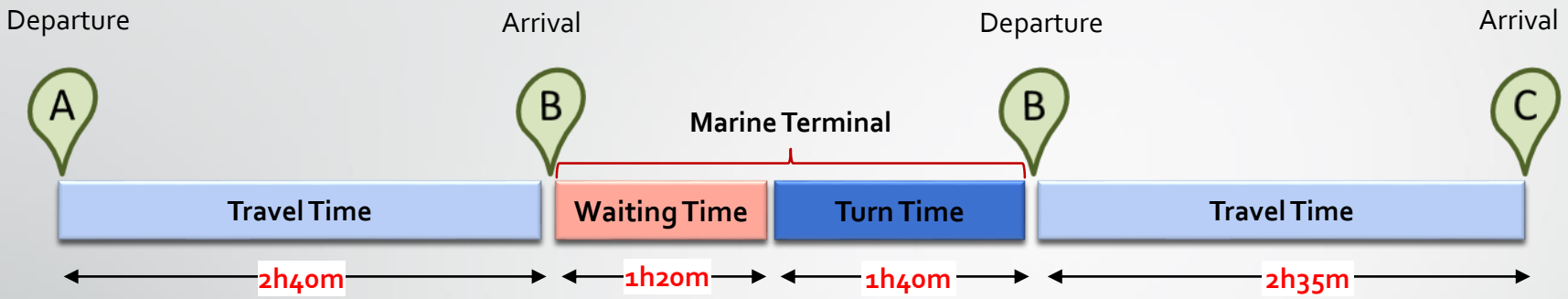
Freight Operations with Limited or No Data



8 hr.15 min.

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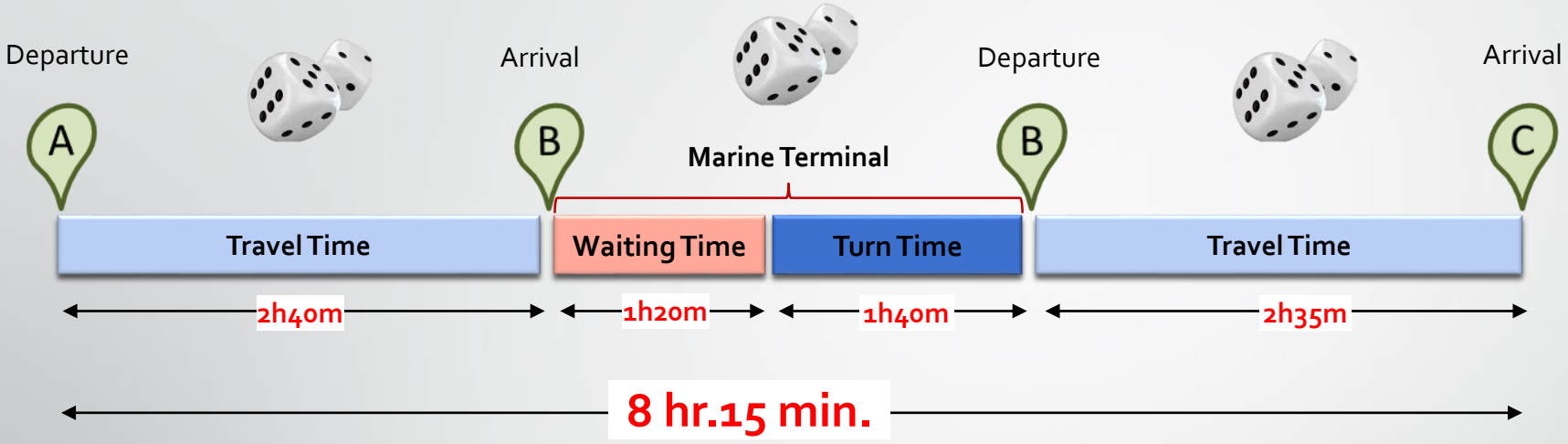

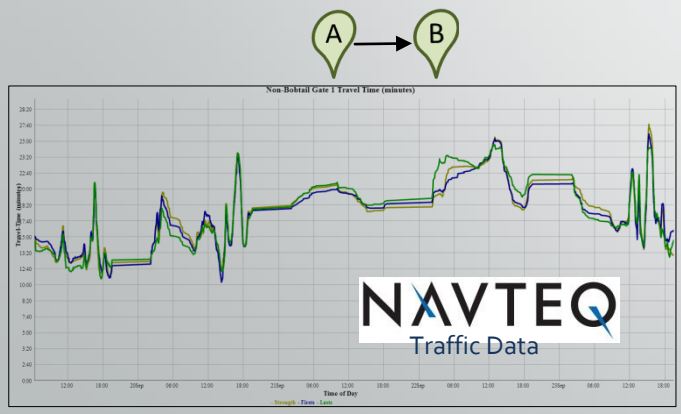

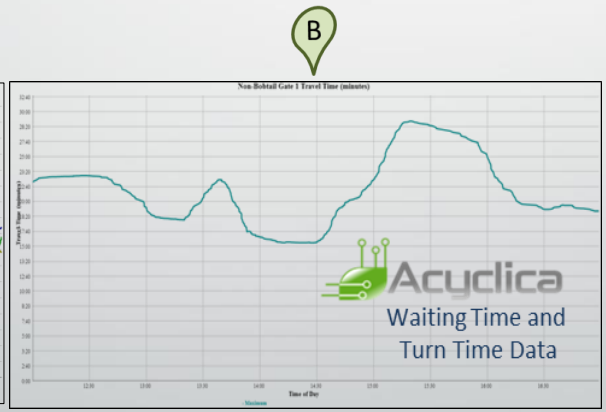

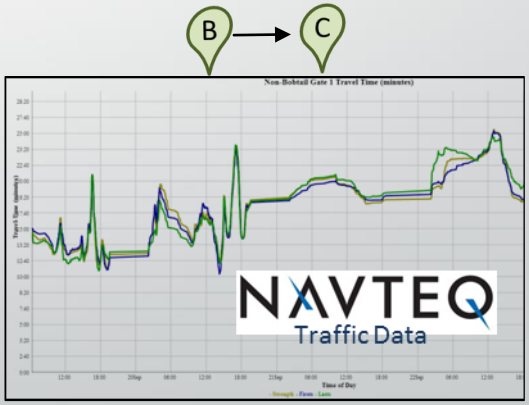

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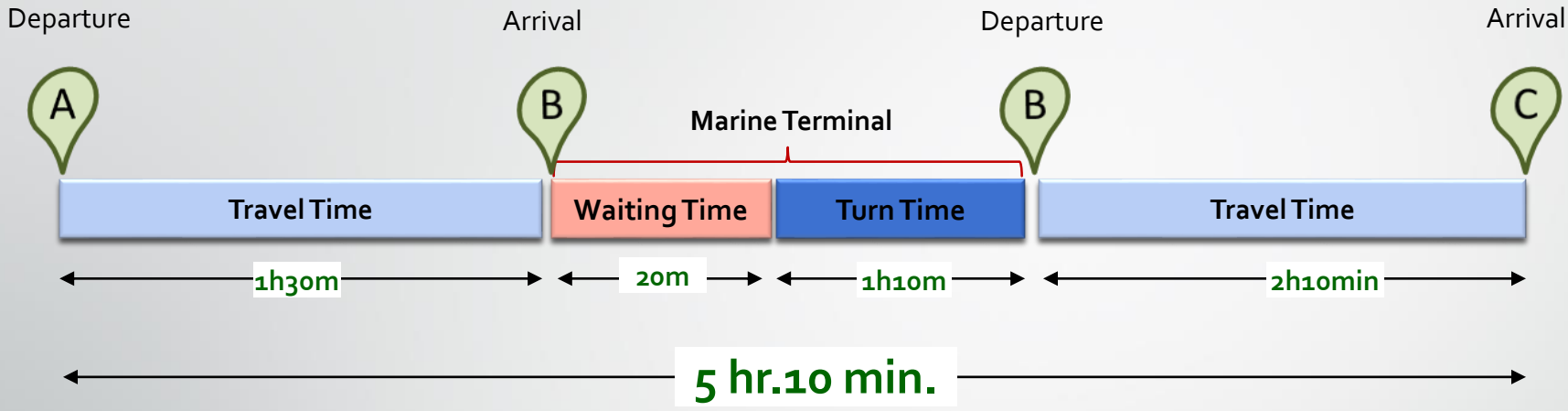
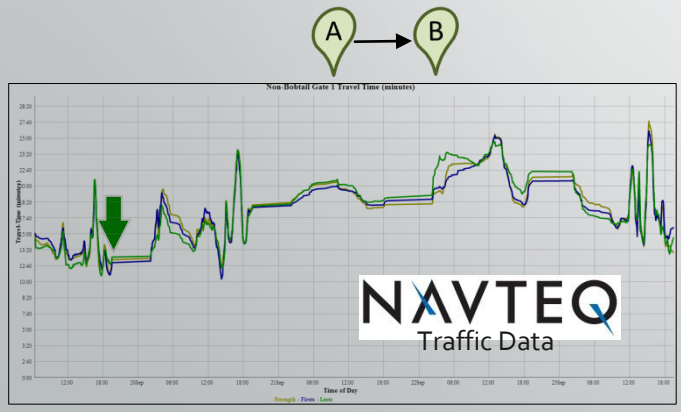
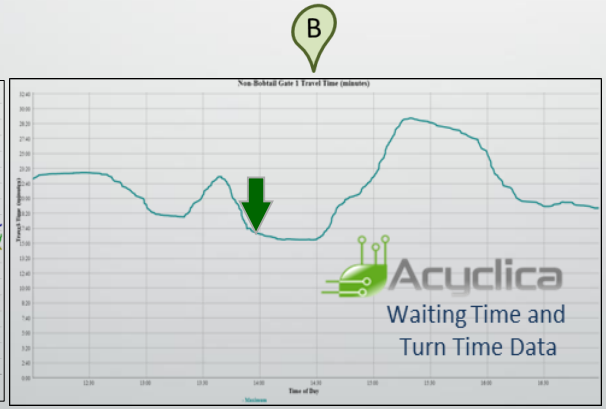
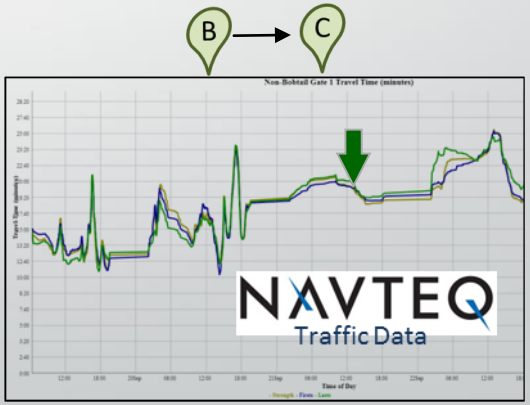
Freight Operations with Data Driven Planning and Execution









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Data and Technology Challenges

Google maps

INRIX TRAFFIC

MPO

TOMTOM

android

navis®

TRINIUM Trucking Systems

NAVTEQ™

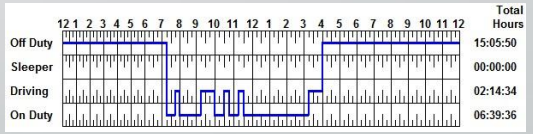
Acyclica

bing™

TMW SYSTEMS

WeatherBug®

511 Travel Info



HDT HEAVY DUTY TRUCKING Truckinginfo

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A Potential Solution: FRATIS

- **Freight-Specific Dynamic Travel Planning and Performance**
  - *Enhances traveler information systems to address specific freight needs*
  - *Integrates data on wait times at intermodal facilities (e.g. ports), traffic conditions, incident alerts, road closures, work zones, routing restrictions (hazmat, oversize/overweight)*
  - *Adaptive Communication between Drayage Company, Drivers, Intermodal Facilities, MTOs, and BCOs*
  - *Real-time Information and Dynamic Routing for Drivers*

A Potential Solution: FRATIS

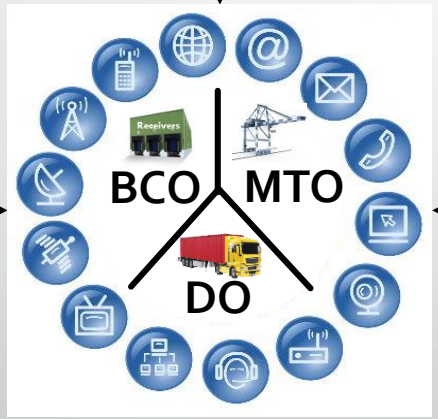
- **Drayage Optimization**
  - *Optimize truck/load movements between freight facilities, balancing early and late arrivals.*
  - *Individual trucks are assigned best time windows for pick-up or drop-off.*
  - *Utilizes travel information and information on port terminal conditions to optimize operations.*

FRATIS Modules

Planning

Execution

Monitoring



Communication

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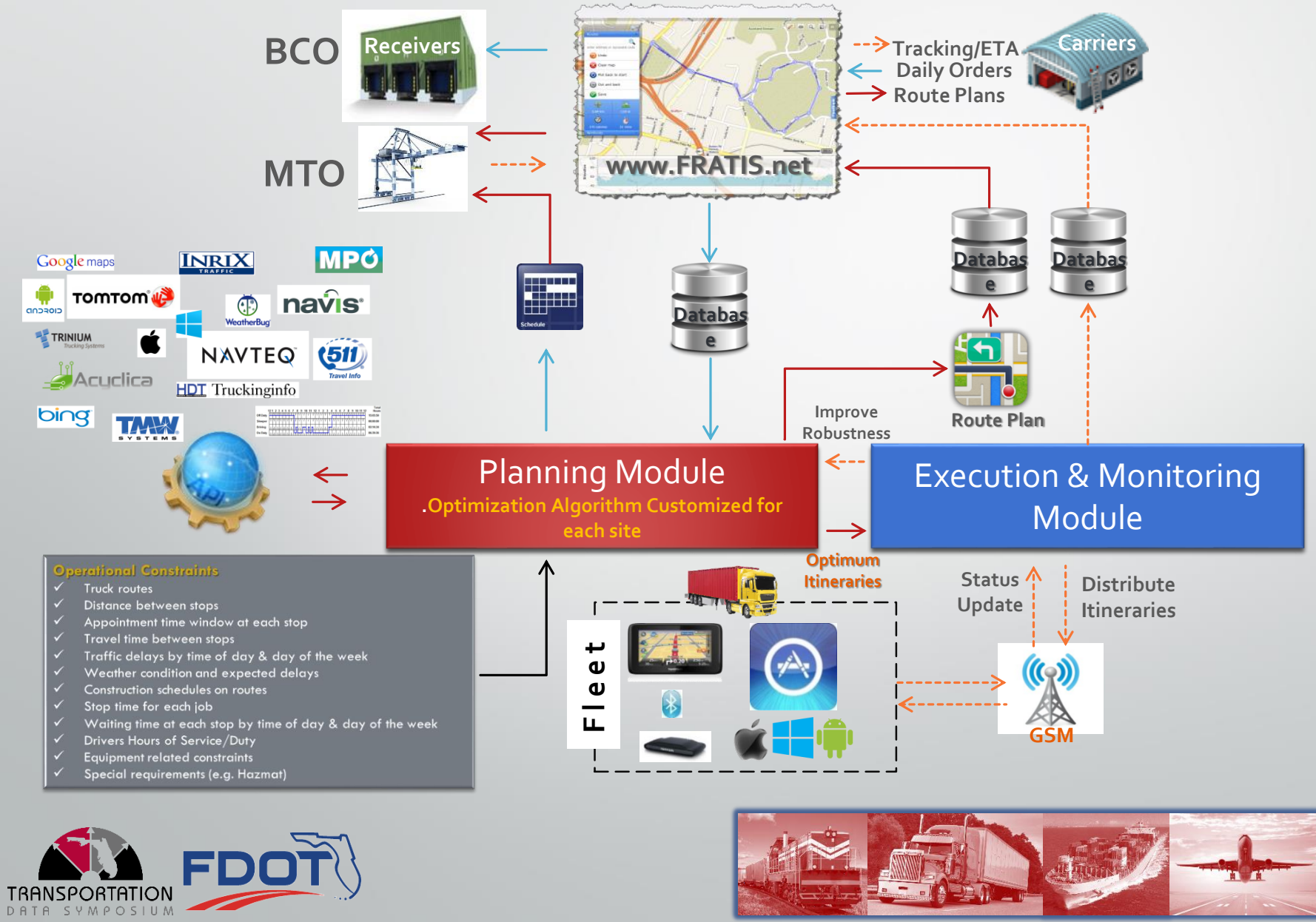
FRATIS Architecture



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Constraints

Operational Constraints

- ✓ Truck routes
- ✓ Distance between stops
- ✓ Appointment time window at each stop
- ✓ Travel time between stops
- ✓ Traffic delays by time of day & day of the week
- ✓ Weather condition and expected delays
- ✓ Construction schedules on routes
- ✓ Stop time for each job
- ✓ Waiting time at each stop by time of day & day of the week
- ✓ Drivers Hours of Service/Duty
- ✓ Equipment related constraints
- ✓ Special requirements (e.g. Hazmat)

Generated Optimal Plan

Optimized Solution (User-Modifiable)

Send to WebFleet

Plan Performance Measures

Modified Plan $5,115.27

Orders:	30
Total Time:	113:40
Total Miles:	1240.00
Total Bobtail Miles:	568.00
Total Time:	113:40
Driving Time:	28:12
Stop Time:	64:00
Waiting Time:	00:53

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Drivers Itinerary

Driver	Distance	Jobs				
Francisco Arias	31.00 mi	1125816	1125218-I	1125371	1125847	1125847-E
Aram Boyadjian	177.00 mi	1125182	1125241			
Dillon Bruno	97.00 mi	1125547	1125661	1125661-E	1125620	1125309
Cesar Cabuyales	155.00 mi	1125548	1125546	1125720	1125720-E	
Suren Khachatryan	168.00 mi	1125545	1125308	1125644		
Ruben Lemus	153.00 mi	1125544	1125415-E	1125634-E	1125634	1125620-E
Jesus Gutierrez	85.00 mi	1125300				
Bert Hernandez	173.00 mi	1125133	1125184			
Sergio Mendez	201.00 mi	1124728	1125385	1125542		
New Driver	0.00 mi					

Drivers with Assignments: 9

Accept Plan and Send to WebFleet

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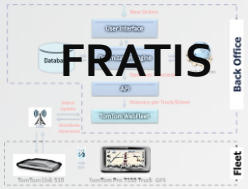
MTO and Drayage Operator Exchange of Information Elements of the FRATIS System

Drayage Fleet Operators (DO's)



Marine Terminal Operators (MTO's)

Container information message is sent from DO to MTO once order information entered in the order management system

Container availability message is sent from MTO to DO once the container is cleared from customs and become ready for pickup

Truck ETA message is sent from DO to MTO one day before a container is to be picked up off at MT, ETA is based on traffic historical data.

Truck ETA message is sent from DO to MTO once the truck start heading to the MT, ETA is based on real time traffic data.

MTO uses truck ETA information to support estimation of labor and equipment orders; and stacking preparation

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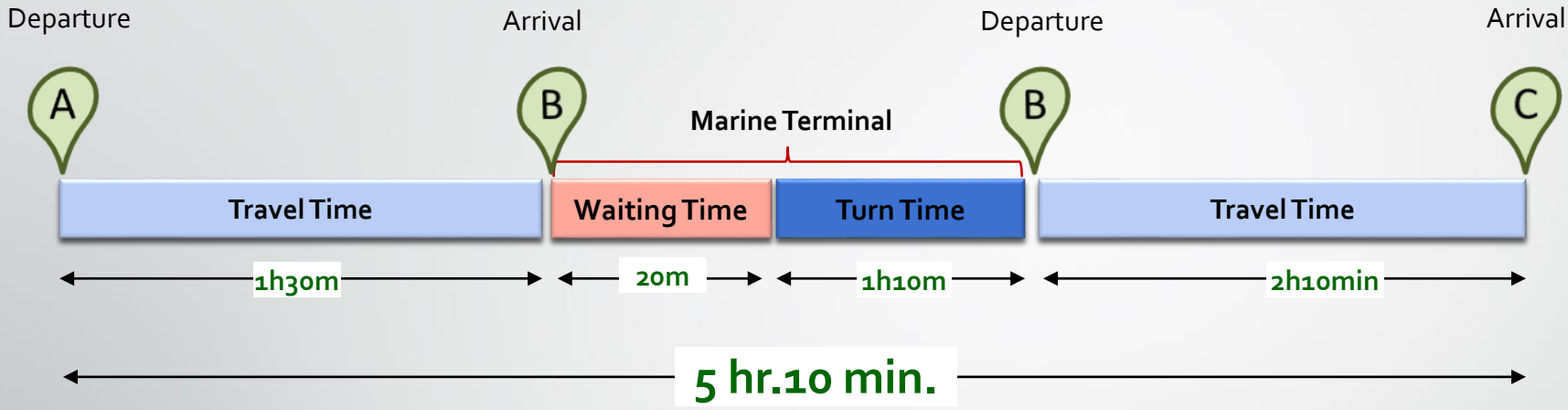
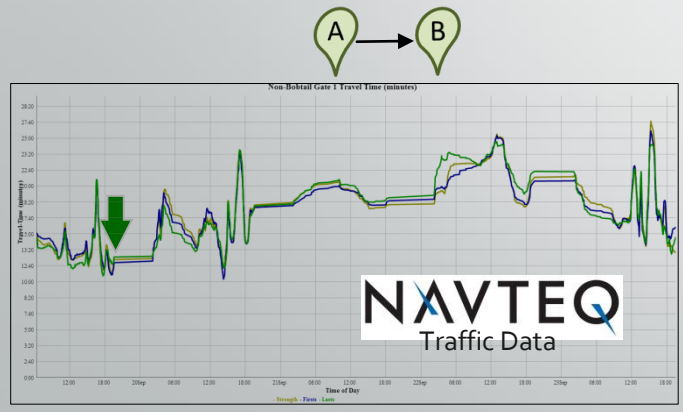
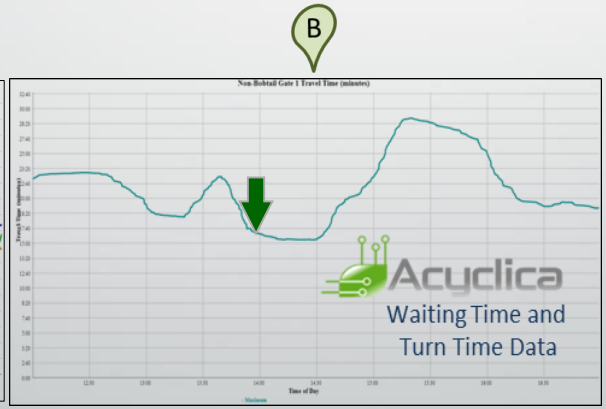
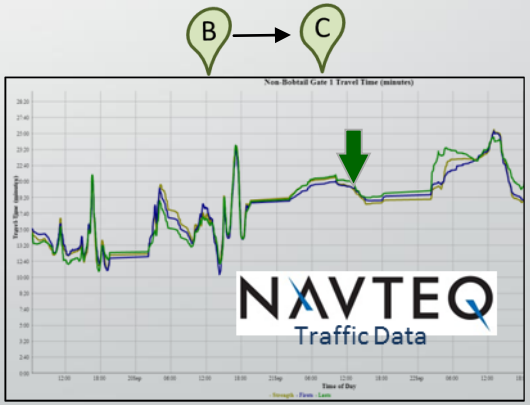
Freight Operations with Data Driven Planning and Execution: Optimum Plans









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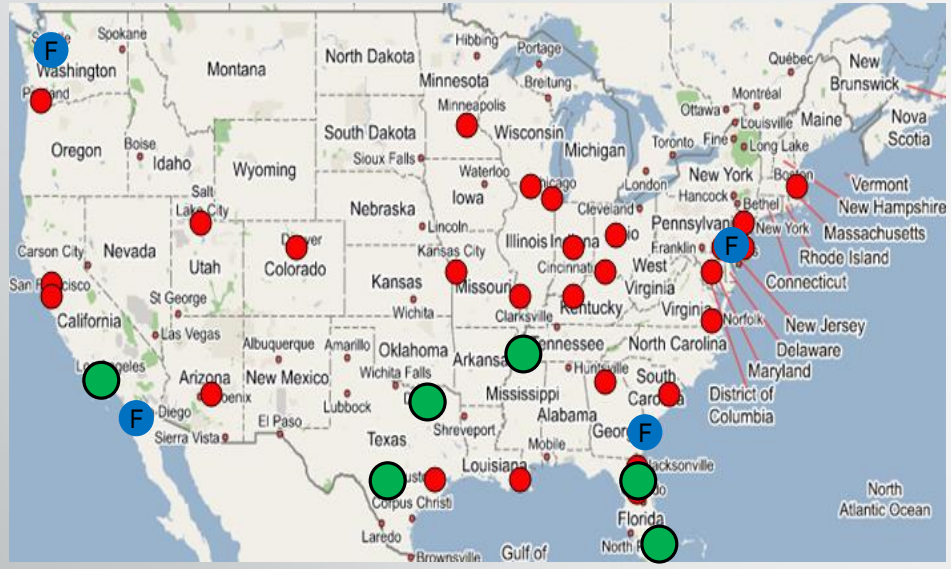
Implementation Results



- Identified FRATIS Sites
- Completed and In-Progress Sites
- Potential Future Sites

Average Improvements and Operational Impacts:

Fleet Productivity: **16%**

Orders/Truck Increase: **9%**

Total Miles Reduction: **1%**

Unproductive Miles Reduction (Bobtail Miles): **12%**

Fuel Consumption Improvement : **8%**

Emission Reduction: **10%**

Driving Time Utilization % Improvement: **15%**

Total Time Utilization % Improvement: **16%**

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THANK YOU !

FRATIS: Route Optimization Strategy (Micro level)

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Up Next:

Transportation Statistics Freight Data

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