

The Future of NYS Ferry System

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**Transportation Technology Symposium
Innovative Mobility Solutions**

**November 15, 2016
New York Institute of Technology
1871 Broadway, New York, NY 10023**

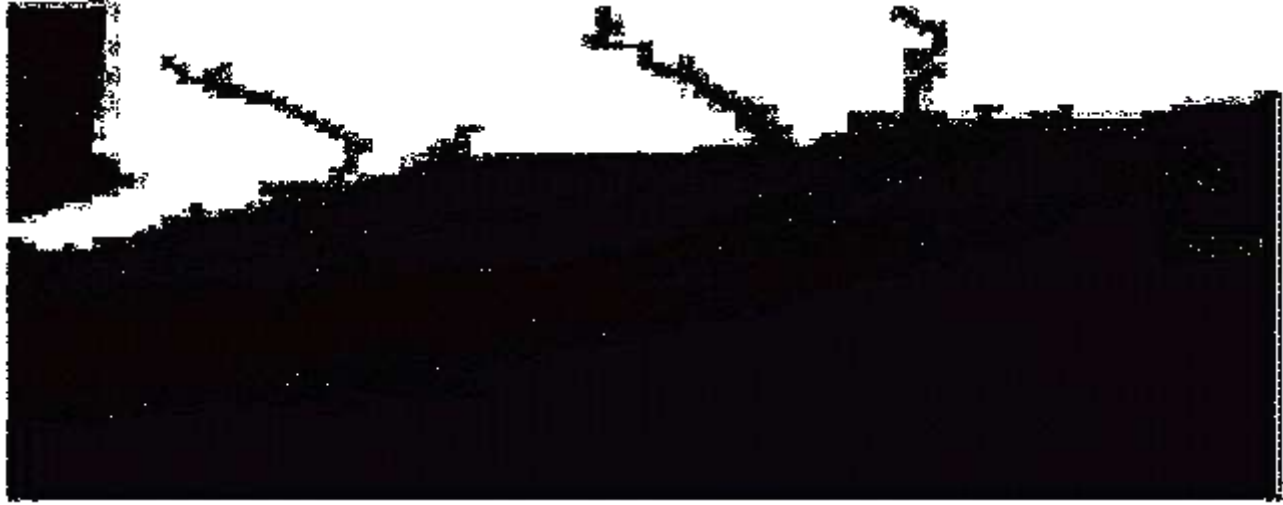
Acknowledgments

- **Dick Beers, FHWA NY**
- **R. Epstein, Assistant Commissioner, NYSDOT**
- **D. Kenneally, Office of Integrated Modal Services, NYSDOT**
- **T. Vaughan, Public Transportation Bureau, NYSDOT**
- **A. Muro, AVAIL, University at Albany**
- **P. Tomchik, AVAIL, University at Albany**
- **J. Tirado, AVAIL, University at Albany**

Current NYS Ferries System Magnitude & Demand

- **Historically one of the largest ferry system in nation;**
- **Largest annual ridership in nation;**
- **One of the largest number of ferry operators, ferry landings/ terminals, routes and number of boats in service;**
- **Three major routes with interstate highway connections with significant vehicular traffic;**
- **Ferry spreads across all NYS:**
 - **NYC Harbor;**
 - **Long Island;**
 - **Hudson Valley;**
 - **Upstate North;**
 - **Upstate West**

NYS Ferry System: LI/ Hudson Valley/ Lake Champlain



NYC Harbor Statistics

(well-known operators)

Operator	Ridership 2014	Ridership 2015	NYS Trip origin 2015	Other States origin	# of Routes* (*NCFO designation)	# of NYS Landings/ Terminals
NYCDOT Staten Island ferry	21,911,536	23,066,963	23,066,963	none	2	2
NYWaterway & Billy Bey (w/o East River)	7,121,466	7,065,511	3,532,756	3,532,756	34	3 (WFC, Pier 11, W39th Str.)
NYWaterway (East River)	1,284,632	1,467,860	1,467,860	none	12	7* *6 new
Seastreak	878,955	935,693	467,846	467,846	6	2* *0 new
Liberty Water Taxi	232,171	224,402	112,201	112,201	2	1* *0 new
NY WaterTaxi	645,065	626,306	626,306	none	12	8* *6 new

NYC Harbor Statistics

(additional operators)

Operator	Ridership 2014	Ridership 2015	NYS Trip origin 2015	Other States origin	# of Routes	# of NYS Landings/ Terminals
NPS (Liberty/ Ellis Island)	12,596,499	12,837,060	10,574,217	2,262,843	3	3
Governors Island	576,897 12,863 (auto)	576,788 12,018 (auto)	576,788 12,018 (auto)	none	2	2
Total NYC Harbor	45,247,221 12,863 (auto)	45,247,221 12,081 (auto)	40,424,937 12,081 (auto)	6,375,646		22



Long Island Ferry System (intrastate)

Operator	Ridership 2013	Ridership 2014	NYS Trip origin 2013	Other States origin 2013	# of Routes* (*NCFO designation)	# of NYS Landings/ Terminals
Fire Island Ferries, Inc.	1,800,000		1,800,000	none	14	8
Fire Island Ferries, Water Taxi	84,149	80,214	84,149	none	14	8* *0 new
Sayville Ferry Service	434,388		434,388	none	8	5
Davis Park Ferry, Co.	56,950		56,950	none	4	4
Bay Point Navigation Corp.				none	2	2
North Ferry Company, Inc.	1,345,288 732,234(auto)		1,345,288 732,234(auto)	none	2	2
South Ferry, Inc.	1,142,884 719,302 (auto)		1,142,884 719,302(auto)	none	2	2

Long Island Ferry System (interstate)

Operator	Ridership 2013	Ridership 2014	NYS Trip origin 2013	Other States origin 2013	# of Routes* (*NCFO designation)	# of NYS Landings/ Terminals
Cross Sound Ferry Services Inc.	1,099,820 425,000 (auto)	1,126,000 462,000 (auto)			2	1
Bridgeport Port Jefferson Steamboat Co.	1,000,000 426,000 (auto)				2	1
Fishers Island Ferry District	125,398 38,610 (auto)				2	1
Viking Superstar*					4	1
Total LI	7,088,877 2,341,146 (auto)		5,976,269 1,896,341 (auto)	1,112,610 444,805 (auto)		27

Hudson Valley & Upstate Ferry System

Operator	Ridership 2013	Ridership 2014	NYS Trip origin 2013	Other States origin 2013	# of Routes* (*NCFO designation)	# of NYS Landings/ Terminals
NY Waterway (Haverstraw- Ossining & Newburgh- Beacon)	194,001		194,001	none	4	4
Lake Champlain Transportation Co.* (*est.)	1,700,000 1,060,000 (auto)		850,000 530,000 (auto)	850,000 530,000 (auto)	6	3
Fort Ti Ferry* (*est.)	25,000 15,000 (auto)		12,500 7,500 (auto)	12,500 7,500 (auto)	2	2
Horne's Ferry, Ltd.* (*est.)	60,000 20,000 (auto)		30,000 10,000 (auto)	30,000 10,000 (auto)	2	2
Chautauqua Lake Historic Vessel, Co.	20,400 5,000 (auto)		20,400 5,000 (auto)	none	2	2
Queen City Bike Ferry (Canalside- Outer harbor)		55,000 (New in 2015)		none	2	2

Summary: Current NYS Ferry System in Numbers

- Annual number of passengers trips generated in NYS (around): **47.5M**
- 40.425M (NYC)+ 6.0M (LI)+ 1.1M (upstate)
- Annual number of vehicles auto trips generated in NYS (around): **2.5M**
- 13.8K (NYC)+ 1,900K (LI)+ 560K (upstate)
- Number of ferry operators: **24**
- Number of landings/ terminals: **62**
- 22 (NYC)+ 27 (LI)+ 13 (upstate)
- Number of boats (about): **140**

What's upcoming:

- Glen Cove ferry;
- Lewiston/ Youngstown to Niagara on the Lake, Canada

Current NYS Ferries System Workforce Supply & Outcome

NYS traditionally provides strong supply of workforce for maritime industry:

Maritime institutions:

- **USMMA, Kings Point**
- **SUNY Maritime, Bronx, NYC**
- **Webb Institute, Glen Cove**

Major engineering institutions:

- **SUNY Buffalo;**
- **Cornell/ Clarkson/ RPI/ Columbia, Cooper Union**

Outcome:

- **Number of boats built in NYS in latest decades (SIF, NY Waterway, Seastreak, Hornblower NPS, Hornblower citywide ferries): 0**
- **Number of shipyards in NYS: 1 (new construction-Derecktor) & 2 (dry dock & repair)**

Future of the Ferries & Future of Maritime Job Market for NYS

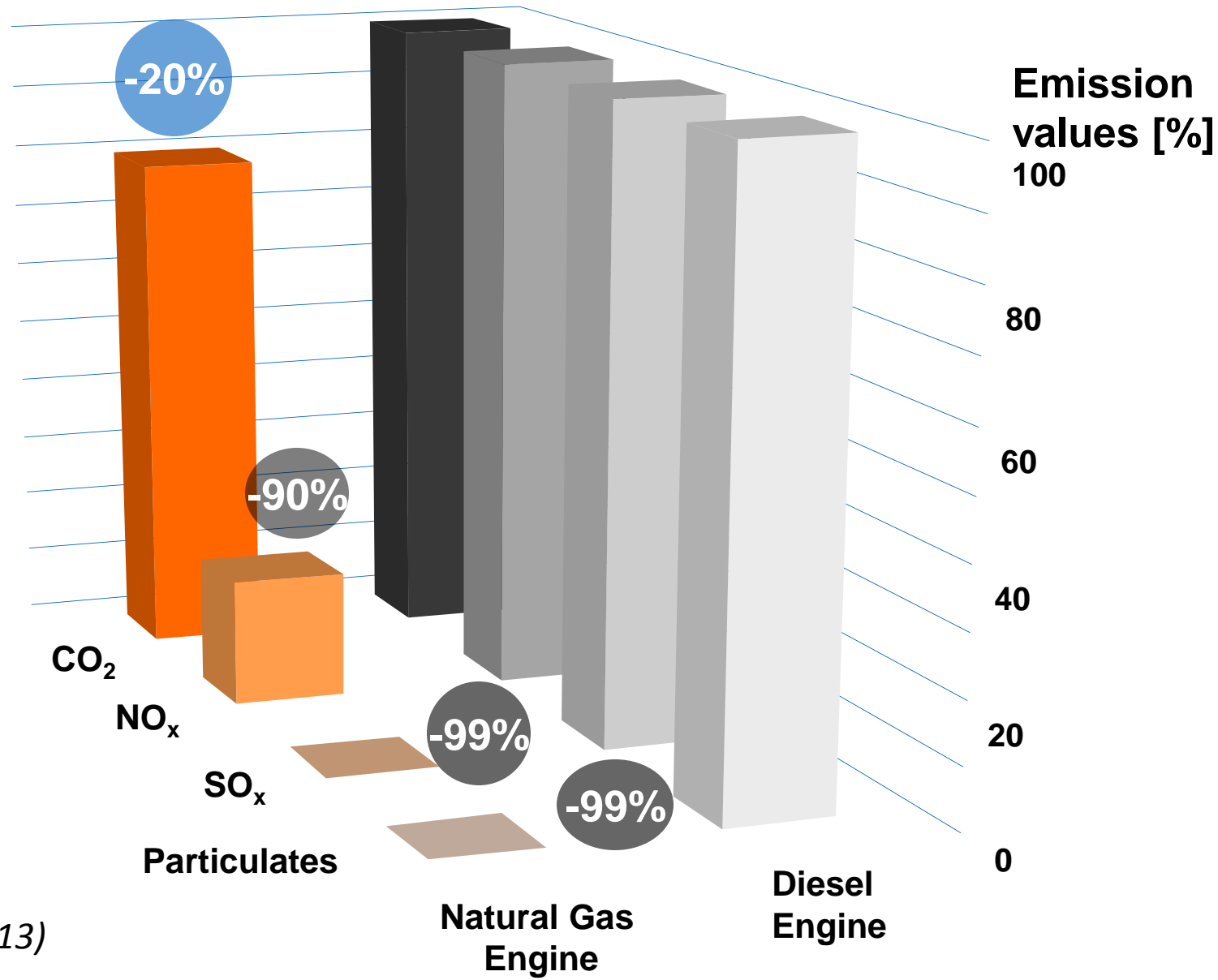
Strong market: *"The country will need 70,000 more people to support the maritime fleet by 2022" March 2016 by Maritime Administrator;*

- 1. Reconstruction of ferry infrastructures (landings, terminals, approaching roads, P&R areas, etc.) mostly built between 1950'S – 1970's to accommodate current and future volume and new vehicle sizes and characteristics;**
 - 5 routes with significant auto crossings**
- 2. Environmental advancement and fuel economy (LNG):**

Meet Tier IV EPA goal: LNG or Liquefied natural gas, is natural gas in a liquid form that is clear, colorless, odorless, non-corrosive, and non-toxic;

Current production capacity for LNG engines in US is: 0

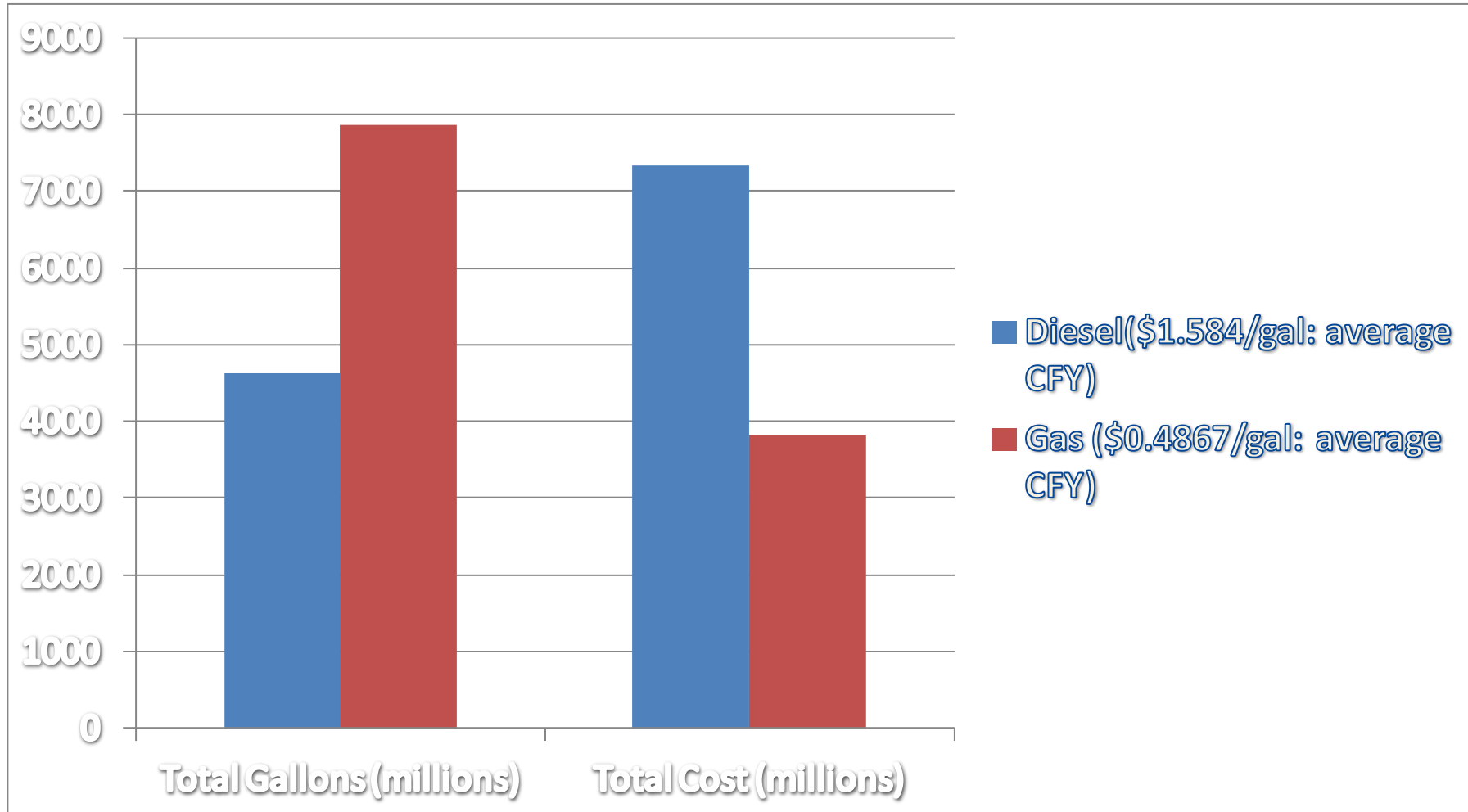
Lowered Exhaust Emissions



Source: NYCDOT SIR (2013)

Lowered Fuel Costs

[CFY '16 ended June 30, 2016]



Future of the Ferries & Future of Maritime Job Market for NYS

(continue)

3. Safety of navigation & landing

- **Electronic data devices for navigation and safe system monitoring to prevent water accidents or collisions**

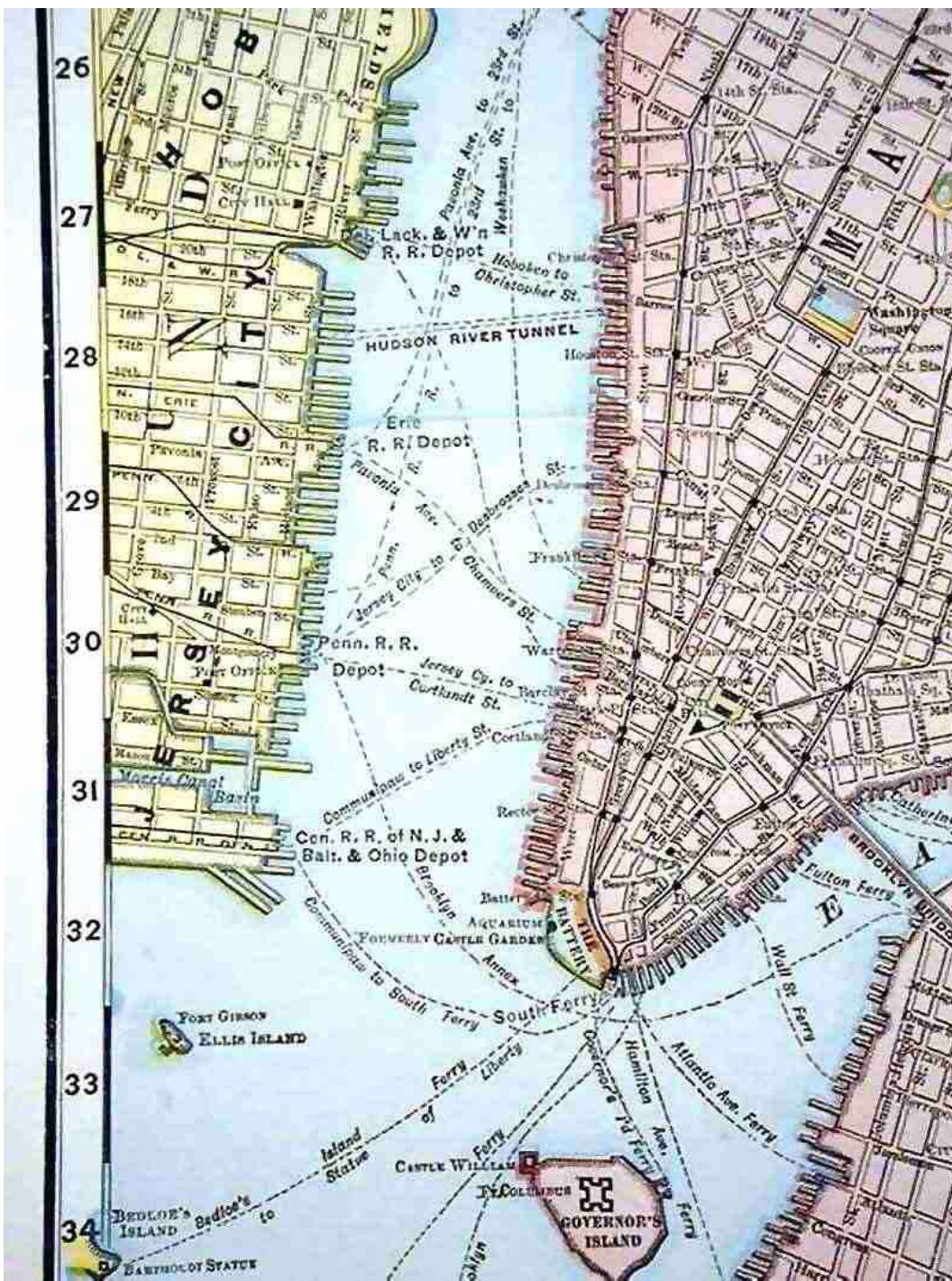
(August 30, 2016 collision between NY Waterway & 10 kayakers near Pier 79)

- **Land based control system at major terminals and landings: remote boat control command system operation (engine, transmission, steering systems, etc., mechanical, electronic components);**

(July 23, 2016 NY Waterway hard landing at Jersey City Pier)

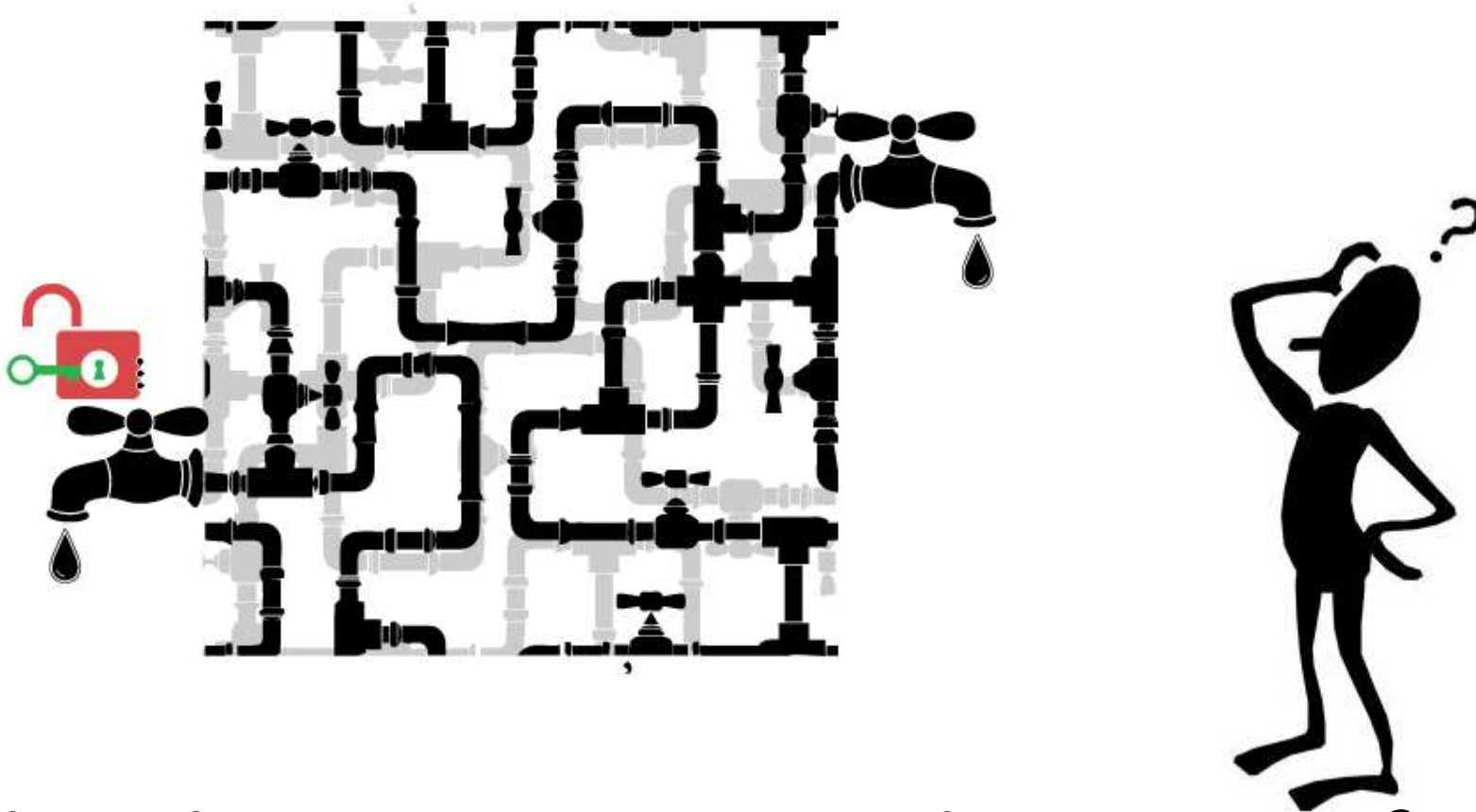
4. Operation optimization.

- **Reduce manual navigation or full autonomous navigation system (driverless boats).**



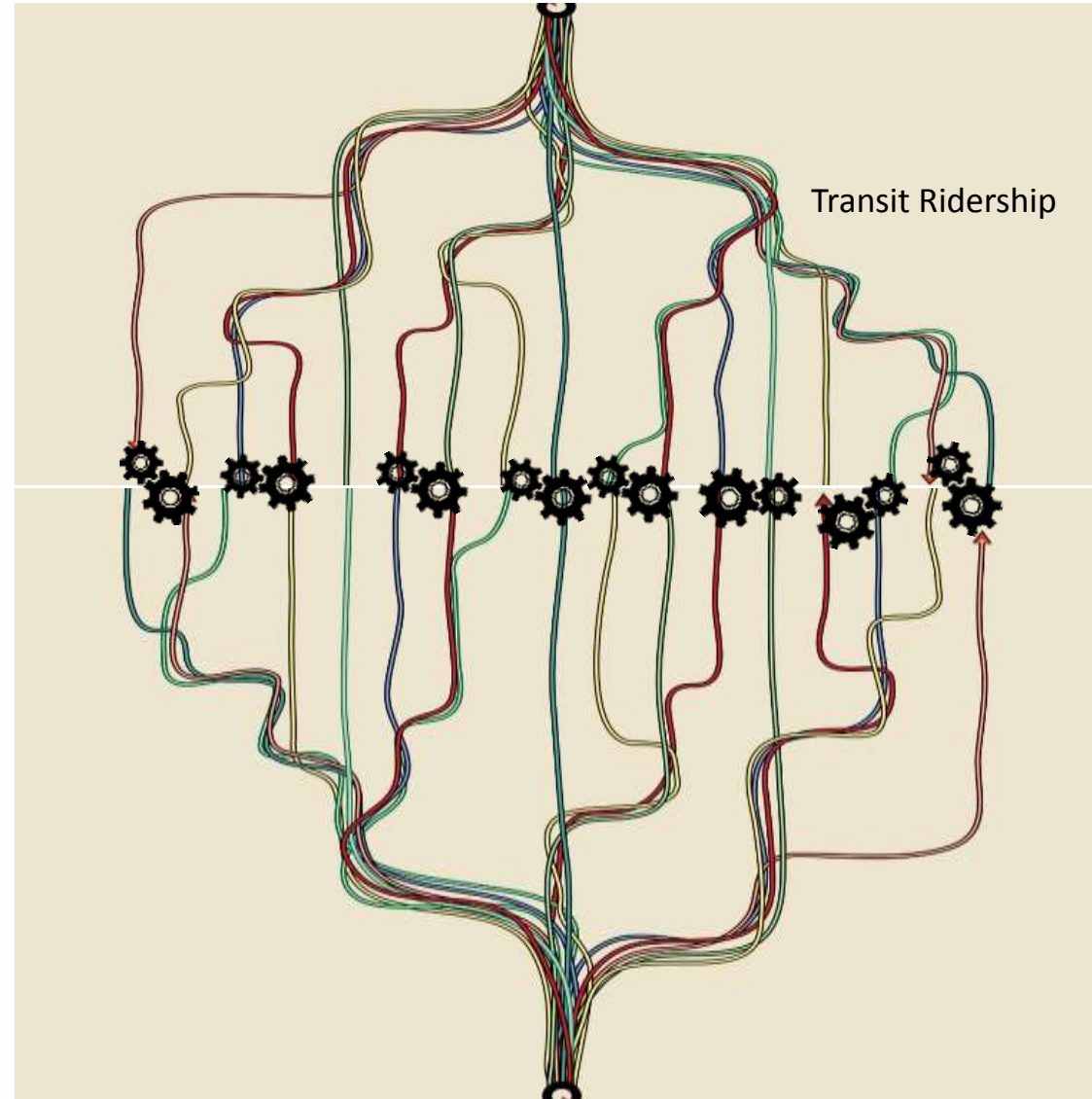
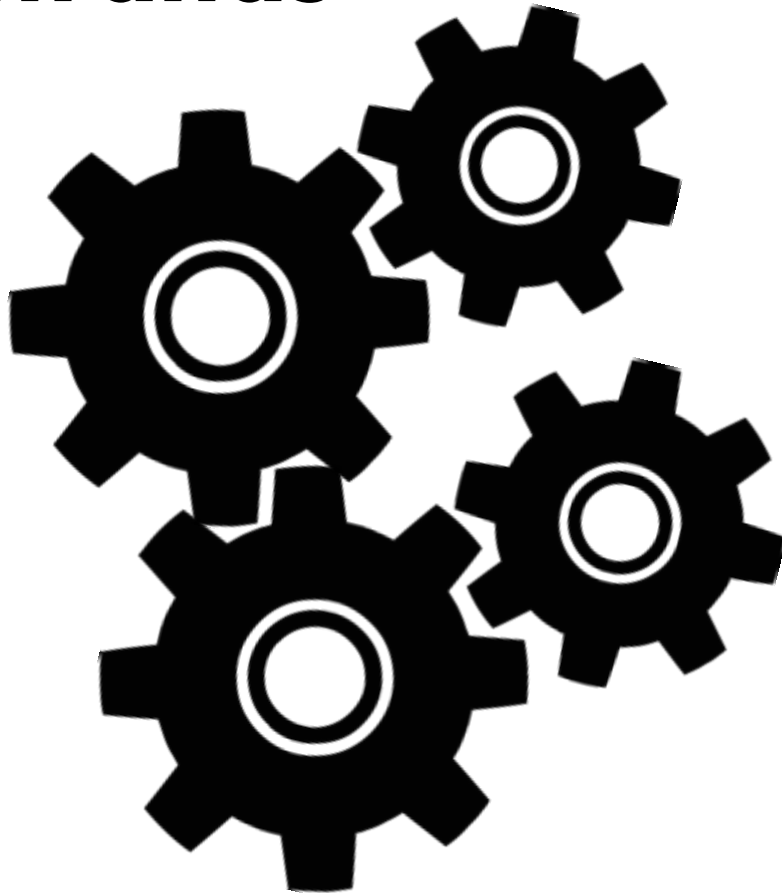
- **Today, transit passengers use mobile devices to plan trips.**
- **Expansion plans underway for ferry service.**
- **Future subway service disruptions for repairs.**
- **Need for new multi-modal translation software to harmonize the data to improve connectivity for transit riders.**

Using a Data Science Approach



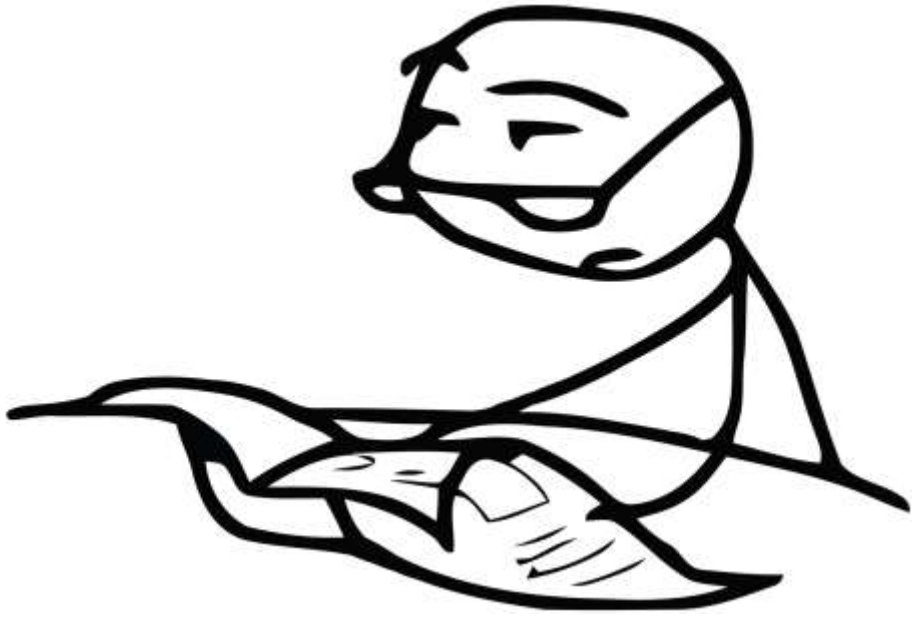
Application Programming Interfaces (APIs)

**Data Scientists
reweave data
strands --**



Transit Service Analytics

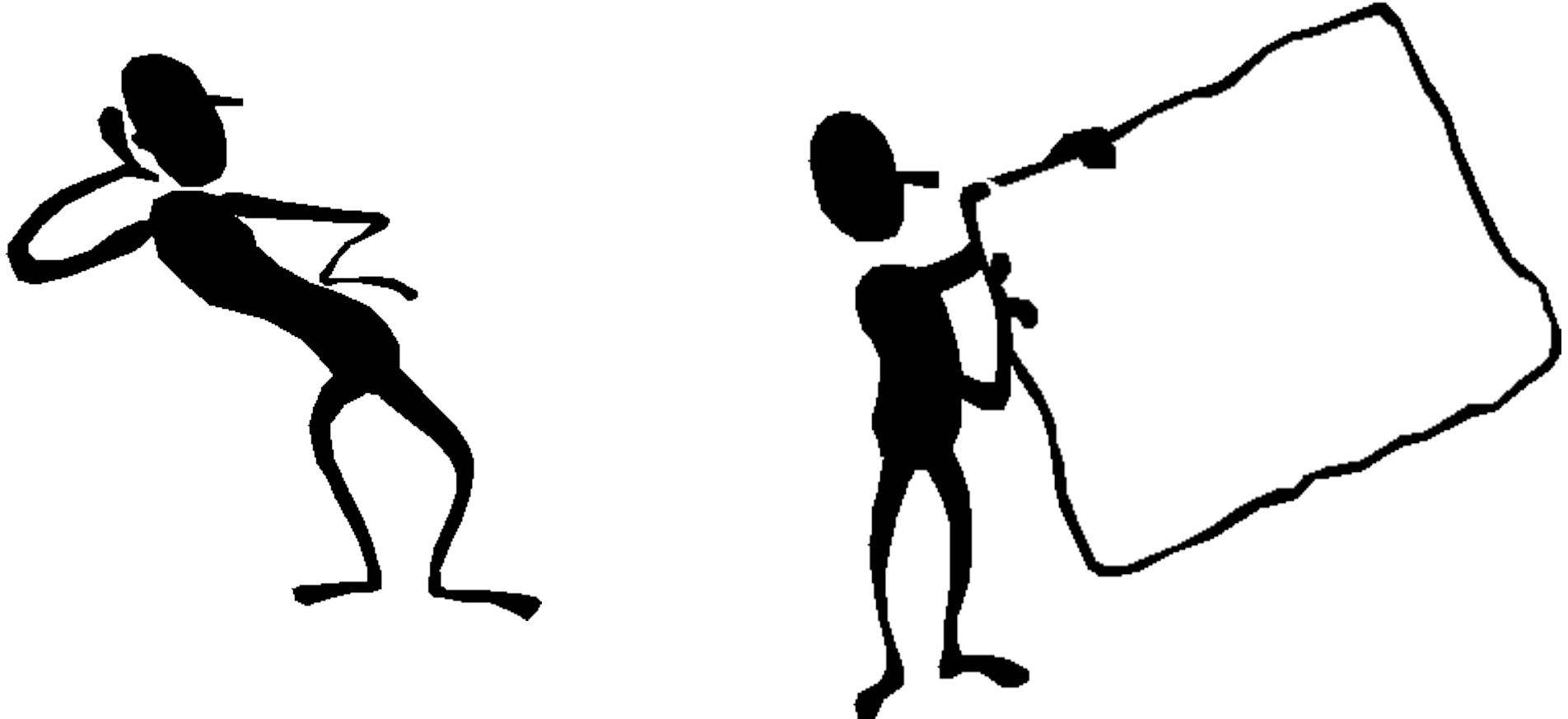
Data Science Strategies: Using a Caching Process

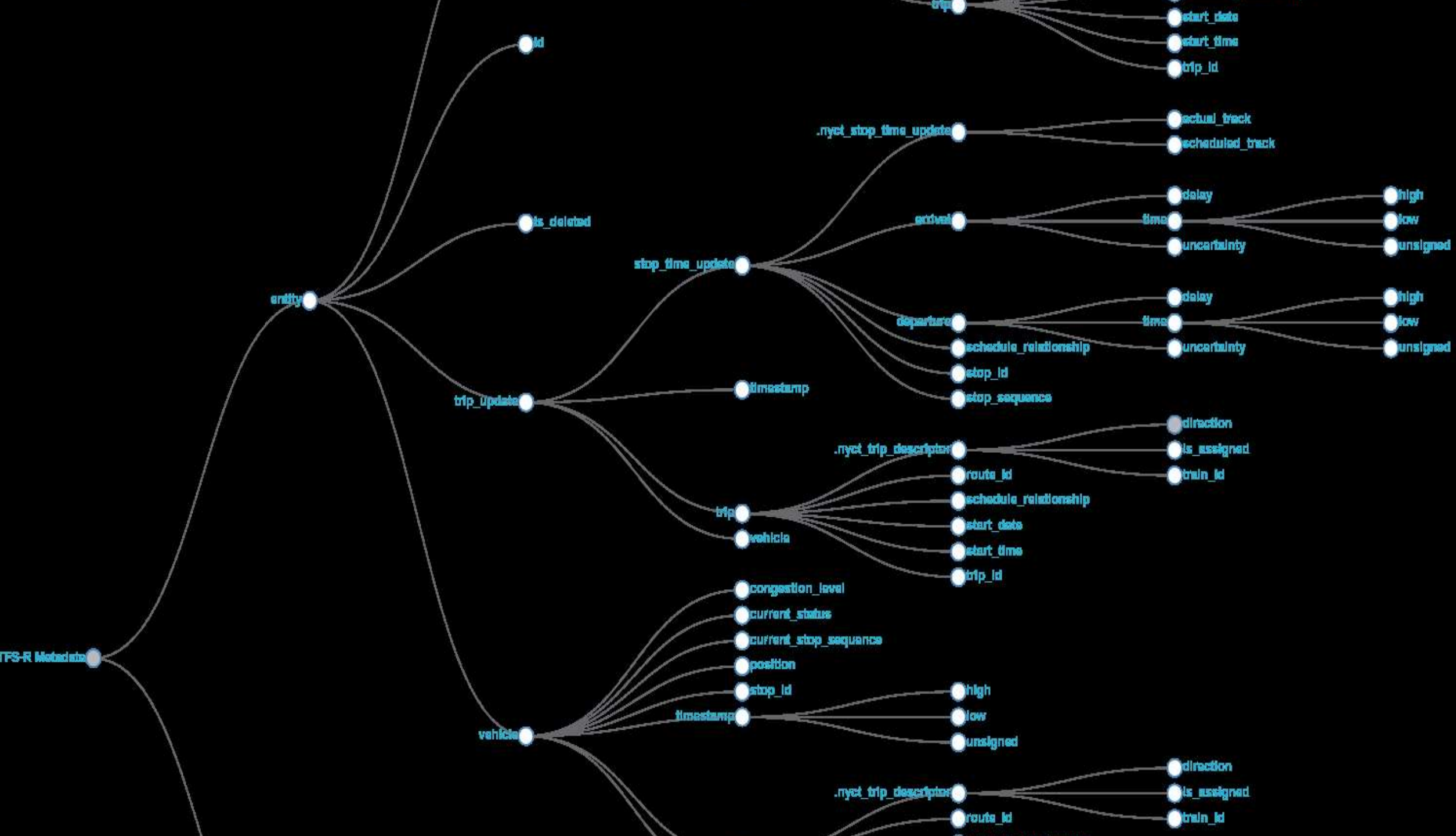


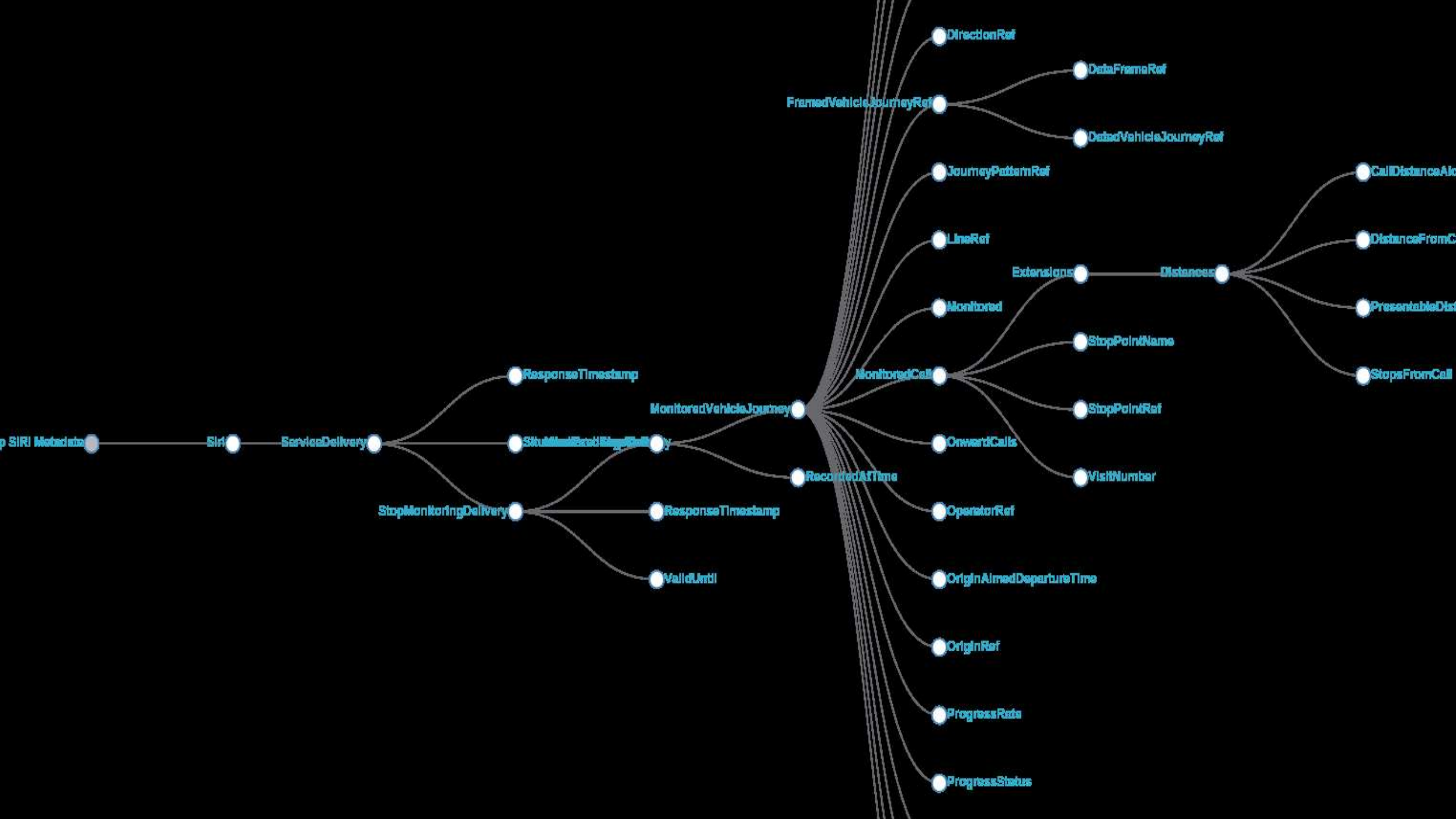
**Instead of reading
every word,
you can get the
answer instantly by
caching!**



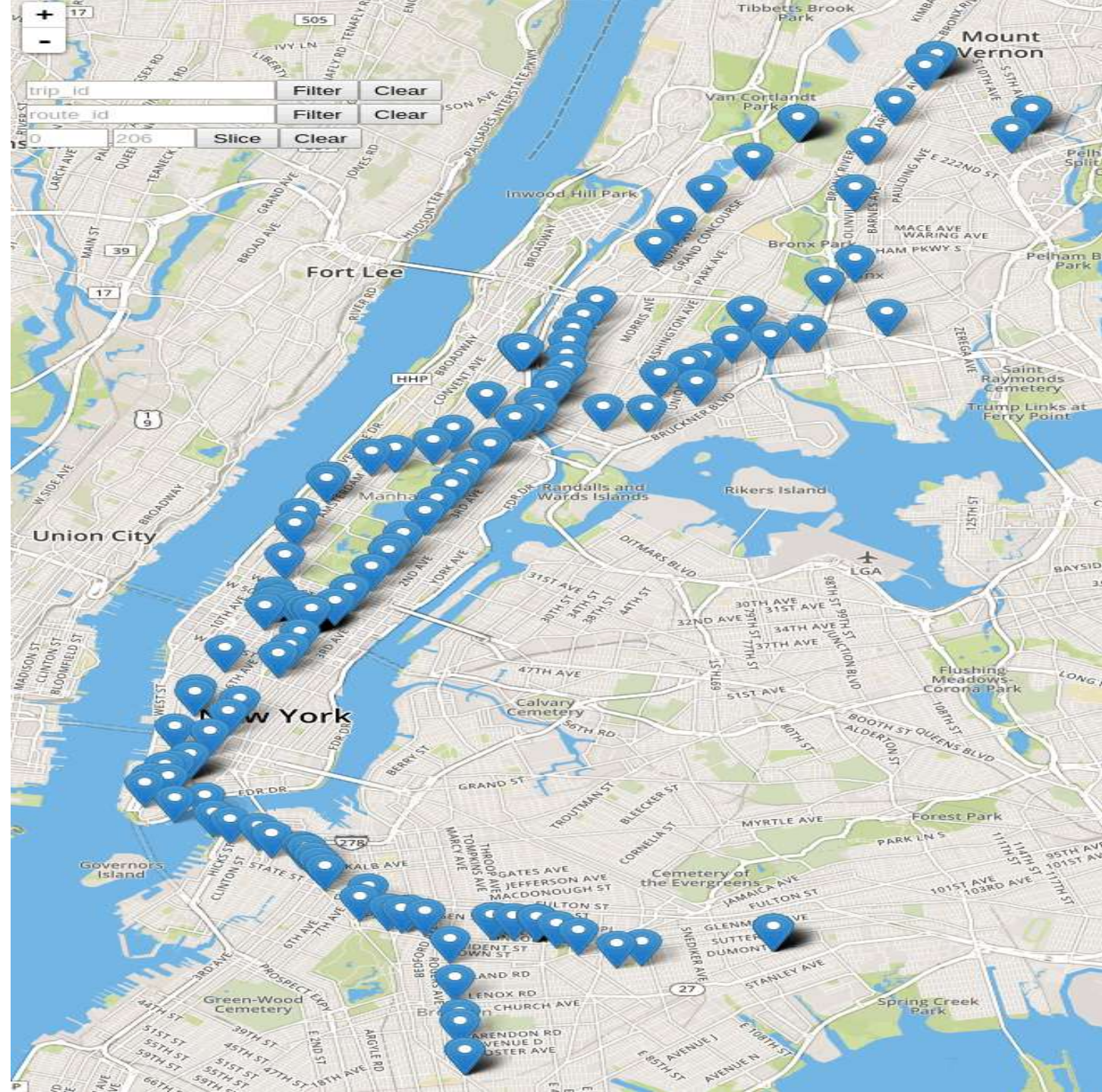
**Using Event-based Logging:
Whatever you hear – you write it down!**







**GTFS-R to SIRI
API updates
with new
data every 30
seconds.**



Essential Ingredients

- **General Transit Feed Specifications (GTFS)**
 - **Scheduling data as a “backbone”**
- **General Transit Feed Specifications – Realtime (GTFS-R)**
 - **From the subway system**
- **Service Interface for Real Time Information (SIRI)**
 - **From the bus system**
- **A data feed from ferries**

Adding Ferries to the Data Network

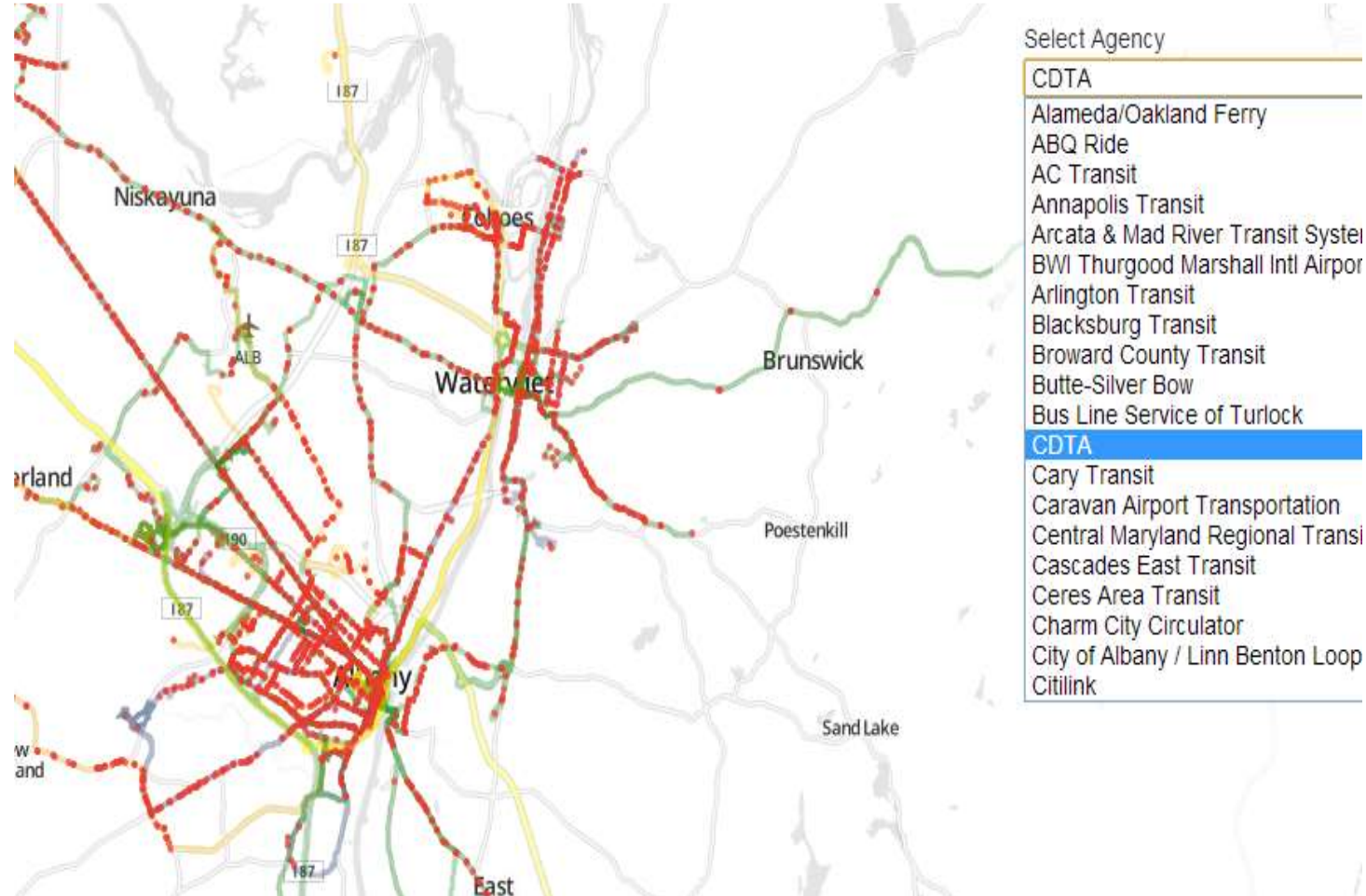
Challenges:

- **Source of machine-generated data that can track and trace ferry traffic.**
- **Completeness of the data source.**
- **Cooperation across multiple agencies and private sector players.**

GTFS for Staten Island Ferries

- **GTFS** (<https://developers.google.com/transit/gtfs/>)
dataset
 - Information about the ferry terminal
 - All scheduled weekday, weekend, and holiday trips
- Schedules are adjusted for heavy weather or low visibility
- Available at
<https://data.cityofnewyork.us/Transportation/Staten-Island-Ferry-Schedule-GTFS-/mwxp-krtu/data>

GTFS Analyst Tool to “Spatialize” Text Data



<http://gtfs.availabs.org>

GPS from ferry passenger traces

- **Trace data generated from smart phones currently collected and distributed in aggregate formats.**
- **Special new data products that provide origins and destinations (e.g., INRIX).**
- **Identify water-constrained O/D data for identifying ferry traffic.**

Automatic Identification Systems (AIS)

- **Contains ship's identity, type, position, course, speed, navigational status and other safety-related information.**
- **Required by Coast Guard for certain types of vessels.**
- **Automatically transmits and receives data from appropriately equipped shore stations and other ships.**
- **Can be accessed through an API (requires permission).**

New Sources from Autonomous Ferries

- **Operations data may be capable of providing complete or partial data streams in real-time.**
- **Could these sources provide ship's identity, type, position, course, speed, navigational status and other safety-related information?**
- **Could be made accessible through a new API.**
- **Could be incorporated immediately into harmonized data network.**

Next Steps

- **Determine interest in the region for a multi-modal transit data harmonization strategy.**
- **Assess the need to develop new translation software.**
- **Develop research experiment to evaluate and incorporate ferry feeds into existing transit data network.**
- **Develop sustainable structure for maintaining multi-agency data network system for the NYC region.**

USE NY STATE FERRIES!

