

Nantucket Bulk Fuel Farm

PRESENTED BY

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Presentation Outline

- Introduction
- Environmental conditions (tank farm site and route)
- Existing/future fuel needs
- Transportation of products
- Fuel farm concepts and permitting
- Next steps

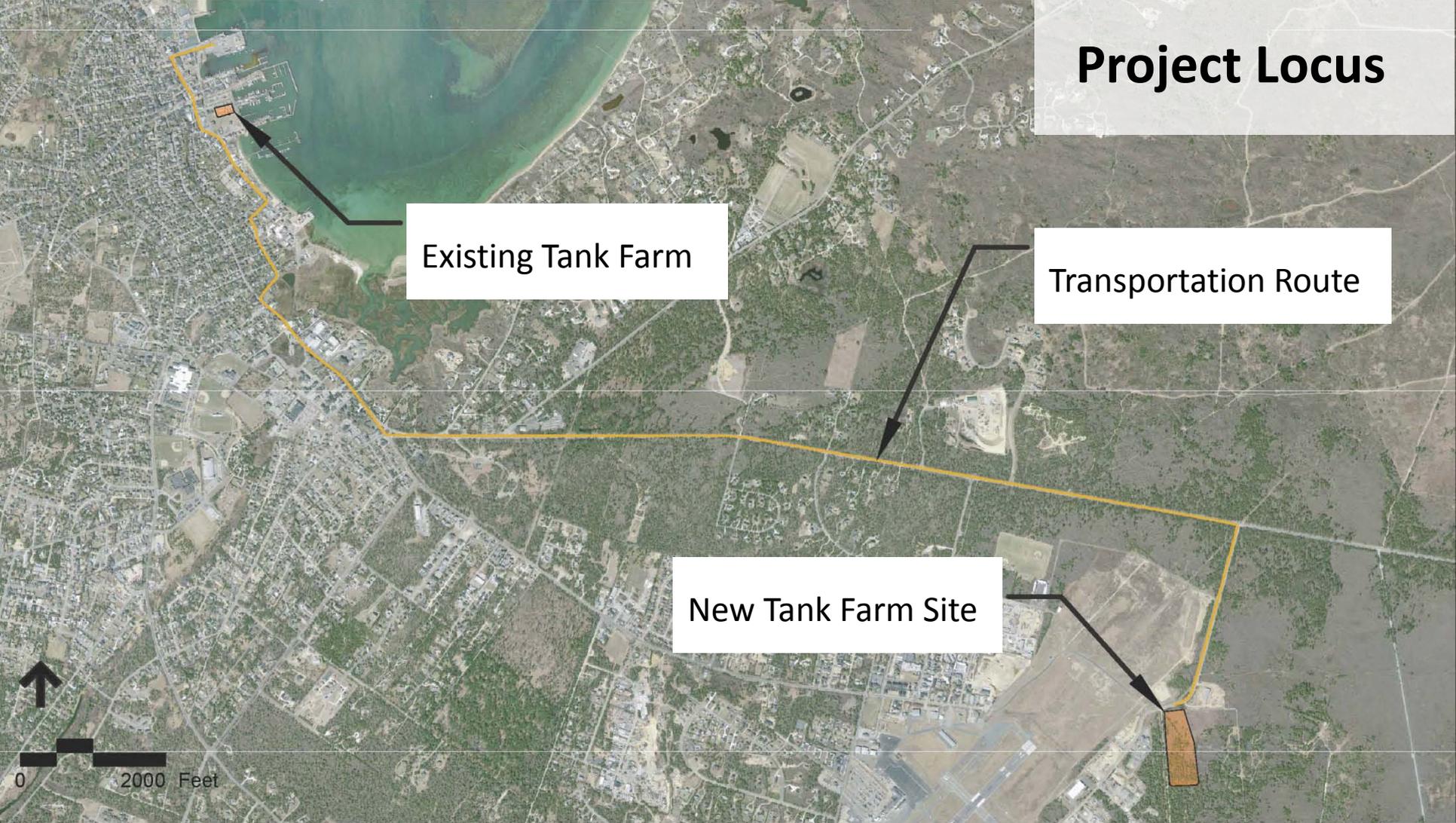


Project Locus

Existing Tank Farm

Transportation Route

New Tank Farm Site

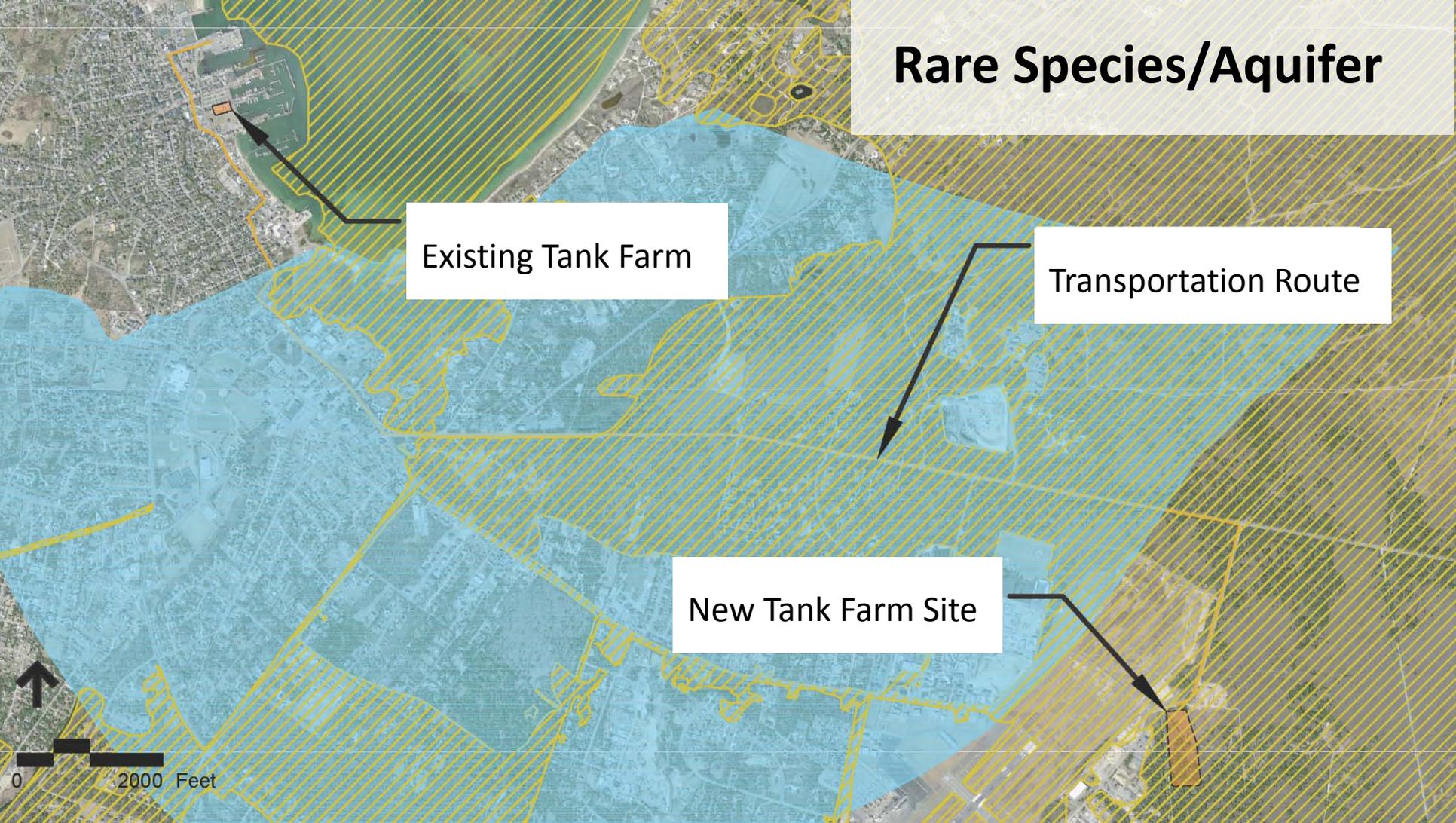


Rare Species/Aquifer

Existing Tank Farm

Transportation Route

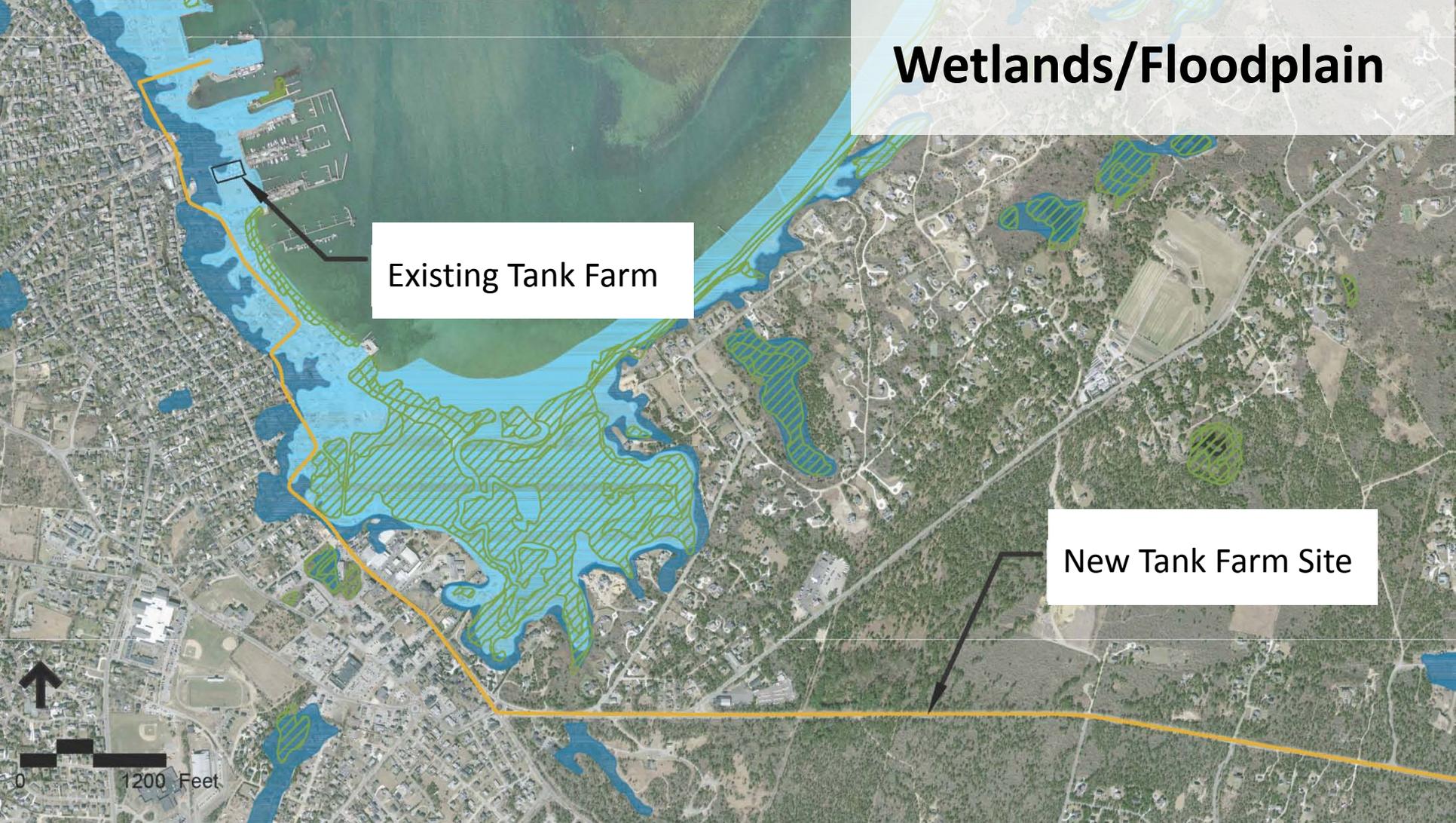
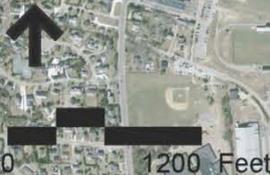
New Tank Farm Site



Wetlands/Floodplain

Existing Tank Farm

New Tank Farm Site



Harbor Fuel Tank Farm

- 11 aboveground fuel storage tanks
- Total volume 954,000 gallons
- Storing gasoline, diesel and heating oil



Harbor Fuel Tank Farm

- Heating oil and diesel fuel delivered to the site by barge
- Gasoline delivered by tanker trucks on steamship authority ferry





Existing Conditions Harbor Fuel Tank Farm

- Fuel trucks loaded at tank farm then deliver to customers across the island

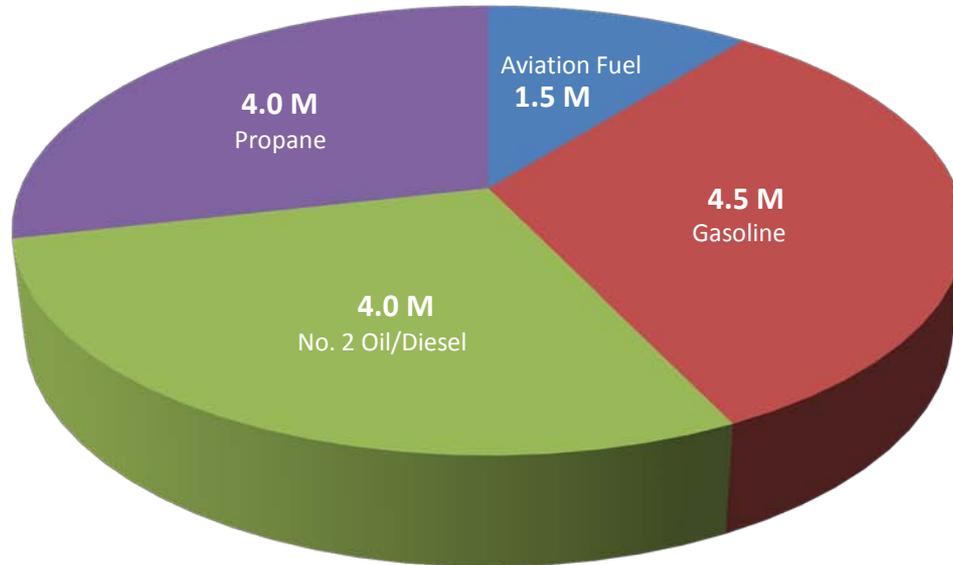
The image shows an industrial fuel pump system. On the left, a large white fuel tank is partially visible. In the center and right, there are two large, blue, cylindrical electric motors mounted on a concrete base. These motors are connected to a network of white pipes and valves. Above the motors, three large, white, rectangular electrical control cabinets are mounted on a wall. To the right of these cabinets are two smaller, white, cylindrical electrical components. The entire setup is located outdoors against a weathered, light-colored wall.

Existing Conditions Harbor Fuel Tank Farm

- Boat Basin fuel supplied directly from the tank farm

2013 Fuel Consumption in Gallons

- Nantucket fuel usage about 14 million gallons per year



Current Fuel Transportation

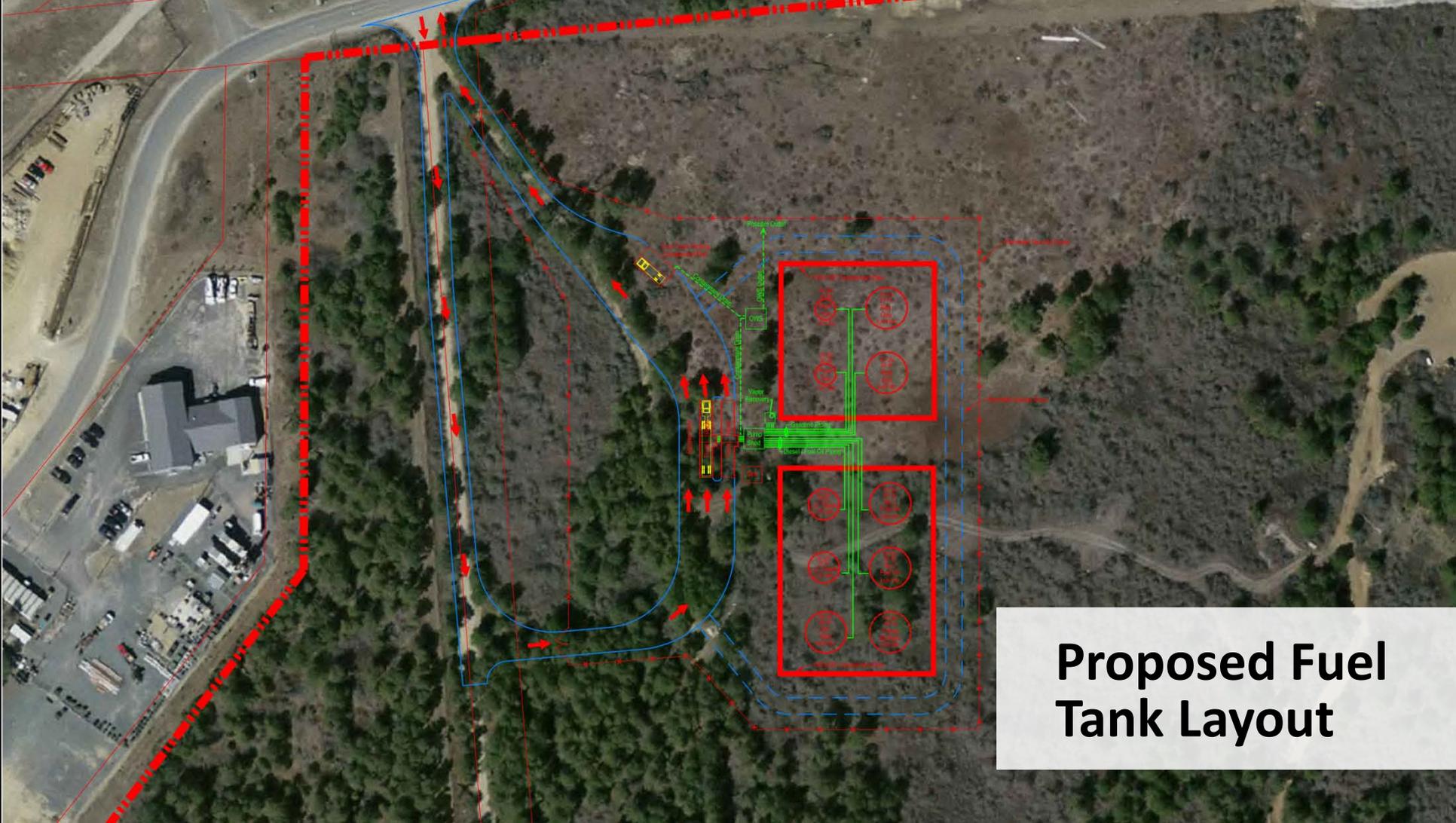
- 10 Million Gallons of Fuel Delivered by Steamship Authority
- 4 Million Gallons of Fuel Delivered by Barges



Future Fuel Considerations

- Increase in consumption estimate 1% per year
- Changes in fuel mix





**Proposed Fuel
Tank Layout**

Proposed Future Consumption

	2018 Max Monthly Demand	Max Demand Month	Receipt Trucks (10,000 gal)	Issue Track (2800/5000 gal)
Regular Gasoline	676,071	July	68	136
Premium Gasoline	75,119	July	8	16
Diesel	121,000	October	13	25
Fuel Out	33,187	October	34	119
Bio-Heat				

*Volume recorded in US gallons

Proposed Future Consumption (continued)

	2018				Selected Tank Dimensions				
	Max Monthly Demand	Max Demand Month	Contingency Volume	Required Ullage	Diameter	Height	Capacity	No. of Tanks	Total Ullage
Regular Gasoline	676,071	July	82,467	758,538	40	42	394,800	2	789,600
Premium Gasoline	75,119	July	9,163	84,282	20	18	424,20	2	84,840
Diesel	121,000	October	60,500	181,500	40	36	95,349	2	190,680
Fuel Out	331,870	October	331,870	663,740	40	36	338,520	2	677,040
Bio-Heat	0	See note 2			40	36	338,520	1	338,520

1) Volume recorded in US gallons, dimensions are in feet

2) Biofuel demand assumed to eventually displace No #2 fuel oil therefore future demand is equal to #2

Transportation Assessment

- Reviewed route
- Identified key intersection and locations
 - Safety history of locations
 - Geometric conditions
 - Traffic volumes
- Existing fuel delivery schedules
- Future fuel delivery scenarios
- Future proposed improvements

Steamship Authority Ferry Terminal

New Whale Street Tank Farm

Nantucket's Truck Route

Nantucket Truck Route —

Proposed Bunker
Tank Farm Site



Broad St.
at S Water St.

Steamship Authority Ferry Terminal

New Whale Street Tank Farm

Washington St.
Francis St.

Union St. at
Francis St.

Union St. Corner

Union St. at
Orange St.

Milestone Rotary

Key Locations Along Route
Nantucket Truck Route —



ATR

Peak Friday Daily: 10,200 vpd

Safety History

- The intersections of Union Street at Francis Street and the Milestone Roundabout each experience an average 1.33 accidents per year.
- All other locations have fewer than 1 accident per year on average

Key Locations for Traffic and Safety Review

Nantucket Truck Route —

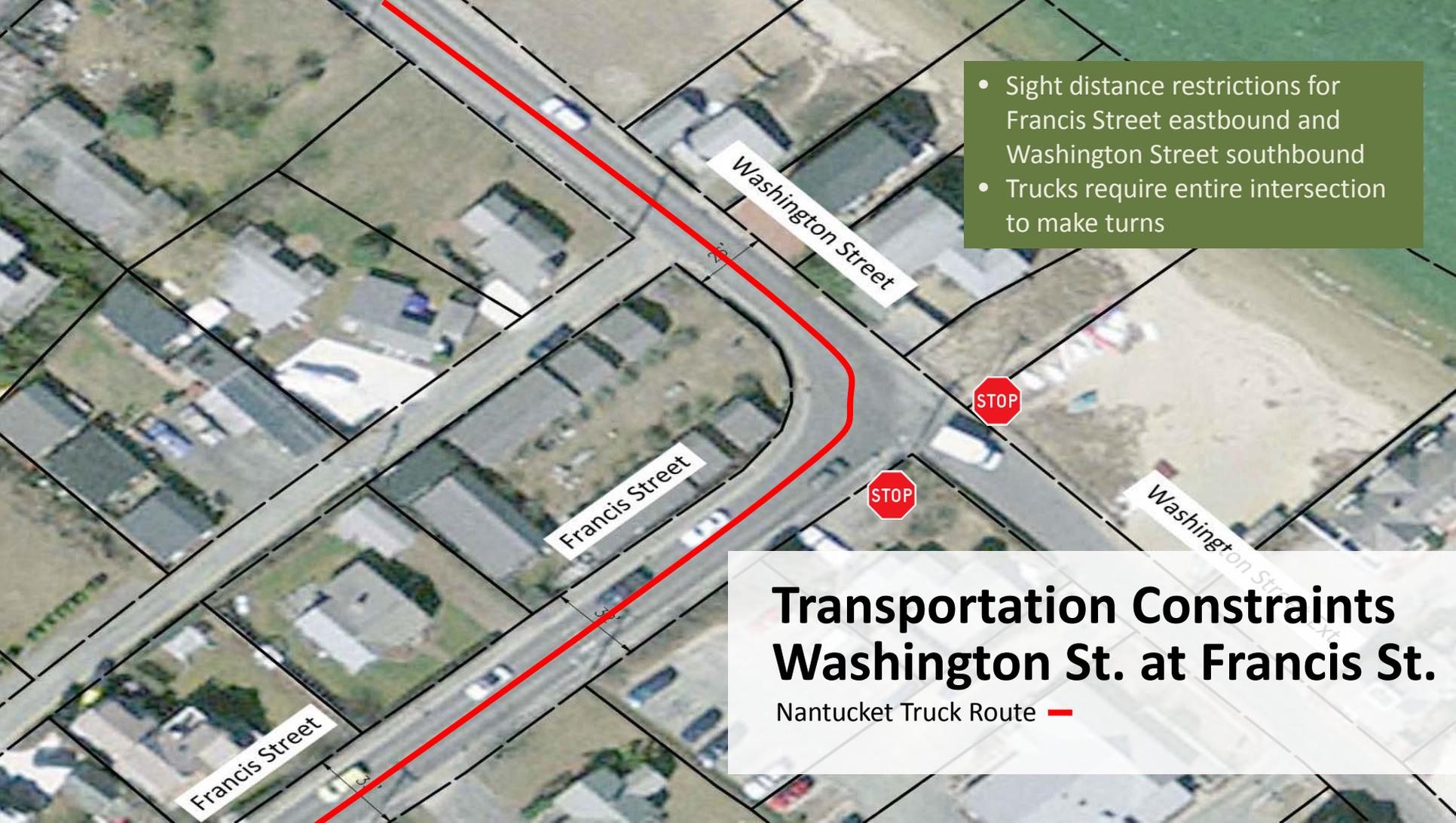
Key Location ○

ATR Location ◄►

- Sight distance restrictions for Francis Street eastbound and Washington Street southbound
- Trucks require entire intersection to make turns

Transportation Constraints Washington St. at Francis St.

Nantucket Truck Route —





**Example of Tractor
Trailer Movement
Through Intersection**

- Sight distance restrictions due to house on northeast corner of intersection
- Trucks require the entire intersection to make turns
- Nantucket Lightship Basket Museum's staircase is adjacent to intersection and has history of being hit by vehicles

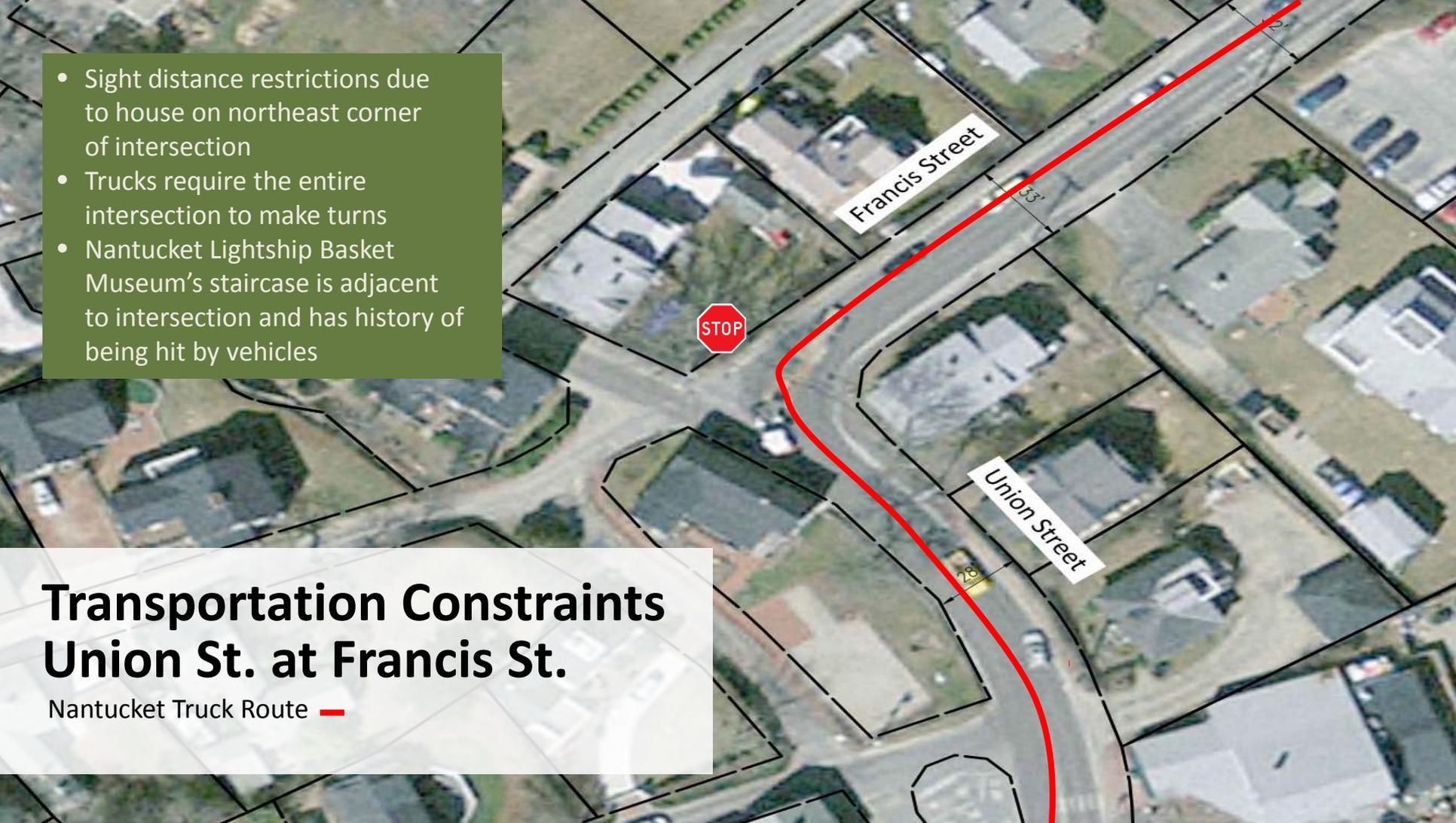


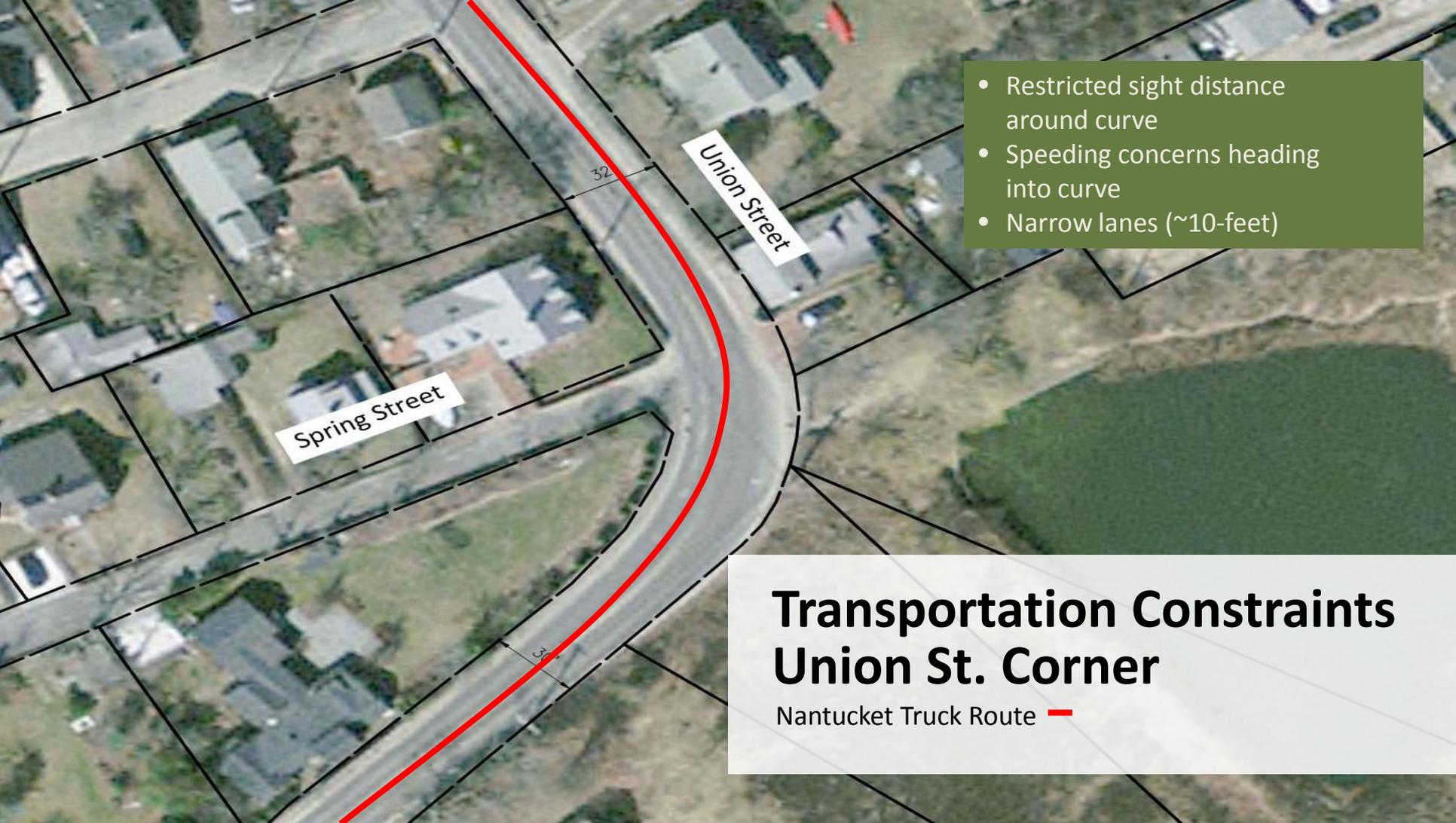
Francis Street

Union Street

Transportation Constraints Union St. at Francis St.

Nantucket Truck Route —





- Restricted sight distance around curve
- Speeding concerns heading into curve
- Narrow lanes (~10-feet)

Transportation Constraints Union St. Corner

Nantucket Truck Route —

- Trucks require the entire intersection to make turns

Orange Street

Union Street



Lower Orange Street

Transportation Constraints Orange St. at Union St.

Nantucket Truck Route —



Existing Fuel Deliveries

Type of Fuel	Yearly Total Throughput (gal/year)	Peak Month(s)	Peak Month Throughput (gal/month)	Trucks Required in Peak Month (trucks/month)	Barges Required in Peak Month (barges/month)
Truck Deliveries					
Gasoline	2,400,000	Summer – July & Aug.	630,000	55	
Heating Oil	520,000	Fall – Sept. & Oct.	75,000	8	
Total	2,920,00				
Barge Deliveries					
Diesel	525,000	Fall – Sept. & Oct.	100,000		2 to 3
Heating Oil	2,800,000	Fall – Sept. & Oct.	400,000		2 to 3
Total	3,325,000				

Future Fuel Deliveries Option 1

– All Truck Deliveries

Type of Fuel	Yearly Total Throughput (gal/year)	Peak Month(s)	Peak Month Throughput (gal/month)	Trucks Required in Peak Month (trucks/month)	Increase in Trucks (trucks/month)
Truck Deliveries					
Heating Oil	3,650,000	Fall – Sept. & Oct	520,000	52	+44
Gasoline	2,640,000	Summer – July & Aug	680,000	59	+4
Diesel	580,000	Fall – Sept. & Oct.	110,000	11	+11
Total	6,870,000				

Future Fuel Deliveries Option 2 – Barge & Truck Deliveries

Type of Fuel	Yearly Total Throughput (gal/year)	Peak Month(s)	Peak Month Throughput (gal/month)	Trucks Required in Peak Month (trucks/month)	Barges Required in Peak Month (barges/month)	Trucks Required to Transport Fuel from Barge (trucks/month)	Increase in Trucks (trucks/month)
Truck Deliveries							
Gasoline	2,640,000	Summer – July & Aug	680,000	59			+4
Heating Oil	570,000	Fall – Sept. & Oct.	82,000	9			+1
Total	3,210,000						
Barge Deliveries							
Diesel	580,000	Fall – Sept. & Oct	110,000		2 to 3	(11) 22*	+11 (22)
Heating Oil	3,080,000	Fall – Sept. & Oct	440,000		2 to 3	(44) 157*	+44 (157)
Total	3,660,000						

*Trucks based upon the assumption that Nantucket will upgrade to 10,000 gallon trucks. The numbers in () are based upon 5,000 gasoline and 2,800 heating oil trucks Nantucket currently operates. Nantucket’s current fleet ranges from 1,400 to 5,000 gallon trucks for on-island transporting.



Potential Improvements

Nantucket Truck Route 

Improvement Location 

- Ideal treatment would be to improve sight lines; however, there are implications to private properties.
- Restripe pavement markings
- Other consideration would be to install a truck based signal at the intersection. When a truck is present, the signal would go from flashing to red on other approaches to allow the truck to get through.



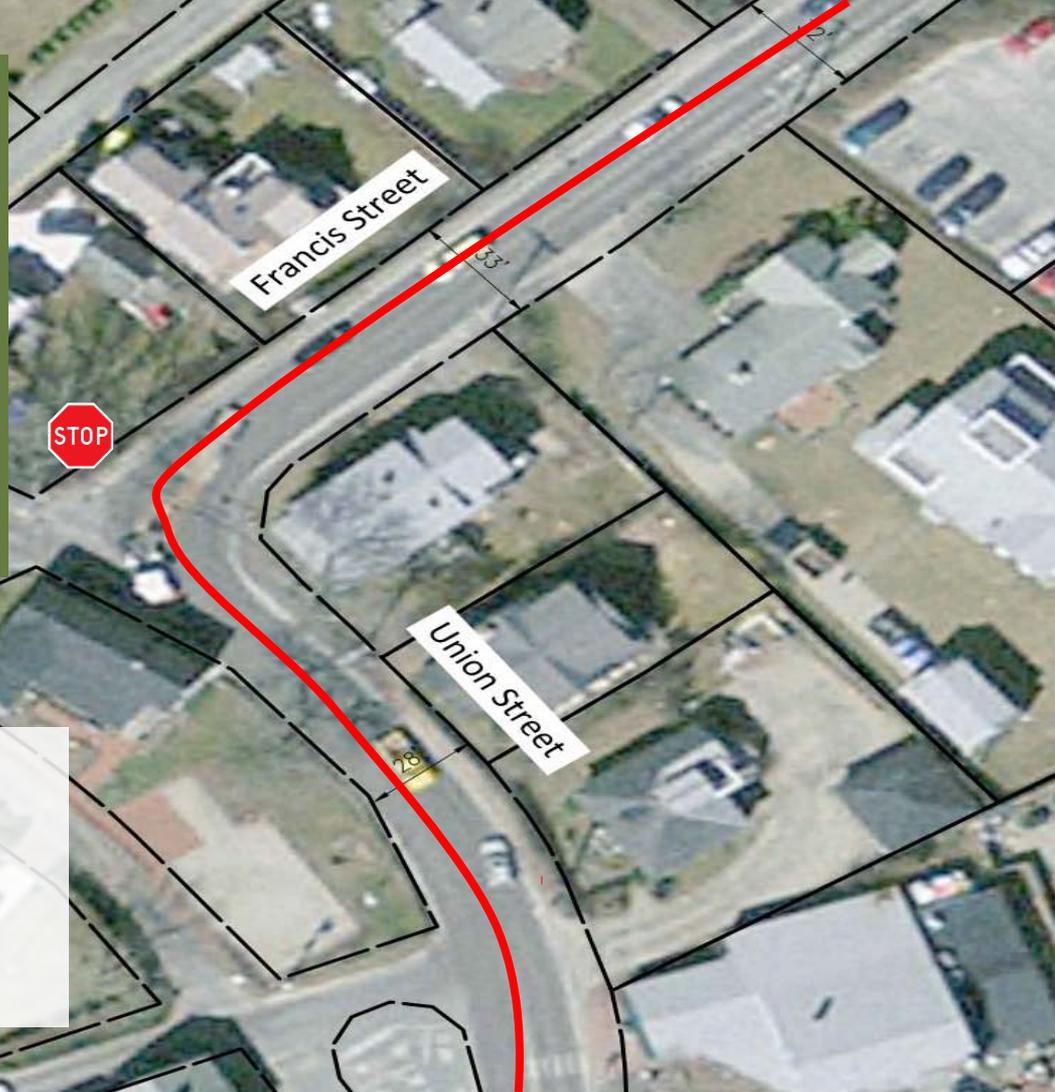
Potential Improvements Washington St. at Francis St.

Nantucket Truck Route —

- Town of Nantucket has already begun the process to open up the intersection and improve sight lines:
 - Relocation of Nantucket Lightship Basket Museum's stairs to other side of the building
 - Purchase of property at 50 Union Street
- Restripe pavement markings
- Install secondary STOP bars and signage on approaches for when trucks are present, allowing the trucks to have full use of the intersection.

Potential Improvements Union St. at Francis St.

Nantucket Truck Route —





- Traffic Calming measures to slow vehicles down through curve:
 - Restriping of centerline through intersection
 - Installing signage to warn motorist of the upcoming curve in the roadway
- Other considerations would be to install a flashing beacon that is activated by oncoming traffic.

Potential Improvements Union St. Corner

Nantucket Truck Route —

- Maintain existing sight lines.
- Restripe pavement markings
- Install secondary STOP bars/signage on approaches for when trucks are present, allowing the trucks to have full use of the intersection.

Potential Improvements Orange St. at Union St.

Nantucket Truck Route —



Preliminary Findings

- Constraints for large trucks exist at a number of locations along the truck route.
- Relocating the tank farm to the Bunker Site will result in an increase in fuel truck trips along the truck route.
- Truck trips should be restricted to off-peak periods (when possible) to minimize the impact to the roadway system.
- Improvement priority should be directed to improving sight distance and operational/safety at key locations identified.

Permit Requirements

Federal

- NPDES CGP and MSGP

State

- MA FPR

Local

- NPB special permit, ZBA height variance, WPA order of conditions (roadway improvements), Flammable Materials Act and building/fuel storage permit

Next Steps and Final Report

- Gather feedback from Town and Public (that is why we are here)
- Complete conceptual design and fiscal assessment
- Complete the report and issue to the town (end of January)
- Assist the town moving forward as necessary to plan for and implement the needed infrastructure

