Peirce Island WWTF Upgrade

Portsmouth City Council Meeting

August 1, 2016

Topics of Discussion

- Barging Discussion
  - Bid Alternates
  - Types
  - Logistics
  - Other Barging Projects
  - Permitting
  - Considerations & Risks
- Barging Costs and Tradeoffs

Project & Barging Status

- Construction Bids Received June 23, 2016
- Barging Originally Considered for Inclusion in the Project in 2013-2014 – Not Pursued Due to Added Cost
- City Council Directed that Barge Bid Alternate(s) be Added to Project – March 14, 2016
- Construction Cost Without Barging $72.79M

Project & Barging Status

Barging Bid Alternate	Estimated Cumulative Reduction In Construction Vehicles (%)	Bid Additional Cost
Alt. 1 – Barge Demo and Surplus Excavation Materials	50%	$3.94 M (1)
Alt. 2 – Additional Cost to Barge Selected Construction Materials	60%	$13.19 M
Alt. 3 – Additional Cost to Barge Vehicles 3 Axles or Greater and Construction Equipment Except Concrete Trucks and Pump Trucks	75%	$16.98 M
Alt. 4 – Additional Costs for Concrete Batch Plant and Barge Raw Concrete Materials	90%	$21.00 M

(1) Up to $7.0M with Costs for Permitting, Engineering, and Contingencies

Barging Considerations & Risks

- Barging Typically Used When Truck Delivery Not Feasible
- Use of Barging Increases Project Risk Profile:
  - Increased Risk of Delay Due to Weather
  - Potential Schedule Risk Due to Barging Logistics
  - Risk of Cost Increases Due to Additional Work On-site Requiring Oversight
  - Risk of Damage/Injury Due to Multiple Handling Steps and Marine Operation

Potential Land-side Location

- Port of New Hampshire?
- Shared Use
- Limited Laydown Area
- Periodic Shutdowns to Barging Due to Ship Traffic
- Contractor Free to Use Other Sites

Potential Peirce Island Locations

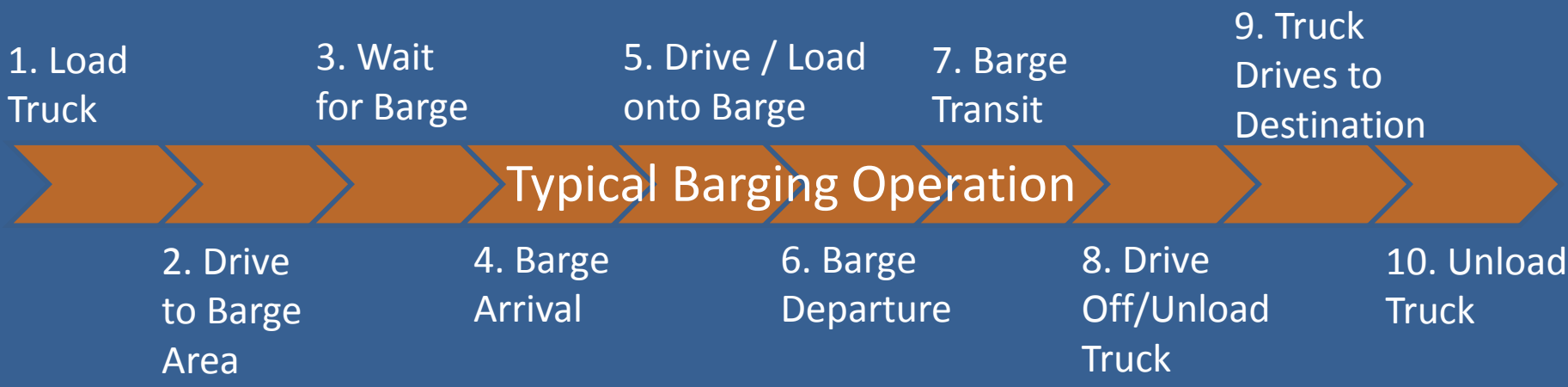
- Contractor to Choose Location & Type of Barge Operation

Source: *Eelgrass Distribution in the Great Bay Estuary and Piscataqua River for 2013*, UNH.

Barge Types

- Spud Barge
- Jack-Up Barge
- Load On / Load Off (LOLO)
- Roll On / Roll Off (RORO)
- Landing Craft

Logistics



Numerous Steps to Arrive at Destination

Deer Island WWTF - Boston, MA

- Adjacent Community Barred Land Access
- Roll On / Roll Off (RORO) Barging Facilities Constructed On Island and Mainland ($35 Million)
- Facilities Cost $3.8 Billion
- Project Duration Was 15 Years
- 100 Construction Contracts

There are Numerous Coastal WWTFs Located in Downtowns In NE Built Successfully Without Barging

Permitting

- Permitting Undertaken by City Based on Contractor's Barging Plan
- Extent of Permitting Dependent on Contractor's Approach to Barging
- Potential Permits / Approvals:
  - NHDES Wetlands Permit (Minor or Major)
  - Portsmouth Conservation Commission
  - NHDES Alteration of Terrain Permit
  - US Army Corps of Engineers (General Permit or Individual)
  - NH Fish & Game
  - National Marine Fisheries
  - US Coast Guard
  - Portsmouth Naval Shipyard
  - NH Division of Historical Resources
  - Harbor Pilots

Permitting Concerns

- NHDES Env-Wt 302.04.a.2:
  - …the applicant shall demonstrate…that the following factors have been considered in the project's design…

(2) The alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site;

- NHDES Env-Wt 302.04.d.1:

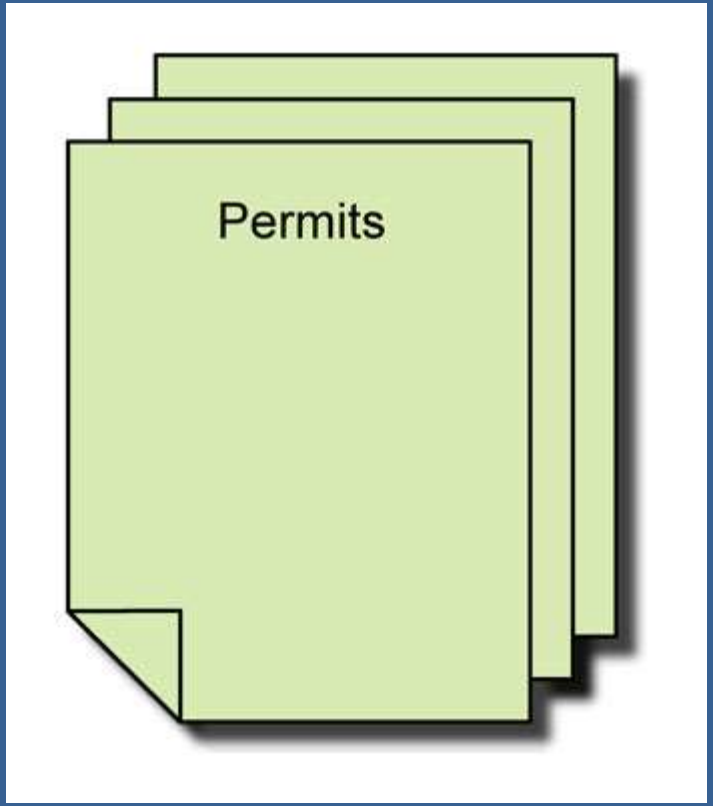
(d) The department shall not grant a permit if:

(1) There is a practicable alternative that would have a less adverse impact on the area and environments under the department's jurisdiction;

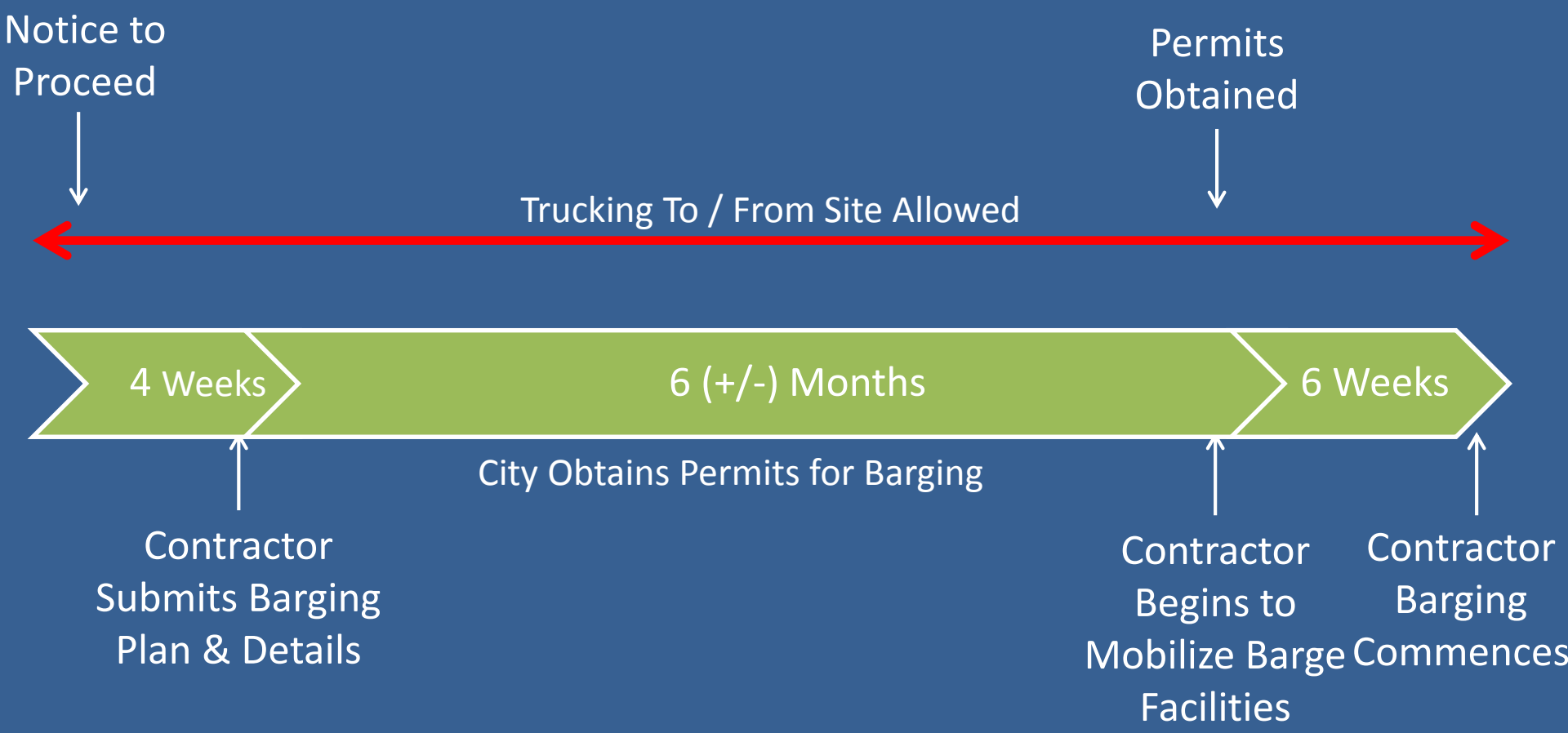
Permitting More Difficult With Feasible Alternative (Trucking)

Permitting Concerns, Cont'd.

- Eelgrass Impacts
- Anadromous Fish
- Benthic Impacts
- Navigational Impacts
- Mitigation Measures



Barging Implementation Timeline



Barging Conclusions

- Barge only when absolutely necessary
- Increases Cost
  - Contractor Costs
  - Permitting & Potential Mitigation
  - Contingency
- Increases Complexity
- Increases Risk
  - Weather Impacts
  - Cost Impacts
  - Damage / Injury

Barging Cost Impact

- Construction Phase Project Costs
  - Base Bid Construction ($72.79M)
  - The Estimated Impact To Average Residential Customer's Sewer Bill For WWTP Is $340 per Year (Additional $5.65 per Unit to Sewer Rate)
  - Barging Would Add UP To $7M For Construction (~10% increase)
  - An Increase of Approximately $29 Per Year For An Average Residential Customer
  - Increase Sewer Rate Approximately $0.48 Per Unit
  - Projected Annual Sewer Rate Increases From 3-4% To 5-6 %

Unit = 748 gallons

$10 Million Bond Issued 6/25/2014

AMORTIZATION AND PAYMENT SCHEDULE-20 YEAR

BOND	$10,000,000
YEARS	20

Note: Approximately $100,000 = $0.09 on the Sewer rate
FY 17 Sewer Rate: 12.24/13.47

Year	Beginning Balance	Principal	Interest	**Total Payment**	Ending Balance	Sewer rate Effect
					10,000,000	
1	10,000,000	500,000	396,667	**896,667**	9,500,000	$0.81
2	9,500,000	500,000	415,000	**915,000**	9,000,000	$0.82
3	9,000,000	500,000	390,000	**890,000**	8,500,000	$0.80
4	8,500,000	500,000	365,000	**865,000**	8,000,000	$0.78
5	8,000,000	500,000	340,000	**840,000**	7,500,000	$0.76
6	7,500,000	500,000	330,000	**830,000**	7,000,000	$0.75
7	7,000,000	500,000	305,000	**805,000**	6,500,000	$0.72
8	6,500,000	500,000	280,000	**780,000**	6,000,000	$0.70
9	6,000,000	500,000	255,000	**755,000**	5,500,000	$0.68
10	5,500,000	500,000	230,000	**730,000**	5,000,000	$0.66
11	5,000,000	500,000	205,000	**705,000**	4,500,000	$0.63
12	4,500,000	500,000	180,000	**680,000**	4,000,000	$0.61
13	4,000,000	500,000	155,000	**655,000**	3,500,000	$0.59
14	3,500,000	500,000	140,000	**640,000**	3,000,000	$0.58
15	3,000,000	500,000	120,000	**620,000**	2,500,000	$0.56
16	2,500,000	500,000	100,000	**600,000**	2,000,000	$0.54
17	2,000,000	500,000	80,000	**580,000**	1,500,000	$0.52
18	1,500,000	500,000	60,000	**560,000**	1,000,000	$0.50
19	1,000,000	500,000	40,000	**540,000**	500,000	$0.49
20	500,000	500,000	20,000	**520,000**	-	$0.47
Totals 20 year		10,000,000	4,406,667	**14,406,667**		
			Average Payment	720,333		

State Revolving Fund
Pojected
AMORTIZATION AND PAYMENT SCHEDULE-20 YEAR

BOND	$75,000,000
less Principal Forgivene	($3,750,000)
Total Principal	$71,250,000
YEARS	20
RATE	2.55%

Substancial Completion 06/01/2020

	Projected Interim Financing
FY 17	388,765
FY 18	421,083
FY 19	362,838
FY 20	79,441
	1,252,128
FY 21	75,680
Total Interim Financing	1,327,808

	Year	Beginning Balance	Principal	Interest	**Total Payment**	Ending Balance	Sewer rate Effect
						71,250,000	
FY 21	6/1/2021	71,250,000	3,562,500	1,818,300	**5,380,800**	67,687,500	$4.84
FY 22	6/1/2022	67,687,500	3,562,500	1,727,385	**5,289,885**	64,125,000	$4.76
FY 23	6/1/2023	64,125,000	3,562,500	1,636,470	**5,198,970**	60,562,500	$4.68
FY 24	6/1/2024	60,562,500	3,562,500	1,545,555	**5,108,055**	57,000,000	$4.60
FY 25	6/1/2025	57,000,000	3,562,500	1,454,640	**5,017,140**	53,437,500	$4.52
FY 26	6/1/2026	53,437,500	3,562,500	1,363,725	**4,926,225**	49,875,000	$4.43
FY 27	6/1/2027	49,875,000	3,562,500	1,272,810	**4,835,310**	46,312,500	$4.35
FY 28	6/1/2028	46,312,500	3,562,500	1,181,895	**4,744,395**	42,750,000	$4.27
FY 29	6/1/2029	42,750,000	3,562,500	1,090,980	**4,653,480**	39,187,500	$4.19
FY 30	6/1/2030	39,187,500	3,562,500	1,000,065	**4,562,565**	35,625,000	$4.11
FY 31	6/1/2031	35,625,000	3,562,500	909,150	**4,471,650**	32,062,500	$4.02
FY 32	6/1/2032	32,062,500	3,562,500	818,235	**4,380,735**	28,500,000	$3.94
FY 33	6/1/2033	28,500,000	3,562,500	727,320	**4,289,820**	24,937,500	$3.86
FY 34	6/1/2034	24,937,500	3,562,500	636,405	**4,198,905**	21,375,000	$3.78
FY 35	6/1/2035	21,375,000	3,562,500	545,490	**4,107,990**	17,812,500	$3.70
FY 36	6/1/2036	17,812,500	3,562,500	454,575	**4,017,075**	14,250,000	$3.62
FY 37	6/1/2037	14,250,000	3,562,500	363,660	**3,926,160**	10,687,500	$3.53
FY 38	6/1/2038	10,687,500	3,562,500	272,745	**3,835,245**	7,125,000	$3.45
FY 39	6/1/2039	7,125,000	3,562,500	181,830	**3,744,330**	3,562,500	$3.37
FY 40	6/1/2040	3,562,500	3,562,500	90,915	**3,653,415**	-	$3.29
Totals 20 year			71,250,000	19,092,150	**90,342,150**		

Total Interest	20,419,958
Total Interest and Principal	91,669,958

	Total Cost Without Barging	
	Bonding	**Pricipal & Interest**
Bonding 06/2014	**10,000,000**	**13,229,062**
SRF	**75,000,000**	**91,669,958**
Total Costs w/ Alt #4	**85,000,000**	**104,899,020**

Effect of $7 Million Additional Funding

BOND	$7,000,000
YEARS	20
RATE	2.55%

Note: Approximately $100,000 = $0.09 on the Sewer rate
FY 17 Sewer Rate: 12.24/13.47

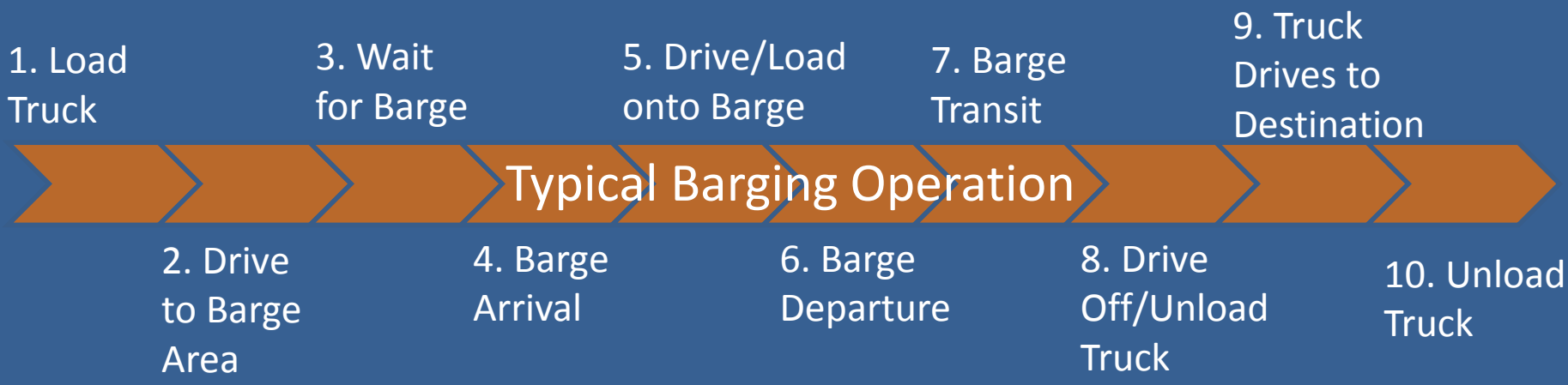
Year	Beginning Balance	Principal	Interest	**Total Payment**	Ending Balance	Sewer rate Effect
					7,000,000	
1	7,000,000	350,000	178,500	**528,500**	6,650,000	$0.48
2	6,650,000	350,000	169,575	**519,575**	6,300,000	$0.47
3	6,300,000	350,000	160,650	**510,650**	5,950,000	$0.46
4	5,950,000	350,000	151,725	**501,725**	5,600,000	$0.45
5	5,600,000	350,000	142,800	**492,800**	5,250,000	$0.44
6	5,250,000	350,000	133,875	**483,875**	4,900,000	$0.44
7	4,900,000	350,000	124,950	**474,950**	4,550,000	$0.43
8	4,550,000	350,000	116,025	**466,025**	4,200,000	$0.42
9	4,200,000	350,000	107,100	**457,100**	3,850,000	$0.41
10	3,850,000	350,000	98,175	**448,175**	3,500,000	$0.40
11	3,500,000	350,000	89,250	**439,250**	3,150,000	$0.40
12	3,150,000	350,000	80,325	**430,325**	2,800,000	$0.39
13	2,800,000	350,000	71,400	**421,400**	2,450,000	$0.38
14	2,450,000	350,000	62,475	**412,475**	2,100,000	$0.37
15	2,100,000	350,000	53,550	**403,550**	1,750,000	$0.36
16	1,750,000	350,000	44,625	**394,625**	1,400,000	$0.36
17	1,400,000	350,000	35,700	**385,700**	1,050,000	$0.35
18	1,050,000	350,000	26,775	**376,775**	700,000	$0.34
19	700,000	350,000	17,850	**367,850**	350,000	$0.33
20	350,000	350,000	8,925	**358,925**	-	$0.32
Totals 20 year		7,000,000	1,874,250	**8,874,250**		

Sewer Bill Increase For $7 Million Barging

Customer Class Average User	Average Annual Sewer Use (Units)	Projected Portion of Sewer Bill from WWTP	Bill Increase to Fund $7 Million Barging
Single Family Residential	60	$340	$29
Multi Family Residential	264	$1,490	$127
Commercial	516	$2,915	$248
Industrial	3,564	$20,140	$1,711

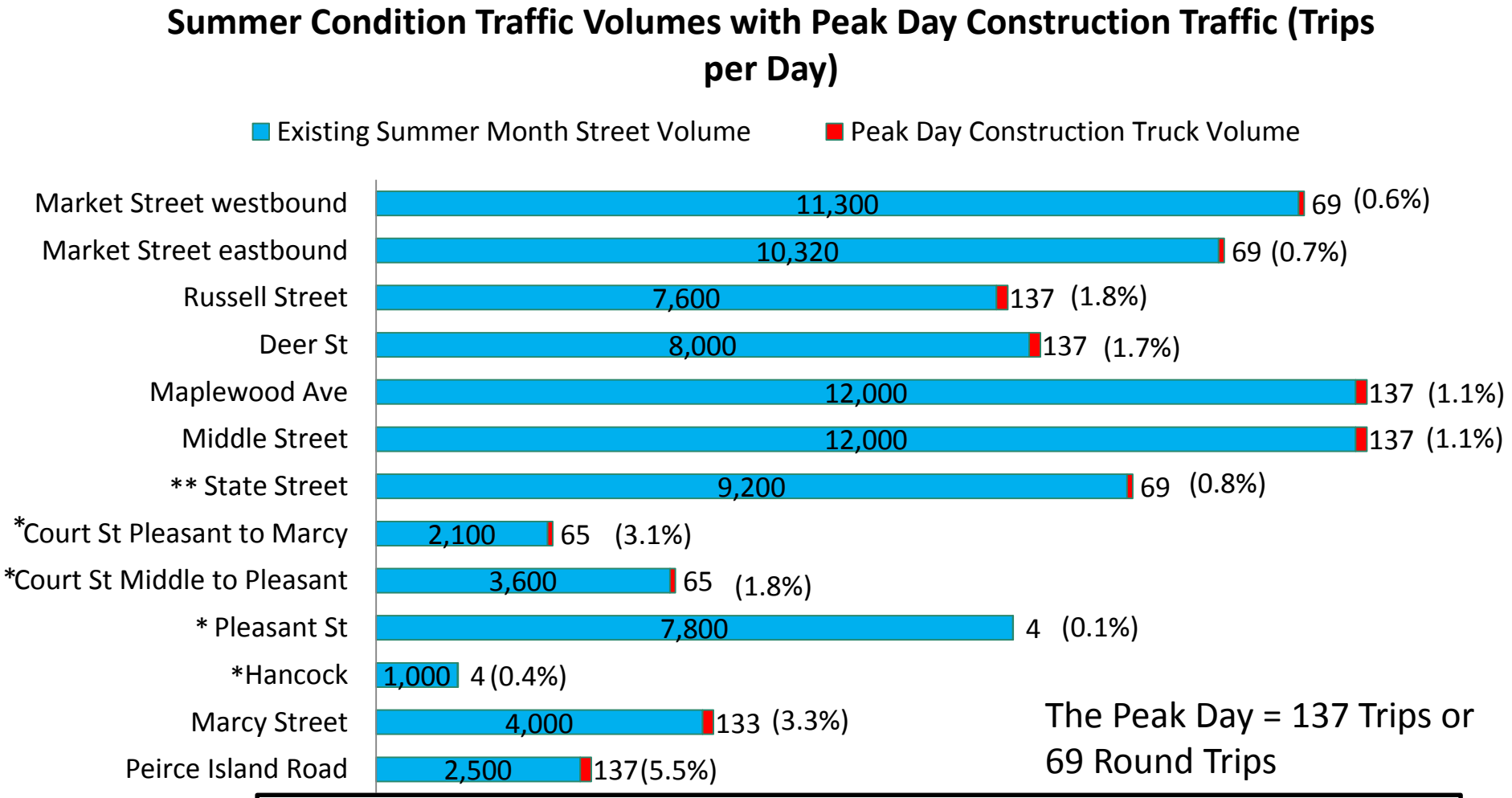
1 Unit = 748 Gallons

Tradeoffs


1. Load Truck
2. Drive to Barge Area
3. Wait for Barge
4. Barge Arrival
5. Drive/Load onto Barge
6. Barge Departure
7. Barge Transit
8. Drive Off/Unload Truck
9. Truck Drives to Destination
10. Unload Truck
Typical Barging Operation


1. Load Truck
2. Truck Drives to Destination
3. Unload Truck
Typical Trucking Operation

Estimated Traffic Volume (No Barging)



The Peak Day = 137 Trips or 69 Round Trips

Notes: *Outbound Construction Traffic Only **Inbound Construction Traffic Only