

# Transit Costs Project

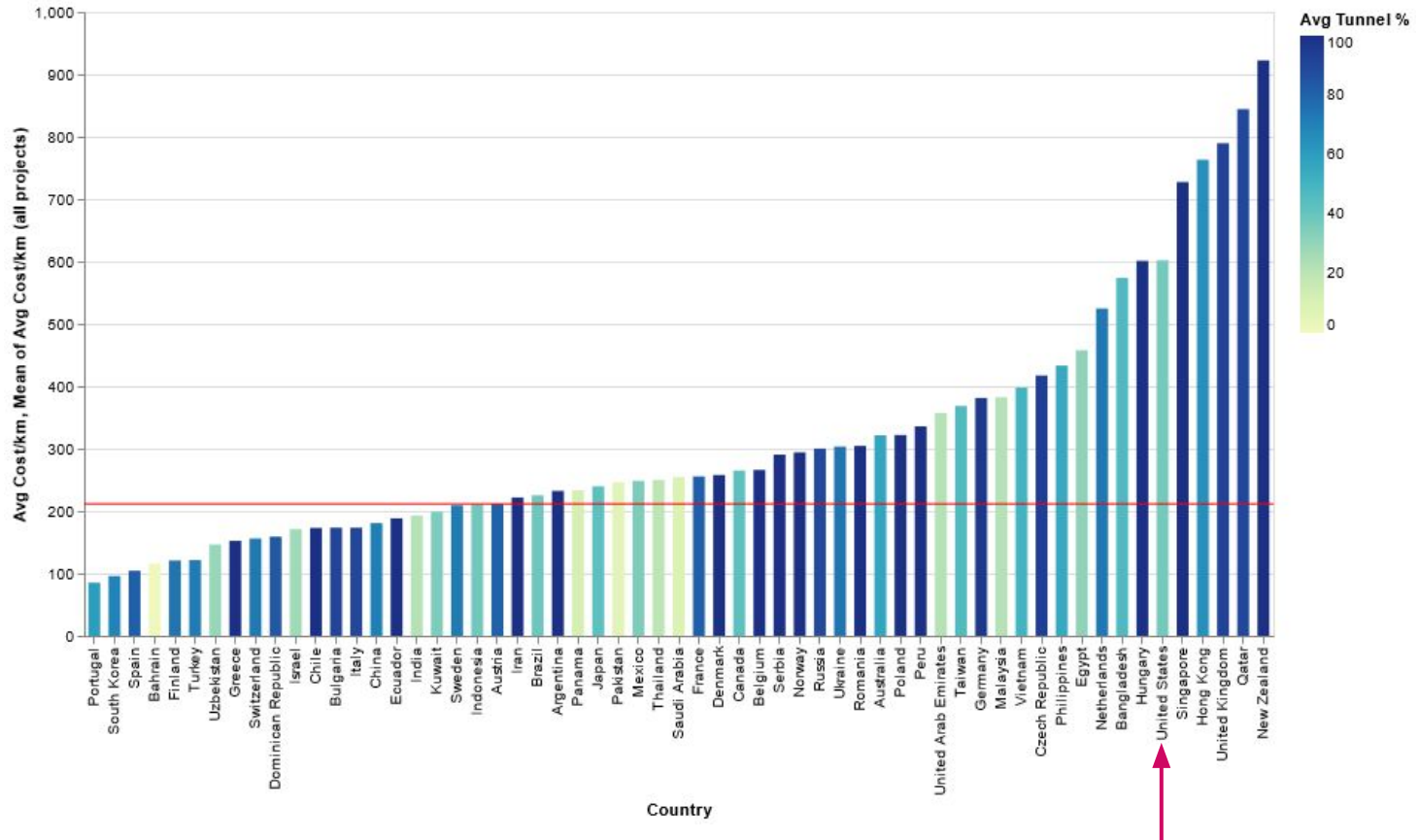
Understanding Transit Infrastructure Costs  
in American Cities

Eric Goldwyn, Alon Levy, Elif Ensari, & Marco Chitti



NYU

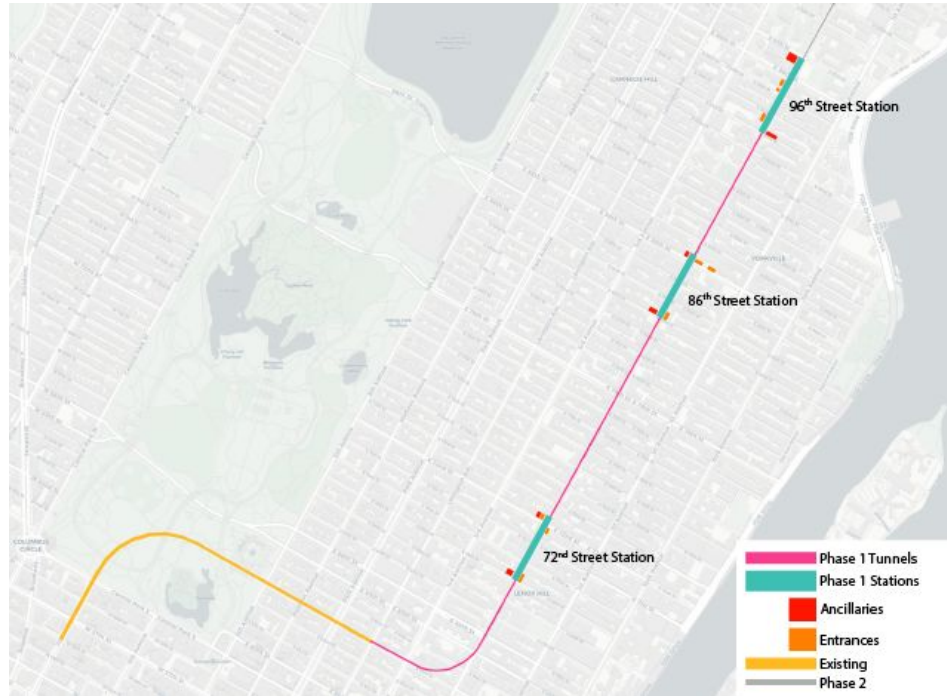
Marron Institute  
of Urban Management



# Case Studies

- Boston: Green Line Extension
- Istanbul: M4, Marmaray and M9
- Italy: Milan, Rome, Turin and Naples
- Sweden: Citybanan and Nya Tunnelbanan
- New York: Second Avenue Subway, Phase 1

# Phase 1 of the Second Avenue Subway



# The Contracts

CONTRACT		PROPOSED	ACTUAL	INCREASE
Date	Contractor	Duration	Completion	Duration
Work	Bids	Cost	Cost	Cost
TUNNELS	3/20/2007		- 3/30/2012	
	S3 Tunnel Constructors JV TBM Tunneling	40 months \$ 337 million	- 60 months - \$ 378 million	50% 12%
96 <sup>th</sup> STREET STATION	5/28/2009		- 11/5/2013	
	E.E. Cruz/Tully Construction Heavy Civil/Structural, and Utility Relocation	43 months \$ 325 million	- 53 months - \$ 372 million	23% 15%
	6/22/2012		- 8/7/2017	
E.E. Cruz/Tully Construction Station Finishes, MEP Systems, Ancillary Buildings, and Entrances	42 months \$ 324 million	- 61.5 months - \$ 411 million	46% 27%	
86 <sup>th</sup> STREET STATION	7/8/2009		- 11/16/2011	
	J.D'Annunzio & Sons, Inc. Excavation, Utility Relocation, and Road Decking	19 months \$ 34 million	- 28 months - \$ 41 million	47% 19%
	8/4/2011		- 12/16/2014	
	Skanska/Traylor JV Heavy Civil/Structural	37 months \$ 302 million	- 52 months - \$ 326 million	41% 8%
6/12/2013		- 9/29/2017		
86th Street Constructors Station Finishes, MEP Systems, Ancillary Buildings, and Entrances	35.5 months \$ 208 million	- 51.5 months - \$ 266 million	45% 27%	
72 <sup>nd</sup> STREET STATION	10/1/2010		- 1/14/2014	
	Schiavone/Shea/Kiewit Cavern Mining, G3/G4 Tunnels, and Heavy Civil/Structural	39 months \$ 447 million	- 39.5 months - \$ 448 million	1% 0%
	2/14/2013		- 8/3/2017	
Judlau Contracting Station Finishes, MEP Systems, Ancillary Buildings, and Entrances	33 months \$ 258 million	- 56.5 months - \$ 347 million	71% 34%	
63 <sup>rd</sup> St. Stn.	1/13/2011		- 12/29/2017	
	Judlau Contracting Reconstruction	40 months \$ 176 million	- 83 months - \$ 229 million	108% 30%
SYSTEMS	1/18/2012		- 7/12/2018	
	Cornstock Skanska JV Track, Power, Signals, and Communications	55 months \$ 262 million	- 78 months - \$ 336 million	42% 28%
DESIGN & CM	5/31/2007		- 8/31/2021	
	PB Americas Consultant Construction Management	91 months \$ 81 million	- 173.5 months - \$ 204 million	91% 152%
12/20/2001		- 3/31/2021		
Aecom-Arup JV Design and Engineering Services	183 months \$ 187 million	- 210 months - \$ 451 million	15% 142%	

# Primary Factors

- Intergovernmental Coordination and Utilities
- Labor Wages and Staffing
- Procurement and Risk
- Station Design

# Intergovernmental Coordination and Utilities



86th Street and Second Avenue Before and After Construction

# A Story About Pipes



*Photo Credit: Ben Heckscher*



# Permitting/3rd Parties Add Uncertainty, Delay, & Costs

News

## Project delays may cost taxpayers \$150K daily as DART officials and Dallas council members squabble

KERA | By Nathan Collins  
Published February 28, 2023 at 3:19 PM CST



DART /

Disagreements between DART and city officials over excess tax revenue, project additions and a lack of communication has delayed DART projects in Dallas.

Delays in a Dallas area light rail project could cost taxpayers \$150,000 a day. That's a rough estimate by a Dallas Area Rapid Transit (DART) official at Tuesday's joint committee meeting with the Transportation and Infrastructure committee.

DURHAM COUNTY NEWS

## Duke opts to not back Triangle light-rail project

by: CBS 17 staff  
Posted: Feb 27, 2019 / 05:34 PM EST  
Updated: Mar 1, 2019 / 06:40 AM EST

The Urbanist Transportation Housing Land Use Politics Donate

Classics Features Link light rail Transit Transportation

### Mercer Island Abandons Long Legal Fight Against Sound Transit

By Ryan Packer - December 14, 2022



After a series of years-long legal fights with Sound Transit, Mercer Island has signed a settlement and given up. (Rendering of future Mercer Island Station courtesy of Sound Transit)

Municipality will pay transit agency \$2.1 million and drop claims surrounding East Link extension.

#### We're Hiring

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#### Recent Posts

Lynwood Link Faces Operational Challenges and Future Service Level Questions  
April 24, 2023

Legislature Abandons Most Traffic Safety Bills As Fatalities Continue To Mount  
April 23, 2023

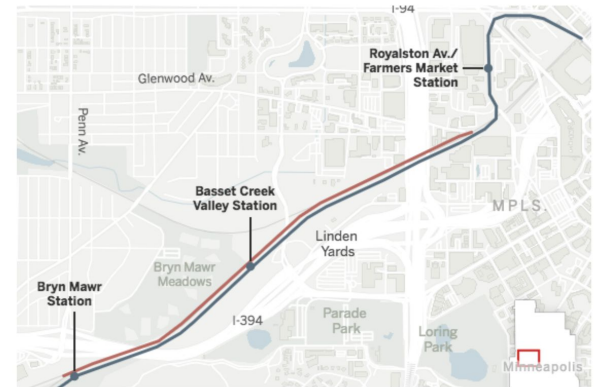
Sunday Video: What Traffic Shows of The Bahama's Racial History  
April 23, 2023

The Urbanist Podcast: What We're Reading

March 24, 2021 | Track Construction

## How much more? Cost of crash wall on Southwest line in Minnesota spikes 356%

Written by RT&S Staff



A 1-mile-long barrier wall required by BNSF will cost more than originally expected.

The Metropolitan Council knows who is going to pay for this wall, but the new price is staggering.

# Labor and Wages

## Second Avenue Subway Phase 1 Tunnel Boring Machine Staffing

### Actual and Proposed Staffing

Team	Number of Staff/Shift	Fully-Laden Employment Cost	Proposed Number of Staff/Shift	Fully-Laden Employment Cost of Proposed Scenario
TBM Crew	20	\$73,720	13	\$47,457
Support Crews	26	\$89,964	17	\$57,882
<b>Total per Shift</b>	<b>46</b>	<b>\$163,684</b>	<b>30</b>	<b>\$116,529</b>
<b>Total</b>	<b>138</b>	<b>\$491,052</b>	<b>90</b>	<b>\$349,586</b>

# *Labor Productivity*



Second Avenue Subway TBM Launch Box

## Agency Capacity



SKANSKA



FLUOR®

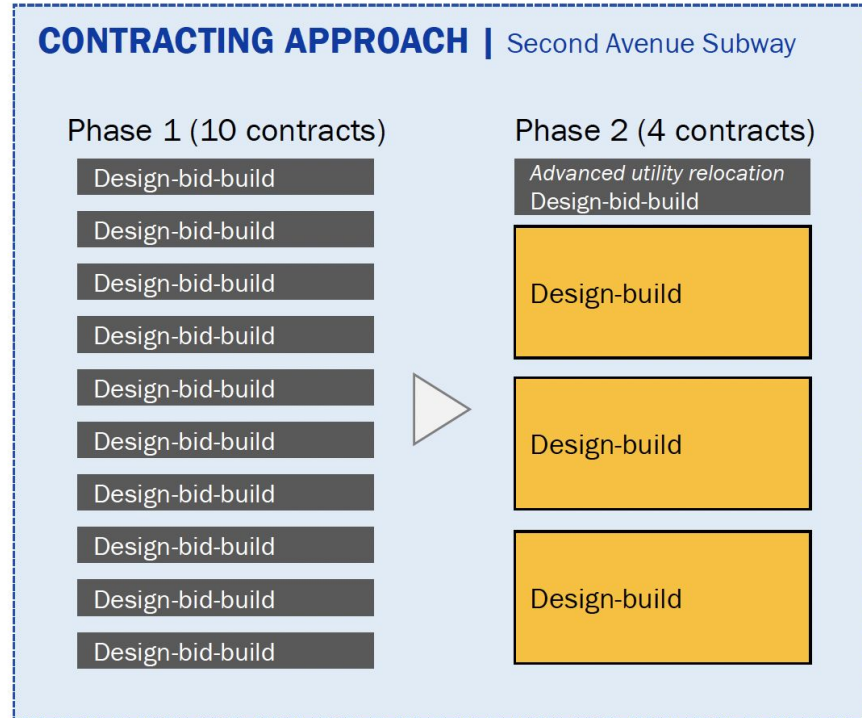
Gilbane

HDR



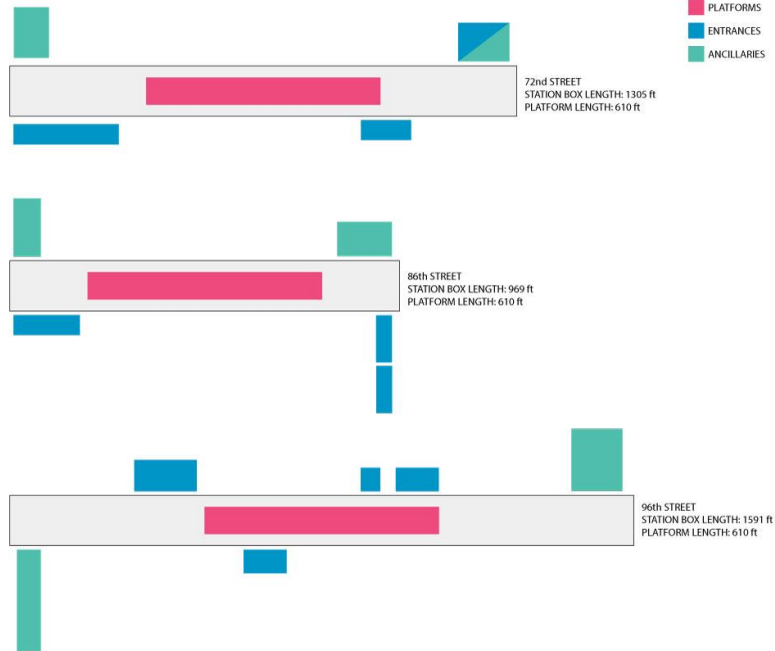
wsp

# Procurement and Risk



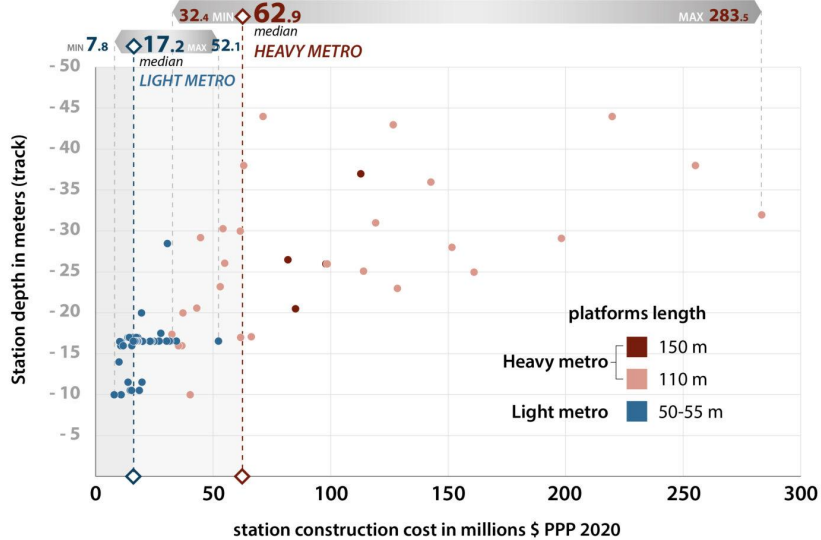
Moving from DBB to DB

# Station Design

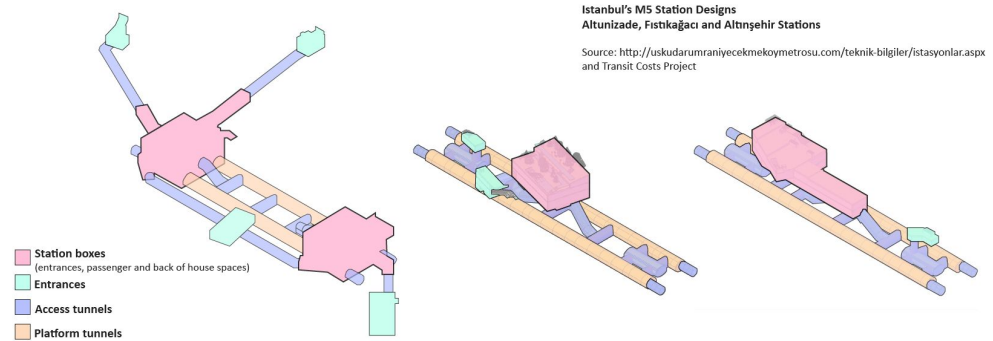


72<sup>nd</sup> st. North: Laverick, K., <https://www.vanshnookenraggen.com>; 72<sup>nd</sup> st. South: Goldwyn, E.; 86<sup>th</sup> st. North: Henderson, J., <https://www.wikiwand.com>; 86<sup>th</sup> st. South and 96<sup>th</sup> st. South: Walsh, K., *Forgotten New York*; 96<sup>th</sup> st. North: Google Street View.

# Another World is Possible

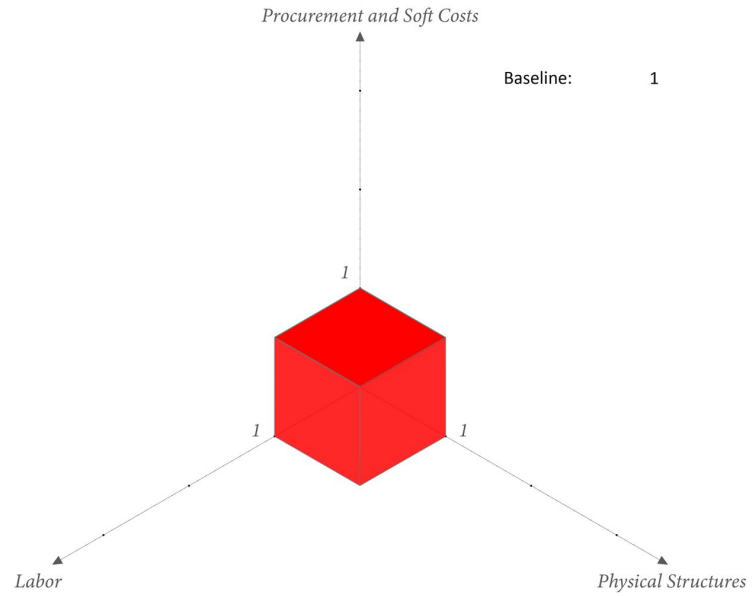


Italian Station Costs



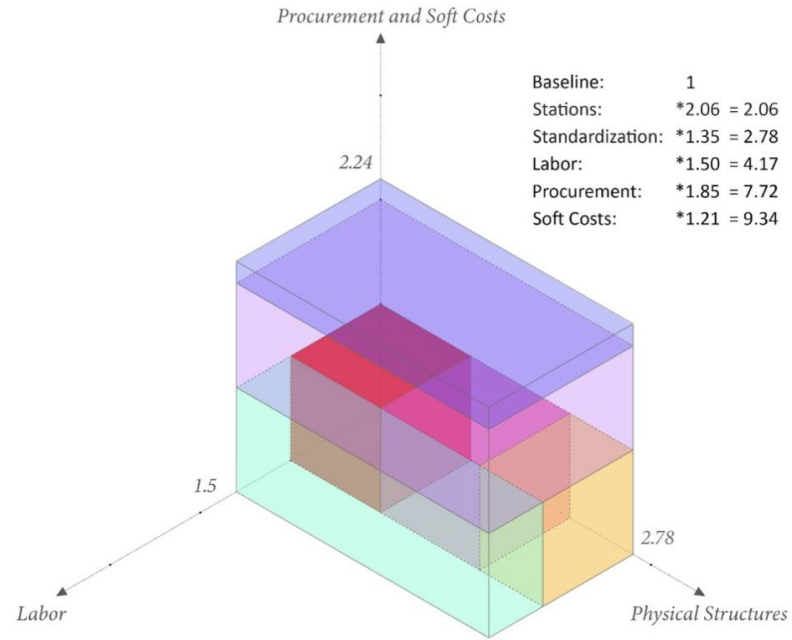
Turkish station boxes are shorter than platforms!

# Factor of 8-12





# Factor of 8-12: Static



## Recommendations - Management

- Find champions
- Import experts, adopt proven standards, cultivate in-house expertise
- Collaborate with other agencies, particularly utilities
- Foster transparency
- Staff-up. Plan to avoid politicization and early commitment.

# Recommendations - Procurement

- Use DBB or DB. Supervise contractors well. Be good clients.
- Itemize contracts
- Ease, speed-up and standardize change order processes
- Keep the risk in the public sector
- Award contracts based on technical merit
- Standardize regulations
- Limit contingencies

## Recommendations - Stations

- Standardize designs
- Use cut and cover, build shallowly
- Build small

# Thank you

More at [transitcosts.com](https://transitcosts.com)

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