



Right Sized Loading

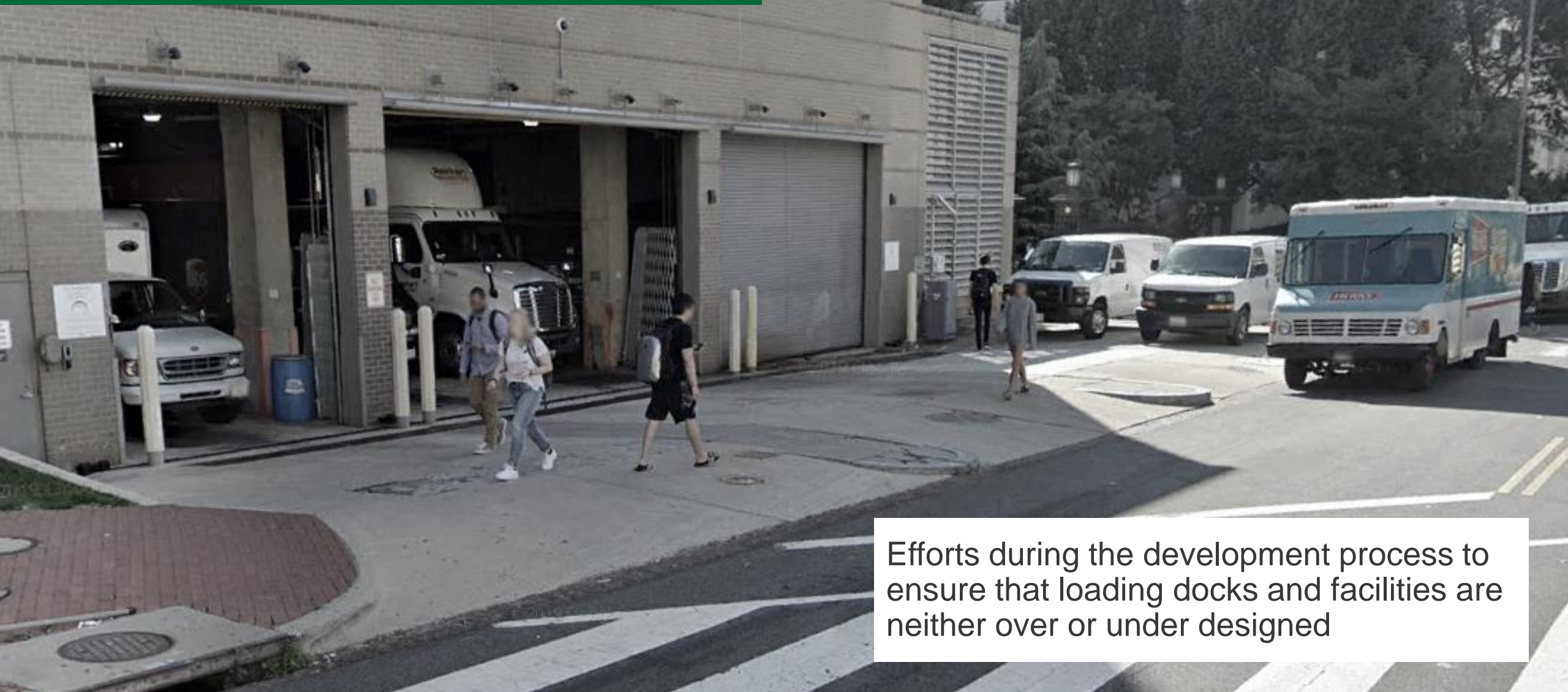
National Capitol Region Transportation Planning Board
Freight Subcommittee

GOROVE SLADE
Transportation Planners and Engineers

November 18, 2021



What is Right Sized Loading?



Efforts during the development process to ensure that loading docks and facilities are neither over or under designed

Why worry about loading docks?



Over-designed docks can negatively impact other modes of travel:

- Large trucks need lots of room for maneuvering, which can increase curb radii, lane widths, and lead to higher speeds for smaller vehicles
- The amount of room needed for these maneuvers is usually taken away from space for other curbside uses or pedestrians

Under-designed docks can be disruptive:

- Large trucks could try to load/unload curbside, double park, or block sidewalks/travel lanes

What this presentation will discuss:

How loading docks are designed during the development process

What issues we see resulting from the current process

Thoughts on what can be done to improve the process

The Development Process:

Developer
gets idea



Architect hired



Plans get
designed



Transportation
engineer hired



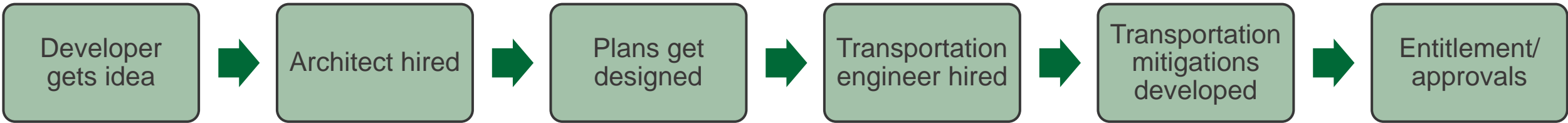
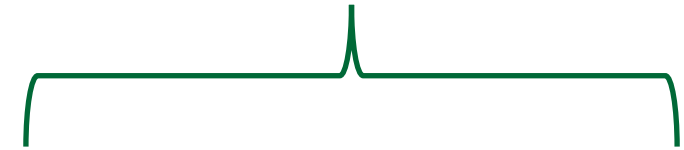
Transportation
mitigations
developed



Entitlement/
approvals

The Development Process:

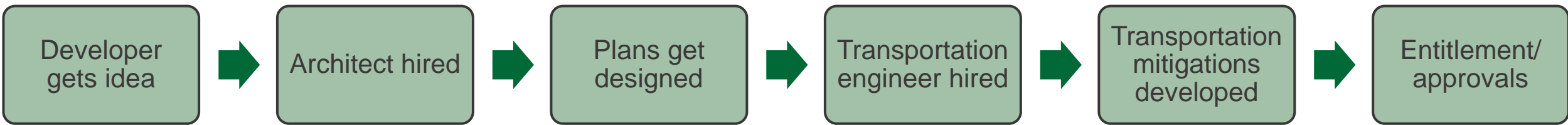
Traditionally, transportation analysis is focused on external impacts and solutions



The Development Process:

But really, many impactful transportation decisions are made here (esp. in urban locations)

Traditionally, transportation analysis is focused on external impacts and solutions



What this means: many transportation decisions during the development process are made by building/zoning codes and not by transportation professionals – including how loading docks are designed

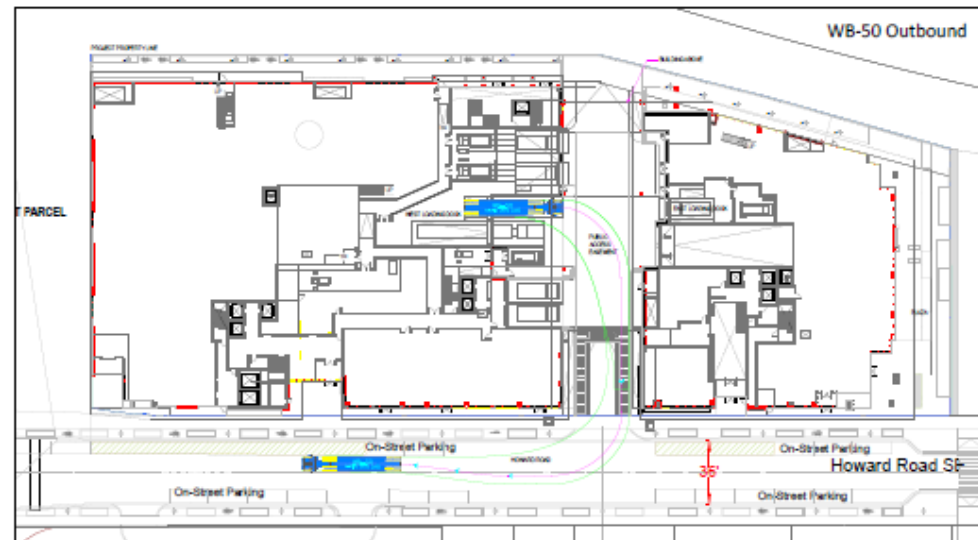
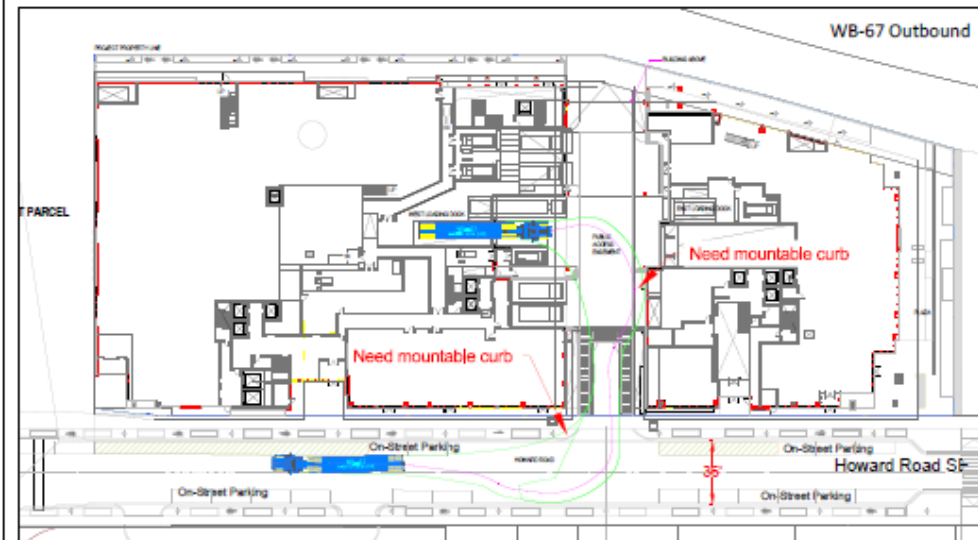
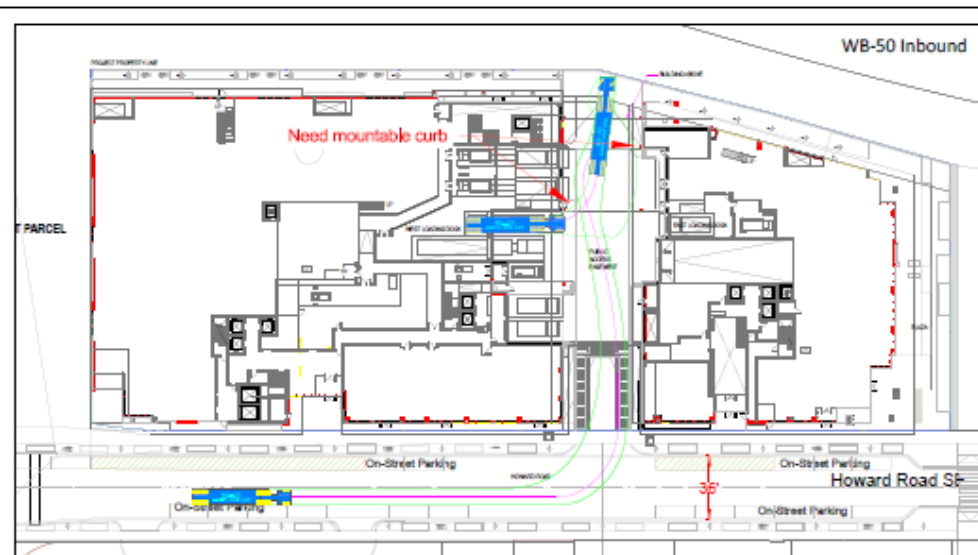
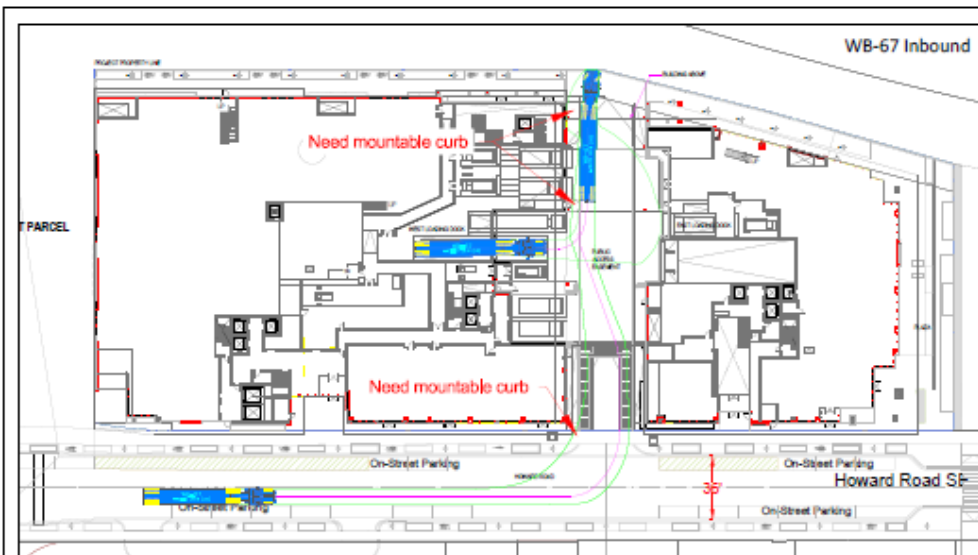
How Architects Design Loading Docks

When tenants are NOT known:

- Build to zoning/building code
- Transportation engineers may check/refine the dock design to make sure it works
 - Depends on the jurisdiction/reviewer, there may be a requirement to provide drawings showing maneuvers (though it's easy to produce poor ones that show it works unless the reviewing agency knows what they're doing)
 - Often through the developer wants assurance that what's built work, especially for trash pick-up

When tenants are known:

- Usually for tenants like big box retailers and grocery stores whose loading needs are unique (they won't sign a notice of intent until they review the loading facilities)
- Architect gets a specific request and takes a first pass
- Transportation Engineers then run maneuvering analyses to check that it works



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Bridge District Parcels 3 & 4: Loading Analysis (36' Road Width)
 Redbrick LMD
 September 16, 2021
 1 of 10

DRAFT
 632 Howard Road SE
 Washington, DC 20002



P:\2021-003 Columbia Quarter Parcels 3 & 4\CAD\16.21 Bridge District 3&4 AutoTurn.dwg - 9/16/2021 4:33 PM

What about other types of loading?

Depends on jurisdiction

- Some will request to see a plan for general deliveries, including those from passenger cars and small vehicles. This includes any resulting impacts to curbside management.
- Some jurisdictions don't really review this at all (in many places the transportation review is still just focused on the external impacts of traffic).



Issues with the process

Encourages generic designs based on building/zoning code

Can lead to over-designed docks (usually code is conservative)

- Negative impacts on urban/pedestrian environment

Can lead to under-designed docks

- Code doesn't change as often as retail does
- Tenants can change after design
- Tenants don't have incentive to work with an under designed dock
 - Double-parking
 - Operational/management solutions often don't work in practice
 - Enforcement issues ('cost of doing business')



Comparison to Right-Sized Parking

Right Sized Parking

- Goal of RSP was to reduce the over-building of parking and encouraging driving as a mode
- Most often parking was designed to meet zoning minimums, sometimes tenant drove higher amounts
- A large amount of research data was needed to convince developers to reduce parking amounts
 - Asking for exceptions is cumbersome
- Some jurisdictions have drastically reduced parking minimums (or replaced with maximums)
 - Results in more input earlier in process (just can't follow code)
- Operations/management can solve under parked locations



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Right Sized Loading

Sounds familiar

Data on loading dock activity is in very short supply

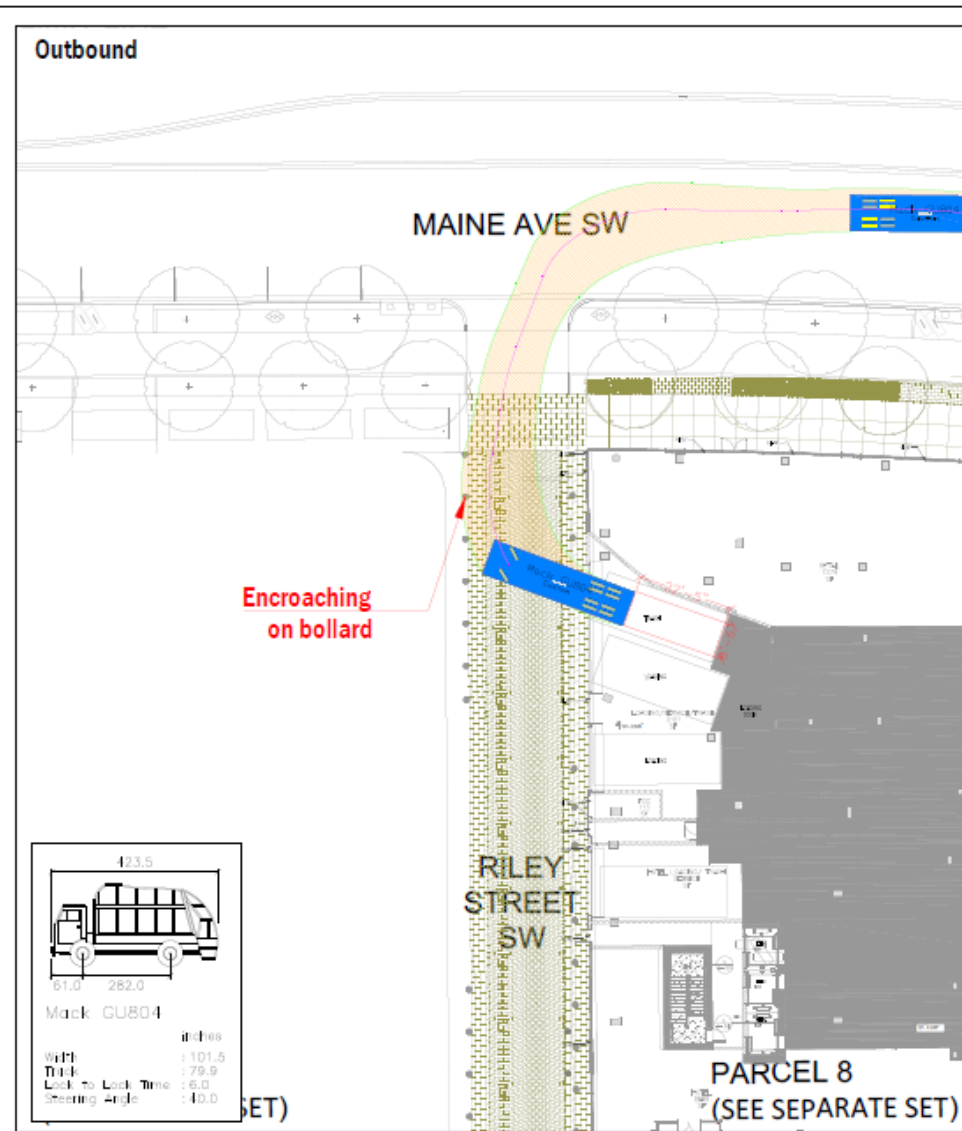
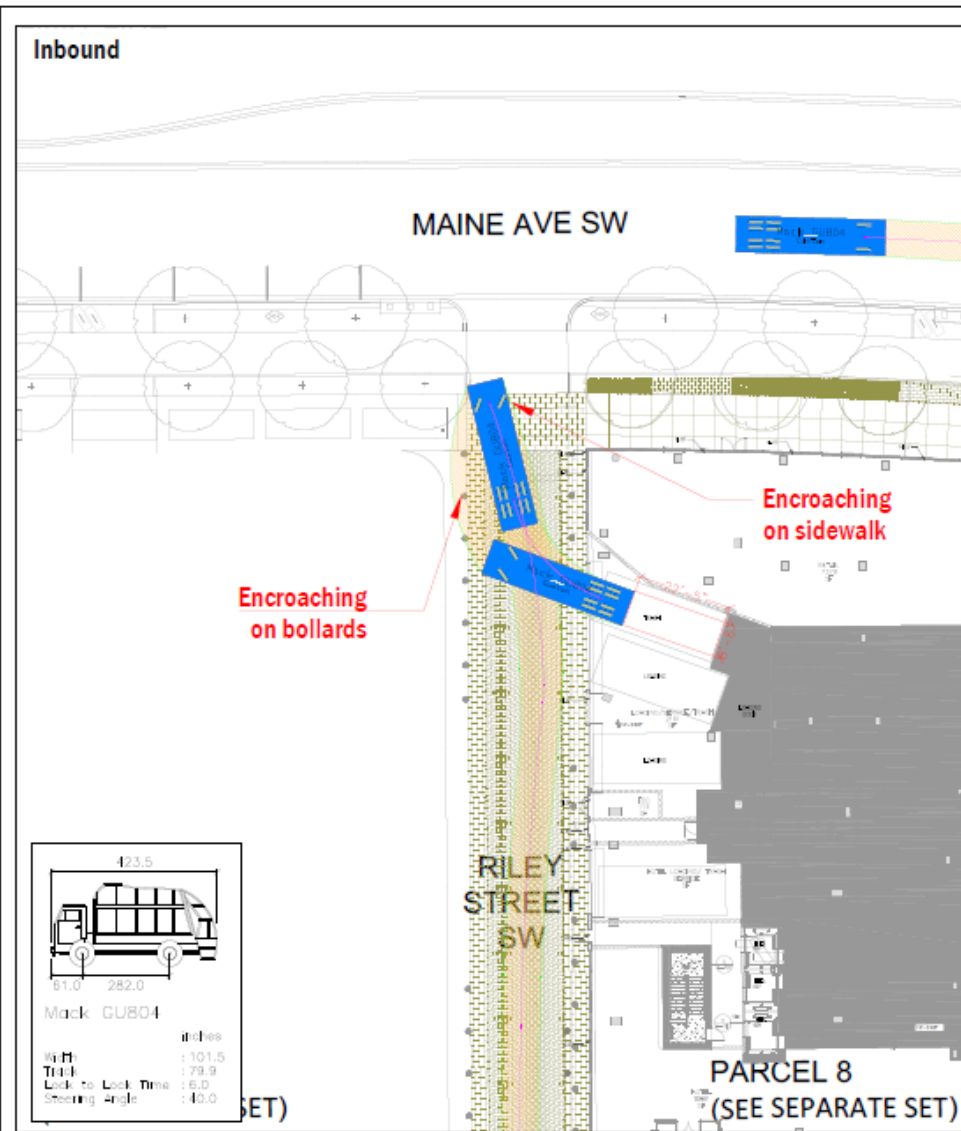
We've encountered issues with this in DC, where loading dock code was reduced (often the first floor is designed based on code, and developers are reluctant to change)

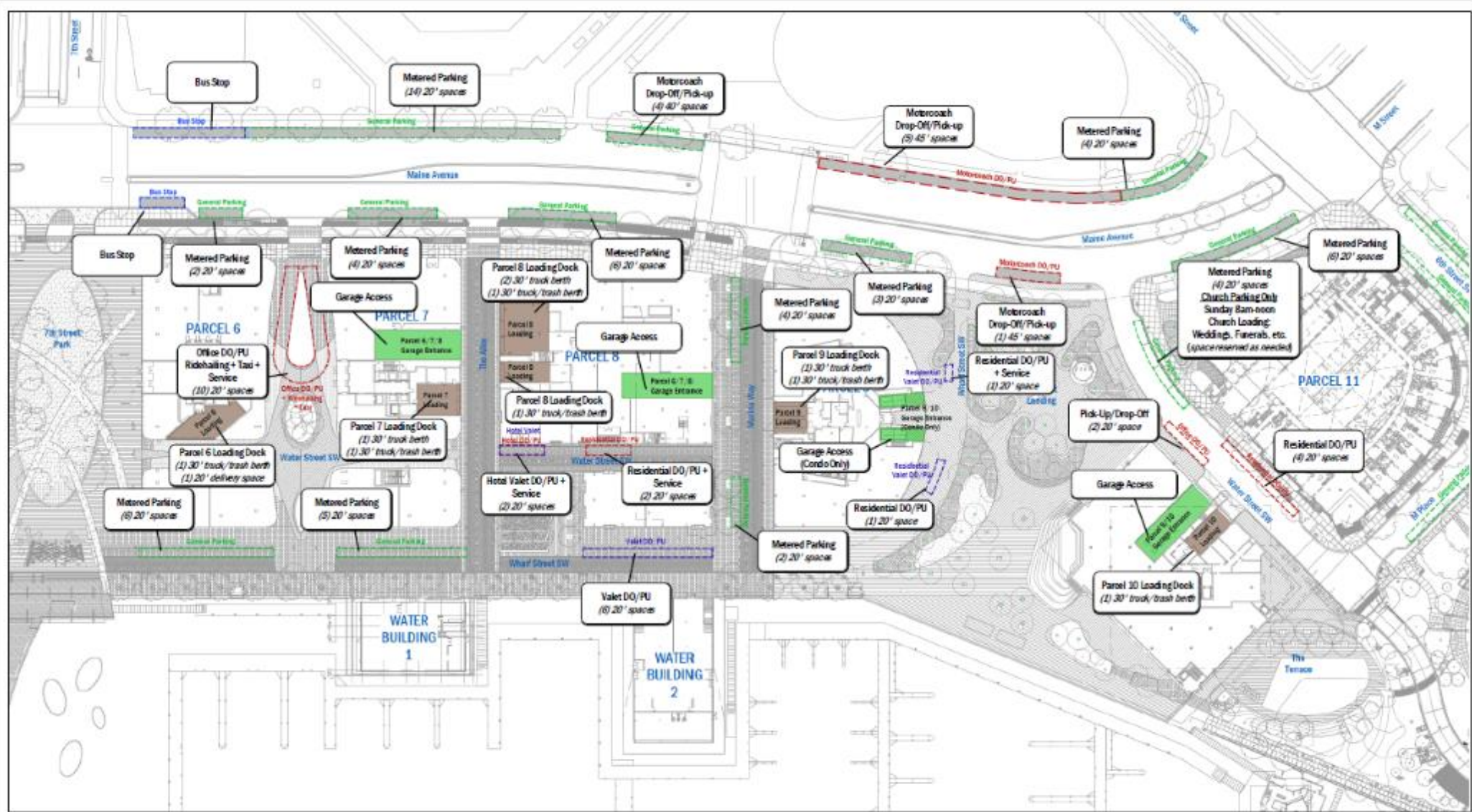
Not the case for RSL



Potential Improvements to Right Sized Loading

- Increased review during approvals
 - Review of dock design
 - Maneuvering
 - Trash
 - Review of curbside uses
- More data to inform decisions
- Creative design solutions
 - Deliveries in garages
 - Curbless environments/flexible space
- Flexibility
 - In zoning code
 - Multiple designs for multiple tenants
 - Parking/curbside operations





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Example: Shared Loading Analysis

Process

Step 1: Gather and review project data

Step 2: Develop critical loading need scenarios

Step 3: Select loading demand ratios (trucks per unit land use, anticipated arrival times, dwell times, trash collection)

Step 4: Calculate practical peak loading demand

Step 5: Test truck turning maneuvers for geometric constraints

Step 6: Recommend loading plan

Data Integrated into Spreadsheet Model

AKRIDGE Gensler
Invested.

100 V STREET SW - LOADING DEMAND MODEL
CONDENSED LOADING SCHEME

Last Updated: 6/15/2020
Note: Anything in red text and shading is an input. All other fields are calculated.

Compactors or loose trash? Compactors

RETAIL MIX				
	Retail	Fine/Casual	Fast Casual	Grocer
Building A	25%	0%	0%	75%
Building B	50%	25%	25%	0%
Building C	50%	25%	25%	0%
Building D	50%	25%	25%	0%
Building E	50%	25%	25%	0%
Building F	50%	25%	25%	0%
Building G	50%	25%	25%	0%
Building H	50%	25%	25%	0%
Building I	50%	25%	25%	0%

DEVELOPMENT PROGRAM										
Land Use	Phase 1				Phase 2				Overall	
	Building A	Building B	Building C	Building D	Building E	Building F	Building G	Building H		Building I
Residential	379 units	345 units	357 units	-	240 units	363 units	-	165 units	1,849 units	
Office	3,364 SF	-	18,432 SF	40,221 SF	-	-	168,000 SF	-	189,717 SF	
Hotel	-	-	-	-	-	-	145,500 SF	-	145,500 SF	
Retail	11,558 SF	14,388 SF	12,382 SF	-	12,500 SF	12,500 SF	12,500 SF	12,500 SF	88,338 SF	

LOADING ASSUMPTIONS BY USE										
Land Use	Loading Ratios				Dwell Times					
	40k Berths	30k Berths	Deliveries	Trucks	40k Berths	30k Berths	Deliveries	Trucks		
Residential	0.000 per unit	0.000 per unit	0.018 per unit	1 per bldg	4 hours	4 hours	0.5 hours	0.5 hours		
Office	0.000 per kaf	0.003 per kaf	0.015 per kaf	1 per bldg	1 hours	1 hours	0.5 hours	0.5 hours		
Hotel	0.000 per kaf	0.017 per kaf	0.029 per kaf	1 per bldg	0.5 hours	0.5 hours	0.5 hours	0.5 hours		
General Retail	0.150 per kaf	0.162 per kaf	0.296 per kaf	1 per bldg	0.5 hours	0.5 hours	0.5 hours	0.5 hours		
Fine/Casual Dining	0.060 per kaf	0.144 per kaf	0.174 per kaf	1 per bldg	0.5 hours	0.5 hours	0.5 hours	0.5 hours		
Fast Casual/Fast Food	0.171 per kaf	0.488 per kaf	0.430 per kaf	1 per bldg	0.5 hours	0.5 hours	0.5 hours	0.5 hours		
Grocer	0.226 per kaf	0.269 per kaf	0.234 per kaf	1 per bldg	3 hours	3 hours	0.5 hours	0.5 hours		

Note: Loading assumptions are based on data collected at various sites in the DCMDVA region.

ZONING REQUIREMENTS										
Loading	Phase 1				Phase 2				Overall	
	Building A	Building B	Building C	Building D	Building E	Building F	Building G	Building H		Building I
Berths	1	1	1	1	1	1	3	2	1	12
Service/Delivery	1	1	1	None	1	1	None	1	1	7

LOADING DEMAND MATRIX			
Practical Peak Demand	Phase 1		Overall
	Phase 1 + Phase 2	Phase 2	Overall
40k Berths	3	4	4
30k Berths	3	5	6
Deliveries	3	5	6
Trash	3	7	7

Version 1: Service/Delivery Spaces in Loading Area			
Provided Loading	Surplus/Deficit	Overall	Notes
40k Berths	4	6	6
30k Berths	3	7	6
Deliveries	5	7	7
Trash	6	9	9
40k Berths	+1	+2	+2
30k Berths	-	+1	+1
Deliveries	+2	+2	+2
Trash	+3	+2	+2

Version 2: Service/Delivery Spaces in Garage			
Provided Loading	Surplus/Deficit	Overall	Notes
40k Berths	4	6	6
30k Berths	6	13	13
Deliveries	4	9	9
Trash	6	9	9
40k Berths	+1	+2	+2
30k Berths	+5	+8	+8
Deliveries	+1	+4	+4
Trash	+3	+2	+2

ANTICIPATED ARRIVAL PERIODS BY USE																
Residential																
40k Berths	[Bar chart showing arrival periods]															
30k Berths	[Bar chart showing arrival periods]															
Deliveries	[Bar chart showing arrival periods]															
Trash	[Bar chart showing arrival periods]															
Office																
40k Berths	[Bar chart showing arrival periods]															
30k Berths	[Bar chart showing arrival periods]															
Deliveries	[Bar chart showing arrival periods]															
Trash	[Bar chart showing arrival periods]															
Hotel																
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30k Berths	[Bar chart showing arrival periods]															
Deliveries	[Bar chart showing arrival periods]															
Trash	[Bar chart showing arrival periods]															
General Retail																
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Trash	[Bar chart showing arrival periods]															
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Fast Casual/Fast Food																
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30k Berths	[Bar chart showing arrival periods]															
Deliveries	[Bar chart showing arrival periods]															
Trash	[Bar chart showing arrival periods]															

NOTES

Note 1: Practical peak demand is based on the available time in the arrival period and the total required time for trucks based on dwell times. Additional berths provided based on required time and available time.

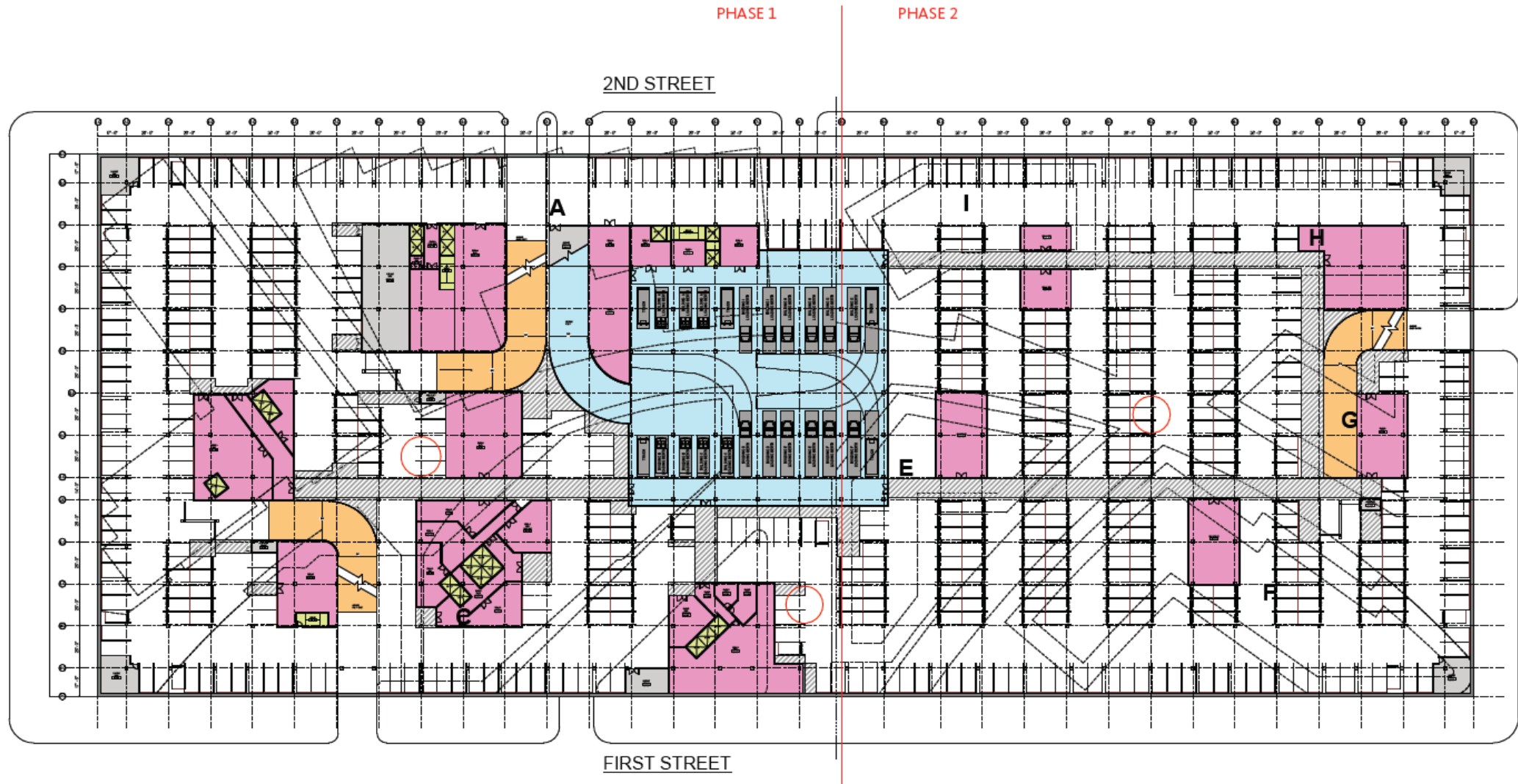
Note 2: The practical peak demand assumes berths are not 100% managed during the anticipated arrival period.

Note 3: Practical peak demand assumes shared loading facilities. Provided loading facilities include a dedicated trash berth for each building.

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RAFT
Page 1

Question: How much loading for a shared facility?



Data used in shared loading model

LOADING ASSUMPTIONS BY USE								
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Note: Loading assumptions are based on data collected at various sites in the DC/MD/VA region.

Data sources:

- 1) ITE (Institute of Transportation Engineers) truck trip generation
- 2) Gorove Slade collected data
- 2) Data collected by jurisdictions (DDOT has provided us with some data)

All data sources have issues (e.g., ITE is daily, doesn't include any truck size information, hourly range of times, limited land uses)

Rates usually adjusted after consultation with client

Shared loading model: End Result

Option 1: Consolidated Loading

LOADING DEMAND MATRIX			
	Phase 1	Phase 1 + Phase 2	Overall
Practical Peak Demand			
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QUESTIONS?

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