Transbay Program Downtown Rail Extension

Second and Howard Streets Crossing Construction Approach

Citizens Advisory Committee

November 9, 2021

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Agenda

- Introduction and Background
- Mining Options
- Cut and Cover Versus Mining Options
- Proposed Options for Crossing
- Feedback from Contractor Outreach
- Questions and Discussions

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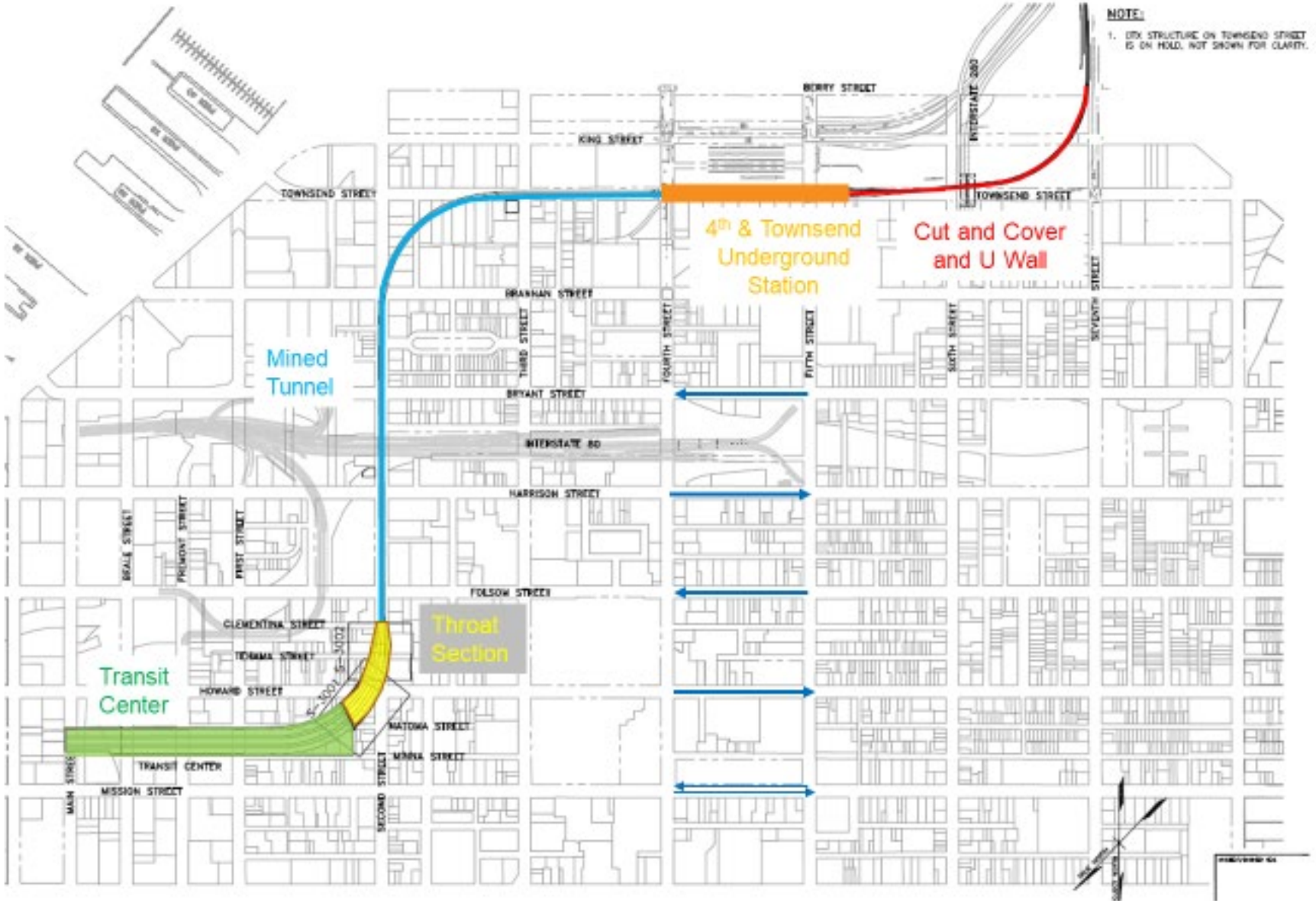
NOTE:
1. DTX STRUCTURE ON TOWNSEND STREET IS ON HOLD, NOT SHOWN FOR CLARITY.
4th & Townsend Underground Station
Cut and Cover and U Wall
Mined Tunnel
Throat Section
Transit Center
TOWNSEND STREET
KING STREET
BERRY STREET
BRANNAN STREET
BRYANT STREET
HARRISON STREET
FOLSOM STREET
CLEMENTINA STREET
TEHAMA STREET
HOWARD STREET
NATOMA STREET
MINNA STREET
MISSION STREET
TRANSIT CENTER
INTERSTATE 80
INTERSTATE 280
THIRD STREET
FOURTH STREET
FIFTH STREET
SIXTH STREET
SEVENTH STREET
BEALE STREET
FREMONT STREET
FIRST STREET
MAIN STREET
SECOND STREET

Purpose of Presentation and Background

- Tunnel Option Study (TOS) identified separate mining options to reduce construction impacts from DTX Throat Section at 2nd and Howard Streets.
- Cost estimates determined construction costs for these options are significantly higher than cut and cover option - in excess of $253 million (fully burdened and escalated to 2027).
- To reduce costs and traffic impacts, Howard Street crossing workshop held by TJPA on November 9, 2017, to explore viable mining alternatives.
- IPMT recommended eliminating the mining option from further consideration at the Howard Street Crossing Charrette on May 25, 2021.
- ESC received Howard Street Crossing presentation on October 22, 2021, to review baseline concept (cut and cover) and mining alternative. No change to IPMT recommendation was made.

Mining Options – Objective and Benefits

- Potential for reduced surface impacts
- Full street closure not required with good planning and coordination
- Utilities relocations minimized though not completely avoided
- Reduced disturbance to adjacent owners and businesses
- Reduced issues associated with Right-of-Way acquisitions

Mining Options - Risks

- Very large span (> 150 ft)
- Shallow ground cover (about 10 ft)
- Very weak soil above and within excavation
- High groundwater table (above excavation)
- Complex mining methods requiring delicate mining operations involving multiple mining special contractors and equipment – limited successful case study history
- Significant uncertainties that may result in construction delays, surface impacts, and claims

Summary of Mining Options

- Mining alternative is viable but involves higher risk and associated higher costs
- Higher complexity in both design and construction operations
- Risks significantly outweigh project benefits
- Surface impacts from mining alternative not avoidable (street closures required for ground improvement, noise from ventilation fans and ground vibrations from mining operations, etc.)
- Design team and IPMT consensus: mining alternative for Howard Street Crossing not recommended

Where Are We Now?

- Additional $208 Million to mine under Howard Street versus baseline
- Risk is not currently fully captured in cost of the project
- Recent improvements and examples in cut and cover construction with mitigated traffic impacts
- Examination of cut and cover methods in a manner that has minimal to same traffic impacts as mined

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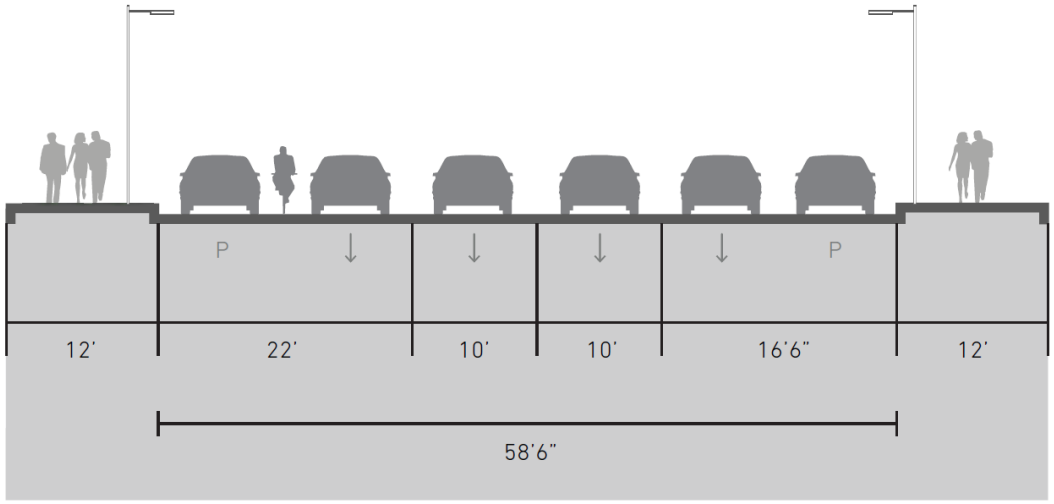
Cut and Cover Concept to Reduce Impacts Project Example – LA Metro Purple Line

Roadway Decking at Wilshire/Rodeo Station in Beverly Hills for Purple Line Ext.

Proposed Cut and Cover Concept to Reduce Impacts

- Implementation of baseline cut and cover concept
- Accelerated bridge construction (ABC) concept



HOWARD STREET

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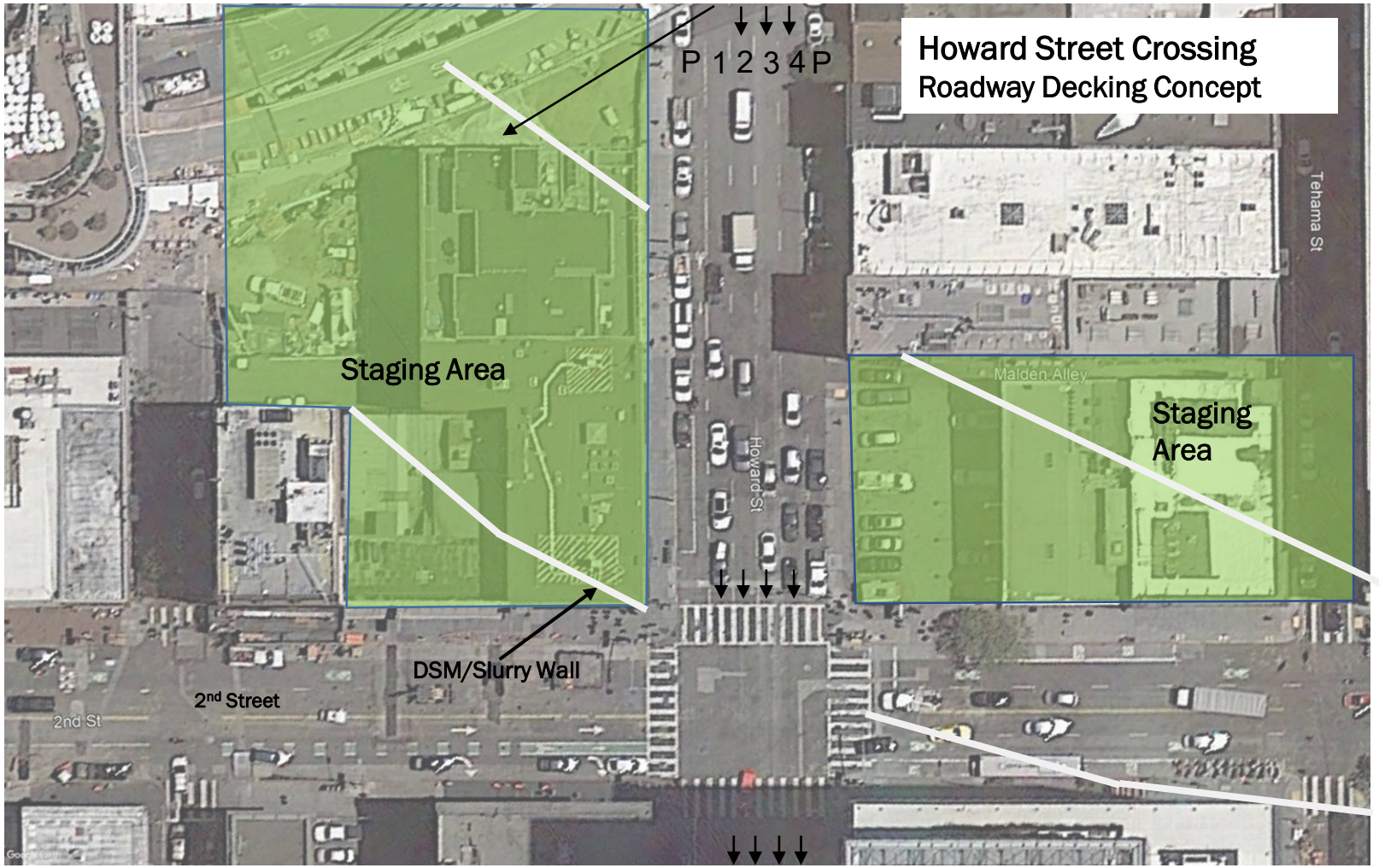

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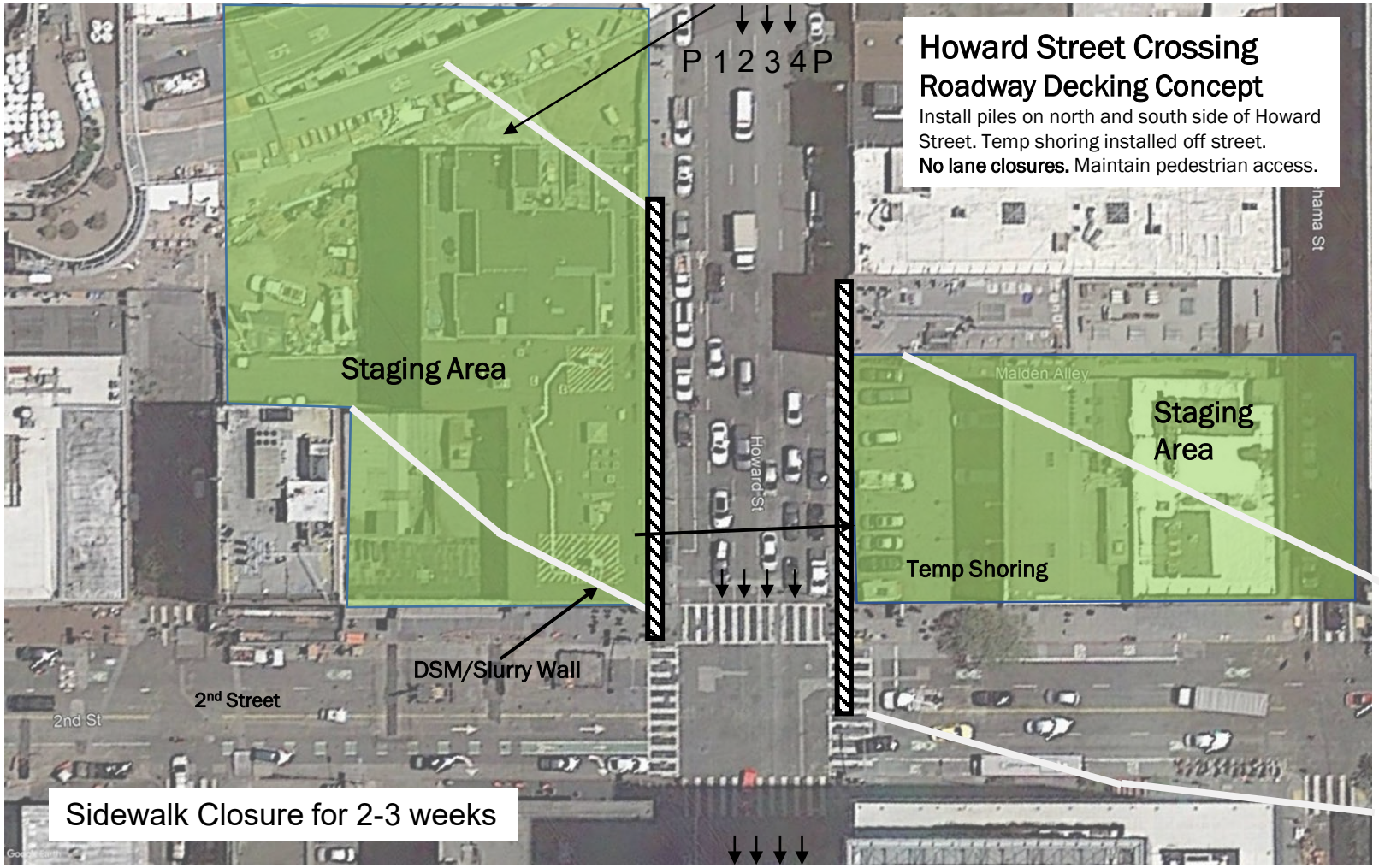

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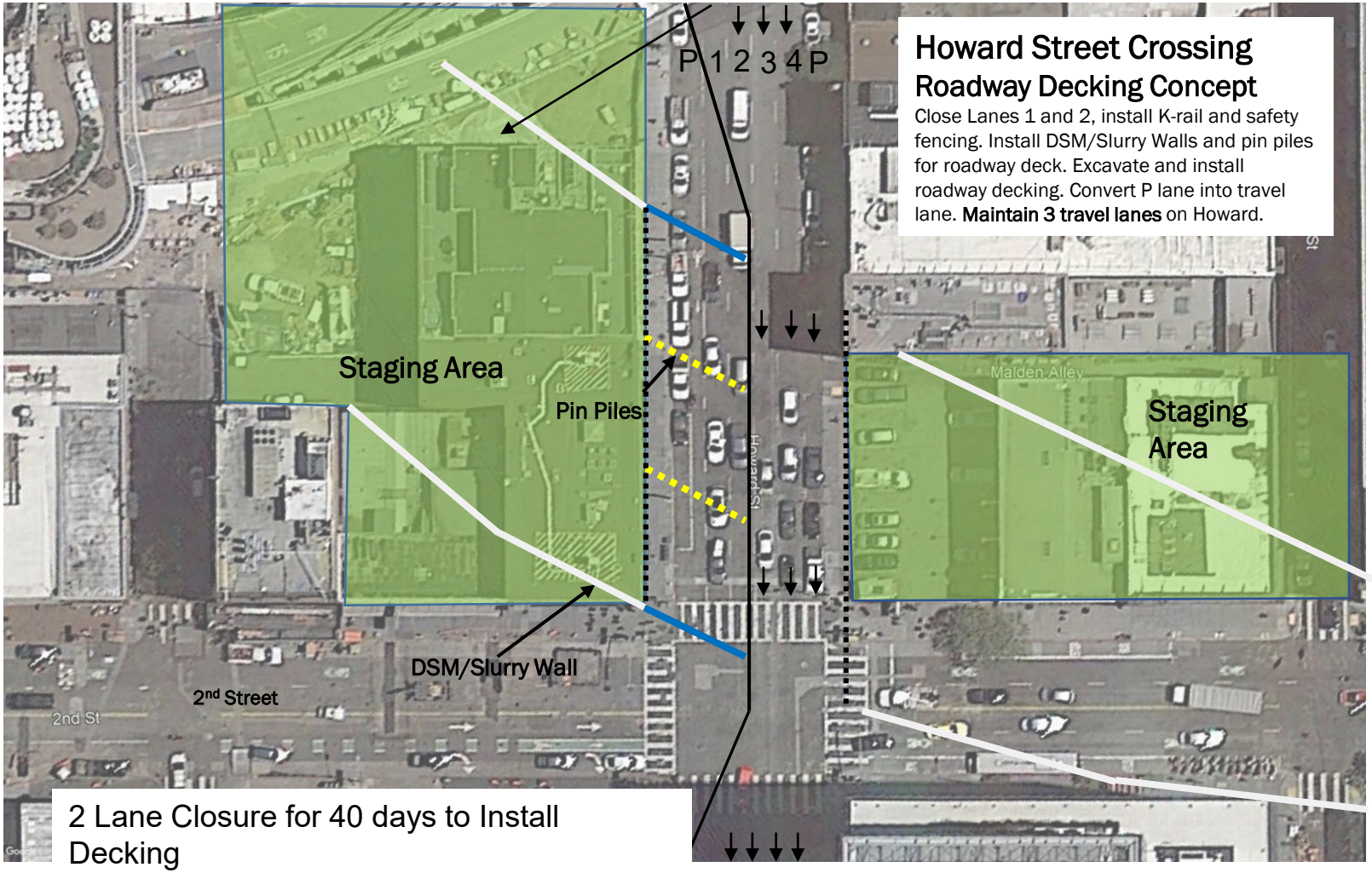

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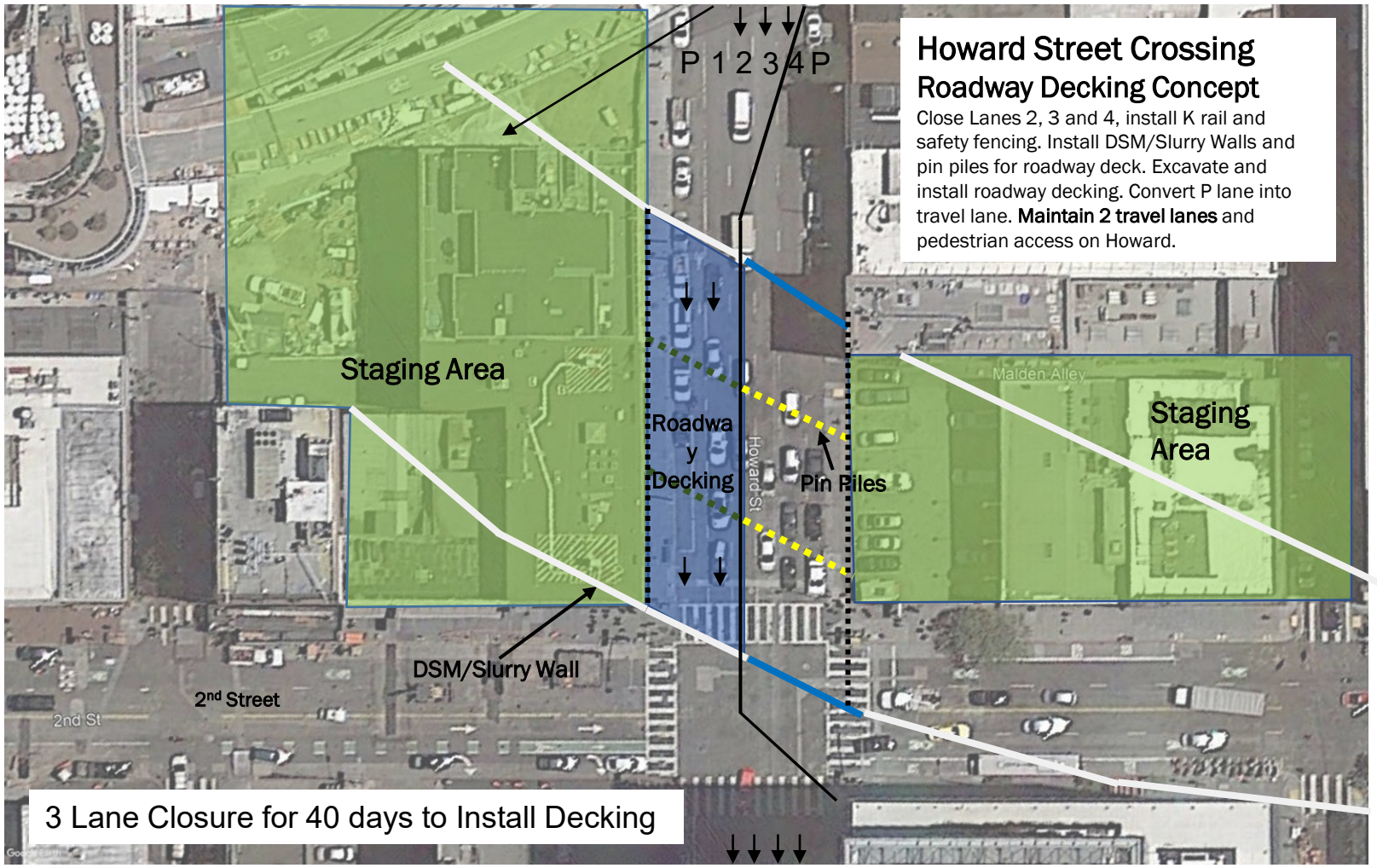

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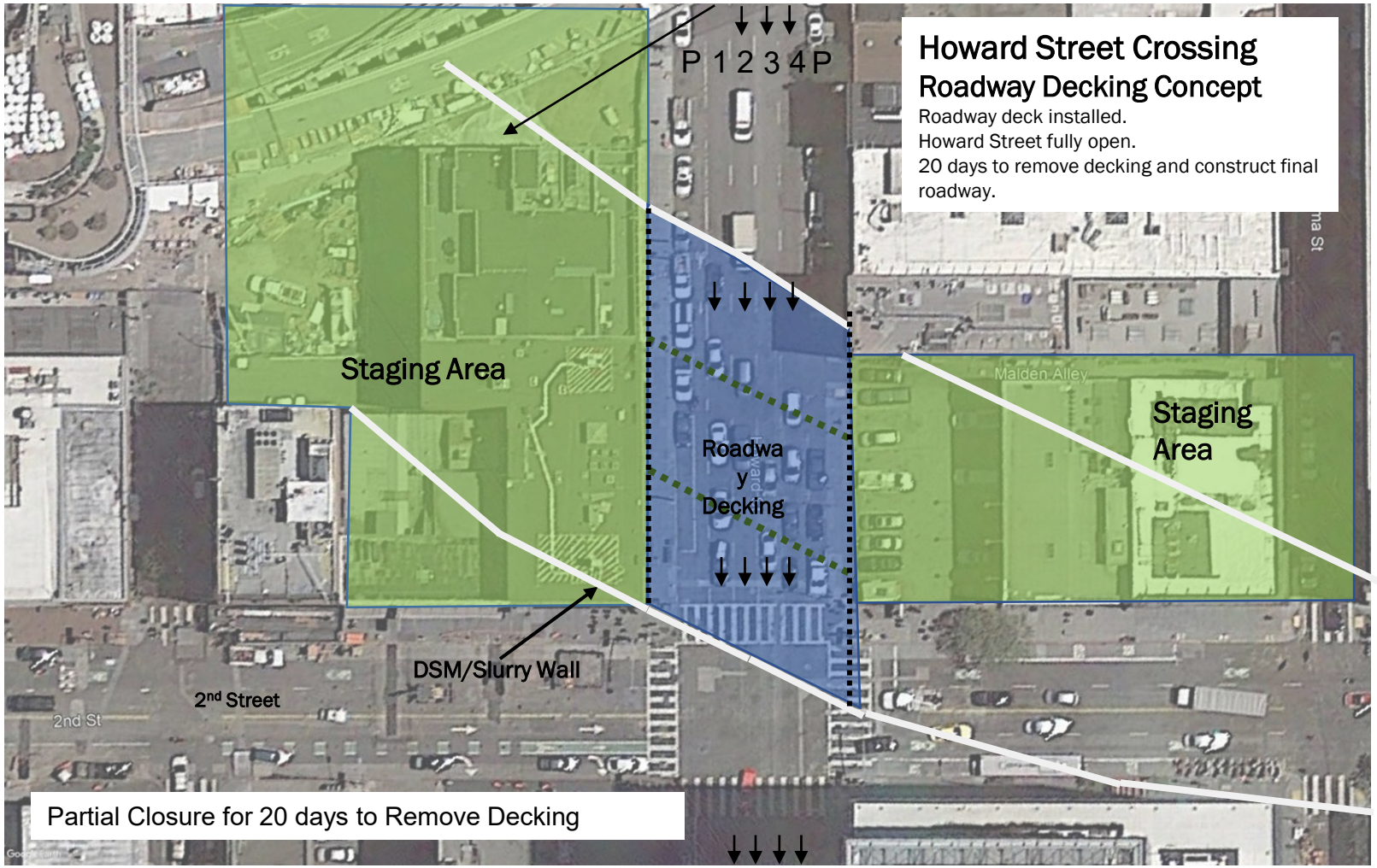

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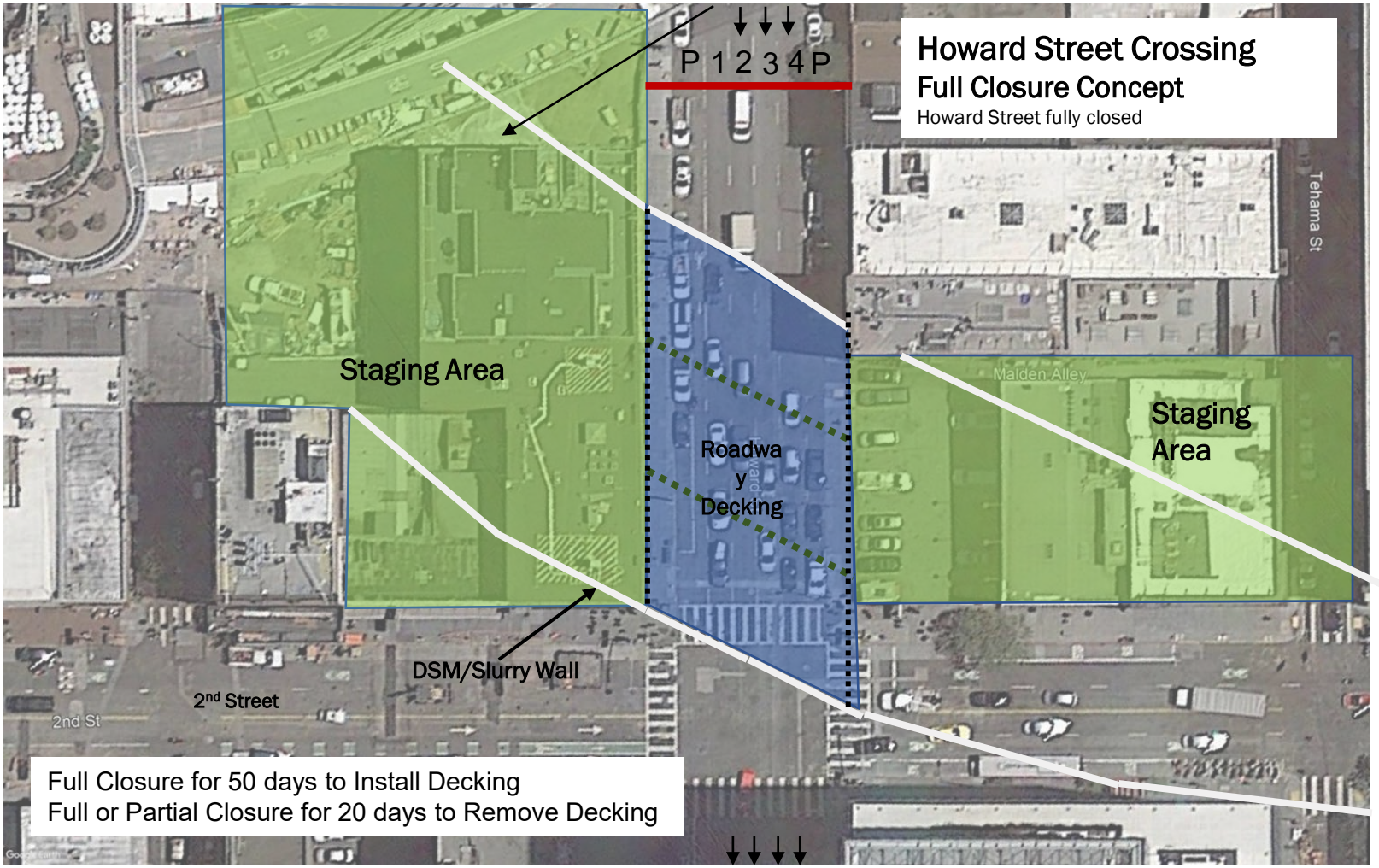

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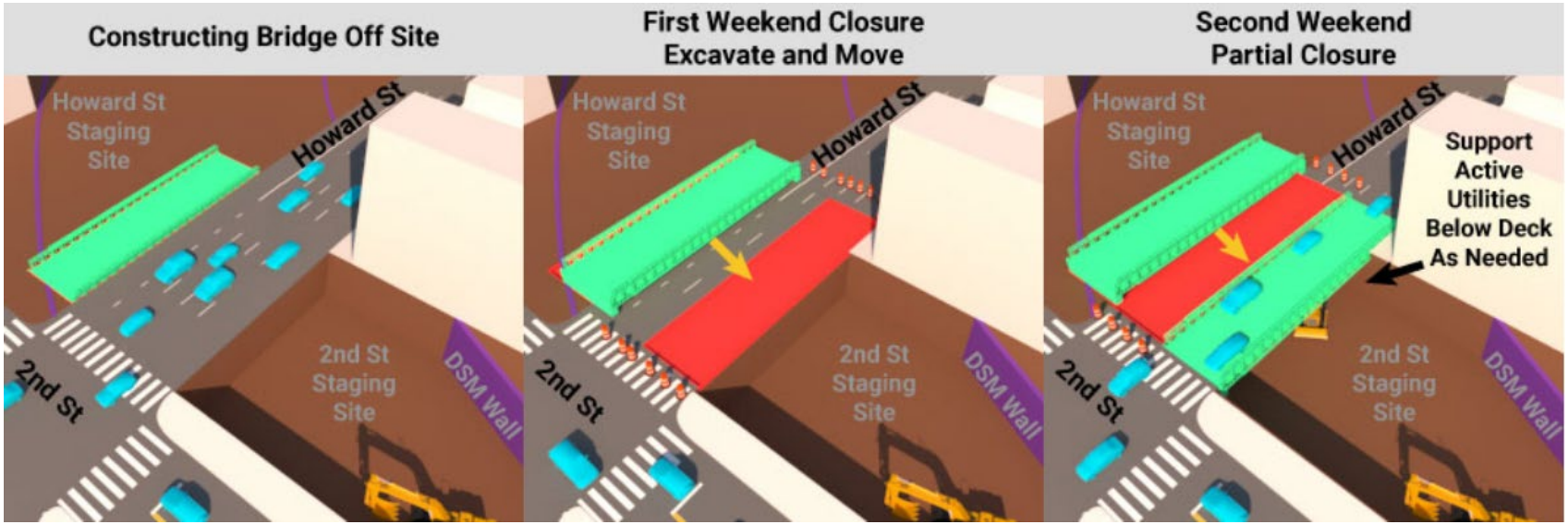
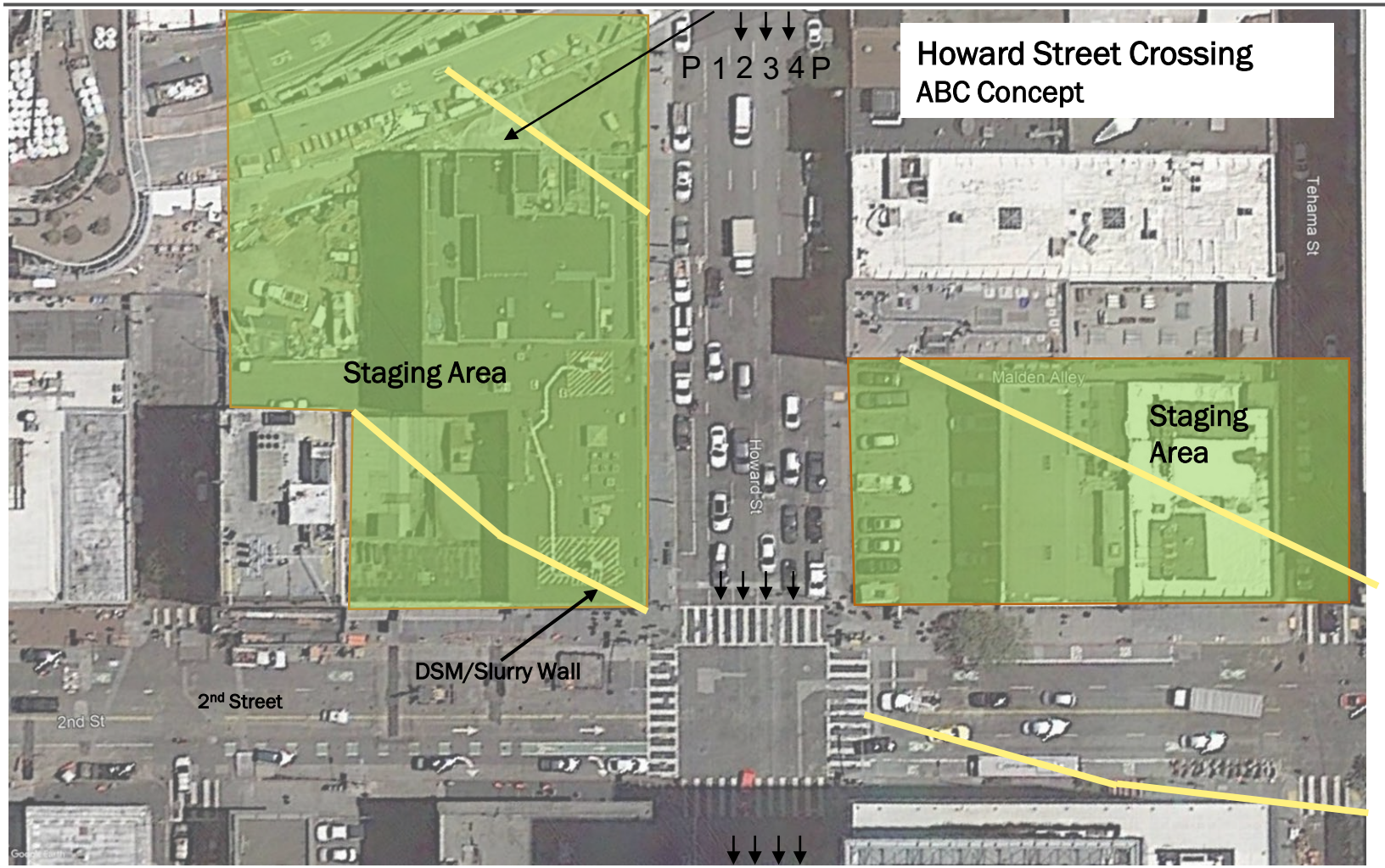
Proposed Cut and Cover Concepts to Reduce Impacts - Accelerated Bridge Construction

- Span over 100 feet using pre-assembled (on-site), shallow decking to complete street decking
- After installation of support of excavation, decking can be completed over one or two weekends.





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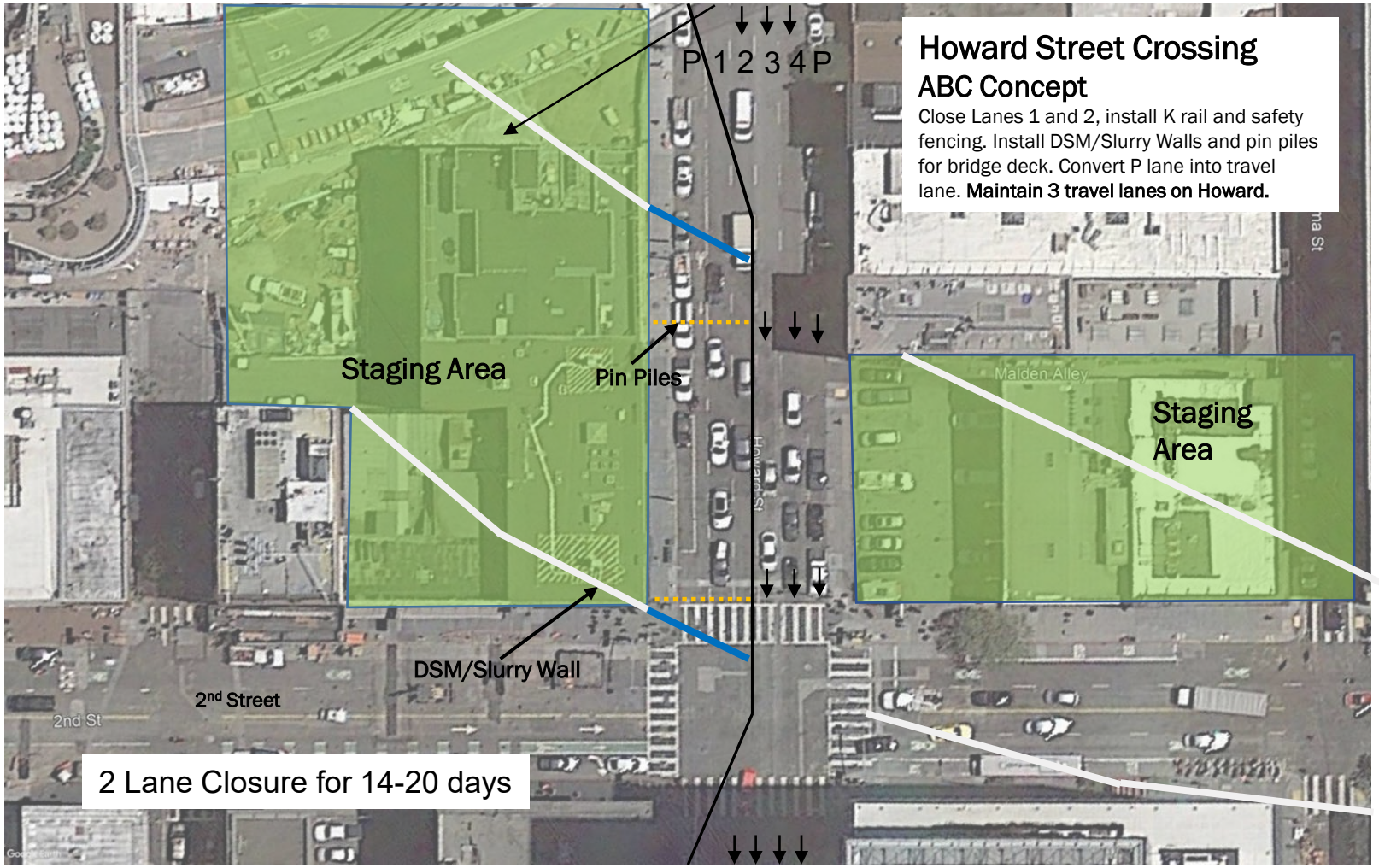

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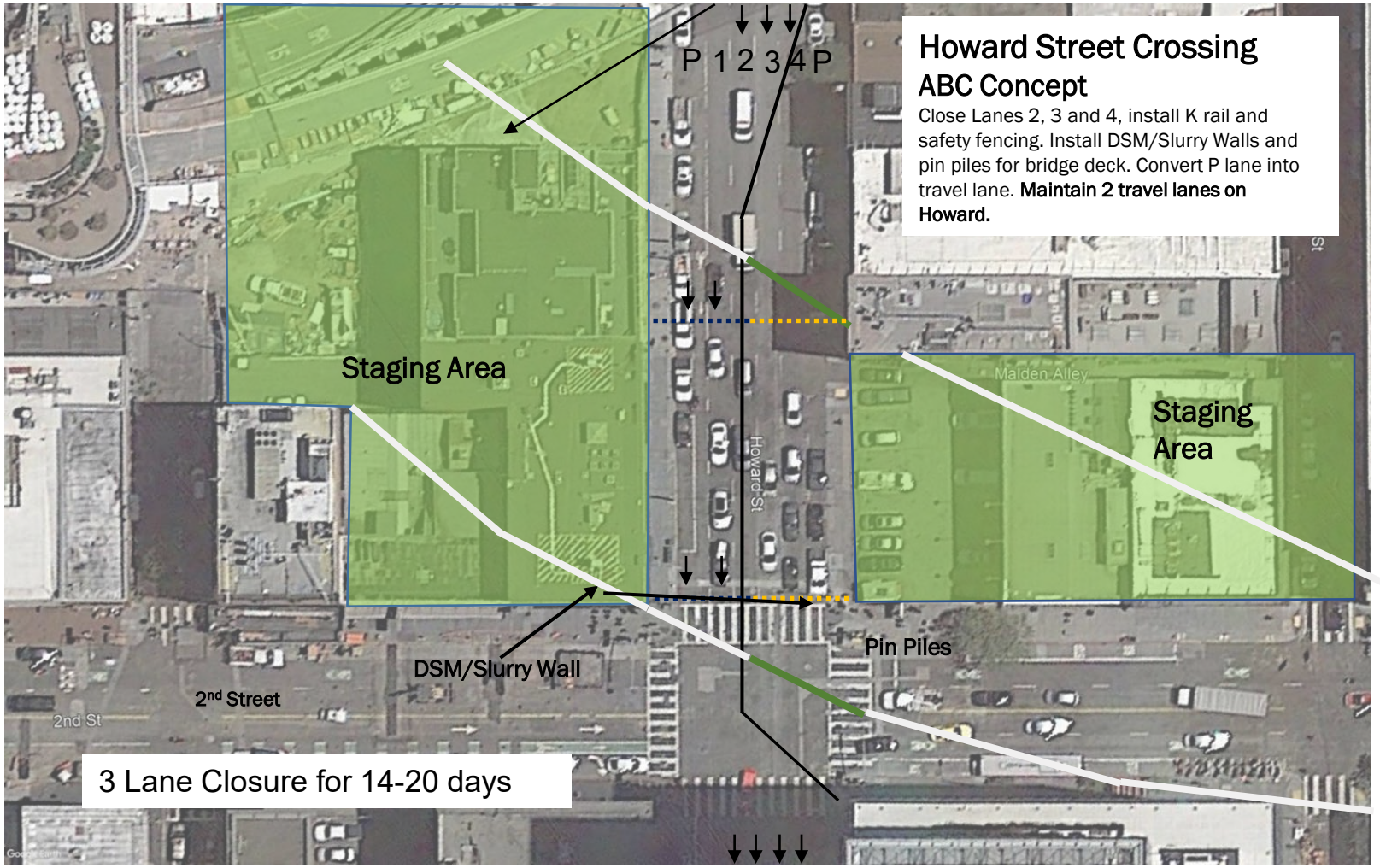

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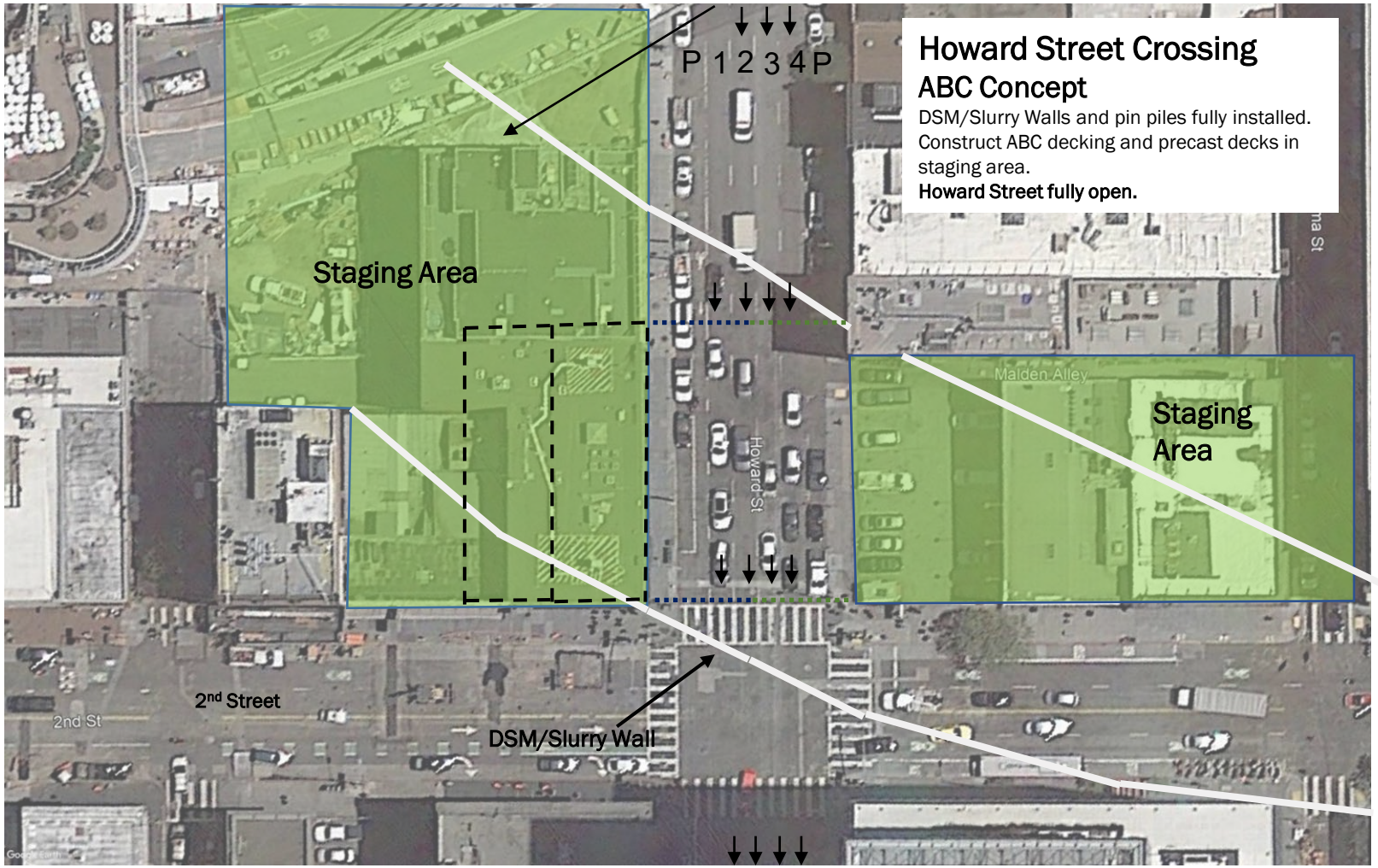

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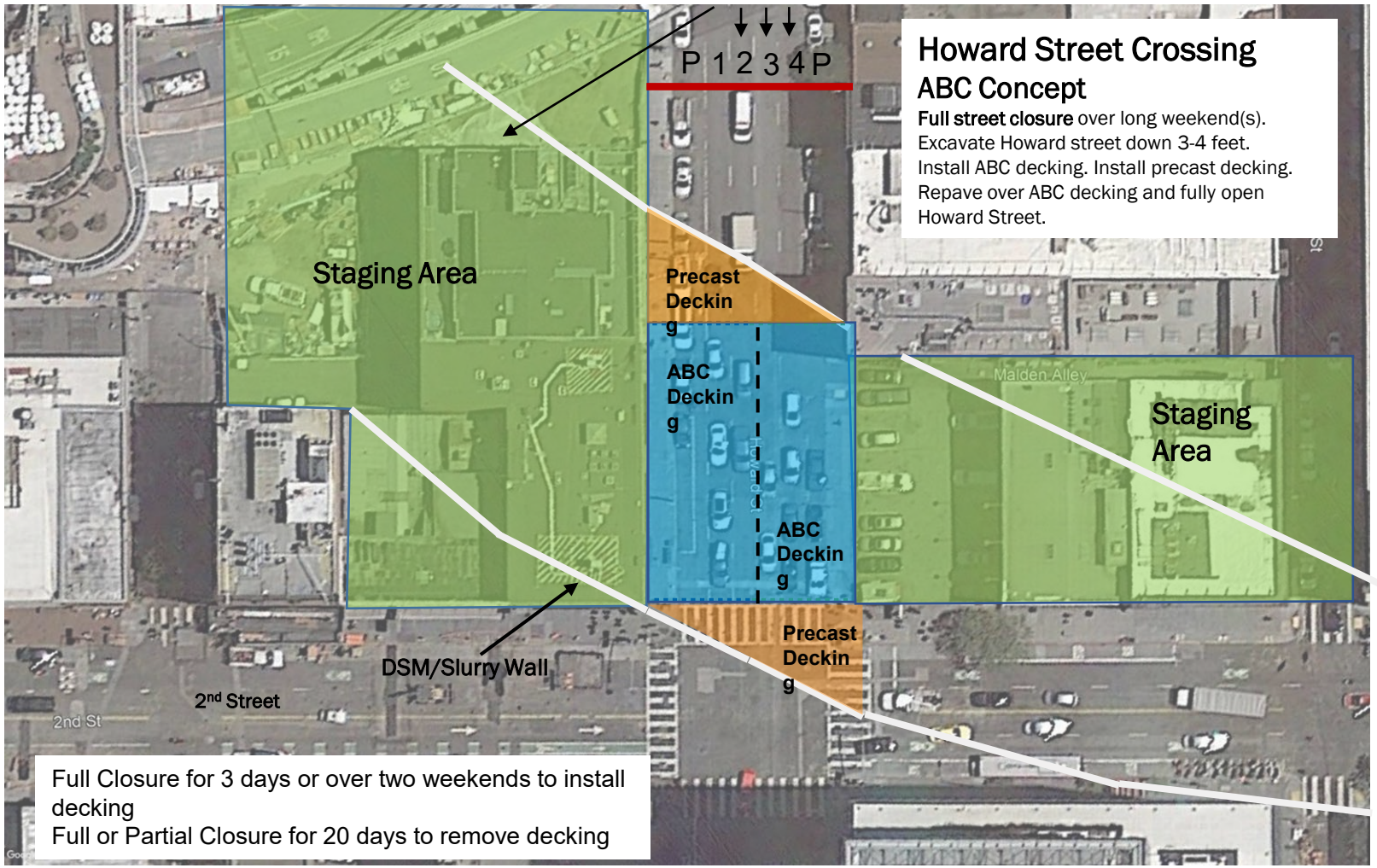

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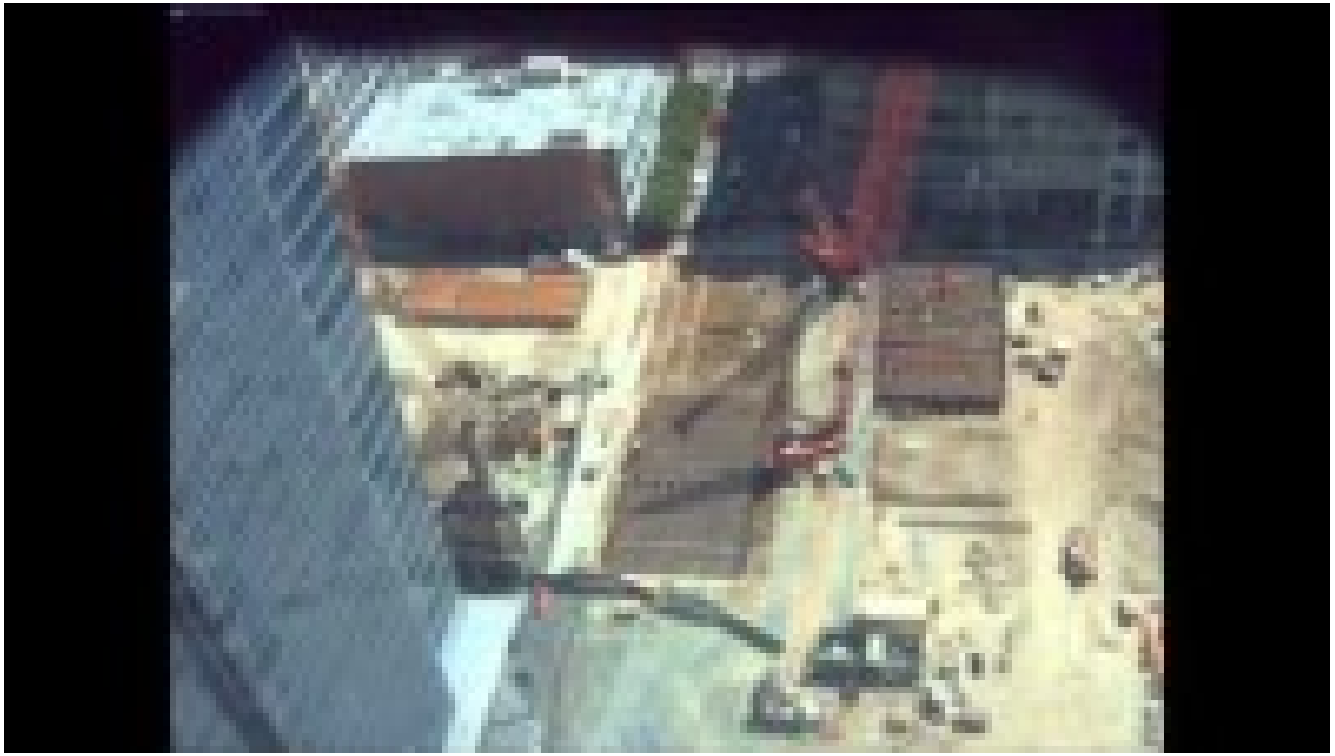
Cut and Cover Concepts to Reduce Impacts Accelerated Bridge Construction

Same concept used for the roadway decking for the Salesforce Transit Center



Youtube Video

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Cost Estimates and Schedule Comparison of Cut and Cover and Mining

Crossing Option	Approx. Additional Costs (Escalated Dollars)	Approx. Traffic Impacts on Howard Street Duration
Cut and Cover Decking on Howard (Limited Closure)	Baseline	**Total: 120 days** North Decking (3 lanes Open): 60 Days Decking Install: 40 days Decking Removal: 20 Days South Decking (2 lanes Open): 60 Days Decking Install: 40 days Decking Removal: 20 Days
Cut and Cover Decking on Howard (Full Street Closure)	Lower than Baseline	**Total: 70 days** Decking Install: 50 days Decking Removal: 20 Days
Accelerated Bridge Concept	Higher than Baseline +$3 to $5M	**Total: 51-63 days** Partial Street Closure: 28-40 days Full Street Closure: 3 days Decking Removal: 20 days
SEM Mining under Howard	+$253M	Intermittent partial lane closures for ground improvement, instrumentation install: **30 days or more***

*Additional traffic impacts associated with mining would be unplanned and of uncertain duration

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Closing

- Mining option:
  - will add $253M in cost over the cut and cover approach
  - will have much higher risks than cut and cover option
  - could result in significant traffic impacts and settlement if risks are realized
  - Industry feedback validated the high risk associated with mining options
- Cut and cover option
  - can be designed and constructed with moderate and planned traffic impacts
  - approach has much lower risk for settlement and groundwater inflows than the mined options
- IPMT and Design Team recommends eliminating further consideration of mining option

Questions?

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