Origins of the Study

• Interest in the extension due to T-Third Phase 2 (Central Subway) project – especially after tunnel boring machines reach North Beach

• Interest from the Board of Supervisors

• Funds approved for limited consultant assistance by SFCTA Board – March 2014
  • Three agency team: SFMTA, SFCTA and SF Planning Department

• Concept Study started in March 2014 and a draft report completed in October 2014
Concept Alignments

T-Third – Phase 3 Conceptual Alignment Alternatives

- **Option 1:** Columbus Avenue (2-way)
- **Option 2A:** Powell Street (2-way)
- **Option 2B:** Powell Street (Option 2A) + Beach Street (2-way)
- **Option 3:** Powell Street–Beach Street-Columbus Avenue (One-way Loop)

- Concept Station Site
- T-Third Phase 2 (Existing tunnels – no tracks)
- Central Subway Station
## Concept Alignments

<table>
<thead>
<tr>
<th>Number</th>
<th>1-1</th>
<th>1-2</th>
<th>2A-1</th>
<th>2A-2</th>
<th>2A-3</th>
<th>2A-4</th>
<th>2A-5</th>
<th>2A-6</th>
<th>2B-1</th>
<th>2B-2</th>
<th>2B-3</th>
<th>2B-4</th>
<th>3-1</th>
<th>3-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street (s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Columbus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powell</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powell-Beach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-Way Loop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Station (s)</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
</tr>
</tbody>
</table>

### Data Highlights

- **4 Corridors**
- **14 Concept Alignments**
- **2 or 3 stations**
- **Subway and Subway-Surface combination**
Constructability
Ground Cross Sections

Powell
Beach
Columbus
Constructability Issues

Data Highlight
No Fatal Flaws

Areas at risk with sea-level rise

Areas of possible liquefaction
Travel Time Estimates

Data Highlights

<table>
<thead>
<tr>
<th>Concept</th>
<th>One-way</th>
<th>Round Trip</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A-2</td>
<td>3 mins</td>
<td>7 mins</td>
<td>fastest</td>
</tr>
<tr>
<td>3-2 Loop</td>
<td>N/A</td>
<td>8 mins</td>
<td>fastest loop</td>
</tr>
<tr>
<td>2B-1</td>
<td>7½ mins</td>
<td>15 mins</td>
<td>slowest</td>
</tr>
</tbody>
</table>

Legend

- One-way
- Round Trip

Number 1-1 1-2 2A-1 2A-2 2A-3 2A-4 2A-5 2A-6 2B-1 2B-2 2B-3 2B-4 3-1 3-2
Street (s) Columbus Columbus Powell Powell Powell Powell Powell-Beach Powell-Beach
Subway / Surface Subway / Surface Subway Subway / Surface Subway Subway Subway / Surface Subway Subway / Surface / Subway
Station(s) North Beach North Beach North Beach North Beach North Beach North Beach North Beach Kirkland Yard Kirkland Yard Kirkland Yard

San Francisco Planning Department
Travel Time Comparison

**Data Highlight**

50% - 65% quicker than existing transit service

---

**Ferry Building to Fisherman’s Wharf**

- **Transit**: 10-15
- **Bicycle**: 5-10
- **Private Auto**: 3-5

**Market St. / Union Square to Fisherman’s Wharf**

- **Transit**: 20-30*
- **Bicycle**: 15-20
- **Private Auto**: 10-15
  
  * Plus up to 60 minute wait

**T-Third Phase 2+3 – Caltrain & Ballpark to Fisherman’s Wharf**

- **Columbus**: 14-17
- **Powell**: 13-17
- **Powell-Beach**: 15-20
Daily Ridership Estimates

Data Highlights

- **55% increase in T-Line passenger levels**
- **At least 1/4 of the increase is from new trips on the Muni system**
- **Up to 3/4 of new trips are passengers moving to the T-Line, relieving overcrowding and pass-ups on buses, cable cars, and the F-Line**
Peak Ridership and Capacity

**Data Highlights**

- **At the maximum load point (MLP)** – T-Line trains spaced no more than 3 minutes apart will be required to meet projected passenger levels.

- **Peak ridership changes less than daily ridership** due to the all-day nature of demand in these neighborhoods.

- **By 2030, T-Line trains are scheduled at 2.5 minutes apart in the peak period**.
Existing Land Use

Data Highlights

Planning Department analyzed:

- Land Use
- Demographic conditions
- Development potential
Value Capture Opportunities

Estimated Bonding Capacity of local financing mechanisms*

Concept Alignment 1-2 analysis
(* all figures in 2014 dollars)

Data Highlights

- CFD = $180-$220 million - 2/3 voter approval
- IFD = $100-$110 million - 55% voter approval
- SpAD = $90 million in - simple majority approval
- Modest revenue differences between current zoning and limited zoning increases
**Capital Costs (2014 $ Estimate)**

**Data Highlights**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Cost Estimate</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A-1</td>
<td>$440 million</td>
<td>lowest cost</td>
</tr>
<tr>
<td>2B-2</td>
<td>$1.410 billion</td>
<td>highest cost</td>
</tr>
</tbody>
</table>

**Subway / Surface**
- 2A-1: Subway / Surface
- 2A-2: Subway / Surface
- 2A-3: Subway / Surface
- 2A-4: Subway / Surface
- 2A-5: Subway / Surface
- 2A-6: Subway / Surface
- 2B-1: Subway / Surface
- 2B-2: Subway / Surface
- 2B-3: Subway / Surface
- 2B-4: Subway / Surface
- 3-1: Subway / Surface
- 3-2: Subway / Surface

**Station(s)**
- Number 1-1: North Beach
- Number 1-2: Conrad Square
- Number 2A-1: North Beach
- Number 2A-2: Conrad Square
- Number 2A-3: Kirkland Yard
- Number 2A-4: Kirkland Yard
- Number 2A-5: Kirkland Yard
- Number 2A-6: Kirkland Yard
- Number 2B-1: North Beach
- Number 2B-2: Kirkland Yard
- Number 2B-3: Kirkland Yard
- Number 2B-4: Kirkland Yard
- Number 3-1: North Beach
- Number 3-2: Conrad Square

**Street(s)**
- Columbus
- Powell
- Powell-Beach
- One-Way Loop

**Dollars (Millions)**
- Not Feasible
- Not Feasible
Cost / Benefit Analysis

Central Subway Phase III Cost Effectiveness with Federal Transit Administration New Starts Breakpoints

$0 $4 $6 $10 $15

$1.78 $2.87

HIGH MEDIUM-HIGH MEDIUM MEDIUM-LOW LOW

COST EFFECTIVENESS

= Project cost effectiveness range

Data Highlight

$1.78^* - $2.87^* = 2040 projected cost per new trip – (FTA Formula)

Concept Alignment 1-2 (low cost and high cost estimate)

* Costs are in 2014 dollars
Potential Funding

**Federal Sources**
Federal Transit Administration (FTA)
New Starts program

**Land Use Value Capture**
Infrastructure Finance District (IFD)
Community Facilities District (Mello-Roos) (CFD)
Special Assessment District (SpAD)

**Local Sources**
Sales Tax (Proposition K)
Future Transportation Funding Measures

**Other Sources**
Joint Development ?
North Beach Station

**Rail to North Beach Facts**
- New environ. review process required
- Tradeoffs with different construction methods
- Offstreet construction access lessens neighborhood disruption

**Pagoda Palace Site Facts**
- SFMTA has active lease until May 10, 2015 to use parcel as a TBM retrieval site
- SFMTA has “right of first refusal” to purchase if owner decides to sell property
- Owner preparing to build 19 units of housing
## Summary Evaluation

### Of Concept Alternatives

<table>
<thead>
<tr>
<th>Number</th>
<th>1-1</th>
<th>1-2</th>
<th>2A-1</th>
<th>2A-2</th>
<th>2A-3</th>
<th>2A-4</th>
<th>2A-5</th>
<th>2A-6</th>
<th>2B-1</th>
<th>2B-2</th>
<th>2B-3</th>
<th>2B-4</th>
<th>3-1</th>
<th>3-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street(s)</td>
<td>Columbus</td>
<td>Powell</td>
<td>Powell-Beach</td>
<td>One-Way Loop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Station(s)</td>
<td>North Beach</td>
<td>North Beach</td>
<td>North Beach</td>
<td>Kirkland Yard</td>
<td>North Beach</td>
<td>Kirkland Yard</td>
<td>North Beach</td>
<td>Kirkland Yard</td>
<td>North Beach</td>
<td>Kirkland Yard</td>
<td>North Beach</td>
<td>Kirkland Yard</td>
<td>North Beach</td>
<td>Kirkland Yard</td>
</tr>
<tr>
<td>Passenger Experience</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>NF</td>
<td>NF</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Operational Efficiency</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>NF</td>
<td>NF</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>System Performance</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>+</td>
<td>NF</td>
<td>NF</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Local Operations</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>NF</td>
<td>NF</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Infrastructure Resiliency</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>0</td>
<td>+</td>
<td>NF</td>
<td>NF</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Construction Disturbance</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>NF</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Capital Const. Cost and Risk</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>-</td>
<td>NF</td>
<td>NF</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>-1</td>
<td>5</td>
<td>-2</td>
<td>5</td>
<td>-3</td>
<td>-2</td>
<td>-4</td>
<td>-6</td>
<td>-3</td>
<td>3</td>
<td>NF</td>
<td>NF</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Capital Cost (2014 $$) (millions)</td>
<td>407-482</td>
<td>848-933</td>
<td>367-442</td>
<td>837-912</td>
<td>406-480</td>
<td>875-950</td>
<td>454-529</td>
<td>924-999</td>
<td>443-518</td>
<td>1,333-1,408</td>
<td>NF</td>
<td>NF</td>
<td>496-571</td>
<td>1,087-1,139</td>
</tr>
</tbody>
</table>

NF = Not Feasible
Concept Alignments

T-Third – Phase 3 Conceptual Alignment Alternatives

- Option 1: Columbus Avenue (2-way)
- Option 2A: Powell Street (2-way)
- Option 2B: Powell Street (Option 2A) + Beach Street (2-way)
- Option 3: Powell Street–Beach Street-Columbus Avenue (One-way Loop)

- Concept Station Site
- T-Third Phase 2 (Existing tunnels – no tracks)
- Central Subway Station
Next Steps

SF 2040 Transportation Plan

T-Third Phase 3 Concept Study (2014) → Share with public and SF officials


MTC - San Francisco Bay Area Core Capacity Transit Study (2015)

Use data in SF 2030 Transportation Plan

Use data in Rail Capacity Strategy