KEY TAKEAWAYS

• What is the Station Planning Toolbox?
• Why is it needed?
• Technical Input
• Toolbox Demonstration
ABOUT CALTRAINS

- Peninsula Corridor Joint Powers Board – governing body
- Bay Area commuter rail serves San Francisco, San Mateo, and Santa Clara counties
- Service dates to 1860s
- Average weekday ridership: ~65,000 riders
Caltrain owns right-of-way from San Francisco to San Jose to Tamien Station (51 miles)

UPRR owns corridor south of Tamien Station; Caltrain has limited trackage rights

Primarily two track system with some 4-track segments

Varying right-of-way widths throughout corridor

42 At-Grade crossings, viaducts, and bridges

32 Passenger Stations in 3 Counties and 19 cities

92 Weekday trains (Baby Bullet/Limited/Local Services)

Diesel push/pull

Corridor Electrification is under construction
STATION MANAGEMENT TOOLBOX

• Purpose: Provide a decision-making tool and technical analysis to help assess potential outcomes and trade-offs associated with access improvements and TOD at stations

• Funded by FTA planning grant and local match

• Objectives:
  - Establish performance goals and metrics related to Caltrain’s station-based assets and programs
  - Provide Caltrain with a methodology to quickly and transparently evaluate the performance of potential access investments and transit oriented developments at and near stations
1. Create the Toolbox Framework
Establish the range of decision and planning scenarios where the Toolbox is needed, and propose tools for quantitative analysis to aid in decision-making

2. Build the Toolbox
Create the set of tools that will comprise the Toolbox and facilitate technical analysis

3. Test the Toolbox
Use case studies of three Caltrain stations (South San Francisco, Belmont, and Redwood City) to test the Toolbox and develop case study plans

summer 2018

TBD - aligning with Business Plan
TOD AND STATION ACCESS at Caltrain Stations

Relationship between the three projects
CALTRAIN PLANNING TOOLS

• Three interrelated planning and policy analyses to address station access and transit-oriented development (TOD)

• Key questions for each project:
  - **Rail Corridor Use Policy:** What can be developed on JPB property? Who can use JPB right-of-way and real estate?
  
  - **TOD Policy:** How should Caltrain develop available property?
  
  - **Station Management Toolbox:** Help answer “Why?” questions to help assess outcomes and trade-offs of station access and TOD decisions
TOOLBOX FRAMEWORK

Dynamic Inputs:
- Fares
- Service Levels
- Vehicle Parking Charge
- Vehicle Parking Supply
- TOD
- Area Development
- Employer Shuttle Program
- Station Transit Accessibility
- Bicycle Network

Forecasting Engine:
- Caltrain Ridership Model*
  * Based 2013 VTA Travel Demand Model
- Mode of Access Model
- Published Research

Primary Outputs:
- Ridership
  - Station System
- Mode of Access
  - Bicycle
  - Transit
  - Drop-off
  - Park-and-Ride
- Off-Peak Ridership
  - (weekday)
  - (weekend)

Secondary Outputs:
- VMT
- Modal Efficiency
  - Bicycle
  - Transit
  - Drop-off
  - Park-and-Ride
- Net Passenger Revenue
- Net Development Revenue
- Geographic Equity
- Social Equity
CALTRAIION RIDERSHIP MODEL

• Regional Travel Demand Model
  - Good for system-wide ridership but misses station-level detail
  - Changes from model baseline estimated using elasticities for population, employment, fare, service level

• Direct Ridership Calibration
  - Adjusts station level ridership via linear regression models
  - Improves sensitivity to station area population, employment, accessibility

• TOD Ridership Calculation
  - Ridership from TOD development calculated separately based on trip rates from research
CALTRAIL RIDERSHIP MODEL
MODE OF ACCESS MODEL

- **Models estimated from 2016 rider survey**
  - Separate models for AM vs PM peaks and for access vs egress
  - Predictor variables include population, employment, accessibility by walk, bike, transit, shuttles, parking availability & cost, Caltrain frequency
  - Logit models transformed to linear regression via Berkson method

- **Adjustments to initial access/egress models**
  - TOD mode of access/egress
  - Ride-hailing trend
  - Changes in station parking
RIDE HAILING TRENDS

• **Effect on Caltrain Ridership**
  - Tool can adjust total ridership based on trends in ride hailing
  - Best current research suggests commuter rail not influenced by ride hailing, so current version of tool does not include adjustment
  - Can be updated easily if future research supports it

• **Effect on Mode of Access**
  - Tool adjusts mode of access based on trends in ride hailing
  - Ride hail access substitutes for other modes in accord with research and Caltrain-specific data
  - Size of ride hail effect can be selected by user
Station Management Toolbox

Graphic User Interface for Tool Inputs

Systemwide Input

Service Level:
- Fare: 120 % of baseline
- % of baseline: 110
- Ride Hailing Trend: Very High
- Parking Price: 150 % of baseline

Station Input

Station: Redwood City

Area Development

Caltrain Transit Oriented Development Options

Site: A
- Residential: 62 DU
- Office: 3 KSF
- Retail: 3 KSF
- Other Commercial: 0 KSF

Site: B
- Residential: 0 DU
- Office: 3 KSF
- Retail: 3 KSF
- Other Commercial: 0 KSF

Site: C
- No site available

Caltrain Parking
- Station has free parking
- Baseline Parking: 357 Spaces
- Parking Removed by TOD: 265 Spaces
- Parking Added by TOD: 0 Spaces
- New Parking Total: 357 Spaces

Station Input (Continued)

Other Station Area Development

<table>
<thead>
<tr>
<th>Residential</th>
<th>New Total</th>
<th>New Affordable Housing</th>
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<tbody>
<tr>
<td>7840 DU</td>
<td>10840 DU</td>
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Other Area Connectivity

Public Transit Access

Employee Shuttle Program

Station Area Walkability

Bike Lane miles within 1 mile of station

<table>
<thead>
<tr>
<th>Class</th>
<th>Lane Miles</th>
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<tbody>
<tr>
<td>Class I</td>
<td>0.8 Lane Miles</td>
</tr>
<tr>
<td>Class II</td>
<td>1.5 Lane Miles</td>
</tr>
<tr>
<td>Class III</td>
<td>1.3 Lane Miles</td>
</tr>
<tr>
<td>Class IV</td>
<td>0 Lane Miles</td>
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</table>

Restoration Options:
- Restore Systemwide Default
- Restore Station Default
- See Detailed Report
STATION MANAGEMENT TOOLBOX

Graphic User Interface for Tool Outputs

RIDERSHIP OUTPUTS

<table>
<thead>
<tr>
<th></th>
<th>STATION Baseline</th>
<th>New Total</th>
<th>SYSTEM Baseline</th>
<th>New Total</th>
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<tbody>
<tr>
<td>Daily Boardings</td>
<td>6,765</td>
<td>7,535</td>
<td>125,261</td>
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<td>Change in Off-Peak Ridership</td>
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</tr>
<tr>
<td>Change in Peak Balance</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Modal Access Efficiency Index</td>
<td>5.5</td>
<td>5.8</td>
<td>5.4</td>
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AM Peak Mode of Access

<table>
<thead>
<tr>
<th></th>
<th>STATION Baseline</th>
<th>New Total</th>
<th>SYSTEM Baseline</th>
<th>New Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park-and-Ride</td>
<td>37%</td>
<td>36%</td>
<td>17%</td>
<td>12%</td>
</tr>
<tr>
<td>Other drop-off</td>
<td>12%</td>
<td>19%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Ride-Hall</td>
<td>19%</td>
<td>17%</td>
<td>18%</td>
<td>17%</td>
</tr>
<tr>
<td>Transit</td>
<td>46%</td>
<td>35%</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>Bike</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Walk</td>
<td>0%</td>
<td>32%</td>
<td>32%</td>
<td>28%</td>
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AM Peak Mode of Egress

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<th></th>
<th>STATION Baseline</th>
<th>New Total</th>
<th>SYSTEM Baseline</th>
<th>New Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park-and-Ride</td>
<td>11%</td>
<td>15%</td>
<td>7%</td>
<td>13%</td>
</tr>
<tr>
<td>Other drop-off</td>
<td>16%</td>
<td>10%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Ride-Hall</td>
<td>73%</td>
<td>67%</td>
<td>49%</td>
<td>46%</td>
</tr>
<tr>
<td>Transit</td>
<td>0%</td>
<td>11%</td>
<td>11%</td>
<td>10%</td>
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<tr>
<td>Bike</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Walk</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
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</table>

REVENUE OUTPUTS

<table>
<thead>
<tr>
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<th>STATION Baseline</th>
<th>New Total</th>
<th>SYSTEM Baseline</th>
<th>New Total</th>
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</thead>
<tbody>
<tr>
<td>Passenger Revenue Annual $1K</td>
<td>$8,547</td>
<td>$10,585</td>
<td>$119,329</td>
<td>$189,430</td>
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<td>Parking Revenue Annual $1K</td>
<td>$842</td>
<td>$810</td>
<td>$7,869</td>
<td>$10,272</td>
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<tr>
<td>Other Operating Costs Annual $1K</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
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EQUITY & ENVIRONMENTAL OUTPUTS

<table>
<thead>
<tr>
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<th>STATION Baseline</th>
<th>New Total</th>
<th>SYSTEM Baseline</th>
<th>New Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jobs within 1/2 mile</td>
<td>17,256</td>
<td>17,256</td>
<td>488,474</td>
<td>488,474</td>
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<tr>
<td>New Affordable Housing 1/2 mile</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Access/Egress VMT</td>
<td>3,819</td>
<td>3,703</td>
<td>150,958</td>
<td>147,894</td>
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PARKING OUTPUTS

<table>
<thead>
<tr>
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<th>STATION Baseline</th>
<th>New Total</th>
<th>SYSTEM Baseline</th>
<th>New Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Parking Spaces</td>
<td>557</td>
<td>557</td>
<td>557</td>
<td>557</td>
</tr>
<tr>
<td>Parking Occupancy</td>
<td>72%</td>
<td>72%</td>
<td>72%</td>
<td>72%</td>
</tr>
<tr>
<td>Net Change Parking Spaces</td>
<td>-200</td>
<td>-200</td>
<td>-200</td>
<td>-200</td>
</tr>
<tr>
<td>Net Change Per Car Riders</td>
<td>-85</td>
<td>-85</td>
<td>-85</td>
<td>-85</td>
</tr>
<tr>
<td>Net Change Non-Park &amp; Ride Riders</td>
<td>54</td>
<td>54</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Net Change Total Ridership</td>
<td>-11</td>
<td>-11</td>
<td>-11</td>
<td>-11</td>
</tr>
</tbody>
</table>

Current Station  Modified Station
STATION INPUTS

4. **Station**: Choose the station you'd like to modify. The chosen station will be circled yellow on the map. Stations you've already modified will be blue.

**Caltrain Transit-Oriented Development Options**: The drop-down menus for Site A, B, and C will be auto-populated with the chosen station's available sites and development options. For each site, choose from the drop-down list the appropriate development option. If you'd like to customize a development, choose "Custom" and manually input the land use and revenue information.

5. **"Station Has Free Parking"**: Check the box if free parking will be provided at the station in the Scenario Year.

**Caltrain Parking Inputs**: Input the parking either added or removed by the TODs entered in Step 4.

6. **Other Station Area Developments**: Add any additional development within the Station Area. The values should represent the new total land use.

7. **For transit, employee shuttles, walking, and biking, input**:
   - **Access**: Choose the level of accessibility for each transportation mode that matches the Scenario.
   - **Capital Costs for Access Improvements**: Input the expected capital costs (Net Present Value) Caltrain would allocate for the planned accessibility improvements for each mode.
   - **Operating/Maintenance Costs for Access Improvements**: Input the expected annual operating/maintenance costs for the access improvements.

Repeat steps 4-7 for each station that has Station Area modifications for the Scenario.
QUESTIONS?
The Caltrain Planning Toolbox

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