Presentations
for the
January 21, 2020
City Council Meeting
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LEGISLATIVE BACKGROUND

Senate Bill (SB) 901 was signed into law on September 21, 2018 in an effort to enhance utility practices in mitigating and preventing future catastrophic wildfires and increase the rate of recovery efforts.

- Modified Public Utilities Code (PUC) Section 8387, which requires publicly-owned utilities to develop and annually present to their respective governing board a comprehensive Wildfire Mitigation Plan (WMP or Plan).
  - PUC Section 8387 outlines the required elements to be included in the Plan.

Assembly Bill (AB) 1054 was recently signed into law on July 12, 2019.

- Critical measure developed with consideration of the Governor’s Strike Force 2018 Wildfire Safety and Reform package to establish state and regulatory Wildfire Safety entities and create a Wildfire Insurance Fund.
- AB 1054 did not change the scope or approach for Plans adopted during this calendar year.
INDEPENDENT EVALUATION PROVISIONAL REQUIREMENTS

(c) The local publicly owned electric utility or electrical cooperative shall contract with a qualified independent evaluator with experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of its wildfire mitigation plan. The independent evaluator shall issue a report that shall be made available on the internet website of the local publicly owned electric utility or electrical cooperative, and shall present the report at a public meeting of the local publicly owned electric utility’s or electrical cooperative’s governing board.

CPAU contracted with Navigant in October of 2019 to perform a comprehensive assessment of its WMP

Source: California PUC Section 8387 (c)
NAVIGANT CONSULTING QUALIFICATIONS

- Navigant has provided independent evaluation (IE) services throughout the nation.
  - IE projects include storm hardening, wildfire mitigation, resiliency assessments, and advanced technology suitability.
- Navigant continues to track proceedings and pending legislation surrounding utility wildfire risk and remains active with WMP engagements across all jurisdictions.
  - E.g., Navigant continues to provide thought leadership and advisory services related to WMP and other resiliency efforts to the California Energy Commission (since 2008).
- Additionally, Navigant’s reach into grid resiliency and disaster-hardening extends across the nation including island grids, such as Puerto Rico, recovering from recent, weather-related catastrophes.

We help clients to:

**BUILD**
capabilities and innovative solutions to transform businesses

**MANAGE**
complexity and remove barriers to accelerate operational performance

**PROTECT**
assets from adversity through compliance, security, and risk management

their future.
EVALUATION APPROACH
SCOPE & APPROACH

SCOPE

Navigant performed an assessment to determine the comprehensiveness of CPAU’s WMP as required by PUC Section 8387 (c) and produced a results report to present to the governing board at a public meeting.

APPROACH

Navigant employed the following methods to successfully complete the evaluation:

• Assessed compliance elements against PUC Section 8387
• Performed a gap analysis of applicable strategies and Plan elements along with investor-owned utility Plan guidance
• Benchmarked CPAU’s Plan elements against industry practices and standards

RESULT

(*) Source: https://www.cpuc.ca.gov/FireThreatMaps/

After completing the independent evaluation, CPAU’s WMP is determined to be comprehensive and meets required statutory provisions listed in PUC Section 8387.
• Navigant determined that CPAU’s WMP is comprehensive and meets the statutory requirements listed in PUC Section 8387
• The Plan elements align with industry standards and practices

Thank you. Any questions?
CONTACTS

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Associate Director
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Why We Are Presenting This Plan

• In August 2018 Council determined the City area west of Highway 280 is at significant risk of catastrophic wildfire resulting from electric lines (Tier 2 – Elevated Risk). Also approved new mitigation measures and studies to reduce the risk.
  • Fire map update initiated by Public Utilities Commission (CPUC) in 2012
  • CPUC General Order 95 updated with more stringent construction, inspection, and maintenance requirements
• Subsequent legislation (Senate Bill 901) requires electric utilities to prepare a Wildfire Mitigation Plan and update it annually.
  • Plan must be reviewed by a qualified independent evaluator
  • Plan must be presented to utility’s governing body at a public meeting
Required Elements of the Wildfire Mitigation Plan

- Objectives of the wildfire mitigation plan
- Identify persons responsible for executing the plan
- Preventative strategies adopted in the plan
- Evaluation Metrics
- Impact of metrics
- Reclosers and Deenergization (Public Safety Power Shutoff PSPS) protocols
- Customer notification procedures
- Vegetation management
- Inspections
- Identification and prioritization of wildfire risks
- Fire threat map adjustments
- Enterprise wide risk identification
- Restoration of service
- Monitoring and auditing
Background

• Increased occurrence of wildfires in California

• Risk Factors
  – Vegetation type and density
  – Weather
  – Changing Weather patterns
  – Drought conditions
  – High Winds
  – Terrain

  Controlable   |   Uncontrollable

  – Electric System Inspection, Maintenance, Construction, and Operations Practices
  – Vegetation Management
Utilities Wildfire Mitigation Plan

- **Objective**
  Minimize risk of overhead electric line caused catastrophic wildfires in High Fire Threat areas

- **Collaboration**
  Prepared with assistance and input from Fire, Urban Forestry, Open Space, Office of Emergency Services
## Activities – Completed

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Palo Alto Foothills Fire Management Plan</td>
<td>Completed by the City of Palo Alto Fire, Urban Forestry, Open Space, Office of Emergency Service Departments and others.</td>
</tr>
<tr>
<td>California Fire Threat Map</td>
<td>Completed by Utilities in conjunction with other California Investor Owned and Publicly Owned utilities.</td>
</tr>
<tr>
<td>Implementation of more stringent Vegetation Management</td>
<td>Urban Forestry is performing inspection and trimming per the requirements of CPUC G.O. 95</td>
</tr>
<tr>
<td>Implementation of more stringent Inspection and Maintenance</td>
<td>Utilities Electric Operations is performing inspection and maintenance per the requirements of CPUC G.O. 95</td>
</tr>
<tr>
<td>Electric System Operations</td>
<td>No reclosing, non-expulsion fuses, protective device coordination review and implementation</td>
</tr>
</tbody>
</table>
## Activities – In Progress

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deenergization (Public Safety Power Shutoff, PSPS) policy and procedures</td>
<td>Draft documents for a PSPS Policy and a PSPS Procedures have been developed and are being reviewed. Some procedures have already been implemented to meet the concerns brought on by Red Flag warnings in October 2019.</td>
</tr>
<tr>
<td>New Weather Station</td>
<td>Electric Operations staff is working to install a new weather station at Montebello Reservoir to supplement information we obtain from the National Weather Service.</td>
</tr>
<tr>
<td>Risk Assessment of wildfire in the foothills</td>
<td>Staff is in negotiation with a consultant to complete a Risk Assessment of wildfire in the foothills due to utilities electric facilities.</td>
</tr>
<tr>
<td>Fiber optic cable extension</td>
<td>Staff is working on development of the design to install new fiber optic cable to enhance the communications capability in the Foothills for City staff. Depending on the staff availability this may be done as its own project or as part of the overhead line rebuild.</td>
</tr>
<tr>
<td>Emergency generator assessment for Utilities facilities in the Foothills</td>
<td>Water, Gas, and Wastewater Engineering and Operations staff are discussing the need for emergency backup generators at the water pumping stations and wastewater lift station in the Foothills.</td>
</tr>
</tbody>
</table>
## Activities – Planned

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCADA switch installation</td>
<td>The switch has been identified that will allow remote implementation of a PSPS, shutting down the Foothills. This requires replacement with a SCADA controlled switch and underground substructure installation for fiber optic communication cables.</td>
</tr>
<tr>
<td>Overhead line rebuild</td>
<td>Staff is working on drafting the Scope of Work and Request for Proposal for consultants/contractors to bid on the design and construction of a new/replacement utility line in the High Fire Threat Area (Foothills). This could include undergrounding the line where feasible.</td>
</tr>
<tr>
<td>Enhanced construction standards for high fire threat areas</td>
<td>New construction standards for use in the high fire threat areas will be developed as Phase I of the Overhead line rebuild/relocation/replacement project and will be completed before any design work is started.</td>
</tr>
<tr>
<td>Drone inspection of utility lines in foothills</td>
<td>This was investigated 3 years ago but the quality of the images and video did not meet Utilities or Urban Forestry needs. Staff is hoping that newer technologies will be more useful.</td>
</tr>
<tr>
<td>Controlled burn policy and plans</td>
<td>To be in conjunction with the City of Palo Alto Fire Department</td>
</tr>
</tbody>
</table>
Metrics

- How do we determine if the Wildfire Mitigation Plan is working?
  1. No overhead electric line caused outages
  2. Minimize impact of fire due to overhead electric lines
Independent Evaluation

Evaluator: Navigant Consulting, Inc.

Reviewed CPAU’s Wildfire Mitigation Plan to determine if it met the requirements of PUC Section 8387 (c)

Introduction

Mr. Andrew Dressel
Associate Director | Risk, Compliance, and Security
Navigant Consulting, Inc.
EXPANDED COMMUNITY ADVISORY PANEL (XCAP) UPDATE #3

For City Council, January 21, 2020
Presented by Nadia Naik and Keith Reckdahl
AGENDA

1. Update on XCAP’s work
2. Presentation of new community generated concepts that XCAP decided have merit and are worthy of Council consideration.
   a. We are asking City Council to decide whether new ideas warrant further study
3. Council feedback and guidance on what we should include in final XCAP recommendations report to Council
New iterations/ideas presented to XCAP

- Five iterations/ideas passed “pre-screening”
  - *Iteration on South Palo Alto Tunnel* (Roland LeBrun)
  - *Iteration on Partial Churchill underpass* (Mike Price)
  - 2 *Roundabout concepts for Embarcadero/Alma* (Tony Carrasco)
  - *Constant Flow Underpass for South Palo Alto* (Elizabeth Alexis)
- XCAP Technical Group (subcommittee) & volunteer Civil Engineers met with AECOM and City Staff to discuss new ideas and vet them for “fatal flaws”
- XCAP received the information and then voted
- **XCAP recommended 3 concepts should be presented** to City Council
COUNCIL CONSIDERATIONS FOR NEW CONCEPTS

• These are **general concepts** presented by citizens – not refined designs
• They need professional vetting and refinement
• They attempt to solve major problems identified in existing alternatives
• XCAP pre-screened concepts with the understanding new concept review costs the City money and time
• XCAP voted to recommend that the following 3 concepts are worth spending money on
## Quick Summary Existing Alternatives

<table>
<thead>
<tr>
<th></th>
<th>South Palo Alto</th>
<th>Churchill</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hybrid</td>
<td>Viaduct</td>
</tr>
<tr>
<td>Cost</td>
<td>$200-$250M</td>
<td>$400-$500M</td>
</tr>
<tr>
<td>Construction Time</td>
<td>4 years</td>
<td>2 years</td>
</tr>
<tr>
<td>Visual Impacts</td>
<td>Elevated 15 ft</td>
<td>Elevated 20 ft</td>
</tr>
<tr>
<td>Water/Utilities Impacts</td>
<td>Major Utility relocation / pumping</td>
<td>Minor utility relocation</td>
</tr>
</tbody>
</table>
3 NEW CONCEPTS

- Constant Flow Underpass for Charleston and Meadow
  (Elizabeth Alexis)

- Churchill Partial Underpass
  (Mike Price)

- Re-think Embarcadero at Alma
  (Tony Carrasco and others)
Constant Flow Underpass for Charleston and Meadow
Existing Alternatives have significant drawbacks:

- **Viability**: Tunnel and Trench have potentially significant groundwater impacts
- **Neighborhood Impacts**: Elevated-rail solutions are unpopular with many residents
- **Cost**: All existing alternatives are very expensive
  - Hybrid likely **very** under-costed – limited Caltrain work windows = more $$$
  - Complicated, busy corridor and limited design work to date means prices are likely to increase further
- **Long Construction period**: Existing alternatives require
  - Alma detours, lane reductions
  - Construction will disrupts traffic network for years
- **Existing Alternatives do not improve circulation**: 
  - Missed opportunity to improve bike/ped travel
  - Bikes/peds bunch together waiting for cars at Alma
CONSTANT FLOW UNDERPASS (CHARLESTON / MEADOW)

- Alma and tracks remain at current elevation
- Charleston is lowered to pass under Alma and tracks
- Construction is localized
- Design takes advantage of Fairmeadow's lack of driveways onto Charleston/Meadow
  - Bikes/peds have separated lane with dedicated tunnel

Meadow is similar but with bike/ped crossing on the South side of Meadow
WESTBOUND CHARLESTON TRAFFIC FLOW

- Westbound traffic passes through roundabout, then continues under Alma
- Northbound traffic passes through roundabout, then turns right onto northbound Alma
- Southbound traffic passes through roundabout, then turns left onto southbound Alma
EASTBOUND CHARLESTON TRAFFIC FLOW

- Southbound traffic passes under the tracks and takes a right directly onto southbound Alma
- Eastbound traffic passes under Alma, continuing through roundabout
- Northbound traffic passes under Alma, reverses direction at roundabout, then turns right onto northbound Alma
NORTHBOUND ALMA TRAFFIC FLOW

- Northbound traffic continues straight on Alma
- Eastbound traffic turns right onto eastbound Charleston, passing through roundabout
- Westbound traffic turns right onto Charleston, reverses direction at roundabout, and continues west under Alma
SOUTHBOUND ALMA TRAFFIC FLOW

• Southbound traffic continues straight on Alma
• Eastbound traffic turns left onto eastbound Charleston, passing through roundabout
• Westbound traffic turns left onto Charleston, reverses direction at roundabout, continuing west under Alma
Constant Flow Underpass for Charleston/Meadow

Goal - Minimize length, width and depth of underpass to:
- Minimize property impacts
- Maximize bike/ped facilities
- Maintain neighborhood feel
- Road and bike/ped go under tracks and Alma
- Minimize car bike/ped (ideally separated completely)
- Cost saving design features:
  - Only one lane in each direction under Alma/train
  - Thin bridge deck design reduces depth
  - Low design speed allows steeper slopes to reduce footprint and cost
    - Similar to Jefferson Ave in Redwood City (which is 20 mph)

Innovative design:
- Bikes and peds in separate two-way tunnel (north side of Charleston, south side of Meadow)
- Dedicated turn lane from Eastbound Charleston to Alma South (similar to Oregon Expressway with longer merge)
- All turns are allowed, but some turns require doubling-back (at a turnback or roundabout) east of Alma
Road Underpass studied in 2014 by consultant (HMM) – two variations considered:

1. Lower Alma and Charleston - same intersection as today but sunken
2. Just lower Charleston, no turns allowed

HMM’s assumptions would have created unneeded extra capacity and cost

- Assumed VERY thick Caltrain bridge
  - Forced the road to dip down much deeper than needed
  - Caused a larger footprint and increased cost

- Wider road assumptions had significant impacts to houses along Charleston/Meadow because of driveway access
Additional design aspects that need further study:

- Further investigate innovative construction methods like those used on Long Island Rail Road (NY)
  - Minimize construction time
  - Cut cost
  - Eliminate shoo-fly tracks
- Consider limiting auto access to Wright Place
  - Limits cut-throughs and improves safety of two-way bike/ped lane
- Determine exact location of turnaround and method of weaving traffic streams
- Different access options on/off of Park Blvd
- Meadow intersection similar to Charleston - less traffic but less room
A purpose designed steel cellular shield, with three compartments on two levels, was rigidly attached to the leading end of the box. The shield was designed to be thrust into the face to ensure face stability whilst permitting safe working access for miners to carry out the excavation. Didcot was the first application of the proprietary wire rope ADS. This comprised 13mm diameter wire ropes placed at 26mm centres across the full width of the box roof.

A single 1200 tonne working capacity jacking rig was used to develop the required jacking thrust which was dissipated into the soft to firm clay ground via adhesion on the underside of the jacking base, and shear/adhesion on the jacking pit side walls.

Performance achieved

Once the jacking pit headwall had been entered the tunnelling operation took 5 days to complete without distress to the railway or interference to its operations. Ground movements were so well controlled that it was found necessary to fettle the tracks only twice in order to maintain the rails within operational tolerances for the reduced line speeds. The maximum recorded aggregate ground settlement was 75mm and maximum recorded aggregate horizontal displacement of the ground in the direction of jacking was 25mm. The monolithic box resulted in a simple tunnelling operation and a tunnel alignment within 25mm of line and 55mm of level.

Silver Street Railway Station, London Project

To construct a 44m long section of vehicular underpass beneath the platforms and railway tracks of Silver Street railway station in Edmonton, north London comprising two boxes placed side by side each 12.5m wide and 10.5m high. Ground conditions comprise made ground overlying water bearing gravel, which in turn overlies London Clay beneath which there is a layer of water bearing sand. The ground water table is situated just above the top of the proposed underpass.

- Tunnel was constructed next to the rail, then inserted under the tracks over a weekend
- Videos of the construction are available on YouTube
ITALIAN ROUNDABOUT

• Located outside of Venice, Italy (45°30'33.9"N 12°13'32.2"E)
  • Via Paccagnella roadway is lowered to pass under Via Pionara and railroad
  • Intersection requires some turns to double-back at roundabout
ITALIAN ROUNDABOUT

- A single lane in each direction is lowered under the tracks
- The turning lanes (on the right side) remain at the original elevation
- Traffic turning under the tracks uses the roundabout to reverse direction
Potential Weaknesses

- Seems more circuitous until people grasp the constant flow concept that makes it work
- Does not require any property acquisitions, but acquisition of 1-2 may improve design

Potential Strengths

- No visual impacts – train stays as today
- Safety improvement - access to tracks would be fenced
- Area of construction very localized
- Potentially significantly cheaper – tracks not moved, potentially no shoo-fly
- Significantly less construction time and impacts - many months or years less than fastest alternatives
- Only alternative consistent with initial VTA criteria
Churchill Partial Underpass
Hybrid Design (eliminated by City Council)
• Involves significant full property impacts

Close Churchill Avenue (under consideration)
• Only separates Bikes and Peds at location – diverts 9,500 cars elsewhere daily
• Some Southgate residents are opposed to closing Churchill Avenue.

Churchill-only Viaduct (under consideration)
• Opposed by many adjacent to the tracks for privacy, views, overall quality of life
• Elevated structure viewed as radical transformation of visual landscape
• Concerns about noise radiating outward
Overhead view looking straight down off the intersection. The above illustration was a bird’s eye view of the Caltrain intersection. From West Churchill from the sidewalk, there are two lanes on Churchill with approaches to the underpass. One for turning left and one for turning right. Now traveling west on Churchill from the east sidewalk of Caltrain, entering from the top, you can only turn right on Caltrain. Heading north, there is now access to southbound Caltrain or the other sidewalk of Churchill from East.

Churchill Caltrain Crossing

Caltrain tracks
Caltrain property fence
bike/pedestrian overpass
bike/pedestrian tunnel entrance ramps
bike trail
bike trail Churchill overpass

Old Palo Alto
Churchill (east)

Southgate
Palo Alto High School
Mariposa
The illustration below is a perspective view looking down at the intersection from the northeast corner.

Most of the roads drop down to the level of the underpass. West Churchill goes under the Caltrain tracks, which remain at grade level.

West Churchill also remains at grade and connects to one northbound lane of 6lma. Bike and pedestrian tunnels enter ramps.

The bicycle trail crosses Churchill on a bridge.

The intersection will need a conflict light to allow left turns to Alma and to allow Churchill trail onto 6lma.

Churchill Caltrain Crossing

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Michael Price - 2019/10/24
This illustration shows the intersection and underpass at Churchill about 1/4 mile below grade level. The right hand northbound lane continues at grade level providing access to West Churchill and the properties along Alma. Southbound lanes move right to provide space for an northbound left turn lane. The lanes today also move slightly right to make room for the left turn lane to the south that has been eliminated. The right turn lane has also been eliminated as now cars need to queue for a right turn. Bikes and pedestrians use the overpass bridge.

Churchill Caltrain Crossing
LOOKING NORTHBOUND ON ALMA JUST SOUTH OF CHURCHILL
This illustration is a perspective view from the Palo Alto High School, looking down from above the intersection of the bike trail over Churchill. The bike trail continues along Churchill and connects to a pedestrian/bike tunnel under tracks. The ramp to the tunnel is visible near the Churchill Caltrain crossing. The diagram also shows the continuing bike trail along Churchill and near the entrance to the Palo Alto High School.
OBJECTIVES
1. Separate Caltrain tracks from Churchill Avenue
2. Take no private properties
3. Allow vehicular access to Alma from Churchill Avenue
4. Improve bike and pedestrian safety while crossing Alma
5. Minimize train grade changes

FEATURES
1. Separates Caltrain from Churchill Avenue
2. Requires no property takings
3. Partially closes Churchill Avenue, but preserves access to Alma – allowing residents West of Alma to access Downtown and South Palo Alto
4. Prevents use of Churchill as a cut-through to Embarcadero, thereby reducing traffic congestion on Churchill east of Alma (Churchill East).
5. Keeps Caltrain at grade level – i.e., no raising or lowering of tracks
6. Separates bicycle and pedestrian traffic crossing Alma from car traffic
7. Provides a bridge over Churchill Avenue to the bike trail next to Palo Alto High School
8. All infrastructure is at or below grade level, so it doesn't create an eyesore like that of a viaduct
There are three issues that need further study:

1. Will Caltrain permit the encroachment onto their right-of-way for the ramp leading to the tunnel under the tracks?

2. Splitting the lanes on Alma to prevent taking properties introduces some safety issues, such as an abutment between the two lanes that could be a hazard. This needs to be investigated, but there are mitigations for the safety issues. There are many examples of this configuration elsewhere in California.

3. The bike/pedestrian ramp will extend onto the Palo Alto High School property on the Alma side. The high school will need to be consulted.
Re-think Embarcadero
WHY RE-THINK EMBARCADERO WHEN THE TRAIN CROSSING BEING CONSIDERED IS AT CHURCHILL?

**Viaduct at Churchill**
- Expensive: $300M - $400M (more than the cost of the cheapest solution for Meadow/Charleston which is two crossings for $200M - $250M)
- Would improve current congestion at Churchill, but could inadvertently induce cut thru traffic to Old Palo Alto
Traffic studies show relationship between Embarcadero and Churchill
- Churchill used more for traffic turning to go North/South on Alma
- Embarcadero used more for traffic traveling East/West
- The existing grade separation is a hybrid that has limited turns and unsignalized movements onto Alma
- Embarcadero runs at an angle to Alma, making it harder to correct the design issues created by the old hybrid
- Closure of Churchill requires significant mitigations at Embarcadero (and other places) which has residents concerned given the area is already very congested
Mitigations for closure of Churchill require altering the existing grade separation:

- widening the Embarcadero overpass along Alma
- removing the Stanford Game Day Station
- removing the stairs used by students coming to and from PALY and Castilleja on South side

Embarcadero grade separation is the oldest in the City (1936) and may need seismic retrofits or full replacement in the future

Area near the grade separation was previously earmarked for bike/ped improvements to make it safer

What if, we started with a clean slate in that area – what would we choose to build?

Two main concepts:

- What is the best way to separate the trains from the cars at Embarcadero and Alma?
- What is the best way to deal with the flow of all modes of traffic when a new separation is built?
Note, this does not include the cycle track designs. Those are possible and would come later in the design process.
RE-THINK EMBARCADERO

Existing Property Lines

Roundabout

Bike/Ped Paths

Palo Alto High School
Train solution: Viaduct at Embarcadero –
- Would stretch to Churchill where it would be up about 5 ft high – making it possible to make a bike/ped tunnel that’s less steep than the one proposed (like Homer tunnel)
- Could also be a better designed Hybrid, instead of a viaduct – taking advantage of existing dug out areas

Road Solution: Roundabout
- Returning streets to grade makes area more walkable and bikeable
- Rebuilding the grade separation allows us to redraw all car/ped/bike routes to fit our needs
- Could consider adding more exits to the roundabout to be able to enter Town & Country from corner near Trader Joe’s or enter Palo Alto High school
- Could also be designed as a regular intersection or any other appropriate traffic interchange
Potential Weaknesses

• Cost could be significant due to construction phasing and need for shoo-fly tracks
• Construction phasing and impacts could be a fatal flaw in executing this concept
• May not be eligible for Measure B Funding

Potential Strengths

• More pedestrian and bike friendly – fits into Comp Plan goals
• Exciting urban design is more “Palo Alto” than current configuration
• Design knits together neighborhoods, Town & Country and PALY into a more cohesive area
Any council feedback or guidance?
What should XCAP include in their final recommendations report to Council?
FUTURE XCAP MEETING PRESENTERS

- Sebastian Petty – Caltrain
- Norm Matteoni – Eminent Domain Attorney
## Summary of Evaluation with City Council-Adopted Criteria

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Meadow / Charleston</th>
<th>Churchill</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Facilitate movement across the corridor for all modes of transportation</td>
<td>Meadow Dr and Charleston Rd will be grade separated from the railroad for all modes and will remain open.</td>
<td>Meadow Dr and Charleston Rd will be grade separated from the railroad for all modes and will remain open.</td>
</tr>
<tr>
<td><strong>B</strong> Reduce delay and congestion for vehicular traffic at rail crossings</td>
<td>With construction of the grade separation, the railroad crossing gates and warning lights at Meadow Dr and Charleston Rd will be removed. Trench crossings for all modes and will remain open.</td>
<td>With construction of the grade separation, the railroad crossing gates and warning lights at Meadow Dr and Charleston Rd will be removed. The tunnel will remain open.</td>
</tr>
<tr>
<td><strong>C</strong> Provide safe, safe routes for pedestrians and cyclists crossing the rail corridor, separate from vehicles</td>
<td>Pedestrian/cyclists will be separated from train traffic and bike lanes will be added to Childhood.</td>
<td>Pedestrian/cyclists will be separated from train traffic and bike lanes will be added to Childhood.</td>
</tr>
<tr>
<td><strong>D</strong> Support continued rail operations and Caltrain service improvements</td>
<td>A temporary railroad track will be required, and a crossover track located north of the San Antonio Caltrain Station will be relocated.</td>
<td>A temporary railroad track will be required, and a crossover track located north of the San Antonio Caltrain Station will be relocated.</td>
</tr>
<tr>
<td><strong>E</strong> Finance with feasible funding sources</td>
<td>No acquisition of private properties is required.</td>
<td>No acquisition of private properties is required.</td>
</tr>
<tr>
<td><strong>F</strong> Minimize right-of-way acquisition</td>
<td>Subsurface acquisitions will be required for the trench retaining walls and right-of-way acquisitions will be required to construct pump stations.</td>
<td>Subsurface acquisitions will be required for the trench retaining walls and right-of-way acquisitions will be required to construct pump stations.</td>
</tr>
<tr>
<td><strong>G</strong> Reduce rail noise and vibration</td>
<td>Train horn noise and warning bells will be eliminated with the replacement of the at-grade crossings with grade separations.</td>
<td>Train horn noise and warning bells will be eliminated with the replacement of the at-grade crossings with grade separations. Utilizing electric engines instead of diesel engines will also reduce noise. Noise will be contained.</td>
</tr>
<tr>
<td><strong>H</strong> Maintain access to neighborhoods, parks, and schools along the corridor, while reducing regional traffic on neighborhood streets</td>
<td>No diversion of regional traffic with the construction of grade separations.</td>
<td>No diversion of regional traffic with the construction of grade separations.</td>
</tr>
<tr>
<td><strong>I</strong> Minimize visual changes along the corridor</td>
<td>Railroad tracks will be below grade with high fencing on two sides and landscaping will be added.</td>
<td>Railroad tracks will be below grade with high fencing on two sides and landscaping will be added.</td>
</tr>
<tr>
<td><strong>J</strong> Minimize disruption and duration of construction</td>
<td>Extended lane reductions on Alta St. and Churchill Ave for the pedestrian/bike undercrossing (20 feet below grade) will last for approximately 3 years.</td>
<td>Extended lane reductions on Alta St. and Churchill Ave for the pedestrian/bike undercrossing (20 feet below grade) will last for approximately 3 years.</td>
</tr>
</tbody>
</table>

### Order of Magnitude Cost

<table>
<thead>
<tr>
<th></th>
<th>$800M to $950M*</th>
<th>$220M to $250M*</th>
<th>$450M to $500M*</th>
<th>$1,218M to $1,827M*</th>
<th>$1,713M to $1,759M*</th>
<th>$550M to $650M*</th>
<th>$500M to $640M*</th>
</tr>
</thead>
</table>

* Total Preliminary Construction Costs in 2018 dollars with escalation to 2025 (Subject to Change).
# Summary of Engineering Challenges

<table>
<thead>
<tr>
<th>Engineering Challenges</th>
<th>Meadow / Charleston</th>
<th>Churchill</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trench</strong></td>
<td>• Requires diversion of Adobe and Barron creeks resulting in the need for pump stations.</td>
<td>• Pump station required.</td>
</tr>
<tr>
<td></td>
<td>• No significant creek or drainage impacts.</td>
<td>• No significant creek or drainage impacts.</td>
</tr>
<tr>
<td><strong>Hybrid</strong></td>
<td>• Pump stations required for lowered roadways.</td>
<td>• Increased risk of flooding with pump stations.</td>
</tr>
<tr>
<td></td>
<td>• Increased risk of flooding due to pump stations.</td>
<td>• Increased risk of flooding with pump stations.</td>
</tr>
<tr>
<td><strong>Viaduct</strong></td>
<td>• Requires diversion of Adobe and Matadero creeks resulting in the need for pump stations.</td>
<td>• Increased risk of flooding with pump stations.</td>
</tr>
<tr>
<td></td>
<td>• No significant creek or drainage impacts.</td>
<td>• Relocation of the pump house at Embarcadero Rd required to accommodate widening of Alma St.</td>
</tr>
<tr>
<td><strong>South Palo Alto Tunnel Passenger and Freight</strong></td>
<td>• Requires diversion of Adobe and Matadero creeks resulting in the need for pump stations.</td>
<td>• Increased risk of flooding with pump stations.</td>
</tr>
<tr>
<td></td>
<td>• No significant creek or drainage impacts.</td>
<td>• Relocation of the pump house at Embarcadero Rd required to accommodate widening of Alma St.</td>
</tr>
<tr>
<td><strong>South Palo Alto Tunnel with At-Grade Freight</strong></td>
<td>• Requires diversion of Adobe and Matadero creeks resulting in the need for pump stations.</td>
<td>• Increased risk of flooding with pump stations.</td>
</tr>
<tr>
<td></td>
<td>• No significant creek or drainage impacts.</td>
<td>• Relocation of the pump house at Embarcadero Rd required to accommodate widening of Alma St.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>L Creek/Drainage Impacts</th>
<th>Increased maintenance costs due to:</th>
<th>Increased maintenance costs due to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Pump stations for creek diversion</td>
<td>• Pump stations for creek diversion</td>
</tr>
<tr>
<td></td>
<td>• Pump stations for trench dewatering</td>
<td>• Pump stations for trench dewatering</td>
</tr>
<tr>
<td></td>
<td>• Below ground railroad alignment.</td>
<td>• Above ground railroad alignment with embankments and viaduct structures.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M Long-Term Maintenance</th>
<th>Increased maintenance costs due to:</th>
<th>Increased maintenance costs due to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Pump stations for creek diversion</td>
<td>• Pump stations for creek diversion</td>
</tr>
<tr>
<td></td>
<td>• Pump stations for trench dewatering</td>
<td>• Pump stations for trench dewatering</td>
</tr>
<tr>
<td></td>
<td>• Below ground railroad alignment.</td>
<td>• Below ground railroad alignment.</td>
</tr>
</tbody>
</table>

| N Utility Relocations | Major utility relocations for lowered railroad. | Major utility relocations for lowered railroad. |  |
|-----------------------|-------------------------------------------------|-------------------------------------------------|  |
|                       | No temporary track (i.e., shoofly) is required. | Temporary track (i.e., shoofly) is required. |  |

<table>
<thead>
<tr>
<th>Q Caltrain Design Exceptions Needed</th>
<th>2% grade on track required. Maximum grade allowed by Caltrain is 1%.</th>
<th>None required.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Temporary vertical clearance of 1/2 feet at undercrossing structures during construction. Minimum vertical clearance allowed by Caltrain is 15.5 feet.</td>
<td>1.6% grade on track required. Maximum grade allowed by Caltrain is 1%.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Improvement</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Housing Work Plan Update

Planning & Development Services
City of Palo Alto
January 21, 2020
# Housing Work Plan

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing initiatives</td>
<td>91%</td>
</tr>
<tr>
<td>2018 amendments</td>
<td>83%</td>
</tr>
<tr>
<td>2019 amendments</td>
<td>0%</td>
</tr>
<tr>
<td>Economic Analysis to Support BMR</td>
<td>66%</td>
</tr>
<tr>
<td>Leveraging City Funds</td>
<td>100%</td>
</tr>
<tr>
<td>Partnerships</td>
<td>57%</td>
</tr>
</tbody>
</table>

*February 2018 Draft*
Housing Work Plan: Ongoing Initiatives

Affordable Housing Overlay (April 2018)

- 100% Affordable Housing Projects
- 1/2 Mile Fixed Rail
- 1/4 Transit Corridor
- Commercially Zoned Property
- .75 Parking Space / Unit
Housing Work Plan: Ongoing Initiatives

Workforce Housing Overlay (June 2018)

- Flexible Development Standards (2.0 / 50 feet)
- 1/2 Mile Fixed Rail
- Local Workforce Preference
- 20% of Units Deed Restricted to 140-150% AMI
Housing Work Plan: 2018 Amendments

- Citywide
- Multi-Family Zones
- Downtown California Avenue
- El Camino Real

Housing Ordinance (2018/19)

- 10% + Parking Reduction for Multi-Family Housing
- Application Review Streamlined
- 100% Affordable Housing Exempt from Retail Preservation
- Rooftop Gardens Count Toward Required Open Space

- RM 15 Up-Zoned to RM 20
- Established a Minimum Unit Density Requirement
- Allows for Redevelopment on Sites Exceeding Density – No Net Loss

- Eliminated Maximum Unit Density
- Exclusively Residential Housing Allowed (w/some exceptions)
- No Parking Required for First 1,500 SF of Retail (Housing Projects)
- Affordable Housing Overlay No Longer Requires Legislative Review
- Housing Incentive Program Established
  - Density Waivers (3.0 Downtown; 2.0 Cal Ave; 1.5 ECR)
  - Lot Coverage Waiver
  - Greater Development Potential Compared to State Density Bonus Law & SB 35
Housing Work Plan: Ongoing Initiatives

Accessory Dwelling Units
Junior ADUs

- Lot Size Restriction Removed
- No Parking Required
- Bonus Floor Area and Lot Coverage
- Development Impact Fee Waivers

Summary Guide to ADUs and Junior ADUs
Housing Work Plan: Leverage Funds & Partnerships

**Affordable Housing Fund**

- $3M Reserved Teacher Housing Project
- $20M for Wilton Court (PAH)

**Partnerships**

- PAUSD (Cubberley Center)
- Santa Clara County
- Stanford University
Colleagues Memos

Strengthening Renter Protections
September 10, 2018
• Local mitigations ordinance
• State law changes: just cause / rent caps (AB 1482)

Safe Parking
June 10, 2019
• Pilot program to start in March

Socio-Economic Diversity & Affordability
September 23, 2019
• Some overlap with housing work plan
• Commercial housing impact fee
Pending Assignments

**Area & Regional Planning**
- NVCAP
- PDA / PCAs
- Housing Element: 2022-2030

**Housing Preservation**
- Safe Parking
- Renter Protections

**Housing Preservation**
- Cottage Clusters / Multi-Plexes
- No-Net Loss Housing Policy
- Housing Replacement In-Lieu Fee
- Restrict Housing to Commercial Use

**Housing Production**
- Inclusionary Housing
- ADU Regulations
- Parking In-Lieu Study
- SB 35 Compliance
- Commercial Housing Impact Fees
- PTOD & Village Residential
- Stanford RP/Shopping Center
- Co-Housing & Small Units
- Special Needs Housing
- TDRs for Residential Uses
- In-Lieu Parking Fees for Housing

**Non-Housing Related**
- EV Chargers + Related
- Wireless Ordinance
- Reach Code
- Seismic Ordinance
## Comprehensive Plan Housing Production Range

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>All Incomes (units)</td>
<td>286</td>
<td>18</td>
<td>89</td>
<td>54</td>
<td>107</td>
<td>343</td>
<td>343</td>
<td>343</td>
<td>3,545</td>
</tr>
</tbody>
</table>

## Housing Element Regional Housing Needs Assessment (RHNA)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>Permitted Units</th>
<th>RHNA Target</th>
<th>% of RHNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>43</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43</td>
<td>691</td>
<td>6.2%</td>
</tr>
<tr>
<td>Low</td>
<td>58</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65</td>
<td>432</td>
<td>15%</td>
</tr>
<tr>
<td>Moderate</td>
<td>11</td>
<td>3</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26</td>
<td>278</td>
<td>9.4%</td>
</tr>
<tr>
<td>Above Moderate</td>
<td>174</td>
<td>15</td>
<td>72</td>
<td>54</td>
<td>105</td>
<td>3</td>
<td></td>
<td></td>
<td>423</td>
<td>587</td>
<td>72%</td>
</tr>
<tr>
<td>Sub Total</td>
<td>286</td>
<td>18</td>
<td>89</td>
<td>54</td>
<td>107</td>
<td>3</td>
<td></td>
<td></td>
<td>557</td>
<td>1988</td>
<td>28%</td>
</tr>
</tbody>
</table>

## SB 35 Streamlined Review @ 50% Affordability for Not Meeting Above Moderate RHNA Target

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>DU/YR (Need)</th>
<th>DU/YR (Permitted)</th>
<th>ADUs / Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>73</td>
<td>147</td>
<td>220</td>
<td>294</td>
<td>367</td>
<td>440</td>
<td>514</td>
<td>587</td>
<td>174</td>
<td>189</td>
<td>261</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>3</td>
<td>12</td>
<td>36</td>
<td>62</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>11</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>
Housing Unit Production Over Time

To Reach Comprehensive Plan Housing Production Mid-Range Target: **343** Housing Units Are Needed on Averaged Over the
## Palo Alto

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>67,019</td>
</tr>
<tr>
<td><strong>Zoning</strong></td>
<td>72% R1 &amp; Low Density 11% Multi-Family 8%+ Commercial</td>
</tr>
<tr>
<td><strong>Households</strong></td>
<td>26,212</td>
</tr>
<tr>
<td><strong>Deed Restricted</strong></td>
<td>8.0%</td>
</tr>
<tr>
<td><strong>Median Home Price</strong></td>
<td>$2.7M</td>
</tr>
<tr>
<td><strong>Median Rent</strong></td>
<td>$4,280 (2 Bedrooms)</td>
</tr>
</tbody>
</table>

**Market Considerations**
- Skilled Labor Shortage
- Construction Materials
- Limited Area to Build
- City Regulations / Fees

Sources: City of Palo Alto, American Community Survey and Zillow, Inc.
What’s Next
Hire Vacant Positions
Complete Grant Funding (SB 2 & Challenge Grant)

Mid Term Housing
• Continue with Housing Work Plan

Long Term
• North Ventura Coordinated Area Plan
• Downtown CAP

Alternative
Short Term Housing Production
• Community Housing Zoning
  ✓ Limited Applicability (Commercial Zoning)
  ✓ Improve Housing Balance (net new jobs)
  ✓ Established On-Site Affordability for Ownership
  ✓ Compliance with City Office Caps
  ✓ Prescreening Required

Recommendation
Review Work Plan and Provide Direction to Staff as Appropriate.