



CALIFORNIA
High-Speed Rail Authority

California High-Speed Rail: Construction Update

Brian Kelly
Chief Executive Officer

2022 Progress

- Today:

- » 380 miles environmentally cleared
 - *Bay Area (San Jose) to LA County (Palmdale)*
- » 119 miles under construction
- » Commitment to complete the Merced to Bakersfield initial operating segment
- » Caltrain electrification construction underway
- » Funding committed for LAUS improvements
- » Advance station planning



Bay Area Valley to Valley Segment

- 159 Miles
- 100% environmentally cleared by 08/2022
- Eligible to begin advanced design in 2022/2023
- Corridor electrification underway on 51 miles through Caltrain Electrification Project
- Segment construction is unfunded

Goal: Advance design work in 2023 (federal funding application pending); identify needed right-of-way; consider federal/state funding for “shared corridor” early capital investments; develop funding plan options.

Southern California Complete Phase 1

- 164 Miles
- 92 miles (56%) environmentally cleared in 2022 (remainder in 2023/24)
- Some advanced design could begin in 2023
- LA Union Station Phase A fully funded, clearing environmental in 2022
- Segment construction is unfunded

Goal: Advance design work in 2023 (federal funding application pending); identify needed right-of-way; consider federal/state funding for “shared corridor” early capital investments; develop funding plan options.

Central Valley

Initial Operating Segment

- 171 Miles
- 100% environmentally cleared
- 119 miles under construction
- 52 miles starting advanced design (pre-construction work)
- Track and Systems contract in 2022
- Train procurement in 2023

Goal: Initial operations by 2030



Central Valley Update

Where We Are Now & Where We Are Going

- Achieving a complete project definition
- Completing right-of-way (ROW) acquisitions
- Focusing on finalizing third party designs
- Updating design and construction activities

Central Valley Update

Achieving Construction Management

- 1. Defining all scope and getting it under contract via executing change orders**
- 2. Improving ROW planning and management for more accurate schedule forecasting**
- 3. Concentrating Third-Party Task Force efforts to expedite and complete third-party design approvals**
- 4. Working with Design-Build Contractors to re-sequence work and mitigate schedule impacts**



Right-of-Way Status Update

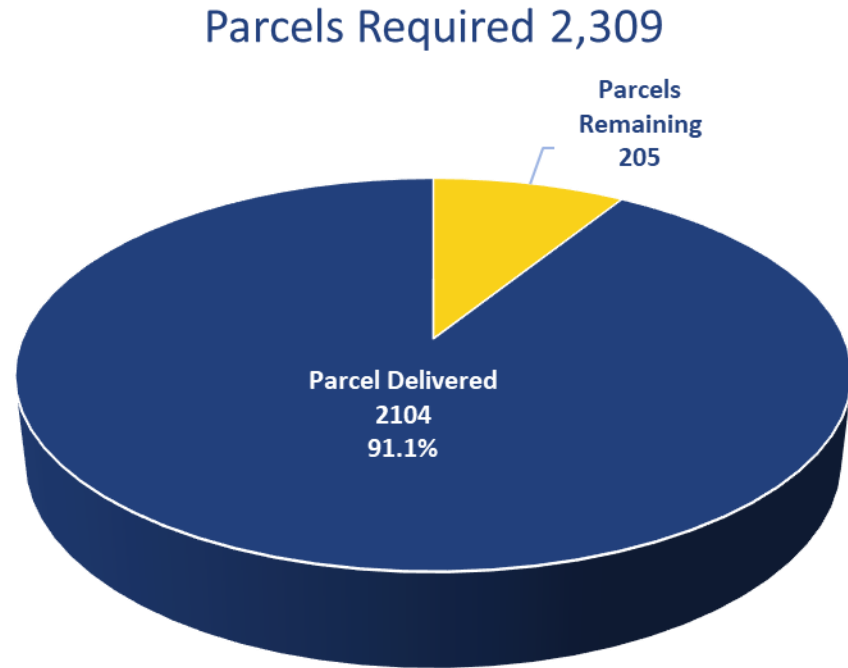


PROGRAM UPDATE

CENTRAL VALLEY RIGHT-OF-WAY

2018 to 2022:

- **723** Parcels Delivered
- **419** Additional parcels added due to refined design

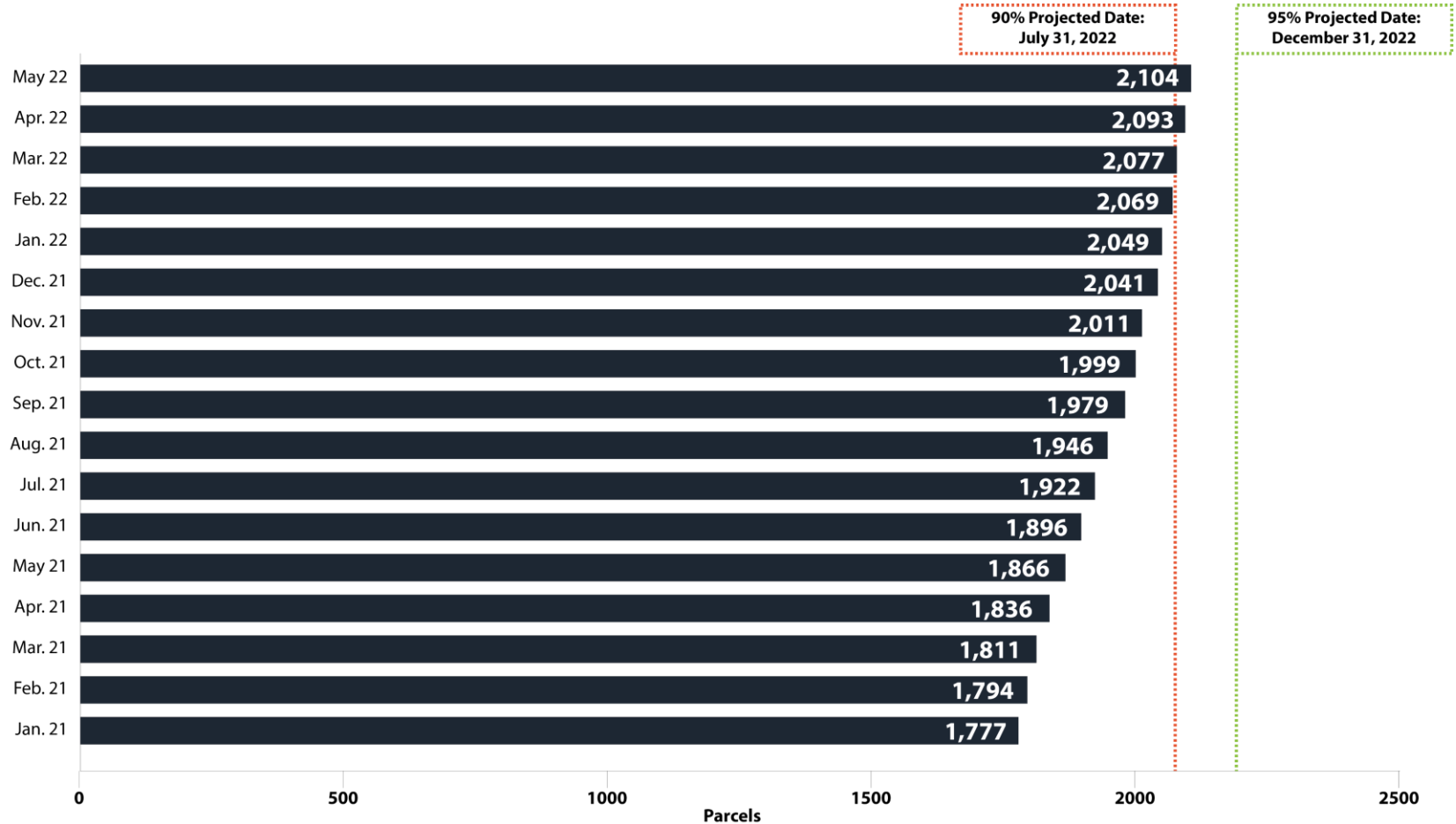


Data Date: 5/31/2022

Right-of-Way Update

Parcel Delivery to DB Summary

Parcel delivery is ahead of schedule. Delivery in April 2022 surpassed the projected goal for July 2022.



This reflects actual parcels delivered to the Design Design-Builder by month compared to the planned delivery schedule which identifies 90% and 95% milestone completion for CP1-4. The 90% and 95% milestone completion does not include parcels that may be added.

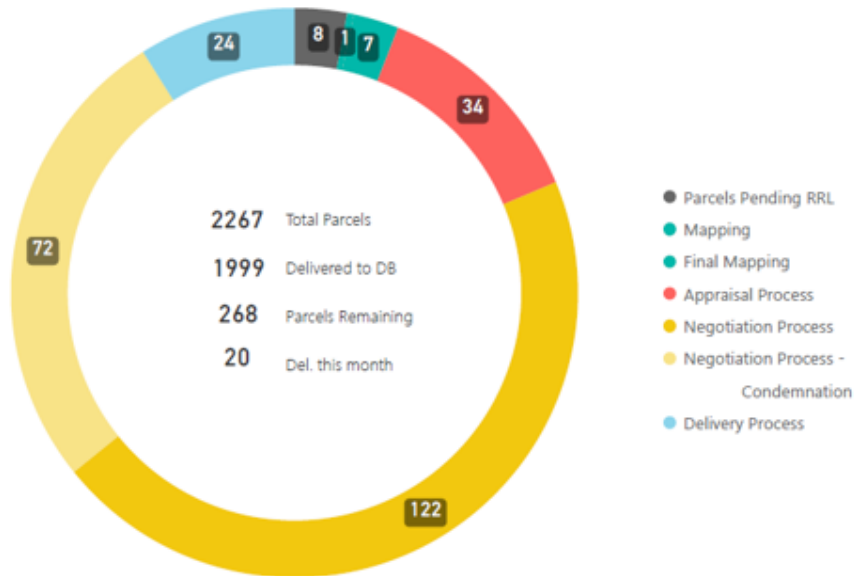
Data Date: 4/30/2022

PROGRAM UPDATE

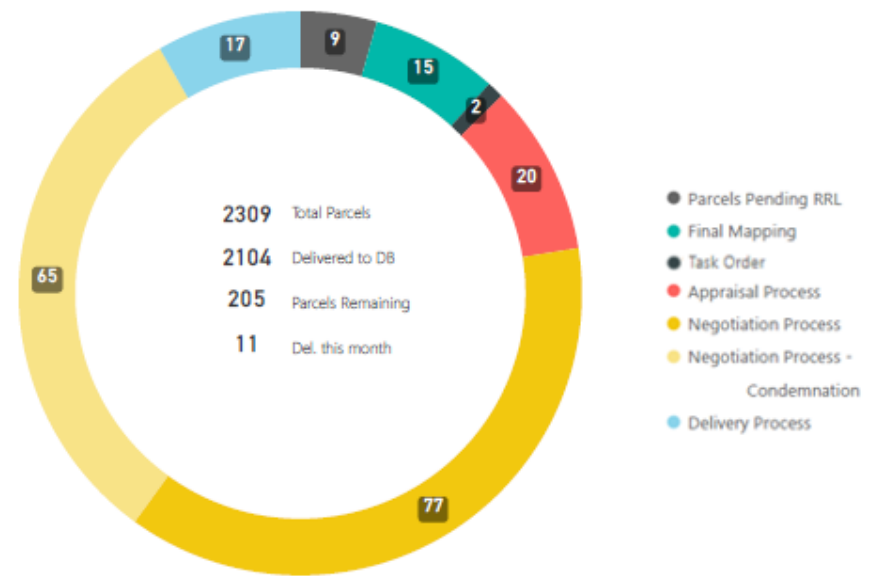
CENTRAL VALLEY RIGHT-OF-WAY

Right of Way Production Graph

October 31, 2021



May 31, 2022



Data Date: 5/31/2022



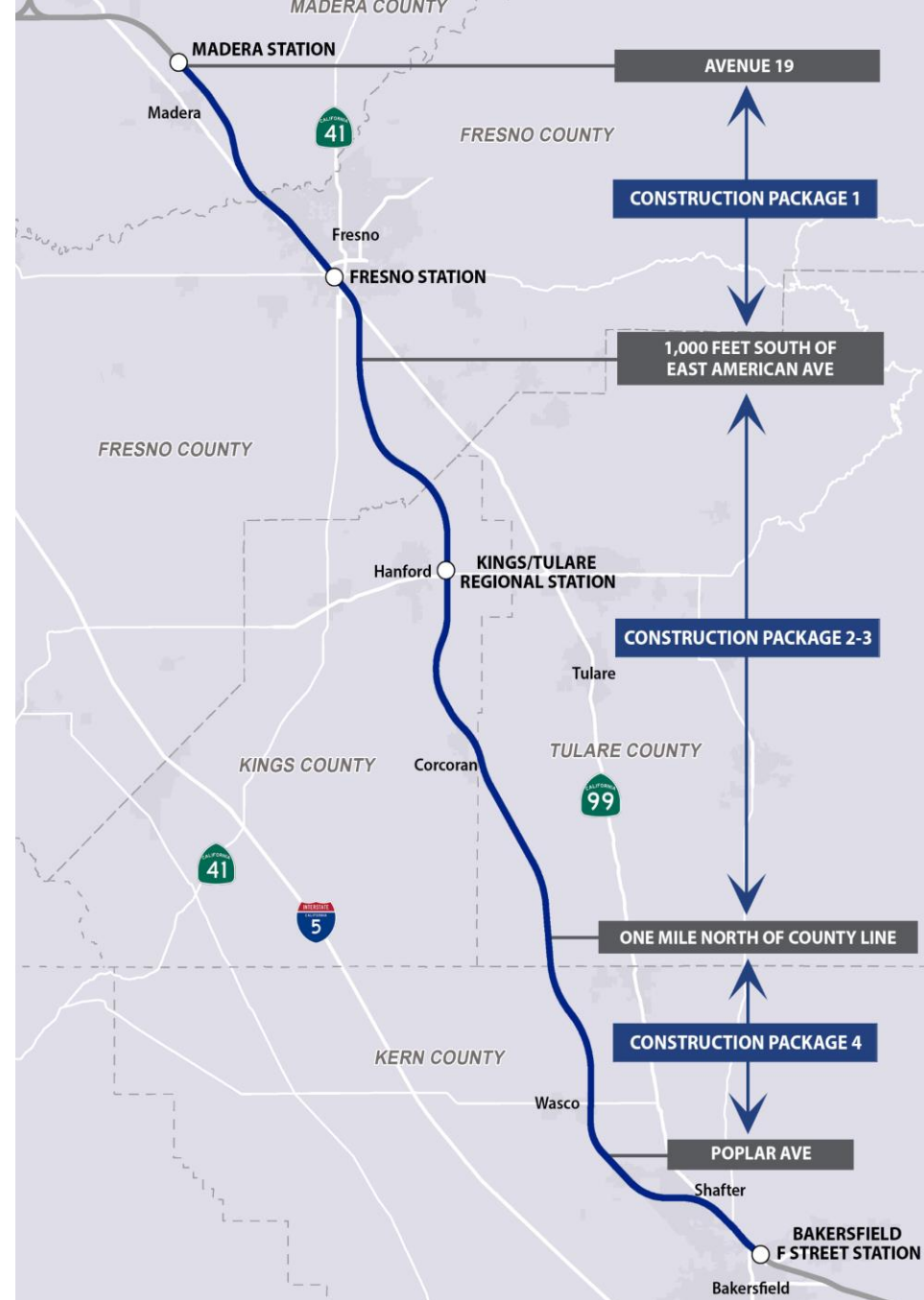
Design and Construction Update



Central Valley Update

119-Miles of Construction

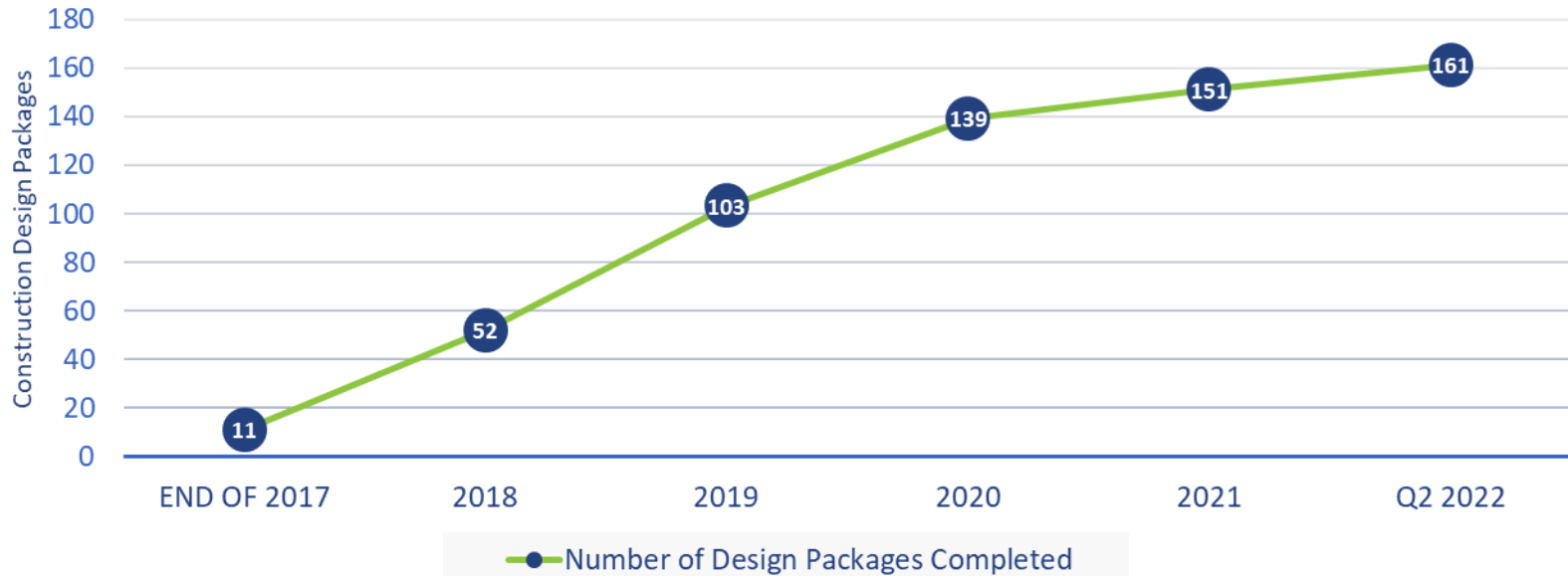
- **Construction Package 1**
 - » 32 Miles
 - » Avenue 19 in Madera County to just South of American Avenue in Fresno County
- **Construction Package 2-3**
 - » 65 Miles
 - » Just south of Fresno to 1 Mile North of the Tulare/Kern County Line
- **Construction Package 4**
 - » 22 Miles
 - » Tulane/Kern County Line to Poplar Avenue





DESIGN PROGRESS - ALL CONSTRUCTION PACKAGES THROUGH MAY 2022

AUTHORITY APPROVED READY FOR CONSTRUCTION (RFC) DESIGN PACKAGES



Two design packages requiring Authority approval remain: The Sweeper Package (CP 1) is on track to be approved by the end of June. The Dutch John Cut Package (CP 2-3) was delayed because the land could not be accessed to perform geotechnical work and is on track to be approved by the end of June.



Construction Package 4



Central Valley Update

Construction Package 4

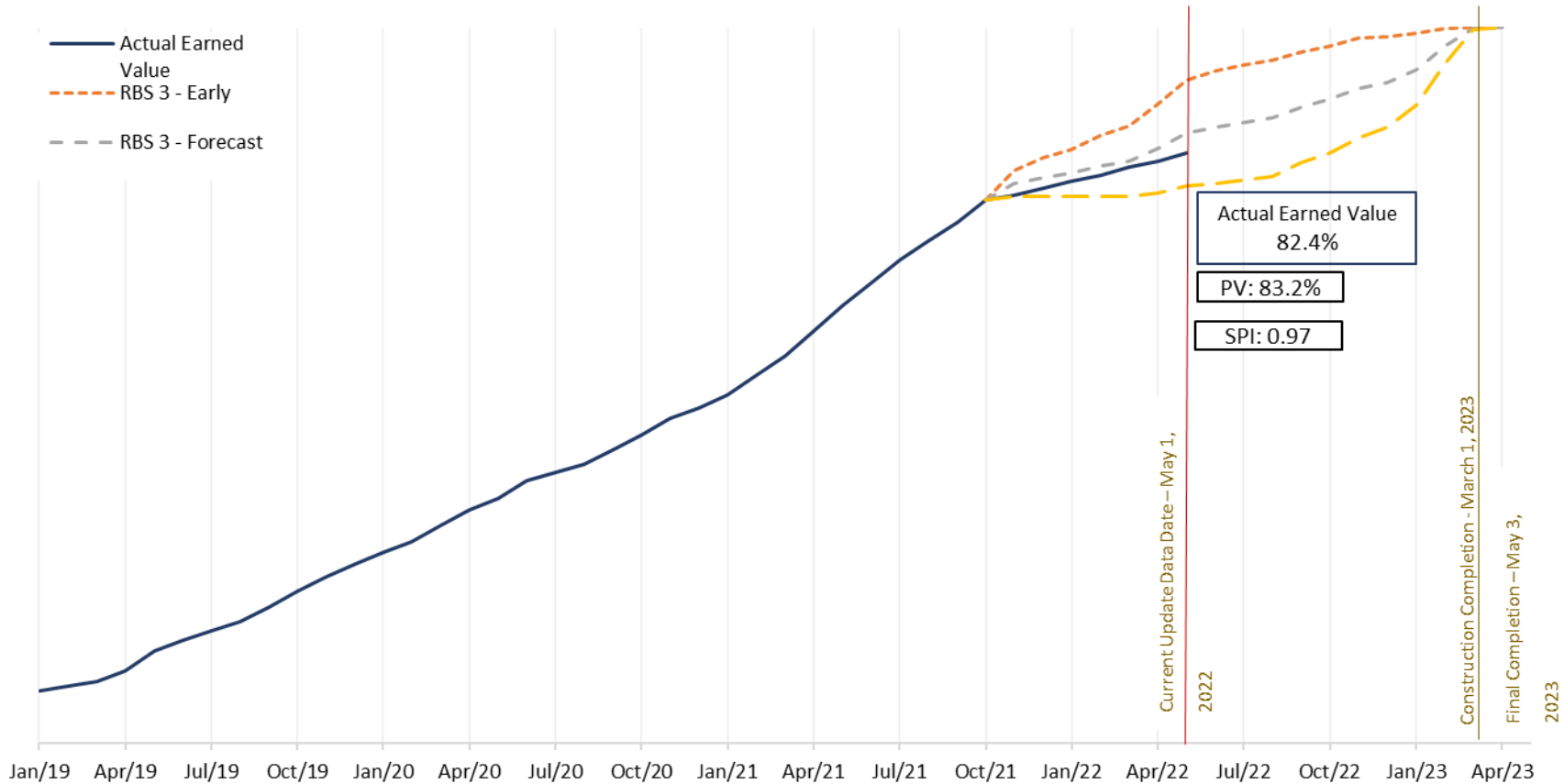
Wasco Viaduct



- Construction Package 4 (CP 4) is the third significant construction contract executed on the Initial Operating Section
- 22-mile stretch bounded by a point approximately one mile north of the Tulare/Kern County Line at the terminus of Construction Package 2-3 and Poplar Avenue to the south
- Will include construction of at-grade, retained fill and aerial sections of the high-speed rail alignment.
- **Substantial completion expected March 2023.**

Central Valley Update

Construction Package 4



- Notes:**
1. The plan graphs are based on RBS Revision 3, which has a data date of October 1, 2021, and a construction completion date of March 1, 2023. Actual graph is as of April 30, 2022.
 2. Earned Value represents physical progress of site activities, which is based on project team verification of site progress measurements.
 3. The early dates graph is optimistic and assumes activities will take place on the schedule early dates.
 4. Average graph assumes non-critical path activities are taking place mid-way of early and late dates.
 5. The late dates graph assumes activities will take place on the schedule late dates. If actuals fall below late graph, it indicates schedule slippage. To provide contingency, the Schedule Performance Index (SPI) is measured against the average graph.
 6. Time contingency is not included in these forecasts. This is Authority owned contingency.

Central Valley Update

Construction Package 4

CP 4



Authority Approved
Design Completed

100%



Right-Of-Way Parcels
Delivered to DB

84%



Utility Relocation
Complete/In-Progress

58%



Structures
Complete/In Progress

100%



Miles of Guideway
Complete/In Progress

100%



Overall Contract

79%



McCombs Road

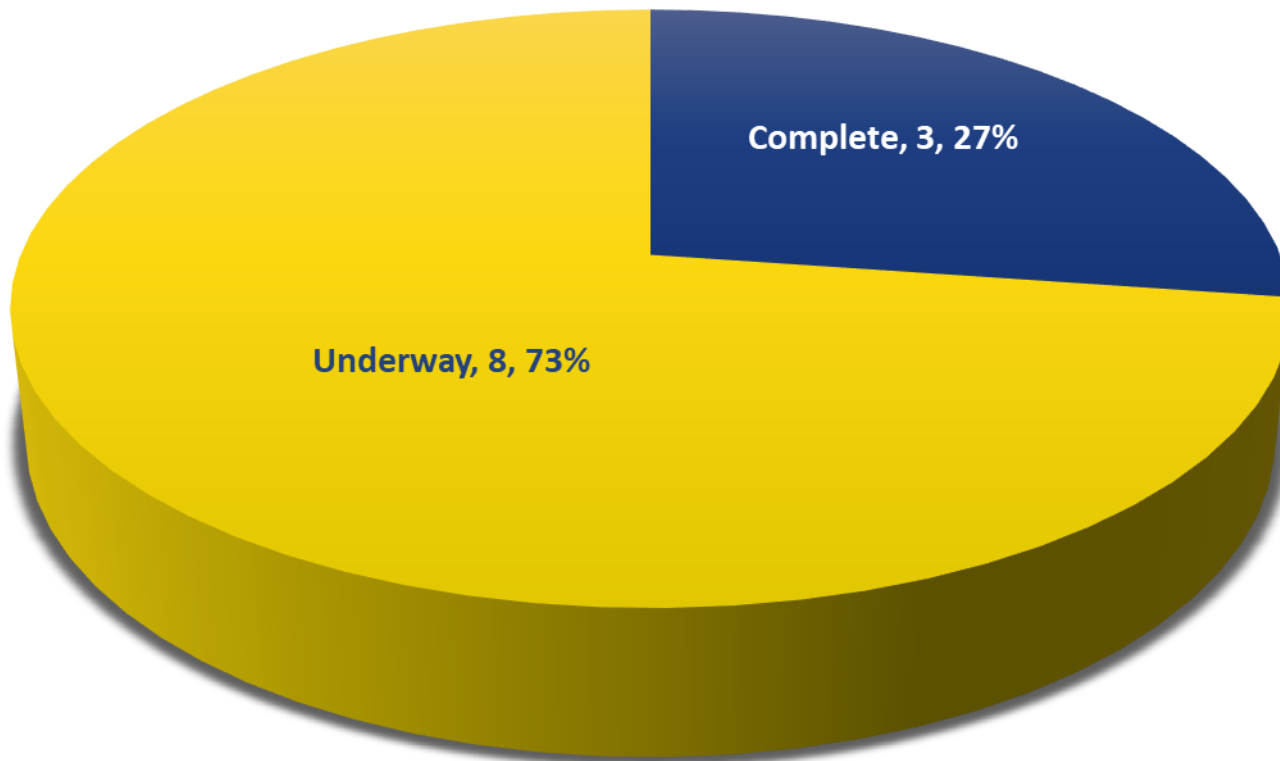
Data Date: 4/30/2022

Central Valley Update

Construction Package 4

Number of Structures in Progress

- » Total Structures: 11
- » **By end of 2022, all structures anticipated to be complete.**



Structure completion is defined as all concrete work complete.

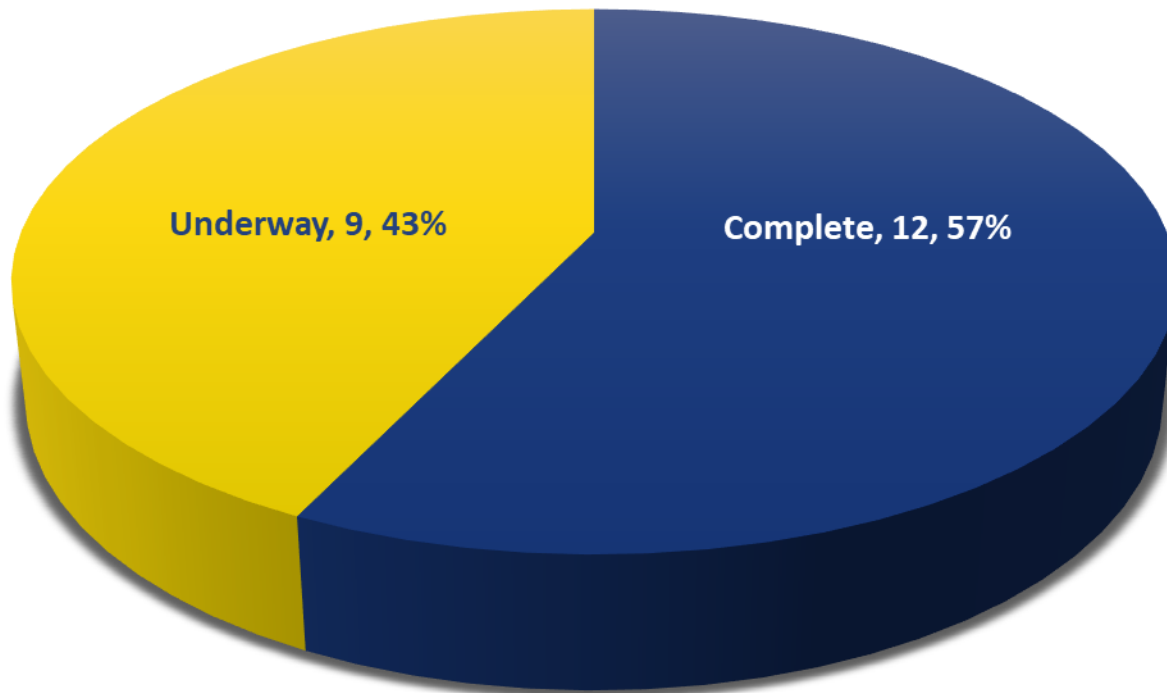
Data Date: 4/30/2022

Central Valley Update

Construction Package 4

Miles of Guideway in Progress

- » Guideway is the riding surface that will support and physically guide the high-speed train.
 - *Total Guideway Miles: 21.2*



Guideway completion is defined as earthworks complete with rough grading.

Data Date: 4/30/2022

Central Valley Update

Construction Package 4

Scope Finalized – Major Change Orders Executed

» Intrusion Protection Barrier

- *Resolution of final components related to the installation of the Intrusion Protection Barrier (loss of excavated material, retaining walls required to implement V-Ditch, and Cast-in-place walls)*

Status Update: Change Order executed; scope finalized.

» Time Impact Analysis

- *Resolution of CRB's claim for excusable and compensable delays resulting from third-party and ROW impacts.*

Status Update: Change Order executed; scope finalized.

Central Valley Update

Construction Package 4

Primary Risk Areas – Unmitigated Risks Could Adversely Affect Schedule

1. Semitropic design and work plan reviews and approval timing.
2. Finalizing permits with the City of Wasco.
3. PG&E and BNSF processing for reviews and approvals of designs and maintenance agreements.

Risk Mitigations Underway

1. Semitropic - Assigned staff lead to work with Semitropic on design review approvals.
2. Semitropic - Executed agreement with Semitropic in August 2021 to execute design approvals and ROW acquisition.

Status Update: Additional approvals in progress, with only two awaiting review.

3. Wasco - Continuing partnership with the City of Wasco to progress permitting and work.

Status Update: Permit received, and work has begun on Poso Avenue.

4. Wasco - Applied for Federal RAISE Grant to address project mitigation in Wasco (demolish former farmworker housing).

Status Update: Grant received, work moving forward.

5. PG&E and BNSF - Established Third-Party Task Force for a more focused effort on expediting design approvals.

Status Update: Two issues resolved; two issues remain.

- PG&E – Review/approvals complete. Anticipate to close escrow on needed property by July 15, 2022 with no impact to critical path.
- BNSF – Canal 9-22 tie-in work pending Utility Agreement with HSR and North Kern Water District, and a mitigation is in place to complete construction with no impact to critical path.



Construction Package 1



Central Valley Update

Construction Package 1







Cedar Viaduct



- Construction Package 1 (CP 1) is the first construction contract executed on the Initial Operating Section
- Extends 32-miles between Avenue 19 in Madera County to East American Avenue in Fresno County
- Includes 19 grade separations, 3 viaducts, a major river crossing over the San Joaquin River and 2 trenches.
- **Revised Baseline Schedule to be finalized summer 2022.**

Central Valley Update

Construction Package 1

	CP 1
 Authority Approved Design Completed 98%	
 Right-Of-Way Parcels Delivered to DB 93%	
 Utility Relocation Complete/In-Progress 71%	
 Structures Complete/In Progress 79%	
 Miles of Guideway Complete/In Progress 53%	
 Overall Contract 66%	

Data Date: 4/30/2022



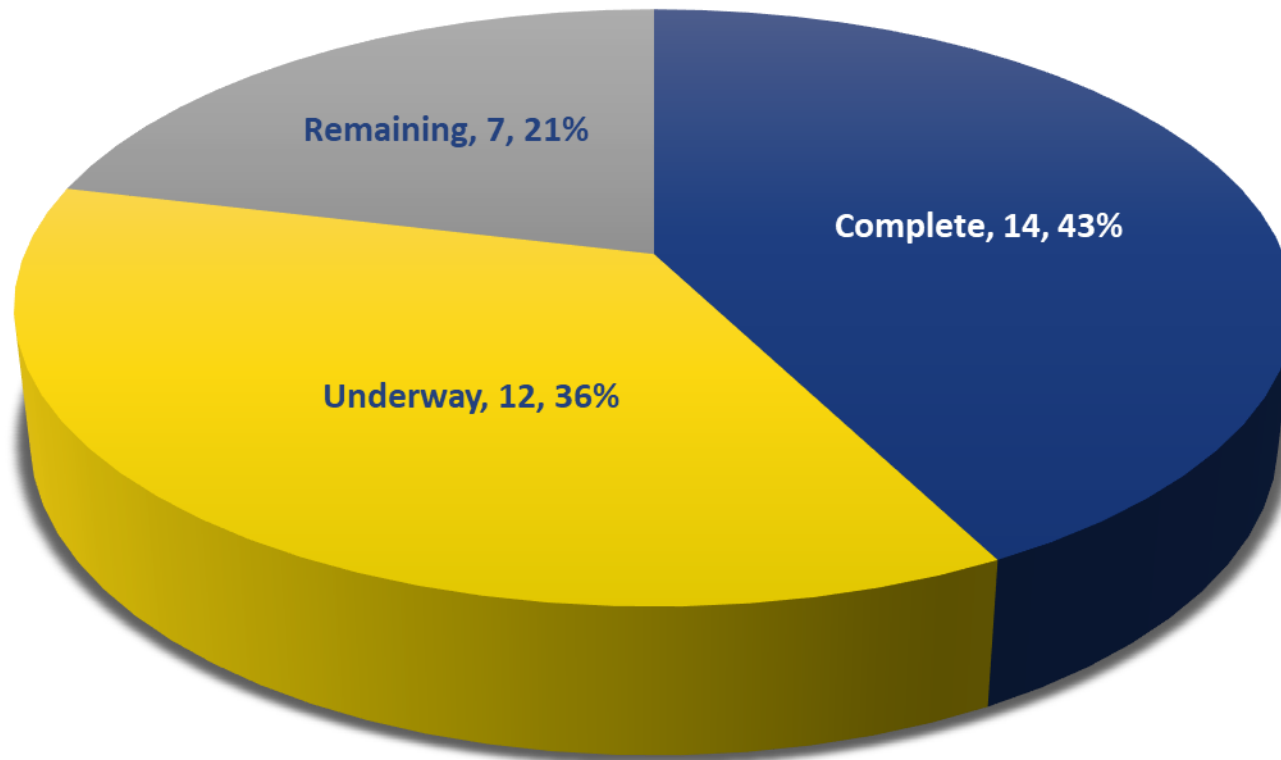
Ventura Street Underpass

Central Valley Update

Construction Package 1

Number of Structures in Progress

- » Total Structures: 33
- » **By end of 2022, 4 additional structures will begin construction, and 3 additional will be completed for a total of 17 structures complete.**



Structure completion is defined as all concrete work complete.

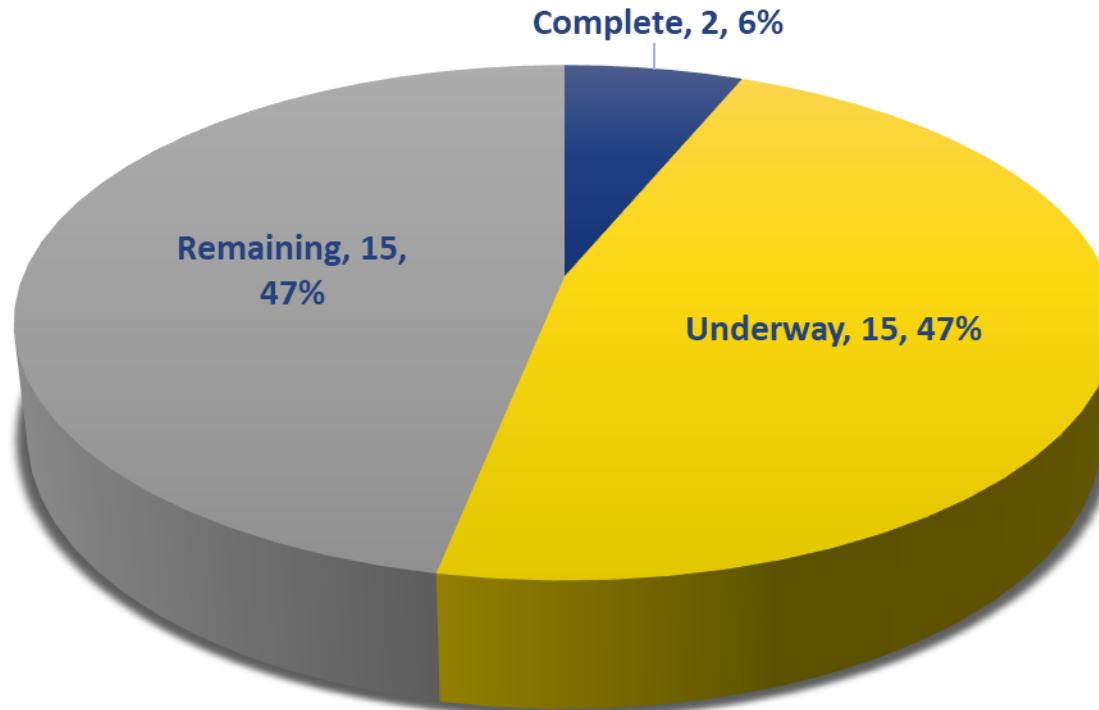
Data Date: 4/30/2022

Central Valley Update

Construction Package 1

Miles of Guideway in Progress

- » Guideway is the riding surface that will support and physically guide the high-speed train.
 - *Total Guideway Miles Needed: 32*



Guideway completion is defined as earthworks complete with rough grading.

Data Date: 4/30/2022

Central Valley Update

Construction Package 1

Finalizing Scope – Significant Change Orders to Complete Construction, Executed

» McKinley Avenue – North Weber Avenue Junction Configuration

- *Change configuration to increase bridge length, relocate traction power substation, City of Fresno traffic control system and utility work*

- Purpose: City of Fresno changed designation of the road

Status Update: Change Order executed; scope finalized.

» Belmont Avenue Overcrossing and Grade Separation

- *Relocate proposed bridge to deconflict with AT&T line, including demolition of UPRR bridge, increasing bridge length and width and changing the Fresno Trench design under Belmont overpass*

- Purpose: City of Fresno requested design refinement

Status Update: Change Order executed; scope finalized.

» Golden State North & South Road Realignment

- *Realigning Golden State Blvd to the West for approximately 4 miles, increasing road from 2 to 4 lane - industrial arterial standard, includes bicycle lanes, increasing sidewalk width.*

- Purpose: City of Fresno required the Authority to realign Golden State Blvd North

Status Update: Change Order executed; scope finalized.

Central Valley Update

CONSTRUCTION PACKAGE 1

Finalizing Scope - Significant Change Orders to Complete Construction, Pending

- » **Guideway Construction for Caltrans SR-99 (Between Clinton and Ashlan Avenues)**
 - Construct additional 2.5 miles of at-grade guideway plus Intrusion Protection Barrier walls between Clinton and Ashlan Avenues
 - *Purpose: Scope was included in the project constructed by Caltrans but could not be completed due to AT&T not being relocated. Adding this scope to the TPZP contract.*

Status Update: Change Order in negotiation.
- » **Church Avenue – Grade Separation Changes**
 - Change configuration to create two bridges in lieu of one at the junction of Church and East Avenue, City of Fresno utilities, and satisfy Fresno to Bakersfield Environmental Impact Report change, added cul-de-sacs, overcrossing modifications, and street connections
 - *Purpose: City of Fresno changed the configuration of the grade separation*

Status Update: Change Order in negotiation.
- » **Downtown Area - Changes to Tulare, Ventura, and Fresno Streets**
 - Widening UPRR structures in Tulare and Ventura underpasses, adding an access structure to the UPRR structures at Fresno Street, changes to specifications to G Street Bridges in all underpasses.
 - *Purpose: UPRR requested wider bridges*

Status Update: Change Order in negotiation

Central Valley Update

Construction Package 1

Primary Risk Areas – Unmitigated Risks Could Adversely Affect Schedule

1. AT&T cutover activities have long durations and are critical pre-construction activities.
2. PG&E design reviews and approvals require specific vendors and bandwidth can be limited.
3. Timeliness of design approval and ROW crossing agreements with railroad partners.
4. Finalizing scope into the contract in a timely manner.

Risk Mitigations Underway

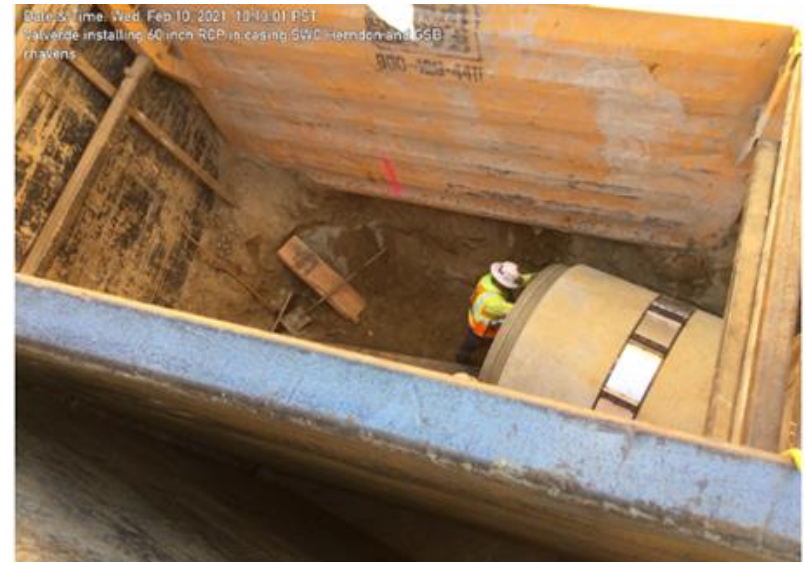
1. PG&E agreement achieved to extend shelf-life of designs to 12 months.
Status Update: On target to exceed Q2 utility relocation goals; commenced executive-level conversations with PG&E to expedite reviews.
2. Established Third-Party Task Force for a more focused effort to improve design reviews with railroads and utilities.
Status Update – 69% of issues resolved by the Third-Party Task Force.
3. Aggressively negotiating remaining scope elements.
Status Update: Executed four significant change orders to complete construction. Negotiations underway for three remaining change orders.

Central Valley Update

Construction Package 1

Major Risk Area – Complex Utilities

- Almost 1,000 utility relocations required, with over 650 in progress or started.
- The City of Fresno averages 6 times more utility conflicts than other areas of the 119 miles under construction (52 conflicts/mile compared to 9 conflicts/mile)
- 36% completed, 35% in progress, 29% not started
- Of relocations not yet started, 56% (159) are PG&E, requiring land acquisition or land conveyance prior to construction
- Striving to complete over 50% of relocations in 2022/2023.
- On target to exceed Q2 2022 utility relocation goals



Jack and bore work being performed under existing railway to relocate utility conduits.

Year	Cumulative Target	Completed/ Target
Pre 2021		223
2021	317	94
2022	547	230
2023	847	300



Construction Package 2-3



Central Valley Update

Construction Package 2-3

Hanford Viaduct



- Construction Package 2-3 (CP 2-3) is the second significant construction contract executed on the Initial Operating Section
- Extends approximately 65 miles from the terminus of Construction Package 1 at East American Avenue in Fresno to one mile north of the Tulare-Kern County line
- Includes approximately 26 grade separations in the counties of Fresno, Tulare and Kings, including viaducts, underpasses and overpasses.
- **Revised Baseline Schedule to be finalized summer 2022.**

Central Valley Update

Construction Package 2-3

CP 2-3



Authority Approved
Design Completed

99%



Right-Of-Way Parcels
Delivered to DB

90%



Utility Relocation
Complete/In-Progress

62%



Structures
Complete/In Progress

61%



Miles of Guideway
Complete/In Progress

74%



Overall Contract

65%

Data Date: 4/30/2022



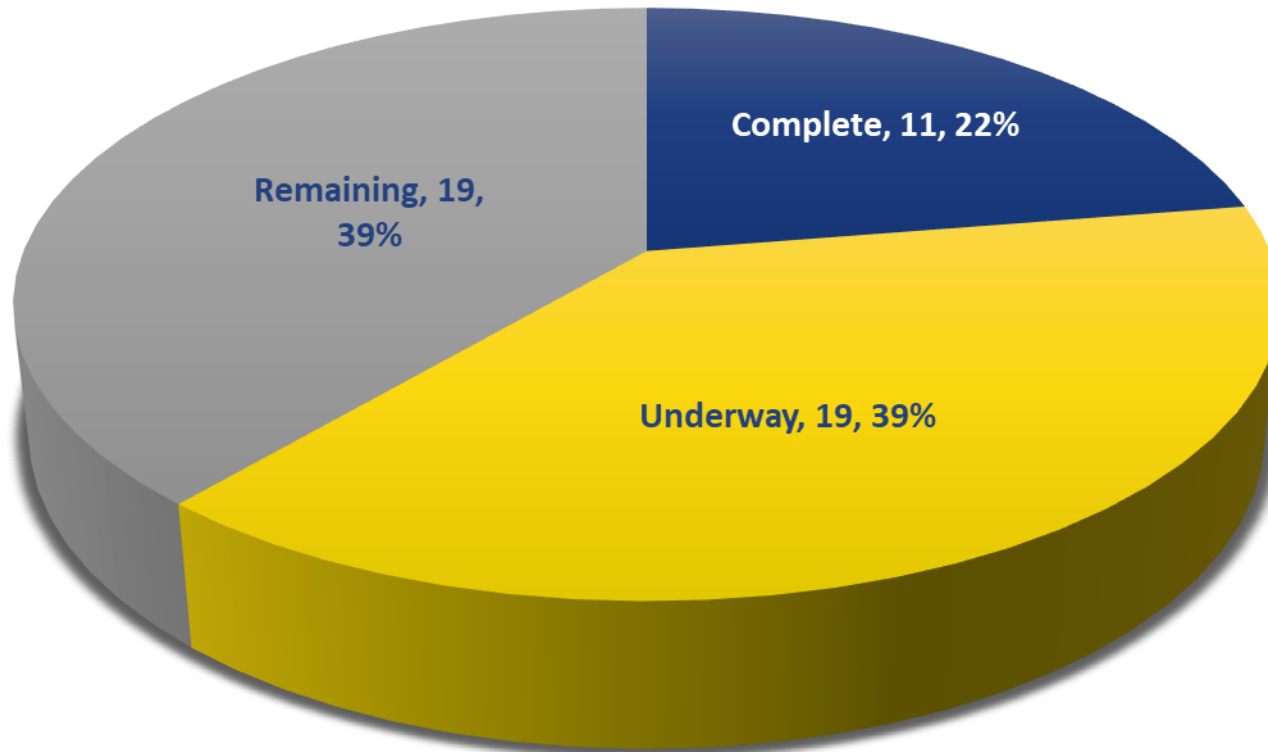
Adams Avenue

Central Valley Update

Construction Package 2/3

Number of Structures in Progress

- » Total Structures: 49
- » **By end of 2022, 6 additional structures will begin construction, and 5 additional structures will be completed for a total of 16 structures complete, with 13 open to traffic.**



Structure completion is defined as all concrete work complete.

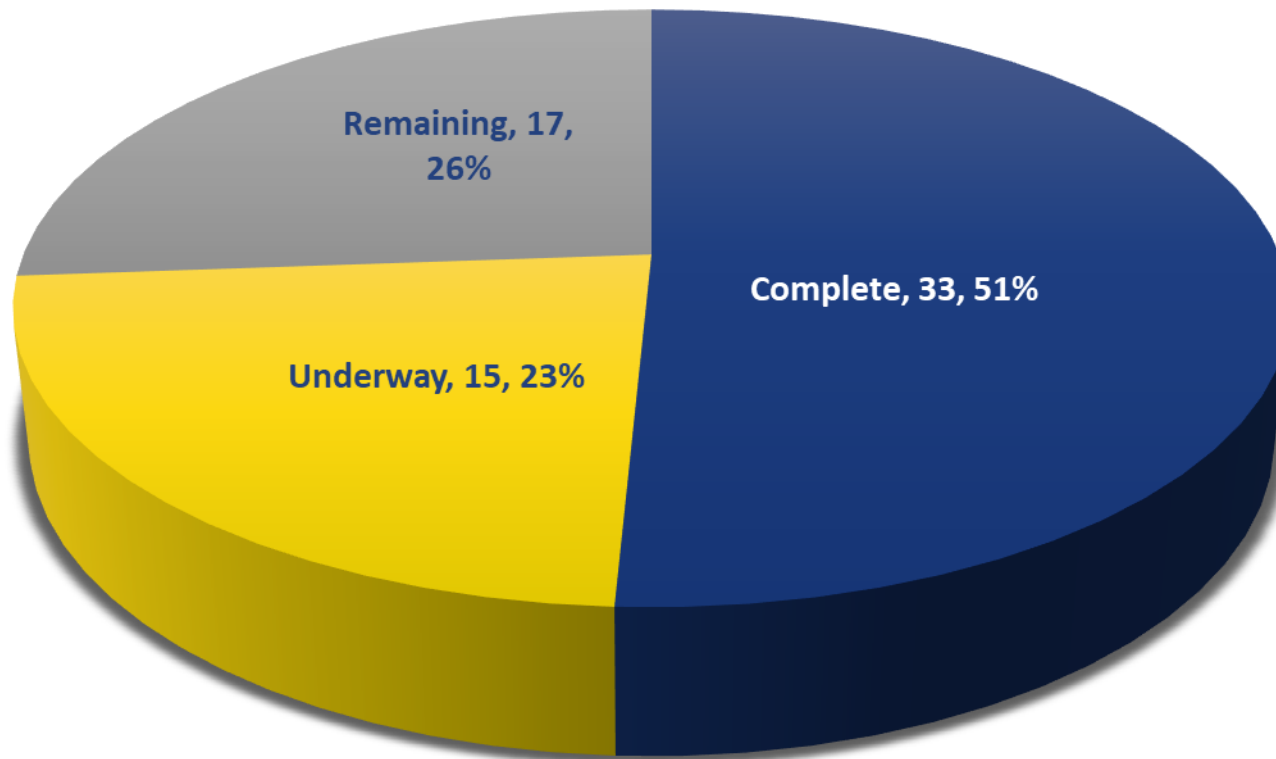
Data Date: 4/30/2022

Central Valley Update

Construction Package 2/3

Miles of Guideway in Progress

- » Guideway is the riding surface that will support and physically guide the high-speed train.
 - *Total Guideway Miles: 65*



Guideway completion is defined as earthworks complete with rough grading.

Data Date: 4/30/2022

Central Valley Update

Construction Package 2/3

Finalizing Scope – Significant Commercial Issues to Complete Construction

» BNSF Intrusion Protection Barrier

- *Construct 15 miles of barrier*

Status Update: Change Order executed; scope finalized.

✓ **Construction underway.**

» Hanford Viaduct

- *Finish superstructure of 6000-foot elevated guideway, configuration change due to Alternative Technical Concept accepted during original procurement*

Status Update: Negotiating remaining scope in June and July 2022.

✓ **Negotiated “Get-to-Work” Time and Materials change orders and monitoring progress.**

» Deer Creek Viaduct

- *Contractor redesigned to 3000-foot viaduct to minimize elevated guideway*

Status Update: Change Order negotiations scheduled for July and August 2022.

✓ **Procured pile casings to expediate construction.**

» Cross Creek Viaduct

- *Contractor redesigned to 2500-foot viaduct to minimize elevated guideway*

Status Update: Under review.

Central Valley Update

Construction Package 2/3

Primary Risk Areas – Unmitigated Risks Could Adversely Affect Schedule

1. ROW Acquisition for critical utility relocations (electric transmission and irrigation).
2. Third-Party coordination for design review/approval, negotiation on work windows (irrigation season, transmission black-out periods, railway moratoriums), and negotiation on maintenance agreements.
3. Commercial settlement of four key disputes.

Risk Mitigations Underway

1. Working to finalize ROW for utility relocations.
Status Update – Between November 2021 and May 2022, 52 of 57 (91%) planned ROW parcels were delivered for CP 2-3. The 5 parcels yet to be delivered are anticipated by Q4 2022.
2. Established Third-Party Task Force for more focused effort to negotiate resolutions.
Status Update - 43% of issues resolved by the Third-Party Task Force.
3. Actively negotiating commercial settlements on disputes.
Status Update – IPB change order executed, allowing construction to begin; two change orders in negotiation process; one commercial issue in review.

Central Valley Update

Construction Package 2/3

Quality Assurance: Tied Arch Bridge Rebuild

- **Structure:**
 - Type 1 structure (Supports HSR trains), located on State Route 43 between Davis and Cairo avenues in Fresno County
 - Structure is 249 feet long & spans over State Route 43.
- **Summary of Issues:**
 - During a concrete pour of Abutments, the Authority identified workmanship issues and notified DFJV's Quality Control:
 - *Large and uneven lifts were placed*
 - *Concrete was dropped from the hose in excess of 5 feet*
 - *Concrete was not placed as close as possible to its final position*
 - *Lack of vibration through the full depth of the lift*
 - *Insufficient lighting to be able to see into the forms*
 - Authority put contractor on notice that there could be potential problems with this pour.
- **Corrective Actions Taken:**
 - Authority required contractor to create a prevention plan to ensure workmanship issues are addressed for future construction.
 - Authority performed its Quality Oversight process and required Contractor begin thorough investigation and third-party testing
 - Two Non-Destructive Tests performed that found locations along the abutment did not meet HSR specifications
 - Authority concurred with contractor determination that best course of action was to remove and rebuild the abutment **at the contractor's cost**.
 - Abutment 2 demolition began March 2022 and is complete.
 - Abutment 1 is in the process of being repaired.



Track & Systems



Track & Systems (TS) Update

TS01 Procurement Timeline

Procurement Milestone	Timeline
Proposals due	Q3 2022
Preferred Bidder to Board	Q4 2022
First Notice to Proceed (NTP) issued	Q4 2022



Program Risks

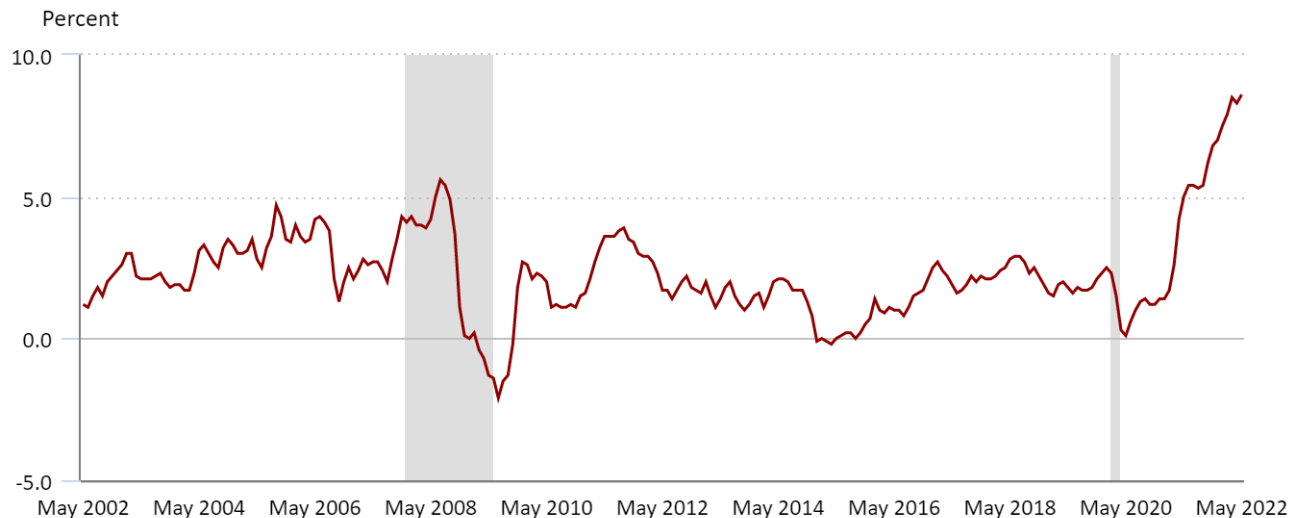


Program Risk

Inflation Escalation

- 40-year high, affecting the construction industry – May 2022 Consumer Price Index (CPI) is 8.6%
- Contractors raising concern about inflation rates as part of escalation
- Authority strategy is to hold on escalation rates, with a quarterly reconciliation based on actuals
- Authority paying 4.12% escalation and developing a composite index to compensate contractors if the rate goes above or below.

12-Month Percentage Change, CPI (All Items, Not Seasonally Adjusted)



Note: Shaded area represents recession, as determined by the National Bureau of Economic Research.
Source: US. Bureau of Labor Statistics.

Program Risk

Analysis of Funding for Merced to Bakersfield Segment

Cost (\$ in Billions)	Low	High	Comment
Total Capital Budget with Merced to Bakersfield (double track, incl Bookends, Phase I environmental, etc.)	22.5	23.9	2022 Business Plan pages 59 & 79
Unified Merced Station HSR Cost (ACE and Amtrak connections funded separately)	0.5	0.5	Estimate of HSR cost to extend to further north Merced station, station cost
Total Cost	23.0	24.4	
Revenue	Low	High	Comment
Current Funding with Cap and Trade as a Range (\$500M / yr to \$1.0B / yr)	21.2	25.2	2022 Business Plan page 47
New Federal Fund Target (federal grant target for Merc-Bakersfield)	4.8	4.8	2022 Business Plan page 55. Assumes 80/20 federal/state funding split
Total Funding if new federal grant target met	26.0	30.0	
Funding Sufficiency Analysis without new federal grants	-3.2	2.2	Funding shortfall of \$3.2B with low revenue and high cost. Funding surplus of \$2.2B with high revenue and low cost.
Funding Sufficiency Analysis with new federal grants	1.6	7.0	Funding surplus of \$1.6B with low revenue and high cost. Funding surplus of \$7.0B with high revenue and low cost.

Questions?



Headquarters

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