

Link Union Station

Detailed Construction Phasing Scenarios

June 2019



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1.0 Construction Phases 1 - 4 (Detailed Construction Scenarios)

Two detailed construction phasing plans were developed for the environmental impact evaluation because the proposed project with above-grade passenger concourse and new expanded passageway and the build alternative with an at-grade passenger concourse require different construction sequencing and durations, truck traffic, and equipment use.

Project Phases A and B are encompassed within Construction Phases 1 - 4 (both scenarios), but do not directly relate because the detailed construction phasing plans described below were prepared to support the traffic, air quality, and noise environmental impact evaluations and are based on a conservative estimate of typical construction activities based on concurrent construction of all major project features (i.e., construction of the new lead tracks, elevated rail yard, run-through tracks, and new passenger concourse together) within a general timeframe of approximately six years.

All phases were developed to provide adequate platform space and associated tracks to maintain rail operations for existing Gold Line and regional/intercity rail service, as well as safe and adequate passenger movement throughout the construction process. The underlying assumptions and approach to the construction phasing plans applicable to both construction scenarios are summarized below:

- The difference in timeframes to construct shared and dedicated tracks in the throat segment is relatively minor in terms of the overall project construction schedule. Lead tracks would be constructed in a similar fashion for both scenarios.
- No less than three track leads from the north, and eight platform tracks would be available at all times to maintain operational objectives during construction.
- Full closure of the rail yard is possible between midnight and 5 AM.
- The East Portal Building would provide continuous passenger access during construction.
- The construction duration is based on a 5-days-per-week, 10-hours-per-day schedule. Where permissible, nighttime construction would be implemented in certain locations
- Double birthing (two tracks utilizing one platform) would be maximized to the extent feasible.
- The at-grade passenger concourse requires a “top-down” construction method, and the above-grade passenger concourse with new expanded passageway requires a “bottom-up” construction method
- Shoring walls would be placed 10 feet from centerline of existing track
- Construction work zones areas would be contained to help manage the staging, distribution of materials, and personnel to specific areas

- Impacts to existing roadways and traffic signal operations would be minimized to the extent possible
- Ancillary roadway improvements (widening, restriping, curb/gutter, etc.) and drainage/water quality improvements would be constructed throughout all construction phases, as needed
- On average, project construction would affect up to 5 acres within each segment of the project footprint per day

The following discussion outlines the general construction activities that would occur within each segment of the project study area. Figure 1-1 through Figure 1-4 depict the four construction phases with the proposed project and above-grade passenger concourse with new expanded passageway, and Figure 2-1 through Figure 2-4 depict the four construction phases with the build alternative and at-grade passenger concourse.

1.1 Proposed Project with Above-Grade Passenger Concourse with New Expanded Passageway – Detailed Construction Scenario

Reconstruction of the throat, elevating the rail yard, and constructing new run-through tracks, concurrent with an above-grade passenger concourse with new expanded passageway would be completed in 22 steps that comprise 4 main construction phases (Phases I through IV). Generally, the construction methodology for the proposed project with an above-grade passenger concourse is the reverse of that for the build alternative with an at-grade passenger concourse (east to west and bottom to top). All construction activities would be conducted in a manner to minimize service disruptions to existing rail/transit service providers during construction.

1.1.1 Phase I Construction (Steps 1 – 6)

Major work elements in this phase include realignment of Commercial Street, lowering of the existing Commercial Street/Center Street intersection, construction of the East and West Plazas, and construction of the run-through track structures south of LAUS (Figure 1-1). Phase I construction activities planned within each of the main segments are summarized below:

- **Segment 1: Throat Segment** – Phase I includes removal of the southern portion of the lead tracks in the throat area, removal of the Garden Tracks, construction of a shoofly and crossovers to facilitate temporary at-grade leads to the rail yard, minor track work at CP Mission, and special track work.
- **Segment 2: Concourse Segment:**
 - **Rail Yard Area** – Phase I includes construction of new temporary leads and connections to existing platform tracks.
 - **Concourse Area** – Phase I includes construction of the East and West Plazas.

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- **Segment 3: Run-Through Segment** – Phase I includes roadway work to realign Commercial Street and lower the existing Commercial Street/Center Street intersection, construction of the US-101 viaduct as a combined structure, construction of an embankment to support run-through tracks south of Commercial Street, and construction of the Center Street viaduct.

1.1.2 Phase II Construction (Steps 7 – 12)

Major work elements in this phase include reconstruction of the throat (east to west), construction of the eastern portions of the Vignes Street and Cesar Chavez Avenue Bridges, construction of new permanent Platforms 7 through 5 (east to west), construction of the loop track and new run-through tracks, and construction of the new above-grade passenger concourse with new expanded passageway (Figure 1-2). Phase II construction activities planned within each of the main areas are summarized below.

- **Segment 1: Throat Segment** – Phase II includes removal of existing track, and reconstruction of the eastern portion of the throat area with new lead tracks on an embankment from the southern end of CP Mission through CP Terminal to the rail yard. Phase II also includes special track work, rail signal and communication work, and construction of the easterly portions of the Vignes Street and Cesar Chavez Avenue Bridges.
- **Segment 2: Concourse Segment:**
 - **Rail Yard Area** – Phase II includes the removal of Platforms 7, 6, 5, and the southern portions of Platforms 4 through 2. As part of Phase II, Platforms 7, 6, and 5 would be reconstructed (east to west) with the corresponding vertical circulation elements connecting to the new passenger concourse above.
 - **Concourse Area** – Phase II includes major construction on the elements of the above-grade passenger concourse over the rail yard, the new expanded passageway below the rail yard, and the associated vertical circulation elements. As platforms are reconstructed east to west, the existing ramps from the pedestrian passageway to the platforms would be closed to the public and reopened for use as the next platform is being reconstructed. Passenger access between new platforms and the newly constructed above-grade passenger concourse and new expanded passageway would be via the new vertical circulation elements.
- **Segment 3: Run-Through Segment** – Phase II includes continuation of the run-through track structure construction south of LAUS. East of Center Street, Phase II also includes replacement of existing tracks at the BNSF West Bank Yard at a lower elevation, track work along the existing two-track main line, and rail signal and communication work to support regional/intercity rail infrastructure requirements.

1.1.3 Phase III Construction (Steps 13 – 17)

Major work elements in this phase include continuation of reconstruction of the throat (east to west), construction of the western portions of the Vignes Street and Cesar Chavez Avenue Bridges, construction of new permanent Platform 4, and construction of run-through tracks south of LAUS (Figure 1-3). Phase III construction activities planned within each of the main areas are summarized below:

- **Segment 1: Throat Segment** – Phase III includes removal of existing track and reconstruction of the center portion of the throat area with new lead tracks on an embankment. Phase III also includes special track work, rail signal and communication work, and construction of the center portion of the Cesar Chavez Avenue Bridge.
- **Segment 2: Concourse Segment:**
 - **Rail Yard Area** – Phase III includes removal and replacement of Platform 4 and removal of Platforms 3 and 2. Phase III also includes associated track work and rail signal and communication work.
 - **Concourse Area** – Phase III includes continuation of construction of the above-grade passenger concourse that would extend above Platform 4.
- **Segment 3: Run-Through Segment** – Phase III includes continuation of construction of new run-through tracks on previously constructed structures.

1.1.4 Phase IV Construction (Steps 18 – 22)

Major work elements in Phase IV are associated with completing reconstruction of the throat (east to west) to facilitate construction of the final three platforms in the elevated rail yard (Platforms 3 through 1) and the new above-grade passenger concourse with new expanded passageway. Phase IV also includes construction and removal of a temporary track shoofly for Gold Line to facilitate construction of the final portion of the Cesar Chavez Avenue Bridge while keeping the Gold Line in operation (Figure 1-4). Phase IV also includes constructing the westerly portion of the Vignes Street Bridge. Phase IV construction activities planned within each of the main areas are summarized below:

- **Segment 1: Throat Segment** – Phase IV includes construction of new lead tracks, a retaining wall/sound wall, the westerly portion of Vignes Street Bridge and Cesar Chavez Avenue Bridge, new embankment, track work, tie-ins to existing tracks, and rail signal and communication work.
- **Segment 2: Concourse Segment:**
 - **Rail Yard Area** – Phase IV includes construction and removal of a track shoofly for the Gold Line and construction of permanent Platforms 3, 2, and 1 (including extension of Platform 1). Phase IV also includes associated track work and retaining walls.
 - **Concourse Area** – Phase IV includes construction of the remaining portion of the new passenger concourse with new expanded passageway and completion of the West Plaza.

- **Segment 3: Run-Through Segment** – Phase IV includes final connections and track work, as new platforms and run-through tracks are brought online.

1.2 Build Alternative with At-Grade Passenger Concourse – Detailed Construction Scenario

Reconstruction of the throat, elevating the rail yard, and constructing new run-through tracks, concurrent with an at-grade passenger concourse would be completed in 17 steps that comprise 4 main construction phases (Phases I through IV). All construction activities would be conducted in a manner to minimize service disruptions to existing rail/transit service providers during construction.

1.2.1 Phase I Construction (Steps 1 – 4)

Major work elements in this phase include construction of a temporary passenger gantry, removal of existing tracks and platforms and construction of temporary platforms, realignment of Commercial Street, lowering of the existing Commercial Street/Center Street intersection, and construction of the run-through structures south of LAUS (Figure 2-1). Phase I construction activities planned within each of the main areas are summarized below:

- **Segment 1: Throat Segment** – Phase I includes reconstruction of the northern portion of the lead tracks in the throat area from CP Chavez to CP Mission, construction of a retaining wall/noise wall to support new lead tracks, removal of the Garden Tracks, special track work, and rail signal and communication work.
- **Segment 2: Concourse Segment:**
 - o **Rail Yard Area** – Phase I includes construction of a temporary platform (Platform 8) and a temporary overhead passenger gantry (pedestrian bridge) with stairways, escalators, and/or elevators. The temporary passenger gantry would be constructed above the rail yard to facilitate ongoing transit service with adequate passenger movement and safe ingress/egress areas during construction of the elevated rail yard below. Phase I also includes removal of the southernmost portion of Platforms 7 and 6, removal of Platforms 5 and 4, construction of temporary Platforms 5 and 4, removal of Platforms 3 and 2, along with the removal of the Garden Tracks, and associated track work.
 - o **Concourse Area** – Phase I includes closure of passenger and vehicular access in the existing concourse and pedestrian passageway. Throughout construction, the existing pedestrian ingress/egress areas would be redirected to new access points at the East Portal Building and the parking lot west of Gold Line Platform 1, which would connect via the temporary passenger gantry. Construction of the East and West Plazas would commence during this phase.

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- **Segment 3: Run-Through Segment** – Phase I includes roadway work to realign Commercial Street and lower the existing Commercial Street/Center Street intersection, construction of the US-101 viaduct as a combined structure, construction of an embankment south of the newly realigned Commercial Street, and construction of the Center Street viaduct. East of Center Street, Phase I also includes replacement of existing tracks at the BNSF West Bank Yard at a lower elevation, construction of embankments/viaducts leading to Keller Yard and the BNSF West Bank Yard, track work in the vicinity of the existing two-track mainline, and rail signal and communication work to support regional/intercity rail infrastructure requirements.

1.2.2 Phase II Construction (Steps 5 – 7)

Major work elements in this phase are associated with reconstruction of the Gold Line Platform 1 (Figure 2-2). Phase II construction activities planned within each of the main segments are summarized below.

- **Segment 1: Throat Segment** – Phase II includes continuation of special track work, removal and reconstruction of new lead tracks on an embankment, and rail signal and communication work in the throat area. The first phase of construction on the Cesar Chavez Avenue Bridge would also commence during Phase II.
- **Segment 2: Concourse Segment:**
 - **Rail Yard Area** – Phase II includes construction of a temporary shoofly and platform to maintain Gold Line operations from temporary Platform 3. This phase also includes the removal and reconstruction of the existing Gold Line Platform 1 and associated track work including two new universal crossovers north and south of the existing platform. After construction of the new Gold Line Platform 1, the temporary shoofly and temporary Platform 3 would be removed.
 - **Concourse Area** – Phase II includes continuation of the East and West Plaza construction. No other construction activities would occur within the concourse area as part of Phase II. The existing concourse and pedestrian passageway under the rail yard would be closed to the public during Phase II. The temporary passenger gantry would facilitate ongoing transit service with adequate passenger movement and safe ingress/egress areas.
- **Segment 3: Run-Through Segment** – Phase II includes continuation of construction of the run-through track structures south of LAUS.

1.2.3 Phase III Construction (Steps 8 – 12)

Major work elements in this phase include reconstruction of the throat (west to east), construction of the western portions of the Vignes Street and Cesar Chavez Avenue Bridges, construction of new permanent Platforms 2 through 5 (west to east), construction of the loop track and new run-through tracks, and construction of the new passenger concourse (Figure 2-3). Phase III construction activities planned within each of the main areas are summarized below:

- **Segment 1: Throat Segment** – Phase III includes reconstruction of the southern portion of the throat area with new lead tracks on an embankment. Phase II also includes special track work, rail signal and communication work, and construction of the westerly portions of the Vignes Street and Cesar Chavez Avenue Bridges.
- **Segment 2: Concourse Segment:**
 - **Rail Yard Area** – Phase III includes construction of new Platforms 2 and 3, removal of temporary Platforms 4 and 5, construction of Platform 4, removal of Platform 6, and construction of Platform 5. All associated track work in the rail yard would also be reconstructed west to east concurrent with construction of the new platforms, usually two tracks at a time. Rail signal and communication work would also be completed in this phase.
 - **Concourse Area** – The existing concourse and pedestrian passageway under the rail yard would be closed to the public during Phase III. The temporary passenger gantry would facilitate ongoing transit service with adequate passenger movement and safe ingress/egress areas. Excavation, slabs, utilities, and interior work on the concourse would begin, and construction on the East and West Plazas would continue.
- **Segment 3: Run-Through Segment** – Phase III includes continuation of the loop track and run-through track construction. Track work at the BNSF West Bank Yard and along the mainline would also be conducted in this phase to support regional/intercity rail infrastructure requirements.

1.2.4 Phase IV Construction (Steps 13 – 17)

Major work elements in this phase include removal of Platform 7 and temporary Platform 8 to facilitate construction of the final two platforms in the elevated rail yard (Platforms 6 and 7) and construction of the at-grade passenger concourse (Figure 2-4). Phase IV construction activities planned within each of the main areas are summarized below.

- **Segment 1: Throat Segment** – Phase IV includes continuation of construction of the Vignes Street and Cesar Chavez Avenue Bridges, new embankment, track work, tie-ins to existing tracks, and rail signal and communication work.
- **Segment 2: Concourse Segment:**
 - **Rail Yard Area** – Phase IV includes removal of Platform 7 and temporary Platform 8 to facilitate construction of the final two platforms in the elevated rail yard (Platforms 6 and 7) and removal of the temporary passenger gantry.

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- *Concourse Area* – Phase IV includes completion of new foundations and walls, new amenities, and the new at-grade passenger concourse. Construction work on the East and West Plazas would also be completed during this phase.
- *Segment 3: Run-Through Segment* – Final connections and track work would be required during this phase.

Figure 1-1. Above-Grade Passenger Concourse with New Expanded Passageway Construction Scenario (Phase I Construction Steps 1-6)



LEGEND		A Minor Track Work	E Construction of East Plaza	I Commercial Street Realignment	M Division 20 Access Road
Structure Constructed in This Phase	Existing Platform	B Construction of a Shoofly and Crossovers	F Construction of West Plaza	J Commercial Street/Center Street Intersection Lowering	N Construction of Regional/Intercity Rail Embankments/Viaducts
Track Constructed in This Phase	Existing Track	C Removal of the Garden Tracks	G Construction of US-101 Viaduct (Combined Structure)	K Construction of the Center Street Viaduct	
Platform Removed in This Phase		D Construction of New Temporary Leads and Connections to Existing Platform Tracks	H Construction of Run-Through Track Embankment	L Construction of Loop Track Embankments/Viaducts Leading to Keller Yard	
Track Removed in This Phase					



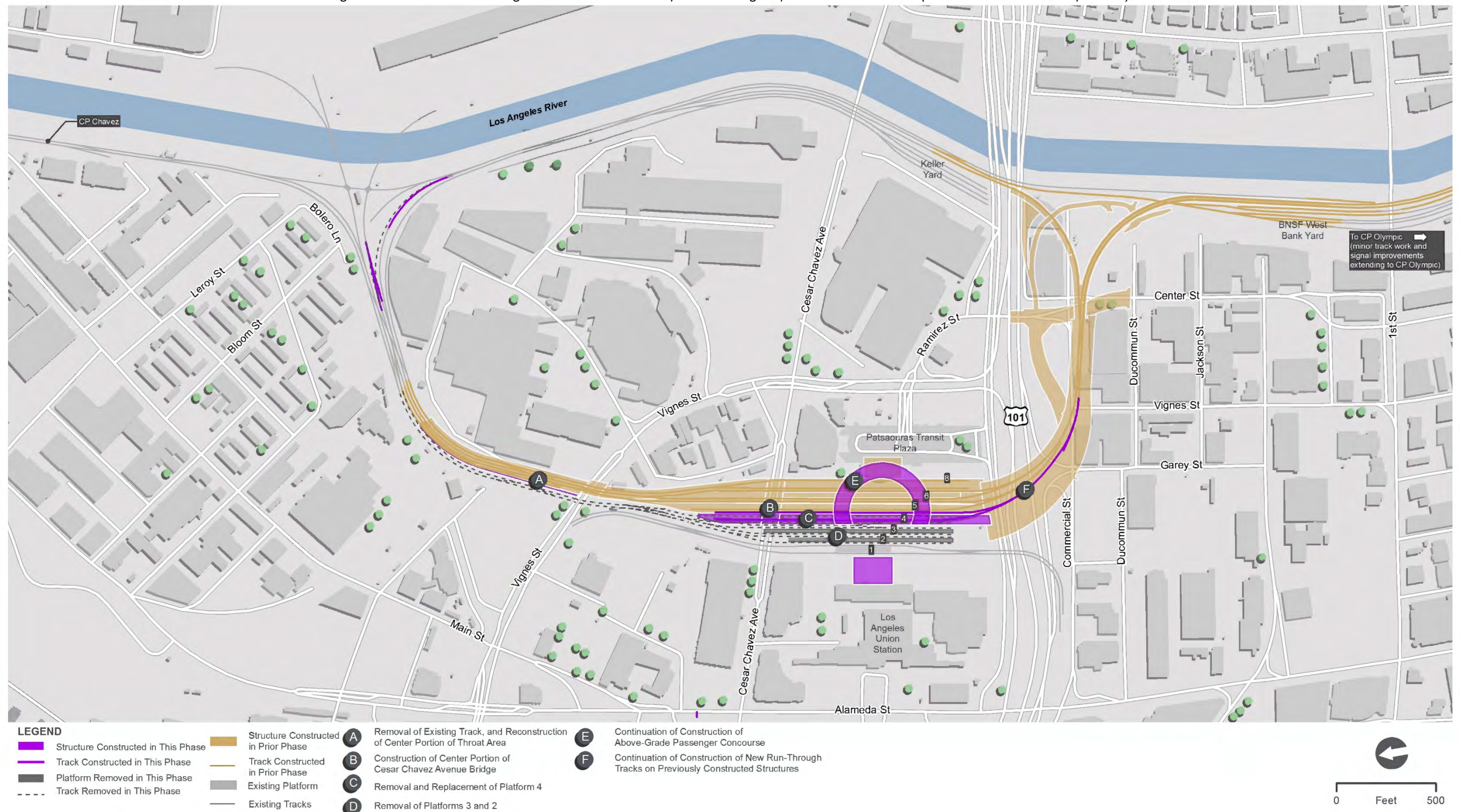
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Figure 1-2. Above-Grade Passenger Concourse with New Expanded Passageway Construction Scenario (Phase II Construction Steps 7-12)



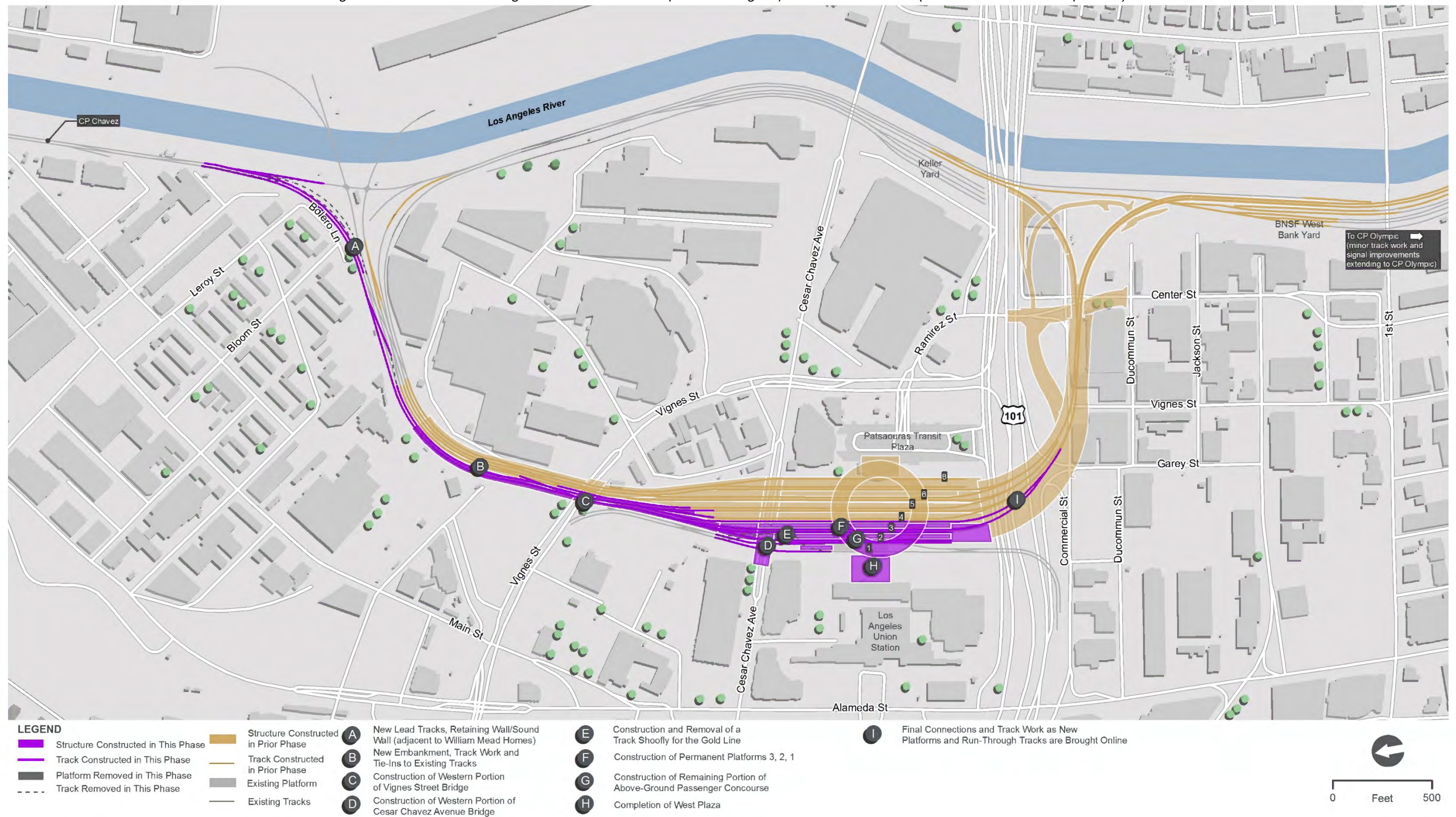
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Figure 1-3. Above-Grade Passenger Concourse with New Expanded Passageway Construction Scenario (Phase III Construction Steps 13-17)



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Figure 1-4. Above-Grade Passenger Concourse with New Expanded Passageway Construction Scenario (Phase IV Construction Steps 18-22)



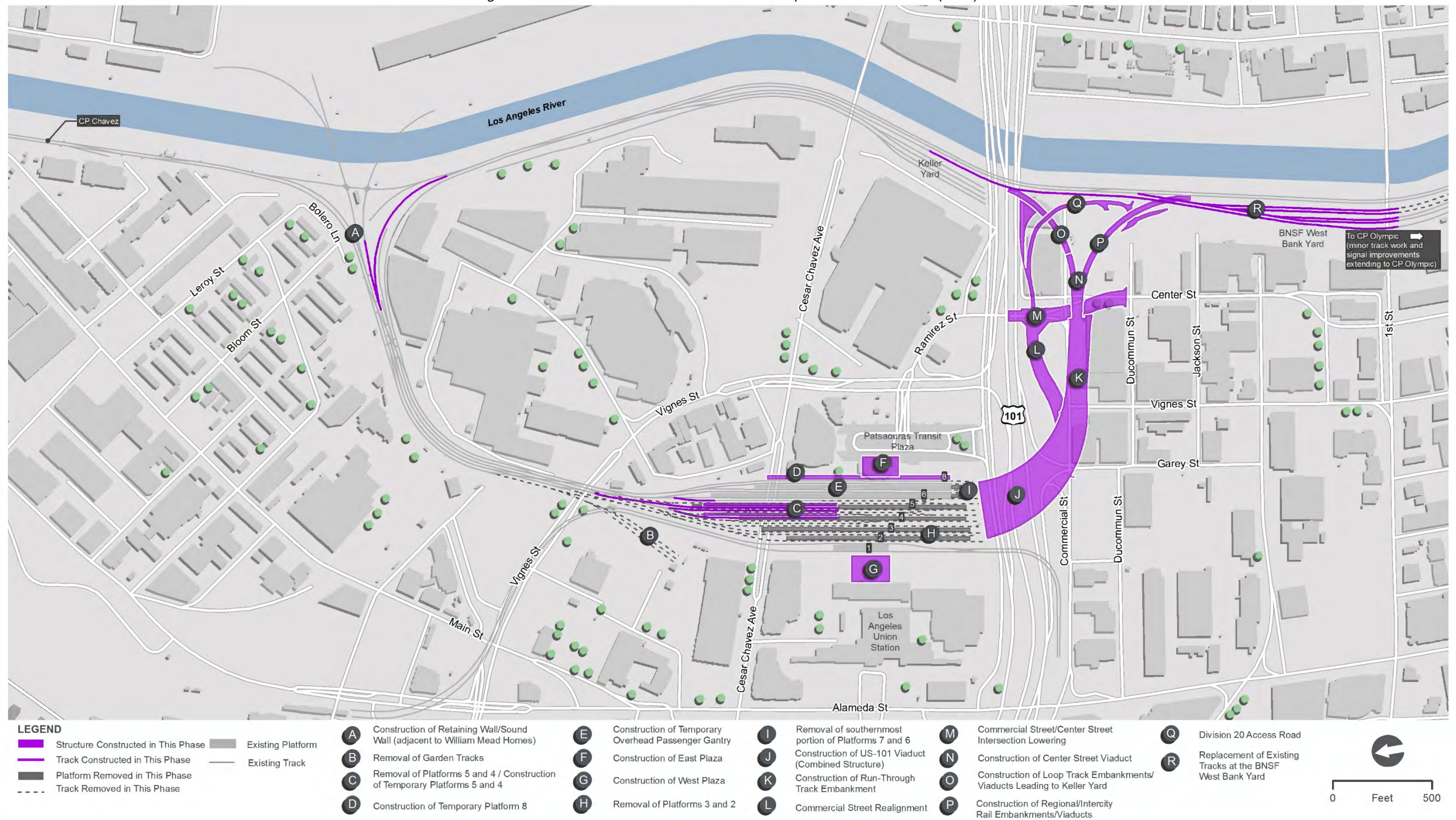
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2.0 Staging and Assembly Areas

Figure 2-5 depicts potential construction staging and assembly areas that may be utilized. Construction staging and assembly areas were selected by identifying agency-owned property (i.e., Metro, Caltrans, etc.) and/or vacant properties adjacent to the project with the most opportunity for efficiency and utility throughout construction.

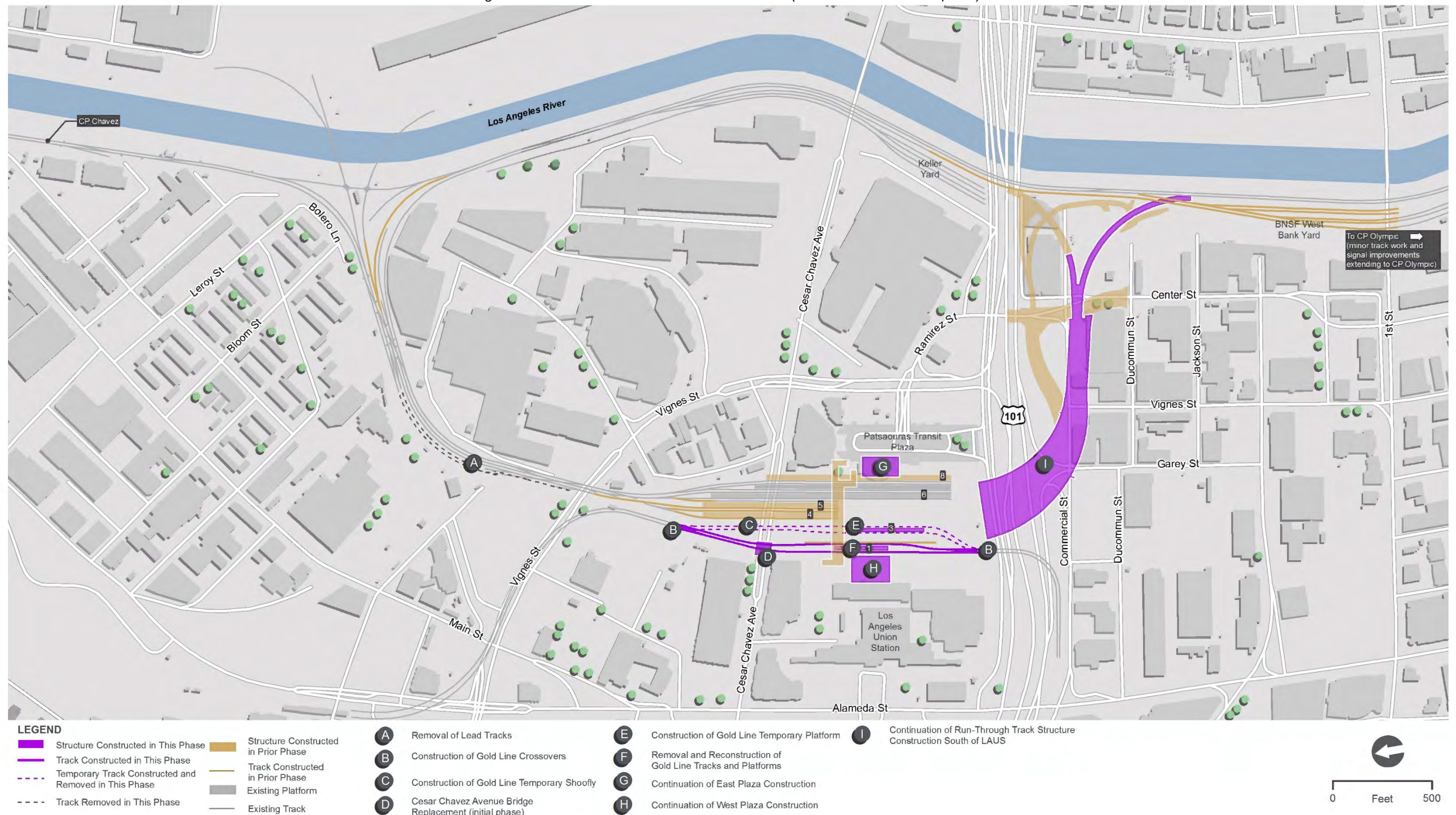
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Figure 2-1. At-Grade Concourse Construction Scenario (Phase I Construction Steps 1-4)



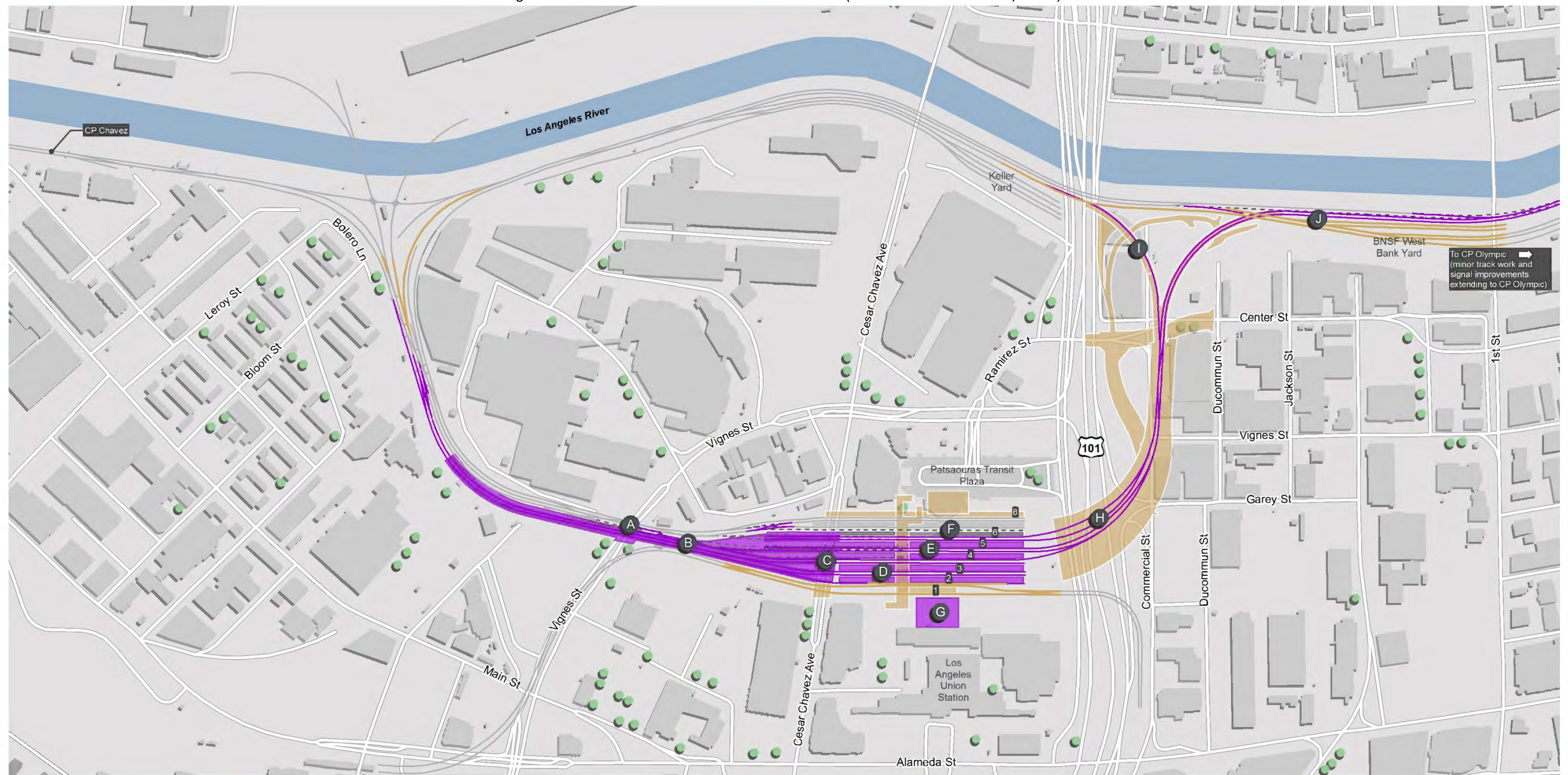
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Figure 2-2. At-Grade Concourse Construction Scenario (Phase II Construction Steps 5-7)



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Figure 2-3. At-Grade Concourse Construction Scenario (Phase III Construction Steps 8-12)

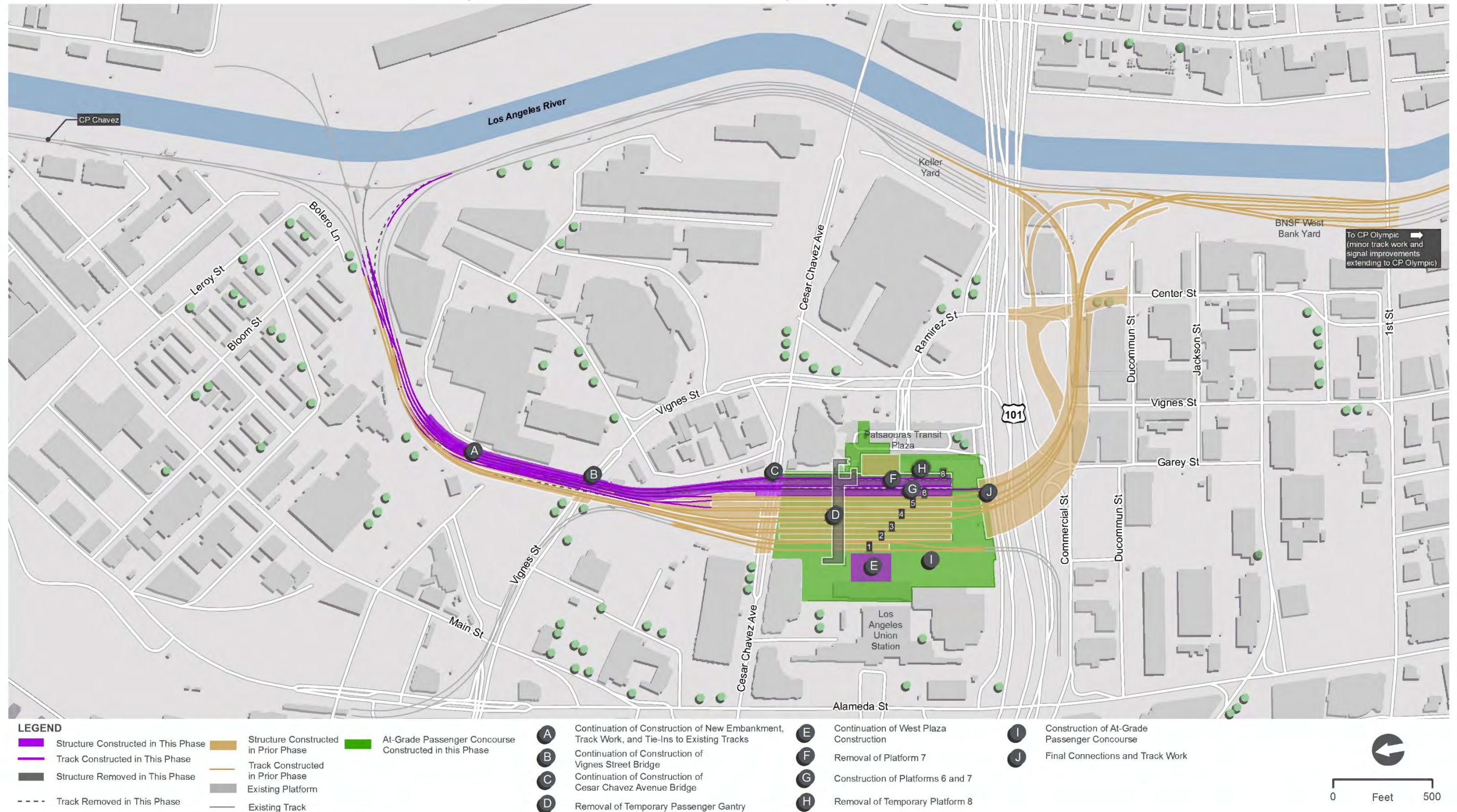


LEGEND		A	Construction of Western Portions of Vignes Street Bridge	E	Construction of Platforms 4 and 5	I	Construction of Loop Track
	Structure Constructed in This Phase		Structure Constructed in Prior Phase	F	Removal of Platform 6	J	Track Work at BNSF West Bank Yard and Main Line
	Track Constructed in This Phase		Track Constructed in Prior Phase	G	Continuation of West Plaza Construction		
	Platform Removed in This Phase		Existing Platform	H	Construction of Run-Through Tracks		
	Track Removed in This Phase		Existing Track				



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Figure 2-4. At-Grade Concourse Construction Scenario (Phase IV Construction Steps 13-17)



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Figure 2-5. Potential Staging Areas (Proposed Project or Build Alternatives)



LEGEND

- Maximum Extent of Physical Disturbance (Proposed Project and Build Alternative)
- Construction Staging/Assembly Area



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