

**PRELIMINARY  
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**The Los Angeles County Metropolitan Transportation  
Authority**

**REGIONAL LIGHT RAIL CONNECTOR  
STUDY SUMMARY**

**July 2004**

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## **REGIONAL LIGHT RAIL CONNECTOR** **SUMMARY**

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### **Introduction**

Metro currently operates two light rail lines that service the Central Business District (CBD) of Los Angeles, the Long Beach to Los Angeles Metro Blue Line and the Pasadena to Los Angeles Gold Line. Metro is in the first stages of constructing a Metro Gold Line extension into East Los Angeles and in the planning stages of a light rail system along Exposition Boulevard connecting the Central Business District (CBD) with the west Los Angeles communities. Metro rail lines mentioned above come within approximately two miles of each other in the CBD. Metro has previously studied the need to connect these separate lines within the CBD and has concluded connecting these lines would significantly increase the utilization of all rail lines (Blue Line Connection Preliminary Planning Study, 1993), and improve regional mobility.

The primary objective of this conceptual feasibility study is to develop a wide range of alternative alignments and engineering configuration, provide an evaluation of these alignments and configurations, refine the route alignments, propose station locations, and understand potential impacts to traffic patterns, rail operations and the urban form. The resulting engineering drawings are at a conceptual level. No exhaustive urban design was required in this phase of the feasibility review but considerable effort was done in demonstration of the urban fit of the various alternatives. No environmental clearance under Federal (NEPA) or State (CEQA) law is required in this phase of the feasibility review.

This document summarizes the technical activities completed, provides a conceptual engineering and technical feasibility analysis, and a comparative evaluation of each alternative.

### **Alternatives Development**

Through an intensive interactive planning effort with the consultant team, Metro staff, and LADOT staff an initial set of 27 concepts were developed that provided the connection between the Gold Line and the Blue Line. These 27 concepts were expanded to 33 conceptual alignments before a screening process was done. The 33 concepts were evaluated based on engineering feasibility, traffic impacts, rail operations, capital costs, downtown development support and urban form fit. Further refinement resulted in the development of 16 alternatives that represented the conditions of the 33 conceptual alignments.

Figure 1 shows the street coverages in the CBD that were utilized by the 16 alternatives. As shown in Figure 1, the major streets considered in the CBD included Flower Street, Hope Street, Figueroa Street, Olive Street, Main Street, Aliso Street, Temple Street, 1<sup>st</sup> Street, 2<sup>nd</sup> Street, 3<sup>rd</sup> Street, and Hewitt Street. Figures 2 through 17 show for each alternative the alignment, the connection points to the Blue Line and Gold Line, the number of light rail tracks, the vertical alignment components (at-grade, underground, elevated, and portal locations), the station locations by type (at-grade, underground, and elevated), cross-over locations for the light rail system, and the direct walking distance influences of each station (1/4<sup>th</sup> mile radius). Table 1 provides a summary description of each alternative that could be considered for future study and consideration by Metro.

### **Comparative Evaluation/Comparison of Each Alternative**

Table 2 provides a comparative evaluation of critical criteria for agencies and decision-makers to consider in further reducing the number of alternatives. Table 3 highlights the alternatives by each criterion which would be determined to be the possible best of the 16 alternatives. For example under travel times the shortest travel times between Union Station and 7<sup>th</sup>/Flower Station would be considered the best, etc. The lowest capital cost alternatives are alternatives 2, 3, 4, 6, and 7, but these alternatives also have some of the highest expected traffic impacts because of being primarily at-grade.

There are a variety of trade-offs depending on capital costs, travel time, traffic impacts, best urban fit, and construction considerations. More grade separations (underground and elevated components) yield higher initial capital costs and more construction issues, but have lower traffic impacts after it is constructed and in operation.

Decision-makers need to review the trade-offs between the alternatives and consider for further study (based on the area to be served) a smaller number of alternatives.

Additionally Table 4 is attached which provides additional information about every station area related to its features, potential right-of-way impact, site issues, and the activities within ¼ mile of the station. A summary of the detailed products is listed below.

### **The Study Products**

- Evaluation and Screening of 33 Alternatives (broad list) to 16 alternatives
- 11 x17 Color Maps showing the 16 Alternatives (Task 3 – Mapping and Layout of Alternatives)
- Plans and Profiles (electronic files are available on request) for the 16 Alternatives at 1"=200' horizontal scale (Task 3 – General Plans, Profiles, and Configurations and Right of Way Requirements)
- Typical Cross-Sections related to the Plans/Profiles and Station Concepts (Task 3 - General Plans, Profiles, and Configurations)
- Capital Cost Estimates for the 16 Alternatives (Task 3 – LACMTA with PB assistance)

- Major Utilities Tech Memo (Task 4 – Tech Memo)
- Major Utilities Maps for all the Downtown streets affected by the 16 Alternatives (Task 4 – Composite Maps for Major Utilities)
- Geotechnical/Geologic Assessment Tech Memo for the 16 Alternatives (Task 5 – Literature and Existing Data plus Evaluation Tech Memo)
- Conceptual Station Site Plans (Task 6 – Conceptual Station Location Plans)
- Existing Details and Pictures of Possible Station Area Locations (Task 6 – Supplemental Information to the Conceptual Station Location Plans)
- Pedestrian Access Study Tech Memo and relationship to the 16 Alternatives including discussion of potential right of way impacts (Task 6 – Pedestrian Access Study, Tech Memo)
- Traffic Analysis Tech Memo related to the 16 Alternatives (Task 7 – Tech Memo; Traffic/Circulation Impacts, Alternative Traffic Circulation Patterns, and Conceptual Recommendations)
- Travel Times related to the 16 Alternatives (Task 8 – Connecting Rail considerations)
- Urban Integration Analysis Tech Memo (Task 9 – Consequences of Alignments on Urban Form, Tech Memo)



**Table 1**  
**Description of Alternatives**  
**Regional Light Rail Connector**

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Alternative No.	Description	Stations
1	Double Track Flower/2 <sup>nd</sup> Sts, Underground Station on Flower (5 <sup>th</sup> -6 <sup>th</sup> ), 1 <sup>st</sup> /Hewitt Connection, Total Length 1.85 miles, At-Grade 1.43 miles	1. Underground Flower St. Station (5 <sup>th</sup> -6 <sup>th</sup> ) 2. At-grade 2 <sup>nd</sup> St. Station (Broadway-Spring) 3. At-grade 2 <sup>nd</sup> St. Station (Los Angeles – San Pedro)
2	Double Track Flower/2 <sup>nd</sup> Sts, At-grade Station on Flower (3 <sup>rd</sup> -4 <sup>th</sup> ), 1 <sup>st</sup> /Hewitt Connection, Total Length 1.85 miles, At-Grade 1.55 miles	1. At-grade Flower St. Station (3 <sup>rd</sup> -4 <sup>th</sup> ) 2. At-grade 2 <sup>nd</sup> St. Station (Broadway-Spring) 3. At-grade 2 <sup>nd</sup> St. Station (Los Angeles-San Pedro)
3	Double Track Flower/2 <sup>nd</sup> Sts, At-grade Station on Flower (4 <sup>th</sup> -5 <sup>th</sup> ), 1 <sup>st</sup> /Hewitt Connection, Total Length 1.85 miles, At-Grade 1.65 miles	1. At-grade Flower St. Station (4 <sup>th</sup> -5 <sup>th</sup> ) 2. At-grade 2 <sup>nd</sup> St. Station (Broadway-Spring) 3. At-grade 2 <sup>nd</sup> St. Station (Los Angeles-San Pedro)
4	Double Track Flower/2 <sup>nd</sup> Sts with Punch into 2 <sup>nd</sup> St tunnel, At-grade Station on Flower (3 <sup>rd</sup> -4 <sup>th</sup> ), 1 <sup>st</sup> /Hewitt Connection, Total Length 1.65 miles, At-Grade 1.24 miles	1. At-grade Flower St. Station (3 <sup>rd</sup> -4 <sup>th</sup> ) 2. At-grade 2 <sup>nd</sup> St. Station (Broadway-Spring) 3. At-grade 2 <sup>nd</sup> St. Station (Los Angeles-San Pedro)
5	Double Track Flower/2 <sup>nd</sup> and 3 <sup>rd</sup> Sts. Single Track, Underground Station on Flower (5 <sup>th</sup> -6 <sup>th</sup> ), 1 <sup>st</sup> /Hewitt Connection, Total Length 3.30 miles, At-Grade 2.88 miles	1. Underground Flower Station (5 <sup>th</sup> -6 <sup>th</sup> ) 2. At-grade 2 <sup>nd</sup> St. Station (Broadway Spring) single track 3. At-grade 2 <sup>nd</sup> St. Station (Broadway Spring) single track 4. At-grade 3 <sup>rd</sup> St. Station (Spring-Main) single track 5. At-grade 3 <sup>rd</sup> St. Station (San Pedro-Central) single track

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Alternative No.	Description	Stations
6	Double Track Flower/2 <sup>nd</sup> and 3 <sup>rd</sup> Sts. Single Track, At-grade Station on Flower (3 <sup>rd</sup> -4 <sup>th</sup> ), 1 <sup>st</sup> /Hewitt Connection, Total Length 3.32 miles, At-Grade 3.02 miles	<ol style="list-style-type: none"> <li>1. At-grade Flower St. Station (3<sup>rd</sup>-4<sup>th</sup>)</li> <li>2. At-grade 2<sup>nd</sup> St. Station (Broadway Spring) single track</li> <li>3. At-grade 2<sup>nd</sup> St. Station (Broadway Spring) single track</li> <li>4. At-grade 3<sup>rd</sup> St. Station (Spring-Main) single track</li> <li>5. At-grade 3<sup>rd</sup> St. Station (San Pedro-Central) single track</li> </ol>
7	Double Track Flower/2 <sup>nd</sup> and 3 <sup>rd</sup> Sts. Single Track, At-grade Station on Flower (4 <sup>th</sup> -5 <sup>th</sup> ), 1 <sup>st</sup> /Hewitt Connection, Total Length 3.32 miles, At-Grade 3.12 miles	<ol style="list-style-type: none"> <li>1. At-grade Flower St. Station (4<sup>th</sup>-5<sup>th</sup>)</li> <li>2. At-grade 2<sup>nd</sup> St. Station (Broadway Spring) single track</li> <li>3. At-grade 2<sup>nd</sup> St. Station (Broadway Spring) single track</li> <li>4. At-grade 3<sup>rd</sup> St. Station (Spring-Main) single track</li> <li>5. At-grade 3<sup>rd</sup> St. Station (San Pedro-Central) single track</li> </ol>
8	Double Track Flower/General TK/Olive/1 <sup>st</sup> Sts., Underground Station on Flower (5 <sup>th</sup> -6 <sup>th</sup> ), 1 <sup>st</sup> /Alameda Connection, Total Length 1.48 miles, At-Grade 0.40 miles	<ol style="list-style-type: none"> <li>1. Underground Flower Station (5<sup>th</sup>-6<sup>th</sup>)</li> <li>2. At-grade GTK Station</li> <li>3. Aerial off-street City Hall/1<sup>st</sup> St. (Spring-Main)</li> </ol>
9	Double Track Flower/Hope/Temple (elevated parts) Sts., Underground Station on Flower (5 <sup>th</sup> -6 <sup>th</sup> ), Temple/Alameda Connection, Total Length 1.61 miles, At-Grade 0.60 miles	<ol style="list-style-type: none"> <li>1. Underground Flower Station (5<sup>th</sup>-6<sup>th</sup>)</li> <li>2. At-grade Hope St. Station (1<sup>st</sup>-Temple)</li> <li>3. Aerial Temple St. Station (Main-Los Angeles)</li> </ol>

**Table 1**  
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Alternative No.	Description	Stations
10	Double Track Flower/Hope/Temple (at-grade) Sts., Underground Station on Flower (5 <sup>th</sup> -6 <sup>th</sup> ), Temple/Alameda Connection, Total Length 1.60 miles, At- Grade 0.76 miles	1. Underground Flower Station (5 <sup>th</sup> -6 <sup>th</sup> ) 2. At-grade Hope St. Station (1 <sup>st</sup> -Temple) 3. At-grade Temple St. Station (Los Angeles-Judge John Aiso)
11	Double Track Flower/3 <sup>rd</sup> /Figueroa/Temple Sts. (at grade), Underground Station on Flower (5 <sup>th</sup> -6 <sup>th</sup> ), Temple/Alameda Connection, Total Length 1.75 miles, At- Grade 1.13 miles	1. Underground Flower St. Station (5 <sup>th</sup> -6 <sup>th</sup> ) 2. At-grade (partial) off-street station at DWP site/Temple (Figueroa-Hope) 3. At-grade Temple St. Station (Los Angeles-Judge John Aiso) (
12	Double Track Flower/2 <sup>nd</sup> /Main/Temple Sts. with Punch into 2 <sup>nd</sup> St tunnel and station south of Disney Hall, Underground Station on Flower (5 <sup>th</sup> -6 <sup>th</sup> ), Temple/Alameda Connection, Total Length 1.50 miles, At- Grade 0.90 miles	1. Underground Flower St. Station (5 <sup>th</sup> -6 <sup>th</sup> ) 2. Underground Disney Hall Station at 2 <sup>nd</sup> St. tunnel "punch" 3. At-grade off-street station at Old Caltrans site
13	Double Track Flower/2 <sup>nd</sup> /Main/Aliso Sts. with Punch into 2 <sup>nd</sup> St tunnel and station south of Disney Hall, Underground Station on Flower (5 <sup>th</sup> -6 <sup>th</sup> ), Aliso/Alameda Connection, Total Length 1.65 miles, At- Grade 0.68 miles	1. Underground Flower St. Station (5 <sup>th</sup> -6 <sup>th</sup> ) 2. Underground Disney Hall Station at 2 <sup>nd</sup> St. tunnel "punch" 3. At-grade off-street station at Old Caltrans site 4. Aerial Main St. Station (Temple-Aliso)
14	Double Track Flower/2 <sup>nd</sup> /Main/Temple Sts. with Punch into 2 <sup>nd</sup> St tunnel and station south of Disney Hall, At-grade Station on Flower (4 <sup>th</sup> -5 <sup>th</sup> ), Temple/Alameda Connection, Total Length 1.52 miles, At- Grade 1.14 miles	1. At-grade Flower St. Station (4 <sup>th</sup> -5 <sup>th</sup> ) 2. Underground Disney Hall Station at 2 <sup>nd</sup> St. tunnel "punch" 3. At-grade off-street station at Old Caltrans site

**Table 1**  
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Alternative No.	Description	Stations
15	Double Track Flower/2 <sup>nd</sup> /Main/Aliso Sts. with Punch into 2 <sup>nd</sup> St tunnel and station south of Disney Hall, At-grade Station on Flower (4 <sup>th</sup> -5 <sup>th</sup> ), Aliso/Alameda Connection, Total Length 1.60 miles, At-Grade 0.68 miles	<ol style="list-style-type: none"> <li>1. At-grade Flower St. Station (4<sup>th</sup>-5<sup>th</sup>)</li> <li>2. Underground Disney Hall Station at 2<sup>nd</sup> St. tunnel "punch"</li> <li>3. At-grade off-street station at Old Caltrans site</li> <li>4. Aerial Main St. Station (Temple-Aliso)</li> </ol>
16	Double Track Flower (elevated to Gen TK)/2 <sup>nd</sup> /Main/Aliso Sts. with At-grade Station at Hope/Grand, Underground Station on Flower (5 <sup>th</sup> -6 <sup>th</sup> ), Aliso/Alameda Connection, Total Length 1.65 miles, At-Grade 0.41 miles	<ol style="list-style-type: none"> <li>1. Underground Flower St. Station (5<sup>th</sup>-6<sup>th</sup>)</li> <li>2. At-grade Disney Hall Station</li> <li>3. At-grade Main St. Station (1<sup>st</sup>-Temple)</li> <li>4.* Optional Aerial station at future Federal Court site (2<sup>nd</sup> St. at Hill St.</li> </ol>

**Table 2**  
**Regional Light Rail Connector**  
**Comparative Evaluation of Critical Criteria**

Alt.	# of Stations	Length, miles				% At-Grade	Capital Cost, Millions 2004 \$	Cost per Mile, \$ Mills.	Travel Time, Union Station to 7 <sup>th</sup> /Flower, minutes	Number of Potentially Impacted Intersections	Number of Intersections with E or F Level of Service	Total Number of Lanes Reduced (cumulative for all streets)	Urban Fit Potential	Construction Issues		
		Under-ground, miles	At-Grade, miles	Elevated, miles	Total, miles									Geologic / Geotech, (Lower is best)	% of Align. Under-ground	Number of Under-ground and Elevated Stations
1	3	0.42	1.43	0.00	1.85	77%	\$183	\$99	16	14	1	26	Low	2	23%	1
2	3	0.3	1.55	0.00	1.85	84%	\$117	\$63	16	15	1	29	Low	1	16%	0
3	3	0.2	1.65	0.00	1.85	89%	\$107	\$58	16	16	1	29	Low	0	11%	0
4	3	0.41	1.24	0.00	1.65	75%	\$116	\$70	13	13	1	27	Low	2	25%	0
5	5	0.42	2.88	0.00	3.3	87%	\$205	\$62	15	27	2	24	Low	2	13%	1
6	5	0.3	3.02	0.00	3.32	91%	\$140	\$42	15	28	2	27	Med-Low	1	9%	0
7	5	0.2	3.12	0.00	3.32	94%	\$130	\$39	15	29	2	27	Low	0	6%	0
8	3	0.42	0.4	0.66	1.48	27%	\$177	\$119	12	5	1	12	Med	4	28%	2
9	3	0.42	0.6	0.59	1.61	37%	\$180	\$112	11	6	0	8	Med	4	26%	2
10	3	0.42	0.76	0.42	1.6	48%	\$172	\$108	11	9	0	16	High	3	26%	1
11	3	0.42	1.13	0.20	1.75	65%	\$180	\$103	11	13	0	22	Med	2	24%	2
12	3	0.6	0.9	0.00	1.5	60%	\$236	\$57	11	9	2	14	High	2	40%	2
13	3	0.6	0.68	0.37	1.65	41%	\$249	\$151	12	7	2	22	High	3	36%	2
14	3	0.38	1.14	0.00	1.52	75%	\$162	\$106	11	11	2	15	High	1	25%	1
15	4	0.38	0.68	0.54	1.6	42%	\$196	\$123	12	7	2	13	High	3	24%	2
16	3	0.42	0.41	0.82	1.65	25%	\$180	\$109	13	3	1	4	High	4	25%	1

**Table 3**  
**Regional Light Rail Connector**  
**Comparative Evaluation of Critical Criteria**

**Highlighted Criteria**

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Alt.	# of Stations	Length, miles				% At-Grade	Capital Cost, Millions 2004 \$	Cost per Mile, \$ Mills.	Travel Time, Union Station to 7 <sup>th</sup> /Flower, minutes	Number of Potentially Impacted Intersections	Number of Intersections with E or F Level of Service	Total Number of Lanes Reduced (cumulative for all streets)	Urban Fit Potential	Construction Issues		
		Under-ground, miles	At-Grade, miles	Elevated, miles	Total, miles									Geologic / Geotech, (Lower is best)	% of Align. Under- ground	Number of Under- ground and Elevated Stations
1	3	0.42	1.43	0.00	1.85	77%	\$183	\$99	16	14	1	26	Low	2	23%	1
2	3	0.3	1.55	0.00	1.85	84%	\$117	\$63	16	15	1	29	Low	1	16%	0
3	3	0.2	1.65	0.00	1.85	89%	\$107	\$58	16	16	1	29	Low	0	11%	0
4	3	0.41	1.24	0.00	1.65	75%	\$116	\$70	13	13	1	27	Low	2	25%	0
5	5	0.42	2.88	0.00	3.3	87%	\$205	\$62	15	27	2	24	Low	2	13%	1
6	5	0.3	3.02	0.00	3.32	91%	\$140	\$42	15	28	2	27	Med-Low	1	9%	0
7	5	0.2	3.12	0.00	3.32	94%	\$130	\$39	15	29	2	27	Low	0	6%	0
8	3	0.42	0.4	0.66	1.48	27%	\$177	\$119	12	5	1	12	Med	4	28%	2
9	3	0.42	0.6	0.59	1.61	37%	\$180	\$112	11	6	0	8	Med	4	26%	2
10	3	0.42	0.76	0.42	1.6	48%	\$172	\$108	11	9	0	16	High	3	26%	1
11	3	0.42	1.13	0.20	1.75	65%	\$180	\$103	11	13	0	22	Med	2	24%	2
12	3	0.6	0.9	0.00	1.5	60%	\$236	\$57	11	9	2	14	High	2	40%	2
13	3	0.6	0.68	0.37	1.65	41%	\$249	\$151	12	7	2	22	High	3	36%	2
14	3	0.38	1.14	0.00	1.52	75%	\$162	\$106	11	11	2	15	High	1	25%	1
15	4	0.38	0.68	0.54	1.6	42%	\$196	\$123	12	7	2	13	High	3	24%	2
16	3	0.42	0.41	0.82	1.65	25%	\$180	\$109	13	3	1	4	High	4	25%	1

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**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
Flower St. – Underground between 5 <sup>th</sup> and 6 <sup>th</sup> Street  (see structural plans and sections)	1,5,8,9,10, 11,12,13,16	<ul style="list-style-type: none"> <li>• Double track underground station</li> <li>• Assume 100 ft additional at south end of the platform and 50 ft for ancillary rooms</li> <li>• 14-ft wide side platforms at 36 feet below existing grade.</li> <li>• Station entrance off Arco Plaza could be combined with existing escalators on the west side of Flower. Level "A" of Arco Plaza retail is close to the elevation of the platform and a joint development connection could possibly be made between them.</li> <li>• at-grade elevators on both sides of the street will be required for access to the platforms</li> <li>• Escalators could be added in front of Library at the south east corner of Flower</li> </ul>	<ul style="list-style-type: none"> <li>• Underground station structure is within the existing 100 ft. street right-of-way.</li> <li>• Additional right-of-way will be required for vertical circulation elements at Arco Plaza and Central Library</li> </ul>	<ul style="list-style-type: none"> <li>• Underground LRT structure will be under both 5<sup>th</sup> and 4<sup>th</sup> street; tracks will be at-grade just north of 4<sup>th</sup> street</li> <li>• Portal will be located between 3<sup>rd</sup> and 4<sup>th</sup> St. the full length of the block, leaving approximately 26 to 28 feet from the portal wall to the street curb.</li> <li>• Possible impacts to the BP Plaza parking entrance if Flower remains one-way for buses going north on 4<sup>th</sup> Street.</li> </ul>	<ul style="list-style-type: none"> <li>• 5<sup>th</sup> and 6<sup>th</sup> St and 4<sup>th</sup> St. between Flower and Figueroa Flower have grades that exceed 5%</li> <li>• Access to Bunker Hill from the Financial District requires use of vertical circulation elements or use of the existing pedway through private property. Library Tower Steps next to the US Bank Tower provides a connection to Hope Street via escalators but no public elevators</li> <li>• 5<sup>th</sup> Street from Grand to Olive has steep grades that exceed 5%</li> </ul>

**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
Flower St. – At-grade between 3 <sup>rd</sup> and 4 <sup>th</sup> Street	2,4,6	<ul style="list-style-type: none"> <li>• double track at-grade station</li> <li>• 16-ft wide center platform in Flower St.</li> <li>• Station entrances and TVM at both ends of the platform</li> <li>• nearest signalized crosswalk and access to the platform from 4<sup>th</sup> St. is over 220 feet away from crosswalk. An alternative location for the station entrance would be a new signalized crosswalk closer to the station platform as shown on the station site plan to minimize the pedestrian circulation in the middle of the street</li> </ul>	<ul style="list-style-type: none"> <li>• Station Platform and station entrances within the existing 100 ft. street right of way.</li> </ul>	<ul style="list-style-type: none"> <li>• The station platform will impact the existing BP parking structure access with the current one-way vehicular circulation southbound and the north bound bus-only lane north of 4<sup>th</sup> St.</li> </ul>	<ul style="list-style-type: none"> <li>• Sidewalk adjacent to BP Plaza on Flower is narrow, with a clear width of only 5 feet</li> <li>• Flower Street north of 3<sup>rd</sup> Street has steep grades that exceed 5%</li> <li>• At the Bonaventure loading areas, there are potential conflicts between vehicles and pedestrians walking to a station entrance at 4th St. on the west side of Flower.</li> <li>• Creating pedestrian-oriented activity and storefronts along WTC and BP building frontage would improve natural surveillance and sense security for pedestrians on the platforms and along sidewalks in the station area.</li> </ul>



**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
Flower St. – At-grade Station between 4 <sup>th</sup> and 5 <sup>th</sup> St.	3, 7, 14, 15	<ul style="list-style-type: none"> <li>double track at-grade station</li> <li>16-ft wide center platform in Flower St.</li> <li>Station entrances and TVM at both ends of the platform.</li> <li>access to platform via existing signalized crosswalk</li> </ul>	<ul style="list-style-type: none"> <li>Station platform and station entrances within the existing 100 ft. street right of way.</li> </ul>	<ul style="list-style-type: none"> <li>The station portal is located between 5<sup>th</sup> and 6<sup>th</sup> in front of the Central Library with the track at-grade just before the 5<sup>th</sup> street crosswalk.</li> <li>Possible operator sight line restrictions and pedestrian safety issues at 5<sup>th</sup> street crosswalk</li> <li>potential LRT conflicts with rush-hour traffic queuing for freeway on-ramps</li> </ul>	<ul style="list-style-type: none"> <li>Good pedestrian connection to the Central Library</li> <li>5<sup>th</sup> Street is a major pedestrian intersection at Flower. The portal location may create pedestrian safety issues due to restricted sight-lines and heavy pedestrian activity at this crosswalk</li> <li>Sidewalks along Flower Street are too narrow in many places for adequate pedestrian circulation. In the area of the Bonaventure, there are wide driveways and the access to the main loading dock that may create vehicular and pedestrian conflicts.</li> </ul>
2 <sup>nd</sup> St. – At-grade station between Broadway and Spring	1, 2, 3, 4	<ul style="list-style-type: none"> <li>Double track at-grade station</li> <li>21-ft wide center platform in 2<sup>nd</sup> St.; station entrances on both ends of the platform</li> <li>TVM are off street on private property near entrances.</li> <li>Station entry points are between tracks from the existing signalized crosswalks at Broadway and Spring</li> </ul>	<ul style="list-style-type: none"> <li>Existing 63 ft street ROW</li> <li>Approximately 30 feet of additional ROW required from existing parking lot on south side of the street for station</li> </ul>	<ul style="list-style-type: none"> <li>Alignment constrained by narrow ROW and existing buildings (L.A. Times Mirror bldg, LA Law bldg.)</li> </ul>	<ul style="list-style-type: none"> <li>Metro Red Line Civic Center Station is approximately 2 blocks away</li> <li>Station serves the Civic Center district to the north and Grand Central Market, Bradbury Bldg and Reagan State bldg, former St. Vibiana Cathedral to the south</li> <li>Adjacent to proposed City Hall Park on Old Caltrans bldg site</li> <li>No access to Bunker Hill, Music Center, Disney Hall or MOCA within ¼ mile radius</li> </ul>

**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
2 <sup>nd</sup> St. At-grade between Los Angeles and San Pedro	1,2,3,4	<ul style="list-style-type: none"> <li>• double track at-grade station</li> <li>• 16-ft wide center platform in 2<sup>nd</sup> St.</li> <li>• TVM at both ends of the platform</li> <li>• Station access both from Los Angeles St and San Pedro via signalized crosswalks</li> </ul>	<ul style="list-style-type: none"> <li>• Existing 65 ft. street ROW</li> <li>• Approximately 25 ft additional ROW required from parking lot on south side of 2<sup>nd</sup> Street</li> </ul>		<ul style="list-style-type: none"> <li>• Future development site at parking lot</li> <li>• Adjacent to proposed St.Vibiana mixed used development and New Caltrans bldg</li> <li>• 2 blocks from City Hall, Parker Center</li> <li>• Pedestrian linkage to Onizuka St.</li> <li>• 1 block to Japanese Village</li> </ul>
2 <sup>nd</sup> St. – At-grade station between Broadway and Spring (Single Track )	5,6,7	<ul style="list-style-type: none"> <li>• Single track at-grade station</li> <li>• 12 ft. side platform integrated with sidewalk</li> <li>• TVM and access to platform is off street on private property.</li> <li>• Station entrances are located at signalized crosswalks</li> </ul>	<ul style="list-style-type: none"> <li>• existing 63 ft street ROW</li> <li>• Approximately 10 to 15 ft. additional ROW required on the south side of 2<sup>nd</sup> St. at the existing parking lot for station platform and public sidewalk.</li> </ul>	<ul style="list-style-type: none"> <li>• Station platform may impact loading dock and parking access for Otani Hotel and Weller Court</li> </ul>	<ul style="list-style-type: none"> <li>• See above site details</li> <li>• Single track stations should be linked visually by signage, landscaping, paving, street furnishings to improve wayfinding and ease of use for system patrons</li> </ul>

**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
2 <sup>nd</sup> St. At-grade Station between Los Angeles and San Pedro (Single track)	5,6,7	<ul style="list-style-type: none"> <li>• Single track at-grade station</li> <li>• 12 ft. side platform integrated with sidewalk</li> <li>• access to platform is off street on sidewalk</li> <li>• TVM on sidewalks at station entry</li> </ul>	<ul style="list-style-type: none"> <li>• Existing 65 ft. street ROW</li> <li>• Approximately 10 to 15 ft. additional ROW required on the south side of 2<sup>nd</sup> St. at the existing parking lot for station platform and public sidewalk</li> </ul>	<ul style="list-style-type: none"> <li>• Narrow street ROW restricts traffic lanes to single lane each direction</li> </ul>	<ul style="list-style-type: none"> <li>• Single track stations should be linked visually by signage, landscaping, paving, street furnishings to improve wayfinding and ease of use for system patrons</li> <li>• Existing grade less than 5%</li> <li>• No direct access to existing Metro stations within 2 blocks</li> </ul>
3 <sup>rd</sup> St. At-grade Station between Spring and Main (Single track )	5,6,7	<ul style="list-style-type: none"> <li>• Single track at-grade station</li> <li>• 12 ft. side platform created by narrowing street and widening sidewalk on south side</li> <li>• TVM areas and access to platform is part of widened sidewalk.</li> </ul>	<ul style="list-style-type: none"> <li>• No significant ROW issues</li> </ul>	<ul style="list-style-type: none"> <li>• Wider street in this part of 3<sup>rd</sup> St. allows use of a lane of the street for the platform without impacting adjacent buildings</li> <li>• Driveway access and existing structures preclude placing platforms west of Spring St.</li> </ul>	<ul style="list-style-type: none"> <li>• Public sidewalk and landscaping should be provided between station platform and State building structure</li> <li>• Existing grades in this area are less than 5%.</li> </ul>
3 <sup>rd</sup> St. At-grade station between San Pedro and Central (single track)	5,6,7	<ul style="list-style-type: none"> <li>• Single track at-grade station</li> <li>• 12 ft. side platform part of sidewalk width</li> <li>• TVM and access to either end of platform is part of sidewalk area</li> </ul>	<ul style="list-style-type: none"> <li>• No significant ROW impacts</li> </ul>	<ul style="list-style-type: none"> <li>• Wider street in this part of 3<sup>rd</sup> St. allows use of a lane of the street for the platform without impacting adjacent buildings</li> </ul>	<ul style="list-style-type: none"> <li>• No significant pedestrian access issues. Station entrances located at existing crosswalks</li> </ul>

**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
General T.K. Way At-grade Station between Hope and Grand	8	<ul style="list-style-type: none"> <li>• Double track at-grade station – narrow track centers</li> <li>• 12-ft wide side platforms in GTK Way</li> </ul>	<ul style="list-style-type: none"> <li>• Existing 65 ft. ROW</li> <li>• Approximately 10ft additional ROW required from parking lots on north side of GTK Way for public sidewalk and 15-20 ft from south side.</li> </ul>	<ul style="list-style-type: none"> <li>• Grand Ave overpass structural supports require 14-ft track centers to pass through lower Grand Ave</li> <li>• Narrow track centers require side-platform station</li> <li>• Overpass structure may constrain road lane widths</li> </ul>	<ul style="list-style-type: none"> <li>• GTK Way station does not have a direct accessible pedestrian connection to Grand Ave without the provision of vertical circulation elements from station platform elevation</li> <li>• With the provision of vertical circulation elements, this station location provides access to Grand Ave, MOCA and other Bunker Hill destinations</li> <li>• Hope St. has moderately steep grades in certain areas south of Disney Hall that may not be ADA accessible</li> <li>• Station platforms should be integrated into proposed development behind Disney Hall and linked with accessible paths with Grand Ave.</li> </ul>
1 <sup>st</sup> St. Aerial Station between Spring and Main	8	<ul style="list-style-type: none"> <li>• Double track aerial station</li> <li>• 12-ft side aerial platforms (center platform with mezzanine possible alternative)</li> <li>• Station entrances off-street and TVM areas at-grade or at platform level</li> </ul>	<ul style="list-style-type: none"> <li>• Additional ROW required on each side of street for side platform access. North entrance may impact existing City Hall park</li> </ul>	<ul style="list-style-type: none"> <li>• Aerial Structure will require approximately 12-ft street median for aerial structure column and structural setback</li> </ul>	<ul style="list-style-type: none"> <li>• No problems with accessible grades</li> <li>• Side platform type stations require transferring from one platform to the other through vertical circulation elements which is less convenient to patrons than direct platform transfers with side platforms</li> </ul>

**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
Hope St. At-Grade Station between 1 <sup>st</sup> and Temple	9, 10	<ul style="list-style-type: none"> <li>• double track at-grade station</li> <li>• 14-ft wide center platform in Hope Street</li> <li>• Entrance of existing crosswalk at 1<sup>st</sup> St; ped crossing required at Music Center Plaza for station entrance at this location</li> <li>• TVM at the each end of the platform</li> </ul>	<ul style="list-style-type: none"> <li>• Requires acquisition of a portion of DWP property</li> </ul>	<ul style="list-style-type: none"> <li>• Existing grades approaching Temple are steep and are non-ADA compliant for platform location unless close to 1st St.</li> <li>• In order to maintain truck access to loading dock on the east side of Hope, station platform must be on the west side of the street. This will require that LRT and vehicular traffic cross each other at 1<sup>st</sup> which may result in traffic and operational conflicts</li> </ul>	<ul style="list-style-type: none"> <li>• Platform access from 1<sup>st</sup> street and from midblock pedestrian crossing.</li> <li>• Connection to the Music Center Plaza also gives access to Grand Avenue and Bunker Hill destinations</li> </ul>
Temple St. At-grade Station between Los Angeles and J.J. Aiso St.	10, 11	<ul style="list-style-type: none"> <li>• Double track at-grade station</li> <li>• 16-ft center platform in Temple St</li> <li>• TVM at each station entry</li> </ul>	<ul style="list-style-type: none"> <li>• No significant ROW issues</li> </ul>	<ul style="list-style-type: none"> <li>• Transition from aerial structure determines station location</li> </ul>	<ul style="list-style-type: none"> <li>• Existing grade and aerial alignment restrictions determine the station location. Locations west of station proposed platform location do not meet ADA required grades for station platforms</li> </ul>

**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
Temple St. Aerial Station between Main and Los Angeles	9	<ul style="list-style-type: none"> <li>• Double track aerial station</li> <li>• 12-ft side platforms (center platform with mezzanine possible alternative)</li> <li>• 12-ft wide aerial side-platforms with station entry at each end of the platform</li> <li>• TVM at each entry either at street level or platform level</li> </ul>	<ul style="list-style-type: none"> <li>• Additional ROW will be required for station entrances and emergency stair exits off-street on private property.</li> </ul>	12-ft. wide street median required for aerial structure along Temple. Extent of aerial structure determined by existing grades and 6% maximum slope of LRT trackway	<ul style="list-style-type: none"> <li>• Steep slopes along Temple and 1st Street restrict access to destination west of the station location.</li> <li>• Station location serves City Hall and the Federal Building</li> </ul>
Temple St. At-grade Station between Figueroa and Hope  (site plan not included see plan and profile for station location)	11	<ul style="list-style-type: none"> <li>• Double track at-grade – 14 ft track centers</li> <li>• 12-ft-wide off-street side platforms in Temple St.</li> <li>• TVM at each station entry</li> </ul>	<ul style="list-style-type: none"> <li>• ROW or easement at DWP site for station and TVM areas</li> </ul>	<ul style="list-style-type: none"> <li>• Station location constrained by grade limitations on Temple in front of the Music Center and by freeway access ramps</li> <li>• Significant grading required at Figueroa and side of DWP parking access road</li> <li>• Platforms are partially elevated due to existing grade constraints and track slope requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Station location provides access to the Music Center</li> <li>• Steep slopes west of Hope may require additional vertical circulation elements to make station area ADA accessible</li> </ul>

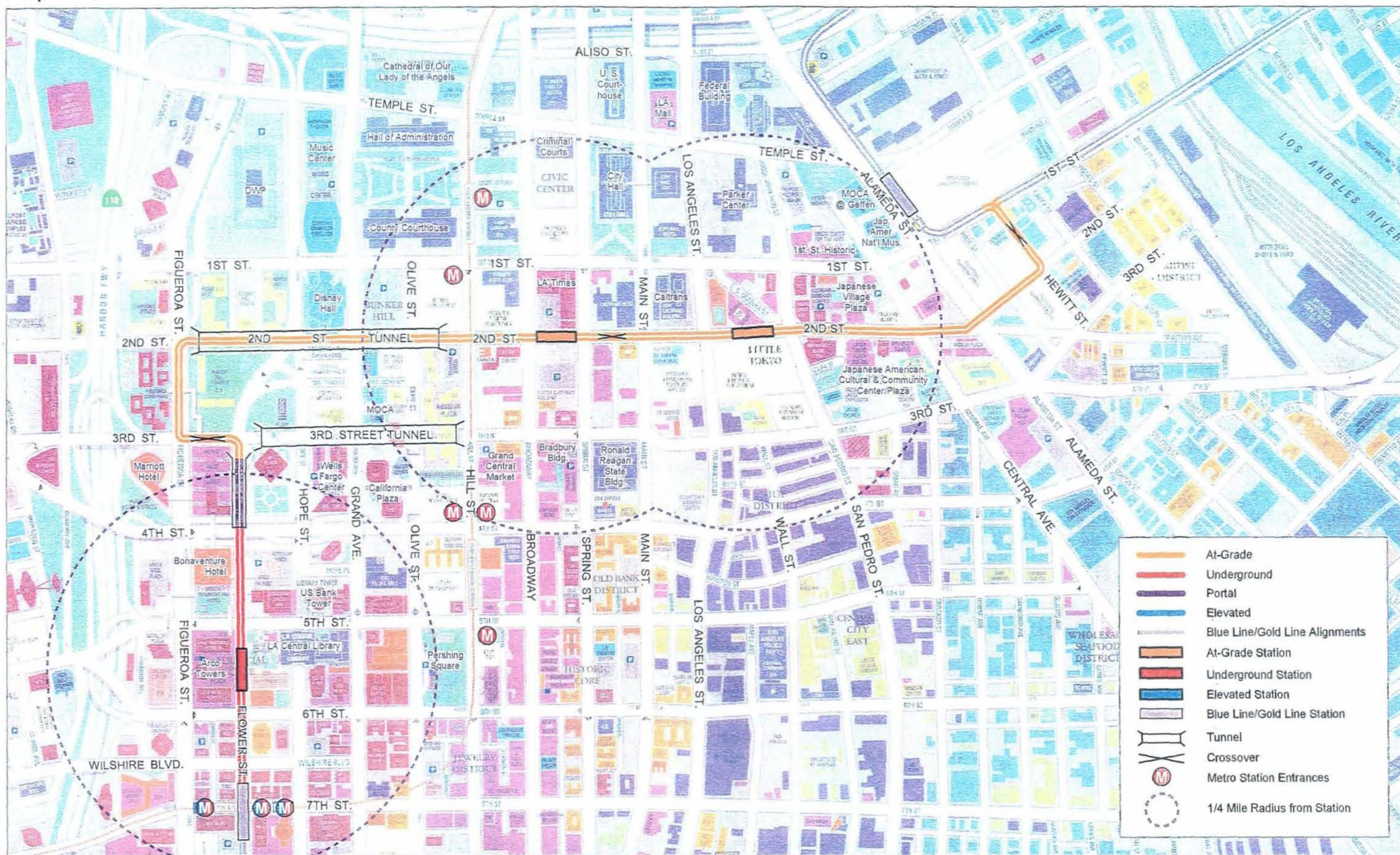
**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
Disney Hall Underground Station at 2 <sup>nd</sup> Street Punch	12,13,14,15	<ul style="list-style-type: none"> <li>• Double track underground station</li> <li>• 24-ft tapered center platform at 2<sup>nd</sup> Street tunnel "punch" elevation, partially in private development</li> <li>• Station entrance and vertical circulation part of joint development</li> </ul>	<ul style="list-style-type: none"> <li>• ROW required for station and off-street plaza entrance at street level</li> </ul>	<ul style="list-style-type: none"> <li>• Station location determined by engineering constraints at the 2<sup>nd</sup> St. "punch" and feasibility of modifying 2<sup>nd</sup> St. tunnel structure</li> </ul>	<ul style="list-style-type: none"> <li>• Station location give good access to Bunker Hill destinations.</li> <li>• Additional vertical circulation elements will be required to provide access to Grand Avenue level.</li> </ul>
Disney Hall - At-grade Station between Hope and Grand	16	<ul style="list-style-type: none"> <li>• Double track at-grade station</li> <li>• A side-platform station is proposed part of joint development of site due alignment constraints in narrow centers</li> </ul>	<ul style="list-style-type: none"> <li>• ROW required for station as part of joint development</li> </ul>	<ul style="list-style-type: none"> <li>• Transition down to Hill Street impacts existing development and may impact existing development and require additional ROW acquisition</li> </ul>	<ul style="list-style-type: none"> <li>• Station location give good access to Bunker Hill destinations.</li> <li>• Additional vertical circulation elements will be required to provide access to Grand Avenue level.</li> </ul>
Old Caltrans Bldg site between Spring and Main	12, 14,15	<ul style="list-style-type: none"> <li>• Double track at-grade station</li> <li>• Either a center or side-platform station is possible as part of joint development of site</li> </ul>	<ul style="list-style-type: none"> <li>• ROW required for station as joint development</li> </ul>		<ul style="list-style-type: none"> <li>• Off-street station provides opportunity to integrate high platforms with site development to provide a seamless connection to the platform with the minimum amount of level change.</li> <li>• Grades in station area are generally ADA compliant</li> </ul>
Main St. Aerial Station between Temple and Aliso	15	<ul style="list-style-type: none"> <li>• Double track aerial station</li> <li>• 12-ft side aerial platforms (center platform with mezzanine possible alternative)</li> <li>• TVM at each entry either at street level or platform level</li> </ul>	<ul style="list-style-type: none"> <li>• Additional ROW required for off-street plaza entrance</li> </ul>	<ul style="list-style-type: none"> <li>• Aerial Structure determined by alignment requirements at Alameda</li> </ul>	

**Table 4**  
**Regional Light Rail Connector**  
**Station Location Summary and Pedestrian Access Issues**

Station Location	Alignment Alternative	Station features	ROW Impact	Site issues	¼ mile radius pedestrian access analysis
Main St. At-Grade Station between 1 <sup>st</sup> and Temple	16	<ul style="list-style-type: none"> <li>• double track at-grade station</li> <li>• 16-ft wide center platform in the middle of the street with entrances at both ends of the platform</li> <li>• TVM area at each end of the platform</li> </ul>	Minor ROW acquisition required		<ul style="list-style-type: none"> <li>• Good access to City Hall main accessible entrance</li> <li>• Existing grades in station area are generally less than 5% except west along Temple and 1<sup>st</sup> St.</li> </ul>
(Optional) 2 <sup>nd</sup> St. at future Federal Courthouse site  (Site Plan similar to Main St. Aerial Station configuration)	16	<ul style="list-style-type: none"> <li>• Double track aerial station</li> <li>• 12-ft side aerial platforms</li> <li>• TVM at each entry either at street level or platform level</li> </ul>	ROW required for aerial structure on proposed Federal Courthouse site	Alignment determined by transition of aerial structure from Bunker Hill	<ul style="list-style-type: none"> <li>• Metro Red Line Civic Center Station 1 block away.</li> <li>• Existing grades are within 5% south of 1<sup>st</sup> St. North and west of 1<sup>st</sup>, existing grades are steep and exceed 5%</li> </ul>





REGIONAL LIGHT RAIL CONNECTOR



Alternative 1: BASELINE

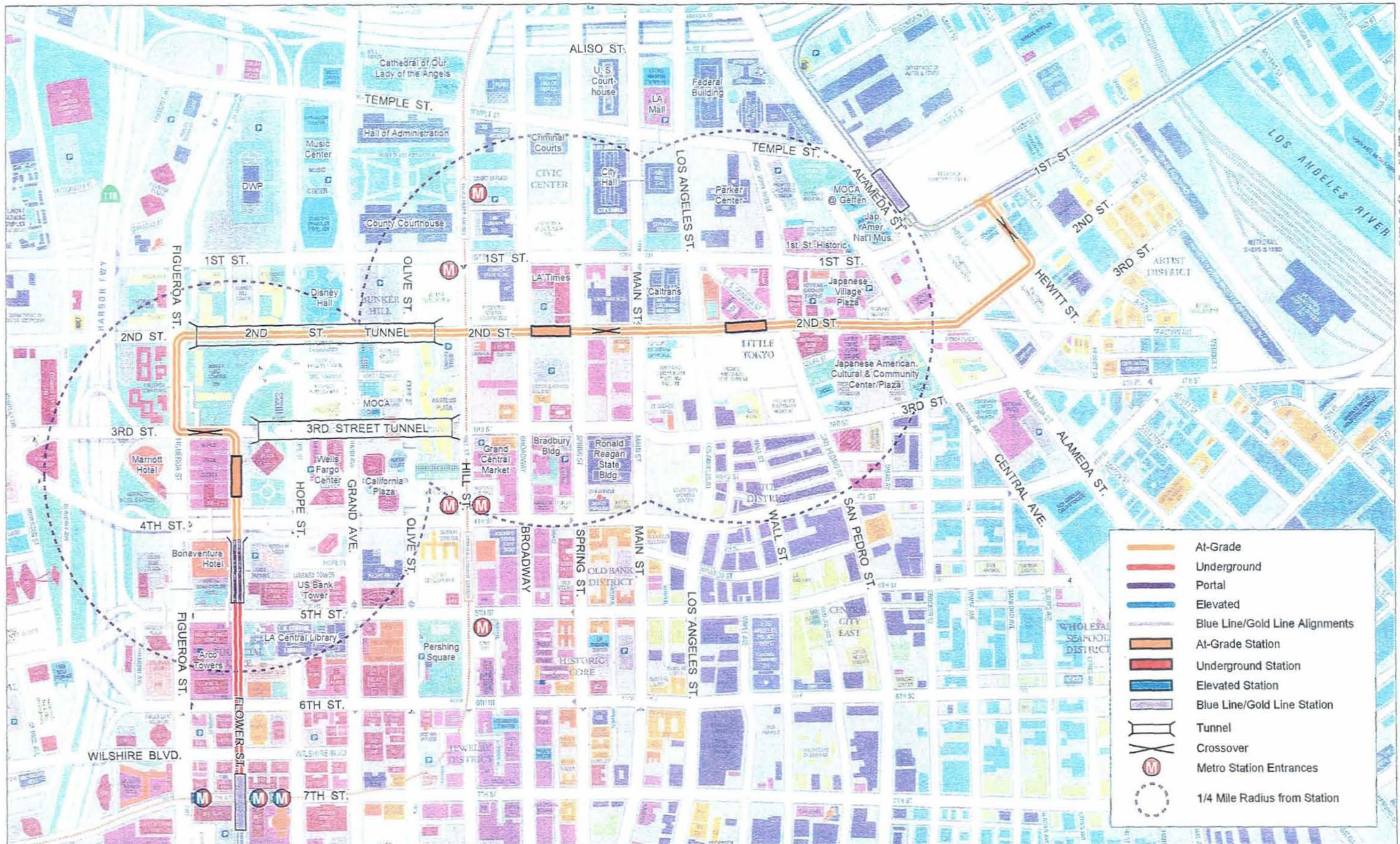


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REGIONAL LIGHT RAIL CONNECTOR



Alternative 2: BASELINE - At-Grade Station on Flower St. (3rd/4th)

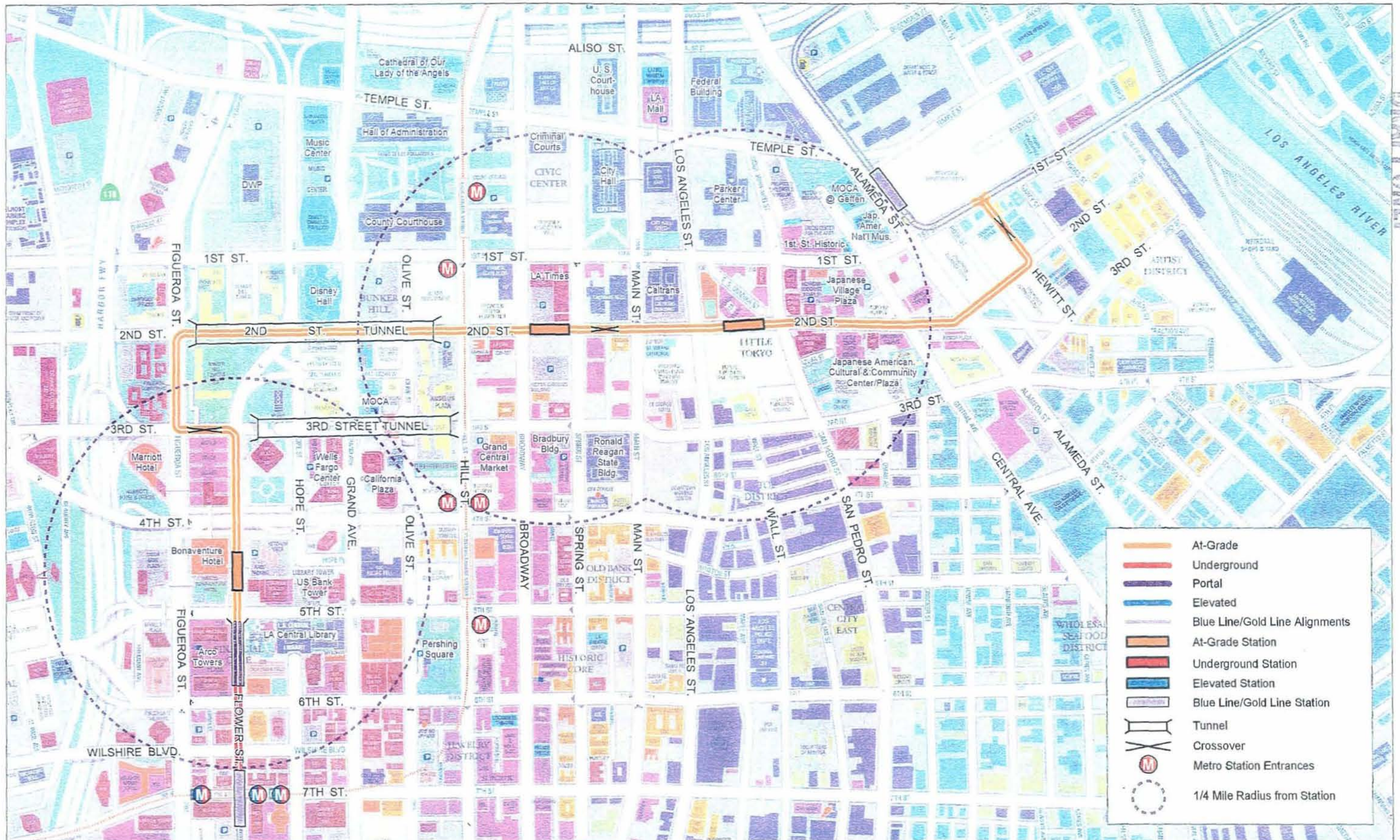


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REGIONAL LIGHT RAIL CONNECTOR



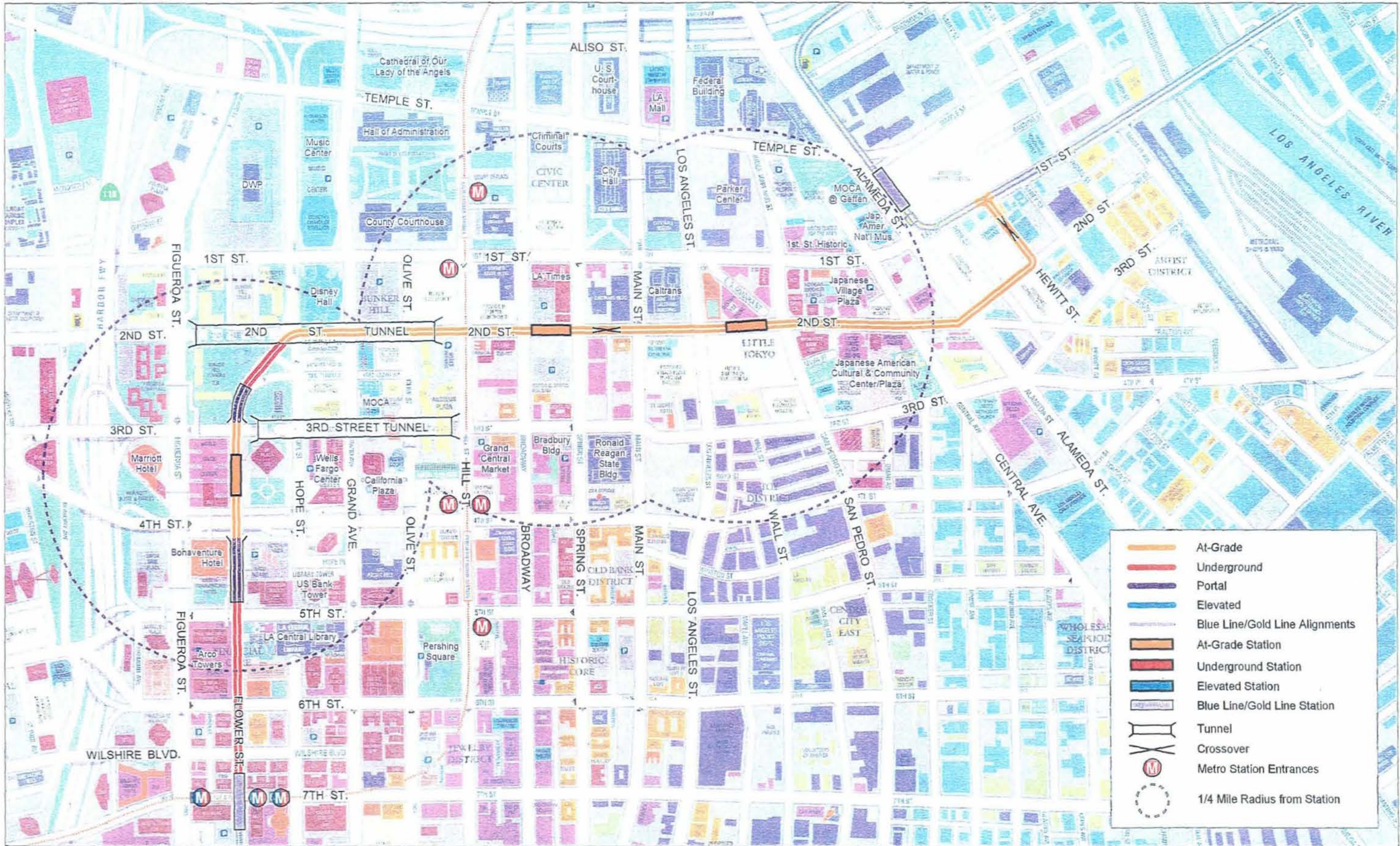
Alternative 3: BASELINE - At-Grade Station on Flower St. (4th/5th)



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REGIONAL LIGHT RAIL CONNECTOR



Alternative 4: BASELINE - With Punch

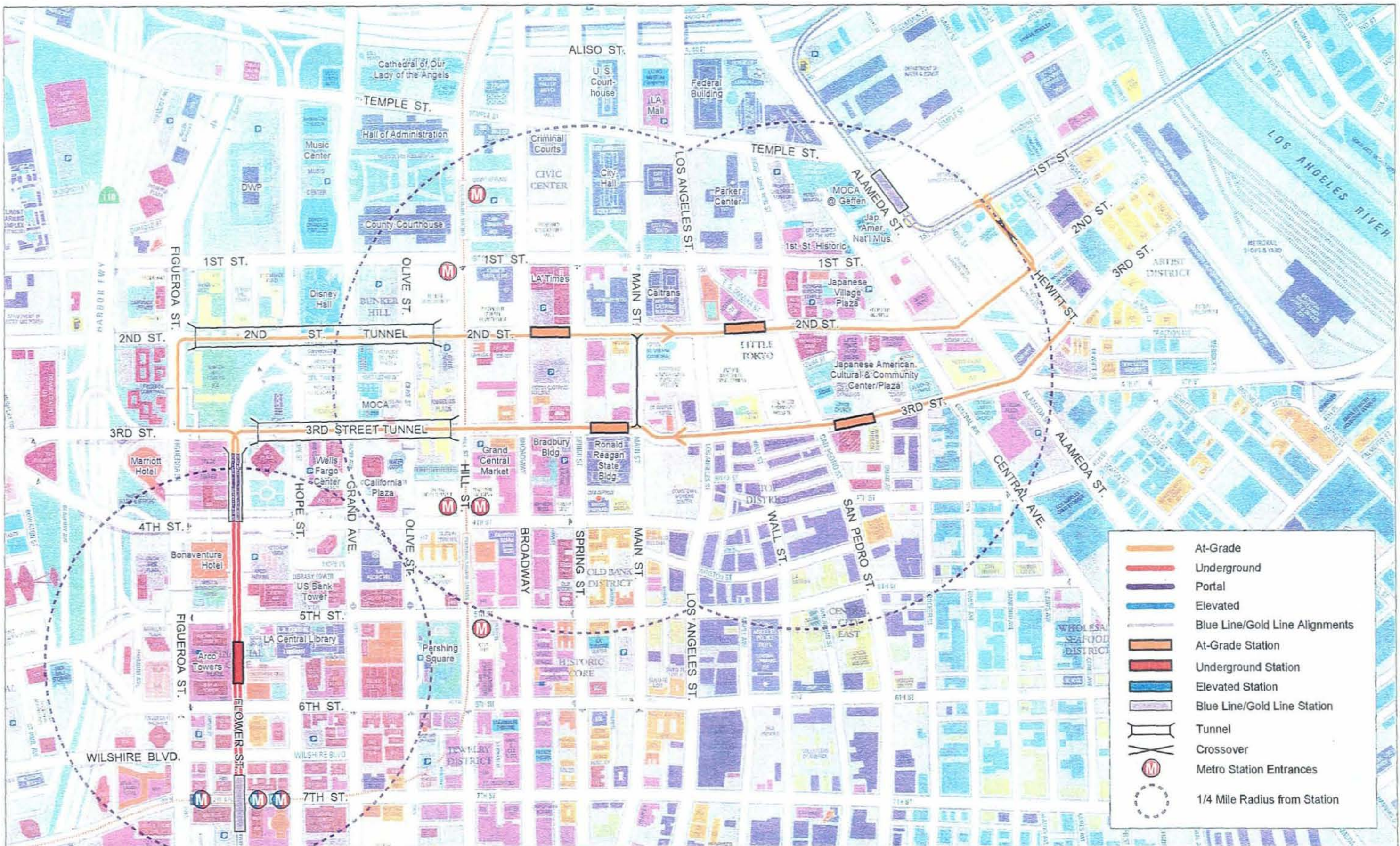
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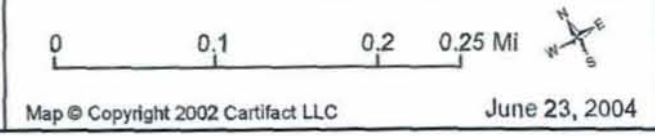




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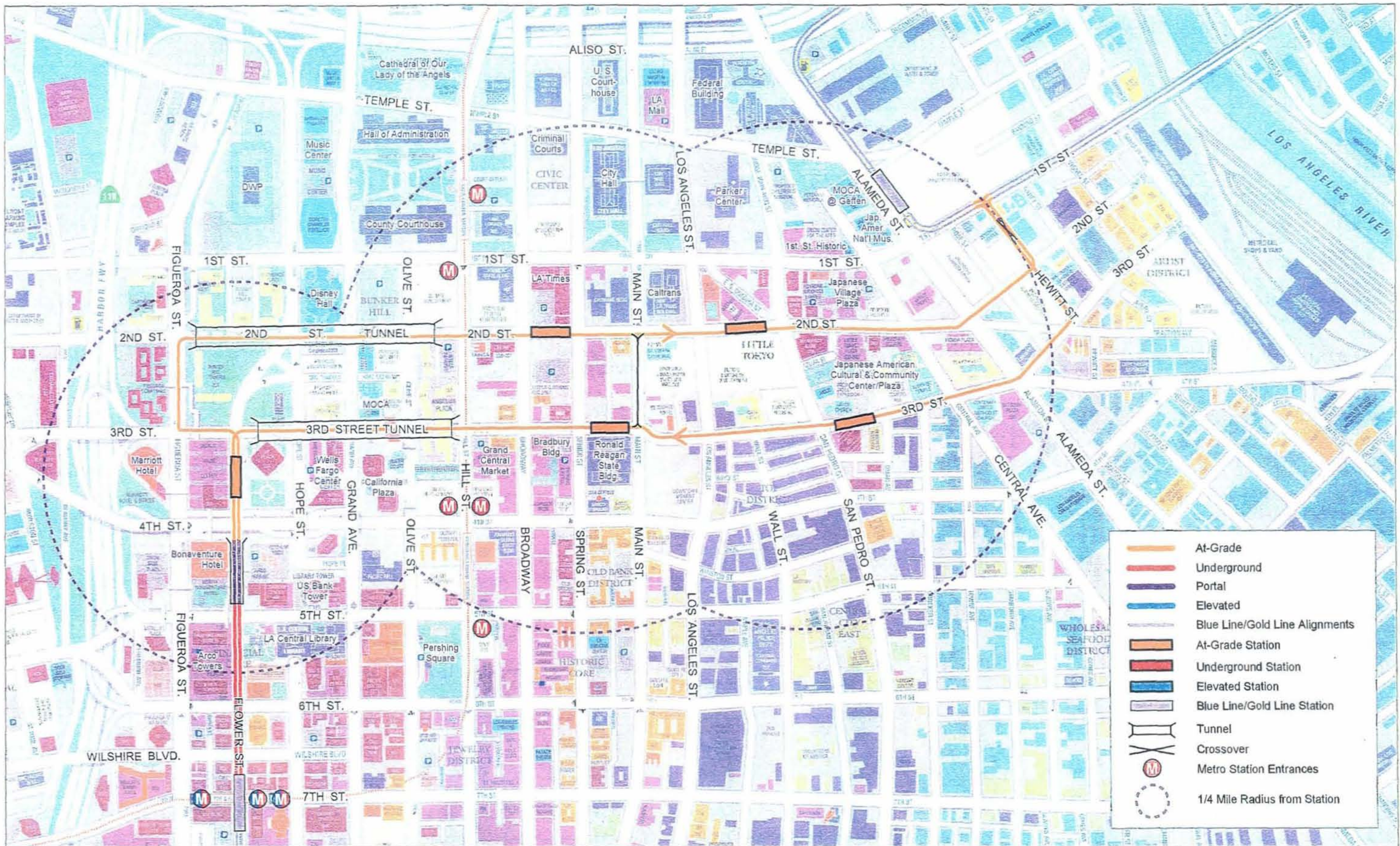


Alternative 5: 2ND-3RD COUPLET - Underground Station on Flower



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REGIONAL LIGHT RAIL CONNECTOR



Alternative 6: 2ND-3RD COUPLET - At-Grade Flower Sta. (3rd/4th)

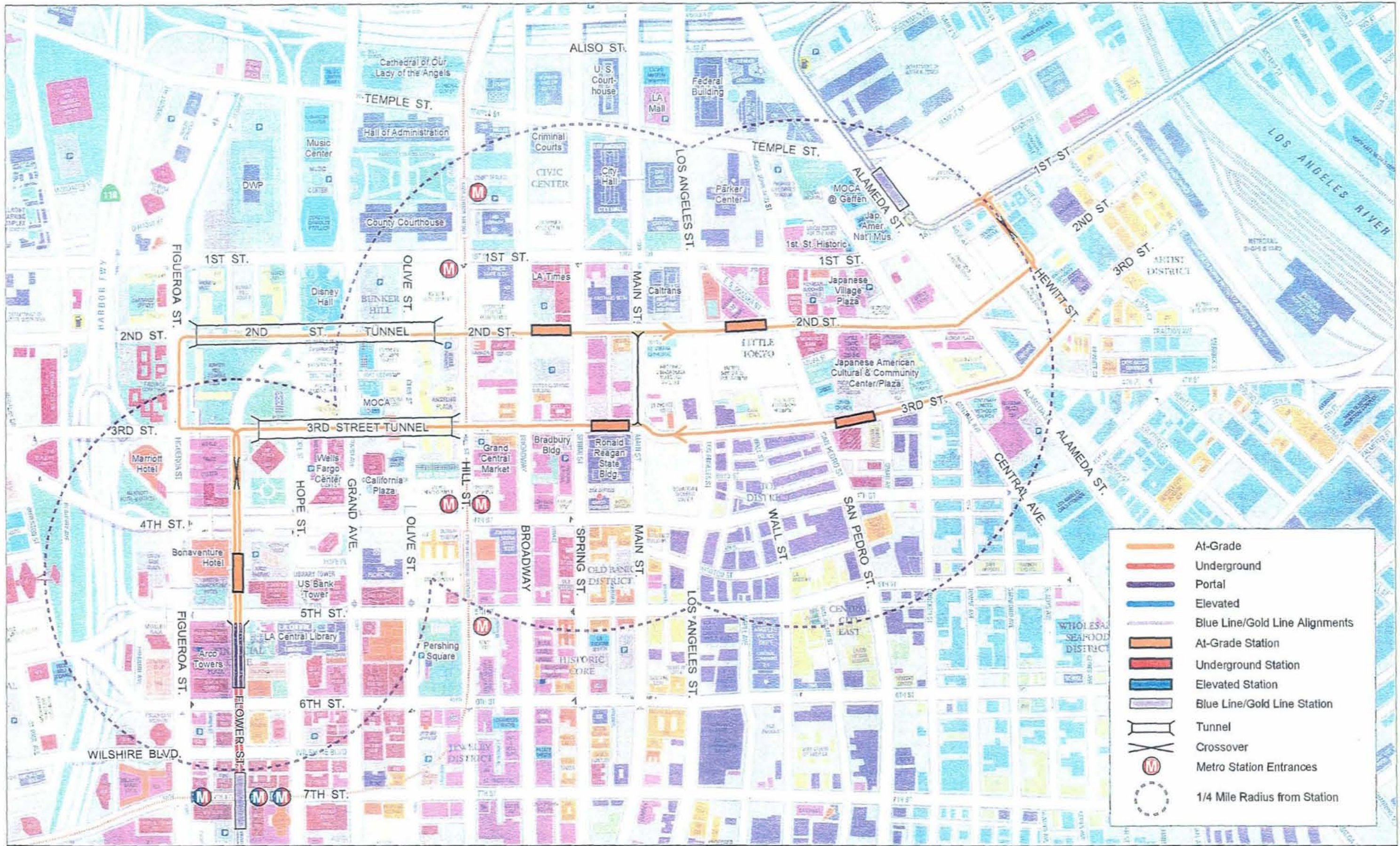


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	At-Grade
	Underground
	Portal
	Elevated
	Blue Line/Gold Line Alignments
	At-Grade Station
	Underground Station
	Elevated Station
	Blue Line/Gold Line Station
	Tunnel
	Crossover
	Metro Station Entrances
	1/4 Mile Radius from Station



REGIONAL LIGHT RAIL CONNECTOR



Alternative 7: 2ND-3RD COUPLET - At-Grade Flower Sta. (4th/5th)

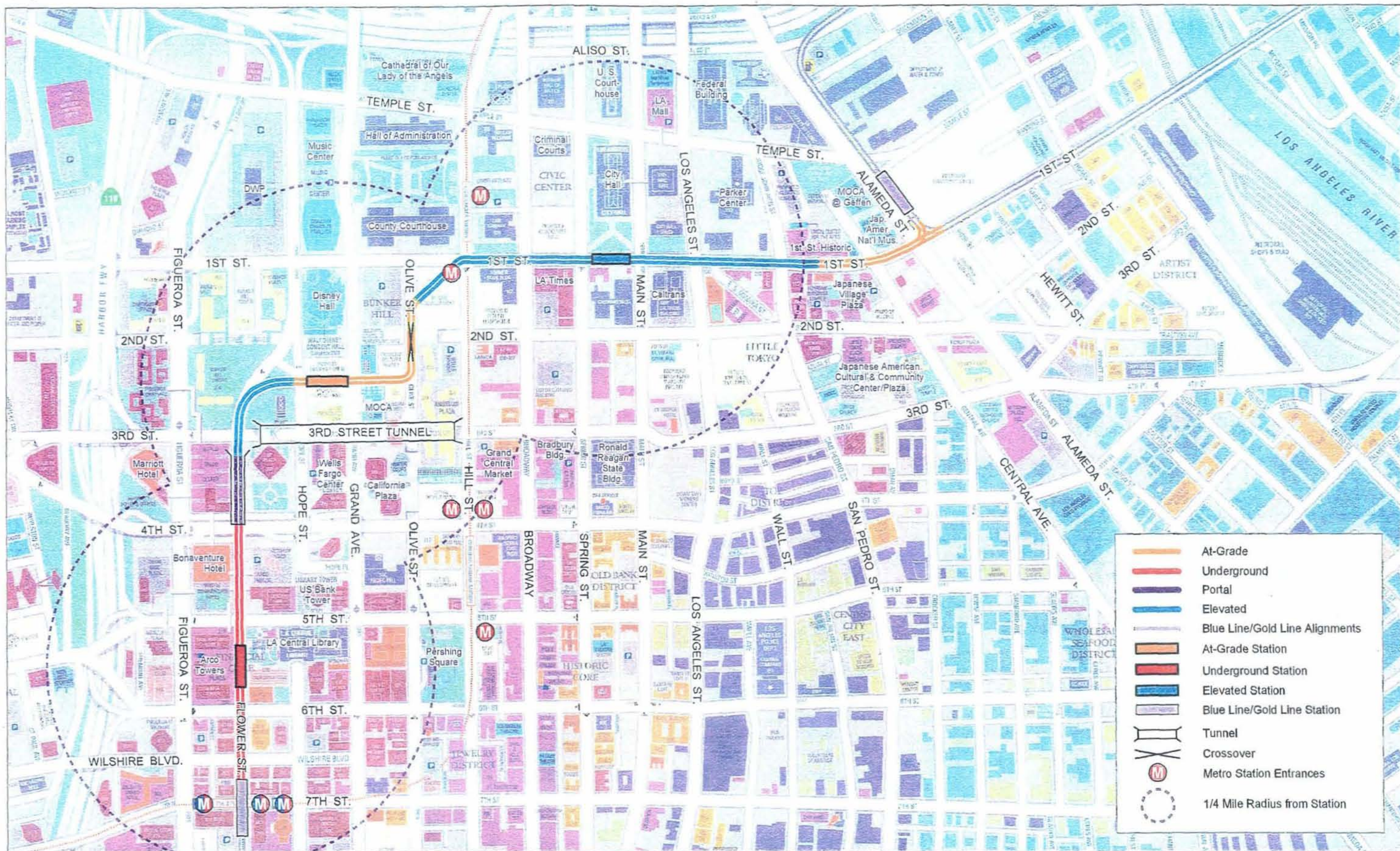
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Alternative 8: 1ST STREET

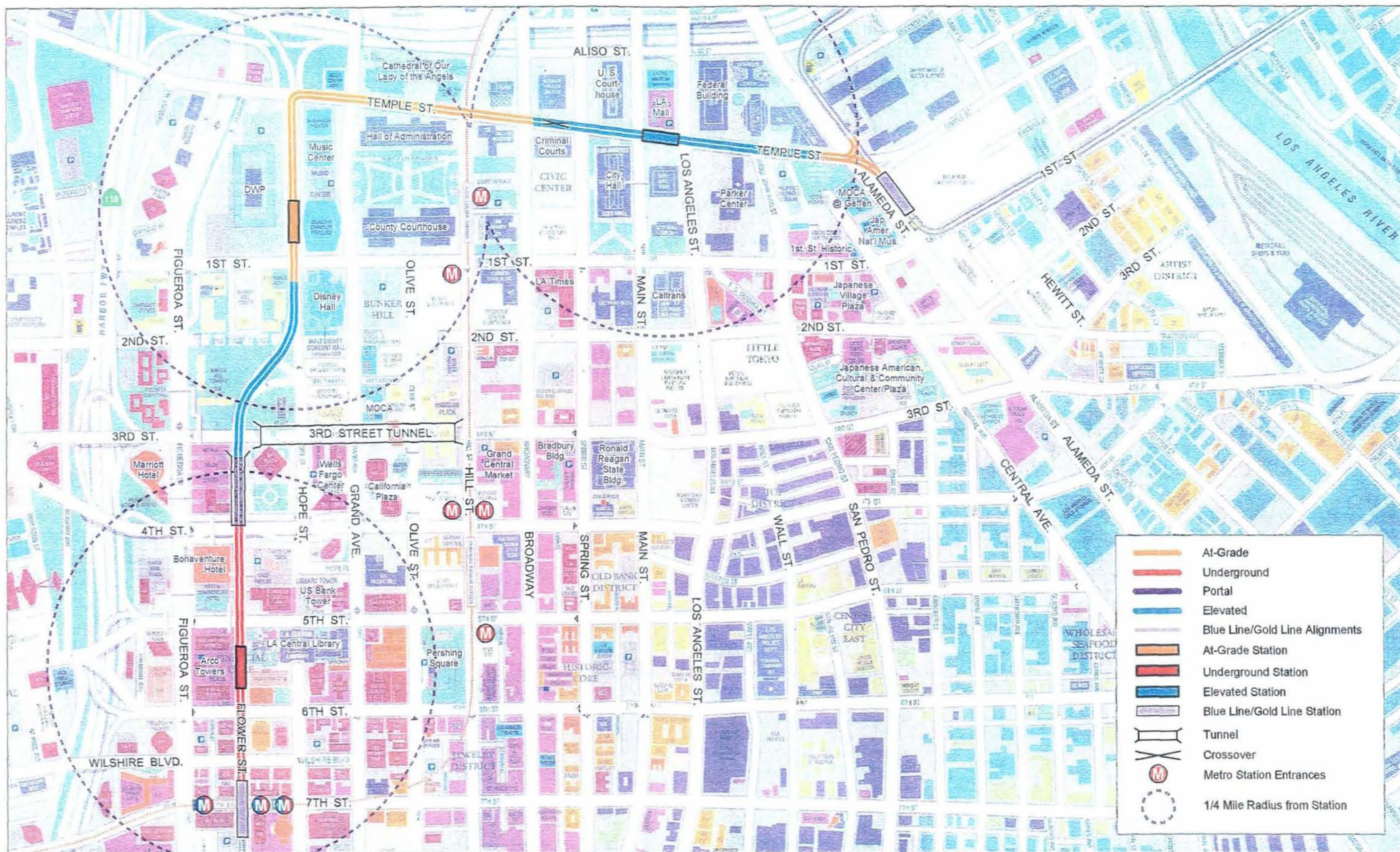


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Alternative 9: TEMPLE STREET - Elevated

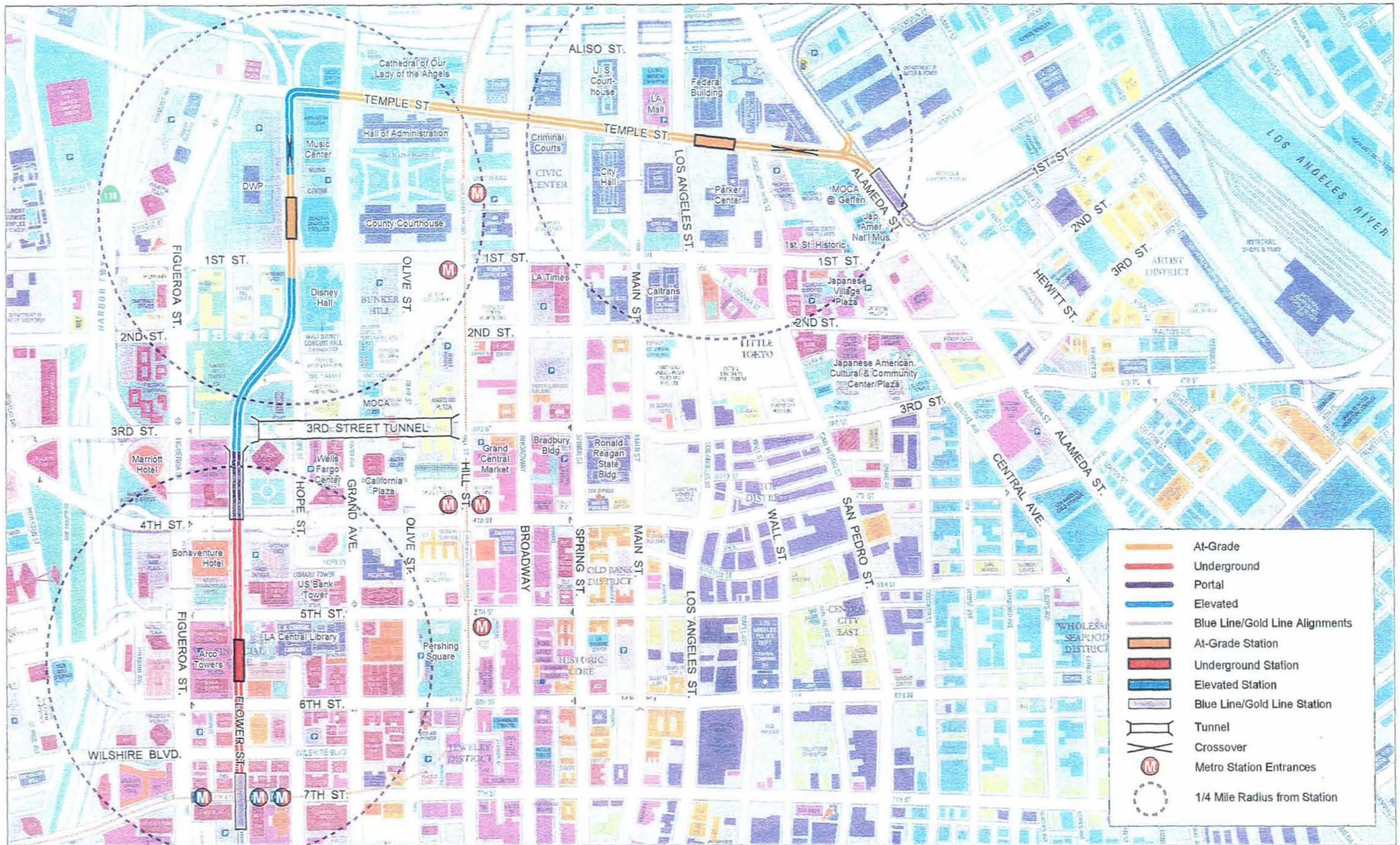
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Alternative 10: TEMPLE STREET - At-Grade

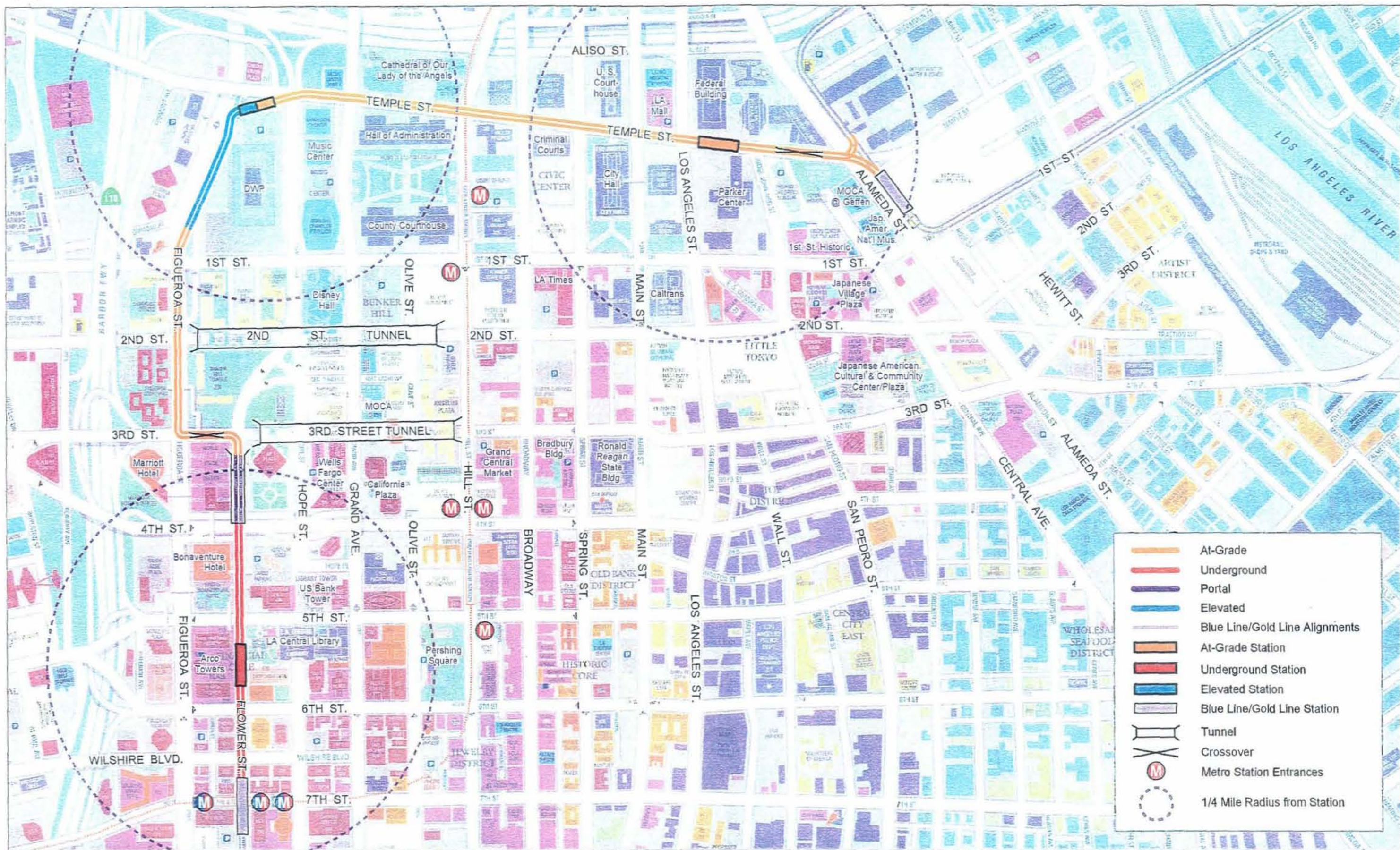
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Alternative 11: TEMPLE STREET - Via Figueroa St.

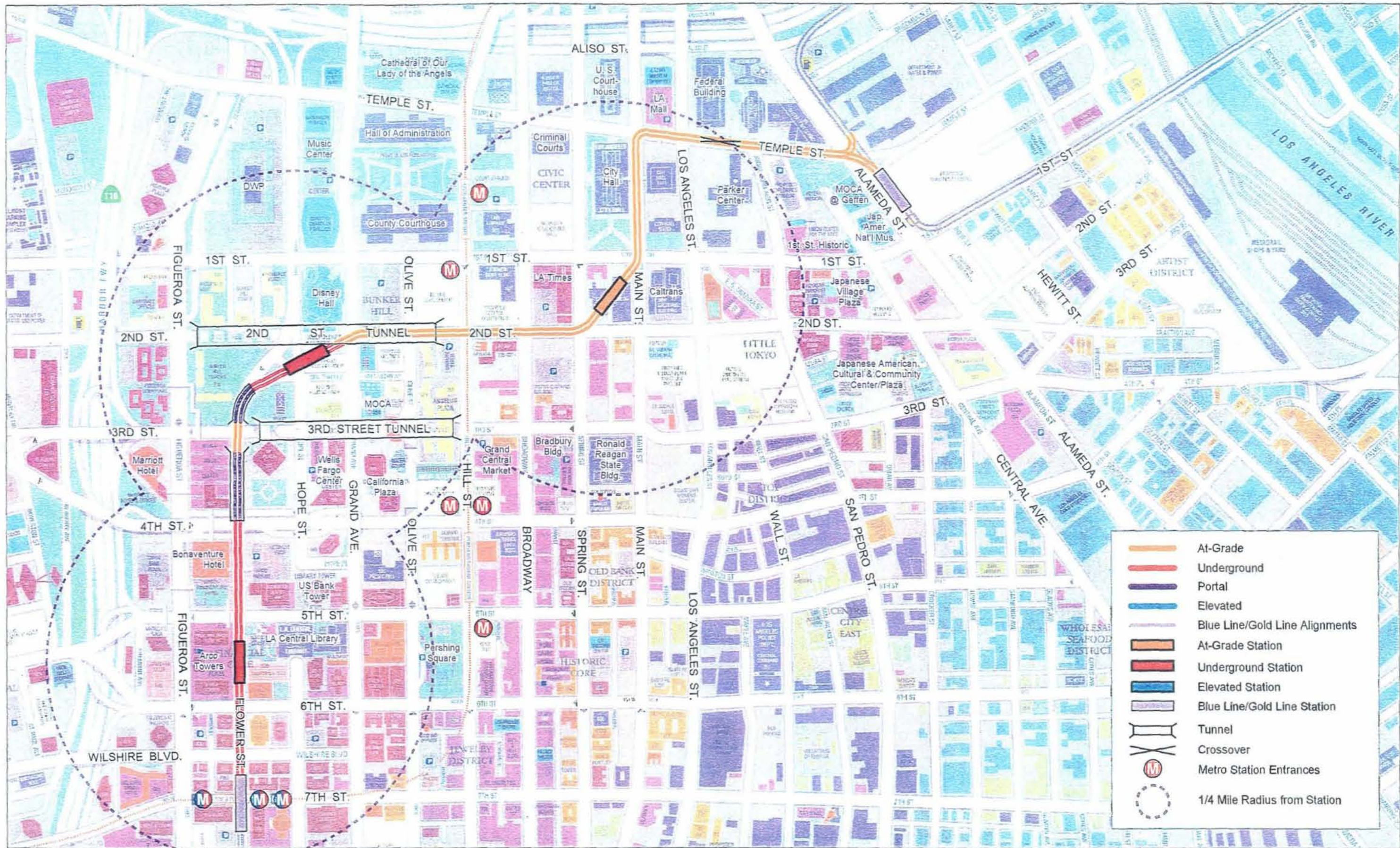
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Alternative 12: MAIN-TEMPLE - Underground Station on Flower

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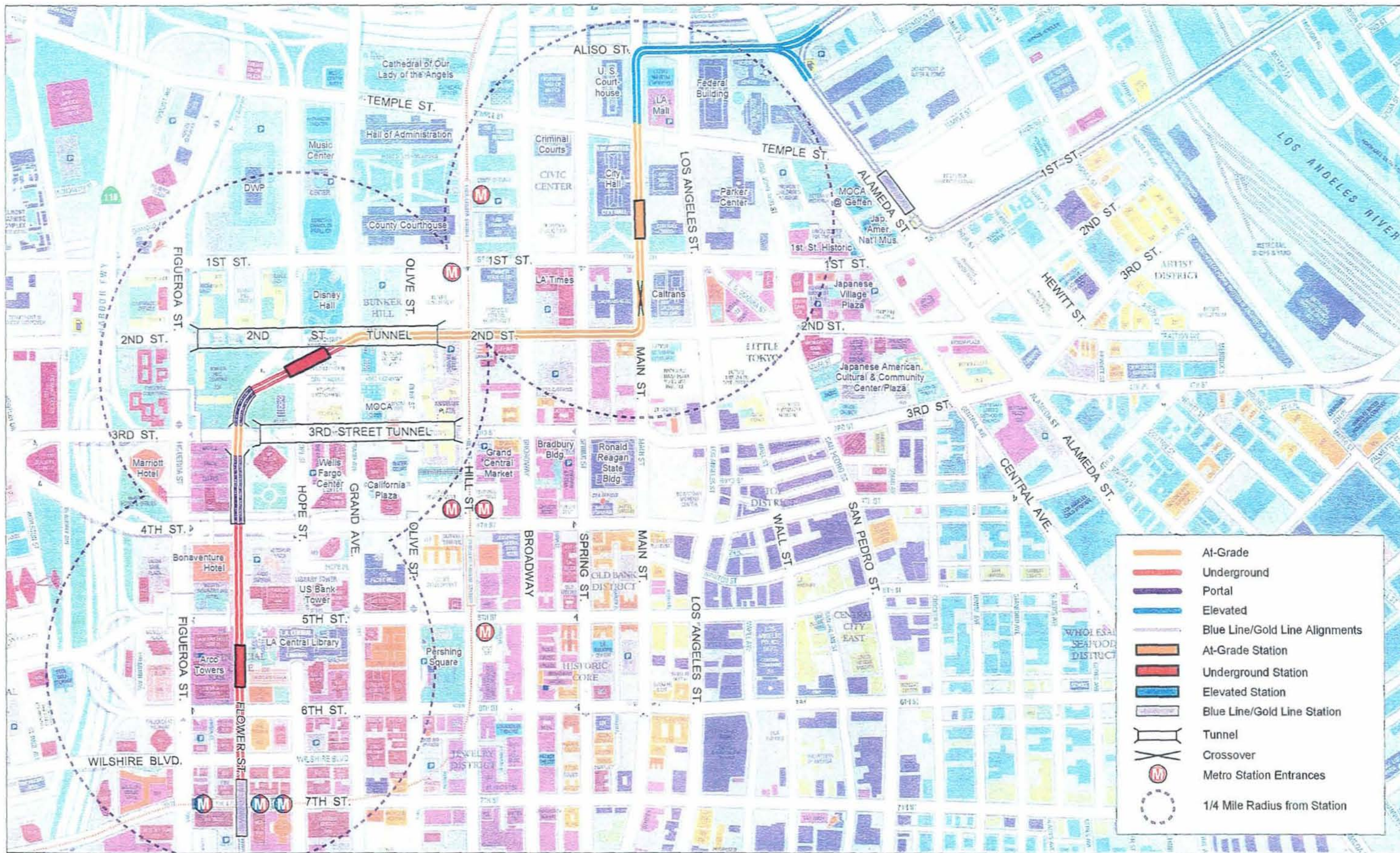
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PRELIMINARY  
DRAFT ONLY



REGIONAL LIGHT RAIL CONNECTOR



Alternative 13: MAIN-ALISO - Underground Station on Flower

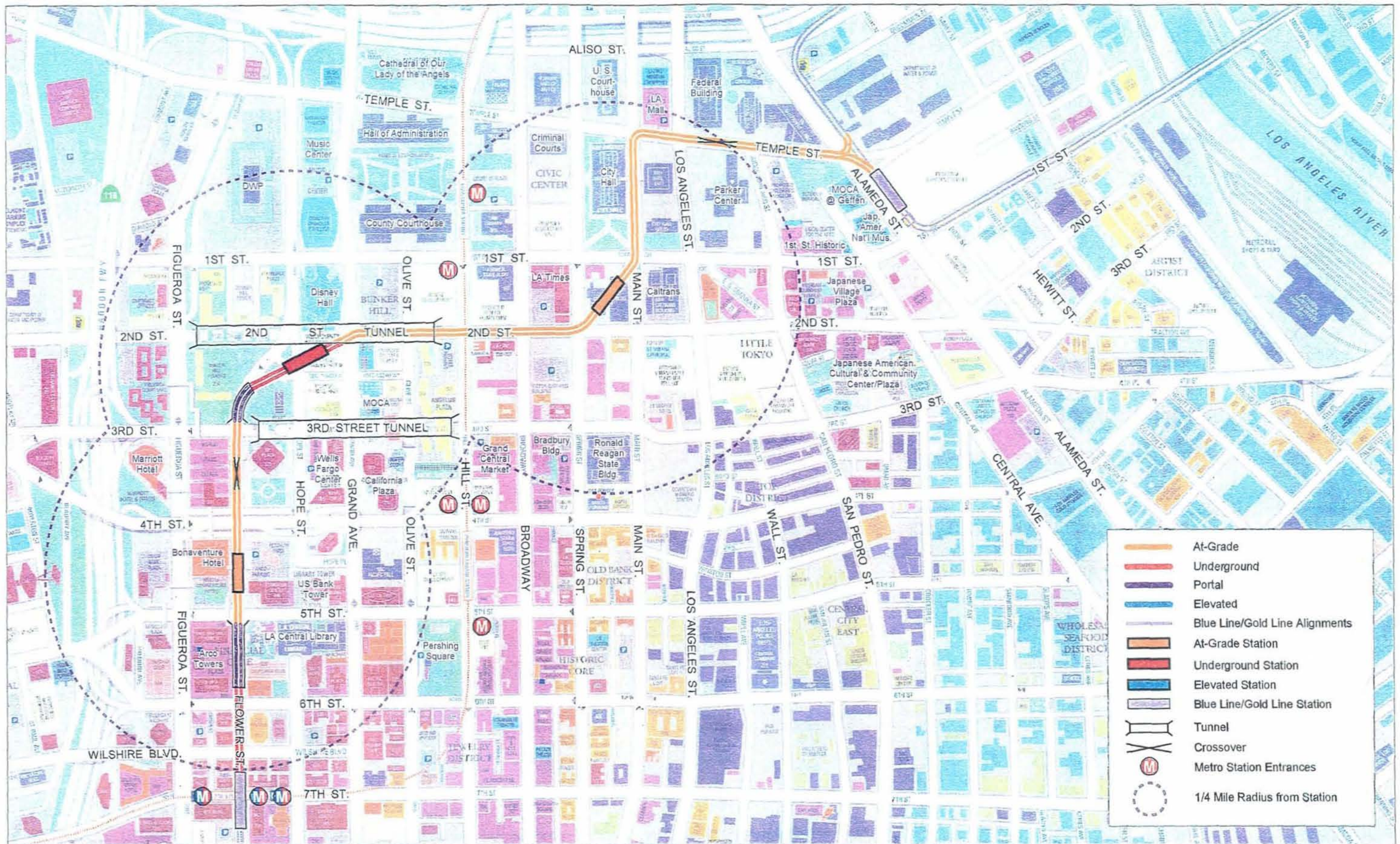
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REGIONAL LIGHT RAIL CONNECTOR



Alternative 14: MAIN-TEMPLE - At-Grade Flower Sta. (4th/5th)

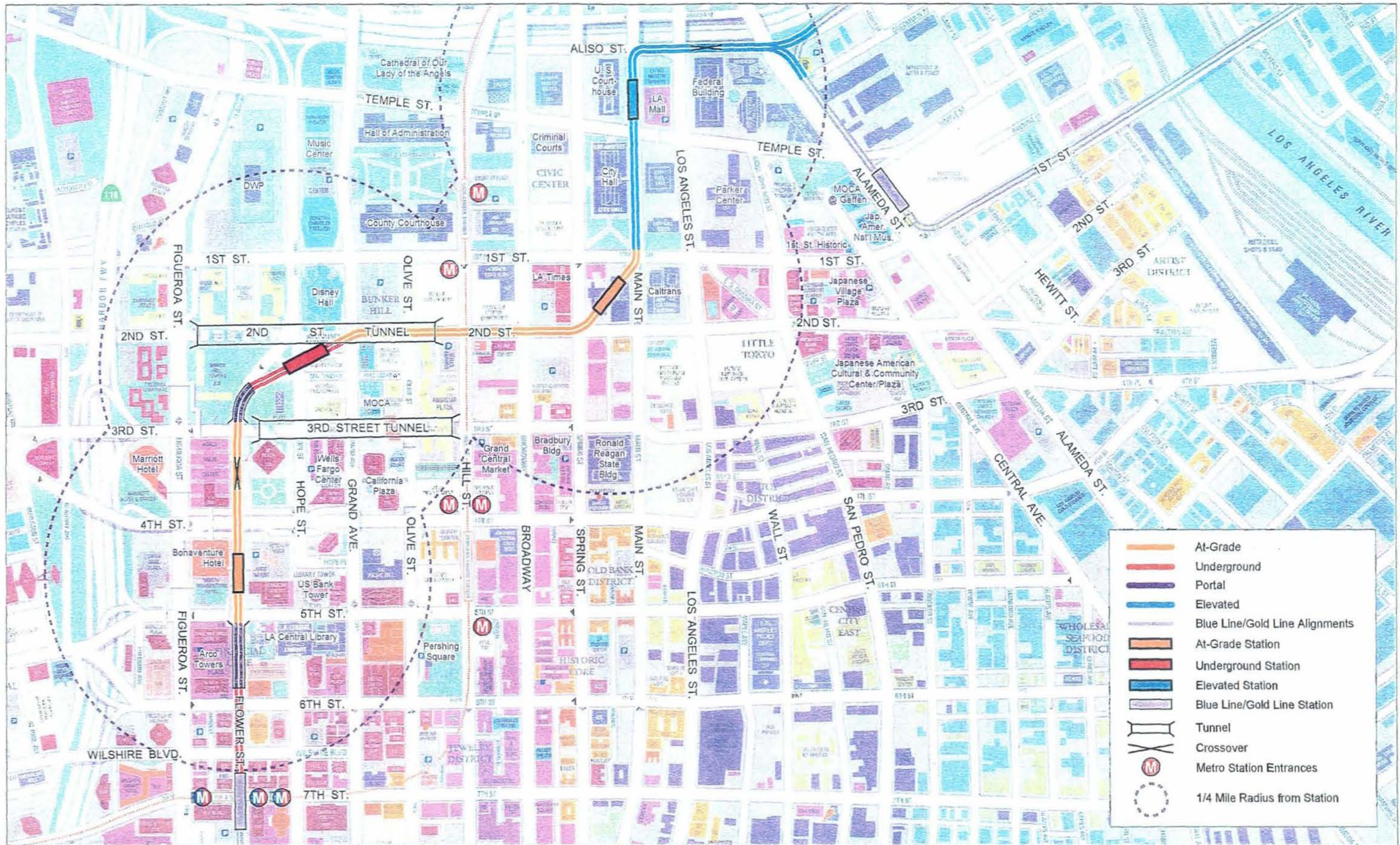
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REGIONAL LIGHT RAIL CONNECTOR



Alternative 15: MAIN-ALISO - At-Grade Flower Sta. (4th/5th)

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