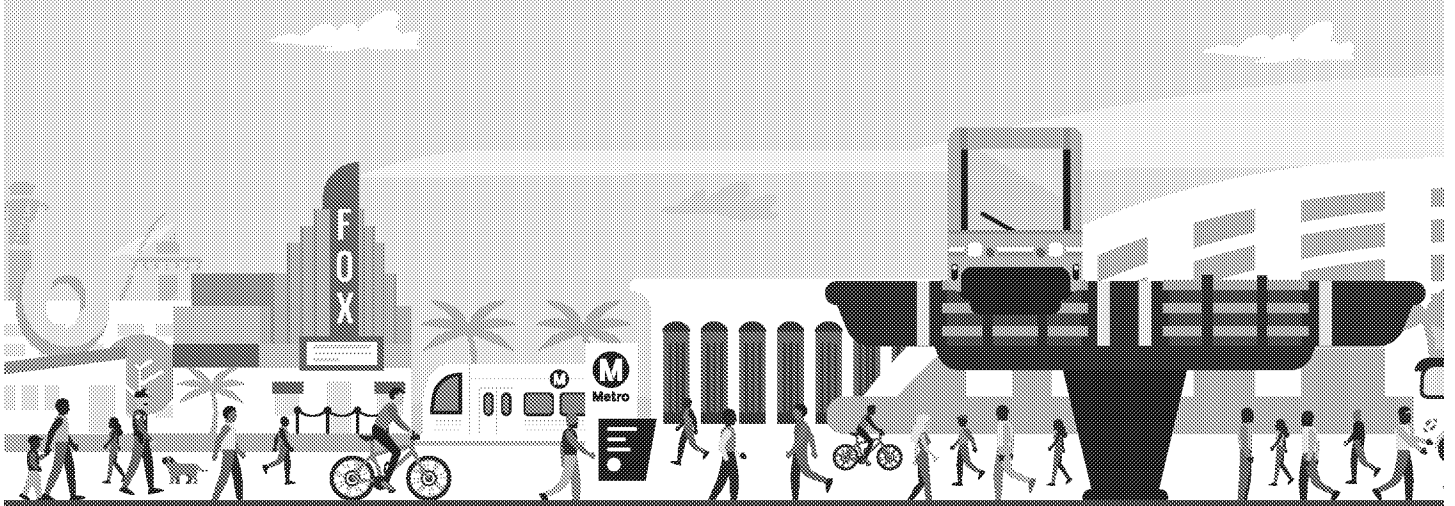


# ENVISION Inglewood

Connecting People, Places, and the Future



JUNE 2018

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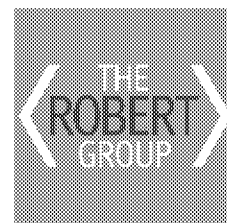
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# 1. INTRODUCTION



# 1.1 BACKGROUND

An exciting transformation for the City of Inglewood is underway as it becomes "The City of Champions" and is redefined as a world-class sports and entertainment center in the greater Los Angeles region. As of August 2017, sales tax revenue in the City of Inglewood increases have outpaced the Los Angeles County average, and property values are up more than 100% since 2012. These accomplishments have been driven by a number of completed and on-going projects in the City. The Metro Crenshaw/LAX Line is set to open in 2019, which will enhance transit access to the City. The Forum's revitalization now actively hosts the largest entertainment acts in the country. The redevelopment of approximately 298 acres at Hollywood Park includes new residential, commercial, and recreational uses, and at the centerpiece is the construction of the Los Angeles Rams and Los Angeles Chargers new National Football League (NFL) stadium.

Additionally, in 2018, the Los Angeles Clippers of the National Basketball Association (NBA) announced a proposal to relocate their headquarters, training facilities and new arena to the City, and a new Los Angeles Philharmonic state-of-the-art music and cultural campus for the Youth Orchestra Los Angeles (YOLA) designed by renowned architect Frank Gehry, will also be headquartered in Inglewood. All of these new venues are bringing new energy and opportunity to the City and are contributing to its social and economic well-being.

As investment in Inglewood has burgeoned in the last several

Figure 1.1-1: Youth Orchestra of Los Angeles (YOLA)



Source: LA Phil/YOLA

years, it has injected the local economy with new jobs, retail, entertainment and residential opportunities. As Inglewood is transformed into a major regional activity center, it also means that the number of trips in and around the City are anticipated to increase. Based on historic traffic counts, traffic volumes have been increasing at the rate of 1.5% per year and many key intersections and key highway corridors are already experiencing congestion. According to the traffic study for the Hollywood Park Stadium Alternative Project performed by Linscott Law & Greenspan in 2015, while roughly 85% of patrons are anticipated to use privately-owned vehicles and 15% will rely on transit or charter buses for stadium events and games, these modes will still compete to utilize the same traffic corridors within the City that may be physically constrained or congested. Moreover, Southern California Association of Government's (SCAG) 2016 RTP/SCS Regional Travel Demand Forecasting Model projects substantial socioeconomic and demographic growth throughout the six-county southern California region. According to SCAG, population, housing and employment growth are expected throughout the cities of Los Angeles, Inglewood, Culver City, unincorporated areas of Los Angeles County and portions of the South Bay Cities consisting of El Segundo, Hawthorne and others. The City is working to manage this growth in a sustainable and responsible way, ensuring that residents, businesses and visitors have convenient and efficient access to new destinations and resources.

Building on the tremendous progress the Los Angeles County Metropolitan Transportation Authority (Metro) has made to develop the County's regional rail network and to create more transportation options associated with the opening of the Crenshaw/LAX Line, Inglewood's existing transportation infrastructure and circulation system should be updated, capacity should be increased on major arterial streets where possible, Metro and municipal bus operations and service should be enhanced, and most importantly, the Metro Rail system should connect directly to the City's major activity centers.

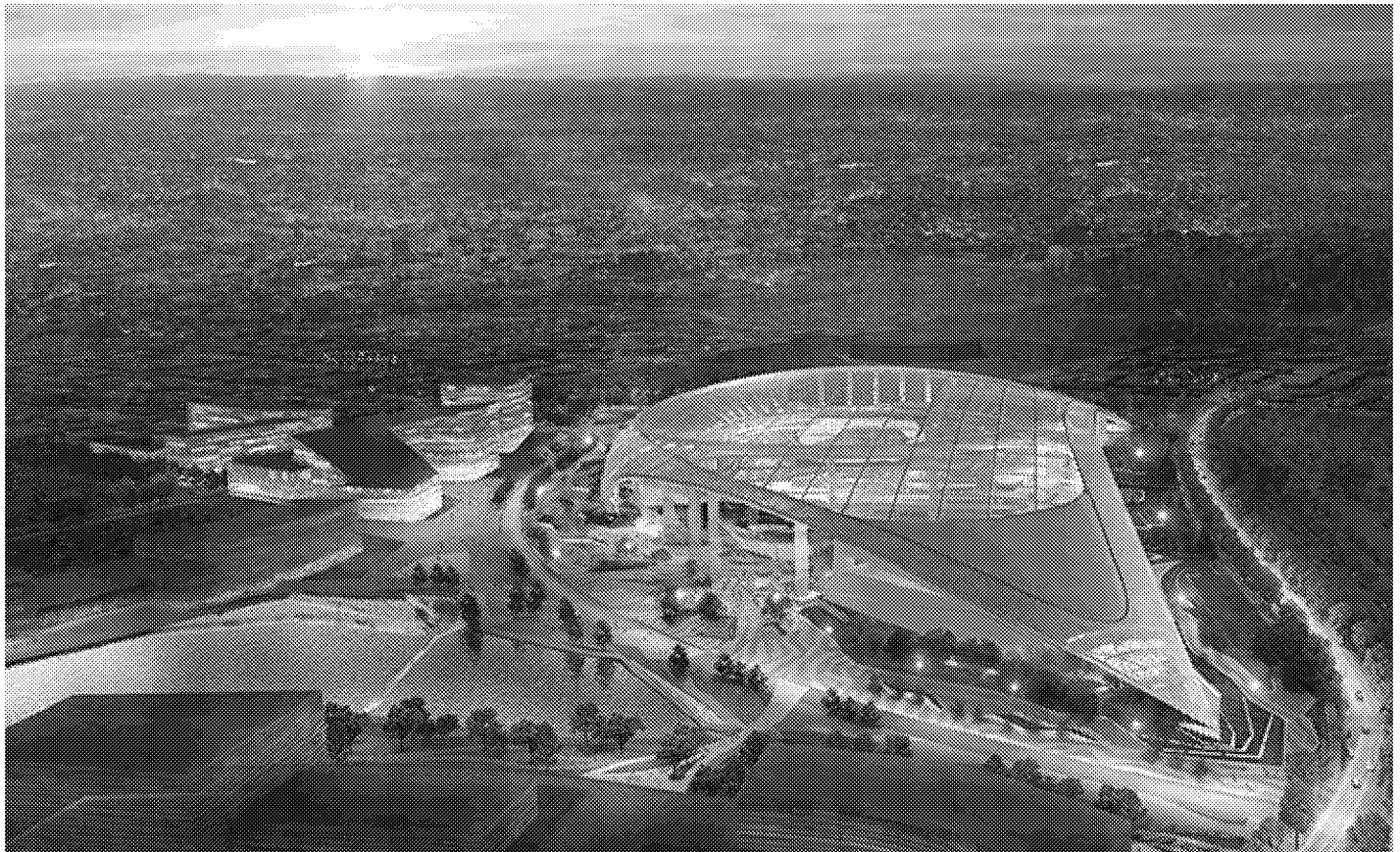
To address these critical mobility issues, Inglewood has



partnered with Metro to perform a focused analysis of viable transit connection options from the Metro Crenshaw/LAX light rail line to the Los Angeles Stadium and Entertainment District at Hollywood Park development (LASED). With the City's input, Metro explored how best to connect Inglewood's future LASED to Metro's rail system via a high-capacity transit connection. The Metro study analyzed 1) an Interlined Operability connection from the Crenshaw/LAX Line in a subway under Prairie Avenue, which also would jointly operate on a portion of the Crenshaw/LAX Line, and 2) Independent Operability options for independent services that could provide a connection from the Metro Rail system at nearby Metro stations along the Crenshaw line to the NFL Stadium. At the conclusion of the study, the City and Metro agreed that the Interlined Operability Scenario is infeasible due to its cost and complexity that would be created on the Metro Rail system.

Consistent with Metro's recommendations, Inglewood has continued to analyze several Independent Operability transit connections to the City's activity centers. The City has assembled an experienced consultant team to continue to define the transit connection concepts, initiate the environmental analysis and clearance process, launch a stakeholder engagement process, and develop an overall project implementation and delivery strategy, which will include the pursuit of an Enhanced Infrastructure Financing District. This report describes the City's further examination and comparative analysis of alternative transit connection concepts, a more detailed analysis of transit ridership potential, rough-order-of-magnitude project cost estimates, and a brief discussion of a project implementation strategy. Based on a deeper understanding of The City's mobility goals and objectives, this report includes a recommendation for the City's preferred conceptual alignment for the Inglewood

Figure 1.1-2: Los Angeles Stadium and Entertainment District at Hollywood Park (LASED)  
City of Inglewood Revitalization Rendering



Source: LASED Website, 2018

Transit Connector Project. The Inglewood Transit Connector Project will be further defined as part of the environmental review process, and develop project delivery and implementation strategies.

## 1.2 INGLEWOOD TRANSIT CONNECTOR GOALS AND OBJECTIVES

The City of Inglewood provides a compelling example of what communities can accomplish when leaders, local organizations and citizens join forces to change the status quo and improve the quality of life. In recent years, the City has made great strides to improve the quality and delivery of essential public services and update its transportation infrastructure. Today, Metro is working to complete the construction of the Crenshaw/LAX Line into Inglewood by 2019, increasing access to public transportation for local residents. Stations at Aviation/Century, Westchester/Veterans, Downtown Inglewood, Fairview Heights, Hyde Park, Leimert Park, MLK Jr., and Expo/Crenshaw are currently under construction. The Metro Crenshaw/LAX will extend light rail transit from the existing Metro Expo Line Station at Crenshaw/Exposition Boulevards to the Metro Green Line station at Aviation/Century Boulevards, and will provide a transit connection to Los Angeles International Airport (LAX) via the City of Los Angeles' Automated People Mover (APM) system at the Airport Metro Connector 96th Street Transit Station. The approximately 8.5 mile light rail transit line will include two stations in Inglewood including the Fairview Heights station and the Downtown Inglewood station. As the City experiences a historic revitalization and benefits from Metro's major transit investment, it is important to synergize and build upon the new development occurring within City boundaries.

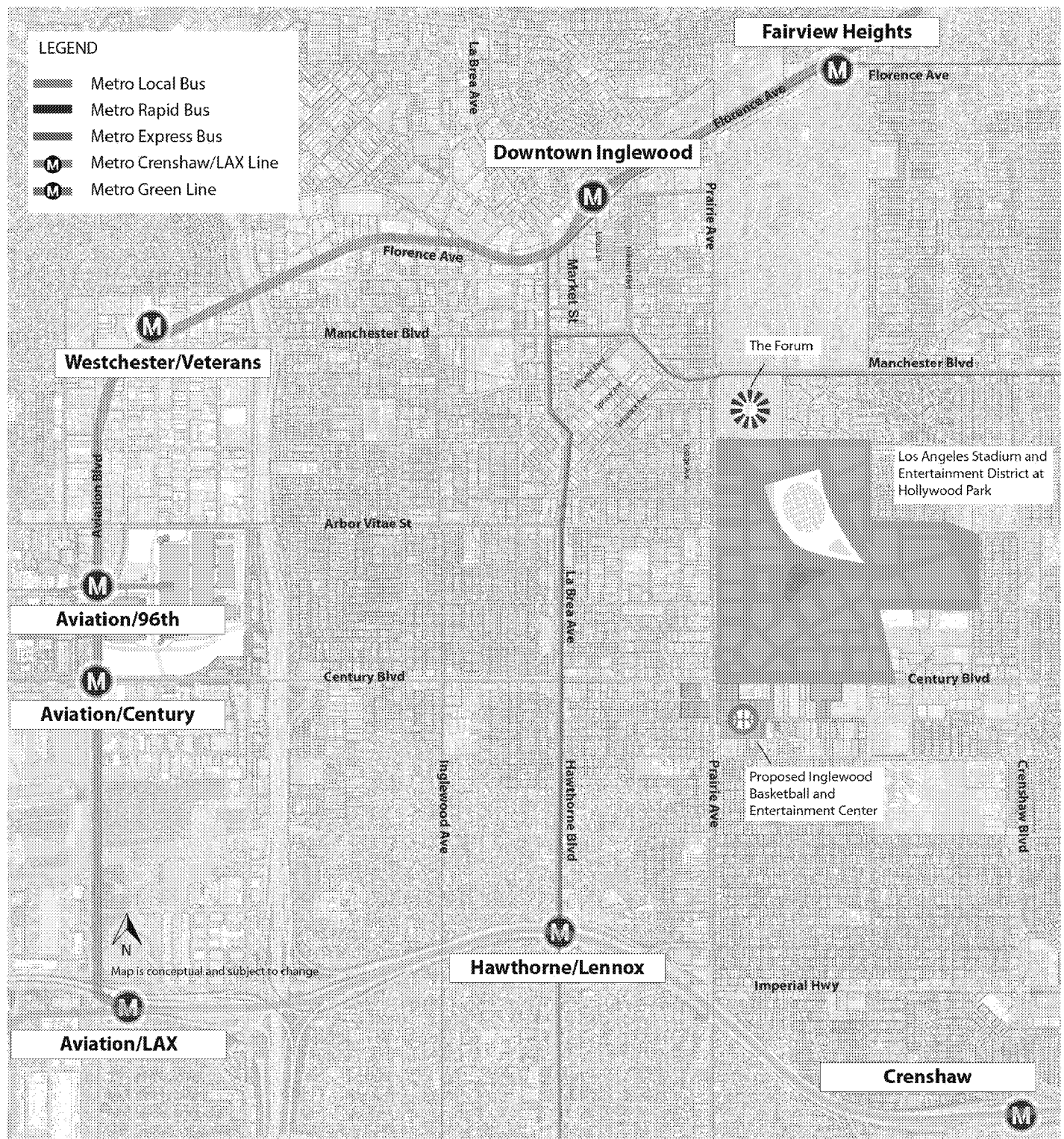
The City is now also working diligently to prepare for the LASED opening and is developing a comprehensive Inglewood Sports and Entertainment Center Transportation Management and Operations Plan (TMOP). Preliminary

analysis indicates that Stadium events could generate over 10,000 additional trips in the AM peak hours, and over 15,000 additional trips during the PM peak hours. The Stadium will provide more than 9,000 parking spaces, consistent with the Hollywood Park Specific Plan requirements, and will also rely on off-site satellite parking with event shuttle service. Yet, while buses, Transportation Network Companies, taxis, shuttles, and other modes will be critical transportation options to access the City's event centers, these modes will still compete with existing roadway traffic and may not provide a convenient time-certain connectivity compared to an elevated rail connection. The physical capacity of the existing local and regional roadway network may challenge the ability of visitors to conveniently access the City's amenities. While a comprehensive satellite parking and shuttle program is being developed for operation on the Stadium's opening day, requisite staging areas will still entail drop-off and pick-up facilities at each end, potentially diverting valuable real estate from its highest and best use. Additionally, even if patrons elect to use transit to Inglewood, the City's new sports and entertainment centers are located approximately 1.5 to 2 miles away from regional transit, leaving a critical last-mile gap.

Accordingly, the City is wholly committed to providing world-class transportation connections to its new state-of-the-art sports and entertainment center and is working diligently to define and propose a last-mile fixed guideway transit connector, referred to as the Inglewood Transit Connector Project. Mobility and direct transit access to the City's new activity centers are critical top priorities, especially given local and regional goals to increase transportation choices, reduce greenhouse gas emissions, improve air quality and human health, and encourage sustainable development patterns. Specifically, the City's goals and objectives for the Inglewood Transit Connector Project are to:

- Encourage intermodal transportation systems by providing convenient, reliable, time-certain transit service and direct transit accessibility and connectivity to the City's major activity centers.
- Reduce the City's traffic congestion and alleviate growing

Figure 1.2-1: Existing Metro Connections to the City of Inglewood



Source: Trifiletti Consulting, 2018

demand on the existing roadway network for both event and non-event days.

- Increase transit mode split and reduce trips and overall vehicle miles traveled to the City's major activity centers, which will improve overall air quality, public health, environmental outcomes and reduce greenhouse gas emissions.
- Activate and synergize with development and redevelopment within the City and enhance the City's economic development, social cohesion, equity and community resilience.
- Connect its community and citizens to jobs, education, services, destinations within the City and within the region, and support regional efforts to become more efficient, economically strong, equitable and sustainable.

The City has evaluated several independent last-mile fixed guideway transit connector options, comparing these options against key screening criteria and evaluating each

option against the City's stated goals and objectives. The City recognizes that an efficient and effective transportation network is essential to achieving the full benefits of this ongoing and widespread investment.

Table 1.2-1: Metro Rail Stations Near City of Inglewood

METRO RAIL STATIONS NEAR CITY OF INGLEWOOD	APPROXIMATE WALKING DISTANCE TO HOLLYWOOD PARK NFL STADIUM
Aviation/Century	2.5 miles
Westchester/ Veterans	2.2 miles
Downtown Inglewood	1.3 miles
Fairview Heights	1.7 miles
Aviation/LAX	3.5 miles
Hawthorne/Lennox	1.8 miles

Source: Google Maps, 2018

This map illustrates the proposed Silver Line extension of the Los Angeles Metro system. The route is shown as a dashed line with station locations marked by circles. The extension starts in Culver City and travels south through Inglewood, Hawthorne, Gardena, and Rosemead, ending in Manhattan Beach. Key stations include Leimert Park, Hyde Park, Fairview Heights, Downtown Inglewood, Westchester / Veterans, Aviation / Century, Hawthorne / Lennox, Aviation / LAX, Mariposa, El Segundo, Douglas, Redondo Beach, and Manhattan Beach. Park-and-ride lots are indicated by 'P' symbols with the number of parking spaces in parentheses. The map also shows major freeways (10, 101, 10, 101, 10, 101) and surrounding cities like Culver City, Inglewood, Hawthorne, Gardena, Rosemead, and Manhattan Beach. A legend in the bottom right corner defines the symbols for stations, the Silver Line, the Green Line, the Crenshaw / LAX Line (Under Construction), and Park & Ride lots. A scale bar at the bottom left indicates distances up to 1 mile.

**STATIONS**

**SILVER LINE**

**GREEN LINE**

**CRENSHAW / LAX LINE (UNDER CONSTRUCTION)**

**PARK & RIDE LOTS (NUMBER OF PARKING SPACES)**

0 0.5 1 Miles

City of Inglewood | 7

## 1.3 INGLEWOOD MOBILITY PLAN

Working in collaboration with the Southern California Association of Governments (SCAG), Metro, Caltrans, and surrounding transportation agencies and municipalities, the City has launched several parallel and coordinated transportation planning and programming efforts. The City of Inglewood's Circulation Element from the City's General Plan, which was adopted in 1992, will also be updated to reflect the City's long-range infrastructure needs and updated transportation goals, objectives, plans and projects. The Mobility Plan will include performance measures aligned with

the City's vision, goals, and objectives, and will include short-term and long-term transportation improvements and policy recommendations designed to improve and enhance the City's local and regional transportation networks. The Inglewood Transit Connector Project will be proposed as the centerpiece and backbone of the Inglewood Mobility Plan.

Figure 1.3-1: Envision Inglewood Website - Mobility Plan Illustration





# 1.4 EXISTING AND FUTURE LAND USE AND TRANSPORTATION CONDITIONS

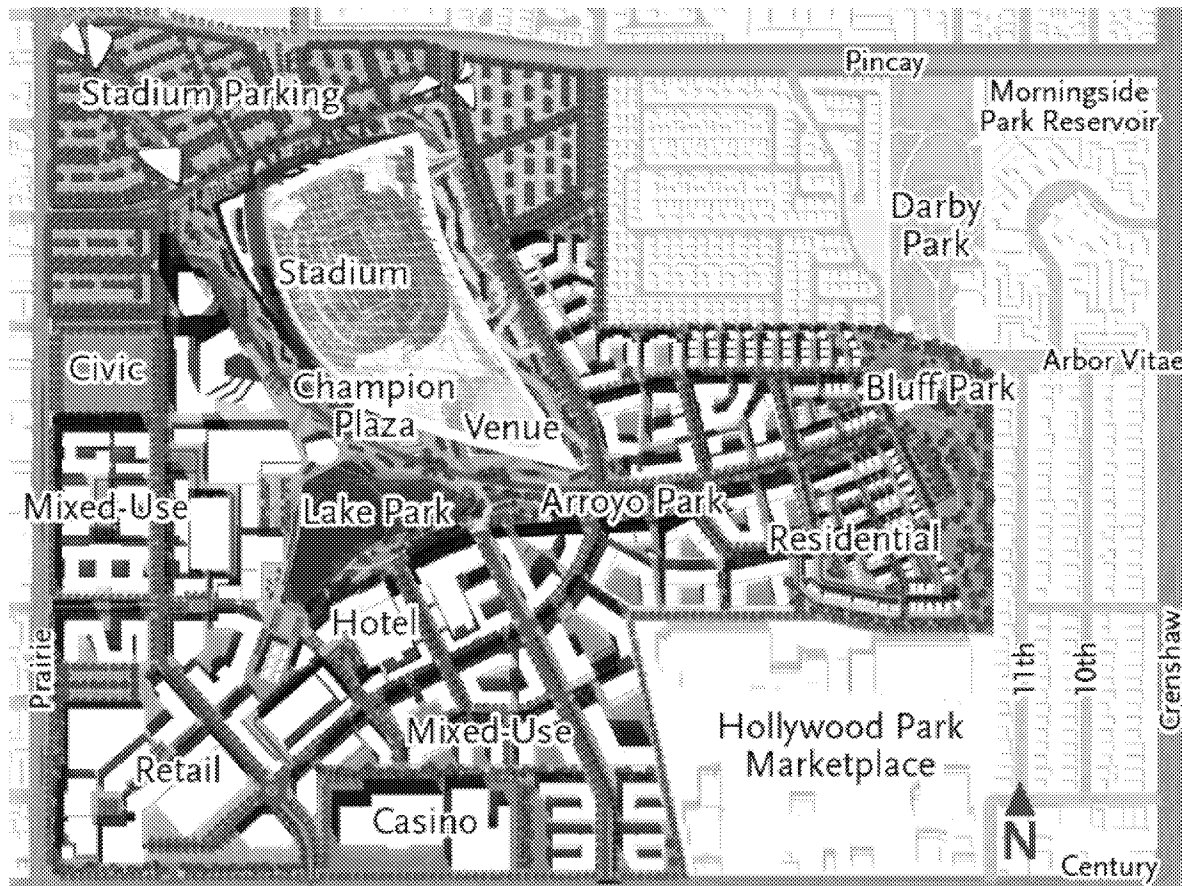
Located a few miles from downtown Los Angeles, the Silicon Beach tech corridor in West Los Angeles and just east of the Los Angeles International Airport and Gateway to Los Angeles hotel and business district, the City of Inglewood is a centrally located area that is seeing new construction and renewed economic development.

The following important projects under construction or proposed within the City are highlighted below.

## 1.4.1 Los Angeles Stadium and Entertainment District at Hollywood Park (LASED)

The LASED project, a new mixed-use, master planned community on the site of the former Hollywood Park racetrack and equestrian training facility, started construction in 2014 and is slated for completion by 2023. The project will transform underutilized asphalt lots and the former racetrack into a vibrant mixed-use community. The project includes a number of new uses including 2,500 residential units, 890,000 square feet of retail, 780,000 square feet of office and a 300-room hotel, as well as 25 acres of new recreational and park amenities for the City. The signature component of the project is new 75,000-seat NFL stadium, which includes a 6,000-seat performance venue that will be home to both the NFL Los Angeles Rams and Los Angeles Chargers teams. The stadium is set to open in 2020.

Figure 1.4-1: Los Angeles Stadium and Entertainment District at Hollywood Park (LASED) Site Plan



Source: City of Inglewood

According to Moody's Analytics, the LASED project is expected to generate nearly \$1 billion in tourist expenditures for the City, pump \$3.8 billion per year into the local economy, and add \$18.7 to \$28 million annually to the City's general fund. The LASED project includes roadway infrastructure upgrades, to modernize traffic systems with intelligent traffic signal systems (ITS) and a state-of-the-art traffic management command center, and implement physical mitigation measures at various intersections along Prairie Avenue and Century Boulevard.

#### 1.4.2 The Forum

Constructed in 1967, The Forum, a multi-purpose indoor arena, has served for decades as one of the region's premier sports and entertainment venues. In 2014, The Forum completed a multi-million-dollar renovation and was added to the National Register of Historic Places. The Forum now actively hosts the largest entertainment acts in the country and is scheduled to host events during the 2028 Summer Olympic games.

#### 1.4.3 The Proposed Inglewood Basketball and Entertainment Center

In June 2017, the NBA's Los Angeles Clippers team announced a proposal to construct a new arena and sports facility in Inglewood designed to host the team and other non-sporting events. In February 2018, the City initiated the environmental clearance process for the proposed project by releasing the Notice of Preparation (NOP) for a Draft Environmental Impact Report (EIR). The proposed project is located on approximately 27 acres and includes an 18,000 fixed seat arena, an approximately 85,000-square foot team practice and athletic training facility, approximately 55,000 square feet of LA Clippers team office space, approximately 25,000-square foot sports medicine clinic for team and potential general public use, approximately 40,000 square feet of retail and other ancillary uses that would include community and youth-oriented space, an outdoor plaza with an approximate area of 260,000 square feet including landscaping, outdoor basketball courts, outdoor community gathering space, and parking facilities sufficient to meet the needs of the proposed uses.

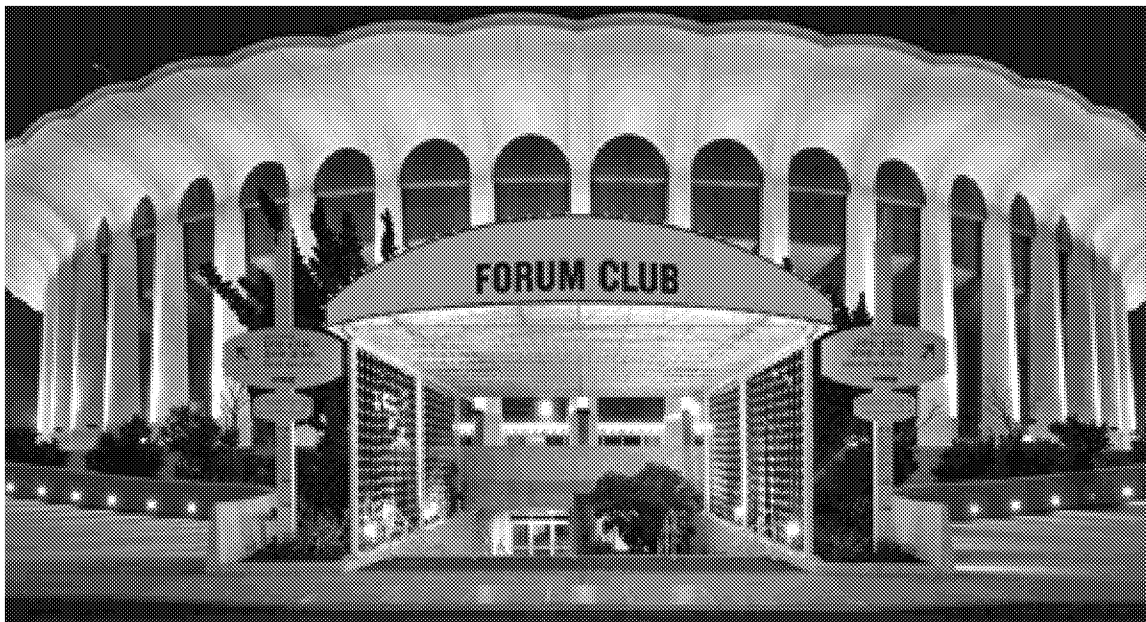
Figure 1.4-2: Los Angeles Stadium and Entertainment District at Hollywood Park (LASED) Rendering



Source: LASED Website, 2018

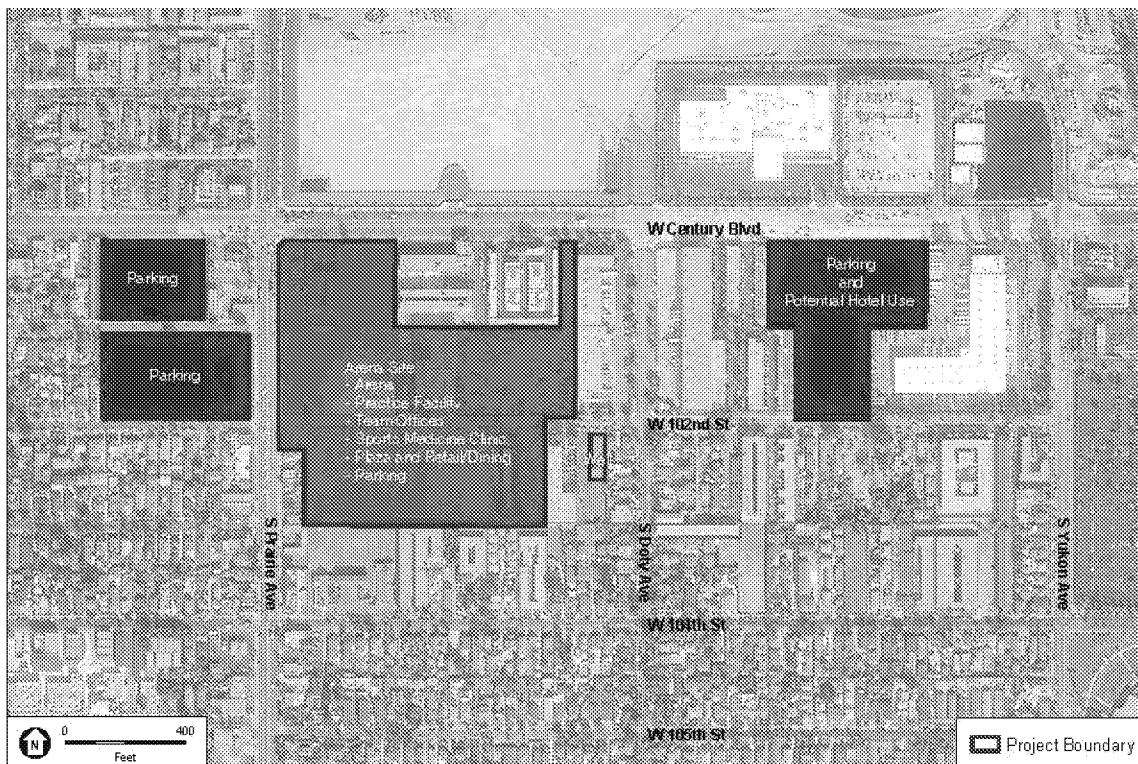


Figure 1.4-3: The Forum



Source: City of Inglewood, 2018

Figure 1.4-4: Proposed Inglewood Basketball and Entertainment Center Preliminary Site Plan



Source: City of Inglewood, Notice of Preparation, 2018

#### 1.4.4 Market Street

The City of Inglewood is also working to revitalize downtown Inglewood in time to synergize with the future Metro Crenshaw/LAX station. The City is encouraging the design and development of new residential, mixed-use and retail oriented projects along Inglewood's Market street along with signage, marketing, landscaping and traffic calming improvements. Situated in the heart of Inglewood's Historic Core, The Miracle Theater was once connected to greater Los Angeles by the Red Car system. Today's Metro Crenshaw/LAX line will stop in downtown Inglewood just three blocks from The Miracle on Market Street. Classic theaters throughout Los Angeles are currently being re-energized as vital cultural venues. In the late 1940s through the early 1960s, Inglewood's Market Street hosted Hollywood film premieres at several movie houses including The Fox Theater, The United Artist's Theater,

and The Ritz Theater. Built in 1937, The Ritz (now revived as The Miracle) is once again home to local and international entertainment. Featuring music, movies, comedy, and community events, The Miracle Theater provides a venue for arts and culture on Market Street.

Figure 1.4-5: Screening of HBO Series, *Insecure: Season 2*, Miracle Theater on Market Street, Fall 2017



Source: Miracle Theater Website, 2018

## 1.5 EXISTING FREEWAY/ ARTERIAL ROADWAYS

Four major interstate highways serve the Inglewood area, including the Santa Monica Freeway (I-10) and Glenn Anderson Freeway (I-105), running east/west, the San Diego Freeway (I-405) running north/south and the Harbor Freeway (I-110) running north/south just east of the Study Area. The I-10, I-105, I-110 and the I-405 experience high levels of congestion, particularly during peak commute periods. I-105 and I-405 experience heavy traffic throughout the day as they provide regional access to West Los Angeles and Los Angeles International Airport.

The roadway system in the City is primarily a grid that includes arterials, collectors, and local roads. A major arterial thoroughfare is a high-capacity urban road with the primary function of delivering traffic from collector roads to freeways or expressways, and between urban centers at the highest level of service possible.

According to the City of Inglewood 1992 Circulation Element, the following streets within in the City are classified as major arterials:

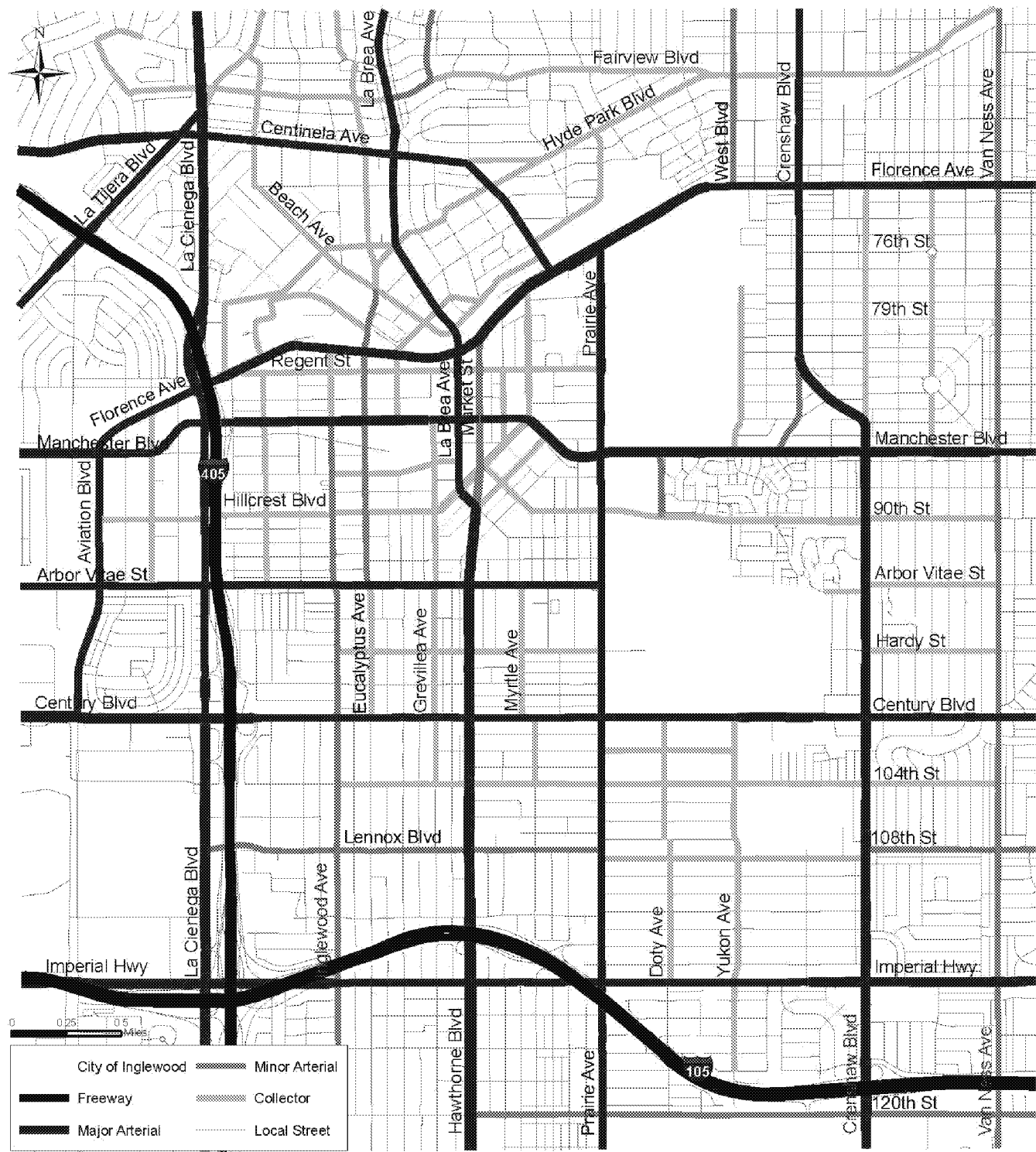
1. Arbor Vitae Street
2. Centinela Avenue
3. Century Boulevard
4. Crenshaw Boulevard
5. Florence Avenue
6. Hawthorne Boulevard
7. Imperial Highway
8. La Brea Avenue
9. La Cienega Boulevard
10. Manchester Boulevard
11. Prairie Avenue

Minor or secondary arterials are similar to major arterials except that they may be discontinuous within the city, may carry less traffic volume and/or may serve as extensions of other major arterials. According to the City of Inglewood 1992 Circulation Element, the following streets within the Study Area is classified as a minor arterial:

1. Crenshaw Drive
2. Eucalyptus Avenue (Beach to Arbor Vitae)
3. Fairview Boulevard (La Brea to Overhill)
4. Kareem Court (Forum Road)
5. Inglewood Avenue (south of Manchester)
6. Lennox Boulevard
7. Market Street (Florence to La Brea)
8. Overhill Drive
9. Van Ness Avenue
10. West Boulevard (north of Florence)
11. 108th Street (east of Crenshaw)

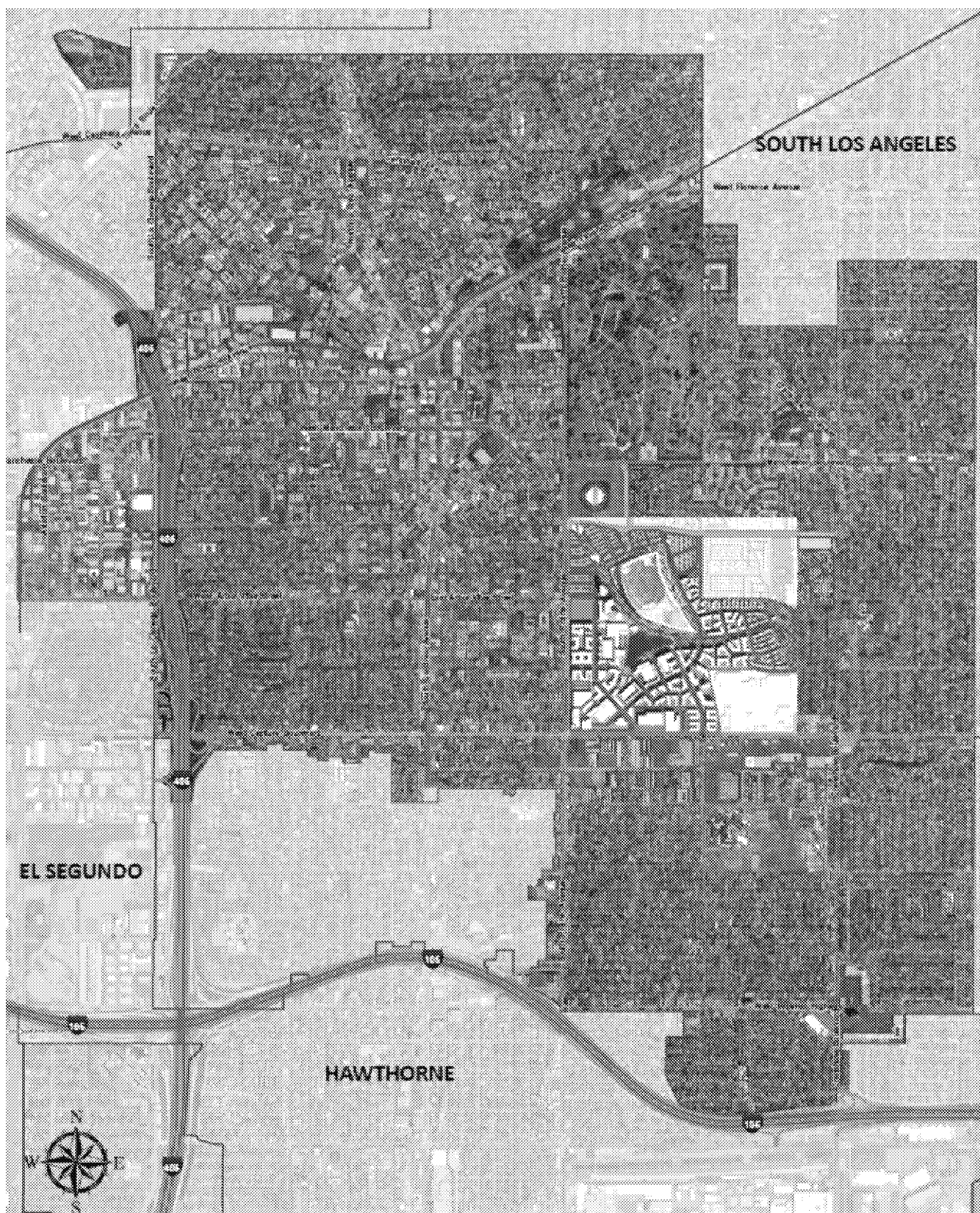
Figure 1.5-1 illustrates Inglewood's freeway and roadway system (arterial, collector, and local streets).

Figure 1.5-1: City of Inglewood General Plan: Circulation Element, 1992



Source: City of Inglewood, 1992

Figure 1.5-2: City of Inglewood, 2018



Source: Trifletti Consulting, 2018

## 1.6 FUTURE FREEWAY/ ARTERIAL ROADWAYS

Several roadway improvements within the City of Inglewood are either programmed or under construction. They include:

- Century Boulevard Corridor Improvements.
- Prairie Avenue Corridor Improvements.
- Florence Avenue and Centinela Avenue Roadway Segment Improvements.
- Citywide Intelligent Transportation System (ITS) Improvements.
- Other intersection improvements.

Several regional improvements outside the City's jurisdiction that would have a positive impact on traffic flow, network connectivity and circulation are either proposed as mitigations or are being planned as part of the SCAG's RTP/SCS and Metro's Long Range Transportation Plan (LRTP). They include:

- I-405 Improvements.
- La Cienega Boulevard Corridor Improvements.
- I-105 Fast-Track Implementation Improvements
- Other improvements.

Additionally, several specific intersection improvements are anticipated as project design features or traffic mitigations required as part of the Hollywood Park Development Project, including but not limiting to, at the following intersections:

- Re-stripe eastbound Arbor Vitae approach.
- Modifications of traffic signal improvements at Arbor Vitae/Prairie, Hardy/Prairie, Prairie/Century, Doty/Century and Yukon/Century.
- Upgrade seven intersections with ITS traffic signal improvements per the EIR including Crenshaw/Century, Prairie/Century, Doty/Century, Yukon/Century, Club Drive/Century, 11th Ave/Century and Van Ness/Century
- Install southbound right-turn lane at Crenshaw and Century Boulevards.
- New private access road to the Hollywood Park Casino.

## 1.7 INGLEWOOD EXISTING TRANSIT

Transit service in Inglewood is provided by Metro and the City of Inglewood. The characteristics of bus services in the City of Inglewood are summarized in Table 1.7-1 and Table 1.7-2, while Figures 1.7-2 and 1.7-3 illustrate existing transit routes for all bus and rail lines within the City.

A combination of Metro Local and Rapid buses provide service to the City of Inglewood, with limited service during weekends and evenings. Inglewood is currently serviced by City-operated I-Line and Metro transportation agencies. The Metro lines serving Inglewood include: Lines 40, 102, 110, 111, 115, 117, 120, 126, 209, 210, 211, 212/312, 217, 442, 607, 625, 710, and 740. These lines connect the City of Inglewood to the greater Los Angeles region. Metro's new LAX/Crenshaw is currently under construction and will provide service to Inglewood at the Downtown Inglewood Station at Florence Avenue and Market Street. An additional Crenshaw/LAX will be built immediately adjacent to the City of Inglewood at Westchester/Veteran at the southwest border of the City.

As part of the City's Mobility Plan and Event Transportation Management and Operations Plan, the City is working with Metro and other municipal bus operators to increase and enhance transit service to City of Inglewood destinations.

Table 1.7-1: Metro Bus Service in the City of Inglewood

OPERATOR	ROUTE	SERVICE AREA		ANNUAL ROUTE RIDERSHIP
		FROM/TO	TO/FROM	
Metro	40	Downtown Los Angeles	South Bay Galleria	8,649
	102	LAX City Bus Center	South Gate	33
	110	Playa Vista	Bell Gardens	2,840
	111	LAX	Norwalk Station	4,305
	115	Playa Del Rey	Norwalk Station	8,734
	117	City Bus Center	Downey	9,359
	120	LAX	Whittwood Town Center	1,177
	126	Manhattan Beach & Valley Dr.	Hawthorne Station	3
	209	Wilshire Center	Athens	88
	210	Hollywood/Vine Station	South Bay Galleria	4,452
	211	Redondo Beach	Inglewood	413
	212	Hawthorne/Lennox Station	Hollywood/Vine Red Line Station	10,788
	442	Hawthorne/Lennox Station	Downtown Los Angeles	118
	607	Inglewood Transit Center	Inglewood Transit Center	87
	710	Wilshire Center	South Bay Galleria	3,761
	740	Jefferson Park	South Bay Galleria	1,734

Source: Metro, 2018

Note: This data is for all Metro bus routes that pass through the City of Inglewood, is limited to activity that occurs within City boundaries, and includes boarding and alighting on weekdays and weekends.

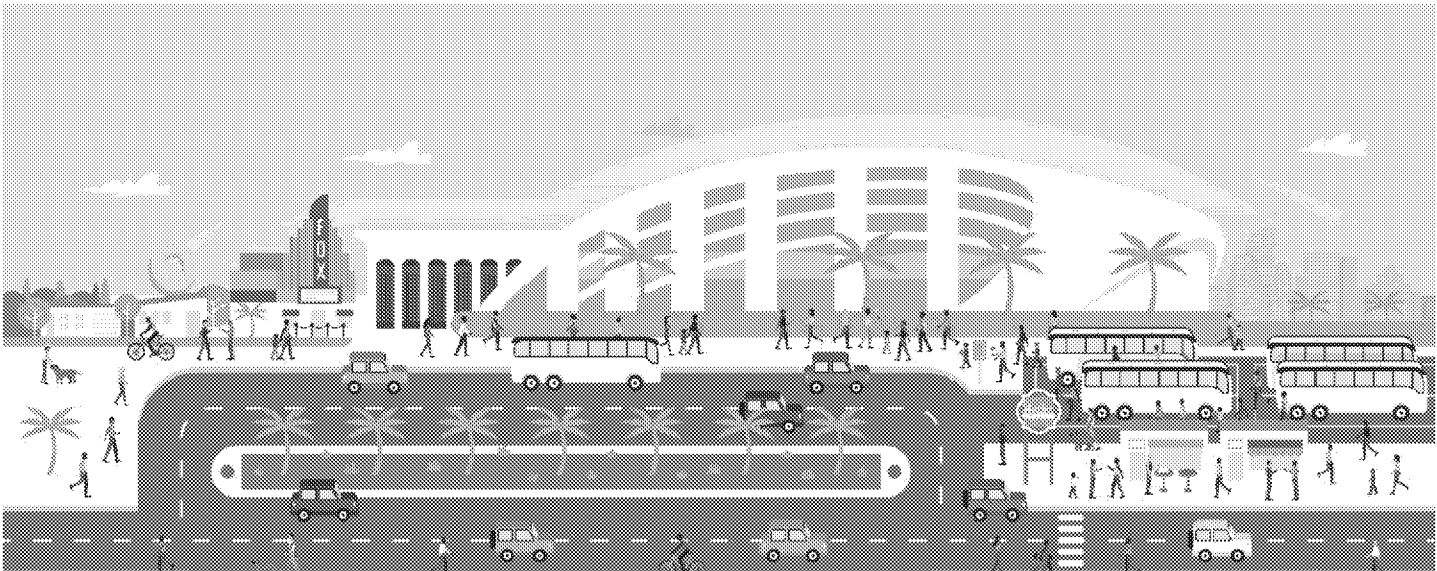


Table 1.7-2: Existing and Future Rail Service in the City of Inglewood

METRO RAIL LINE	DESCRIPTION
Metro Crenshaw/LAX Line	The Crenshaw/LAX transit line, currently under construction, has two stations located in the City of Inglewood – the Downtown Inglewood Station at the intersection of Florence Avenue and La Brea Avenue and the Fairview Heights Station at Florence Avenue and West Boulevard.
Metro Green Line	The Metro Green Line currently terminates at the Redondo Beach Station to the south and Norwalk Station to the east. It provides transfer service to the Blue Line, Silver Line and several Metro bus lines traveling north – south. Metro’s Expenditure Plan identifies the extension of the Green Line to Torrance at Crenshaw Boulevard. The project is anticipated to be completed by 2030.

Source: Metro, 2018

Figure 1.7-1 Envision Inglewood Website Illustration

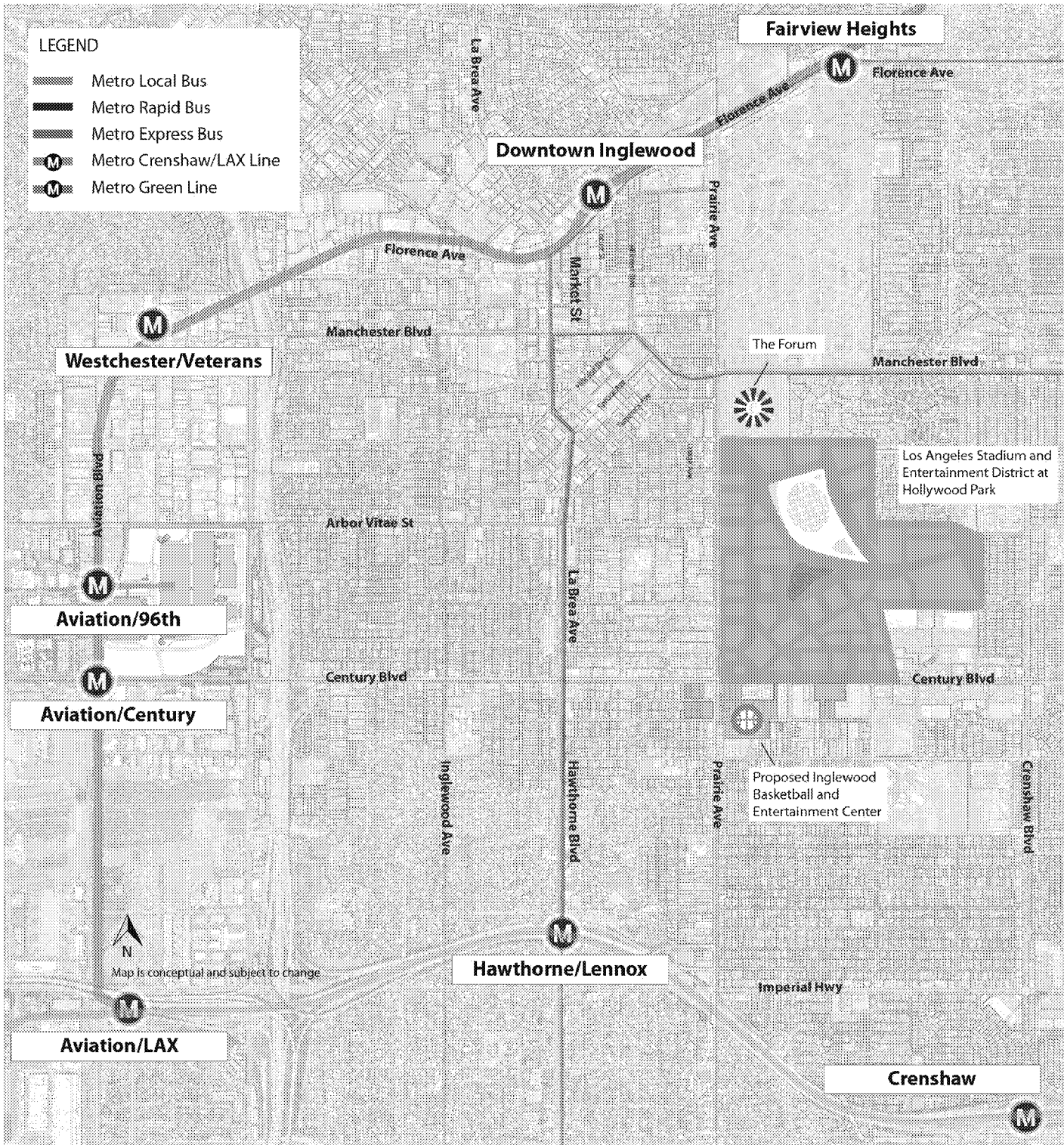




[illegible]

City of Inglewood | 19

Figure 1.7-3: Current Metro Rail Conectivity Throughout the City of Inglewood



Source: Trifiletti Consulting, 2018

# 1.8 METRO CITY OF CHAMPIONS/INGLEWOOD (NFL) PROJECT STUDY

Metro completed the City of Champions/Inglewood (NFL) Project Focused Analysis of Transit Connection Study in July 2017. Metro's study analyzed a potential underground rail transit connection from the under-construction Metro Crenshaw/LAX Fairview Heights at-grade light rail station at Florence south Prairie Avenue to the NFL Stadium/Hollywood Park mixed-use development. The study evaluated the feasibility of using high-capacity transit technology to serve the Los Angeles Stadium and Entertainment District at Hollywood Park under an Interlined Operability Scenario and Independent Operability Scenarios. The Metro study concluded the following, summarized below and in Figure 1.8-1:

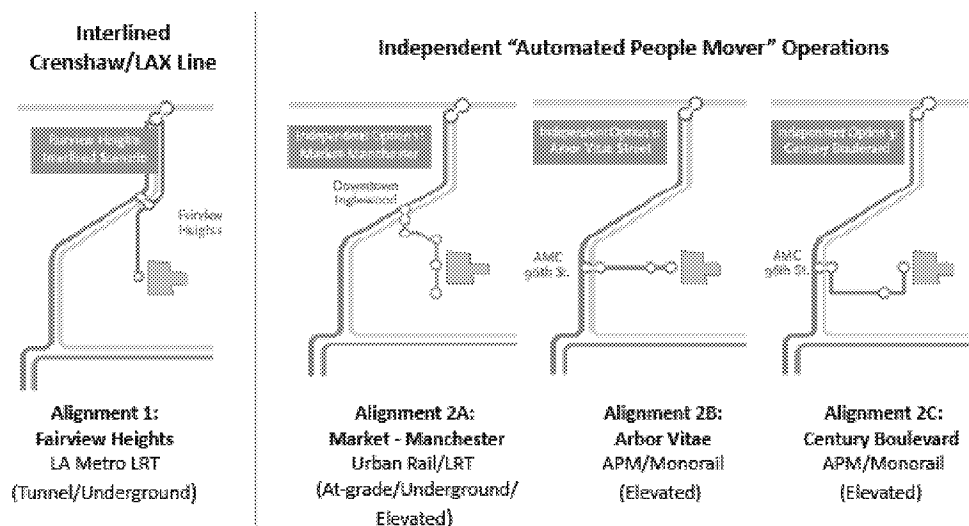
- Alignment 1 Fairview Heights: The Interlined Operability Scenario looked at a branch from the Crenshaw/LAX Line in a subway under Prairie Avenue.
- Alignment 2A Market-Manchester: An independent

urban rail transit connection to Downtown Inglewood to leverage Market Street in Inglewood's historic core and to promote economic development opportunities in the City.

- Alignment 2B Arbor Vitae: An independent automated people mover transit connection to the Airport Metro Connector 96th Street Transit Station via Arbor Vitae Street to provide connections to LAX and Metro's major multi-modal hub at the AMC 96th Street Transit Station.
- Alignment 2C Century Boulevard: An independent automated people mover transit connection to the Airport Metro Connector 96th Street Transit Station via Century Boulevard to provide connections to LAX and Metro's major multi-modal hub at the AMC 96th Street Transit Station.

Regarding the Independent Operability Scenario, other alternatives, which could be considerably less costly, were not studied, because of the City's concern that congestion during peak periods at the entertainment/stadium district could create conflicts with at-grade, fixed – guideway transit service, degrading transit service. Future "Long term" connections to the Green Line and Hawthorne were identified but not recommended for further study at this phase and were not included in Metro's analysis.

Figure 1.8-1: Metro Transit Alternatives



Source: Metro/AECOM, 2017

Table 1.8-1: Summary of Metro City of Champions/Inglewood (NFL) Project Study Findings

		INTERLINED WITH CRENSHAW/LAX LINE	INDEPENDENT		
			OPTION 1: DOWNTOWN VIA MARKET-MANCHESTER	OPTION 2: ARBOR VITAE	OPTION 3: CENTURY
CAPACITY GOAL	MAXIMUM CAPACITY	5,400 passengers/hr	13,500 passengers/hr	18,000 passengers/hr	
	PROJECTED RIDERS <sup>1</sup>	Average Weekday: 3,734 riders/day	Average Weekday: 3,158 riders/day	Average Weekday: 1,740 - 3,803 riders/day	
		Event: 4,130 - 15,000 attendees/event	Event: 3,900 - 14,300 attendees/event	Event: 6,120 - 24,180 attendees/event	
COST	CAPITAL COST (2017\$) <sup>2</sup>	\$1,333 - \$1.960 billion	\$497-\$746 million	\$561-\$990 million	\$563 million - \$1.049 billion
	OPERATION & MAINTENANCE COST (2017\$) <sup>3</sup>	\$13.6-\$22.5 million/year	\$11.2-\$17.1 million/year	\$9.9-\$14.3 million/year	\$11.0-\$17.1 million/year
TECHNOLOGY/MODE		Underground LRT	Urban Rail	APM/Monorail	
STATIONS		Fairview Heights, Development	Market North, Market South, Manchester, Forum, Development	AMC, La Brea, Development	AMC, La Cienega, La Brea, Century/Prairie, Development
DISTANCE (mi)		1.8 <sup>4</sup>	1.2	2.1	2.8
AVG SPEED (mi/hr)		35.6 <sup>4</sup>	14.9	32.7	24.6
ONE-WAY TRAVEL TIME (min.)		3.0 <sup>4</sup>	4.8	3.8	6.8
POTENTIAL RIGHT-OF-WAY ACQUISITION (acres)		22	15	33	19
PRIVATE/PUBLIC PARTNERSHIP OPPORTUNITIES		Low	High	High	High

1. Range reflects differences in attendance between teams, varying mode splits, and parking utilization (for Independent Option 2 & 3)

2. Range reflects a low and high capacity operating plan as well as uncertainty and contingency due to current stage of design

3. Range reflects a low and high capacity operating plan

4. Based on the new branch from Fairview Heights Station to the Development

Source: Metro/AECOM

The Metro study concluded that interlined operations with the Crenshaw/LAX line offered some advantages associated with a one-seat ride (thus avoiding passenger transfers) inter-operability and maintenance of fleet. However, the Metro study found a one-seat ride would introduce complexities to Metro regional network operations due to the introduction of an additional route to Los Angeles Stadium and Entertainment District at Hollywood Park. The operational headways for the overlapping routes must account for the route demands, which differ. For example, the special events/ game-day ridership demands on the Inglewood Transit Connector are exponentially higher than the peak hour demands of the other Metro rail routes. Metro deemed the Interlined Operability alternative not feasible due to the costs and operational impacts on the regional system.

The Metro study concluded the following:

- The existing and planned venues within the City of Inglewood are major traffic generators with a high event driven transit mode share.

- Independent APM operations would better serve the event driven ridership.
- The single seat interlined operation would introduce complexities and added costs to the mainline rail operations.
- While Metro deemed the Interlined Option not viable, it recommended that the City further develop independent automated people mover options to serve major development sites.
- A public-private-partnership strategy and an Enhanced Infrastructure Financing District is recommended, especially since Measure M and the Metro Long Range Transportation Plan do not earmark funding for such a project.

Figure 1.8-2: Iconic Market Street Sign



Source: Olivia Niland for Neon Tommy, 2014



## 2. INGLEWOOD TRANSIT CONNECTOR ALTERNATIVES



## 2.1 INGLEWOOD TRANSIT CONNECTOR ALTERNATIVES

To build upon the work initiated by Metro, the City refined the Inglewood Transit Connector Alternatives to achieve the City's goals and objectives. Accordingly, this Study evaluates the following four conceptual transit alternatives, all consisting of elevated APM Systems:

- Alternative A: Market-Manchester Alignment
- Alternative B: Fairview Heights Alignment
- Alternative C: Arbor Vitae Alignment
- Alternative D: Century Boulevard Alignment

This Study is evaluating for overall project feasibility, and therefore it should be stressed that each alternative is based on a conceptual, preliminary design. Engineering would undoubtedly result in shifts and modifications to the overall project design, including stations, platforms and support facilities. Yet, preliminary conceptual designs are provided so

that various alternative concepts can be compared with one another and feasibility issues can be identified.

Each of the alternatives described in Sections 2.2 through 2.5 provide an assessment of APM technologies with key findings on the candidate technologies that would be viable for the Inglewood Transit Connector Project. The specific technology is expected to be selected through a competitive procurement process and is not dependent on the selection of the preferred alignment. A number of alternative features and project characteristics are expected to be comparable to each other. These non-differing characteristics are 1) station size, configuration and locations/distances serving the key traffic generators; 2) guideway right-of-way and elevations; 3) maintenance and storage facilities; and 4) passenger convenience/amenities. It is assumed for purposes of this analysis that each station and station access will be comparable across the Alternatives. This Report also includes specific details associated with each of these non-differentiating characteristics.



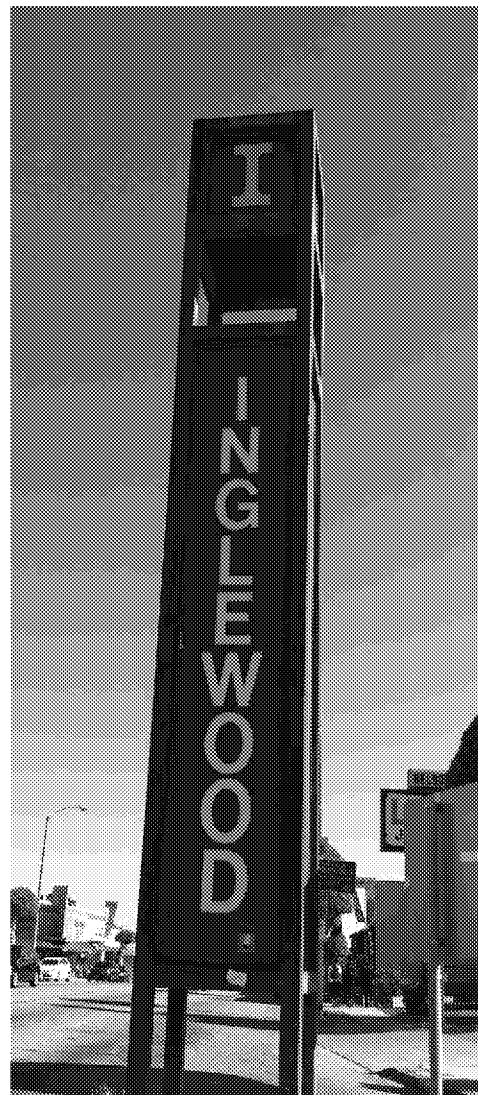
Los Angeles Clippers

## 2.2 ALTERNATIVE A: MARKET-MANCHESTER ALIGNMENT

The Market-Manchester Alignment (Alternative A) is an aerial alignment that runs approximately one-quarter of a mile along Market Street between Florence Avenue and Manchester Boulevard, where it transitions east along Manchester Boulevard for approximately half a mile to Prairie Avenue. The alignment continues for approximately one mile south of Manchester Boulevard along Prairie to Century Boulevard. This Alternative provides service to downtown Inglewood, The Forum, Los Angeles Stadium and Entertainment District at Hollywood Park, and the proposed Inglewood Basketball and Entertainment Center. This is the shortest alignment concept in comparison to other options. The mainline length of this alternative is approximately 1.8 miles, dual-lane, and includes an anticipated five stations as illustrated in Figure 2.2-1. The station locations and number were identified to provide connections to the traffic generators/development, and potential opportunities for further development/investment.

Alternative A (see Figure 2.2-1) is designed to connect major development sites to Metro LAX/Crenshaw line station at downtown Inglewood and presents an opportunity for integration with local economic activity, current and future transit-oriented development, and other initiatives in the downtown/commercial district of Inglewood. Unlike the 2017 Metro study's urban rail technology and at-grade segment at Market Street, the City's option is proposed to be elevated so that the Inglewood Transit Connector would not compete for the same roadway network as other road-based vehicles.

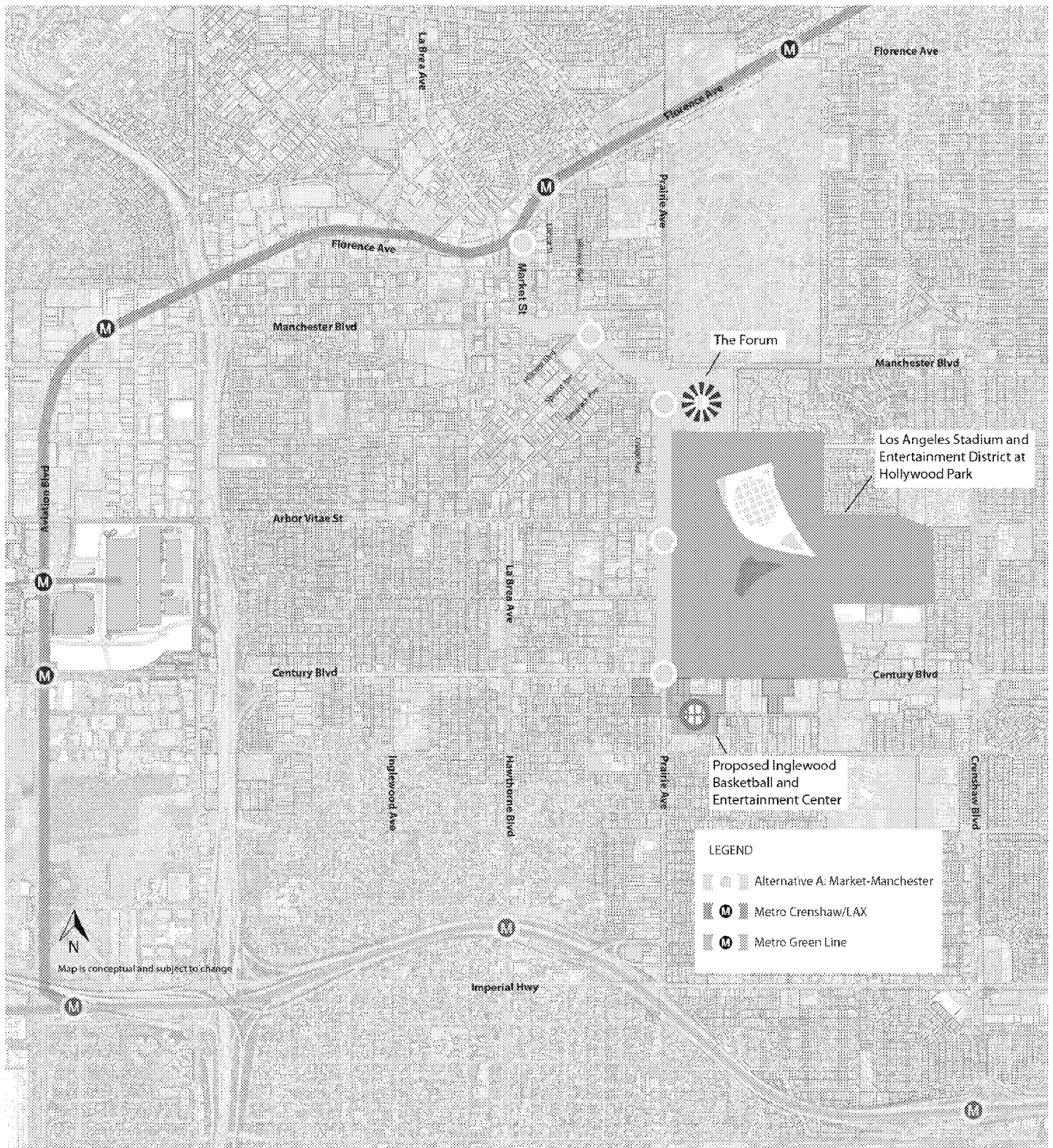
Possible intermodal facility locations to capture road-based traffic such as buses, transportation network companies (TNCs), taxis, and private vehicles, and facilitate a convenient transfer to the Internet Transit Connector have been identified (see Figure 2.2-1). These potential intermodal facilities provide an opportunity to limit the amount and type of road-based traffic into the area especially during special events. Such limits may be voluntary, based on convenience, and/or controlled through regulatory policies such as possible congestion pricing for access.



Source: City of Inglewood

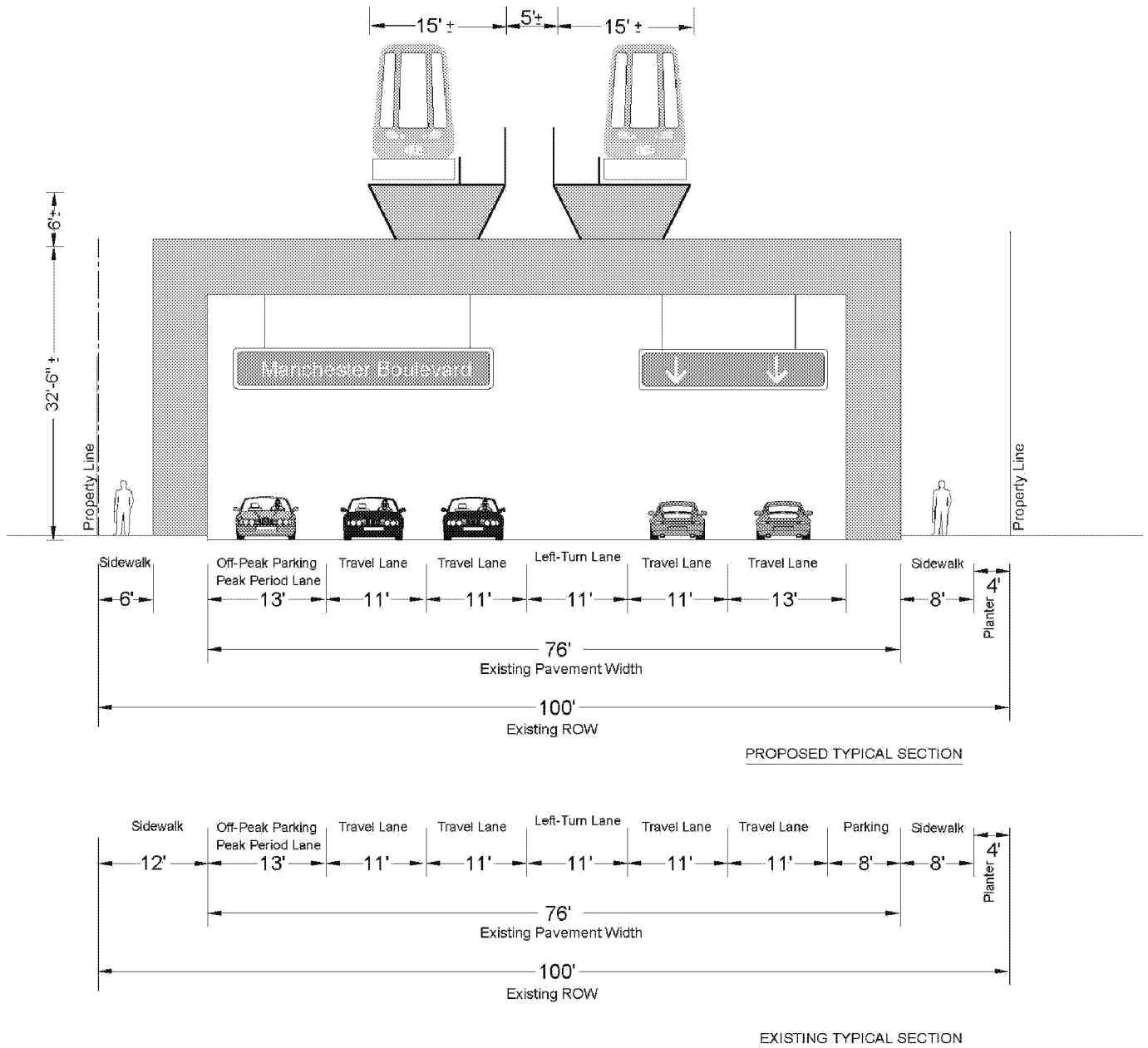


Figure 2.2-1: Alternative A: Market-Manchester Alignment



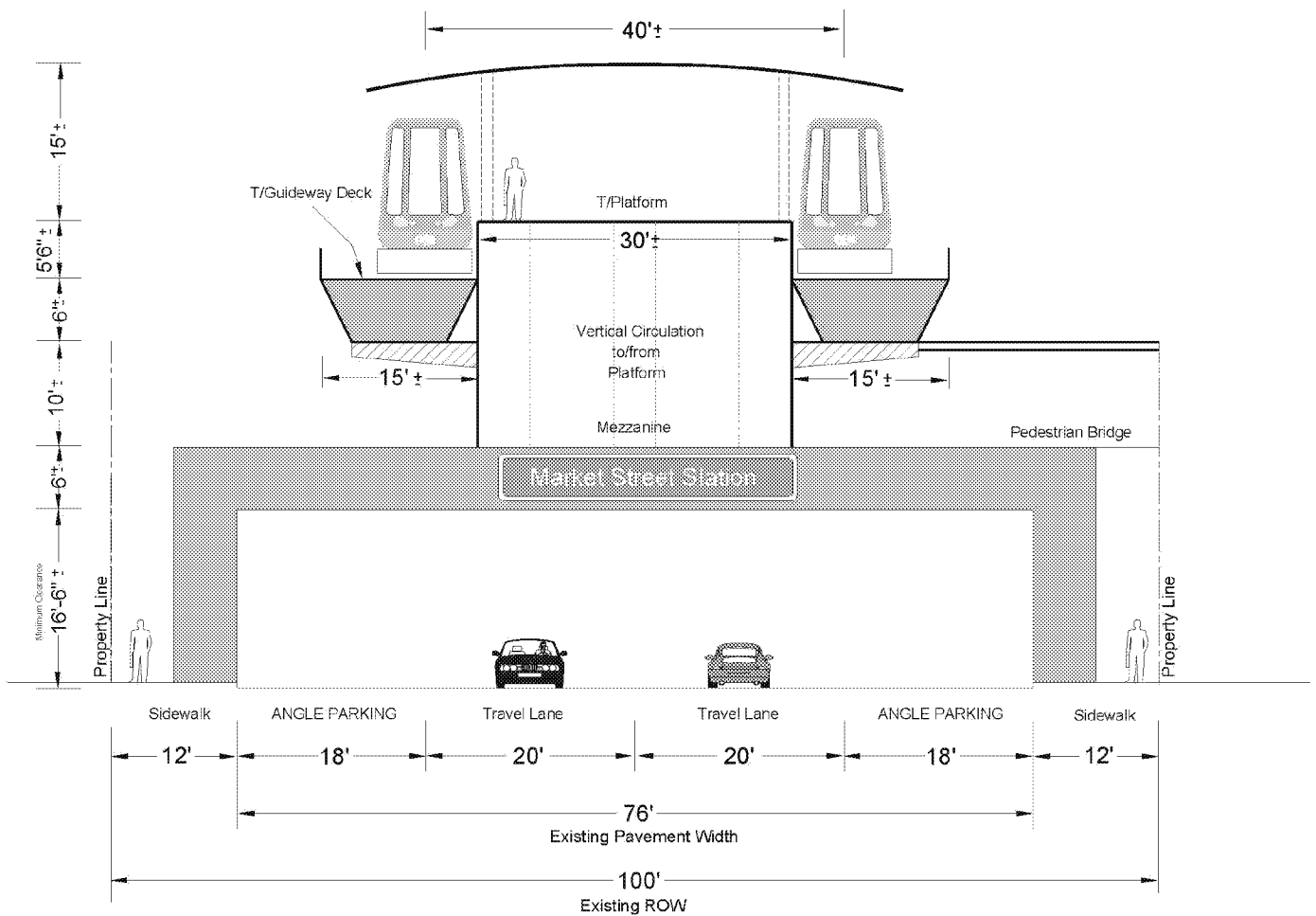
Source: Trifiletti Consulting, 2018

Figure 2.2-2: Alternative A: Market-Manchester Alignment  
Manchester Boulevard, Looking West in Between Stations



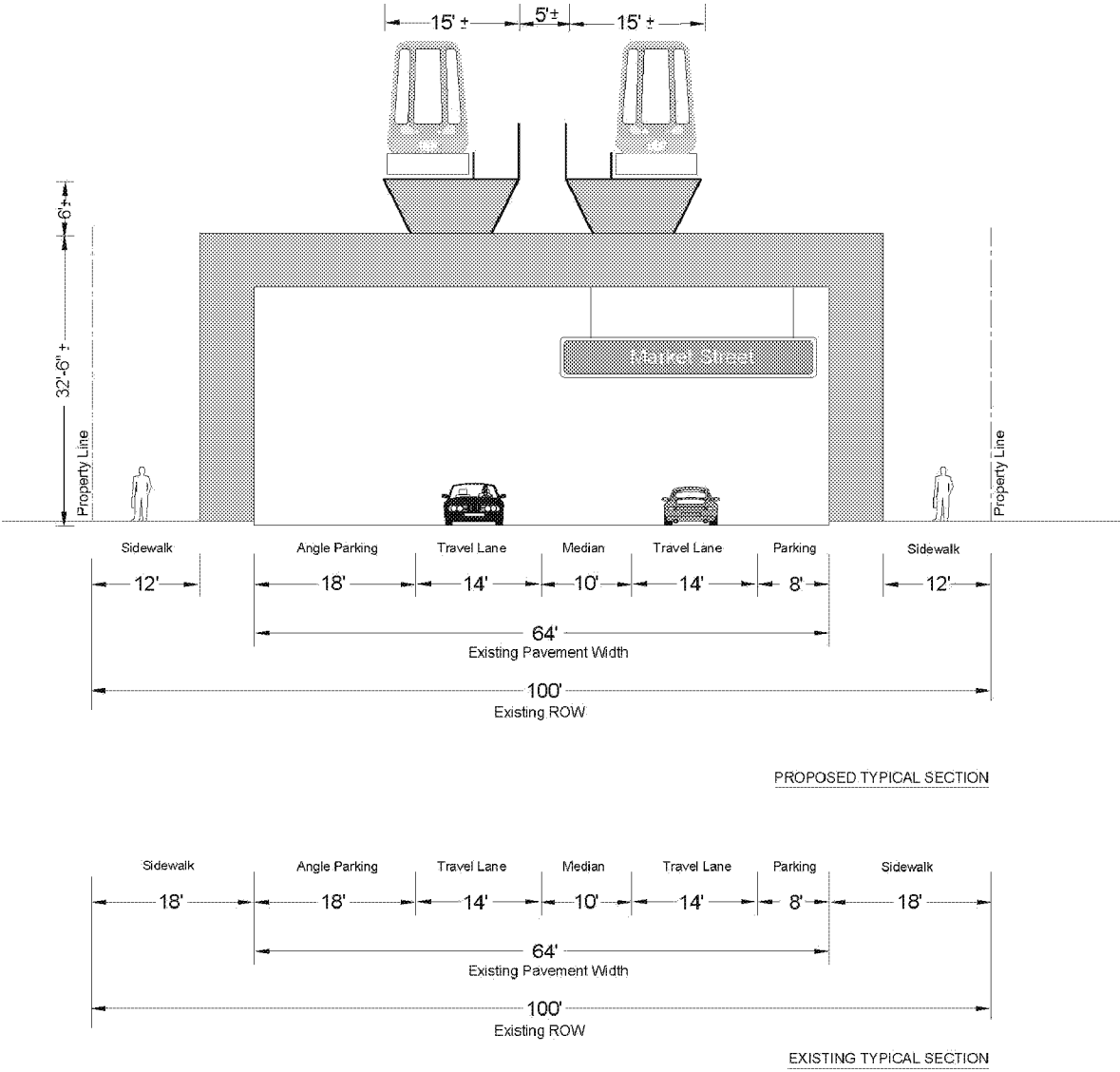
Source: Raju Associates, 2018

Figure 2.2-3: Alternative A: Market-Manchester Alignment  
Manchester Boulevard, Looking West at Station



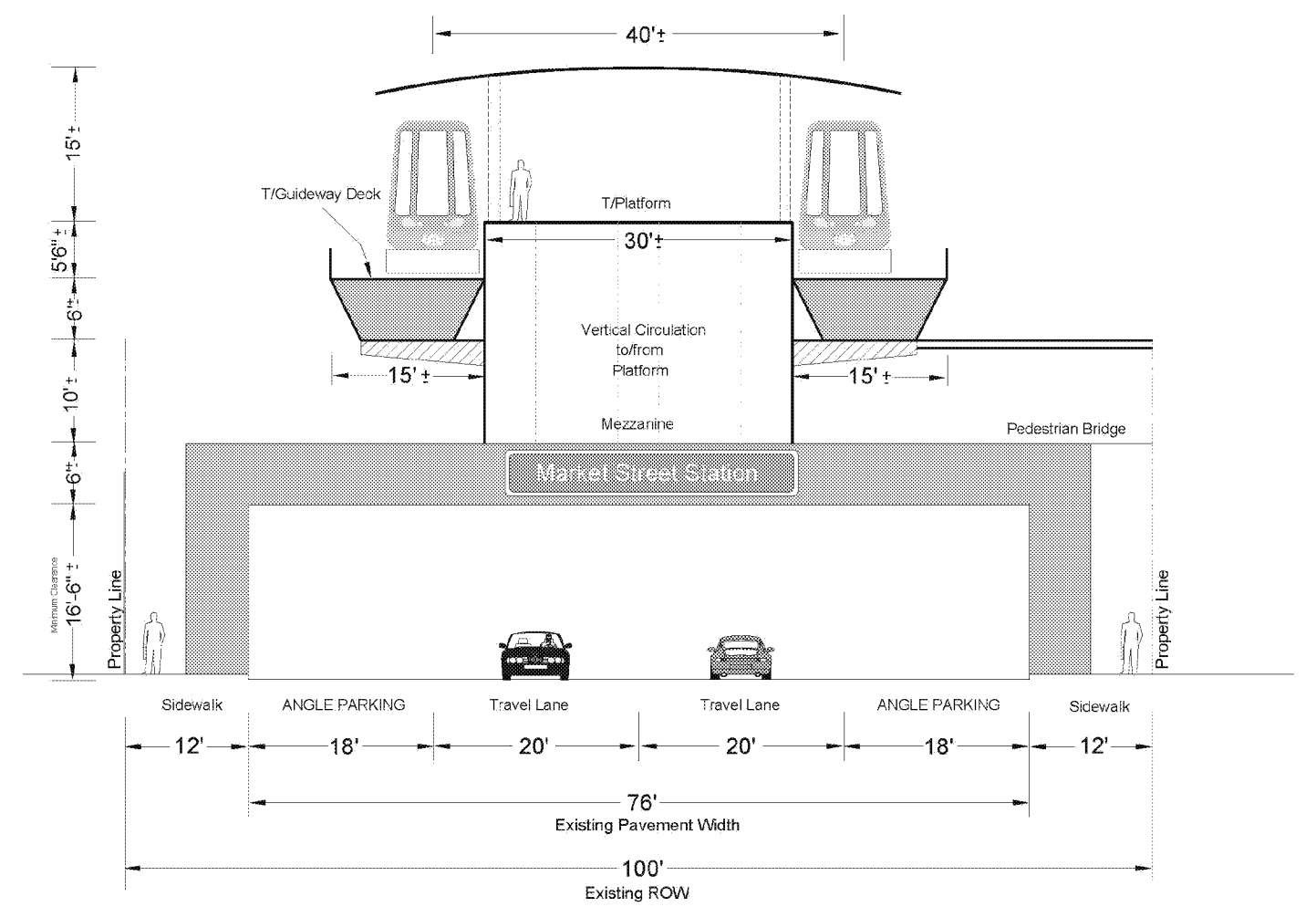
Source: Raju Associates, 2018

Figure 2.2-4: Alternative A: Market-Manchester Alignment  
Market Street, Looking North between Regent St and Queen St



Source: Raju Associates, 2018

Figure 2.2-5: Alternative A: Market-Manchester Alignment  
Market Street Looking North at Station



Source: Raju Associates, 2018

## 2.3 ALTERNATIVE B: FAIRVIEW HEIGHTS ALIGNMENT

including possible congestion pricing for access.

The City identified an independent elevated APM System as a refined alternative connecting directly to the Fairview Heights Station along Prairie Avenue. The Fairview Heights Alignment (see Figure 2.3-1) is an aerial alignment that runs approximately one-half mile along Florence Avenue between Prairie Avenue and West Boulevard. The alignment then transitions south along Prairie Avenue for approximately one and three-quarter miles between Florence Avenue to Century Boulevard. This Alternative provides service to downtown Inglewood, The Forum, LASED, and the proposed Inglewood Basketball and Entertainment Center. The mainline length of this alternative is approximately 2.2 miles, dual lane, and includes an anticipated four stations as illustrated in Figure 2.3-1. The number of stations and their locations were identified based on providing connections to traffic generators/development. Further development opportunities are limited by Edward Vincent Jr. Park, Inglewood Cemetery, and residential areas; furthermore, Alternative B would not service the downtown Inglewood area.

A possible intermodal facility location to capture road-based traffic such as buses, TNCs, taxis, and private vehicles, and facilitate a convenient transfer to the ITC has been identified. This potential intermodal facility provides an opportunity to limit the amount and type of road-based traffic into the area especially during special events. Such limits may be voluntary based on convenience, and/or regulatory through policies

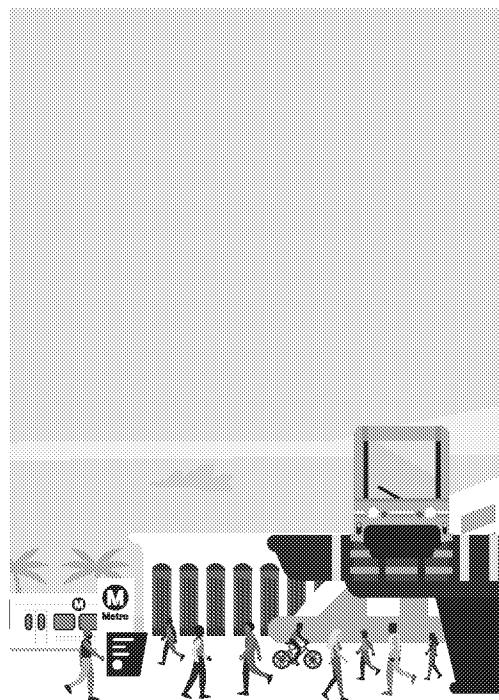
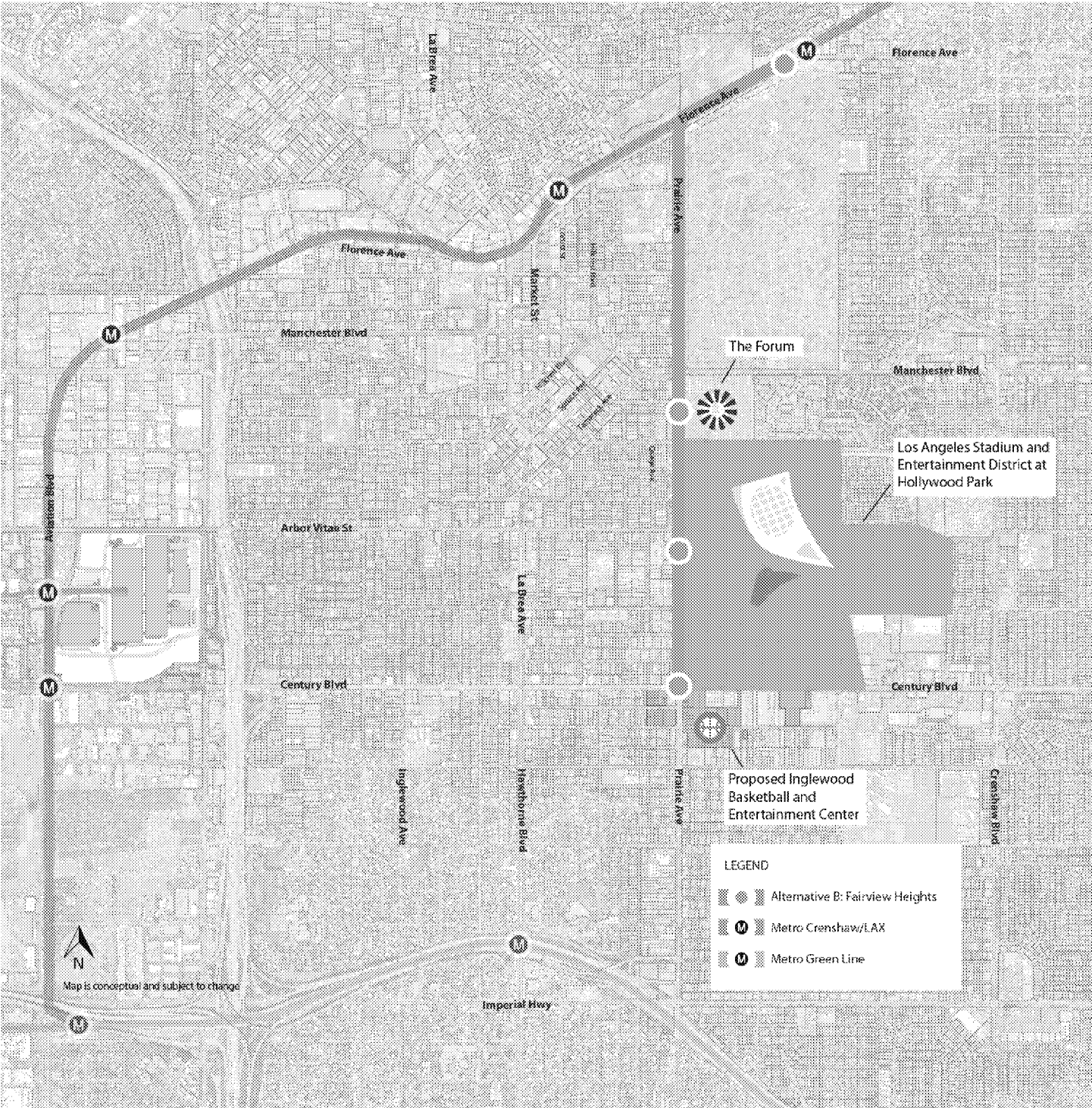
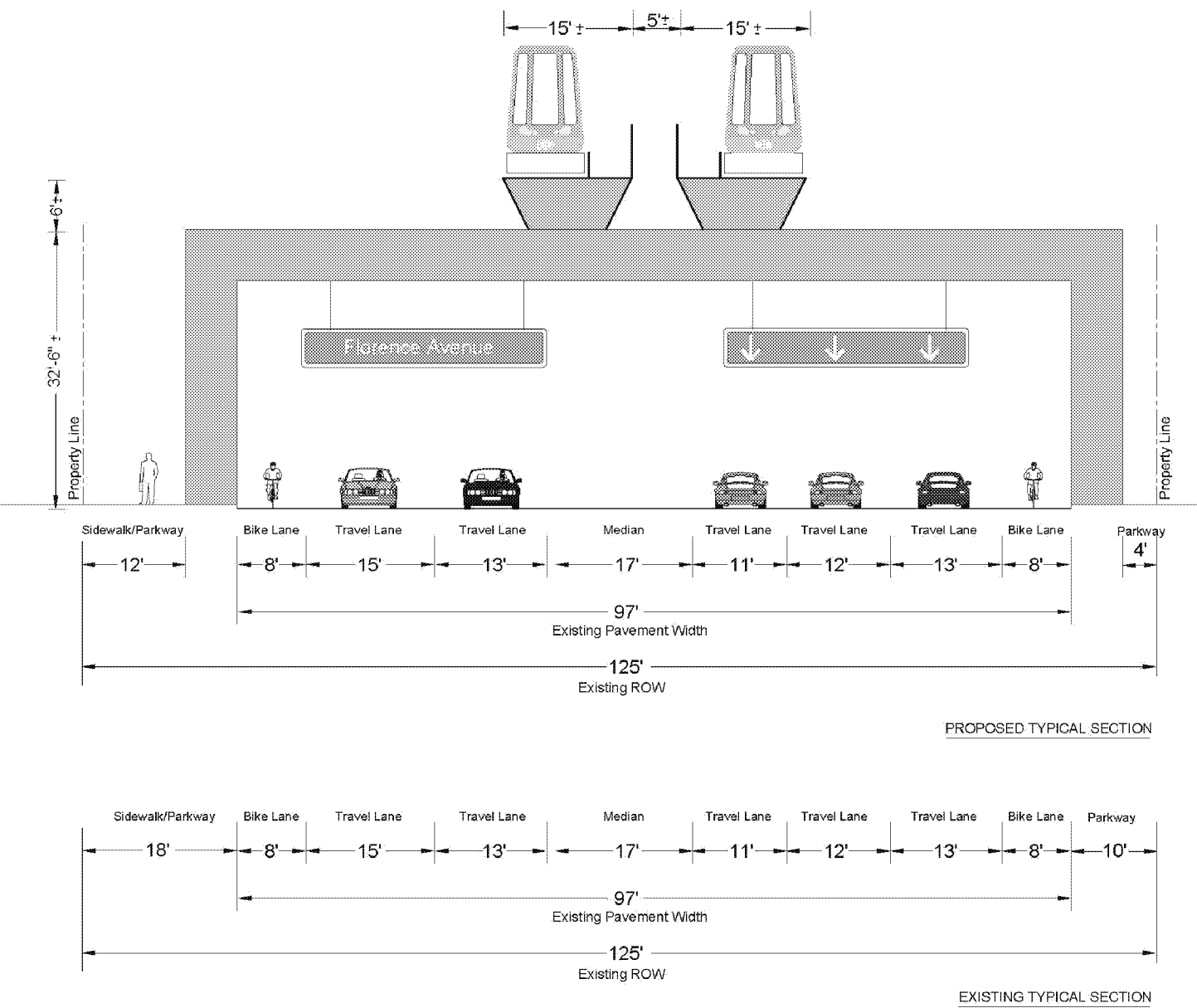


Figure 2.3-1: Alternative B: Fairview Heights Alignment



Source: Trifiletti Consulting, 2018

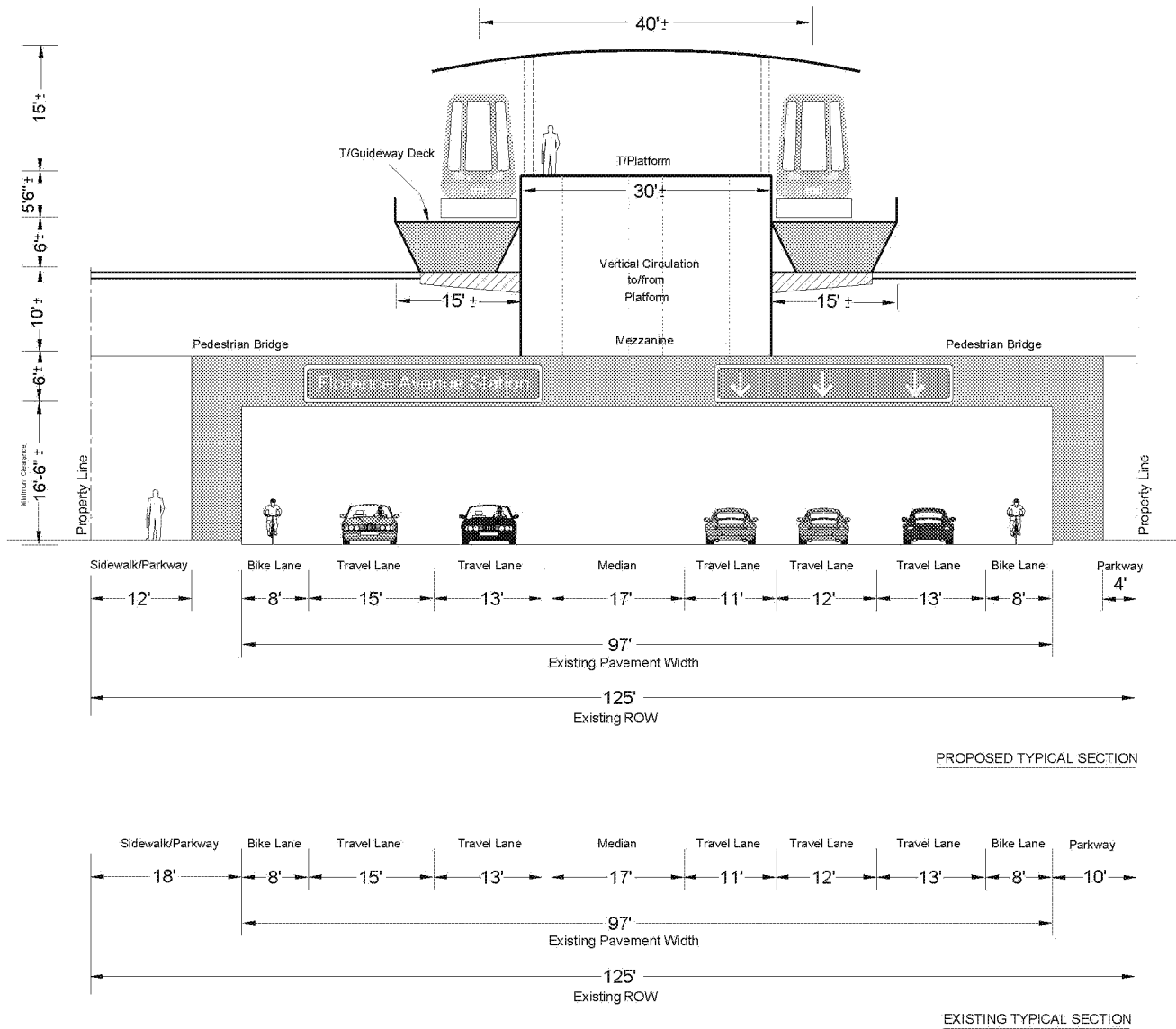
Figure 2.3-2: Alternative B: Fairview Heights Alignment  
 Florence Avenue, Looking West in Between Stations



Source: Raju Associates, 2018



Figure 2.3-3: Alternative B: Fairview Heights Alignment  
Florence Avenue, Looking West at Station



Source: Raju Associates, 2018

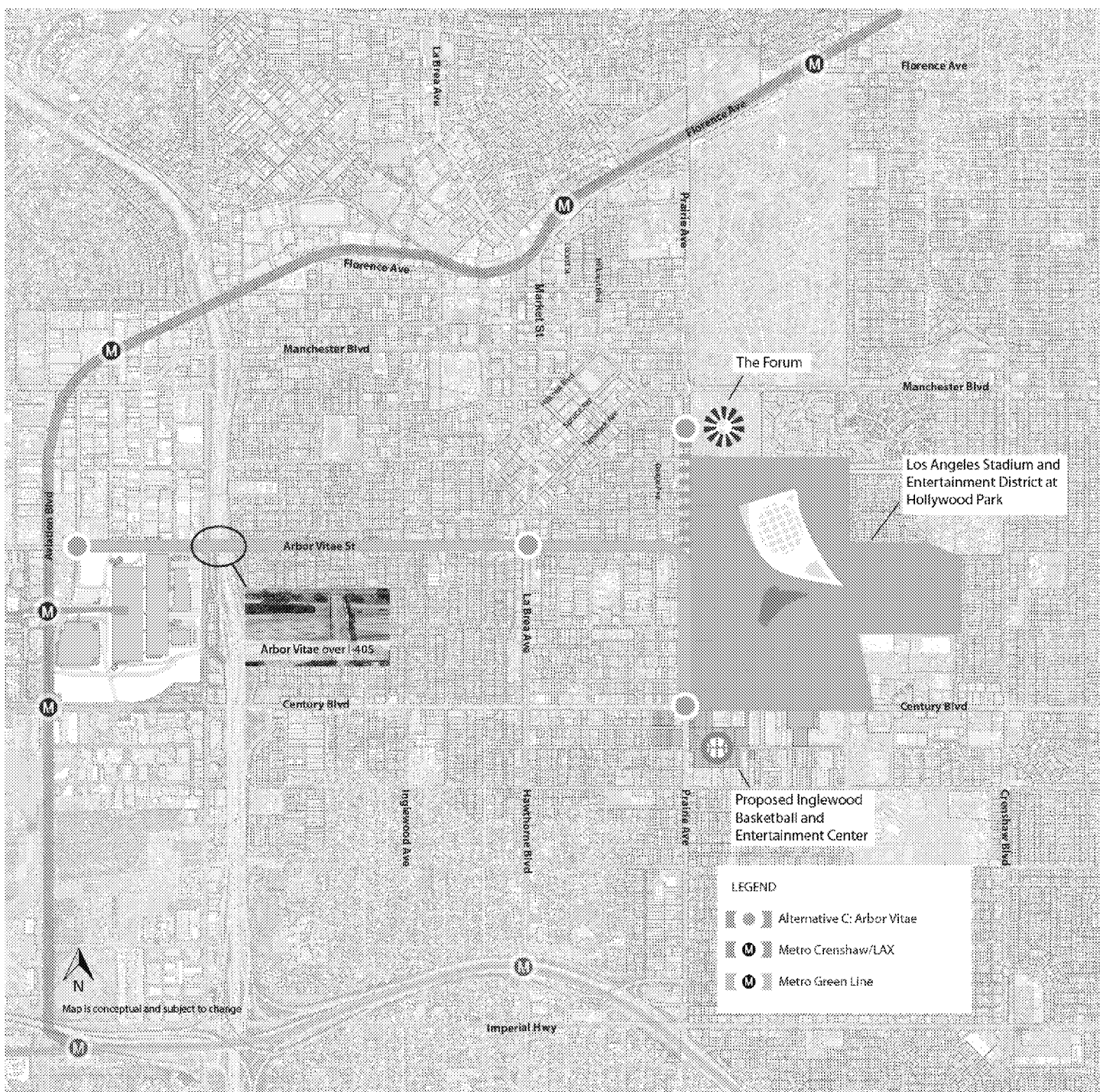
## 2.4 ALTERNATIVE C: ARBOR VITAE ALIGNMENT

The Arbor Vitae Alignment (Alternative C) is an aerial alignment concept that runs approximately two miles along Arbor Vitae Street from Aviation Boulevard to Prairie Avenue, where it transitions south, and potentially north, along Prairie Avenue for approximately one half mile to Century Boulevard. This Alternative provides service to The Forum, LASED, and the proposed Inglewood Basketball and Entertainment Center. Alternative C presents the opportunity to directly connect to the Los Angeles International Airport (LAX) and its Landside Access Modernization Program (LAMP) that includes substantial parking opportunities, a consolidated rental car center, planned regional multi-modal hub served by both Metro's Crenshaw/LAX and Green Lines, various Metro and municipal bus lines, and the LAX Automated People Mover system. Although this alternative connects to a planned multi-modal hub, development opportunities are limited in downtown Inglewood since it will not serve the area.

Crossing over the I-405 and a narrow right-of-way along Arbor Vitae Street poses significant obstacles for Alternative C. Crossing over the I-405 requires coordination with Caltrans, Los Angeles Department of Transportation and Los Angeles World Airports. However, since Arbor Vitae Street crosses over the I-405, the complexity of the coordination is expected to be less than the Century Boulevard Alignment (Alternative D). East of La Brea Avenue, the roadway section only includes one through-lane in each direction and one parallel parking lane. This section would require significant modifications to accommodate the alignment and create potential major impacts to existing small businesses as well as possible neighborhood displacement.

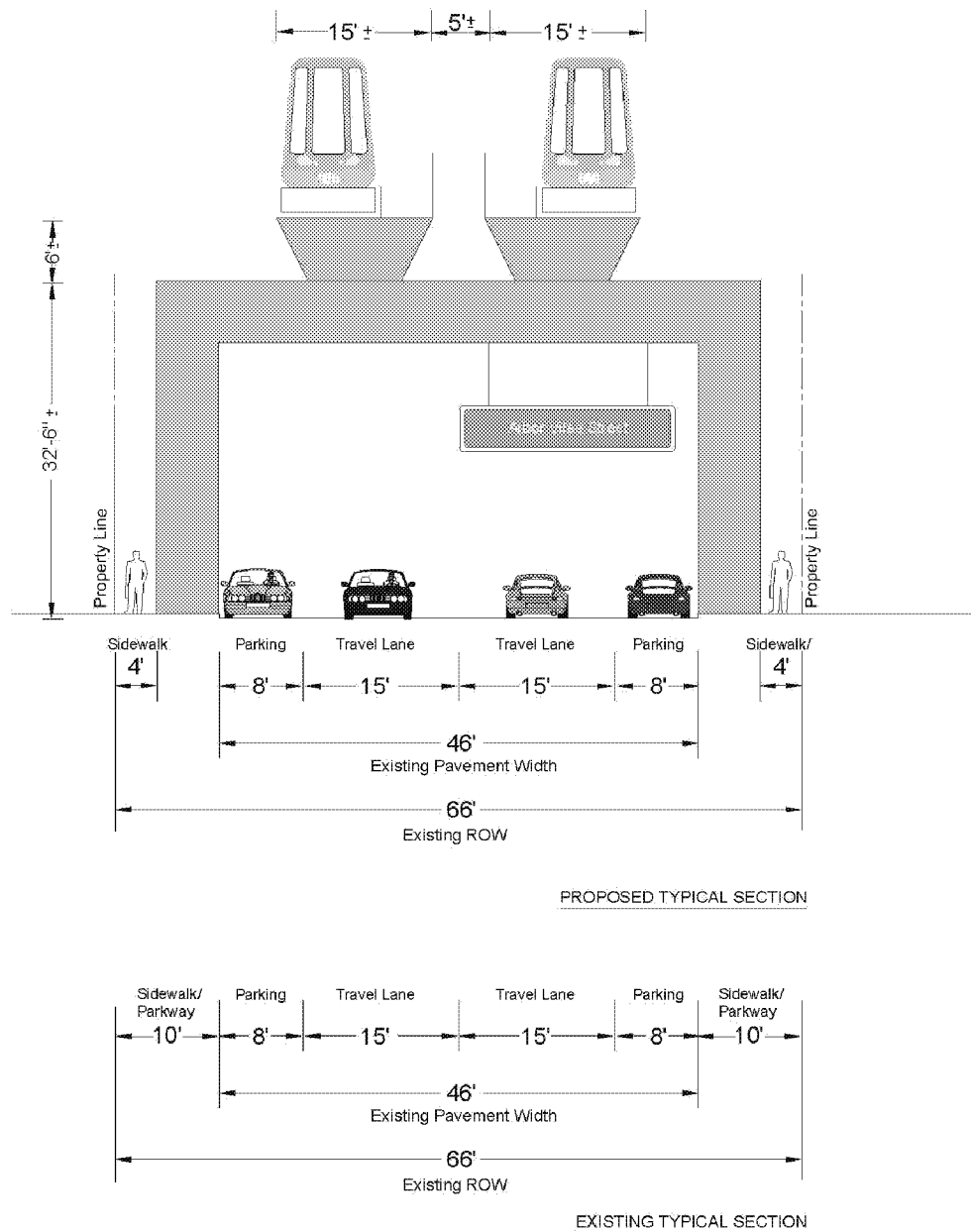
Possible intermodal facility locations to capture road-based traffic such as buses, TNCs, taxis, and private vehicles and facilitate a convenient transfer to the ITC have been identified. These potential intermodal facilities provide an opportunity to limit the amount and type of road-based traffic into the area especially during special events; such limits may be voluntary based on convenience, and/or controlled through regulatory policies including possible congestion pricing for access.

Figure 2.4-1: Alternative C: Arbor Vitae Alignment



Source: Trifiletti Consulting, 2018

Figure 2.4-2: Alternative C: Arbor Vitae Alignment  
Arbor Vitae Street, Looking West in Between Stations



Source: Raju Associates, 2018

## 2.5 ALTERNATIVE D: CENTURY BOULEVARD ALIGNMENT

The Century Boulevard Alignment (Alternative D) is an aerial alignment concept that runs approximately two miles along Century Boulevard from Aviation Boulevard to Prairie Avenue, where it transitions north along Prairie Avenue for approximately one mile to south of Manchester Boulevard. This Alternative provides service to The Forum, LASED, and the proposed Inglewood Basketball and Entertainment Center. Alternative D provides the opportunity to directly connect to a regional multimodal facility served by Metro's Crenshaw/LAX and Green Lines, various Metro and municipal bus lines, and the LAX automated people mover (APM) system.

To connect to the multimodal facility, Alternative D would be required to cross the I-405 on the south side of the LAX LAMP development near Manchester Square. A preliminary review indicates that the transition from an elevated segment to a level sufficient under the I-405 may not be feasible due to the short distance available and the real estate constraint between Century Boulevard and the LAX LAMP development

at Manchester Square. Crossing over and under the I-405 would require coordination with Caltrans, Los Angeles Department of Transportation and Los Angeles World Airports. This alignment does not present the opportunity for integration with local economic activity, current and future transit-oriented development, and other initiatives in downtown Inglewood.

Possible intermodal facility locations to capture road-based traffic such as buses, TNCs, taxis, and private vehicles and facilitate a convenient transfer to the ITC have been identified (see Figure 2.5-1). These potential intermodal facilities provide an opportunity to limit the amount and type of road-based traffic into the area especially during special events. Such limits may be voluntary based on convenience and/or controlled by regulatory policies including possible congestion pricing for access.

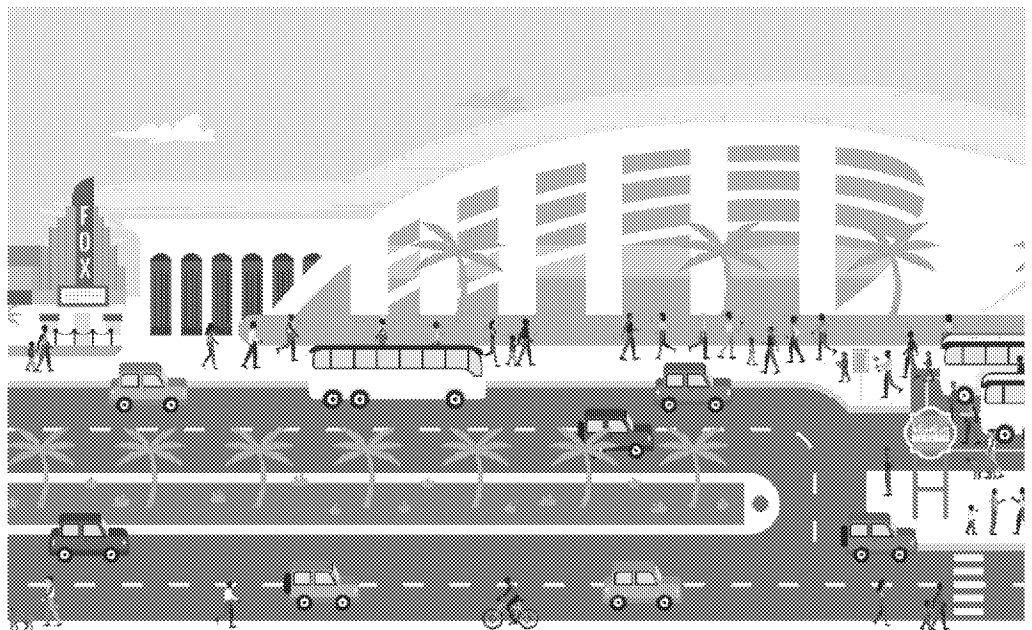
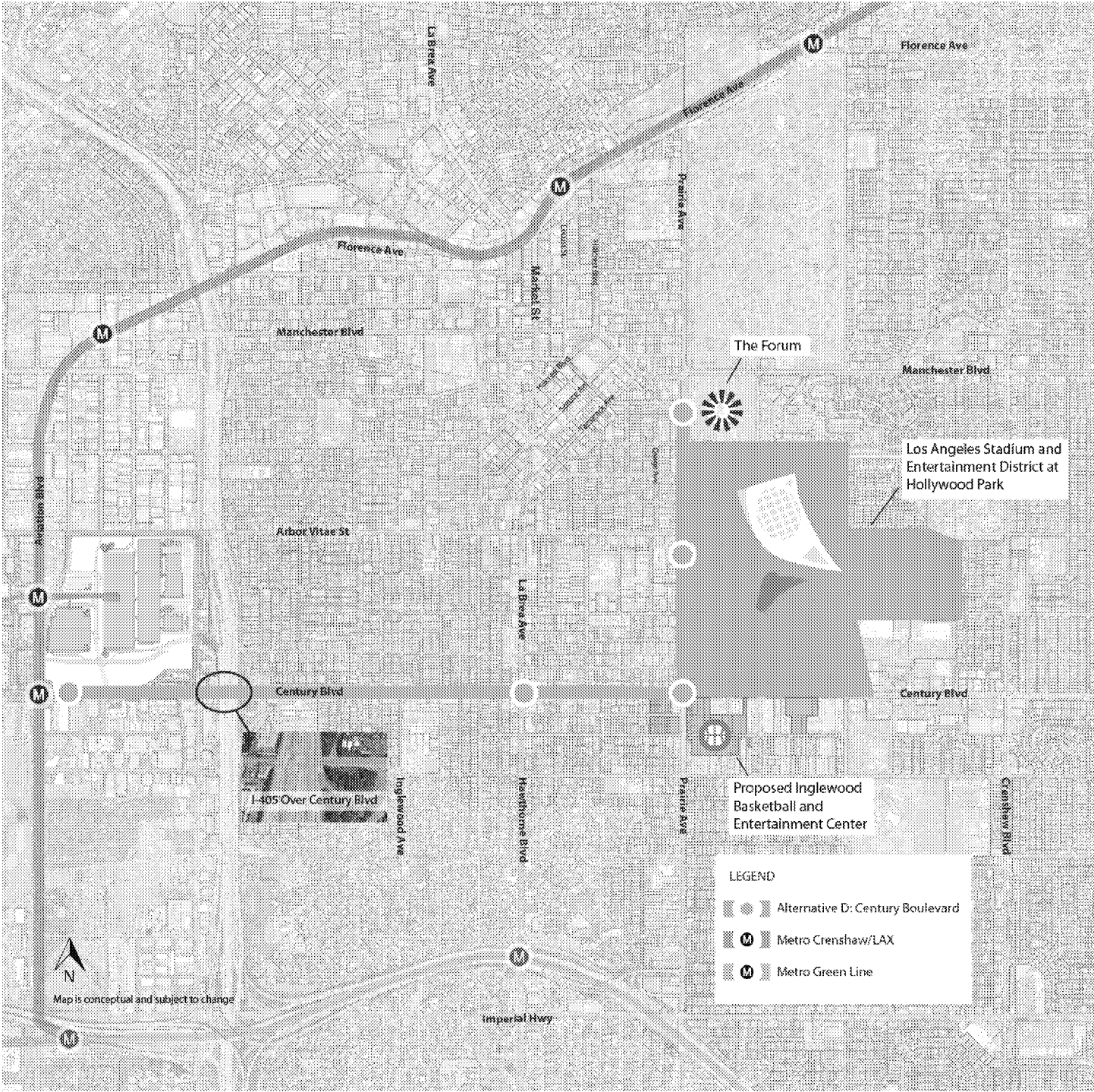
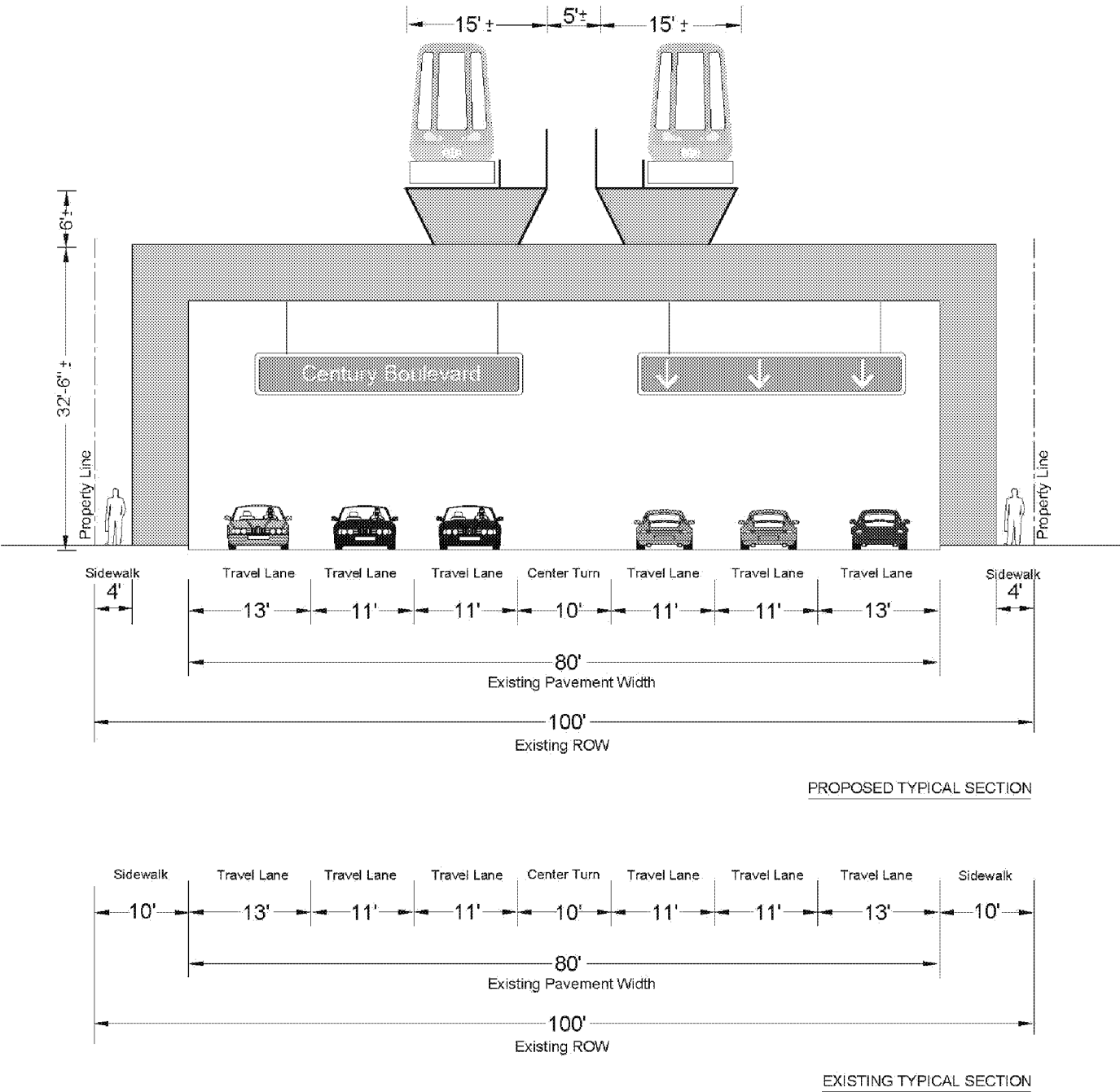


Figure 2.5-1: Alternative D: Century Boulevard Alignment



Source: Trifiletti Consulting, 2018

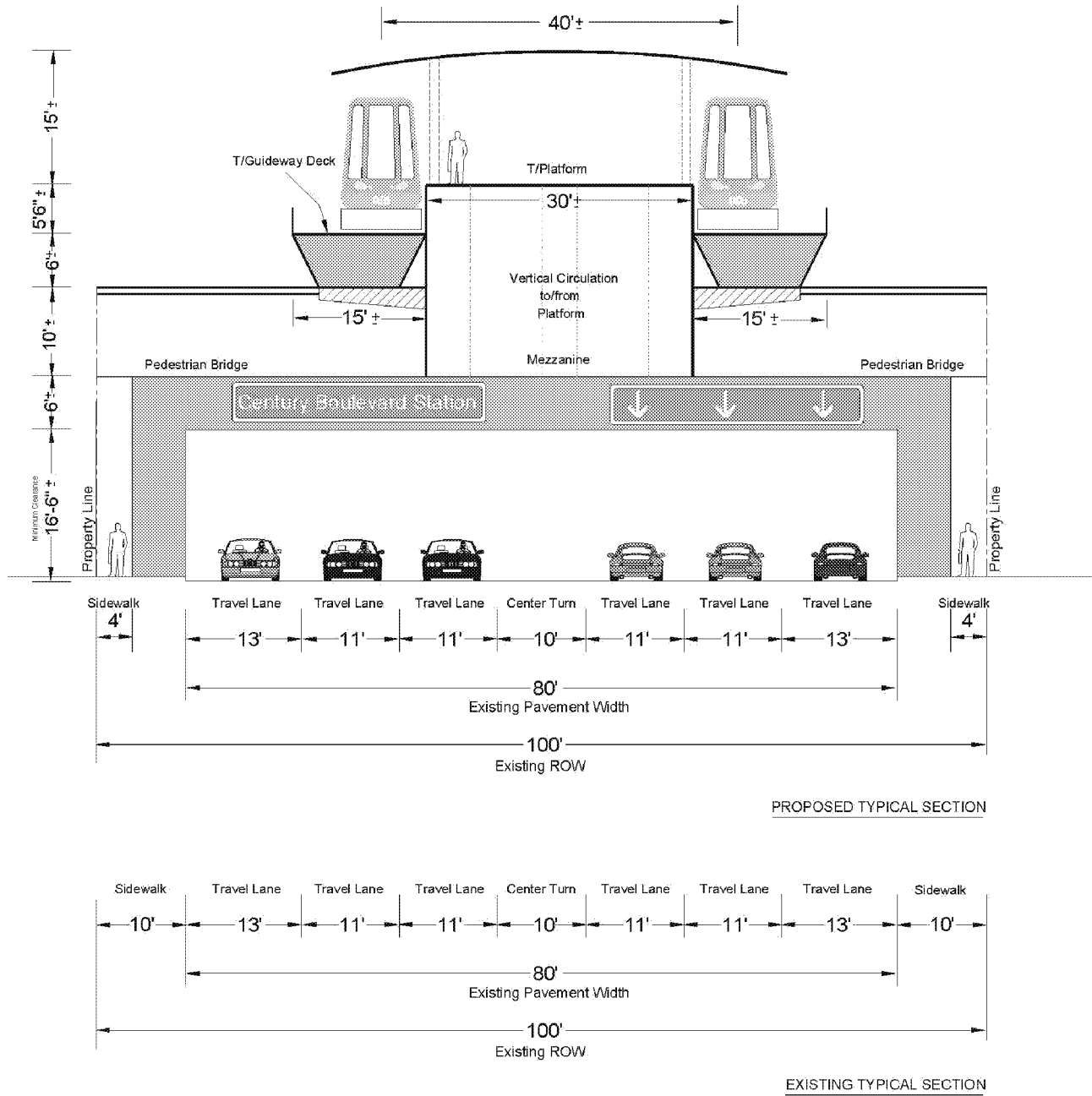
Figure 2.5-2: Alternative D: Century Boulevard Alignment  
 Century Boulevard, Looking West in Between Stations



Source: Raju Associates, 2018



Figure 2.5-3: Alternative D: Century Boulevard Alignment  
Century Boulevard, Looking West at Station



Source: Raju Associates, 2018

# 2.6 TRANSIT TECHNOLOGY ASSESSMENT

The City also evaluated a range of transit technologies to determine the viable classes of technologies that can potentially meet the anticipated requirements for the Inglewood Transit Connector. Driverless technologies have been presumed as these are similar to manually operated technologies except that with an automated train control system, the driverless technologies can be operated at shorter (more frequent) headways. The system performance requirements will be established after the selection of the locally preferred alternative and further project development. Such system requirements will drive the ultimate selection of the optimal technology. Manually operated technologies have been removed from consideration as they will not be able to meet the operational requirements (i.e. short headways) to meet the anticipated line capacity demands, nor fit within the geometric constraints given the short system route and the high peak ridership demands from special events and game days at the key ridership generators.

The range of such technologies are considered to be a class of Automated Guideway Transit or APM Systems. Differentiation is primarily based on the size of the vehicles, guideway mounting, propulsion and guidance systems. The candidate transit technologies are:

- Personal Rapid Transit (PRT)
- Large and Small Monorails
- Cable-propelled APMs
- Self-propelled Rubber-Tired APMs
- Large Steel Wheel-Rail APMs

Table 2.6-1 provides a summary of the typical characteristics of the different potential technologies.

Table 2.6-1: Summary of Technology Specifications of Modes Considered

MODES	TYPICAL APPLICATION AND OPERATIONS	TYPICAL CAR LENGTH (ft)	TYPICAL CAR CAPACITY (Pax/car at 2.7 to 3.5 sf/pax)	TYPICAL OPERATING SPEEDS (mph)	GUIDEWAY/ ALIGNMENT ROW CHARACTERISTICS
Personal Rapid Transit (PRT)	Designed to provide nonstop, origin-to-destination service to individuals or small groups of passengers with multiple cars operating in a network. To date, network size has been very limited.	10 to 15 feet	Small (max four to six passengers seated)	Typical low operating speed (less than 25mph) but some suppliers claim up to 40 mph	Five to seven feet per guideway (excluding emergency walkway) Min. turning radius capability of 16 feet, but preferable 20-25 feet or higher.
Small Monorails	Provides line haul type service connecting multiple stations. May be operated as a shuttle or pinched loop with multiple trains following each other stopping at every station before turning back at the end of line stations. Applied when geographically compact area. May operate on top of the guideway, or be suspended from the guideway.	15-20 feet (typical trains can be six to eight cars long)	12 to 20	20 to 30 mph	Seven to eight feet per guideway (excluding emergency walkway) includes vehicle overhang. Min. turning radius capability of 50 feet, but preferable 150 feet or higher. At turnback – requires guideway structure movement to switch tracks.
Large Monorails	Provides line haul type service connecting multiple stations. May be operated as a shuttle or pinched loop with multiple trains following each other stopping at every station before turning back at the end of line stations. Applied when geographically compact area. May operate on top of the guideway, or be suspended from the guideway.	40 feet (typical trains can be four to five cars long)	55 to 70	30 to 55 mph	12 feet per guideway
Cable Propelled APMs	Provides line haul service connecting multiple stations. Applied when geographically compact area. Typically operated as a shuttle where trains operate on their track shuttling back and forth between the end-of-line stations. Trains are "pulled" by cables with "cars" attached to the cable with grips. Cable drives between station pairs. Detachable grips available with some technology suppliers – to facilitate multiple trains operating behind each other with trains turning back at end of line stations. Requires that station pair distances be roughly uniform to maintain synchronized operations.	25-30 feet (typical trains can be up to five to seven cars long)	35 to 55	25 to 30 mph	10 to 12 feet per guideway (excluding emergency walkway) Min. turning radius capability of 75 feet, but preferable 150 feet or higher.
Self Propelled Rubber-Tired APMs	Provides line haul type service connecting multiple stations. Typically operated in a pinched loop with multiple trains following each other stopping at every station before turning back at the end of line stations; can also be operated in shuttle operations where a train shuttles back and forth on same track between the stations. Applied when geographically compact area. Typically applied when operational flexibility is required, and when system is implemented in phases – as future expansion is more easily accommodated compared to monorails or cable propelled technologies. Applied at airports (landside and airside), as well as downtown circulators.	40-42 feet (typical two to four car trains, but up to six car trains)	50 to 75	30 to 50 mph	12 feet per guideway (excluding emergency walkway) Min. turning radius capability of 75 feet, but preferable 150 feet or higher.

Figure 2.6-1: Personal Rapid Transit Examples - Heathrow Airport, Morgantown, WV and Masdar, UAE



Source: Heathrow Airport



Source: Morgantown, WV

#### Personal Rapid Transit - Key Considerations:

- Small, limited operating systems with limited capacities.
- Small cars with limited interior capacity, maximum of 4 to 6 passengers, and low headroom.
- Low operating speed, less than 25 mph.
- Only three small starter systems with very limited complexity and capacity, though this technology has been developed for over 30 years.
- Operating headway and resulting system capacity remains controversial. PRT suppliers claim that the operating headways can be as close as 0.5 seconds to get higher capacities. However, this has not been service proven, even on a test track, with a representative operating fleet and guideway configuration. To accommodate such a high vehicle volume, the infrastructure at the stations and bypass lanes would be substantially larger than for larger vehicle APM systems.



Source: Masdar, UAE

Figure 2.6-2: Small Monorail Guideway and Switch Examples



Source: Bombardier Monorail at Newark Airport



Source: Bombardier Monorail at Newark Airport

#### Small Monorails - Key Considerations

- Small vehicles/cabins with single doors.
- Longer, narrower vehicles for same number of passengers.
- Fixed vehicle length.
- Limited flexibility to extend train length by coupling due to front and tail car nose.
- Relatively small guideway but large guideway replacement switches.

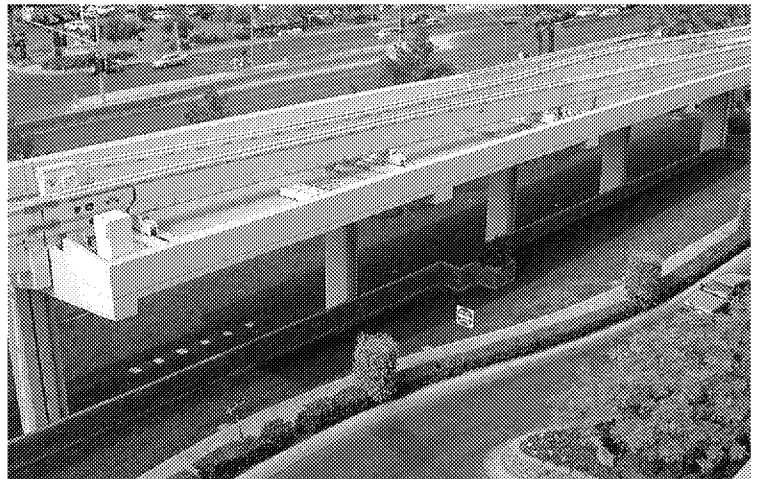
Figure 2.6-3: Large Monorail Guideway and Switch Examples



Source: Bombardier Monorail in Las Vegas

#### Large Monorails - Key Considerations

- Larger cabins with one or two bi-parting door sets.
- Fixed vehicle length.
- Limited flexibility to extend train length by coupling due to front and tail car nose.
- Inefficient vehicle floor use due to bogies – longer vehicle per number of passengers.
- Relatively small guideway but massive guideway replacement switches.
- Ability to support competitive procurement with the number of active suppliers with technically mature and/or ready for deployment technologies.



Source: Bombardier Monorail in Las Vegas



Figure 2.6-4: Cable-Propelled APM Examples



Source: BART, Oakland International Airport



Source: Aerotrén, Mexico City International Airport



Figure 2.6-5: Self-Propelled APM Examples



Source: Bombardier Innovia 100, George Bush (Houston) Intercontinental Airport



Source: Bombardier Innovia 200, Phoenix Sky Harbor International Airport

Figure 2.6-6: Large Steel Wheel-Rail APM Examples



Source: Bombardier Innovia ART 300 APM System at JFK

Self Propelled Large Steel Wheel Rail APM - Key Considerations:

- Vehicles typically longer than rubber-tired vehicles, 55 feet compared to 40 feet.
- Flexible train length: one to six cars.
- Shuttle, loop, and pinched loop operating modes.
- Higher operating speeds, typically 50 to 60 mph.
- Generally applied to urban/metro systems that are longer and have more stations.
- Steel wheel-rail noise, particularly in curves.

## 2.7 TECHNOLOGY EVALUATION

Technologies were evaluated against a set of defined criteria to provide a preliminary assessment of viable systems that are suitable for further evaluation and consideration.

- Ability to fit within the site-specific constraints.
- Ability to fit the scope and scale of the project.
- Ability to meet anticipated ridership demand, in terms of peak hour demand or line capacity.
- Flexibility of operations in terms of different train lengths
  - Train lengths would be longer during peak periods and shorter during off-peak periods to maintain the same frequency and service levels.

- Ability to expand the fleet size with minimal or no disruption to ongoing normal passenger service during peak operational hours.
- Ability to extend the system with minimal or no disruption to ongoing passenger service.
- Viability/availability of technology suppliers as measured by 1) longevity of business providing new systems and continued operations and maintenance; 2) at least one technology application proven in passenger service; and 3) applications of comparable size/scale to the Inglewood Transit Connector proposed project.

Table 2.7-1 Summary of How Each Technology is Evaluated According to the Criteria

CRITERIA	PRT	SMALL MONORAIL	LARGE MONORAIL	CABLE-PROPELLED	RUBBER-TIRED APM	LARGE STEEL-WHEEL RAIL APM
Ability to fit within site specific constraints/ geometry	Yes	Yes	Yes	Yes	Yes	Maybe
Fits the project scope and scale	No	No	Maybe/Yes	No	Yes	Maybe
Ability to meet peak hour ridership (line capacity)	No	No	Maybe/Yes	No	Yes	Yes
Flexible train length operations	No	No	No	No	Yes	Yes
Expand fleet size with minimal to no disruption	Yes	Yes	Yes	No	Yes	Yes
Extend system with minimal to no disruption	Yes	Yes	Yes	No	Yes	Yes
Viability/availability of suppliers	Yes	Yes/Limited	Yes	Yes	Yes	Yes
Maintain consideration for the Inglewood Transit Connector Project	No	No	Yes	No	Yes	Maybe

Source: Trifiletti Consulting, 2018

The analysis concluded that PRT, small monorails, and cable-propelled APMs are not appropriate for the Inglewood Transit Connector project. To determine the viability of steel wheel-rail APMs, further analysis is required. Although steel wheel-rail APMs could provide the passenger capacity necessary to meet the demand generated by the activity centers and have been successfully applied to larger systems in the US such as the JFK Air Train, which is more than ten miles long with eight stations, the technology cannot accommodate the tight right-of-way, and curves, including a minimum turning radius of 120 feet, which is anticipated for the proposed project alternatives. Therefore, it is highly unlikely that steel wheel-rail APMs will be suitable for the Inglewood Transit Connector Project.

Large monorail systems can provide the necessary passenger capacity for both event and non-event days to newly constructed, under construction, and proposed activity centers. However, train lengths are not readily adjustable, and technology suppliers may not have the ability to fit their technology within the project's constraints, such as the line capacity/demand requirement, the tight right-of-way, and curves anticipated for the proposed alternatives. These are not technical flaws, but they may have an impact on the commercial competitiveness, as a total cost of ownership, of the monorail technology. This is not definitively known and further evaluation, including technology maturity and readiness for deployment is recommended as part of the further project definition process for the locally preferred alternative.

## 2.8 STATIONS

APM stations accommodate passengers boarding/deboarding to and from the APM vehicles. Station platforms also provide the required space for passengers to circulate between the station platform and the adjacent facilities. Stations are required to be fully accessible to passengers with disabilities.

Each of the alternatives are described in Sections 2.2 through 2.5. Section 2.6 provides details of the technology assessment of APM technologies with key findings on the candidate technologies applicable to the project; the specific technology is expected to be selected through a competitive procurement process that is not alternative dependent.

Since all the alternatives consist of elevated APM systems, typical station configurations and requirements will be similar and are not differentiators between the different alternatives. Any adjustments to station locations and configurations at this stage would apply equally to each of the alternatives. Station location and configurations will be refined and adjusted for the selected preferred alternative as the project is further developed, in coordination with the activity generator facility designs, site specific passenger access/egress concepts, and to address utility and right-of-way constraints for the preferred alternative.



At this time, the anticipated locations of stations have been established for each of the alternatives and illustrated in Figures 2.2-1, 2.3-1, 2.4-1, 2.5-1. The station locations were primarily designed to serve the key event and activity generators in the City.

Because ridership projections for the alternatives are comparable, as described in Section 3, the station occupant load at the key stations can be expected to be similar. The worst case loading for any station is governed by life safety constraints to address a scenario where two fully loaded trains are brought to the same station under an emergency or failure mode. NFPA-130 establishes life safety requirements for fixed guideway transit systems. It requires that all passengers must be evacuated to a point of safety within a set amount of time. For normal operational conditions, the station must be designed in a manner to ensure that all de-boarding passengers are able to get off the station platform before the arrival of the next train. Specific station designs will be site-specific and will be defined as the project development progresses for the preferred alternative.

Typical station descriptions provided below are based on accommodating a large class of automated guideway transit vehicles; the transit technology most likely to be applied to the project. Due to the variation that may occur between technologies within this class, the station configuration can be expected to be adjusted as part of the design development phase once the transit system technology has been selected.

#### 2.8.1 Platform Configurations

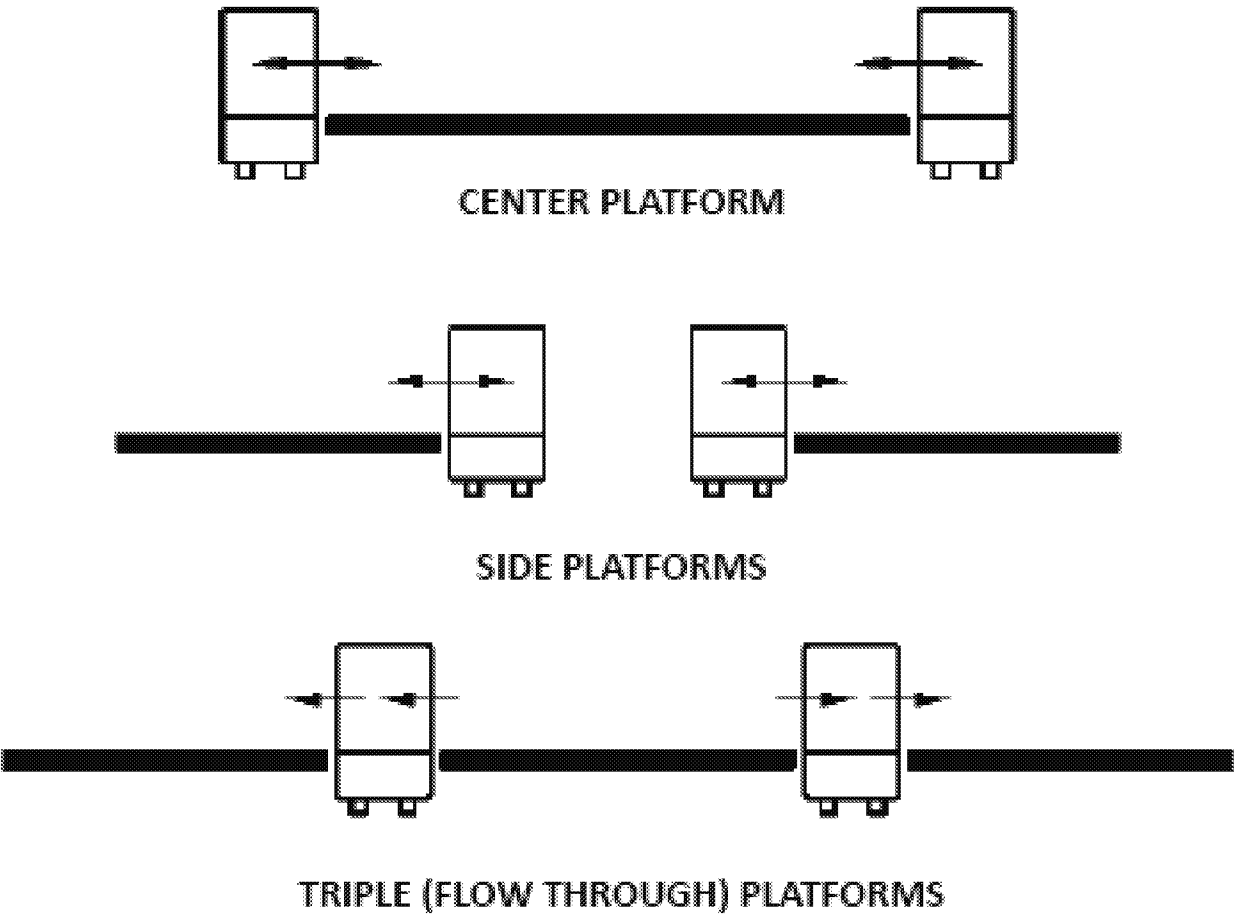
Many different platform configurations are possible. Some configurations are more appropriate than others dependent upon the location within the system and the type of facility or area served by the station, security and passenger flow considerations, level of service, cost, and other factors. As described below, and illustrated in Figure 2.8-1 platform configurations may be:

1. Center Platforms - are located between relatively widely spaced guideways and serve as both boarding and de-boarding platforms for passengers traveling in either direction on the System.

2. Side Platforms - are located outside guideways. Each side platform generally serves as a boarding and de-boarding platform for passengers traveling in one direction only on a pinched-loop system, and in either direction on shuttle systems.
3. Triple (flow through) Platforms - combine a center platform with side platforms. Side platforms usually serve de-boarding passengers and the center platform serves as a boarding platform. Triple platforms are sometimes referred to as flow through platforms because the flow of boarding and de-boarding passengers is through APM vehicles.

Center platforms can be more compact in size and less expensive than comparable side or triple platforms because center platforms generally require less infrastructure. Additionally, they provide a consistent and easier wayfinding scheme for passengers, where the decision on direction of travel is made once the passenger is on the platform. The specific platform configuration is expected to be defined in coordination with the activity generators and site specific requirements related to ability to fit the station. Since all alternatives serve the same activity centers within the City's business district, it is reasonable to expect that the station configurations will remain consistent across each of the different alternatives. For the purpose of this, center platform configuration is assumed since it is the most compact in size and thus expected to have the least physical impact compared to the other platform configurations.

Figure 2.8-1: Typical Platform Configurations



Source: Trifiletti Consulting, 2018

Vertical circulation can be provided at one end (single end-loaded) or both ends (double end-loaded) of station platforms, or within the length of the platform (center loaded) for any of these platform configurations:

- Single end-loaded platforms only provide this circulation from one end of the station platform.
- Double end-loaded platforms permit passengers to move from the platform to adjacent facilities, and vice versa, from both ends of the station platform.
- Center loaded platforms require additional platform width since the vertical circulation cores disrupts the circulation within the platform.

For the purpose of this study, platforms are assumed to be either single or double end-loaded to provide the most compact, in size, station platform to minimize the physical impact of the stations.

A mezzanine level is anticipated under the station platform. This mezzanine will provide connectivity to the adjacent facilities through pedestrian walkways.

#### 2.8.2 Station Equipment /Amenities

All stations will be equipped with Public Address systems, static and dynamic signage to provide information to passengers, CCTV to enable central control operators to surveil the operations of each station and make announcements, adjustments and/or take other action as appropriate, as well as emergency telephones and blue light stations in case of emergencies. Since the station platforms are transitory spaces, amenities such as seating and concessions will not be provided at the platform level, but may be provided at the mezzanine level.

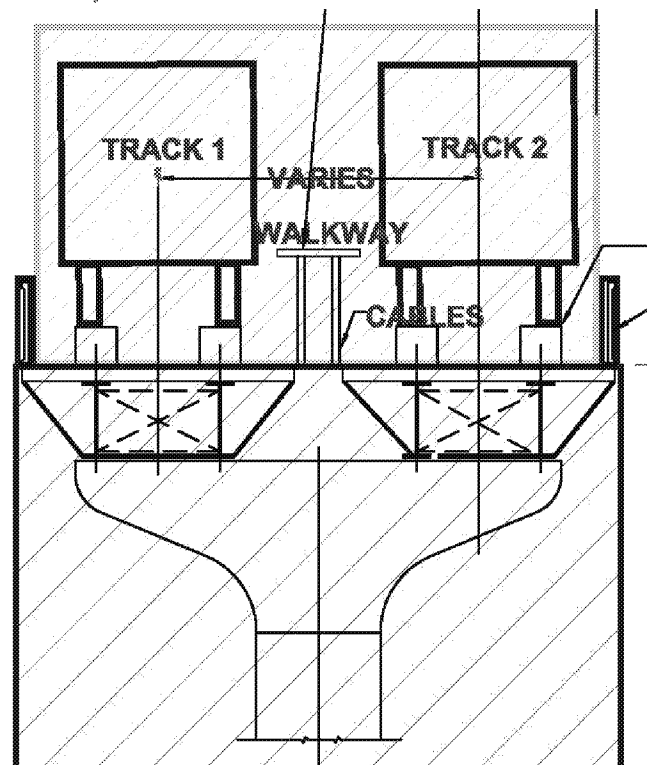
#### 2.8.3 Platform Dimensions

Station platforms are anticipated to be approximately two hundred feet long, excluding vertical circulation, to accommodate the anticipated longest train, and thirty feet wide to accommodate passenger queuing and circulation. A minimum ceiling height of twelve feet would be provided in APM stations to accommodate CCTV cameras and dynamic graphics above the automated platform doors.

#### 2.8.4 Vertical Circulation

Vertical circulation consists of fixed stairs, escalators and elevators. Sufficient vertical circulation elements will be provided to assure that under normal circumstances all de-boarding passengers can clear the platform before the next train arrives. Additionally, all code prescribed emergency egress requirements must be satisfied.

Figure 2.8-2 – Example of Emergency Walkway Along Trainway Between Stations





## 2.9 MAINTENANCE AND STORAGE FACILITY REQUIREMENTS

All of the alternatives are aerial APM Systems. The selected technology will be applicable equally to each of the alternatives and is not a differentiator between them. Each of the alternatives will require a Maintenance and Storage Facility (M&SF) to perform regular and preventive maintenance of the transit operating system, for storage of the vehicle fleet, as well as for the operations control center where automated train operations are monitored and controlled. The specific design of the M&SF will be driven by the selected M&SF site, which will depend on the alternative selected.

Road access to the M&SF is required for employees, visitors, suppliers, and emergency vehicles. Accommodations must be made for a delivery entrance to load and unload equipment, materials and parts from tractor-trailer trucks. Roadway access is also required near the M&SF to allow APM vehicles to be delivered. In addition, stopping positions for firefighting equipment must be provided adjacent to the Maintenance Facility.

Appropriate space should be provided to allow adequate maneuvering by these ground vehicles. Anticipated M&SF requirements are noted below to define the project requirements. Depending on the available site, the M&SF may be split to fit onto the available site(s); however, a consolidated M&SF is more efficient and preferable.

The M&SF is expected to be an elevated structure that will accommodate the following functions: 1) support of system operations, 2) vehicle storage, and 3) APM system maintenance. Additionally, the transit system operations and maintenance administrative facilities would be co-located within the M&SF.

The following functional areas are required at the M&SF:

- Service and inspection shops.
- Major repair area.
- Vehicle storage areas.
- Inspection and service bays, including under vehicle bays.
- Equipment and materials storage areas.
- Offices, lunch/break areas, restrooms, locker areas, personnel wash facilities.
- Loading platforms, paint booth, and other areas based on design information to be provided by the selected System Supplier.

Design of the facility would also include access roadways, landscaping, exterior lighting, parking, signage, and means of controlling access into and out of the M&SF such as secure fencing. The M&SF design would include the guideway and an access platform at the vehicle floor level with stairs to grade to allow Operations and Maintenance (O&M) personnel access into APM vehicles and other facilities infrastructure, such as lighting required to accommodate the train receiving and departure tracks and its operation.

### 2.9.1 Operations

Automated system operations will be monitored and controlled from a Central Control Facility within the M&SF. Central Control Operators monitor the system operations aided by CCTV coverage, and alarms that will identify and notify any issues within the system. Depending on the type of issue and/or alarm, the Central Control Operators remotely implement corrective actions to return the system to normal operations as quickly as possible. Additionally, Central Control Operators are the key interface with emergency response. All responses and actions are procedurally defined in the System Operations Plan, the System Safety Program Plan and other documents that are jointly developed by the System Supplier and the Owner's Safety and Security Committee during project implementation.

All equipment for communications, train control, power distribution, SCADA, CCTV, whether along the system trainway, at stations or other locations is connected to equipment at the Central Control Facility.

### 2.9.2 Maintenance

Maintenance performed on system equipment includes:

- Service: the periodic replacement of consumables and expendables and adjustment of parts to their nominal position, required tolerance, setting, and output.
- Cleaning: interior and exterior cleaning of accumulated trash, dirt, and grime, including graffiti.
- Inspection: periodic inspection of parts, appurtenances and subsystems subject to deterioration and failure.
- Repair: the repair or replacement of a part that has been damaged, has failed, or is nearing the end of its service life.
- Maintenance Information Management and Scheduling: the processing of maintenance information, work reports, failure reports, and system performance data needed to manage the system maintenance program effectively and efficiently.

Maintenance facilities include an automatic car wash for vehicle exterior cleaning, maintenance pits with under vehicle access, electronics and mechanical and lubrication workshops, tool and equipment storage, spare parts and consumables storage, shipping/receiving areas, freight elevator, hoists, administrative offices, employee locker rooms/facilities, and sufficient parking.

### 2.9.3 Spatial Requirements

Approximately four to six acres is estimated to accommodate the M&SF functions as described. Access and egress tracks to and from the M&SF to the mainline would be developed for the preferred alternative. Based on available sites, the M&SF may be functionally split; however, consolidating functions into a fully functional M&SF provides the most efficient and cost-effective solution.

The following overhead clearances are required for the M&SF:

- A minimum vertical clearance of ten feet is required in the shop and shipping/receiving areas.
- A minimum vertical clearance of eight feet is required in office areas.
- A minimum vertical clearance of twenty feet is required in the vehicle heavy maintenance area and designated highbay areas.
- A minimum vertical clearance of fourteen feet is required in the propulsion power substation.



### 3. PRELIMINARY RIDERSHIP PROJECTIONS



## 3.1 RIDERSHIP METHODOLOGY

For the purposes of selecting a Locally Preferred Alternative Project, preliminary transit ridership was developed to provide a basis of comparison between alternative concepts for the Inglewood Transit Connector. Further ridership analysis will be completed and refined as part of the future environmental analysis and project definition work.

While the City utilized the early ridership analysis performed by Metro, it updated the ridership analysis with more current available information. The analysis also recognized that the Inglewood Transit Connector Project would be different from a traditional urban/metro regional transit system:

- Compared to a traditional urban/metro transit system which provides regional connectivity, the Inglewood Transit Connector would provide the last-mile connectivity, with relatively small route lengths of approximately one to three miles, between the Metro system to key facilities and trip generators within the City of Inglewood.
- Key trip generators are the various venues within the Inglewood Sports and Entertainment District including the NFL Stadium, The Forum, and the Los Angeles Stadium and Entertainment District at Hollywood Park. The travel demands and ridership are largely driven by scheduled events with peak demands expected to be multiple times higher than those for normal work days and weekends.

To better understand potential future ridership, the City sought to establish the anticipated demands over the course of a year to account for fluctuation over months, weeks and days of the week, and to provide a foundation for developing the anticipated operational scenarios and the appropriate technology, and to provide data in support of the estimation of rough order of magnitude costs.

The typical regional planning models used for estimating ridership on a typical urban/metro transit system were supplemented with additional analysis and models. This study

adopted the horizon year of 2040 to maintain consistency with the Southern California Association of Government's (SCAG) Regional Transportation Plan 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy RTP/SCS. SCAG'S RTP utilizes the horizon year of 2040 and provides policy direction for specific improvements, sets forth a transportation plan and sustainable communities strategy for 2040 conditions. This study and related plans need to be consistent with the regional transportation plan and forecasting. Given preliminary available information and data, this Report provides a concept planning level estimate of the anticipated users of the Inglewood Transit Connector system for:

1. Non-event normal day anticipated users based on a calibrated and validated regional travel demand model for the typical work weekday and weekend days. The estimates address the hourly distribution over the day, per direction, with origin and destination to estimate non-event normal day peak ridership.
2. Event day anticipated users, which was informed by preliminary data regarding anticipated events, distribution of the events over the year, days of week, time of day, as well as anticipated attendees, anticipated transportation modes and arrival and departure profiles to and from the events.
  - Event based information was tabulated based on event venue, size and type of event, day and time, and anticipated transportation mode.
  - For event based anticipated transit system users, the City developed estimates of peak hour demand and direction, the duration and time of the peak hour, and the anticipated duration of the event-based demand. This should be established for each event.

A preliminary total anticipated user demand was identified by overlapping the non-event normal day ridership with preliminary event-based ridership estimates. The overall ridership estimation is based on initial assumptions that will be refined and researched as the Inglewood Transit Connector Project moves into the project definition and environmental clearance phase, and as other proposed projects are more fully defined.

The preliminary ITC transit ridership analysis included the following scenarios:

1. Weekday non-event conditions.
2. Weekend non-event conditions.
3. Weekday/weekend event conditions individually at the The Forum, NFL Stadium, the 6,000-seat Performance Arena, and the proposed Inglewood Basketball and Entertainment Center.
4. Estimation of overall yearly non-event and event conditions ridership using information on low and high estimates during events and the number of such events over an entire year. Additionally, average event conditions along with non-event conditions ridership estimates for each of the alignment alternatives under consideration were also developed.

The weekday non-event conditions were simulated using the latest SCAG 2016 RTP/SCS Model, the SCAG 2012 Regional Model including updates to SED databases and transit networks to reflect the various Inglewood Transit Connector alternatives, as well as operational scenarios and associated transit base-network changes. The weekend day non-event conditions were estimated by normalizing weekday ridership estimates using specific weekday and weekend day transit utilization in the study area, provided by Metro.

The event-day conditions were simulated using a spreadsheet-based model based on Metro's mode-split model and actual data related to the event attendees' zip-code information. The NFL game attendees included information on ticket sales data while all other attendees at events at all venues included information on distribution of population by zip-code derived from the SCAG 2012 Regional Model.

## 3.2 TRANSIT RIDERSHIP RESULTS

Model simulations were performed, and transit ridership estimate results were compiled for each of the alignment alternatives.

### 3.2.1 Non-Event Normal Conditions

Table 3.2-1 presents the ridership estimates for each alternative on a non-event normal commuter weekday. Alternatives A and D have the highest non-event, normal commuter weekday ridership with roughly about 2,000 more riders than Alternatives B and C.

Travel demand models are not available for weekend days. However, transit service characteristics and demand data are available for all days of the week. Transit ridership and service characteristics in 2017 available on weekdays, Saturdays and Sundays were utilized to compute the related utilization of the transit system. Table 3.2-2 and Table 3.2-3 present weekend non-event day estimates for Saturday and Sunday per each alternative.

### 3.2.2 Event Day Conditions Forecast

Tables 3.2-4, 3.2-5, 3.2-6, and 3.2-7 provide a summary of event ridership profiles for each of the four proposed alternatives. These tables include ridership profiles for both low and high estimates, broken down by types of events at each of the venues.

Based on preliminary ridership analysis, the following key observations can be made:

1. The peak ridership estimate is projected for an LA Rams NFL game high-estimate departure period for all Inglewood Transit Connector alignment alternatives. The variation in peak ridership estimates during that peak timeframe between these alignment alternatives is less than +/- 5%.
2. The ridership projections for the Market-Manchester and Century Boulevard alignments indicate that the maximum ridership estimate occurs on an NFL game event day and is equivalent to 8,985 riders occurring in the one-hour period after the game.

Detailed ridership estimates for each of the Inglewood Transit Connector alignment alternatives by venue and type of event including profiles of arrivals and departures are provided in Appendix B.

Table 3.2-1: Year 2040 Line Level Ridership (Non-Event, Normal Commuter Weekday) Estimates

	RIDERSHIP (ON LINE)		
	PEAK TOTAL	OFF-PEAK TOTAL	TOTAL
Alternative A: Market-Manchester Alignment	3,717	1,252	4,969
Alternative B: Fairview Heights Alignment	2,118	938	3,057
Alternative C: Arbor Vitae Alignment	2,340	1,056	3,396
Alternative D: Century Blvd Alignment	4,194	1,789	5,982

Table 3.2-2: Year 2040 Line Level Ridership (Normal Commuter Weekend – Saturday)

	2040 RIDERSHIP TOTAL	AM 6am – 9am	BASE 9am – 3pm	PM 3pm – 7pm	NT 7pm – end
Alternative A: Market-Manchester Alignment	3,228	412	1,397	918	501
Alternative B: Fairview Heights Alignment	1,986	253	859	565	308
Alternative C: Arbor Vitae Alignment	2,206	281	955	627	343
Alternative D: Century Blvd Alignment	3,886	495	1,682	1,105	604

Table 3.2-3: Year 2040 Line Level Ridership (Normal Commuter Weekend – Sunday)

	2040 RIDERSHIP TOTAL	AM 6am – 9am	BASE 9am – 3pm	PM 3pm – 7pm	NT 7pm – end
Alternative A: Market-Manchester Alignment	2,773	348	1,183	777	424
Alternative B: Fairview Heights Alignment	1,681	214	728	478	261
Alternative C: Arbor Vitae Alignment	1,868	238	808	531	290
Alternative D: Century Blvd Alignment	3,290	420	1,424	936	511

Source: Raju Associates, 2018

This study is consistent with the SCAG Regional Transportation Plan, and automated people mover system will be designed to accommodate future ridership consistent with the regional transportation plan forecasting.

Table 3.2-4: Market-Manchester Alignment  
Event Ridership Profile Summary

VENUE	EVENT	NO. OF EVENTS	SERVICE HOURS	RIDERSHIP ESTIMATE PROFILES							
				LOW ESTIMATE				HIGH ESTIMATE			
				ARRIVAL <sup>1</sup>		DEPARTURE <sup>2</sup>		ARRIVAL <sup>1</sup>		DEPARTURE <sup>2</sup>	
LASED	NFL Game	20	8	> 2 hours 1-2 hours < 1 hour	731 1,453 3,276	During Game 1-2 hours < 1 hour	546 4,368 546	> 2 hours 1-2 hours < 1 hour	1,504 2,989 6,739	During Game 1-2 hours < 1 hour	1,123 8,985 1,123
	Medium Event	8	6	1-2 hours < 1 hour	1,382 1,843	< 1 hour 1-2 hours	2,534 691	1-2 hours < 1 hour	3,554 4,738	< 1 hour 1-2 hours	6,515 1,776
	Small Event	20	6	1-2 hours < 1 hour	353 461	< 1 hour 1-2 hours	637 177	1-2 hours < 1 hour	1,513 1,974	< 1 hour 1-2 hours	2,731 757
THE FORUM	Large Event	37	6	1-2 hours < 1 hour	415 553	< 1 hour 1-2 hours	760 207	1-2 hours < 1 hour	1,036 1,382	< 1 hour 1-2 hours	1,901 519
	Medium Event	29	6	1-2 hours < 1 hour	277 369	< 1 hour 1-2 hours	506 138	1-2 hours < 1 hour	711 948	< 1 hour 1-2 hours	1,303 355
	Small Event	16	6	1-2 hours < 1 hour	138 184	< 1 hour 1-2 hours	254 69	1-2 hours < 1 hour	474 632	< 1 hour 1-2 hours	868 237
PROPOSED INGLEWOOD BASKETBALL AND ENTERTAINMENT CENTER*	Clippers Game	44	7	1-2 hours < 1 hour	519 691	< 1 hour 1-2 hours	950 259	1-2 hours < 1 hour	1,096 1,461	< 1 hour 1-2 hours	2,009 548
	Large Event	31	6	1-2 hours < 1 hour	415 553	< 1 hour 1-2 hours	760 207	1-2 hours < 1 hour	1,096 1,461	< 1 hour 1-2 hours	2,009 548
	Medium Event	13	6	1-2 hours < 1 hour	277 369	< 1 hour 1-2 hours	506 138	1-2 hours < 1 hour	711 948	< 1 hour 1-2 hours	1,303 355
	Small Event	17	6	1-2 hours < 1 hour	138 184	< 1 hour 1-2 hours	254 69	1-2 hours < 1 hour	474 632	< 1 hour 1-2 hours	868 237
PERFORMANCE ARENA	Event	75	6	1-2 hours < 1 hour	138 184	< 1 hour 1-2 hours	254 69	1-2 hours < 1 hour	355 474	< 1 hour 1-2 hours	652 178

<sup>1</sup> Arrivals occurring prior to the event, travel southbound

<sup>2</sup> Departures occurring post-event, travel northbound

\* Note: Preliminary assumptions regarding events were estimated for proposed Inglewood Basketball & Entertainment Center but will be further developed during its environmental clearance process.

Source: Raju Associates, 2018



Table 3.2-5: Fairview Heights Alignment  
Event Ridership Profile Summary

VENUE	EVENT	NO. OF EVENTS	SERVICE HOURS	RIDERSHIP ESTIMATE PROFILES							
				LOW ESTIMATE				HIGH ESTIMATE			
				ARRIVAL <sup>1</sup>		DEPARTURE <sup>2</sup>		ARRIVAL <sup>1</sup>		DEPARTURE <sup>2</sup>	
LASED	NFL Game	20	8	> 2 hours 1-2 hours < 1 hour	731 1,453 3,276	During Game 1-2 hours < 1 hour	546 4,200 714	> 2 hours 1-2 hours < 1 hour	1,504 2,989 6,739	During Game 1-2 hours < 1 hour	1,123 8,640 1,469
	Medium Event	8	6	1-2 hours < 1 hour	1,341 1,789	< 1 hour 1-2 hours	2,460 671	1-2 hours < 1 hour	3,449 4,599	< 1 hour 1-2 hours	6,325 1,725
	Small Event	20	6	1-2 hours < 1 hour	343 447	< 1 hour 1-2 hours	618 171	1-2 hours < 1 hour	1,470 1,916	< 1 hour 1-2 hours	2,651 1,725
THE FORUM	Large Event	37	6	1-2 hours < 1 hour	403 537	< 1 hour 1-2 hours	737 201	1-2 hours < 1 hour	1,006 1,342	< 1 hour 1-2 hours	1,845 503
	Medium Event	29	6	1-2 hours < 1 hour	268 358	< 1 hour 1-2 hours	492 134	1-2 hours < 1 hour	690 920	< 1 hour 1-2 hours	1,265 345
	Small Event	16	6	1-2 hours < 1 hour	134 179	< 1 hour 1-2 hours	245 67	1-2 hours < 1 hour	460 613	< 1 hour 1-2 hours	844 230
PROPOSED INGLEWOOD BASKETBALL AND ENTERTAINMENT CENTER*	Clippers Game	44	7	1-2 hours < 1 hour	503 671	< 1 hour 1-2 hours	922 252	1-2 hours < 1 hour	1,063 1,418	< 1 hour 1-2 hours	1,950 532
	Large Event	31	6	1-2 hours < 1 hour	403 537	< 1 hour 1-2 hours	737 201	1-2 hours < 1 hour	1,063 1,418	< 1 hour 1-2 hours	1,950 532
	Medium Event	13	6	1-2 hours < 1 hour	268 358	< 1 hour 1-2 hours	492 134	1-2 hours < 1 hour	690 920	< 1 hour 1-2 hours	1,265 345
	Small Event	17	6	1-2 hours < 1 hour	134 179	< 1 hour 1-2 hours	245 67	1-2 hours < 1 hour	460 613	< 1 hour 1-2 hours	844 230
PERFORMANCE ARENA	Event	75	6	1-2 hours < 1 hour	134 179	< 1 hour 1-2 hours	245 67	1-2 hours < 1 hour	345 460	< 1 hour 1-2 hours	632 172

<sup>1</sup> Arrivals occurring prior to the event, travel southbound

<sup>2</sup> Departures occurring post-event, travel northbound

\* Note: Preliminary assumptions regarding events were estimated for proposed Inglewood Basketball & Entertainment Center but will be further developed during its environmental clearance process.

Source: Raju Associates, 2018

Table 3.2-6: Arbor Vitae Alignment  
Event Ridership Profile Summary

VENUE	EVENT	NO. OF EVENTS	SERVICE HOURS	RIDERSHIP ESTIMATE PROFILES							
				LOW ESTIMATE				HIGH ESTIMATE			
				ARRIVAL <sup>1</sup>		DEPARTURE <sup>2</sup>		ARRIVAL <sup>1</sup>		DEPARTURE <sup>2</sup>	
LASED	NFL Game	20	8	> 2 hours 1-2 hours < 1 hour	694 1,381 3,112	During Game 1-2 hours < 1 hour	519 4,419 519	> 2 hours 1-2 hours < 1 hour	1,428 2,840 6,402	During Game 1-2 hours < 1 hour	1,067 8,537 1,067
	Medium Event	8	6	1-2 hours < 1 hour	1,306 1,741	< 1 hour 1-2 hours	2,395 653	1-2 hours < 1 hour	3,358 4,477	< 1 hour 1-2 hours	6,157 1,679
	Small Event	20	6	1-2 hours < 1 hour	334 435	< 1 hour 1-2 hours	602 167	1-2 hours < 1 hour	1,431 1,865	< 1 hour 1-2 hours	2,580 715
THE FORUM	Large Event	37	6	1-2 hours < 1 hour	392 522	< 1 hour 1-2 hours	718 196	1-2 hours < 1 hour	980 1,306	< 1 hour 1-2 hours	1,795 489
	Medium Event	29	6	1-2 hours < 1 hour	261 348	< 1 hour 1-2 hours	479 131	1-2 hours < 1 hour	672 895	< 1 hour 1-2 hours	1,231 335
	Small Event	16	6	1-2 hours < 1 hour	131 174	< 1 hour 1-2 hours	239 65	1-2 hours < 1 hour	448 597	< 1 hour 1-2 hours	821 224
PROPOSED INGLEWOOD BASKETBALL AND ENTERTAINMENT CENTER*	Clippers Game	44	7	1-2 hours < 1 hour	489 653	< 1 hour 1-2 hours	898 245	1-2 hours < 1 hour	1,035 1,380	< 1 hour 1-2 hours	1,899 518
	Large Event	31	6	1-2 hours < 1 hour	392 522	< 1 hour 1-2 hours	718 196	1-2 hours < 1 hour	1,035 1,380	< 1 hour 1-2 hours	1,899 518
	Medium Event	13	6	1-2 hours < 1 hour	261 348	< 1 hour 1-2 hours	479 131	1-2 hours < 1 hour	672 895	< 1 hour 1-2 hours	1,231 335
	Small Event	17	6	1-2 hours < 1 hour	131 174	< 1 hour 1-2 hours	239 65	1-2 hours < 1 hour	448 597	< 1 hour 1-2 hours	821 224
PERFORMANCE ARENA	Event	75	6	1-2 hours < 1 hour	131 174	< 1 hour 1-2 hours	239 65	1-2 hours < 1 hour	335 448	< 1 hour 1-2 hours	616 168

<sup>1</sup> Arrivals occurring prior to the event, travel eastbound

<sup>2</sup> Departures occurring post-event, travel westbound

\* Note: Preliminary assumptions regarding events were estimated for proposed Inglewood Basketball & Entertainment Center but will be further developed during its environmental clearance process.

Source: Raju Associates, 2018

Table 3.2-7: Century Boulevard Alignment  
Event Ridership Profile Summary

VENUE	EVENT	NO. OF EVENTS	SERVICE HOURS	RIDERSHIP ESTIMATE PROFILES							
				LOW ESTIMATE				HIGH ESTIMATE			
				ARRIVAL <sup>1</sup>		DEPARTURE <sup>2</sup>		ARRIVAL <sup>1</sup>		DEPARTURE <sup>2</sup>	
LASED	NFL Game	20	8	> 2 hours 1-2 hours < 1 hour	783 1,557 3,510	During Game 1-2 hours < 1 hour	585 4,680 585	> 2 hours 1-2 hours < 1 hour	1,504 2,989 6,739	During Game 1-2 hours < 1 hour	1,123 8,985 1,123
	Medium Event	8	6	1-2 hours < 1 hour	1,088 2,142	< 1 hour 1-2 hours	2,718 412	1-2 hours < 1 hour	2,610 5,141	< 1 hour 1-2 hours	6,525 989
	Small Event	20	6	1-2 hours < 1 hour	280 536	< 1 hour 1-2 hours	684 107	1-2 hours < 1 hour	1,121 2,142	< 1 hour 1-2 hours	2,735 429
THE FORUM	Large Event	37	6	1-2 hours < 1 hour	326 643	< 1 hour 1-2 hours	816 124	1-2 hours < 1 hour	761 1,499	< 1 hour 1-2 hours	1,904 289
	Medium Event	29	6	1-2 hours < 1 hour	218 428	< 1 hour 1-2 hours	543 82	1-2 hours < 1 hour	522 1,028	< 1 hour 1-2 hours	1,305 198
	Small Event	16	6	1-2 hours < 1 hour	108 214	< 1 hour 1-2 hours	272 41	1-2 hours < 1 hour	348 685	< 1 hour 1-2 hours	870 131
PROPOSED INGLEWOOD BASKETBALL AND ENTERTAINMENT CENTER*	Clippers Game	44	7	1-2 hours < 1 hour	408 803	< 1 hour 1-2 hours	1,020 155	1-2 hours < 1 hour	805 1,585	< 1 hour 1-2 hours	2,012 305
	Large Event	31	6	1-2 hours < 1 hour	326 643	< 1 hour 1-2 hours	816 124	1-2 hours < 1 hour	805 1,585	< 1 hour 1-2 hours	2,012 305
	Medium Event	13	6	1-2 hours < 1 hour	218 428	< 1 hour 1-2 hours	543 82	1-2 hours < 1 hour	522 1,028	< 1 hour 1-2 hours	1,305 198
	Small Event	17	6	1-2 hours < 1 hour	108 214	< 1 hour 1-2 hours	272 41	1-2 hours < 1 hour	348 685	< 1 hour 1-2 hours	870 131
PERFORMANCE ARENA	Event	75	6	1-2 hours < 1 hour	108 214	< 1 hour 1-2 hours	272 41	1-2 hours < 1 hour	261 514	< 1 hour 1-2 hours	653 99

<sup>1</sup> Arrivals occurring prior to the event, travel eastbound

<sup>2</sup> Departures occurring post-event, travel westbound

\* Note: Preliminary assumptions regarding events were estimated for proposed Inglewood Basketball & Entertainment Center but will be further developed during its environmental clearance process.

Source: Raju Associates, 2018

### 3.2.3 Average Annual Ridership Estimates

The average annual ridership estimates were developed for each of the four Inglewood Transit Connector alignment alternatives as follows:

1. Average weekday and weekend day, Saturday and Sunday, non-event-based ridership estimates were expanded by the number of days of their respective occurrences.

2. Average event-day ridership estimates for each of the types of events at each of the venues were expanded by the number of instances that they occur in a given year.
3. Combination of the above two ridership estimates.

Table 3.7-8 through Table 3.7-10 summarizes the average annual ridership for each of the four alternatives.

Table 3.2-8: Event Day Annual Ridership by Alignment

	EVENT ANNUAL RIDERSHIP				
	LASED	THE FORUM	IBEC	PERFORMANCE ARENA	TOTAL
Alternative A: Market-Manchester Alignment	409,230	184,538	353,992	78,148	1,025,908
Alternative B: Fairview Heights Alignment	404,652	179,132	280,276	75,860	939,920
Alternative C: Arbor Vitae Alignment	387,974	174,368	350,184	73,842	986,368
Alternative D: Century Blvd Alignment	420,248	189,684	374,150	80,328	1,064,410

Source: Raju Associates, 2018

Table 3.2-9: Overall Total Annual Ridership by Alignment

ALIGNMENT	ANNUAL RIDERSHIP
Alternative A: Market-Manchester Alignment	2,578,120
Alternative B: Fairview Heights Alignment	1,894,826
Alternative C: Arbor Vitae Alignment	2,047,055
Alternative D: Century Blvd Alignment	2,933,147

Source: Raju Associates, 2018

Table 3.2-10: Annual Non-Event Related Ridership Estimates

	NUMBER OF DAYS	DAILY RIDERSHIP/ANNUAL RIDERSHIP			
		Alternative A: Market-Manchester Alignment	Alternative B: Fairview Heights Alignment	Alternative C: Arbor Vitae Alignment	Alternative D: Century Blvd Alignment
Weekdays (all Weekdays in the year)	250	4,969/ 1,242,250	3,057/ 764,220	3,396/ 848,878	5,982/ 1,495,567
Saturdays (all Saturdays in the year)	52	3,228/ 167,849	1,986/ 103,259	22,206/ 114,698	3,886/ 202,076
Sundays (all Sundays in the year)	52	2,733/ 142,113	1,681/ 87,427	1,868/ 97,112	3,290/ 171,093
Total Annual		1,552,212	954,906	1,060,687	1,868,737

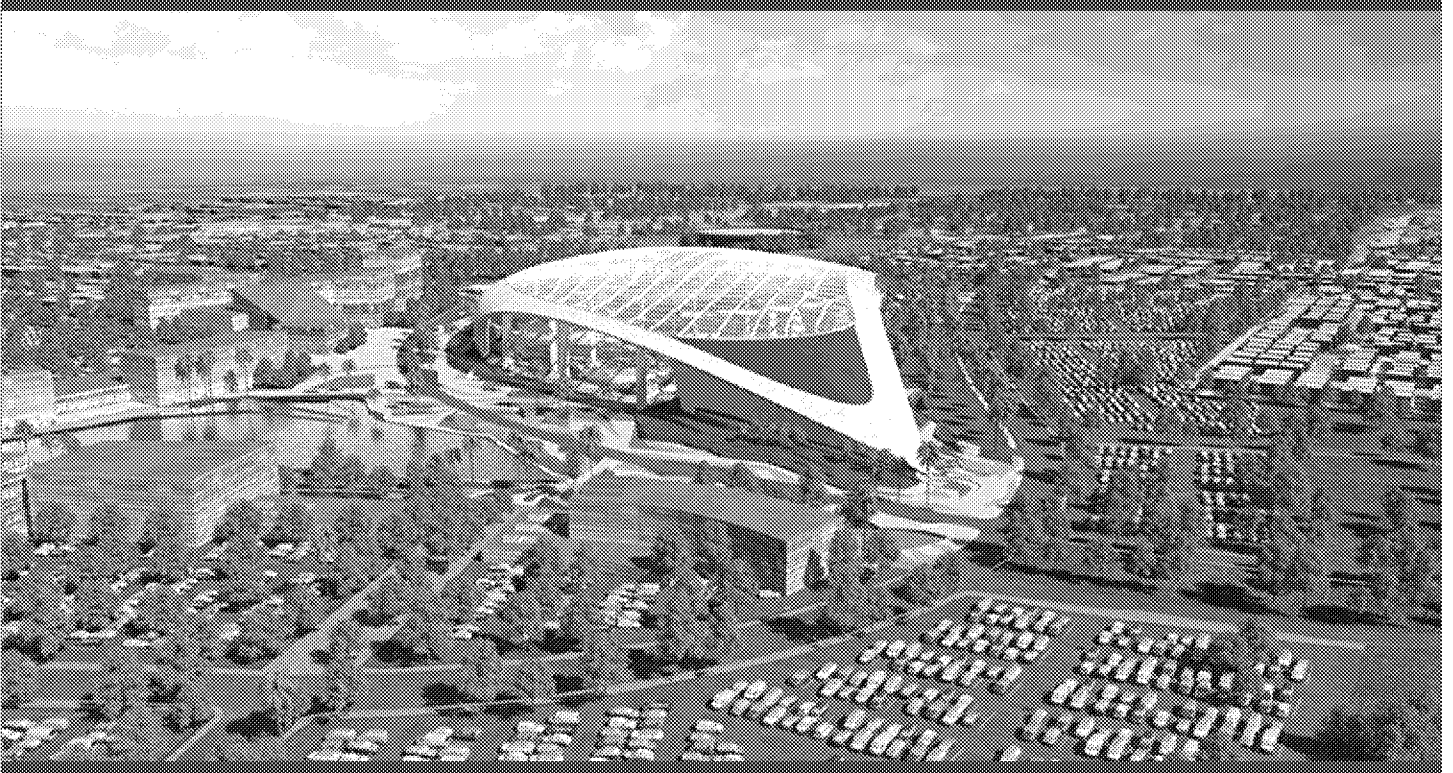
Source: Raju Associates, 2018

Figure 3.2-1: The Miracle on Market Street



Source: Aero Collective Website, 2018

## 4. COMPARISON ANALYSIS OF ALTERNATIVES



To identify the the City of Inglewood's locally preferred alternative project, the following screening criteria were established:

- Connection between Metro and key City venues
- Passenger convenience
- Cost and feasibility
- Total costs – Capital and Operations & Maintenance
- Ability to fit within the public right of way constraints and ability to resolve conflicts with utilities
- Ridership potential
- Synergistic Economic Development within the City
- Required Major Coordination Efforts

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## 4.1 PASSENGER CONVENIENCE

Passenger convenience is measured by the criteria defined below:

1. **Reliable Connection to Inglewood Activity Centers:** convenient service with minimum delay, wait, and travel times to LASED, The Forum, and the proposed Inglewood Basketball and Entertainment Center.
2. **Regional Connectivity:** ease of transferring to and from the Metro Rail system and potential intermodal facilities that would be served by various Metro and municipal bus lines
3. **Safety and Security:** all the alternatives are elevated APM systems that will operate within a defined right-of-way. All Fixed Guideway Transit Systems, such as the APM, are subject to oversight by the California Public Utilities Commission (CPUC) which will determine whether the system is safe to carry passengers and issue the operating certificate.

Each of the alternatives are described in Section 2.2 through 2.5. Section 2.6 provides details of the technology assessment of APM technologies with key findings on the candidate technologies applicable to the project. The specific technology is expected to be selected through a competitive procurement process, which is not alternative dependent. Multiple characteristics of the alternatives are expected to be comparable to each other across the alternatives, and will not provide any differentiation between them.

For the selection of the Locally Preferred Alternative (LPA), passenger convenience is expected to be similar among all alternatives, and therefore, is a non-differentiating characteristic because:

- All alternatives will provide a time-certain travel experience, i.e. reliable connection to the key traffic generators.
- All alternatives will provide a transfer connection to Metro and each alternative will be designed to include an intermodal facility that would serve various Metro and municipal bus lines.
- Station locations, configurations, access and amenities will be comparable across all alternatives.
- All alternatives will be subject to CPUC requirements.





## 4.2 COST AND FINANCIAL FEASIBILITY

As the Inglewood Transit Connector Project is refined, cost estimates will be updated and developed. Nonetheless, to assist the comparative analysis of alternative concepts, in project evaluation, the City developed preliminary cost estimates based on a conceptual level project definition for each of the alternatives. System cost estimates considered demand, capacity, and technology needs.

APM systems are comprised of two major elements, the Operating System and Fixed Facilities, which are integrated into a fully functional total system. The Operating System consists of vehicles, running track, guideway equipment, propulsion power, automatic train control and communications subsystems, station and wayside equipment, maintenance equipment and other elements. Fixed Facilities include guideway infrastructure, stations, buildings for the Maintenance and Storage Facilities (M&SF), Command and Control Facilities, propulsion power substations and other facilities upon which Operating System elements are installed by the APM system supplier.

Estimates of probable costs for the APM Operating System and the Fixed Facilities were prepared for each of the Alternatives, based on a concept level definition and are presented herein.

## 4.3 CAPITAL COSTS

### 4.3.1 APM Operating System Capital Cost

APM Operating Systems are proprietary designs that are typically procured as complete packages. The major subsystems, such as vehicles, tracks, switches and control systems, station equipment, from different suppliers cannot be mixed to form a system. Operating Systems are typically procured under a turnkey design, supply and installation contract. The Operating System of an APM application is

specially configured using supplier developed equipment designs that are applied to satisfy site-specific requirements. As a result, costs within the APM industry vary widely on a project by project basis as APM suppliers implement their unique proprietary technology for a particular system. Costs for different projects by the same supplier may also vary significantly because of differences in fleet size, capacity requirements, and performance requirements. Probable capital costs for the APM Operating System were developed and estimated based on historical cost information and applied to this project considering factors such as guideway length, configuration and number of passenger stations, size of the M&SF, number of propulsion power substations and fleet size.

Globally, there are likely only a handful APM Operating System suppliers with technically mature technologies capable of providing a system that will meet the anticipated performance requirements of this project within the site specific constraints. A competitive procurement environment is essential and inherently assumed in developing the estimate of probable costs.

### 4.3.2 Fixed Facility Cost Estimates

In contrast with the Operating System, there are a substantially larger number of potential entities capable of designing and building the fixed facilities elements. The estimated probable cost of the fixed facility elements was developed based on a concept level definition of the different fixed facility elements including similar transit projects within the Los Angeles Metropolitan area. Estimated unit costs for the different elements are noted below:

- Aerial guideway, per linear feet of dual lane: \$7,000 per linear foot.
- Stations, including pedestrian bridge to sidewalks, and excluding Operating System elements: \$20 M per station.
- Maintenance and Storage Facility, excluding Operating System elements: \$40 M.
- Utility infrastructure: \$2,000 per linear foot of dual lane.

Table 4.3-1: Capital Cost Estimate (Conceptual) - 2018\$

	Alternative A: Market-Manchester Alignment	Alternative B: Fairview Heights Alignment	Alternative C: Arbor Vitae Alignment	Alternative D: Century Blvd Alignment
System Length	1.8 route miles	2.2 route miles	3.0 route miles	3.1 route miles
Number of Stations	5	4	5	5
Traction Power Substations	2	2	3	3
Number of Cars ("Generic") Operating Fleet/Total Fleet	28/32	28/32	28/32	28/32
<b>APM OPERATING SYSTEM CAPITAL COST ESTIMATE</b>				
Guideway, Wayside, ATC, Power and Communication Systems and Maintenance Equipment	\$62 M	\$70 M	\$90 M	\$93 M
Rolling Stock/Fleet	\$75 M	\$75 M	\$75 M	\$75 M
Other Costs not included above includ- ing but not limited to other equipment, System Supplier's PM/Engineering/T&C, bonds, insurance, etc. (at 30%)	\$42 M	\$43.5 M	\$49.5 M	\$50.4 M
Subtotal Estimate of Operating System Probable cost	\$179M	\$188.5 M	\$214.5 M	\$218.4
<b>FIXED FACILITY COST ESTIMATE (CONCEPTUAL) - 2018\$</b>				
Stations and Ped bridges structure and Building systems	\$100 M	\$80 M	\$ 100 M	\$ 100 M
Aerial Guideway (incl. columns, foundations)	\$66.6 M	\$ 81.3 M	\$110.9 M	\$ 114.6 M
Maintenance and Storage Facility Structure and Building Systems	\$40 M	\$ 40 M	\$ 40 M	\$ 40 M
Utility Infrastructure, Traction and building power substations, housekeeping power equipment and distribution (downstream from utility connection points)	\$19 M	\$23 M	\$31.7 M	\$ 32.7 M
Other Costs not included above such as and including DB Contractor's engineering/CM/etc, bonds, insurance etc. (est. 30%)	\$68 M	\$ 68 M	\$ 85 M	\$ 86 M
SubTotal - Estimate of Fixed Facility Probable cost	\$293.6 M	\$ 292.3 M	\$ 367.6 M	\$ 373.3 M
Subtotal (Operating System + Fixed Facilities)	\$472.6 M	\$480.8 M	\$582.1 M	\$591.7 M
Contingency (30%)	\$141.8 M	\$144.3 M	\$174.6 M	\$177.5 M
<b>TOTAL ESTIMATED PROBABLE CAPITAL COST (2018\$) <sup>1, 2</sup></b>				
<b>TOTAL COST <sup>1, 2</sup></b>	<b>\$614.4 M</b>	<b>\$625.1 M</b>	<b>\$756.7 M</b>	<b>\$ 769.2 M</b>

1. Right of way acquisition, environmental and physical mitigations, parking/intermodal center costs and costs of other infrastructure are not included since these are not defined and subject to future analysis and input from other city and regional transportation plans/studies.

2. Owner soft costs not included - Owner soft costs cover Owner's management costs including Owner retained consultants etc.

Source: Pacifica Services, Trifiletti Consulting, 2018

#### 4.3.3 Operations and Maintenance Cost Estimates

Operations and maintenance cost estimates are provided for each of the alternatives below.

There are two components: 1) APM Operating System operations and maintenance, and 2) Fixed Facility/ infrastructure operations and maintenance.

The APM Operating System operations and maintenance cost estimates address the operations and maintenance of the Operating System components including the vehicles, the automatic train control system, the traction and auxiliary power distribution systems and communication systems, all of which are the components that when fully integrated, provide the reliable and safe transportation service that is desired. Staffing consists of central control operators, supervisors, mechanical and electrical shop technicians, as well as management, administrative and janitorial staff necessary for the APM Operating System. Costs for regular preventive maintenance, as well as spare parts and consumables are included, however, costs for major overhauls and capital asset replacement are not included. The typical design service life of an APM Operating System is approximately 25 to 30 years. Major overhauls and capital asset replacement can be expected to occur at year fifteen of service. Considering that the Operating System characteristics are similar for all the alternatives, the major overhaul and capital asset replacement costs are considered to be approximately comparable and not expected to change the comparative costs between the alternatives. Since the project is at a conceptual definition phase, the estimate of probable cost is based on a concept level operations plan considering the fleet and anticipated annual fleet miles.

Fixed Facility operations and maintenance cost estimates address the following scope of work: regular inspections and routine repairs to the infrastructure, including guideway structure, station structure, maintenance and storage facility structure, power substation structure, and the electro-mechanical systems within that are not part of the APM Operating System. These electro-mechanical systems include housekeeping power systems, building heating-ventilation-air-conditioning systems, escalators and elevators, fire management systems, and other similar building management systems. An estimate of probable annual O&M costs for the Fixed Facilities is approximately 1.5% of the total Fixed Facility capital cost.

Estimates of probable annual operations and maintenance costs are shown in Table 4.3-2.



Table 4.3-2: Annual Operations and Maintenance Cost Estimate (Conceptual) – 2018\$

	Alternative A: Market-Manchester Alignment	Alternative B: Fairview Heights Alignment	Alternative C: Arbor Vitae Alignment	Alternative D: Century Boulevard Alignment
System Length	1.8 route miles	2.2 route miles	3.0 route miles	3.1 route miles
Number of Stations	5	4	5	5
Traction Power Substations	2	2	3	3
#Number of Cars ("Generic") Operating Fleet/Total Fleet	28/32	28/32	28/32	28/32
<b>ESTIMATE OF FIXED FACILITY ANNUAL O&amp;M COSTS (EXCLUDING UTILITIES)</b>				
Estimate of Fixed Facility Annual O&M Costs (excluding Utilities)	\$5 M	\$5 M	\$6 M	\$6 M
<b>ESTIMATE OF OPERATING SYSTEM ANNUAL O&amp;M COSTS</b>				
Operating System Annual O&M Cost Estimate (excl Utilities, mid-life over- hauls and capital asset replacement/ rejuvenation)	\$6 M			
Estimates annual reserve for mid life overhaul, capital asset rejuvenation etc.	\$3 M			
Sub Total – Estimate of Annual O&M Costs including reserves for Operating System capital asset rejuvenation	\$14 – \$15 M			
Contingency (30%)	\$ 4.2 - \$ 4.5 M			
Total Estimate of Annual O&M Costs including reserves for Operating System capital asset rejuvenation <sup>1</sup>	\$18.2 - \$19.5 M			

1. Assumes a Design-Build-Operate-Maintain delivery strategy with a 25 to 30-year term with Contractor responsible for all operations/maintenance of contractor delivered assets. Does not include cost of utilities or Owner soft costs.

Source: Pacifica Services, Trifiletti Consulting, 2018

## 4.4 ENGINEERING AND PHYSICAL FEASIBILITY

Physical constraints and engineering feasibility are key factors to selecting the Locally Preferred Alternative for the Inglewood Transit Connector Project. Because all alternatives are elevated APM systems with similar design and constructability aspects, this section focuses on areas where the alignment characteristics differ, specifically the available right-of-way and location of underground utilities.

### 4.4.1 Ability to Fit Within the Right-of-Way

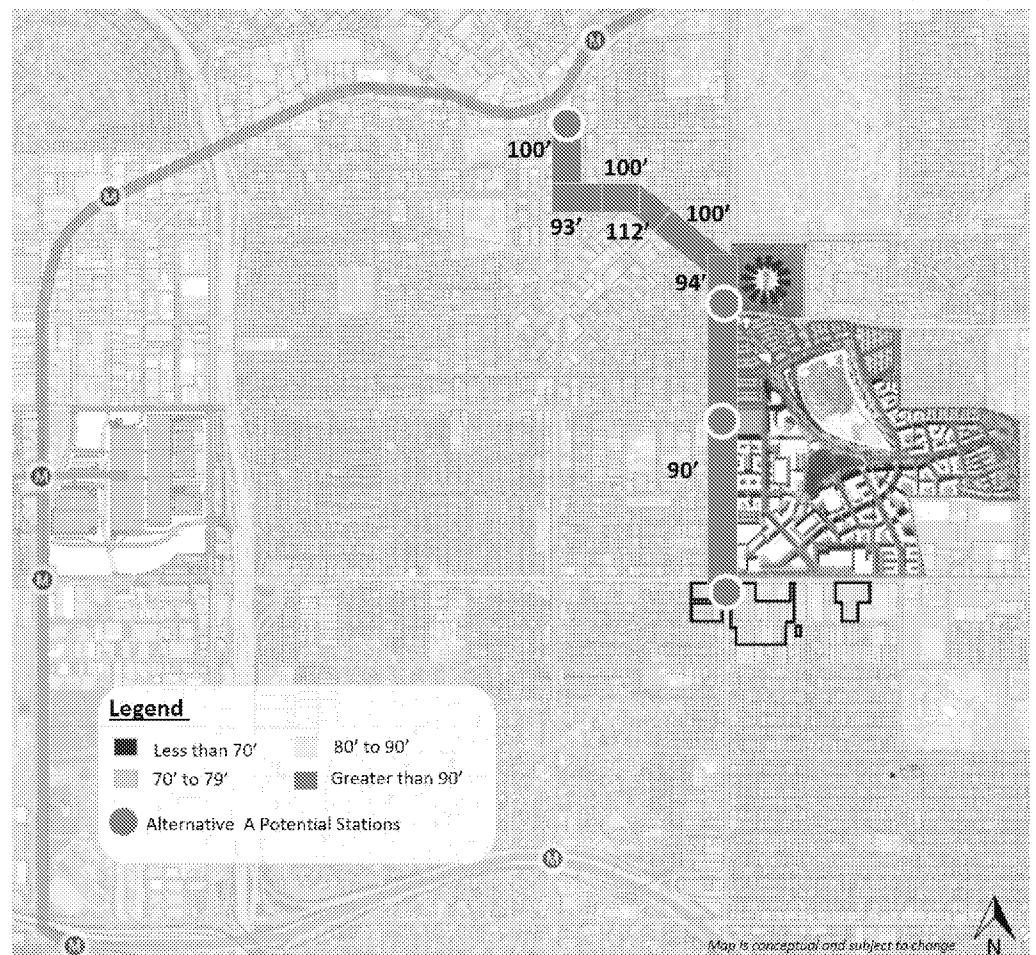
This section summarizes a preliminary analysis on the right-of-way acquisitions that may be required for the Project alternatives. The four alternatives have stations along their respective alignments that may involve redevelopment in the areas adjacent to the stations. In addition to station areas, additional property acquisitions may be required for Maintenance Storage Facilities and traction power stations. As part of the detailed design and environmental review analysis of the preferred alternative, specific property acquisition requirements will be established for the preferred

alternative as part of the next stage of the project development during the EIR phase.

### Alternative A: Market-Manchester Alignment:

The right-of-way along Alternative A ranges from approximately 93 feet to 112 feet, thus minimal property acquisitions due to utilities are anticipated. The alignment would be located primarily on the street right-of-way with the exception of a segment on the northeast quadrant of Market Street and Manchester Boulevard where the alignment transitions east onto Manchester Boulevard from Market Street. Potential acquisition or right-of-way easement requirements at the southwest quadrant of Prairie Avenue and Arbor Vitae Street are projected.

Figure 4.4-1 Alternative A: Right-of-Way Analysis



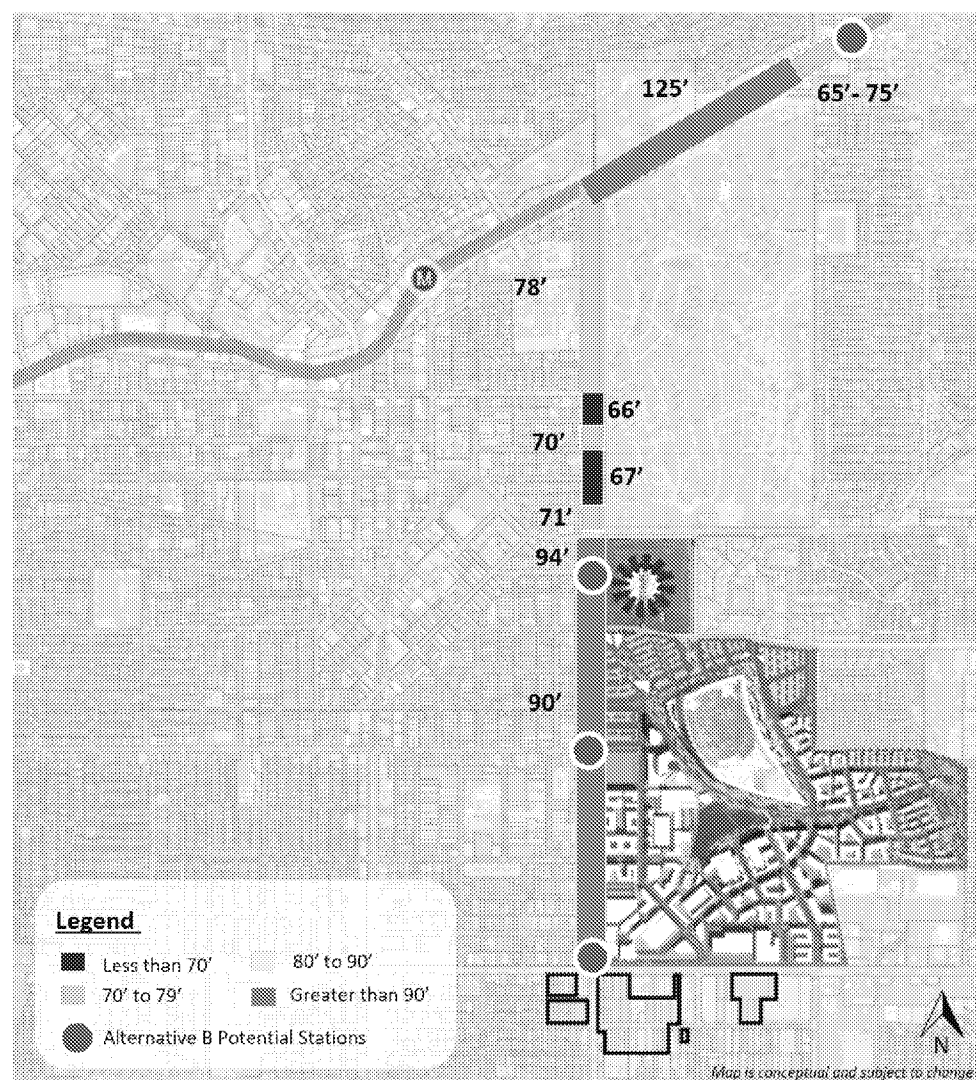
Source: Trifiletti Consulting, Raju Associates, 2018

**Alternative B: Fairview Heights Alignment:**

Although Alternative B is located primarily within the street right-of-way, there is limited roadway width between Florence Avenue and Manchester Boulevard (Figure 4.4-2). Potentially significant property impacts to the Inglewood Cemetery are anticipated because the alignment transitions from Florence Avenue which has a wide right-of-way of 125 feet, to Prairie Avenue, which has a right-of-way of 78 feet. Furthermore, the

right-of-way of Prairie Avenue decreases to less than 70 feet south of Regent Street. This would potentially further impact the Inglewood Cemetery and would potentially conflict with utility infrastructure.

Figure 4.4-2: Alternative B: Right-of-Way Analysis



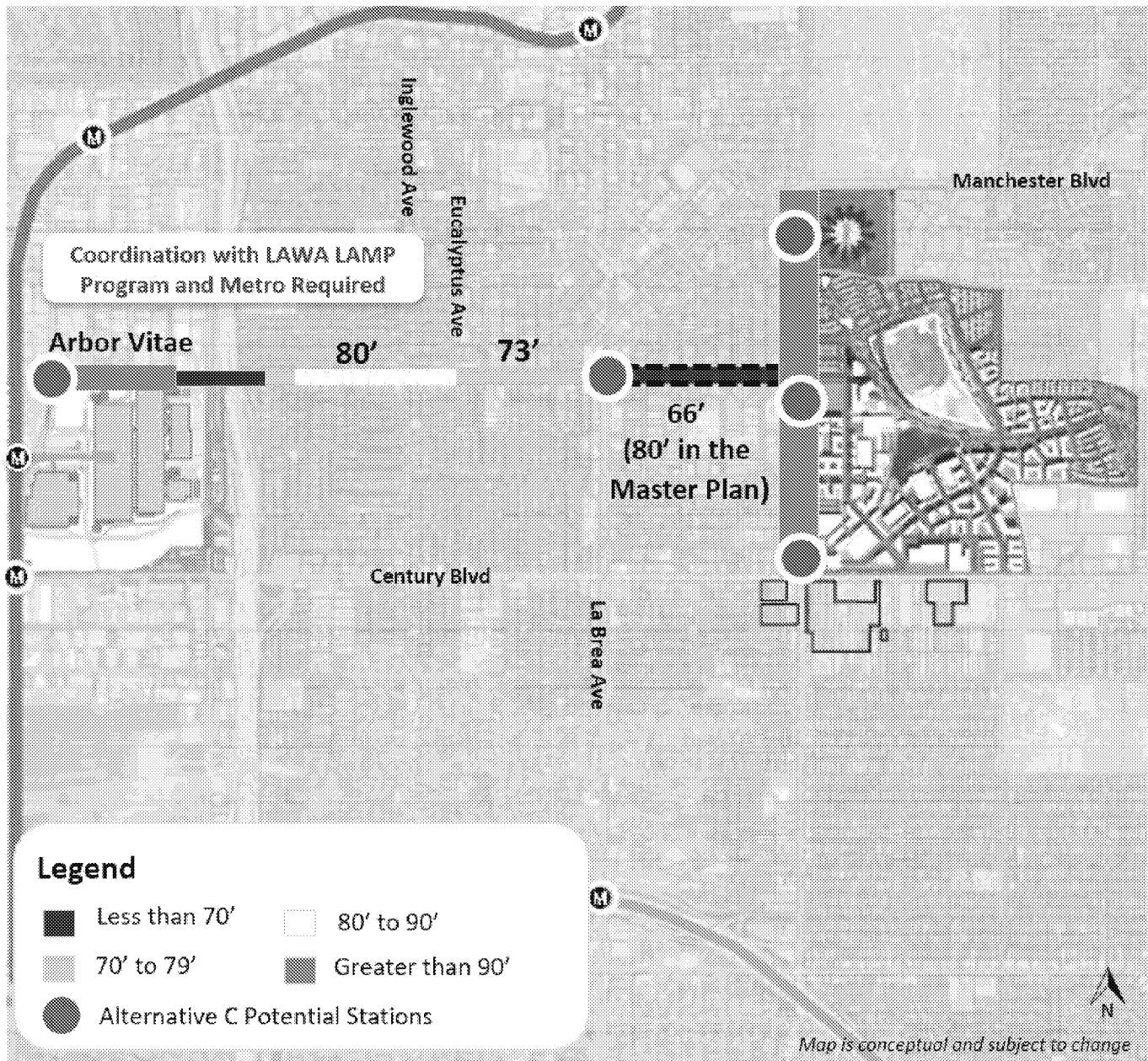
Source: Trifletti Consulting, Raju Associates, 2018

Alternative C: Arbor Vitae Alignment:

Alternative C: Arbor Vitae Alignment right-of-way ranges from 100 feet to 66 feet, narrowing of the right-of-way east of Eucalyptus Avenue (Figure 4.4-3). Given the narrow right-of-way, this concept would potentially require acquisition of existing small business and possible neighborhood

displacement. It would also potentially have adverse economic and fiscal impacts to local businesses along Arbor Vitae due to potentially reduced visibility, potential loss of on-street parking during construction and potential permanent removal of on-street parking spaces to accommodate the alignment.

Figure 4.4-3: Alternative C: Right-of-Way Analysis



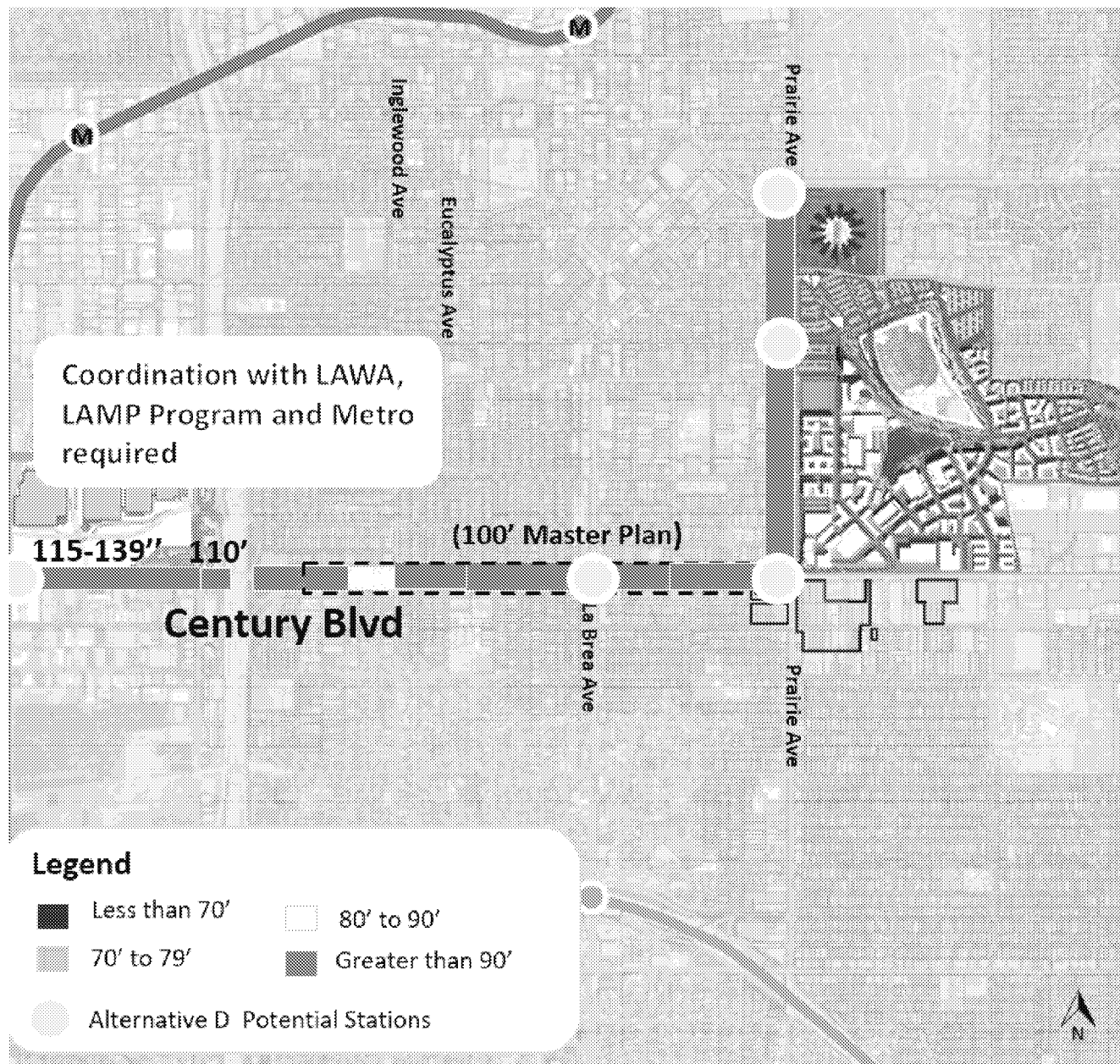
Source: Trifiletti Consulting, Raju Associates, 2018



Alternative D: Century Boulevard Alignment:  
Alternative D has a wide right-of-way of at least 100 feet (Figure 4.4-4) and a continuous center median. Major utilities are located along Century Boulevard and may pose significant conflicts. Major property acquisitions or a major utility relocation effort are required if Alternative D is the selected alternative. Although Century Boulevard has a wide

right-of-way of at least 100 feet and a continuous medium, major utilities are located along Century Boulevard and pose significant conflicts that may require a major utility relocation effort or property acquisitions to avoid utilities. Additionally, the I-405 crosses Century Boulevard with a single 100-foot bridge span impeding over or under clearance.

Figure 4.4-4: Alternative D: Right-of-Way Analysis



Source: Trifiletti Consulting, Raju Associates, 2018

#### 4.4.2 Ability to Address/Resolve Underground Utility Conflicts

Utility information has been provided from the following agencies and utility purveyors:

- City of Inglewood
- Southern California Gas Company, Transmission Department
- Southern California Gas Company, Northwest Distribution Region
- Los Angeles Department of Water and Power
- Los Angeles Department of Public Works
- West Basin Municipal Water District

For the purpose of selecting a Locally Preferred Alternative, the available utility information was examined by overlaying the transit alignment alternatives to determine whether there were any fatal flaws. For this analysis, a fatal flaw is deemed to be a utility conflict that could not be resolved through design to avoid the conflict or by providing for a technically viable utility relocation. A conflict resolution that requires the relocation of a major utility, i.e. a utility that serves a regional base, is considered technically non-viable. The utility identification and assessment process consisted of requests for information from various agencies and utility purveyors. Data obtained included existing and planned major utilities within the project limits. Data and utility maps were prepared for major identified utilities. These maps have been incorporated into preliminary project concept plans for each alternative concept and included in Appendix A.

Available data did not provide exact utility locations in terms of plan and profile; rather, exact utility locations will be determined during project implementation by utilizing ground penetrating radar and/or other methods. During the environmental review of the locally preferred alternative, the City will perform a more comprehensive utility analysis, including depths, width of utilities, material makeup, condition of utility, and clearance requirements to address potential significant impacts and mitigation measures.

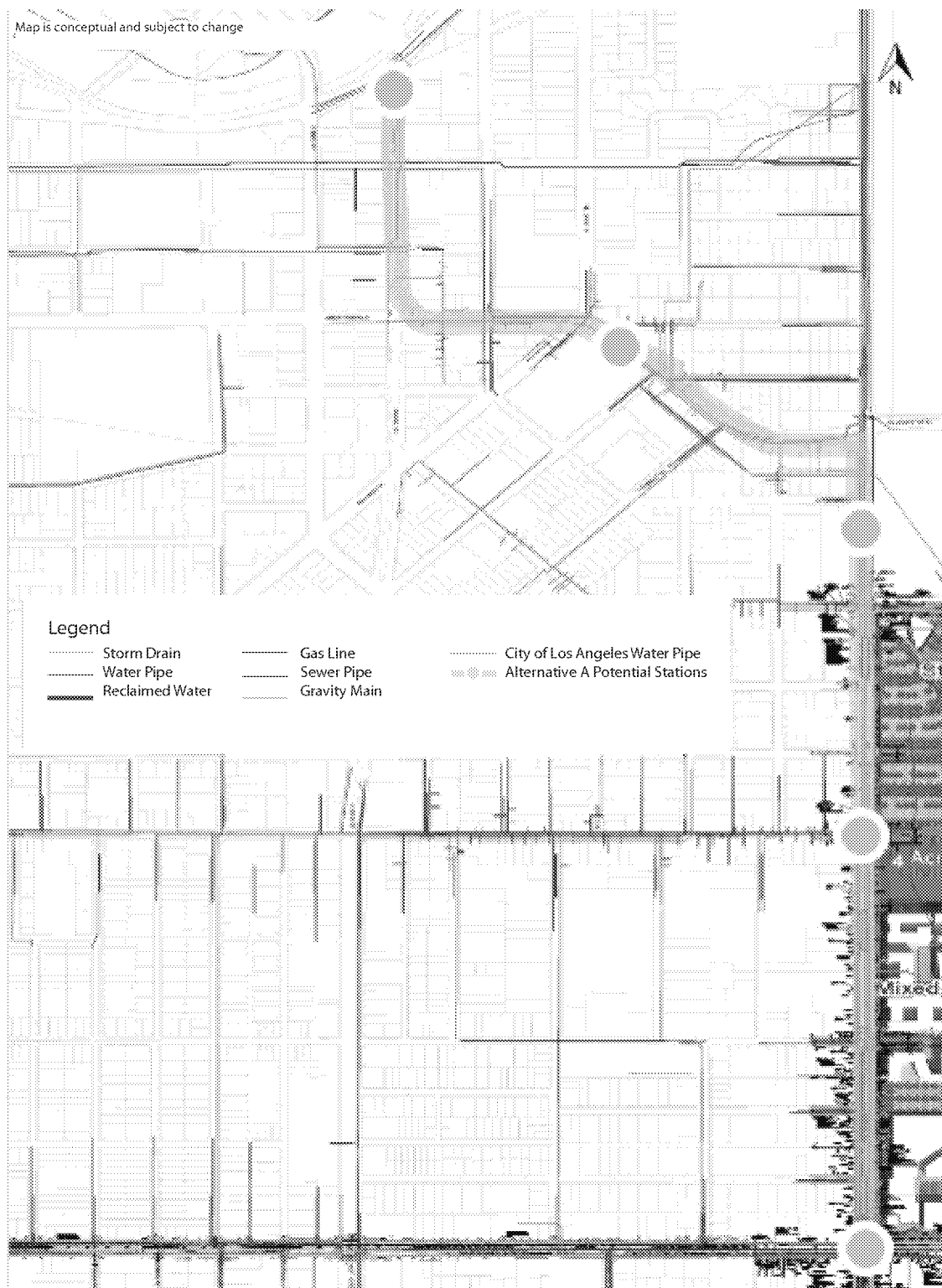
#### Alternative A: Market–Manchester Alignment:

Potential obstacles along the Alternative A alignment include a 36-inch West Basin Water District recycled water line at street centerline and several utilities within fifteen feet along Prairie Avenue. A large 60-inch Department of Water and Power (DWP) main pipe and a 33-inch storm drain line are located on the east side of Prairie Avenue, approximately 20 to 40 feet from centerline. Underground electrical lines, including vaults, are primarily concentrated along or adjacent to easterly and westerly sidewalks and do not pose a major impediment to the Alternative A alignment.

Existing utilities along the northern portion of the alignment pose minimal obstacles for placement of guideway columns. However, due to the span of utilities tie-ins and crossings along Manchester Boulevard at Hillcrest Boulevard, Spruce Avenue, Manchester Drive and Manchester Terrace, placement of guideway columns in this alignment should avoid relocation of gravity flow utilities including sewer and storm drains.

Utilities along the Alternative A route do not pose as major conflicts, and these conflicts could be resolved as there is sufficient roadway width along Market Street, Manchester Boulevard and Prairie Avenue (see Figure 4.4-5). As part of the detailed design of the preferred alternative, the City will conduct site investigations to determine exact utility locations and coordinate column placements to avoid or resolve conflicts, or relocate based on costs versus benefits.

Figure 4.4-5: Utilities Along Alternative A: Market-Manchester



Source: Trifiletti Consulting, Raju Associates, 2018

#### Alternative B: Fairview Heights Utility Analysis:

Based on preliminary research, minor utility pipes, as well as lateral connections to these pipes, from adjacent properties, have been identified along Florence Avenue. Existing utilities, including sewer, gas and water mains along these streets pose minimal obstacles for placement of guideway columns; however, various utility crossings at the curve alignment transition at Florence Avenue and Prairie Avenue should be avoided.

Several utilities along Prairie Avenue have been identified within close proximity, approximately fifteen feet, to this preliminary project alignment alternative. A 36-inch recycled water line travels along the easterly side of Prairie Avenue and transitions to the centerline of the street at Grace Avenue. A large 60-inch LADWP water main and a 33-inch storm drain line are located toward the southerly end of the alignment on the east side of Prairie Avenue, approximately twenty to forty feet from centerline. These utilities may pose significant obstacles but would not be considered to render the alignment infeasible at this stage.

Underground electrical lines, including vaults, are primarily concentrated along or adjacent to easterly and westerly sidewalks and do not pose a concern. Non-gravity flow utilities, including water service lines, may be relocated vertically, i.e. lowered, in lieu of horizontal relocation. Utility crossings including electrical and relatively large sized

storm drain lines are primarily found at street intersections. Extensive utility crossings have been identified south of Manchester Boulevard, at Kelso Street/Pincay Drive, and north of Arbor Vitae Street. Guideway column placements should be avoided near these utility crossings and street intersections.

Utilities along alternative B pose a significant obstacle but relocations are not considered infeasible at this stage. As part of the detailed design of the preferred alternative, the City will conduct site investigations to determine exact utility locations and coordinate column placements to avoid or resolve conflicts.

Figure 4.4-6: Utilities along Alternative B: Fairview Heights Alignment



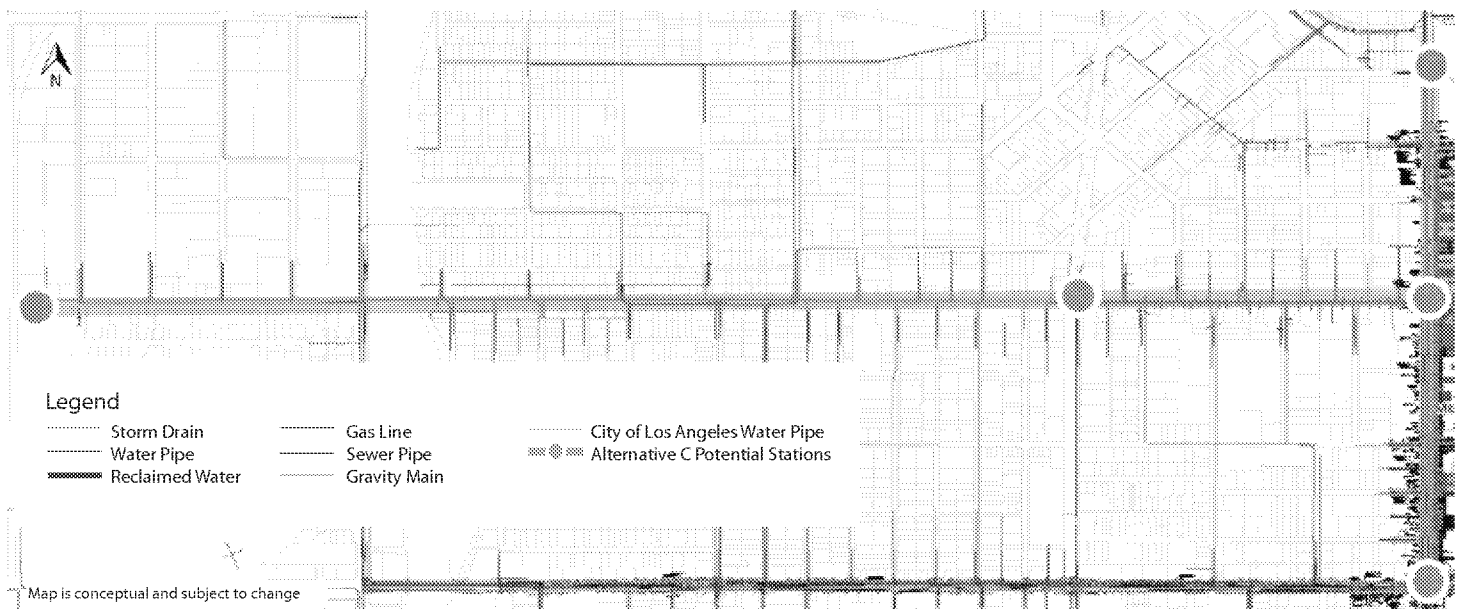
Source: Trifiletti Consulting, Raju Associates, 2018

#### Alternative C: Arbor Vitae Utility Analysis:

The most significant utilities identified as part of preliminary research for this alignment alternative includes an eight to ten inch sewer pipe along the centerline of Arbor Vitae Street between Eucalyptus Avenue and La Brea Avenue, a 36-inch recycled water line along Prairie Avenue centerline within fifteen feet of the preliminary alignment. A large 60-inch DWP water main and a 33-inch storm drain line are located at the east side of Prairie, approximately twenty to forty feet from centerline. Together, these utilities may pose significant obstacles but relocation would not be considered infeasible at this stage. Underground electrical lines, including vaults, are primarily concentrated along or adjacent to sidewalks and do not pose a major impediment. Non-gravity flow utilities, including water service lines, may be relocated vertically, i.e. lowered, in lieu of horizontal relocation.

Due to narrowing of the right-of-way east of Eucalyptus Avenue (Figure 4.4-7), there are potential major impacts to existing small businesses and possible neighborhood displacement. During detailed design of the preferred alternative, the City will conduct site investigations for exact utility locations and coordinate column placements to avoid or resolve conflicts or relocate utilities based on cost versus benefit to the project.

Figure 4.4-7: Utilities Along Alternative C: Arbor Vitae Alignment



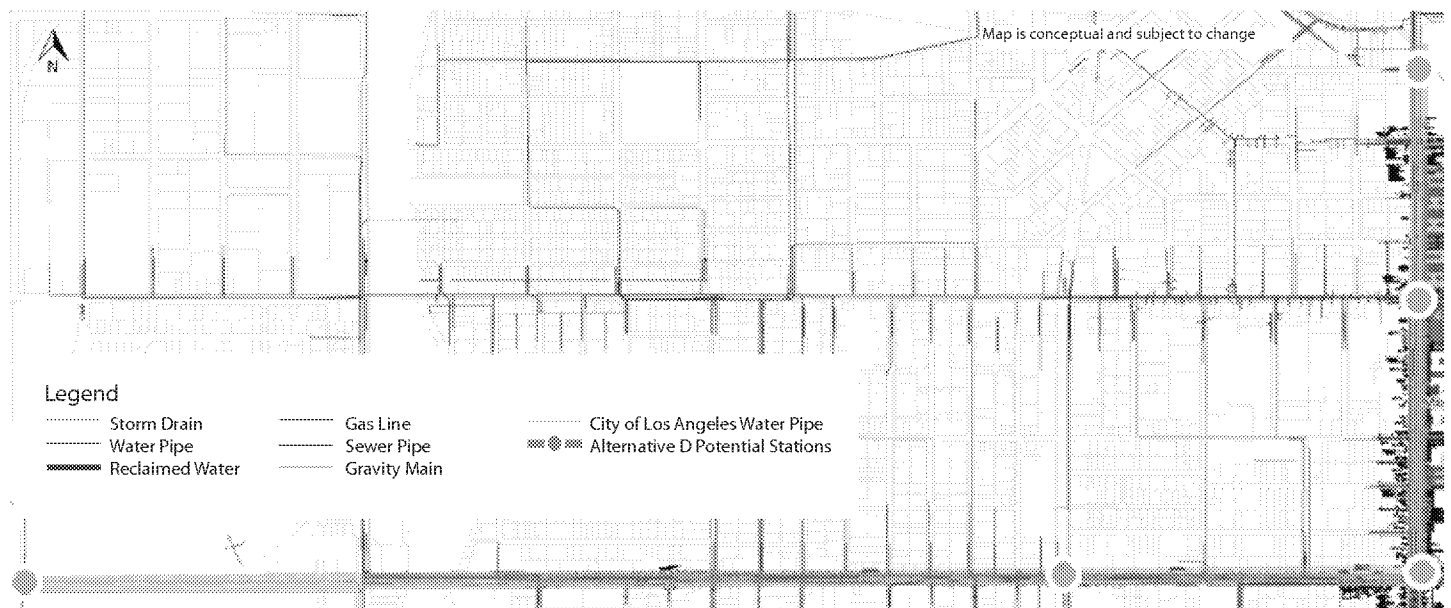
Source: Trifiletti Consulting, Raju Associates, 2018

Alternative D: Utilities Along Century Boulevard:  
Overhead power lines are located along and crossing Century Boulevard from east of Felton Avenue to Condon Avenue. Clearance requirements for these power lines should be considered when evaluating this alignment. Additional underground electrical lines are located along Alternative D including crossings between Grevillea and Burn Avenue and at the intersection of Prairie Avenue and Century Boulevard. Figure 4.4-8 illustrates utilities located along alternative D at a high level.

Although Century Boulevard has a wide right-of-way of at least 100 feet (Figure 4.4-8) and a continuous center median, major utilities are located along Century Boulevard and pose significant conflicts that may require a major utility

relocation effort or property acquisitions to avoid utilities. Major property acquisitions or a major utility relocation effort are required if Alternative D is the selected alternative. Additionally, the I-405 crosses Century Boulevard with a single 100-foot bridge span impeding over or under clearance. As part of the detailed design of the preferred alternative, the City will conduct site investigations to determine exact utility locations and coordinate column placements to avoid or resolve conflicts or relocate utilities based on cost versus benefit to the project.

Figure 4.4- 8: Utilities along Alternative D: Century Boulevard Alignment



Source: Trifiletti Consulting, Raju Associates, 2018

## 4.5 OPERATIONAL ANALYSIS

Ridership analysis supports the following assumptions for the development of sufficient information for a conceptual definition of probable costs, and preliminary conceptual APM system performance, (i.e., travel times and operations):

- Because ridership projections between the different alternatives vary only marginally, the highest projections were assumed for fleet sizing and operations.
- Normal day service: approximately sixteen hours a day from 5 AM to 9 PM.
- Highest per direction ridership projection is approximately 400 passengers-per-hour-per-direction. Over a year, this equates to 5,840 service hours.
- When special events service hours are considered, the net annual service hours for normal day service is 3,940 hours.
- Special event ridership estimates range between low and high, and reflect the anticipated arrival and departure profile for attendees. The required service hours are a maximum of eight hours for NFL Game Day, and six hours for the other events.
- For the purposes of this study, service requirements were assumed based on no overlap between special events. While some overlap may occur, it is expected that this would be addressed as part of service scheduling once events calendars are better defined as part of regular service coordination between the ITC and the venues.

### 4.5.1 Car Capacity and Travel Times

The estimated APM peak hour ridership is used as an initial basis to determine operational capacity needs and fleet requirements. One other variable in estimating system capacity is the estimated space that passengers will occupy while riding the APM system. Because the Inglewood Transit Connector is the last mile urban transit connector, a passenger space allocation of 2.7 square feet per passenger has been assumed; this is consistent with urban metro systems.

Different technologies have different size cars, and therefore different passenger capacity per car. For the purpose of this analysis, an average APM car has been assumed to provide a capacity of between 75 and 90 passengers per car. This assessment is subject to update based on further project development for the preferred alternative.

The dwell time at each station depends on the number of boarders and de-boarders at each station. An average dwell time of 30 seconds has been assumed for each station. While this is sufficient for the average APM car with dual door sets on each side of the car, this assumption also provides for some operational flexibility wherein station dwell times can be adjusted based on the actual boarding and de-boarding at the stations.

Operation of a train over the system for the different alternatives was estimated based on preliminary track geometry and limits on velocity, acceleration and jerk, which is the rate of acceleration. A maximum cruise speed of 50 mph was assumed with speed limits applied in sections of the route to prevent speed surges, or spikes, that would be uncomfortable for passengers. Dwell times of 30 seconds were assumed for each station stop, and then adjusted to achieve round trip times that are equally divisible by the desired minimum operating headway capability. The resulting estimated round-trip times for each of the alternatives are:

- Alternative A: Market-Manchester:
  - Round Trip Time: 770 seconds
- Alternative B: Fairview Heights:
  - Round Trip Time: 710 seconds
- Alternative C: Arbor Vitae (T-alignment to equitably serve all sites):
  - Round Trip Time: 750 seconds
- Alternative D: Century Boulevard:
  - Round Trip Time: 760 seconds

The round-trip time is driven not only by the route length but also the geometry, which places speed limits, and the number of stations.



#### 4.5.2 Fleet Estimate

Line capacity is normally defined as the number of passengers-per-hour-per-direction (PPHPD) that the system can carry past any particular point. Determining factors are the operating headway capability and the passenger capacity per train, which is the number of cars per train, or the train length. Preliminary train simulations indicate that the round-trip times between the different alternatives are within 10% of each other. The number of operating trains must be a whole number. For the purpose of this study, the longest round-trip time of 770 seconds has been used to establish the line capacities based on different operating fleet and headway scenarios. Assuming that a generic train car can carry 75 passengers, the line capacities for varying headways and train lengths are provided below:

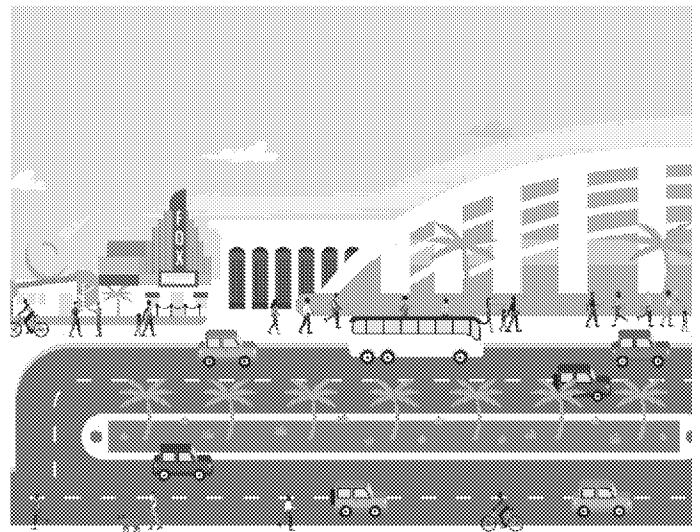


Table 4.5-1 Estimated Line Capacities

NUMBER OF TRAINS	HEADWAY (SECONDS)	LINE CAPACITY 4-CAR TRAIN (PPHPD)	LINE CAPACITY 2-CAR TRAIN (PPHPD)	LINE CAPACITY 1-CAR TRAIN (PPHPD)
8	96.3	11,221	5,610	2,805
7	110.0	9,818	4,909	2,455
6	128.3	8,416	4,208	2,104
5	154.0	7,013	3,506	1,753
4	192.5	5,610	2,805	1,403
3	256.7	4,208	2,104	1,052
2	385.0	2,805	1,403	701
1	770.0	1,403	701	351

Source: Trifiletti Consulting, Raju Associates, 2018

Operating Fleet Scenario to Meet Anticipated Demands:  
The high ridership projections are used as the basis to determine the operating fleet; variation in the ridership over the day and/or special event duration is not considered at this stage of concept planning. This approach provides for robust concept planning, sufficient flexibility to respond to ridership

refinement as better data and information is available, and establishes a conservative estimate for the fleet size, and capital and operations/maintenance costs. It establishes a conservative business case for evaluation in making appropriate project related policy decisions.

Table 4.5-2 Estimated Line Capacities

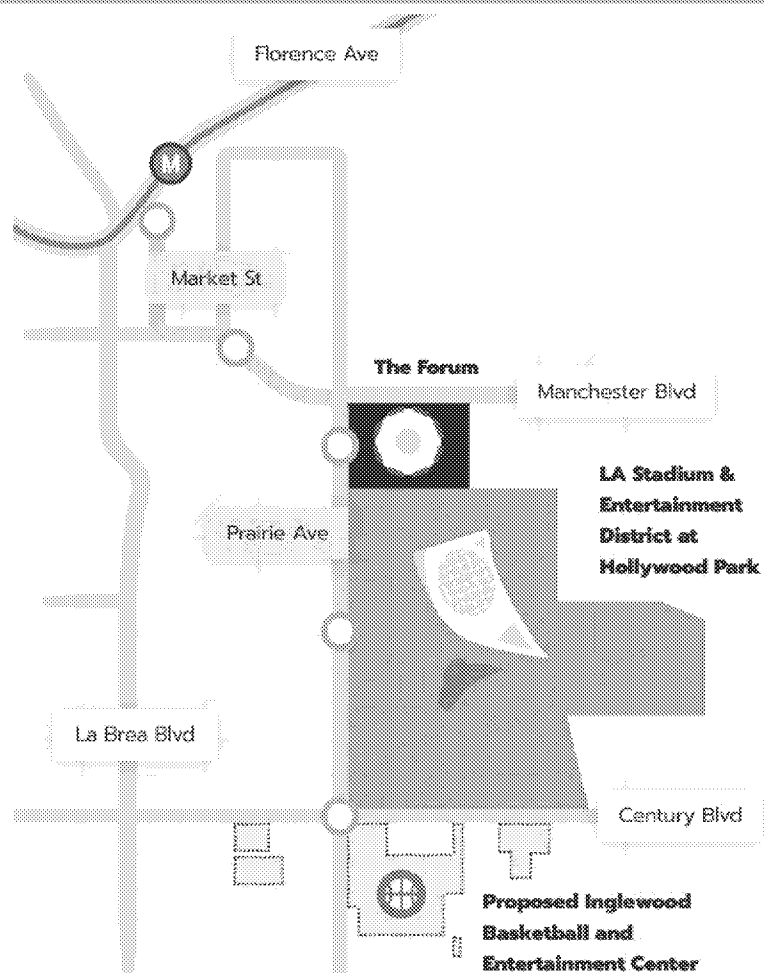
SERVICE	DEMAND (PPHPD)	NORMAL PLUS SPECIAL EVENT DEMAND (PPHPD)	OPERATING FLEET	CAPACITY PROVIDED (PPHPD)	NUMBER OF ANNUAL SERVICE HOURS
Normal Day	400	400	Operate 2-1 car trains at 385 s headways (total 2 cars operating)	701	3940
Small Events	870	1270	Operate 4-1 car trains at 192.5 s headways (total 4 cars operating)	1403	648
Medium and Large Events incl. Clipper Games	2012	2412	Operate 4-2 car trains at 192.5 s headways (total 8 cars operating)	2805	924
NFL Stadium Small Event	2735	3135	5-2 car trains operating at 154 s headways	3506	120
NFL Stadium Medium Event	6525	6925	5-4 car trains operating at 154 s headways	7013	48
NFL Stadium Game Day	8985	9385	7-4 car trains operating at 110 s headways (total 28 car operating fleet)	9818	160

Source: Trifiletti Consulting, Raju Associates, 2018

Based on the above analysis, the following assumptions are being used to develop rough order of magnitude costs and will support the next level of planning and project definition work:

- Fleet Size: 32 generic cars (28 operating fleet cars, plus 4 spare cars).
- Maximum Cruise Speed: At least 50 mph.
- Minimum Operating Headway: Not greater than 110 seconds.
- Maximum Round Trip Time: 770 seconds (12 minutes 50 seconds).
- Station Dwell Times: 30 seconds.
- Train Operations: Ability to operate different length trains from 1-car (approx. 45 feet long) to up to a 4-car train (approx. 175 feet long train).
- Operating Headways:
  - o Normal Day and Weekend – no less frequently than 6 – 6 ½ minutes.
  - o Special Events – no less frequently than between 1 ½ to 3 ½ minutes depending the special event.

## 5. INGLEWOOD TRANSIT CONNECTOR RECOMMENDED ALIGNMENT



The Market–Manchester Alignment (Alternative A) is recommended for further study, as the alternative would provide a direct connection between downtown Inglewood and the major activity centers. Alternative A presents the opportunity for integration with local economic activity, current and future transit-oriented development and other initiatives in the downtown/commercial district of Inglewood. This alternative would also minimize utility relocations, and construction impacts to the adjacent commercial and residential uses along the alignment.

The alignment is approximately 1.8 miles of dual-lane guideway with five anticipated stations. The anticipated stations were identified with the objective of serving traffic generators, current, proposed or potential, with an intuitive and convenient connection. The exact station locations and number of stations will be refined as part of the future environmental impact report (EIR) phase in coordination with the City, stakeholders and through the continuing public outreach process. At this time, the anticipated station locations are:

- Market Street/Downtown Inglewood Crenshaw/LAX Metro Station.
- Manchester Boulevard at or near Market Street.
- The Forum.
- Los Angeles Stadium and Entertainment District at Hollywood Park.
- Proposed Inglewood Basketball and Entertainment Center.

The other alternatives were not recommended for future consideration as they are fundamentally inconsistent with community goals. Alternative B would require one major transition from Florence Avenue onto Prairie Avenue that would potentially impact the Inglewood Cemetery and does not generate economic development opportunities within the City. Alternative C is located primarily on Arbor Vitae Street whose right-of-way ranges from 100 feet to 66 feet. This would potentially require acquisition of existing small businesses and possible neighborhood displacement. It would have adverse economic and fiscal impacts to local businesses along Arbor Vitae Street due to potentially

reduced visibility, potential loss of on-street parking during construction and potential permanent removal of on-street parking spaces to accommodate the alignment. In addition to design challenges, Alternative D is located along a corridor that contains major utilities which may potentially pose significant conflicts that may require a major utility relocation effort or property acquisitions along Century Boulevard to avoid utilities.

Alternative D presents the opportunity to directly connect to a regional multimodal facility served by Metro’s Crenshaw/LAX and Green Lines, various Metro and municipal bus lines, and the LAX APM system. However, to connect to the multimodal facility, the alignment would have to cross the I-405 on the south side of the LAX APM system. Crossing over the I-405 would require coordination with Caltrans, the Los Angeles Department of Transportation and Los Angeles World Airport and would pose design challenges as the transition from an elevated segment to a level sufficient under the I-405 may not be feasible due to the short distance available and the real estate constraint between Century Boulevard and the LAX LAMP Manchester Square development.

Table 5.0-1 presents key characteristics for each alternative. Summary of the key findings and conclusions of the screening analysis are listed below:

- For the Fixed Guideway Transit Alternatives, the preferred technology is an Automated People Mover technology, which could be rubber tired, steel wheel or monorail technology.
- All alternative alignments provide a comparable level of passenger service and convenience, including connectivity to Metro and the key traffic generators within the City.
- While alternatives A and D demonstrate the greatest ridership potential for “normal” non-event days, the degree to which each of the alternatives is able to relieve road-based congestion and improve overall air quality is generally comparable. The potential ridership for alternatives A and D have heavier ridership than the Alternatives B and C, however, challenges associated with Alternative D, including the utility relocation challenges, challenges with crossing the I-405 freeway, project costs,

- The total cost of ownership for Alternatives A and B is lowest, and is comparable. Because ridership potential is comparable, these two Alternatives offer the lowest cost per rider.

While each of the alternatives can be constructed, the impacts during construction, and the duration of construction varies. This relative measure of construction impacts is, in the context of this report, termed constructability. The impacts during construction are driven by 1) length of alignment, 2) extent of underground utility (which introduce conflicts to be resolved) and 3) traffic impacts due to construction work affecting roadways.

All alternatives traverse Prairie Avenue, as such it is the remaining segments of the alignment that are the differentiators. Alternative A has little or no major utility within the corridor, has a sufficiently wide right of way and the shortest alignment. Thus, it is best in terms of constructability. Alternative D (Century Boulevard) and Alternative C (Arbor Vitae Street) are the least attractive. While Century Boulevard is wide, there are major utilities along the corridor and a narrow sidewalk - this will likely impact the roadway travel lanes and possibly impact properties to place foundations and columns. Arbor Vitae Street is a narrow right-of-way, and will impact properties during construction and also traffic along a narrow right of way. Additionally, both alternatives cross the I-405 introducing construction logistical and traffic mitigation challenges. Alternative B, north of Prairie Avenue is a narrow right-of-way - during construction, impacts to the cemetery and the residences are expected. While Alternative B is more attractive than C or D, it is less attractive than Alternative A.

Underground options were preliminarily reviewed and discarded due to the significantly higher costs, but more importantly due to conflicts with the major underground utilities along Prairie Avenue - which is common to all alternatives. Transitioning from an underground to an elevated option along Prairie would cutoff major roadways at the transition - a fatal flaw to traffic circulation and capacity.

The Market–Manchester Alternative (Alternative A) performs well on a number of key measures including projected high annual ridership (2,578,120), minimal conflicts related to utility and construction impacts, and provides economic opportunities for downtown Inglewood.

Furthermore, based on outreach efforts conducted during the phase of study, stakeholders and representatives from local jurisdictions indicated their support for Alternative A. Initial stakeholder meetings were conducted, including meetings with the Inglewood City Council, block clubs, neighborhood watch groups, Inglewood Rotary, businesses, merchant groups, and early feedback has indicated support for Alternative A. As part of the environmental clearance process robust stakeholder outreach will be continued and conducted to help define the Inglewood Transit Connector Project, including project design, stakeholder locations, intermodal facilities, and over all interface with the City's major activity centers and pedestrian realm.

Therefore, it is recommended that the Alternative A: Market–Manchester, be advanced as the preferred alternative for further review as part of the environmental review process.

Table 5.0-1: Screening Results of the Inglewood Transit Connector Alternatives

	Alternative A: Market-Manchester Alignment	Alternative B: Fairview Heights Alignment	Alternative C: Arbor Vitae Alignment	Alternative D: Century Blvd Alignment
Length of System (approximately)	1.8 miles	2.2 miles	3 miles	3.1 miles
Connection to Metro	Yes at Downtown Inglewood Station	Yes at Fairview	Yes	Yes
Service to Key Venues	Comparable	Comparable	Comparable	Comparable
Right-of-way impacts/ability to resolve	Minimal	Potential impact to Inglewood Cemetery	Potential impacts to small businesses and residences	Property acquisitions likely due to major utility relocations
Potential impacts, based on available roadway width	Minimal	Potential impact to Inglewood Cemetery	Potential impacts to small businesses and residences	Property acquisitions likely due to major utility relocations
Utility Conflicts/ability to resolve with relocations	Minimal/Good	Minimal/Good (with potential impacts to Inglewood Cemetery)	Minimal/Good (with potential impacts to small businesses and residences)	Major/Limited (major utilities with impacts driving property acquisitions)
Annual Ridership	2,578,120	1,894,826	2,047,055	2,933,147
Passenger Convenience	Comparable	Comparable	Comparable	Comparable
Synergistic Economic Development within City	Good	Limited	Limited	Limited
Required Major Coordination Efforts	Coordinate with Metro	Coordinate with Metro	Coordinate with Metro, LAWA and Caltrans (I-405)	Coordinate with Metro, LAWA and Caltrans (I-405)
Estimate of Probable Capital Cost (2018 \$) <sup>1,2</sup>	\$614.4M	\$625.1M	\$756.7M	\$ 769.2M
Estimate of Probable Annual O&M Cost (2018 \$) <sup>3</sup>	\$18.2 - \$19.5 M			

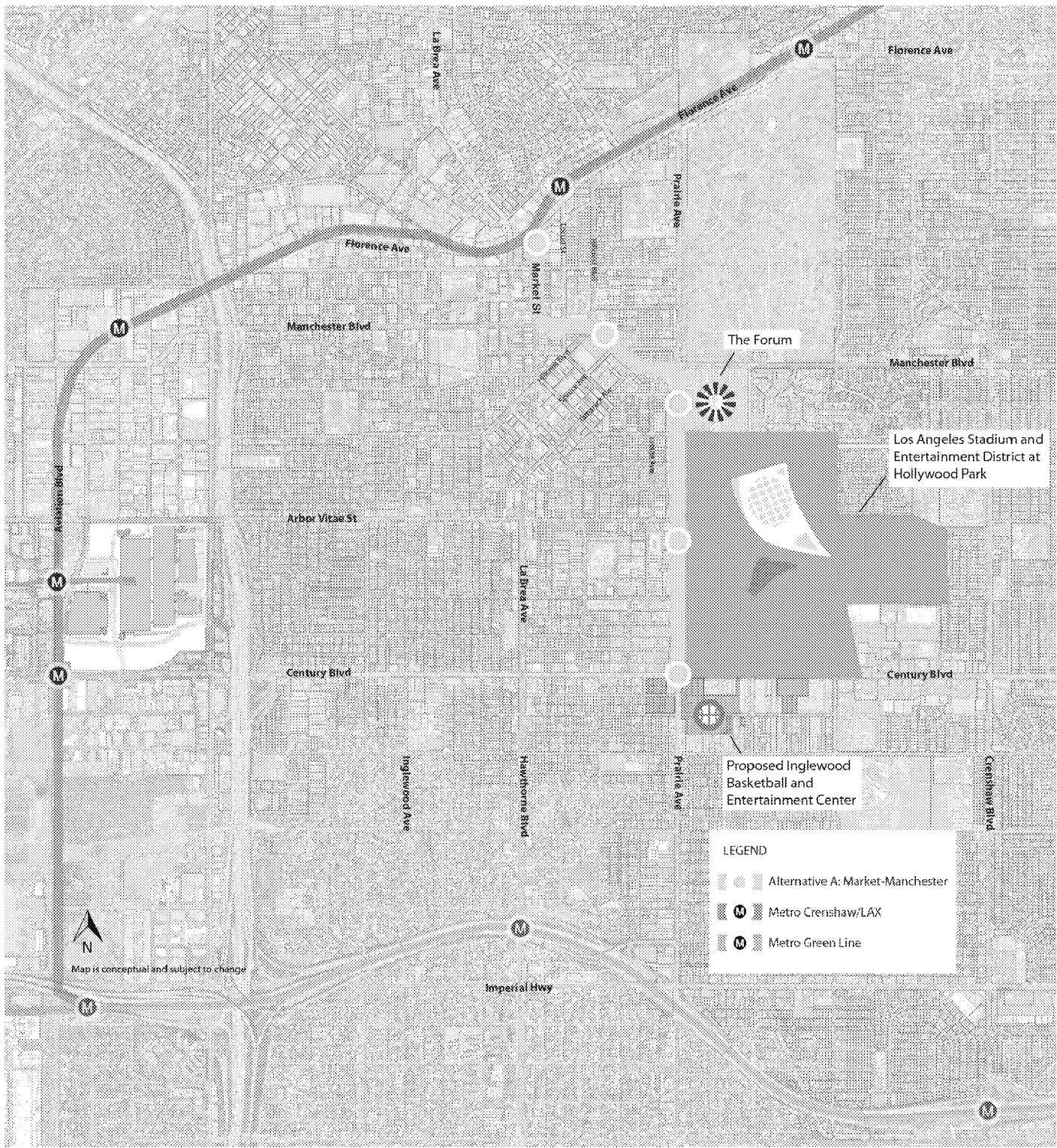
1. Right of way acquisition, environmental and physical mitigations, parking/intermodal center costs and costs of other infrastructure are not included since these are not defined and subject to impacts/influence from other city and regional transportation plans/studies.

2. Owner soft costs not included – Owner soft costs cover Owner's management costs including Owner retained consultants etc.

3. Assumes a Design-Build-Operate-Maintain delivery strategy with a 25-30 year term with Contractor responsible for all operations/maintenance of contractor delivered assets. Does not include cost of utilities or Owner soft costs.

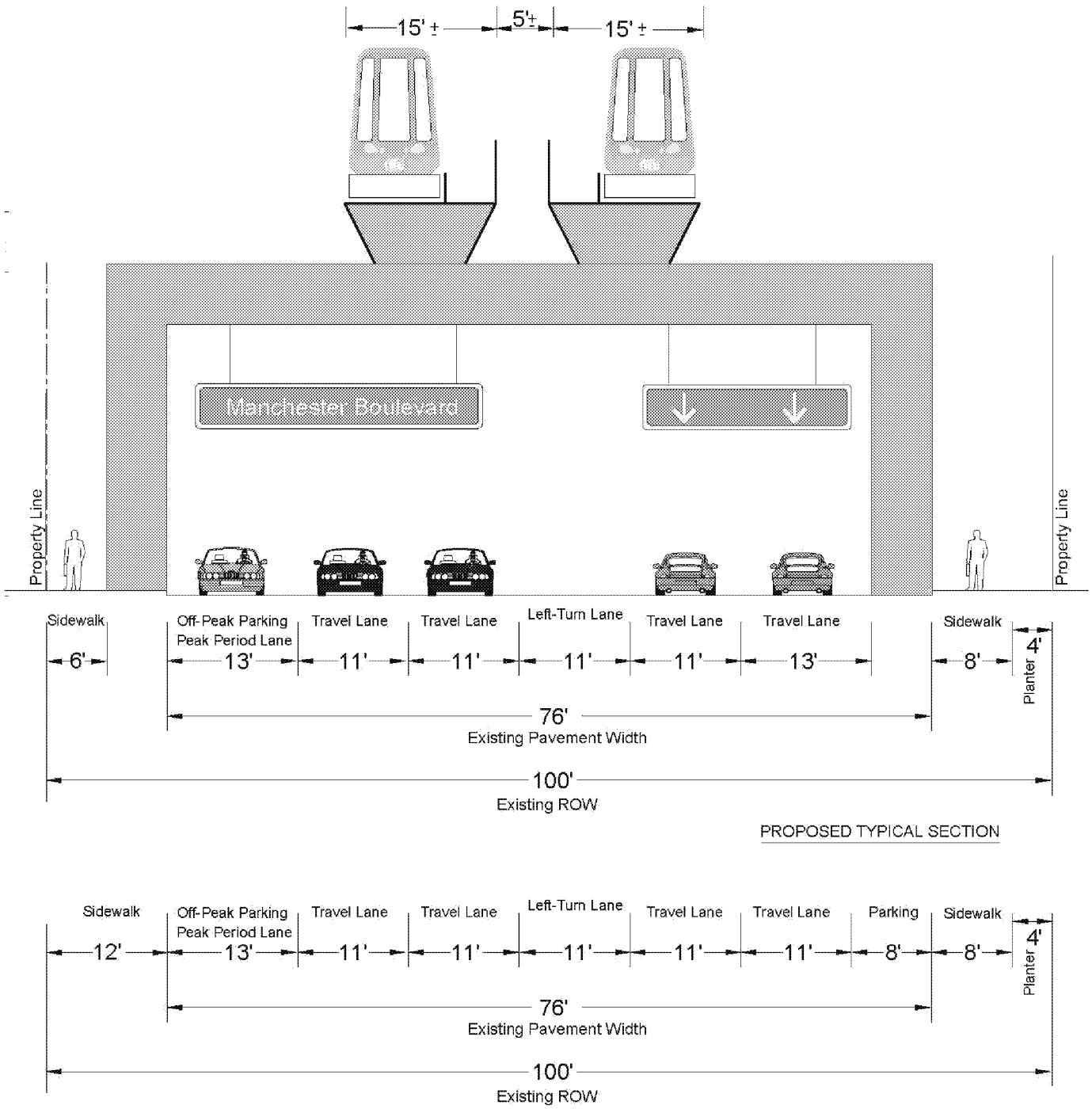
Source: Raju Associates, Trifiletti Consulting, Pacifica Services, 2018

Figure 5.0-1: Alternative A: Market-Manchester Alignment



Source: Trifiletti Consulting, 2018

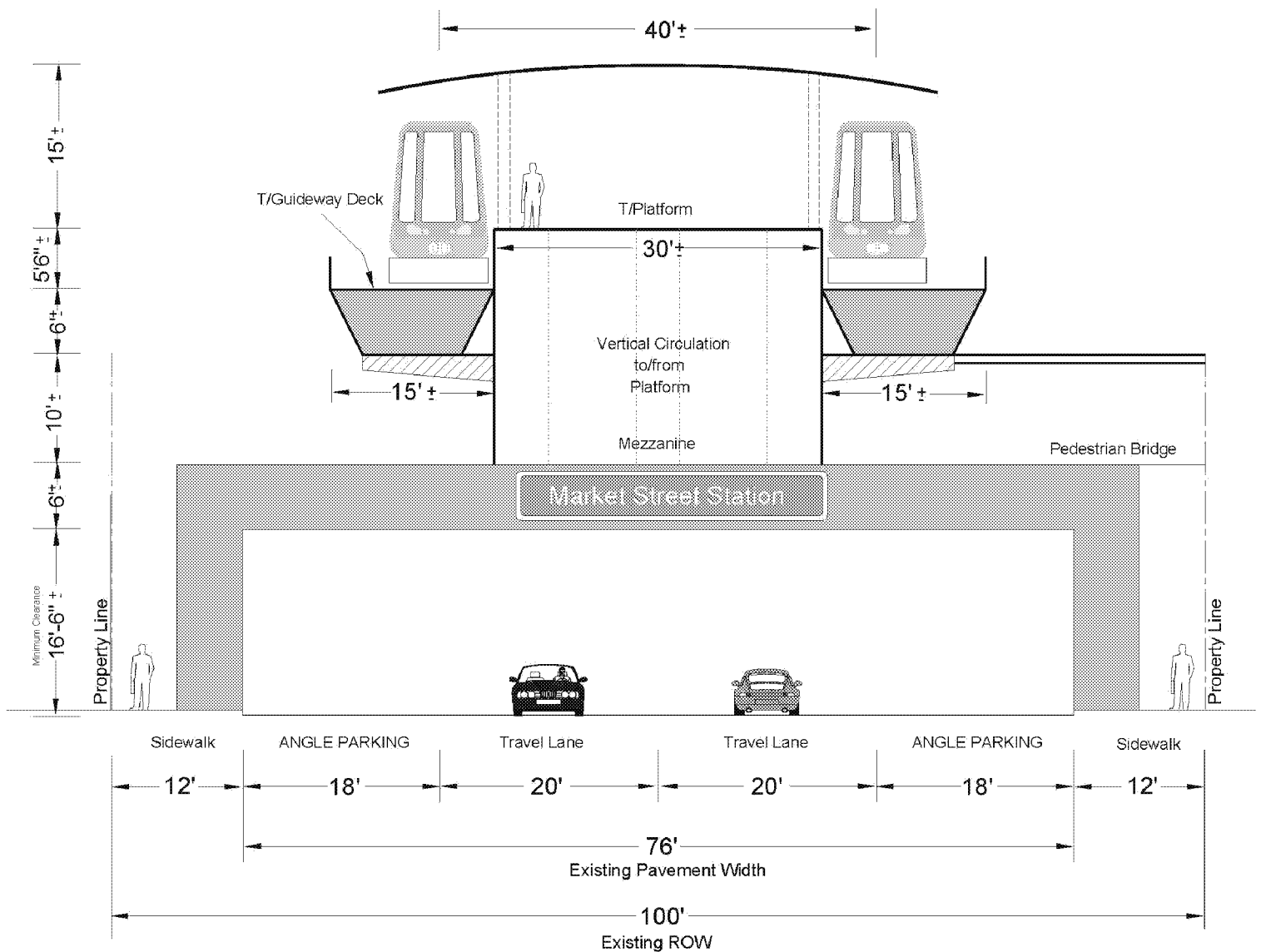
Figure 5.0-2: Alternative A: Market- Manchester Alignment  
 Manchester Boulevard, Looking West in Between Stations



Source: Raju Associates, 2018



Figure 5.0-3: Alternative A: Market-Manchester Alignment  
Market Street, Looking West at Station



Source: Raju Associates, 2018

Intermodal facilities are preliminarily located at each end of the alignment, at Market Street and near the Prairie/Century intersection. The objective is to provide an opportunity for passengers on buses, shared ride vehicles, TNCs, and taxis to conveniently transfer to the APM system for the final journey into the City. This strategy is consistent with the objective of relieving traffic demands within the City's commercial district by providing a convenient transfer to the final destination. This also alleviates additional demand on real estate currently used for parking that can now be utilized

for its highest and best use. The intermodal facilities will be appropriately sized to accommodate traffic projections that will vary based on special events and is likely to consist of a surface lot with convenient vehicle access and egress and curb cuts to facilitate short-term stopping to pick up or discharge passengers to and from the APM system. Specifics will be developed as part of the environmental impact report (ERI) phase of the Project and in coordination with the City, stakeholders and input from public outreach programs.

**6. NEXT STEPS**

**7. FUNDING/FINANCING STRATEGY**

**8. PROCUREMENT STRATEGY**



## 6. NEXT STEPS

The City will further define the Market-Manchester Alignment as the locally preferred alternative, and will now launch the environmental review process pursuant to the California Environmental Quality Act (CEQA). The specific configurations and station locations, intermodal facilities and other various technical and design characteristics will be identified and developed in coordination with the key City departments and stakeholders, including the community, residential, civic organizations, business groups and potentially impacted property owners. The project definition work and the environmental analysis will also include coordination with third-party agencies including but not limited to Metro, Los Angeles County Regional Planning and Public Works, Caltrans, SCAG, and the City of Los Angeles. Public engagement will continue throughout the environmental and public process.

To support the environmental and project delivery process, the City will conduct and include engineering and other technical studies and will continue to assess and identify potential project designs, environmental impacts, operational profiles, cost estimates, ridership and overall environmental benefits. This further analysis will supplement this report and produce more detailed project benefits and description designed to be fully integrated into the transit network and transportation system. Next steps include launching the environmental process pursuant to CEQA, which includes releasing the Notice of Preparation and commencing the preparation of a Draft Environmental Impact Report.

## 7. FUNDING/FINANCING STRATEGY

The Project shall seek funding as a special district and form an Enhanced Infrastructure Finance District (EIFD). The project shall seek the EIFD formation concurrently with the environmental process through CEQA and fulfill subsequent requirements of the EIFD along with the requirements of the

environmental process. The City will also explore and seek all available public funds at the local, state and federal level, and will also develop innovative project delivery strategies to establish public-private partnerships and/or joint funding and development tools.

## 8. PROCUREMENT STRATEGY

The Metro study concluded and recommended a public-private-partnership/concessionaire strategy to deliver the project, primarily due to Metro's inability to fund the project, which is not included in either the Measure M Expenditure Plan or the Metro Long Range PTransportation Plan. It is critical to understand that such a strategy still requires the Owner to have sufficient debt capacity/revenue generation capacity/strategy to provide the back stop on the contract. Additionally, the City must consider its own strategy for entering into such a transaction, including but not limited to establishing a special purpose entity, or identifying policies to assure financing to support the back-stop on the contract. To that end, consultation with stakeholders, the City's legal counsel and policy makers is essential as the strategy is developed further for the City's locally preferred alternative for the Inglewood Transit Connector Project.

## 9. APPENDICES



Appendix A: Utility Analysis Memo  
Appendix B: Ridership Memo  
Appendix C: Cost Estimates Memo  
Appendix D: July 2017 Transit Connection Study