APPENDIX 4.14

Utilities

APPENDIX 4.14.1

Conceptual Design Utility Impacts

Inglewood Transit Connector

Conceptual Design Utility Impacts – December 2019

1.0 Background

The following information provides an updated review of the potential utility impacts associated with the Inglewood Transit Connector (ITC) Project. This Project (proposed Project) would develop an automated people mover (APM) system to connect the downtown Inglewood near the Metro Crenshaw/LAX Line to the City's major activity centers, including the Forum, the Los Angeles Stadium and Entertainment District (LASED) at Hollywood Park, and the proposed Inglewood Basketball and Entertainment Center (IBEC).

The proposed APM system would be a fully automated, grade-separated train system consisting of an elevated dual-lane guideway, largely contained within the public rights-of-way, and run for approximately 1.8 miles for the length of the alignment.

As part of a preliminary review, four conceptual alignment alternatives were considered for the Project. A utility analysis was completed in 2018 to evaluate any potential major conflicts associated with the alignment alternatives. The four initially evaluated transit alternatives included the following alignment designations:

Alternative A: Market-Manchester Street Alignment

Alternative B: Fairview Heights Alignment

Alternative C: Arbor Vitae Alignment

Alternative D: Century Blvd Alignment

1.1 Preferred Project Alternative

As the preferred project alternative, station locations, guideway spans, and column placements were evaluated along the Market-Manchester Street alignment with right-of-way, streetscape, traffic, and utility impacts in mind. This design alignment incorporates the APM guideway beginning on Market Street near the downtown Inglewood Metro station and proceeding south through Market Street, then east on Manchester Boulevard, turning south on Prairie Avenue until its intersection with Century Boulevard. In addition, the proposed Project would include other support facilities including a Maintenance and Storage Facility (MSF) to accommodate storage, maintenance, and cleaning of the APM train cars; an Intermodal Transportation Facility (ITF), and traction power substations (TPPSs).

The APM guideway would be approximately 43 feet above grade, varying in width at track switches and stations. Both lanes of the APM guideway would be situated on one side of the right-of-way in between stations and generally be supported by single columns, then gradually transition to opposite sides of the right-of-way on approach to station platforms where they would be supported by dual columns on both sides of the street.

2.0 Conceptual Station Locations

Various conceptual station locations and related infrastructure have been analyzed to assess and minimize overall impacts. Conceptual design plans have included up to five station locations including stations on Market Street and Manchester Blvd as well as three stations along Prairie Ave designated as the Forum, Hollywood Park, and Century Blvd stations.

Stations would be above grade and largely located within the public rights-of-way. The Market Street station would be located along North Market Street in between Florence Avenue and Regent Street, in the vicinity of the downtown Inglewood Metro Crenshaw/LAX Line station. The Manchester Boulevard would be situated in between Manchester Terrace and Manchester Drive, adjacent to the proposed Maintenance and Storage Facility (MSF)for the APM system. The APM station

located near the Forum would be located along Prairie Avenue in between Nutwood Street and Kelso Street/Pincay Drive. The Hollywood Park station would be located along Prairie Avenue at one of the primary entrances to the LASED at Prairie Avenue's intersection with Arbor Vitae Street. Lastly, the APM station near Century Boulevard would be situated just north of the Prairie Avenue and Century Boulevard intersection. Stations would generally be sized approximately 300–400 feet long and 50–100 feet wide, and would include ground, mezzanine, and guideway platform levels.

2.1 Market Street Station Alternative

In addition to the location on Market Street, an alternate station location outside the public right-of-way has been evaluated with potential for joint use development.

The Market Street Station Alternative would provide for an alternative location for the Market Street APM station and for additional mixed-use development adjacent to the station. This Alternative proposes to locate the Market Street APM station further to the north in closer proximity to the Metro downtown Inglewood station and onto the adjacent property at the southeastern corner of Florence Avenue and Market Street. This property is bounded by Florence Avenue, Locust Street, Regent Street, and Market Street and is developed as a commercial shopping center. The Market Street Station Alternative would include a pedestrian connection across Florence Avenue connecting to the existing Metro Station. Additionally, this Alternative would enable the joint development of approximately 600,000 to 700,000 square feet of mixed use (commercial, hotel, and residential uses) adjacent to the station.

3.0 Design Updates

This utility analysis incorporates the most current conceptual alignment and design dated May 23, 2019. The most notable design considerations and changes since the 2018 analysis have included the inclusion of the Manchester station and associated column and alignment impacts. Additionally, various column placements and alignment shifts at the Market Street and Manchester Blvd transition and along the

Manchester Blvd roadway curves have been evaluated. Preliminary conceptual designs included various columns centered on Market Street. The current conceptual design has eliminated these center placements and shifted them to the west side of the street.

The current conceptual design also includes an alternate station location for the Market Street Station for consideration. This alternate location would be located outside the public right-of-way between Market Street and North Locust, encompassing the commercial block south of Florence Ave with closer proximity to the existing Metro downtown Inglewood station.

3.1 Column Design Considerations and Selection

Variations in conceptual designs have included selection between larger-sized columns with placements centered at roadways and/or on one side of the street versus smaller-sized columns placed on each side of the street right-of-way. Shifts in station locations and attributed column loading at these locations have also impacted selection of column sizing and placement. Furthermore, span distances between columns contributed to column sizing requirements at these locations.

Factors that were considered in the overall selection of column placements and alignment adjustments included the proximity to property lines and utilities, subsurface infrastructure, and traffic impacts. Although limited record information for various utilities (i.e. electrical and telecommunication systems) has been made available, focus has been on larger-sized and gravity flow mains that may be infeasible or impractical to relocate. Relocation of larger-sized lines may pose significant complexities as they could potentially further impact additional utility lines that are otherwise not impacted by the project columns and/or stations. Additionally, pipe invert elevation and minimum slope requirements to gravity flow lines (i.e. sanitary sewer and stormdrain systems) pose further design and construction constraints which can subsequently increase limits of disturbance and overall impacts.

Along with the current Manchester station design, column sizes and locations have been modified from one side of the street to placements on both sides of the street between Hillcrest Blvd and Tamarack Ave. To avoid larger utility lines along Prairie Ave, including a 36" recycled water main, column sizing and placements were closely analyzed and shifted on each side of Prairie Ave.

The current conceptual alignment and design includes varying column widths between 6 to 12 feet wide. While conceptual station and column placements have been selected based on available data to date and with proximity to property lines and overall impacts in mind, utility impacts at numerous locations will remain unavoidable.

4.0 Utility Analysis Update

Record drawings and utility information were provided by various agencies, including the City of Inglewood, Southern California Gas Company, Los Angeles Department of Water and Power, Los Angeles County of Department of Public Works, and the West Basin Municipal Water District. Utilities identified along the preferred Market-Manchester Street alignment during the 2018 utility identification and assessment process are shown in **Appendix A**. Updated utility information and corresponding impacts are included in Tables below.

4.1 Utility Easement and Clearance Considerations

While station and column placement selections have been made with attempts to avoid major utility relocations, even minor utility modifications will require clearance considerations. Of particular interest are easement and/or clearance requirements between other utilities and infrastructure. Health Codes require a typical 10-foot horizontal, and a 2- to 5-foot vertical, separation between sewer and water lines. Clearance requirements between other utilities can vary by jurisdiction and site conditions, however a minimum horizontal separation of 2 feet is common in order to protect utility lines from future potential damage when adjacent lines are serviced and/or repaired. Furthermore, minimum allowable depths below gutter grade can

impact vertical placements to surrounding utilities. Prior to design phase, site utility potholing surveys, including record of invert elevations, will need to be performed to determine precise horizontal and vertical placement and to further evaluate the extent of impact and if relocations can be avoided.

4.2 Utility Impact Determination and Thresholds

While typical service pipelines and utility main lines are a minimum of 2 feet and 5 feet beneath pavement surface, respectively, various large utility mains are located within the project alignment and are estimated to be as deep as 10 feet below surface. Limits of disturbance and weakened zones vary depending on numerous factors including column sizing, depth and size of footings, as well as method of excavation and drilling. Onsite soil conditions, easements, and utility spacing requirements can also contribute to these limits of disturbance. When establishing parameters of impact to adjacent utilities, potential as-built deviations from utility record drawings have been considered along with projected 1-to-1 weakened zone of influences.

For the purpose of the project utility impact determination, a conservative 10-foot distance from the edge of all conceptual column placements has been used to identify utilities that may be impacted from construction activities. All utility locations are approximate based on best available map data. It is projected that utilities within a 5-foot proximity may require relocation or modification while those within a 5 to 10-foot proximity may be less impacted and may likely be protected in place depending on site conditions and utility restrictions.

Notwithstanding the above, while various utilities may appear to have minimal to no impacts, modifications to other lines and subsequent clearance requirements may potentially impact utilities that appear to be a safe distance away. Moreover, while some utilities may be within inches of column locations, several conditions such as type and size of utility, as well as construction methodology, may factor into the potential for protection-in-place measures.

Overall, efforts should be made to avoid relocations when feasible. However, any modifications to impacted utility lines and their tributary area of disturbance pose

negative impacts to the surrounding community due to temporary loss of service and traffic impacts related to unavoidable lane or full street closures. The following outlines projected utility impacts based on referenced thresholds.

4.3 Projected Utility Impacts

Despite efforts to minimize utility impacts, affected infrastructure includes storm drain lines and catch basins, sanitary sewer and water lines, gas pipelines, and electrical vaults and transmission lines. Coordination with utility agencies will be required for temporary or permanent utility relocations and/or service interruptions.

Based on referenced parameters of impact, the Tables below outline projected utility conflicts that may require relocation, modification, or protections in place. Based on available information to date, utility type, size, length of impacted utility span, and direction of referenced utility lines are included in the summary tables by street segments.

Table 1: Projected Utility Impacts – Market Street includes impacted water lines along Market Street between Florence Ave and Manchester Blvd. Minimal record data has been made available for this street segment. However, stormdrain lines which are of most interest due to limited right-of-way and potential tributary infrastructure impacts appear to be a safe distance away from any column locations. These lines run in the east-west direction, crossing Market Street at Regent Street and Queen Street.

Table 2: Projected Utility Impacts – Manchester Blvd includes various impacted utility lines along Manchester Blvd between Market Street and Prairie Ave. The current conceptual design impacts various existing water, sewer, gas and stormdrain lines, however, the most significant conflict appears to be to a 12" waterline span that runs along the south side of Manchester Street between Market Street and Hillcrest Blvd. Although the size of the stormdrain line along this street segment is unknown, project impacts appear to be isolated to catch basin connections on the north side of Manchester Blvd.

Table 3: Projected Utility Impacts – Prairie Avenue includes various impacted utility lines along Prairie Ave between Manchester Blvd and Century Blvd. The current conceptual design impacts various existing water, sewer, gas, electrical and stormdrain lines however, column placements have been shifted on each side of the street to avoid larger utility lines including a 36" recycled water main that runs along most of this street segment. The most significant conflicts appear to be to existing sewer and water line spans running along the west side of Prairie Ave. Additionally, a stormdrain segment is near various column placements along the east side of Prairie. As referenced, various utility sizes are unknown at this time and will require further investigation with utility purveyors.

In addition to the utilities outlined below, multiple service connections to adjacent properties (i.e. gas, sewer and water laterals) are anticipated to be affected. However, these conflicts are not considered as significant in comparison to impacts associated with the modification of utility mains including high-pressure water and electrical transmission lines. Relocation of utilities in close proximity may be avoided with adequate protections in place and should be carefully considered for larger utility lines where relocations pose significant obstacles and impacts.

Efforts to avoid or minimize disruptions should be considered during final design and construction phases however, temporary interruptions in services (for several hours) could occur during the relocation or re-routing of utilities. During final design phases, and prior to any construction, pre-construction potholing investigations and coordination with utility purveyors will be implemented to determine existing as-built conditions that could affect design considerations, construction approach, and/or schedules. Additionally, street and/or lane closures associated with utility relocation efforts that will disrupt normal street operations will need to be factored into the final design.

5.0 Additional Utilities of Interest

While all utilities within referenced threshold limits are listed below, additional utility lines greater than the 10-foot threshold but still in relatively close proximity may also need to be protected pending construction parameters (i.e. extent of over-excavation) and/or potential subsequent impacts attributed to adjacent utility relocations.

Of significant interest are larger sized utility lines that may be impractical to relocate or modify. As an example, a large 60-inch water main transitions from street centerline to the the east side of Prairie Avenue south of Kelso St/Pincay Dr. While the line has been selectively avoided with varying proximity to adjacent columns, the closest at approximately 11 feet should still be closely monitored since the nature of the utility transition may vary from record drawings. Its proximity and varying alignment may still warrant design and construction considerations to protect the line in place as relocation would be considered infeasible.

Similarly, an existing 36" recycled water main runs along most of the project alignment on the west side of Prairie Avenue. While the main does not conflict with conceptual column locations and its proximity is greater than the 10-foot threshold, other utility conflicts and potential relocations along the west side of the street may subsequently impact the 36" main. Utility clearance requirements may warrant design and construction considerations to protect this 36" recycled water line in place.

As a conservative precaution, utilities with limited information have been included for further conflict considerations. Available record drawings show electrical/power infrastructure along the southerly portion of the project alignment on Prairie Avenue. However, it is anticipated that this utility also runs further north along Prairie Avenue.

As noted in the Tables below, a few catch basins are impacted by current conceptual column placements. Design considerations to protect or modify these structures, in lieu of relocations, should be made. Relocation or significant alterations to catch basins would require further hydrologic evaluation.

Finally, an additional utility line of interest is a former BP gas pipeline along the east property line of Prairie Avenue. While record drawings show this line has been mostly removed and its former location is outside the public right-of-way, the current conceptual design includes various column placements east of the property boundaries. Furthermore, record drawings show two separate segments of this pipeline have remained. One remaining segment located at the corner of Century Blvd and Prairie Ave is about 18-30 ft from the closest two columns in this area. The second segment of the remaining pipeline is on Hardy Street, east of Prairie Ave. While the current conceptual design shows no columns on the east side of Prairie Ave within the vicinity of this remaining pipeline, it is worth noting for future potential design considerations.

5.1 Market Street Station Alternative Utility Considerations

As noted above, an alternate location for the Market Street Station has been identified for consideration outside the public right-of-way. Although limited record drawings for this area have been made available, a stormdrain line southeast of the Florence Ave and Market Street intersection has been identified. The size of this line is unknown but records show the line extends into one of the north parcels south of Florence Ave within the projected station boundary. Current conceptual plans for this station show no conflicts with this stormdrain line however, If this alternative station location is selected, further investigation and determination of potential impacts to this line will be required. Furthermore, the stormdrain line and its tributary flow area will also need to be considered into both station and future joint development plans.

As noted above, conceptual station and column placements have been selected based on available data to date. Final utility impact determinations and the overall extent of these impacts will be re-evaluated following onsite potholing and utility survey activities to confirm both horizontal and vertical placements. In coordination with applicable utility purveyors and other stakeholders, final project design and construction parameters will be determined to minimize overall impacts.

Table 1: Projected Utility Impacts – Market Street

Street Segment Location	From	To	Conflict	Utility	Description
Market Street	Florence Av	Regent St	Station A - Market Columns	Water	8" 85' N-S line
	Regent St	Queen St	Guideway Columns	Water	12" 30' N-S line (east side of street)
				Water	12" 65' E-W line (west side of street)
	Queen St	Manchester Bl	Guideway Columns	Water	12" 330' N-S line

Table 2: Projected Utility Impacts – Manchester Blvd

Street Segment Location	From	To	Conflict	Utility	Description
Manchester Blvd	Market St	Locust St	Guideway Columns	Stormdrain	Unknown size 30' N-S line
				Water	12" 390' E-W line
				Gas	Unknown size 80' E-W line
	Locust St	Hillcrest Bl	Guideway Columns	Stormdrain	Unknown size 50' connection to N-S line
				Water	12" 350' E-W line
	Hillcrest Bl	Tamarack Av	Station B - Manchester Columns	Gas	Unknown size 30' E-W line (north side of street)
				Sewer	8" 30' N-S line
				Stormdrain	Unknown size 100' N-S line
				Gas	Unknown size 250' E-W line (south side of street)
				Water	12" 50' N-S line
	Tamarack Av	Prairie Av	Guideway Columns	Sewer	8" 20' E-W line (south side of street)
				Gas	Unknown size 20' E-W line
				Sewer	8" 20' E-W line (north side of street)

Table 3: Projected Utility Impacts – Prairie Avenue

Street Segment Location	From	To	Conflict	Utility	Description
Prairie Avenue	Manchester Bl	Nutwood St	Guideway Columns	Sewer	24" 250' N-S line
				Gas	10" 250' N-S line
				Water	10" 250' N-S line
	Nutwood St.	Kelso St/Pincay Dr	Station C - Forum Columns	Sewer	24" 575' N-S line
				Gas	10" 575' N-S line
				Water	10" 575 N-S line
				Electrical	Unknown size 575' N-S line
	Kelso St/Pincay Dr	La Palma Dr	Guideway Columns	Electrical	Unknown size 450' N-S line (west side)
				Gas	10" 450' N-S line
				Water	10" + Additional unknown size 450' N-S lines (west side)
				Gas	Unknown size 20' E-W line
				Water	Unknown size 200' N-S direction (east side)
				Sewer	10" 185' N-S line
				Stormdrain	Unknown size 185' N-S line
	La Palma Dr	Buckthorne St	Guideway Columns	Gas	10" 350' N-S line
				Water	10" 350' N-S line
				Electrical	Unknown size 350' N-S line

Prairie Avenue	Buckthorne St	Arbor Vitae St	Guideway Columns	Gas	2" and 10" 450' N-S lines
				Electrical	Unknown size 450' N-S line
				Water	Unknown size 450' N-S line
				Stormdrain	Unknown size 40' N-S line
				Sewer	12" 20' N-S line
				Stormdrain Catchbasin	Unknown size 25' N-S line and catch basin
	Arbor Vitae St	Hardy St	Station D - Hollywood Park Columns	Electrical	Unknown size 1200' N-S line
				Gas	2" and 10" 1200' N-S lines
				Water	8" 1200' N-S line
				Sewer	8" 1100' N-S line
				Water	Unknown size 20' E-W line
				Stormdrain	Unknown size 20' E-W line
	Hardy St	97th St	Guideway Columns	Electrical	Unknown size 350' N-S line
				Sewer	8" 350 N-S line
				Gas	2" and 10" 350' N-S line
				Water	8" 350' N-S line
				Stormdrain	Unknown size 50' E-W line
	97th St	Century Bl	Guideway Columns	Electrical	Unknown size 375' N-S line
				Sewer	8" 375' N-S line
				Gas	2" and 10" 375' N-S line
				Water	8" 375' N-S line

Appendix A

2018 Utility Analysis – Market Street Alignment

Street Segment	Segment ID	To	From	Utilities
MARKET STREET				
B-1	14	Florence Av	Regent St	8" water pipe, east side of street
B-1	15	Regent St	Queen St	8" water pipe, east side of street switching to west side (curb) of street at Queen St
B-2	16	Queen St	Manchester Bl	8" water pipe, west side (curb) of street
MANCHESTER BOULEVARD				
B-2	18	Market St	Locust St	12" water pipe south curb of street 8" sewer pipe, center of street Gas line running across at alley and Locust St Numerous connections to the lines
B-2	19	Locust St	Hillcrest Bl	12" water pipe south curb of street 8" sewer pipe, center of street Gas line running across at Hillcrest Numerous connections to the lines
C-1	20	Hillcrest Bl	Spruce Av	12" water pipe south curb of street 8" sewer pipe south curb of street Numerous connections to the lines
C-1	21	Spruce Av	Tamarack Av	12" water pipe, south side of street Gas line, south curb of street and across at Spruce
C-2	22	Tamarack Av	Prairie Av	12" water pipe, south side of street 8" sewer pipe, south side of street Gas line, south curb of street

PRAIRIE AVENUE

E-1	26	Manchester Bl	Nutwood St	Large electrical (16kva, 17.5 kva, 50 kva) lines Large 60" DWP line on east side Large 36" recycled water Storm drain and gas lines
E-2	27	Manchester Bl	Kelso St-Pincay Dr	Large electrical (16kva, 17.5 kva, 50 kva) lines Large 60" DWP line on east side Large 36" recycled water Storm drain and gas lines
E-3	28	Kelso St-Pincay Dr	La Palma Dr	Large electrical (16kva, 17.5 kva, 50 kva) lines Large 60" DWP line on east side Large 36" recycled water Storm drain and gas lines
E-4 E-5	29	La Palma Dr	Arbor Vitae St	Large electrical (16kva, 17.5 kva, 50 kva) lines Large 60" DWP line on east side Large 36" recycled water Storm drain and gas lines
E-6 E-7	30	Arbor Vitae St	Hardy St	Large electrical (16kva, 17.5 kva, 50 kva) Large 60" DWP line on east side Large 36" recycled water Storm drain and gas lines
E-8 E-9 E-10	31	Hardy St	Century Bl	Large electrical (16kva, 17.5 kva, 50 kva) lines Large 60" DWP line on east side Large 36" recycled water Storm drain and gas lines
E-11 E-12	32	Century Bl	104th St	Large electrical (16kva, 17.5 kva, 50 kva) lines Large 36" recycled water Storm drain and gas lines