

Chasing the Win-Win: Integration of the Mid-City/Exposition LRT Project with a Transit-Oriented Development

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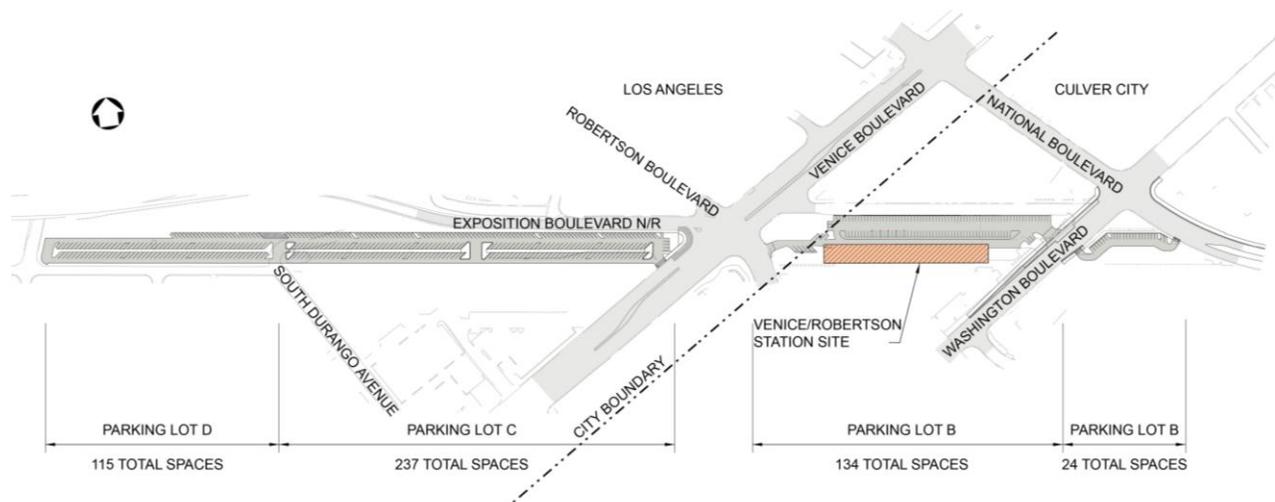
INTRODUCTION AND PROJECT BACKGROUND

Scholarly research, FTA New Starts evaluation criteria, the Urban Land Institute’s (ULI’s) principles, and prevailing opinion of elected officials suggest that transit-oriented developments (TODs) at major transit stops have become the default solution to land available in the vicinity of urban transit stations. To date, the majority of the case studies available nationally have focused on TODs within the framework of so-called New Urbanist developments or on sites adjacent to existing transit facilities. This has to some degree led to a formulaic approach to TODs that does not necessarily translate well to more complex real-world scenarios. This paper discusses such complexities that were encountered when a variety of entities set out to launch a successful private development on the backbone of a policy-

driven transportation/land-use connection, attempting to apply the default formula to a dense urban area under rapidly changing economic conditions.

The public transportation project discussed in this paper is the 9-mile Mid-City/Exposition light rail project (Expo Project), which runs from downtown Los Angeles southwest to Culver City. The Exposition Metro Line Construction Authority (Authority) is constructing the project, and the Los Angeles County Metropolitan Transportation Authority (Metro) will operate it. While most of the project lies within former rail right-of-way (ROW) purchased by Metro, parts of the project within the City of Los Angeles run in city streets. The project also touches the edge of the recently revitalized downtown Culver City.

Phase 1 of the project, being designed and constructed by a joint venture of



Vicinity Plan

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Flatiron/Fluor/Parsons (FFP), contains a 2,200-foot-long aerial structure whose temporary terminus is the Venice/Robertson aerial station. The station is located just east of the major vehicular intersection of Venice/Robertson, and immediately south of a 2.9-acre triangular parcel owned by the City of Culver City (City). The City's Community Development Department (CDD) obtained that site via eminent domain and designated it for a TOD. Due to the current development climate, the challenge of integrating a TOD has become more complex since it now needs to integrate phasing.

At the City's request, the Authority tasked FFP with accommodating a TOD alternative including a station support foundation system that will accommodate a variety of possible development scenarios for the adjacent site. In addition, implementing an agreement among the Authority, the City, and Metro, the Authority tasked FFP with developing an integrated parking solution using both City- and Metro-owned ROW. This paper presents some of the challenges encountered in implementing transportation infrastructure designs reflective of potential future TOD developments and lays out the technical and engineering analysis used to develop a solution that allows for maximum future flexibility to accommodate area stakeholders.

Expo Project Phases 1 and 2

Phase 1 of the Expo Project was environmentally cleared in February 2006. The project is both locally and federally funded, so the environmental documents included both an FEIS and FEIR (California version). Phase 1 will run from downtown Los Angeles to Culver City some 9 miles southwest. The project begins at the downtown 7th/Metro Blue Line station. Expo Line trains will share the Blue Line tracks running south on Flower until the intersection of Flower and Washington. At this point the Blue Line tracks turn easterly along Washington, while the Expo Line tracks will continue south on Flower another 1½ miles to the intersection of Flower/Exposition, adjacent to the University of Southern California, the California Science Center, and the Coliseum. There the Expo Line tracks turn westerly in the median of Exposition, running in the former Pacific Electric Santa Monica

Air Line, part of Los Angeles's famed Red Line system.

A small storage facility is being provided connecting to the Blue Line tracks at Washington/Long Beach, east of Washington/Flower. Portions of the Blue Line track and signaling are being retrofitted and upgraded to accommodate the junctions with the Expo Line at Washington/Flower and Washington/Long Beach.

The Expo Line is primarily at grade, with street-running portions and also with gated crossings. A short trench section runs under Flower/Exposition, and aerial structures cross the major arterials La Brea and La Cienega; the flood control channel Ballona Creek; and National and Washington. In addition to two existing stations along the shared Blue Line tracks, the Expo Line originally included 8 new passenger stations. Two of these are simple, at-grade, center-platform stations (like those of the Blue Line) with level boarding. Four of them are at-grade side-platform stations, three of which straddle intersections and provide far-side platforms. Two of them, La Brea and La Cienega, are aerial center-platform stations without mezzanines. Ultimately the Authority adopted an additional at-grade side-platform station at Expo Park/USC and, as will be described later in this paper, replaced one of the original at-grade center platform stations with a third aerial station at Venice/Robertson.

The FEIS/EIR cleared two alternatives for the interim terminus, one of which was an at-grade station at Washington/National in Culver City. It was always intended that the line would be extended on aerial structure crossing Washington/National, ending (on an interim basis) in an aerial station between the Washington/National and Venice/Robertson intersections. Since funding was not initially available for the additional aerial structure when the Authority hired FFP in 2006, Phase 1 ended with the at-grade Washington/National Station, which was to be designed and built to allow the extension to be implemented while Phase 1 was in operation. The configuration of the Washington/National Station will be described in the next section.

Phase 2 of the Expo Project will extend the line from the interim terminus to Santa Monica on the

west. Phase 2 is entirely locally funded, and its FEIR was certified in February 2010. While two alignment alternatives were studied, the Locally Preferred Alternative (LPA) was identified as an extension of the Phase 1 alignment continuing across Venice in the Metro ROW.

Phase 1 is scheduled to be in operation in 2011 and Phase 2 in 2015.

Original vs. Ultimate Interim Terminus

The original interim western terminus at Washington/National was a standard at-grade center-platform station, 270 feet long to accommodate 3-car trains. The station was offset slightly north of the heading of the alignment, so that the ultimate extension across National and Washington could maintain the same heading. The alignment was designed to allow for the new track to be cut in while maintaining operations to the interim terminus, with a double crossover located to the east to accommodate single-track turnarounds during the cutover.

Constructing the extension while maintaining operations just to the north would result in more expensive construction and significant operational disruption. In addition, the traveling public within Culver City would be subjected to longer construction and traffic disruption. In 2008, the Authority and the City obtained funding from the State of California in the form of Proposition 1B funds, plus a local contribution from the City itself, to construct the aerial structure extension and aerial station at Venice/Robertson as part of Phase 1. The Washington/National Station was eliminated from the project and the new aerial structure and aerial interim terminus at Venice/Robertson were added to FFP’s work scope.

The aerial structure was designed structurally to accommodate either of the two alignment alternatives being considered at the time for Phase 2. Since the extended guideway would be west of the Phase 1 guideway, single tracking would not be required on Phase 1 while the extension was being constructed, significantly improving the operational interface and making the Phase 2 construction less expensive. The aerial station itself is similar to the aerial stations at La Brea and La

Cienega, with a 270-foot long center platform, plaza and ticketing facilities below (at-grade), and vertical circulation by stair and elevator linking the at-grade facilities and the platform.

The FEIS/EIR requires 600 parking spaces to be provided at the interim terminus until Phase 2 is in operation; thereafter, 300 parking spaces are required at Venice/Robertson. The FEIS/EIR shows the 600 surface parking spaces being located in Lots A (42 spaces), B (68 spaces), and C and D (490 spaces between the two), within the Metro ROW, as shown on the site plan. When FFP designers laid out the parking lots using Expo design criteria for parking space size, these numbers changed to 24, 134, and 352, respectively, for a total of 510 spaces.

This parking configuration had three major disadvantages: first, there is a 90-space deficit from the 600-space initial requirement of the FEIS/EIR; second, the west end of Lot D is about 1/3 of a mile from the station, requiring people to walk a relatively long distance (especially for Los Angeles!) to reach the station; and third, since Lots C and D are located within the Metro ROW, the Phase 2 LPA displaces those 352 parking spaces during construction, while Venice/Robertson is still the interim terminus. Thus during the construction of Phase 2, until the parking requirement drops to 300 spaces when Phase 2 operations begin, there is a 442-space parking deficit and temporary parking would have to be identified and implemented. How the Authority and the City have agreed to solve these problems is discussed later in this paper.

PROJECT-SPECIFIC ANALYSIS

Authority Planning and Intermodal Connections

One of the main ingredients of a successful TOD, according to ULI, is bus connections. Often overlooked as a less sophisticated transportation mode than rail, buses are often integral to the success of a development since they carry a significant number of passengers to the destination. It is common practice for transit agencies to re-route their bus lines when a new rail line is added. To accommodate the effects of the Expo Line on the existing bus system, FFP met with the operators of

the bus lines currently serving the area. The two major operators of bus service in the area are Culver City Bus (CCB) and Big Blue Bus (BBB) of Santa Monica; Metro also operates bus service on Venice. CCB currently serves the area with two lines that run on Venice and Washington. BBB serves the area with three lines running along Venice.

CCB Line 7 runs at 45-minute headways along Venice and currently has a scheduled stop on the southeast corner of Venice and Robertson for eastbound traffic, and a stop on the northeast corner for westbound traffic. The line is planned to remain in service with the stops roughly in their existing locations. CCB Line 1 runs at 10-minute headways along Washington. Since Line 1 serves as an important link between the West LA Transfer Center and desirable destinations on the beach, the City plans for the line to remain in place, and FFP is simply adjusting the current stop locations to integrate with the new Venice/Robertson Station.

BBB Local Line 12 is expected to continue to run on Venice, and FFP will provide convenient on-street stops. Santa Monica's bus operating agency has voiced a strong interest in having stops for BBB Line Super 12 and Line 6 integrated closely into the TOD at Venice/Robertson. In addition to provisions for these lines, the City has indicated that, in an effort to serve local residents more conveniently, local shuttle buses are planned which will connect nearby residential areas with the Venice/Robertson Station.

After a series of comprehensive meetings with the bus operators and other stakeholders in the area, it was determined that FFP would provide 2 bus bays for standard 40' buses, one layover space for a standard 40' bus, two spaces for local shuttle buses, and a space for paratransit services to address the public transportation needs at the Venice/Robertson Station. Consistent with the above-discussed preferences of the local transit operators, FFP submitted 30% and 85% design drawings showing bus stops and layover facilities, along with kiss-and-ride space, located immediately north of the aerial structure and station plaza near the elevator. Maintaining the existing circulation patterns to the greatest extent possible, buses were envisioned to enter the site from Robertson, turn east so that

passengers could be dropped off on the plaza without having to cross a driveway, and continue east to exit on Washington.

In addition to the efforts discussed above to coordinate bus and rail service, Metro planners also implemented a comprehensive effort to develop a truly multimodal transportation system. In addition to a focus on improving pedestrian access at all the Expo Line stations, the FEIS/EIR also focuses on serving bicyclists and supporting the integration of that mode into the overall transportation network. To address the needs of bicyclists, the FEIS/EIR requires the construction of a Clean Mobility Center (CMC) at the station site.

Ridership projections for transportation systems generally show that transfers between modes penalize the overall performance data of that system. CMCs are envisioned to help ease the transition from one transportation mode, most notably bicycles, to another, in this case a light rail system. Similar to the CMC already operating in downtown Long Beach on the Blue Line, the Venice/Robertson CMC will provide a secure area where bicycle commuters can store their bikes in lockers or racks, change their clothes, and have minor service done to their bikes while they take the Expo Line to their destination. After discussions with Metro bicycle operations staff regarding programming for the CMC, a 1,200-square-foot building with changing rooms and shower facilities was located at the west end of the station site. The facility will also provide bicycle parking for 70 bikes, 16 of which will be in enclosed bike lockers and the others in open racks.

Culver City Development Planning

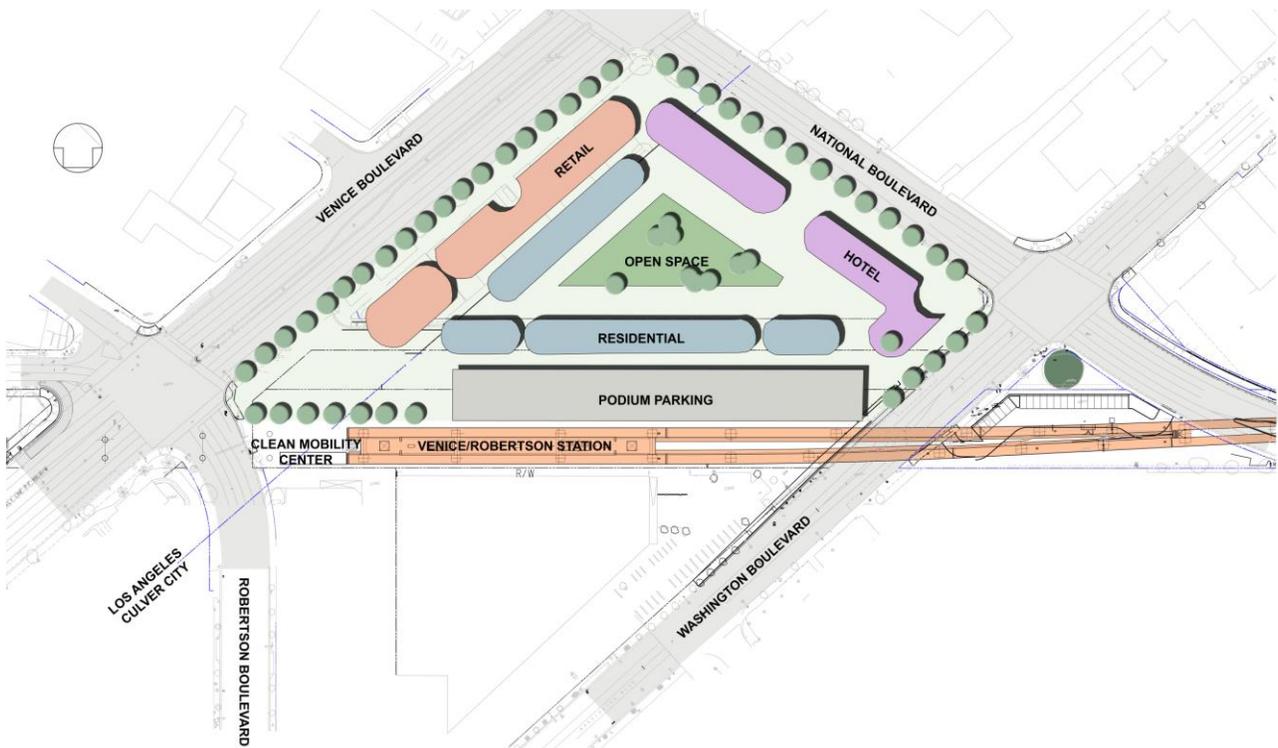
In addition to the efforts described so far, which were conducted by the Authority, Metro, and FFP, significant parallel efforts to enhance the vicinity of the Venice/Robertson Station were initiated by the City's CDD in form of the Washington/National Specific Plan. More specifically, within that plan, the property bounded by National, Venice, and Exposition, named the Triangle Site, was identified as one of the three catalyst projects for the redevelopment identified as the goal of that Specific Plan. Planning efforts by the

CDD resulted in the following key findings with respect to the economic potential of the property:

- The property is expected to compete successfully for future residents and to generate additional demand for commercial land use.
- The project is positioned to become a robust regional and possibly national office market.
- Proximity to the Venice/Robertson Station will likely have a positive impact on lease rates and lot values.

The CDD approached the Authority and FFP to assure that the Expo Line facilities are compatible with the City’s development goals and do not hinder or prevent the realization of these significant identified economic opportunities.

Shortly before FFP completed its 85% design submittal, the City approached the Authority, in August 2008, to discuss the interface between their planned redevelopment and the Venice/Robertson transit facilities. The initial request dealt with the interface between the City’s planned parking structure immediately north of the station plaza and aerial structure. The parking structure was initially intended to consist solely of two stories of underground parking. Before the aerial Venice/Robertson Station was incorporated in Phase 1 of the Expo Project, it appeared likely that the parking structure could be built before the aerial structure. However, when the aerial station was funded as part of Phase 1, at about the same time that the real estate market slowed nationally, it became evident that the aerial structure would be constructed before the parking structure and before the adjacent TOD that the parking structure would serve. The City wanted to make sure that the underground



Ultimate Development Plan

parking structure could be built adjacent to an operating aerial transit structure without undermining its foundations or affecting operations, and committed to paying the extra design and construction costs. The Authority directed FFP to study several alternatives to accomplish this goal and ultimately selected one and incorporated it into the design, as will be discussed below.

PROJECT PHASING AND RESULTING ISSUES

As the economic climate continued to worsen, the City realized that they would need to provide more parking to make their planned development economically viable. They added two stories of “podium parking” above-grade and decided it would be advantageous to increase the footprint of the underground parking. They asked the Authority if they could place their parking structure partially within Metro’s 100’ ROW, in exchange for the City providing the 300 parking spaces required when Phase 2 is in operation, within their parking structure. FFP designers studied this issue at the Authority’s request and determined that a 59’ swath of the Metro ROW would be reserved for the aerial structure and station, and that the City could place their facilities north of the 59’ clearance line.

In addition, the City offered that the Authority could use the Triangle Site in the interim period (before Phase 2 begins operation) for the required 600 parking spaces, which would all be at grade and immediately adjacent to the station. These proposals overcame all three major disadvantages of the scheme described above involving remote Lots C and D and were a major win-win proposal for all parties to the project, benefiting the Authority, Metro, the City, and the traveling public. Phasing issues are discussed later in this paper.

In addition to the significant technical issues that developed as a result of the necessary phasing of the two adjacent projects, the overall economic climate and the particularities of the City’s development climate also impacted the programming of the Triangle Site and the location of the land uses included on the site itself. In a traditionally conservative residential development market

dominated by single-family homes, the CDD perceived the adjacency of a major transportation hub (including layover spaces for diesel buses) to be a significant drawback to the marketability of the envisioned residential product in the development. In addition, the CMC, which FFP had located where its high visibility and easy access to the public were expected to contribute significantly to its success, was perceived by the CDD to occupy one of the prime corners of the commercial portion of the planned development.

The development climate was not conducive to finalizing a financially feasible development scenario for the site, so the CDD could not complete urban design and architectural layouts for the commercial component of the Triangle Site. Since for these reasons the development of a comprehensive design solution, fully integrating all uses at the site, was not feasible, the Authority, City, and FFP ultimately agreed to relocate the bus stop/layover facilities and the CMC to locations minimizing their potential negative impacts on the future development.

With the location of the transportation-related functions on the site resolved, the focus shifted toward resolution of the significant urban design and technical issues prompted by the expected phasing of the two adjacent projects.

Urban Design Issues

As discussed above, the ultimate layout of the Triangle Site will be dominated by a substantial TOD and the aerial Venice/Robertson Station. Given the current development climate and the fact that no development permits have been obtained for the TOD as of this writing, and that the Expo Line Phase 2 is scheduled to be in service in 2015, it is likely that by the time the development is completed the Venice/Robertson Station will no longer be an interim terminus, but rather will be a station in the center of the alignment. To focus the urban design, architectural, and landscape efforts of the at-grade station improvements onto those areas that would benefit the passenger the most, the 59’ wide plaza area underneath the aerial structure is designed as a pedestrian esplanade with special pavement, appropriately scaled lighting, and pedestrian

amenities such as benches, all focused on creating a dedicated pedestrian realm leading to the central station plaza.

The implementation timeline for the development of the site in essence resulted in restrictive development rights for portions of the property at certain times. While not legally restricted by land use or zoning policies, the site is restricted by the understanding reached between the two parties sharing ownership. With the understanding reached, almost all improvements put in place south of the 59' plaza demarcation line are permanent improvements for the lifetime of the Expo Project, whereas almost all improvements north of that demarcation line will be replaced once the TOD is implemented. This timed implementation and simultaneously placed restriction on the reach of the implemented Urban Design elements resulted in a unique focus of the utilized design elements.

To that end, most of FFP's urban design efforts for the Triangle Site focus on the passenger experience of the station during the processional approach from the public realm to the station boarding area. Particular emphasis was placed on maintaining the existence of an effective pedestrian realm, with or without the development, and as both an interim terminus and a mid-line station. The design also considered the construction of an efficient and convenient integrated surface parking lot on Metro and City ROW, and the implementation of an integrated bus stop and layover facility that minimizes the detrimental effect of a mode switch on the overall ridership numbers. A number of additional coordination meetings with the City and the local bus operators were conducted prior to agreeing on the preferred layout. In order to implement the aforementioned pedestrian realm, effective design tools created a sense of place and comfort for those using the station.

A significant landscaped buffer was implemented along the existing property line with the adjacent light industrial property. An intricate lighting scheme was developed that is integral to the overall design elements of the pedestrian plaza while celebrating and illuminating the superstructure of the Expo Line as a major infrastructure design

accomplishment. The station pedestrian plaza, located within the permanent 59' zone, is designed to be the central focal point of all pedestrian activity for the users of the line. It concentrates essential functional elements such as ticket vending and vertical circulation, and combines it with the creation of a public space that is at times a bid to the senses for each user, and simultaneously the graceful expression of a utilitarian infrastructure system in the tradition of the historic LA River bridges, the Sepulveda Dam, and the rich oeuvre of the LADWP.

It was determined that in the ultimate build-out of the Triangle Site the CMC would benefit most from being integrated into the expected retail development along Venice. To that end and in an effort to be consistent with Metro's recent bicycle program, the functions of the CMC are located in three prefabricated buildings along the southern edge of the station plaza, directly beneath the aerial structure. One of them houses the CMC functions proper, including indoor bike storage; one of them contains the shower areas; and the third is the train operators' lounge.

The integration of the CMC into the TOD in the ultimate build-out is another major win-win, in that the TOD provides desired services to Expo Line passengers, while the Venice/Robertson Station (with nearly 10,000 riders per day) provides the development with a large new customer base. The Expo Line will also deliver a reliable and predictable stream of customers to the retail and office components of the development, in addition to offering several alternative modes of transportation to the residents of the TOD over that of a single-occupancy vehicle.

Structural Issues

One of the significant technical issues dealt with was a structural one—how to support an aerial structure on columns up to 18 feet high, during both normal operational and earthquake loads, while an underground parking structure some 20 feet deep is being constructed parallel to it and only 2 feet away.

FFP increased the piles supporting the Venice/Robertson aerial structure in diameter and made them deeper to take the required seismic forces,

given the soil conditions at the site. Groundwater is high, about 20 to 30 ft below original ground. The piles were lengthened and surrounded with a steel casing, with an air gap in between to take the lateral movement during the maximum design earthquake.

Two CIDH piles were increased from 11-foot diameter with pile length of 82 feet to 11-foot diameter with pile length of 86 feet. Four CIDH piles were increased from 11-foot diameter with pile length of 71 feet to 12-foot diameter with pile length of 89 to 91 feet. Eight CIDH piles were increased from 11-foot diameter with pile length of 71 to 77 feet to 12-foot diameter with pile length of 83 to 87 feet ft.

The 11-foot diameter piles were also designed with a 13.5-foot diameter steel casing for the top 20 feet, and the 12-foot diameter piles with a 15-foot diameter casing. The void between the casings and CIDH piles allows for lateral movement during a major earthquake without damaging the pile or the superstructure.

When the idea of making structural provisions in the aerial structure for a future underground parking structure arose, it was assumed that the structures should be totally independent, that is, that the loads imposed by the aerial structure would not need to be taken into account by the structural designers of the parking structure. However, as the conceptual design was developed it became evident that the cost differential of a totally independent system over the baseline design might be more than the City had available in its budget.

Therefore the Authority requested that FFP study a second alternative, in which the Expo Project would install a row of soldier piles parallel to the aerial structure. When the City builds the parking structure, their contractor will have to design the support for the soldier pile supporting system. They can either use a tieback system or temporary bracing during the excavation of the underground parking structure. The City and its contractor will have to

perform calculations to determine the safest and most economical alternative for constructing the underground parking structure.

Integrated Interim Surface Parking Layout

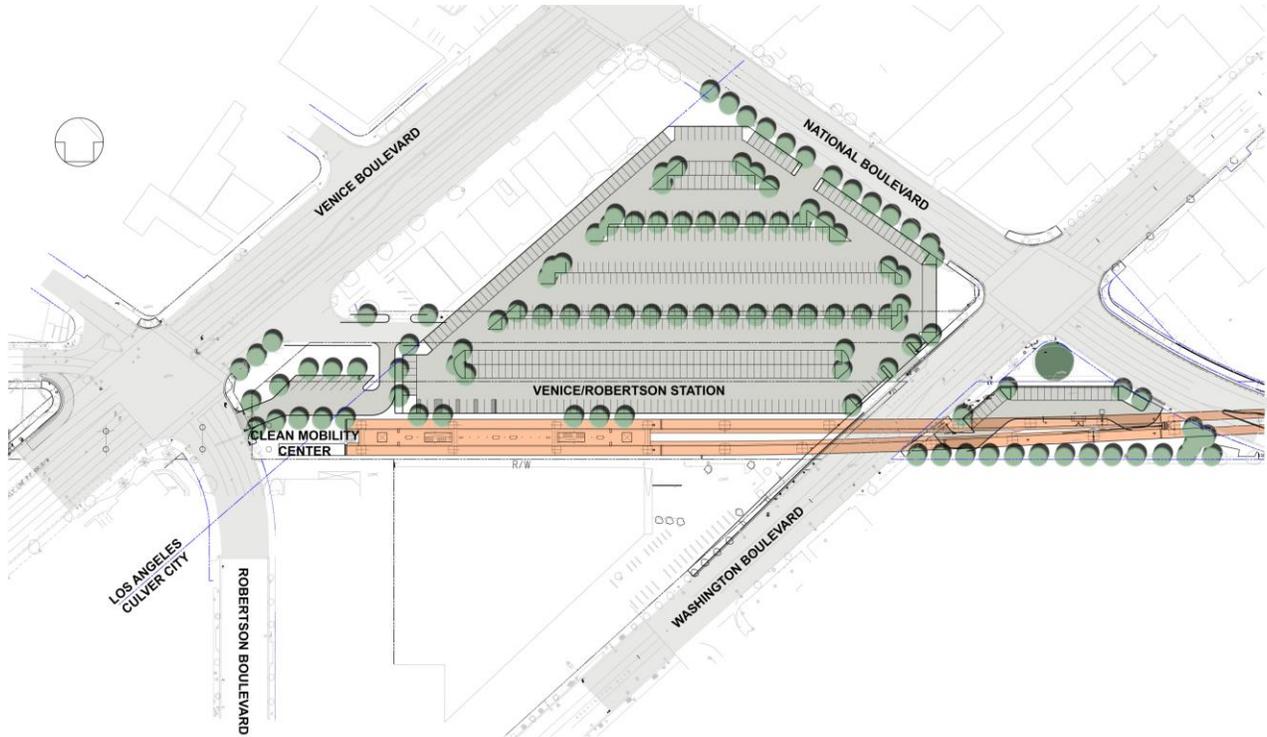
At the request of the CDD, FFP concentrated the required bus stops and layover facilities along a comparatively quiet stretch of Robertson immediately south of the station area, rather than at curbside in the station plaza area as originally designed. To the extent possible the bus area will include pedestrian amenities and receive streetscape consistent with the overall design of the project. Additionally, a dedicated paratransit pickup/dropoff area has been designated immediately adjacent to the station elevator, integrated into the station layout.

The integrated interim surface parking lot, about 4.6 acres comprising the previous Lot B, Exposition, and the Triangle Site, has been laid out to provide 601 parking spaces (328 regular size, and 239 compact), 8 handicapped, 8 shared ride/electric vehicle, and 8 motorcycle spaces. Including 23 spaces in Lot A, there are a total of 624 spaces, slightly more than the 600 spaces required by the FEIS/EIR for the interim condition. The lot also accommodates the CMC buildings, operators' lounge, bike racks and bike lockers, and paratransit facilities on-site.

Because of the temporary nature of the lot (expected to be 4 to 5 years before the TOD is implemented), landscaping will consist of groundcover and small trees to be relocated when the parking is reconfigured during Phase 2, parking lot lighting on wooden poles with overhead wires, a thinner than normal asphalt paving section, and internal asphalt curbs in lieu of concrete. However, all underground utilities (such as water and sewer connections to the CMC or parking lot drainage) had to be routed outside of the footprint of the City's underground parking so that they will not have to be re-routed during construction of the TOD.

The layout of the integrated surface parking lot is shown in the attached figure.

as an integral part of the project. Not all modes integrate in the same way and by utilizing the same



Interim Integrated Surface Parking Lot Plan

CONCLUSIONS AND RECOMMENDATIONS

Compared to traditional developments, the successful implementation of a TOD is still a relatively rare event. While guidelines and proven principles exist, there is no formula that can be applied consistently to yield success. The commercially most successful and most repetitively implemented development products are those that keep the number of variables low, and can be constructed while keeping the number of external components to a minimum. A successful TOD by its very nature is almost the exact opposite of a repetitive development with a low number of components. In fact, the success of a TOD almost demands attention to partnerships, the mix of uses, and combination of multiple modes of transportation

formula; not all development scenarios uniformly apply to all existing development conditions; jurisdictional constraints and nuances in the development climate can shift alliances; and the passenger experience will significantly influence ridership numbers for the system and therefore affect the success of the development.

All of the above, and the findings discussed in this paper make these kinds of projects very difficult to accomplish successfully, but ultimately very rewarding for those involved, and more importantly for the ultimate users, when successfully completed.

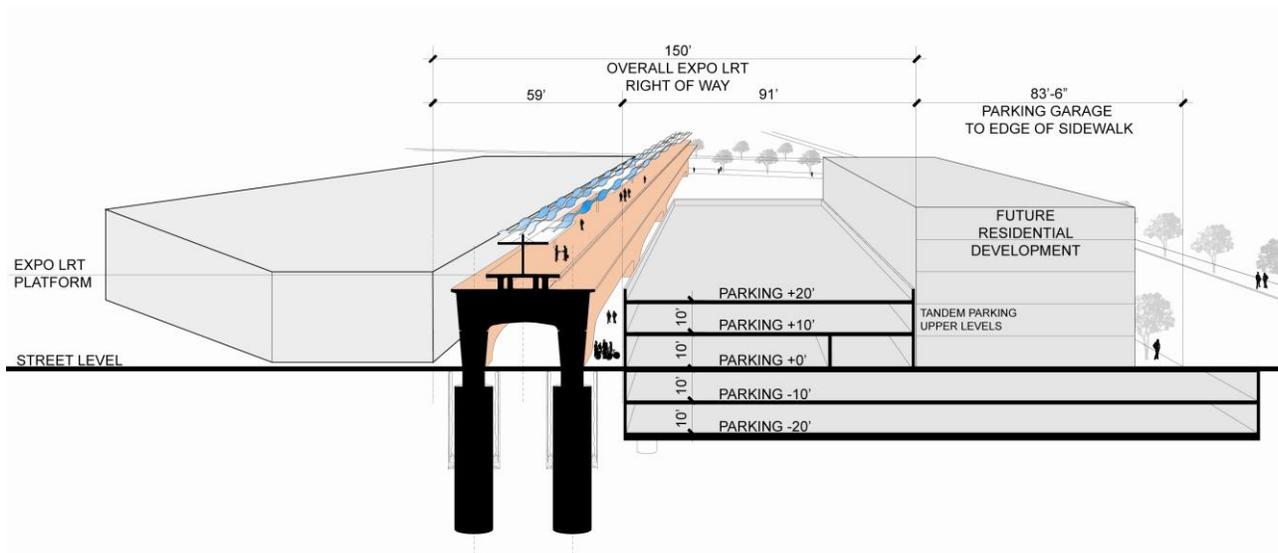
The scenario investigated in this paper represents a number of challenges that do not fit the commonly expected development scenario for a

TOD. For that reason the resulting project at first sight also does not appear to fit the commonly used evaluation formula for a successful or unsuccessful project. The resulting project, while integrating buses and bicycles in a true multimodal scenario, does not locate the facilities on site as close to the rail access points as desired by the transit operators. While the project generates a commendable pedestrian experience in the design of its approaches to the rail system, it does not fully capitalize on the opportunity to develop a significant public open space that is tightly integrated with the planned development.

What the project does accomplish in an exemplary fashion, however, is integration of a new mode of transportation into a fully developed, dense urban environment, with a design and engineering vocabulary that is at the top of its field, utilizing solutions that are imaginative, respectful, and flexible to adapt to future development.

The authors have identified a number of lessons learned from the roughly two-year process in developing the station area around the Venice/Robertson Station. The authors believe that the principles listed below were a key to achieving win-win solution at the Venice/Robertson Station site, and can be applied to other projects as well:

- Consider phasing carefully and do not rely on a future phase for success since it may never come.
- Stay nimble in your design decisions.
- Commit to trusting collaboration with all parties that have a vested interest in the project, and engage with these parties from the beginning.
- Focus on the passenger and visitor experience.



Ultimate Development Cross-Section