



# **Kapolei Maintenance Facility & Transit Center Alternatives Analysis**

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## **Alternatives Analysis Report**

*Prepared by Kimley-Horn and Associates, Inc. in Cooperation with the Oahu Metropolitan Planning Organization and the United States Department of Transportation.*

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## INTRODUCTION

The primary objective of this Kapolei Maintenance Facility & Transit Center Alternatives Analysis (AA) is to conduct conceptual planning and design studies to assess alternatives for the development of a transit center (mobility hub) and a new public transit support facility on vacant City-owned land in Kapolei, West Oahu. An approximately 5.23-acre City-owned property has been identified as a potential location for the proposed mobility hub and public transit support facility in Kapolei.

The existing Kapolei Transit Center is located on Haumea Street and spans two blocks. A new mobility hub could replace the existing Kapolei Transit Center located on Haumea Street and provide additional passenger amenities. Although the existing transit center currently serves 10 bus routes, limited seating and shelters are provided for passengers (see **Figure 1**). The proposed Kapolei Transit Center and Maintenance Facility is intended to connect multiple transportation modes such as fixed-route and paratransit buses, bikes, pedestrians, taxis, transportation network companies (TNCs), and the future Honolulu Rail Transit (HRT) service and integrate these modes into a cohesive transportation system.



**Figure 1: Existing Kapolei Transit Center**

Development of a transit support facility on the City-owned land in Kapolei could address the need for a third bus maintenance and parking facility to improve operational efficiencies for Oahu Transit Services. The transit support facility could serve as a West Oahu base for the fixed-route (TheBus) and paratransit (TheHandi-Van) fleet and could include facilities for administration, light maintenance, and vehicle (bus) parking.

The location of the City-owned land in proximity to Kapolei's City Center District and nearby commercial and residential developments presents an opportunity to evaluate alternative development schemes, including as a stand-alone transit facility or potentially as a mixed-use development with housing and commercial elements. The site is bounded by Kamaaha Avenue to the west, Alohikea Street to the east, and Kapolei Parkway to the south. **Figure 2** presents an aerial map of the project location.

The subsequent sections of this report will present an analysis of the programmatic needs for the transit facilities along with site development parameters, the development and evaluation of preliminary schemes, and the refinement of conceptual designs. The stakeholder consultation and public outreach activities conducted during the course of this project will also be summarized.



**Figure 2: Project Location Map**





This section of the report summarizes the consultation conducted to define a program of uses for the mobility hub and the transit support facility. The program of uses was informed by input received during a series of meetings with stakeholders representing the City’s Department of Transportation Services (DTS) Transportation Mobility Division, DTS Transportation Engineering Division, DTS Transportation Planning Division, DTS Complete Streets Administrator, Department of Planning and Permitting (DPP), and Department of Land Management, along with Oahu Transit Services. This section of the report also summarizes land use regulations and site development parameters applicable to the City-owned land and the potential uses associated with the mobility hub and the transit support facility.

Along with input received from stakeholders, the program of uses for the new mobility hub in Kapolei was informed by an analysis of both current bus routes serving the existing transit center in Kapolei and the expected future fixed-route bus service after initiation of the Honolulu Rail Transit service to East Kapolei. **Figure 3** presents the existing fixed-route bus service in the project area.

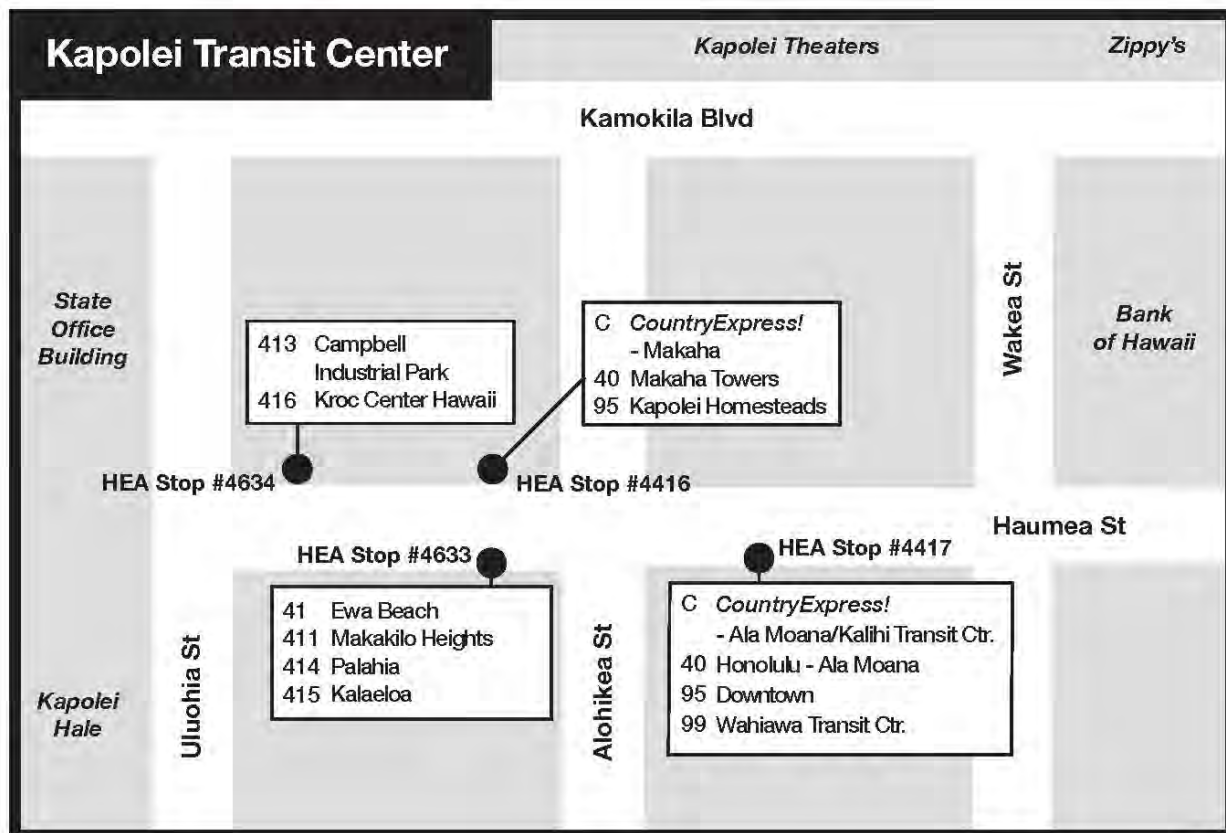
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## Fixed-Route Bus and Paratransit Operations

The existing Kapolei Transit Center is located on Haumea Street and spans two blocks. The transit center is bounded by Uluohia Street on the west and Wakea Street on the east. The transit center currently serves 10 fixed routes at four stop locations, as shown in **Figure 4** below. Additional changes to the fixed-route service may be implemented to integrate with the Honolulu Rail Transit after the initiation of service to East Kapolei. These service changes could potentially alter the number of bus trips stopping, originating, or terminating at the Kapolei Transit Center.

**Figure 4: Bus Routes and Positions at Existing Kapolei Transit Center**



The number of bus stops provided at a mobility hub depends on a variety of factors, including the size and layout of the site; the number of routes passing through the mobility hub and their headways (i.e. frequency); and the number of routes terminating at the mobility, their headways, their scheduled layover/recovery time, the size of buses (e.g., 40-foot, 60-foot), and electric bus charging needs. The Kapolei Transit Center is anticipated to serve as many as 11 fixed bus routes when the Honolulu Rail Transit begins service.

The mobility hub should also provide a convenient stop to serve the TheHandi-Van paratransit operations. TheHandi-Van generally uses cutaway vans with a maximum length of 26 feet. A stop for TheHandi-Van should be provided at the mobility hub to facilitate transfers to the fixed-route bus services. The paratransit stop needs to provide an accessible curb for loading and unloading and an

access aisle. A staging location may also be considered for the pre-positioning of TheHandi-Van vehicles at the mobility hub.

According to the Bus Fleet Management Plan, there is a directive to transition to a non-polluting fleet, which will include adding a substantial number of electric buses. The mobility hub should be designed to provide equipment for in-route charging. Several bays could be configured to accommodate charging equipment such as an overhead gantry system. Transit agencies have implemented overhead gantry facilities with either a bus-mounted or gantry-mounted pantograph for conductive (direct contact) charging (see **Figure 5**).

The charging system requires support infrastructure such as a meter, transformer, and alternating-to-direct current converter. This type of charging is better suited to routes that have a layover and dwell time in the bus bay, allowing for the vehicle to charge during daily operations without having to return to the maintenance facility. The pantograph offers the advantage of allowing the vehicle to be charged without the driver having to leave the vehicle to connect with a plug-in charger. There are additional items that need to be considered including signage that alerts transit riders to the electric bus charging operations within the transit center and the placement of emergency shutdown switches.



**Figure 5: Overhead Pantograph Charging System**

### **Passenger Facilities**

A variety of passenger facilities should be provided at the mobility hub to furnish travel information and a safe and secure environment. The passenger facilities that should be considered for the Kapolei Transit Center include:

- **Waiting areas including shelters and benches** – comfortable, easily accessible, and well-designed waiting areas should be provided at the Kapolei Transit Center. Facilities that should be considered include weather protection, seating, trash receptacles, lighting, Wi-Fi connectivity, and charging stations for devices (see **Figure 6**).



**Figure 6: Transit Shelter (Source: aluminum-offshore.com)**

- **Wayfinding including real-time information** – wayfinding is an important element for directing users to the mobility hub and to the appropriate transit service within the mobility hub, including facilitating seamless transfers between routes and modes. Real-time information (i.e. next bus arrival) facilitates transfers between transit modes and allows transportation users to pick the best transit option in real-time. Real-time information also warns users of expected delays or changes in transit service and can help improve the customer experience. Real-time information can be displayed on dynamic message signs or provided at digital kiosks. Providing multilingual wayfinding information is an important consideration.
- **Public restrooms** – should be considered for the Kapolei Transit Center, including the corresponding safety and maintenance implications.
- **Public space and art** – a mobility hub should provide a pleasant public realm including open spaces, plazas, landscaping, murals, and artwork. The public space should be congruent with the surrounding area.
- **Vendors and transit-oriented retail** – retail can be provided on-site at the mobility hub or nearby sites within walking distance. On-site opportunities may range from temporary structures, such as carts, kiosks, or other flexible structures, to fixed or permanent retail spaces.

### **Bicycle Facilities**

Bicycle facilities are geared primarily toward two user groups: bike owners and bike sharers. For bike owners, the focus is on providing secure and safe parking in the proximity of the mobility hub. Bicycle lockers that are pre-reserved and key-operated, or bike rooms, are considered the best protection against bicycle theft and are ideally suited for “long-term” bike parking applications (see Figure 7). Outdoor bike racks are the most basic and common “short-term” bike parking option.



**Figure 7: Secure Bicycle Parking for Long-Term**

Bikeshare has emerged as a popular transportation option, although Honolulu’s bikeshare system is currently centered on the core area of the city. For bike sharers, the focus is on providing space for bikeshare companies to install bikeshare stations (i.e., bikeshare racks). Reserving space for the future deployment of bikeshare in Kapolei should be considered as concepts are developed for the Kapolei Transit Center.

### **Transportation Network Companies (TNCs)/Taxis/Drop-Off**

Accommodations for taxis and transportation network companies (TNCs) should be provided. A pick-up zone should be designated for taxis and TNCs to reduce disruption to traffic flow resulting from disorganized loading activities in the surrounding streets. The zone should be in a designated area in proximity to the transit center but should not interfere with fixed-route and paratransit operations.

## Micromobility

Micromobility refers to a range of small, lightweight vehicles operating at speeds typically below 30 miles per hour including electric/pedal-assisted bicycles, electric scooters, and electric skateboards. Micromobility vehicles may become popular for first-last mile access to the Kapolei Transit Center. Shared electric scooters have experienced a rapid adoption in many locations and are offered by companies such as Lime and Bird (see **Figure 8**). However, the deployment of electric scooters in Oahu is pending legislation to amend the vehicle code at the state level and the adoption of safety rules. A recurring problem associated with electric scooters is the cluttering of sidewalks and public spaces. Some cities now require companies to deploy their rental scooters in designated parking areas or corrals where riders must place the scooters when they are finished riding.



**Figure 8: Lime Electric Scooter**

## Operations and Maintenance

Accommodations need to be provided in the Kapolei Transit Center for operations and maintenance support functions including **security, janitorial services, and other support functions**. Security options may include space for law enforcement/on-site security personnel, security cameras, lighting, and maintaining clear sight lines for natural surveillance consistent with crime prevention through environmental design (CPTED) principles. A storage room/closet should include a sink or floor-set mop sink and should be situated in an area that is clean, dry, and well-ventilated. A comfort station should be provided for operators near the layover area which could include a break room and bathrooms for staff, including drivers and road supervisors.

## Summary

**Table 1** summarizes the potential program of uses for the new mobility hub in Kapolei.

**Table 1: Transit Center Program of Uses**

ELEMENTS
TheBus Fixed-Route Bus Bays
TheHandi-Van (Paratransit) Bay(s)
Passenger Facilities (Shelter, Benches, Restrooms, etc.)
Wayfinding and Real-Time Information
Bicycle Parking, Bicycle Sharing, Micromobility
Drop-off Zones and Staging for Taxis and TNC Zones
Open Space, Landscaping, Artwork
Operations and Maintenance Support Functions (e.g., Security)
Future Electric Bus Charging
Future Connection to Potential Honolulu Rail Transit West Kapolei Extension



## Transit Support Facility

The City's bus fleet is currently supported by two primary maintenance facilities: vehicle maintenance facilities are located in Pearl City and Kalihi. These facilities are in the southcentral and southeast portions of Oahu, respectively. The facility in Pearl City accommodates 254 fixed-route (TheBus) revenue vehicles. The facility in Kalihi accommodates 290 fixed-route (TheBus) revenue vehicles. There is a total of approximately 205 revenue vehicles in the paratransit fleet. The paratransit facility at Kalihi serves as the primary hub for (TheHandi-Van) vehicle storage and is sized for 150 vehicles. Overflow storage is provided for the paratransit fleet at the Pearl City maintenance facility.

The Bus Fleet Management Plan (BFMP) indicates that the fixed-route bus fleet is anticipated to increase by 27 vehicles to 571 vehicles and the paratransit fleet is expected to increase by 45 vehicles to 250 vehicles. The maintenance and storage facilities are currently at or near capacity and additional space will be needed to store the vehicles that will be added to the fleet.

All routes are based out of the bus maintenance facilities in Pearl City and Kalihi, which adds a significant amount of deadhead travel for routes that go to the west end of the island. A new maintenance facility at Kapolei could serve as a West Oahu base of operations for fixed-route and/or paratransit service in the Kapolei area and surrounding environs.

Given the commercial, institutional, and future residential uses of the surrounding properties and site development parameters, a heavy vehicle maintenance facility is not viable on the City-owned land in Kapolei. The project site is also limited in size and needs to accommodate both the transit support facility and a mobility hub. Therefore, the transit support facility should focus on light vehicle maintenance activities and overnight parking/vehicle storage for the bus fleet. Heavy maintenance and repair activities would still be performed at the Pearl City and the Kalihi bus maintenance facilities.

### Parking/Vehicle Storage for Fixed-Route Buses

Most of the fixed-route buses (see **Figure 9**) that serve the Kapolei Transit Center begin or end their trips at or near the transit center. These fixed-route buses could be stored and dispatched from the Kapolei light maintenance facility to reduce deadhead movements versus being stored and dispatched from the Pearl City or Kalihi bus maintenance facilities.



**Figure 9: TheBus**

### Parking/Vehicle Storage for Paratransit Vans

Pre-Covid-19, TheHandi-Van provided up to 285 daily paratransit trips with both the pickup and drop-off in Ewa, Kapolei, Makakilo, or Waianae. Those trips required up to 72 vehicles daily dispatched from the Kalihi and Pearl City bus maintenance facilities. In addition, up to 670 daily paratransit trips were provided with either the pickup or drop-off in Ewa, Kapolei, Makakilo, or Waianae, requiring 115 vehicles daily. Dispatching paratransit from the Kapolei light maintenance facility would provide better customer service and improve operational efficiency. In addition, paratransit trip demand continues to increase and the existing bus maintenance facilities at Kalihi and Pearl City are approaching vehicle storage capacity.

## **Parking for Non-Revenue Support Vehicles, Staff, and Visitors**

Non-revenue vehicles support the day-to-day operations, maintenance, service, and deliveries of the transit system, including providing service supervision, delivering parts and supplies, responding to emergencies, maintaining facilities and equipment, relieving operators, attending meetings, and various other administrative functions. Space should be allocated for the storage of non-revenue support vehicles at the Kapolei light maintenance facility.

The staffing requirements for the Kapolei light maintenance facility would include employees responsible for maintenance, administrative, and dispatch functions, as well as bus operators. The facility would likely be a 24-hour facility. Buses will be retired for the night, serviced, and prepared for early morning departures. On-site parking will need to accommodate the overlap of shifts plus provide additional spaces for additional visitors.

## **Electric Vehicle Charging**

Based on the directive to transition to an all-electric/hybrid non-polluting fleet, the light vehicle maintenance facility should also accommodate electrical vehicle charging infrastructure. There are several types of charging systems (see **Figure 10**) that can be considered such as:

- **Plug-in:** These units operate comparably to a typical fuel dispensing unit.
- **Overhead Gantry:** There are overhead gantry systems that can be integrated into the parking fields to charge buses once they return to the light vehicle maintenance facility at the end of the day. The system can charge groups of buses sequentially in the overnight hours.
- **Wireless charging:** This approach typically involves a ground-mounted or embedded electromagnetic plate with a corresponding plate installed on the underside of the bus. An electric current is passed through an in-ground plate which generates a magnetic field, and a bus-mounted plate uses electromagnetic induction to generate a current that charges the bus battery.



**Figure 10: Plug-In Electric Vehicle Charges**

Each of the electric vehicle charging systems has tradeoffs among space requirements, staff support/technical capacity, capital investments, operations, maintenance, and life-cycle costs that need to be considered. The electric vehicle charging system for the Kapolei light vehicle maintenance facility should be designed to:

- **Minimize site impacts:** The layout should be compact to minimize the space requirements. The City-owned site is constrained, and the electric vehicle charging infrastructure would further reduce the available space for vehicle storage and other functions. The electric vehicle charging

system should take advantage of a compact parking field and fit within the confines of the maintenance facility footprint.

- **Be adaptable and scalable:** The transition to an electric vehicle fleet will occur over time to distribute the capital costs associated with vehicle acquisition and supportive infrastructure charging infrastructure. The electric vehicle charging system should be flexible to adjust to changes in the fleet conversion strategy.
- **Optimized for operational efficiency:** The implementation of the electric vehicle charging equipment should provide a balance between capital investment and operational efficiency.

The existing bus maintenance facilities at Pearl City and Kalihi have partial backup power systems in the event of a power failure. To accommodate electric vehicle charging at the new Kapolei light vehicle maintenance facility, backup power generation, and storage systems will need to be sized appropriately to keep all or a portion of the fleet operational in the event of an extended power outage.

### Light Vehicle Maintenance Facility Functions

The light vehicle maintenance facility should focus on activities such as fluids top-up, fueling, fare collection, exterior washing, interior cleaning, and overnight storage of revenue and non-revenue vehicles. In addition, storage for preventative maintenance items, bus cleaning materials, and hazardous materials storage should be provided in the facility, as well as office space for administrative and dispatch functions. The program for the light vehicle maintenance facility should include the following:

- Fare collection
- Bus wash facilities (see **Figure 11**)
- On-site fueling
- Maintenance bays to perform functions such as fluid top-ups and preventative maintenance
- Storage for preventative maintenance parts, tools, and bus cleaning and hazardous materials
- Office space for administrative and dispatch staff
- Facilities for drivers/operators and maintenance staff including lounges/breakrooms, restrooms, and lockers
- Training/conference rooms



**Figure 11: Bus Wash (Source: Westmatic)**

## Summary

**Table 2** summarizes the potential program of uses for the light vehicle maintenance facility in Kapolei.

**Table 2: Light Vehicle Maintenance Facility Program of Uses**

ELEMENTS
Parking/Vehicle Storage for Fixed-Route Buses
Parking/Vehicle Storage for Paratransit Vans
Parking for Non-Revenue Support Vehicles, Staff, and Visitors
Electric Vehicle Charging
Fare Collection
Bus Wash Facilities
On-Site Fueling
Maintenance Bays
Storage Space (Parts, Tools, Hazardous Materials, etc.)
Office Space for Administrative and Dispatch Staff
Employee Facilities (Lounge, Restrooms, Lockers, etc.)
Conference and Training Rooms

## Site Development Evaluation

The purpose of this section is to summarize applicable land use regulations for the City-owned land in Kapolei (i.e. project site).

### Plans and Ordinances

**Ewa Development Plan (Amended in 2020):** The project site is located in the Ewa Development Plan (DP) area. As one of eight development or sustainable community plans on Oahu, the Ewa DP provides a framework for implementing aspects of the City and County of Honolulu's General Plan at a more focused, regional level. The Ewa DP provides for significant economic and residential growth centered around the City of Kapolei.

The project site is located within the Civic Center district and the Ewa DP identifies the project site as a transit node. The project site borders the City Center district and parcels occupied or identified for mixed-use development. The project site is located within a five-minute walking distance, or within about 1,300 feet, from the majority of the parcels zoned for medium-density residential. The Ewa DP encourages higher residential and commercial development around the transit node, and neighboring uses should be oriented toward the transit node to encourage pedestrian activity.

**City of Kapolei Urban Design Plan (2007):** The project site is also located within the boundaries of the City of Kapolei Urban Design Plan (UDP), which was created as a condition of zoning approval for the City of Kapolei. The Kapolei UDP supplements and is subject to existing regulatory controls, including



zoning requirements of the City and County. Projects within its boundaries are subject to review by both the Kapolei UDP Design Advisory Board and the City's DPP for compliance.

The plan identifies the project site as a Public Transit Center in the Civic Center district. The Public Transit Center is defined as a hub that integrates buses and park-and-ride facilities. The project site is located at the edges of three districts: Civic Center, City Center, and Commercial Emphasis Mixed Use.

The Kapolei UDP prescribes that buildings and open spaces should encourage pedestrian activity and social interaction by being oriented toward the street. There is a minimum setback of 15 feet from the property line, to be developed as landscaped spaces. Functions such as parking, loading, and other services are encouraged to be located toward the interior of properties. The Kapolei UDP allows for a height limit of 150 feet in the Civic Center district, but the project site is also subject to the height restrictions of the underlying zoning.

**City and County of Honolulu, Revised Ordinances of Honolulu, Chapter 21, Land Use Ordinance:** The Land Use Ordinance (LUO) defines the allowable uses of land in the City and County of Honolulu. The project site is in the Business Mixed-Use (BMX)-3 zoning district with a height limit of 90 feet and a maximum floor area ratio (FAR) of 2.5, although the FAR may be increased to a maximum of 3.5 with an open space bonus. The project site has a front setback requirement of 10 feet for dwellings and 5 feet for other uses, and a side/rear setback requirement of 10 feet for multi-family dwellings and 0 feet for other uses. The BMX-3 zoning district allows for a variety of uses, including minor repair establishments.

**East Kapolei Neighborhood TOD Plan (2020):** This plan establishes a vision for transit-oriented development (TOD) around three future Honolulu Rail Transit stations in East Kapolei (East Kapolei, University of Hawaii (UH) West Oahu, and Hoopili). The plan identifies improvements to encourage transit use and facilitate connections with the surrounding communities, such as park-and-ride lots, bus terminals, medium-to high-density mixed-use development, greenway corridors, and pedestrian-oriented street environments. A future extension of the Honolulu Rail Transit system to West Kapolei would provide a direct rail connection with these East Kapolei station areas.

**Federal Transit Administration Guidance on Joint Development (FTA Circular C 7050.1B):** This Federal Transit Administration (FTA) circular defines the term "joint development" and explains how a joint development project can qualify for FTA assistance. Joint development is defined as a public transportation project that integrally relates to and often co-locates with commercial, residential, mixed-use, or other non-transit development. Although related in purpose – creating vibrant, compact, mixed-use, economically successful communities near public transportation – joint development and transit-oriented development (TOD) differ. Joint development uses project property, whereas TOD has a broader neighborhood scale. Joint development provides opportunities for private sector participation in public sector transportation projects.

Note that joint development is defined in the LUO as "the development of two or more adjacent subdivision lots under a single or unified project concept." The concept of joint development in this report is consistent with its definition in the FTA circular, rather than in the LUO.

## Site Development Parameters

**Building Height and Setback:** The maximum building height for the project site is established by the more restrictive limit of 90 feet established in the LUO, whereas the more restrictive setback requirements of 15 feet established in the Kapolei UDP are applicable.

**FAR and Square Footage:** Per the LUO, the maximum FAR for the project site is 2.5, which corresponds to 569,873 square feet of building space based on the lot size. In addition, the project site is eligible for an open space bonus of an additional five square feet of building space for each square foot of open space.

**Permitted Uses:** The project site is in the BMX-3 zoning district. The purpose of the BMX-3 district is to provide residences in close proximity to employment and retail opportunities, providing innovative and stimulating living environments and reducing energy consumption. The project's potential uses as a vehicle maintenance facility and a transit center are permitted in the BMX-3 zoning district, provided the project site functions as a light maintenance facility. "Minor repair establishments" are a permitted use in the BMX-3 zoning district, whereas "major repair establishments," including bus and truck repair, are not a permitted use in the BMX-3 zoning district.

The BMX-3 district is intended to provide areas for both commercial and residential uses at a lower density than the central business mixed-use district. It is also intended to further develop existing mixed-use areas, whether occurring horizontally or vertically. BMX-3 zoning allows for a variety of residential units, including duplexes, detached one- and two-family homes, and multifamily apartments. It also allows for retail, dining, office space, hotels and lodging, and social and civic services such as art galleries, day-care facilities, meeting facilities, schools, and theaters. This provides flexibility to include mixed-use joint development in addition to the transit hub and light maintenance facility.

Based on input received from the City's DPP, additional flexibility may be available for the allowable uses on the project site as "public uses and structures" owned and managed by the City to provide a public benefit. The determination of "public uses and structures" is made by the City's DPP. According to the LUO (City and County of Honolulu, Revised Ordinances of Honolulu, Chapter 21, Land Use Ordinance):

"Public uses and structures means uses conducted by or structures owned or managed by the federal government, the State of Hawaii or the City to fulfill a governmental function, activity or service for public benefit and in accordance with public policy. Excluded are uses which are not purely a function, activity or service of government and structures leased by government to private entrepreneurs or to nonprofit organizations. Typical public uses and structures include libraries, base yards, satellite city halls, public schools, and post offices."

According to the LUO, base yards are defined as follows:

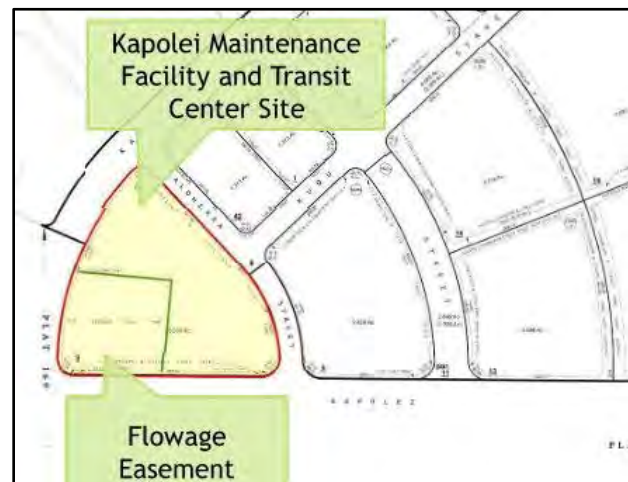
- (1) "Base yards" means the principal facility for establishments that provide their services off-site, but where a site is needed for the consolidation and integration of various support functions, and where the parking of company vehicles is a prominent if not principal activity. Typical base yards include a construction company's facility or a bus yard.
- (2) Storage, cleaning, and repair of materials, vehicles, and equipment used by the establishment.

- (3) Vehicle dispatch.
- (4) Personnel-related support facilities (e.g., locker and shower rooms, kitchen or cafeteria, lounge).

The proposed light maintenance facility is permitted as a base yard use provided it meets the following criteria: “All repair work shall be performed within an enclosed structure and the facility shall be subject to the same minimum development standards for a storage yard provided in this article.”

**Driveways:** The project site has driveway access restrictions on Kapolei Parkway, which follows the intent and is consistent with the requirements applied to developments in the vicinity of the project site along Kapolei Parkway. Driveways may be located on Kamaaha Avenue and Alohikea Street subject to 15-foot setbacks from intersection curves. In addition, the total driveway width on any street fronting the site may not exceed 45 percent of the site’s frontage on that street.

**Easements:** A flowage easement (see **Figure 12**) occupies a large portion of the southwest area of the project site. This flowage easement was created to collect off-site stormwater runoff from Kamaaha Avenue before the extensions of Kamaaha Avenue and Kapolei Parkway were constructed. With the extensions of Kamaaha Avenue and Kapolei Parkway and the completion of their drainage infrastructure in 2019, stormwater now diverts to another detention basin south of Kapolei Parkway. The James Campbell Company (JCC) was consulted, and they confirmed that the flowage easement can be removed. The City’s DPP-Subdivision Branch was also consulted, and they indicated that the removal of the easement would occur via a typical subdivision application, which is an approximate 6-month process.



**Figure 12: Flowage Easement on Project Site**

There are landscape and utility easements along the perimeter of the project site, which are standard for parcels in Kapolei. These easements must be reserved and are typically maintained as a landscape buffer. Note that these easements are within the required building setbacks per the Kapolei UDP.

**Design Review Requirements:** The project site is located in the Kapolei Urban Design District. According to the Kapolei UDP, any construction, installation, or alteration on any lot, building, or structure is subject to review by both the Kapolei Design Advisory Board (DAB) and the City’s DPP. Projects found to be inconsistent with the urban concept, themes, or city structure established in the Kapolei UDP shall be rejected.

## Summary

**Table 3** summarizes the site development parameters applicable to the City-owned land. Table 3 also identifies joint development (i.e. commercial, residential, or mixed-use) as a potential component of the program of uses for the Kapolei Maintenance Facility & Transit Center. Joint development could provide several benefits including revenue generation, such as income derived from lease payments, and private sector contributions to the capital costs of the public infrastructure (e.g. private sector constructs public sector).

**Table 3: Site Development Parameters**

ITEM	DESCRIPTION
Project Location	East Kapolei, Ewa District, Oahu, Hawaii
Tax Map Key (TMK)	9-1-148:009
Lot Size	227,949 Square Feet (Approximately 5.233 Acres)
Surrounding Streets	Kamaaha Ave. (West), Alohikea St. (East), Kapolei Pkwy. (South)
Existing Use	Temporary Regional Drainage for Kapolei
Surrounding Land Uses	Governmental/institutional, commercial/shopping centers, vacant
State Land Use District	Urban
Ewa Development Plan (DP) Land Uses	Civic Center, Transit Node
Kapolei Urban Design Plan (UDP) Land Uses	Civic Center, Transit Node
Land Use Ordinance (LUO) Zoning	BMX-3 (Business Mixed-Use)
Kapolei UDP Height Limit	150 feet
LUO Height Limit	90 feet
Kapolei UDP Setbacks	15-feet minimum; all setback areas shall be developed as landscaped spaces for sitting and walking
LUO Yards (Setbacks)	<u>Front</u> : 10 feet for dwellings, 5 feet for other uses <u>Side/Rear</u> : 5 feet for detached dwellings, 10 feet for multi-family, and 0 feet for other uses Any portion of the structure over 40 feet in height must be set back an additional 1 foot for each 10 feet in height
LUO Floor Area Ratio (FAR)	2.5 FAR, 3.5 FAR with Open Space Bonus
Special Management Area (SMA)	Not in an SMA or Shoreline Setback Area
Joint Development	Potential to include commercial, residential, mixed-use, or other non-transit development on the project site



## PRELIMINARY DEVELOPMENT SCHEMES

The purpose of this section is to describe the six preliminary schemes that were developed for the Kapolei Transit Center and Maintenance Facility. The descriptions provide a high-level summary of each preliminary development scheme, with references to each relevant concept drawing. The preliminary development schemes are presented as concept drawings.

The 5.23-acre City-owned property under consideration for the proposed transit center and maintenance facility is in the Business Mixed Use Community (BMX-3) zoning district, which has a maximum building height of 90 feet and a floor area ratio (FAR) of 2.5 as a base density. However, the Land Use Ordinance (LUO) provides an open space bonus which allows the FAR to be increased to 3.5. Accordingly, the maximum building square footage allowed on the property ranges from 569,873 to 797,822 square feet depending on the allocation of the open space bonus. Per the City of Kapolei Urban Design Plan (UDP), there is a minimum building setback of 15 feet from the property line, to be developed as landscaped spaces.

The preliminary development schemes for the transit center provide positions for fixed-route buses (TheBus) and positions for paratransit buses (TheHandi-Van), while also allocating space for public restrooms, customer service kiosks, bike storage, bikeshare, and micromobility (i.e. partially or fully motorized, low-speed devices such as electric-assist bicycles and electric scooters). The preliminary development schemes for the maintenance facility include space for bus wash, fueling, fare collection, light maintenance bays, bus parking, employee parking, and administrative/office space.

Vehicle turning radii were considered in the development of the preliminary development schemes based on 40-/60-/27-foot design vehicles for standard, articulated, and paratransit buses, respectively. The preliminary development schemes, with the exception of Option 4, include multi-level buildings for the maintenance facility. The six preliminary development schemes are described next.

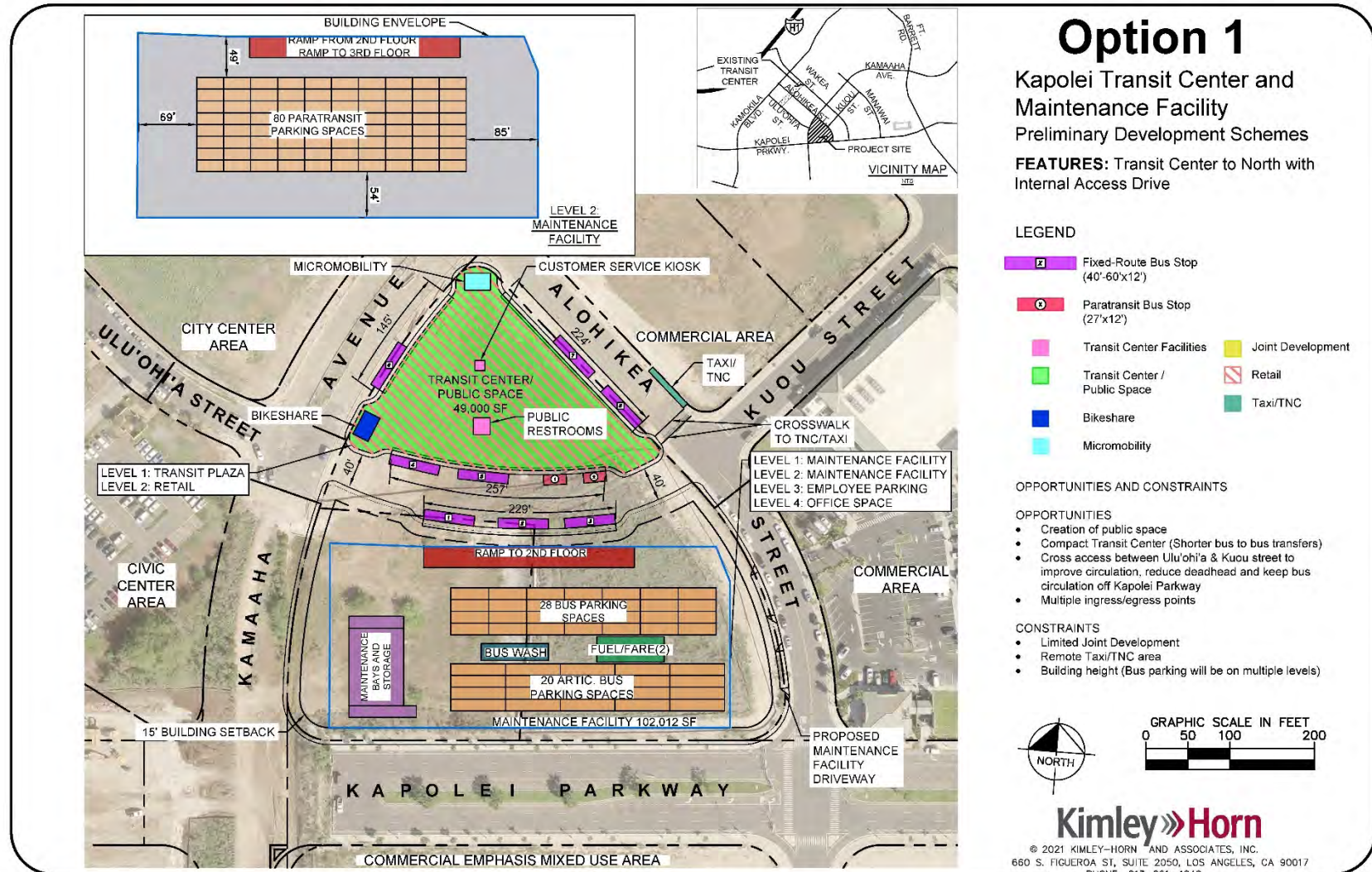
### Option 1: Transit Center to North with Internal Access Drive

This concept (see **Figure 13**) features an internal access drive through the site connecting Uluohia Street and Kuou Street. The transit center is located to the north of the internal access drive and the maintenance facility is located to the south. The internal access drive between Uluohia Street and Kuou Street will facilitate better circulation for buses accessing the transit center, potentially reducing deadhead movements and decreasing bus circulation on Kapolei Parkway. The transit center's bus positions are focused on the northern part of the site which should facilitate transfers between bus routes. A taxi/TNC loading area is identified across the street from the transit center on Alohikea Street. This concept envisions a retail plaza located on a second level above the transit center's public space.

The maintenance facility provides storage (i.e. parking) for 28 standard and 20 articulated fixed-route buses on the ground floor in addition to bus wash, fuel, and fare collection stations. Space is also allocated on the ground floor level for light maintenance bays. The second level of the maintenance facility provides storage for 80 paratransit buses. The maintenance facility's multi-level bus parking may negatively impact operational efficiency. Employee parking is provided on the third level of the maintenance facility building and office space is provided on the fourth level.

Besides the retail space above the transit center, this preliminary development scheme does not provide an opportunity for mixed-use joint development to activate the street frontages.

**Figure 13: Option 1: Transit Center to North with Internal Access Drive**



## **Option 2: Transit Center to North with Internal Access Drive and Subterranean Parking**

This concept (see **Figure 14**) is similar to Option 1, but the concept includes a subterranean parking lot under the transit center for maintenance facility employees. Locating the maintenance facility employee parking below ground reduces the height of the maintenance building to three levels. Providing access to the subterranean parking area requires a driveway along the internal access drive, which forces the relocation of bus positions to Kamaaha Avenue south of the internal access drive. Compared to Option 1, the distances for transfers between bus routes increase, as the layout of the transit center is less compact.

Similar to Option 1, the maintenance facility provides storage for 28 standard and 20 articulated fixed-route buses on the ground floor and 80 paratransit buses on the second level. Office space is provided on the third level of the maintenance facility building.

This option also does not provide opportunity for mixed-use joint development to activate the street frontages.

## **Option 3: Transit Center to North without Internal Access Drive**

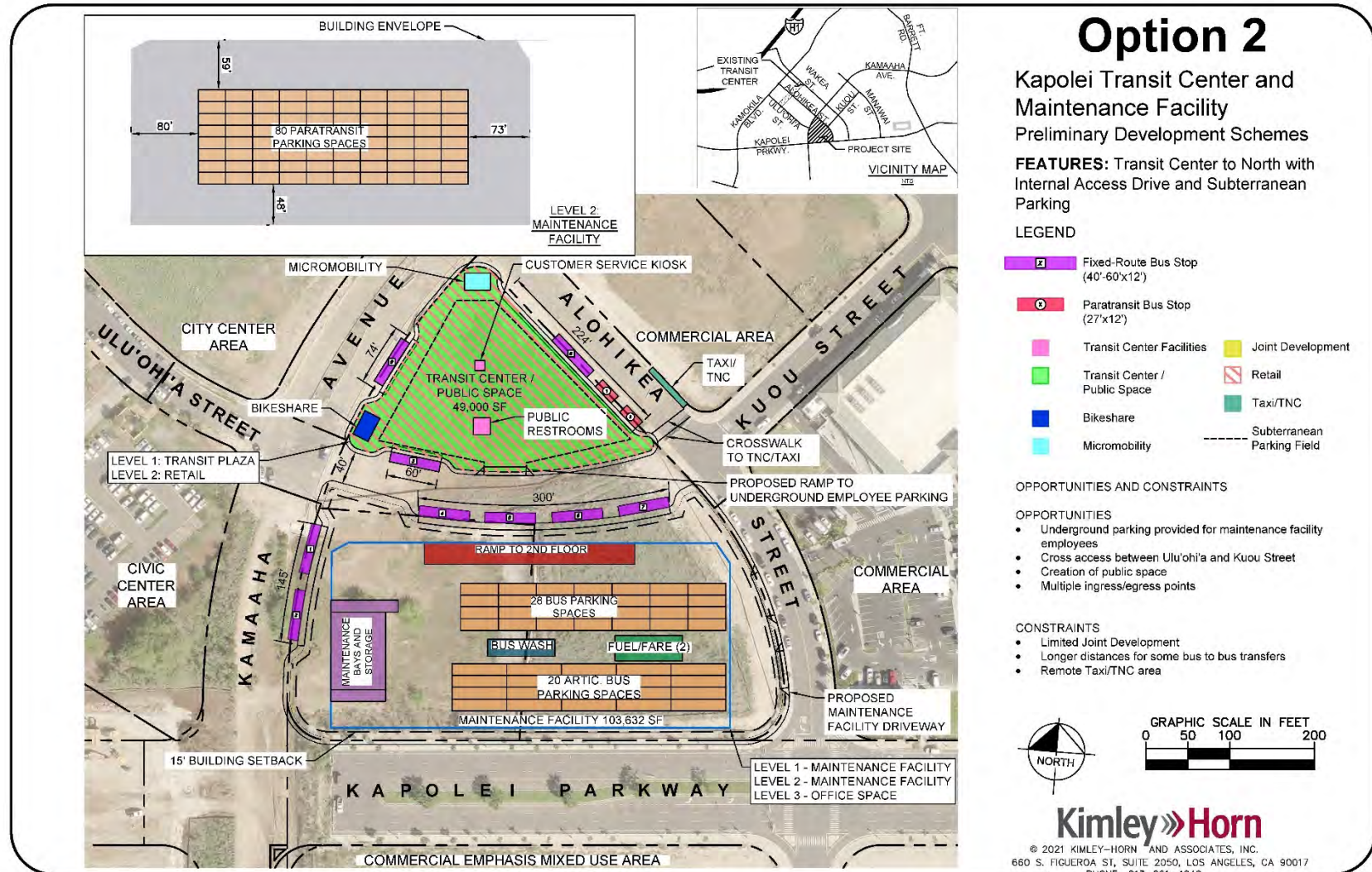
This concept (see **Figure 15**) also features a transit center on the north end of the site and a maintenance facility to the south. Unlike Options 1 and 2, this concept does not include an internal access drive through the site connecting Uluohia Street and Kuou Street. The absence of the internal access drive may have negative impacts on circulation for buses accessing the transit center, potentially increasing deadhead movements and bus circulation on Kapolei Parkway. The transit center's bus positions are located around the perimeter of the site, on Alohikea Street and Kamaaha Avenue, thus increasing the distance for transfers between bus routes. A taxi/TNC loading area is identified across the street from the transit center on Alohikea Street. Similar to Options 1 and 2, this concept envisions a retail plaza located on a second level above the transit center's public space.

The maintenance facility provides storage for 28 standard and 9 articulated fixed-route buses on the ground floor and 80 paratransit buses on the second level. Bus wash, fuel, and fare collection stations, and light maintenance bays are accommodated on the ground floor. Employee parking is provided on the third level of the maintenance facility building and office space is provided on the fourth level.

This concept provides space for mixed-use joint development along the Kapolei Parkway frontage, which could help screen the maintenance facility. However, the parking for the mixed-use joint development may need to occupy the ground level, impacting the opportunity to activate the street frontage.

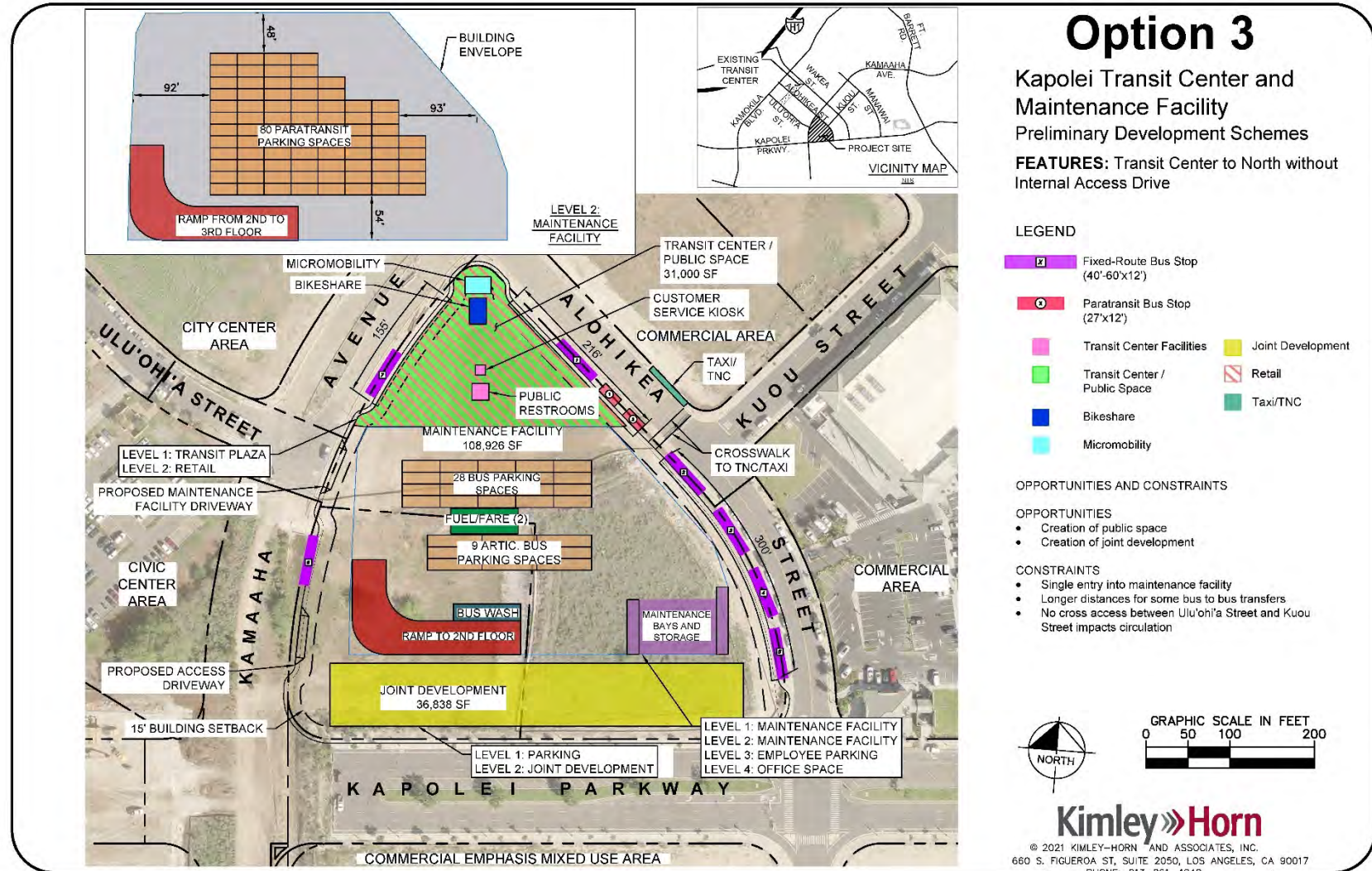


**Figure 14: Option 2: Transit Center to North with Internal Access Drive and Subterranean Parking**





**Figure 15: Option 3: Transit Center to North without Internal Access Drive**



#### **Option 4: Transit Center to North with Single-Story Maintenance Facility**

This concept (see **Figure 16**) also places the transit center on the north end of the site and the maintenance facility to the south. Similar to Option 3, this concept does not include an internal access drive through the site connecting Uluohia Street and Kuou Street, and the transit center's bus positions are located around the perimeter of the site, on Alohikea Street and Kamaaha Avenue, thus increasing the distance for transfers between bus routes.

The maintenance facility provides storage for 76 paratransit buses in a single-story building. Accommodations are not provided in the maintenance facility for fixed-route buses. The absence of a multi-level building constrains the capacity of the maintenance facility and limits the space available for bus storage and employee parking.

Similar to Option 3, this option allocates space along the Kapolei Parkway frontage for mixed-use joint development, although parking may occupy the ground level impacting the opportunity to activate the street frontage.

#### **Option 5: Transit Center in Proximity to Future Rail Station with Internal Access Drive**

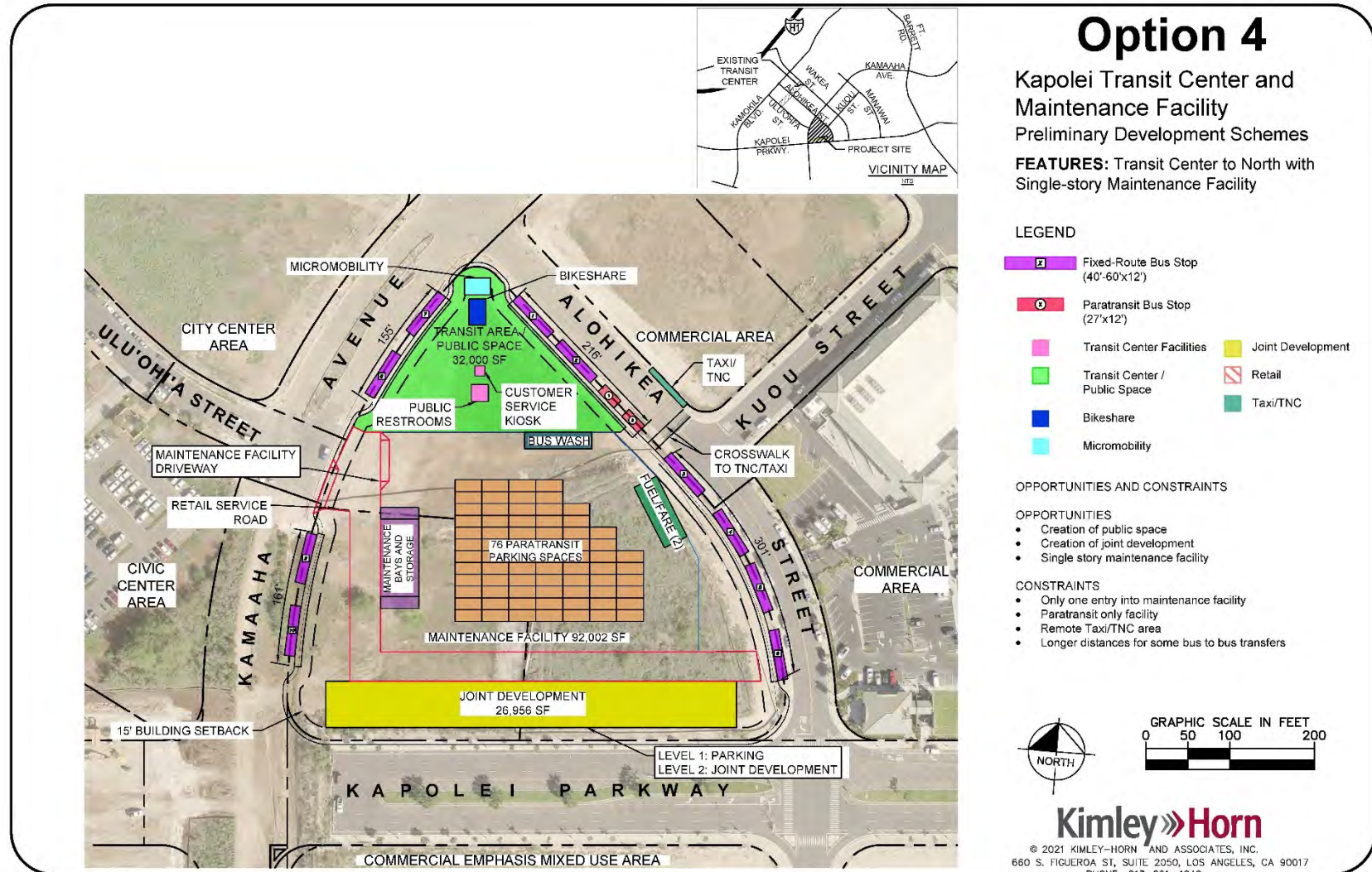
This concept (see **Figure 17**) locates the transit center in the southwest corner of the site, which would facilitate convenient intermodal transfers to the future West Kapolei HRT station on Kapolei Parkway. Due to driveway access restrictions on Kapolei Parkway, bus positions are not integrated within the transit center area. The bus positions are provided on the internal access drive through the site connecting Uluohia Street and Kuou Street (similar to Options 1 and 2) and on the site's perimeter along the Kamaaha Avenue and Alohikea Parkway frontages. The layout of the bus positions increases the distance for transfers between bus routes and future transfers between bus routes and the HRT line. The ground floor of the transit center would accommodate public restrooms, customer service kiosks, bike storage, bikeshare, and micromobility. A mezzanine level would connect to the elevated HRT station via a pedestrian bridge and provide space for transit-oriented retail.

A four-story maintenance facility building is located to the east of the transit center, on the south side of the internal access drive. Storage is provided for 30 standard and six articulated fixed-route buses on the ground floor, in addition to bus wash, fuel, and fare collection stations and light maintenance bays. The second level of the maintenance facility provides storage for 56 paratransit buses. Since the footprint of the maintenance facility building is smaller with this concept, there is less space available for bus storage than with Options 1-3. Employee parking is provided on the third level of the maintenance facility building and office space is provided on the fourth level.

This concept allocates the northern portion of the site, to the north of the internal access drive, for joint development. The layout provides ample space for a building with parking underneath.

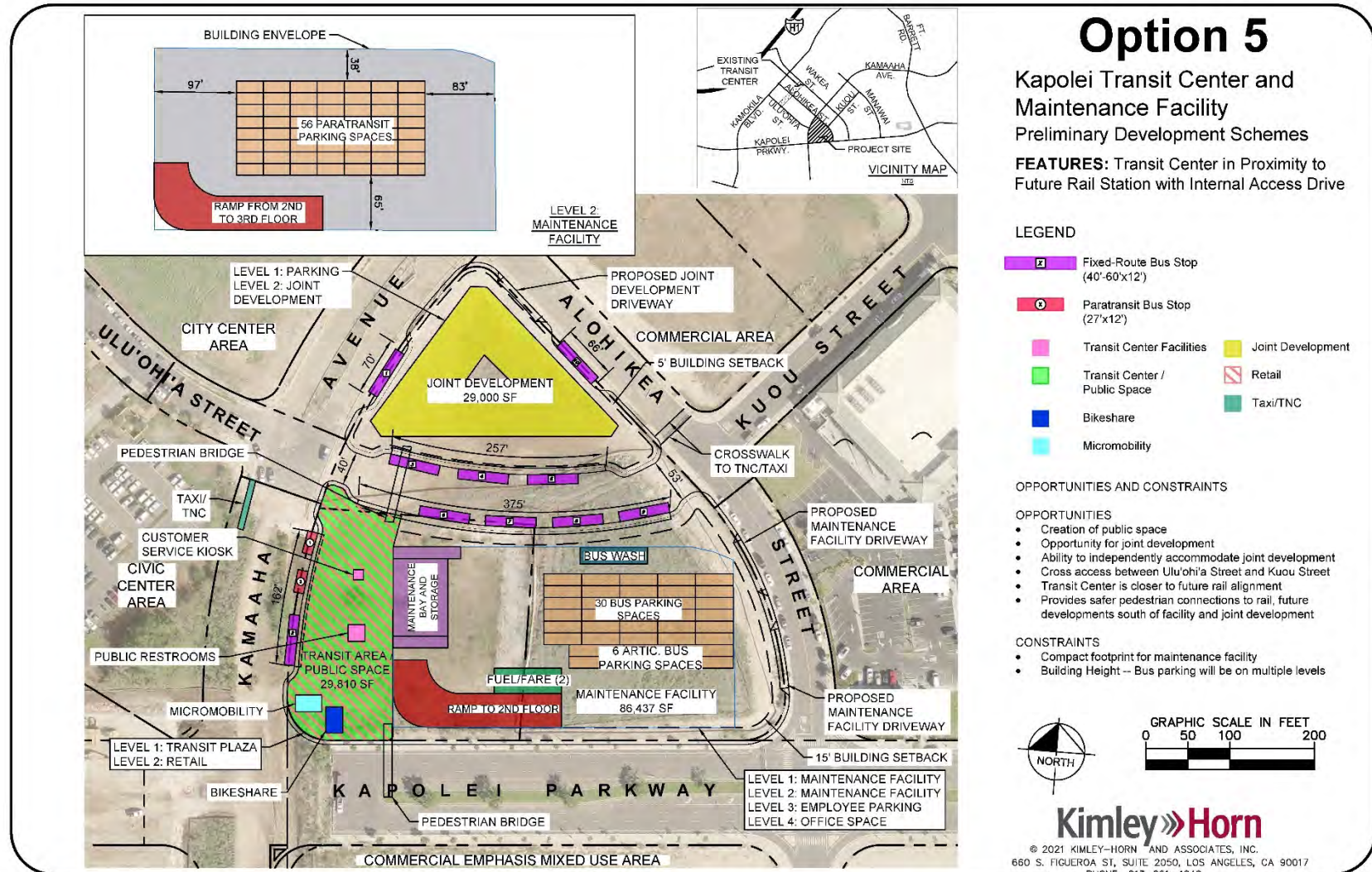


**Figure 16: Option 4: Transit Center to North with Single-Story Maintenance Facility**





**Figure 17: Option 5: Transit Center in Proximity to Future Rail Station with Internal Access Drive**



## **Option 6: Transit Center in Proximity to Future Rail Station without Internal Access Drive**

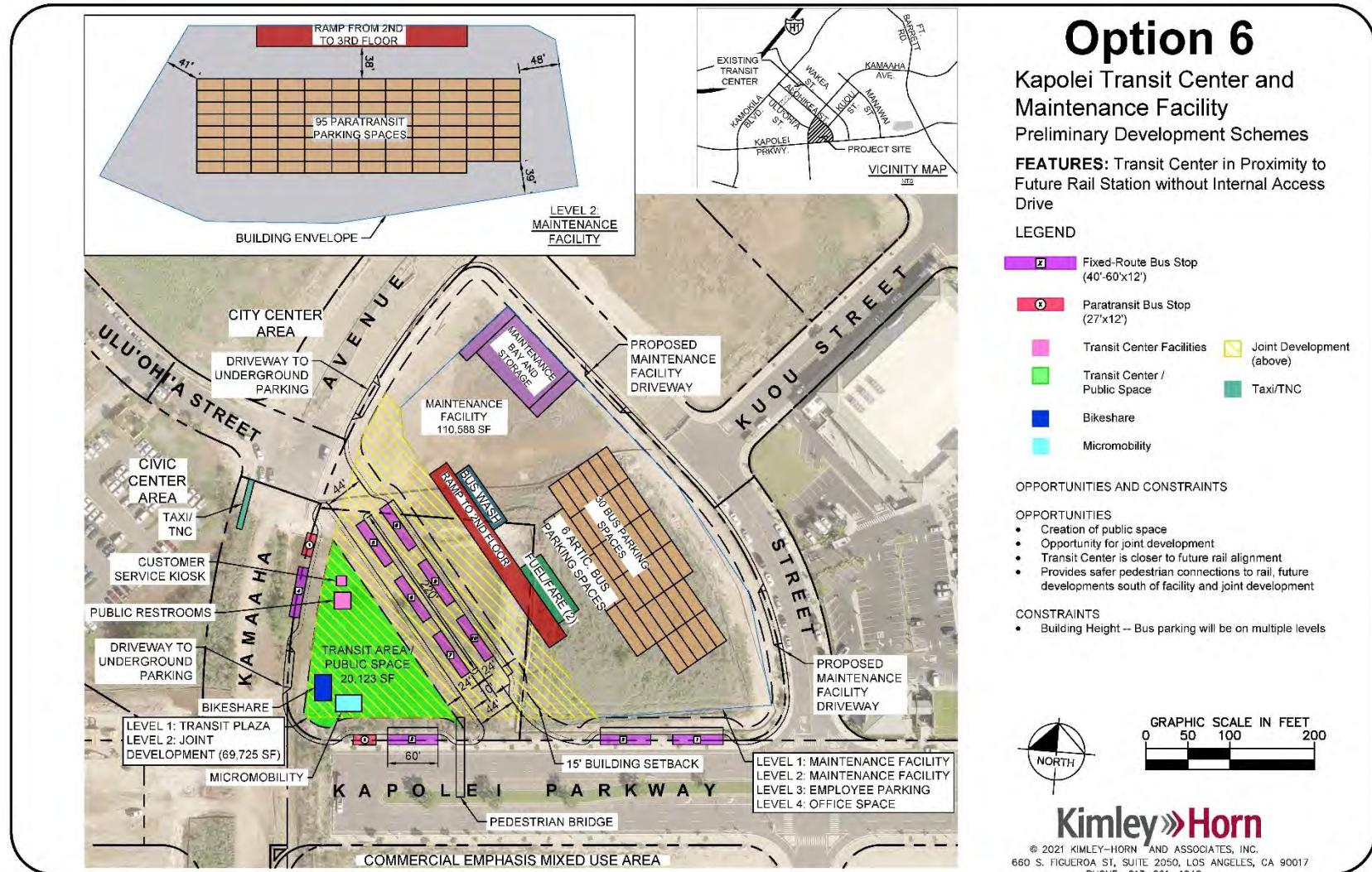
Similar to Option 5, this concept (see **Figure 18**) also locates the transit center in the southwest corner of the site to facilitate transfers to the future West Kapolei HRT station on Kapolei Parkway. However, this concept consolidates the bus positions on the transit center site and along the Kapolei Parkway and Kamaaha Avenue frontages in close proximity. The consolidation of the bus positions will enhance both transfers between bus routes and future transfers between bus routes and the HRT line. A bus-only driveway connection to Kapolei Parkway facilitates the opportunity to provide six bus positions on-site within the transit center, but this driveway connection will require a variance. The larger footprint of the transit center provides the opportunity for additional transit-oriented retail on the mezzanine level, which would connect to the elevated HRT station.

A rectangular-shaped portion of the site is allocated for the maintenance facility building, which enables a more efficient layout. Storage is provided for 30 standard and six articulated fixed-route buses on the ground floor, in addition to bus wash, fuel, and fare collection stations and light maintenance bays. The second level of the maintenance facility provides storage for 95 paratransit buses. Employee parking is provided on the third level of the maintenance facility building and office space is provided on the fourth level.

This concept provides an opportunity for joint development with a building located above and underground parking located below the transit center. The construction of the joint development would likely need to be integrated with the transit center to not impact the operations of the transit center. This approach could facilitate the private sector in building the transit center and being a long-term financial partner in the project with the City.



**Figure 18: Option 6: Transit Center in Proximity to Future Rail Station without Internal Access Drive**



## SCREENING OF PRELIMINARY DEVELOPMENT SCHEMES

### Evaluation Criteria

Evaluation criteria were developed for the screening of the preliminary development schemes to identify the most feasible concepts for further refinement and evaluation. The evaluation criteria were primarily qualitative and sought to identify the relative advantages and disadvantages of each preliminary development scheme. The evaluation criteria for the overall transit facility are summarized in **Figure 19** below.

**Figure 19: Evaluation Criteria – Overall Transit Facility**

Operational Characteristics and Site Functionality for Transit Center	Operational Characteristics and Site Functionality for Maintenance Facility	Project Context
<ul style="list-style-type: none"><li>• Efficient circulation for pedestrians and buses</li><li>• Connectivity for transfers</li><li>• Facilities – bus bays, passenger amenities, passenger information</li></ul>	<ul style="list-style-type: none"><li>• Efficient layout</li><li>• Circulation – bus ingress/egress and staging</li><li>• Bus and employee parking</li><li>• Compatibility – maintenance functions located toward interior of property</li></ul>	<ul style="list-style-type: none"><li>• Opportunity for joint/mixed-use development</li><li>• Proximity of mixed-use development to transit service</li></ul>

The evaluation criteria were grouped into three primary categories: operational characteristics, site functionality (i.e. meets programmatic needs for facilities), and opportunity for joint development. The evaluation criteria were assigned a weight with a maximum of 50 points for operational characteristics (maximum of 25 points each for the transit center and maintenance facility), a maximum of 40 points for site functionality (maximum of 20 points each for the transit center and maintenance facility), and a maximum of 10 points for opportunity for the joint development. The highest possible score is 100.

### Screening Evaluation Worksheets for Preliminary Development Schemes

Evaluation worksheets were prepared for the six preliminary development schemes and are presented in **Tables 4-9** on the following pages.

**Table 4: Evaluation Worksheet for Option 1**

Evaluation Worksheet Preliminary Development Scheme Option 1 Transit Center to North with Internal Access Drive				
Category	Feature	Score	Max. Points	Comments/Explanation
<b>Operational Characteristics</b>				
<b>Transit Center</b>	EV Bus Charging Capabilities	4	5	Most bus positions located off-street for charging during layovers
	Connection to Future HART Station	1	5	Transit center located on opposite side of property from future rail station with maintenance facility in between
	Off-Street Bus Positions	3	5	3 of 8 fixed-route bus positions located on-street
	Bus-to-Bus Transfers	3	5	Some distance between bus positions and some street crossings needed
	Driveway Feasibility	5	5	No driveways wider than 40 feet wide or located on Kapolei Pkwy.
<b>Maintenance Facility</b>	Efficiency (# of Floors)	2	5	Maintenance facility and administrative office space spread over three levels with employee parking on another level
	Allows for Storage/Service of Mixed-Fleets (Fixed-Route and Paratransit)	5	5	Accommodates standard and articulated buses and paratransit buses
	Layout of Facilities (Fueling, Fare Collection, Wash)	3	5	Fueling/fare collection and wash laid out linearly, but accessing to parking may require multi-point maneuvers
	Maintenance Functions Placed at Interior	2	5	Building fronts Kamaaha Ave., Alohikea St., and Kapolei Pkwy., but opportunity for screening in setback area
	Space for Staging Buses	3	5	Some space available for staging buses upon arrival
<b>Subtotal</b>		<b>31</b>	<b>50</b>	
<b>Site Functionality (Meets Programmatic Needs)</b>				
<b>Transit Center</b>	Bus Bays and Paratransit Bays	5	6	8 bus bays (3 on-street) and 2 paratransit bays
	Passenger Amenities	5	5	Restrooms, customer service kiosk, space for transit-oriented retail
	Passenger Drop-off /Taxi/TNC	2	5	Taxi/TNC located across street; no dedicated passenger drop-off (kiss and ride) or waiting areas
	Bike Parking/Bikeshare/Micromobility	4	4	Space is allocated
<b>Maintenance Facility</b>	Fixed-Route Bus Parking	5	5	Storage for 28 standard buses and 20 articulated buses
	Paratransit Vehicle Parking	4	5	Storage for 80 paratransit buses
	Employee/Visitor/Non-Revenue Vehicle Parking	4	5	Located on third level
	Office Space/Driver Facilities	4	5	Located on fourth level
<b>Subtotal</b>		<b>33</b>	<b>40</b>	
<b>Opportunity for Joint Development</b>				
	Allocates Space for Joint Development	1	5	Retail space above transit center, no additional space provided for mixed-use development
	Proximity of Development to Transit Service	2	5	Retail located close to bus positions, but far from future rail station
<b>Subtotal</b>		<b>3</b>	<b>10</b>	
<b>GRAND TOTAL</b>		<b>67</b>	<b>100</b>	

**Table 5: Evaluation Worksheet for Option 2**

Evaluation Worksheet Preliminary Development Scheme Option 2 Transit Center to North with Internal Access Drive and Subterranean Parking				
Category	Feature	Score	Max. Points	Comments/Explanation
<b>Operational Characteristics</b>				
<b>Transit Center</b>	EV Bus Charging Capabilities	3	5	Most bus positions located off-street for charging during layovers
	Connection to Future HART Station	1	5	Transit center located on opposite side of property from future rail station with maintenance facility in between
	Off-Street Bus Positions	3	5	4 of 9 fixed-route bus positions located on street
	Bus-to-Bus Transfers	2	5	Additional distance between bus positions and some street crossings needed
	Driveway Feasibility	5	5	No driveways wider than 40 feet wide or located on Kapolei Pkwy.
<b>Maintenance Facility</b>	Efficiency (# of Floors)	1	5	Maintenance facility and administrative office space spread over three levels with employee parking on another part of site
	Allows for Storage/Service of Mixed-Fleets (Fixed-Route and Paratransit)	5	5	Accommodates standard and articulated buses and paratransit buses
	Layout of Facilities (Fueling, Fare Collection, Wash)	3	5	Fueling/fare collection and wash laid out linearly, but accessing to parking may require multi-point maneuvers
	Maintenance Functions Placed at Interior	2	5	Building fronts Kamaaha Ave., Alohikea St. and Kapolei Pkwy., but opportunity for screening in setback area
	Space for Staging Buses	3	5	Some space available for staging buses upon arrival
<b>Subtotal</b>		<b>28</b>	<b>50</b>	
<b>Site Functionality (Meets Programmatic Needs)</b>				
<b>Transit Center</b>	Bus Bays and Paratransit Bays	6	6	9 bus bays (4 on-street) and 2 paratransit bays
	Passenger Amenities	5	5	Restrooms, customer service kiosk, space for transit-oriented retail
	Passenger Drop-off /Taxi/TNC	2	5	Taxi/TNC located across street; no dedicated passenger drop-off (kiss and ride) or waiting areas
	Bike Parking/Bikeshare/Micromobility	4	4	Space is allocated
<b>Maintenance Facility</b>	Fixed-Route Bus Parking	5	5	Storage for 28 standard buses and 20 articulated buses
	Paratransit Vehicle Parking	4	5	Storage for 80 paratransit buses
	Employee/Visitor/Non-Revenue Vehicle Parking	3	5	Located underground below the transit center
	Office Space/Driver Facilities	4	5	Located on third level
<b>Subtotal</b>		<b>33</b>	<b>40</b>	
<b>Opportunity for Joint Development</b>				
	Allocates Space for Joint Development	1	5	Retail space above transit center, no additional space provided for mixed-use development
	Proximity of Development to Transit Service	2	5	Retail located close to bus positions, but far from future rail station
<b>Subtotal</b>		<b>3</b>	<b>10</b>	
<b>GRAND TOTAL</b>		<b>64</b>	<b>100</b>	



**Table 6: Evaluation Worksheet for Option 3**

Evaluation Worksheet Preliminary Development Scheme Option 3 Transit Center to North without Internal Access Drive				
Category	Feature	Score	Max. Points	Comments/Explanation
<b>Operational Characteristics</b>				
<b>Transit Center</b>	EV Bus Charging Capabilities	1	5	Challenges with charging buses in on-street bays during layovers
	Connection to Future HART Station	1	5	Transit center located on opposite side of property from future rail station with maintenance facility in between
	Off-Street Bus Positions	0	5	All bus positions located on-street
	Bus-to-Bus Transfers	1	5	Increased distance between bus positions
	Driveway Feasibility	5	5	No driveways wider than 40 feet wide or located on Kapolei Pkwy.
<b>Maintenance Facility</b>	Efficiency (# of Floors)	2	5	Maintenance facility and administrative office space spread over three levels with employee parking on another level
	Allows for Storage/Service of Mixed-Fleets (Fixed-Route and Paratransit)	5	5	Accommodates standard and articulated buses and paratransit buses
	Layout of Facilities (Fueling, Fare Collection, Wash)	2	5	Fueling/fare collection and wash not aligned, accessing to parking may require multi-point maneuvers
	Maintenance Functions Placed at Interior	4	5	Building fronts Kamaaha Ave. and Alohikea St., but screened by joint development from Kapolei Pkwy. with opportunity for additional screening in setback area
	Space for Staging Buses	3	5	Some space available for staging buses upon arrival
<b>Subtotal</b>		<b>24</b>	<b>50</b>	
<b>Site Functionality (Meets Programmatic Needs)</b>				
<b>Transit Center</b>	Bus Bays and Paratransit Bays	4	6	7 bus bays on-street and 2 paratransit bays on street
	Passenger Amenities	5	5	Restrooms, customer service kiosk, space for transit-oriented retail
	Passenger Drop-off /Taxi/TNC	2	5	Taxi/TNC located across street; no dedicated passenger drop-off (kiss and ride) or waiting areas
	Bike Parking/Bikeshare/Micromobility	4	4	Space is allocated
<b>Maintenance Facility</b>	Fixed-Route Bus Parking	4	5	Storage for 28 standard buses and 9 articulated buses
	Paratransit Vehicle Parking	4	5	Storage for 80 paratransit buses
	Employee/Visitor/Non-Revenue Vehicle Parking	4	5	Located on third level
	Office Space/Driver Facilities	4	5	Located on fourth level
<b>Subtotal</b>		<b>31</b>	<b>40</b>	
<b>Opportunity for Joint Development</b>				
	Allocates Space for Joint Development	5	5	Retail space above transit center, additional space provided for mixed-use development along Kapolei Parkway frontage
	Proximity of Development to Transit Service	4	5	Mixed-use joint development located near future rail station
<b>Subtotal</b>		<b>9</b>	<b>10</b>	
<b>GRAND TOTAL</b>		<b>64</b>	<b>100</b>	



**Table 7: Evaluation Worksheet for Option 4**

Evaluation Worksheet Preliminary Development Scheme Option 4 Transit Center to North with Single-Story Maintenance Facility				
Category	Feature	Score	Max. Points	Comments/Explanation
<b>Operational Characteristics</b>				
<b>Transit Center</b>	EV Bus Charging Capabilities	1	5	Challenges with charging buses in on-street bays during layovers
	Connection to Future HART Station	1	5	Transit center located on opposite side of property from future rail station with maintenance facility in between
	Off-Street Bus Positions	0	5	All bus positions located on-street
	Bus-to-Bus Transfers	1	5	Increased distance between bus positions
	Driveway Feasibility	5	5	No driveways wider than 40 feet wide or located on Kapolei Pkwy.
<b>Maintenance Facility</b>	Efficiency (# of Floors)	5	5	Maintenance facility on one level
	Allows for Storage/Service of Mixed-Fleets (Fixed-Route and Paratransit)	1	5	Accommodates paratransit buses only
	Layout of Facilities (Fueling, Fare Collection, Wash)	2	5	Fueling/fare collection and wash not aligned, accessing to parking may require multi-point maneuvers
	Maintenance Functions Placed at Interior	4	5	Building fronts Kamaaha Ave. and Alohikea St., but screened by joint development from Kapolei Pkwy. with opportunity for additional screening in setback area
	Space for Staging Buses	3	5	Some space available for staging buses upon arrival
<b>Subtotal</b>		<b>23</b>	<b>50</b>	
<b>Site Functionality (Meets Programmatic Needs)</b>				
<b>Transit Center</b>	Bus Bays and Paratransit Bays	6	6	10 bus bays on-street and 2 paratransit bays on-street
	Passenger Amenities	4	5	Restrooms, customer service kiosk, but limited space for transit-oriented retail
	Passenger Drop-off /Taxi/TNC	2	5	Taxi/TNC located across street; no dedicated passenger drop-off (kiss and ride) or waiting areas
	Bike Parking/Bikeshare/Micromobility	4	4	Space is allocated
<b>Maintenance Facility</b>	Fixed-Route Bus Parking	0	5	No storage for fixed-route buses
	Paratransit Vehicle Parking	4	5	Storage for 76 paratransit buses
	Employee/Visitor/Non-Revenue Vehicle Parking	1	5	Limited space available
	Office Space/Driver Facilities	1	5	Limited space available
<b>Subtotal</b>		<b>22</b>	<b>40</b>	
<b>Opportunity for Joint Development</b>				
	Allocates Space for Joint Development	4	5	Space provided for mixed-use development along Kapolei Parkway frontage
	Proximity of Development to Transit Service	4	5	Mixed-use joint development located near future rail station
<b>Subtotal</b>		<b>8</b>	<b>10</b>	
<b>GRAND TOTAL</b>		<b>53</b>	<b>100</b>	

**Table 8: Evaluation Worksheet for Option 5**

Evaluation Worksheet Preliminary Development Scheme Option 5 Transit Center in Proximity to Future Rail Station with Internal Access Drive				
Category	Feature	Score	Max. Points	Comments/Explanation
<b>Operational Characteristics</b>				
<b>Transit Center</b>	EV Bus Charging Capabilities	4	5	Most bus positions located off-street for charging during layovers
	Connection to Future HART Station	3	5	Transit center located adjacent to future rail station although many bus positions are located on far side of the transit center
	Off-Street Bus Positions	4	5	3 of 10 fixed-route bus positions located on-street
	Bus-to-Bus Transfers	4	5	Most bus positions are located in proximity adjacent to the transit center
	Driveway Feasibility	5	5	No driveways wider than 40 feet wide or located on Kapolei Pkwy.
<b>Maintenance Facility</b>	Efficiency (# of Floors)	2	5	Maintenance facility and administrative office space spread over three levels with employee parking on another level
	Allows for Storage/Service of Mixed-Fleets (Fixed-Route and Paratransit)	5	5	Accommodates standard and articulated buses and paratransit buses
	Layout of Facilities (Fueling, Fare Collection, Wash)	2	5	Fueling/fare collection and wash not aligned, accessing to parking may require multi-point maneuvers
	Maintenance Functions Placed at Interior	3	5	Building fronts Alohikea St. and Kapolei Pkwy., , but opportunity for screening in setback area
	Space for Staging Buses	4	5	Additional space available for staging buses upon arrival
<b>Subtotal</b>		<b>36</b>	<b>50</b>	
<b>Site Functionality (Meets Programmatic Needs)</b>				
<b>Transit Center</b>	Bus Bays and Paratransit Bays	6	6	10 bus bays (3 on-street) and 2 paratransit bays (on-street)
	Passenger Amenities	5	5	Restrooms, customer service kiosk, space for transit-oriented retail at mezzanine level
	Passenger Drop-off /Taxi/TNC	2	5	Taxi/TNC located across street; no dedicated passenger drop-off (kiss and ride) or waiting areas
	Bike Parking/Bikeshare/Micromobility	4	4	Space is allocated
<b>Maintenance Facility</b>	Fixed-Route Bus Parking	4	5	Storage for 30 standard buses and 6 articulated buses
	Paratransit Vehicle Parking	3	5	Storage for 56 paratransit buses
	Employee/Visitor/Non-Revenue Vehicle Parking	4	5	Located on third level
	Office Space/Driver Facilities	4	5	Located on fourth level
<b>Subtotal</b>		<b>32</b>	<b>40</b>	
<b>Opportunity for Joint Development</b>				
	Allocates Space for Joint Development	5	5	Retail space above transit center, additional space provided for north of internal access drive
	Proximity of Development to Transit Service	3	5	Mixed-use joint development located close to bus positions, but far from future rail station
<b>Subtotal</b>		<b>8</b>	<b>10</b>	
<b>GRAND TOTAL</b>		<b>76</b>	<b>100</b>	

**Table 9: Evaluation Worksheet for Option 6**

Evaluation Worksheet Preliminary Development Scheme Option 6 Transit Center in Proximity to Future Rail Station without Internal Access Drive				
Category	Feature	Score	Max. Points	Comments/Explanation
<b>Operational Characteristics</b>				
<b>Transit Center</b>	EV Bus Charging Capabilities	3	5	Most bus positions located off-street for charging during layovers; however, three bus positions are located along Kapolei Pkwy.
	Connection to Future HART Station	5	5	Transit center located adjacent to future rail station along with all the bus positions
	Off-Street Bus Positions	3	5	4 of 10 fixed-route bus positions located on-street
	Bus-to-Bus Transfers	5	5	Bus positions are located in proximity adjacent to the transit center
	Driveway Feasibility	1	5	Requires a driveway connection to Kapolei Pkwy. that may be wider than 40 feet
<b>Maintenance Facility</b>	Efficiency (# of Floors)	2	5	Maintenance facility and administrative office space spread over three levels with employee parking on another level
	Allows for Storage/Service of Mixed-Fleets (Fixed-Route and Paratransit)	5	5	Accommodates standard and articulated buses and paratransit buses
	Layout of Facilities (Fueling, Fare Collection, Wash)	4	5	Fueling/fare collection and wash laid out linearly, but accessing ramp to parking for paratransit may require multi-point maneuvers
	Maintenance Functions Placed at Interior	2	5	Building fronts Kamaaha Ave., Alohikea St., and Kapolei Pkwy., but opportunity for screening in setback area
	Space for Staging Buses	5	5	Most space available for staging buses upon arrival
<b>Subtotal</b>		<b>35</b>	<b>50</b>	
<b>Site Functionality (Meets Programmatic Needs)</b>				
<b>Transit Center</b>	Bus Bays and Paratransit Bays	6	6	10 bus bays (4 on-street) and 2 paratransit bays (on-street)
	Passenger Amenities	5	5	Restrooms, customer service kiosk, space for transit-oriented retail at mezzanine level
	Passenger Drop-off /Taxi/TNC	2	5	Taxi/TNC located across street; no dedicated passenger drop-off (kiss and ride) or waiting areas
	Bike Parking/Bikeshare/Micromobility	4	4	Space is allocated
<b>Maintenance Facility</b>	Fixed-Route Bus Parking	4	5	Storage for 30 standard buses and 6 articulated buses
	Paratransit Vehicle Parking	5	5	Storage for 95 paratransit buses
	Employee/Visitor/Non-Revenue Vehicle Parking	4	5	Located on third level
	Office Space/Driver Facilities	4	5	Located on fourth level
<b>Subtotal</b>		<b>34</b>	<b>40</b>	
<b>Opportunity for Joint Development</b>				
	Allocates Space for Joint Development	4	5	Retail space above transit center, additional joint development possible above transit center with underground parking
	Proximity of Development to Transit Service	5	5	Mixed-use joint development located close to bus positions and future rail station
<b>Subtotal</b>		<b>9</b>	<b>10</b>	
<b>GRAND TOTAL</b>		<b>78</b>	<b>100</b>	

## Evaluation Summary for Preliminary Development Schemes

The screening results are presented in the evaluation summary matrix in **Table 10**. The overall scores for the Tier 1 alternatives ranged between 53 points and 78 points.

Options 1 and 2 have similar layouts with the transit center located at the north end of the site and the maintenance facility on the south end. Options 1 and 2 score competitively for operational characteristics and site functionality, but do not score well for opportunity for joint development. Option 1 scores slightly higher than Option 2 based on operational characteristics.

Options 3 and 4 have similar layouts with the transit center located at the north end of the site and mixed-use joint development fronting Kapolei Parkway. Options 3 and 4 score the lowest for operational characteristics, and Option 4 also scores low for site functionality as the single-story maintenance facility can only accommodate paratransit buses. Options 3 and 4 score competitively for opportunity for the joint development.

Options 5 and 6 have similar layouts with the transit center located in the southwest corner of the site adjacent to the future West Kapolei HRT station on Kapolei Parkway. Options 1 and 2 score the highest for operational characteristics and also score competitively for site functionality and opportunity for joint development. Options 5 and 6 score the highest overall, with Option 6 scoring slightly higher than Option 5. However, Option 6 includes a bus-only driveway connection to Kapolei Parkway, which will require a variance.

**Table 10: Preliminary Development Schemes Evaluation Summary**

Evaluation Criteria Category	Preliminary Development Scheme Option Number					
	1	2	3	4	5	6
Transit Center Operational Characteristics	16	14	8	8	20	17
Maintenance Facility Operational Characteristics	15	14	16	15	16	18
<b>Operational Characteristics Subtotal</b>	<b>31</b>	<b>28</b>	<b>24</b>	<b>23</b>	<b>36</b>	<b>35</b>
Transit Center Site Functionality	16	17	15	16	17	17
Maintenance Site Facility Functionality	17	16	16	6	15	17
<b>Site Functionality Subtotal</b>	<b>33</b>	<b>33</b>	<b>31</b>	<b>22</b>	<b>32</b>	<b>34</b>
Opportunity for Joint Development	3	3	9	8	8	9
<b>Total</b>	<b>67</b>	<b>64</b>	<b>64</b>	<b>53</b>	<b>76</b>	<b>78</b>
Ranking	3	4	4	6	2	1

Based on the screening of the six preliminary development schemes, a decision was made to advance the top two scoring schemes (Option 6: Transit Center in Proximity to Future Rail Station without Internal Access Drive and Option 5: Transit Center in Proximity to Future Rail Station with Internal Access Drive) for refined conceptual design. Based on input received in a stakeholder meeting, a decision was to develop a new preliminary development scheme (Option 7: Transit Center in Proximity to Future Rail Station with Internal Access Drive and Joint Development) that locates the transit center in proximity to the future rail station, similar to Option 5, while also investigating the opportunity to

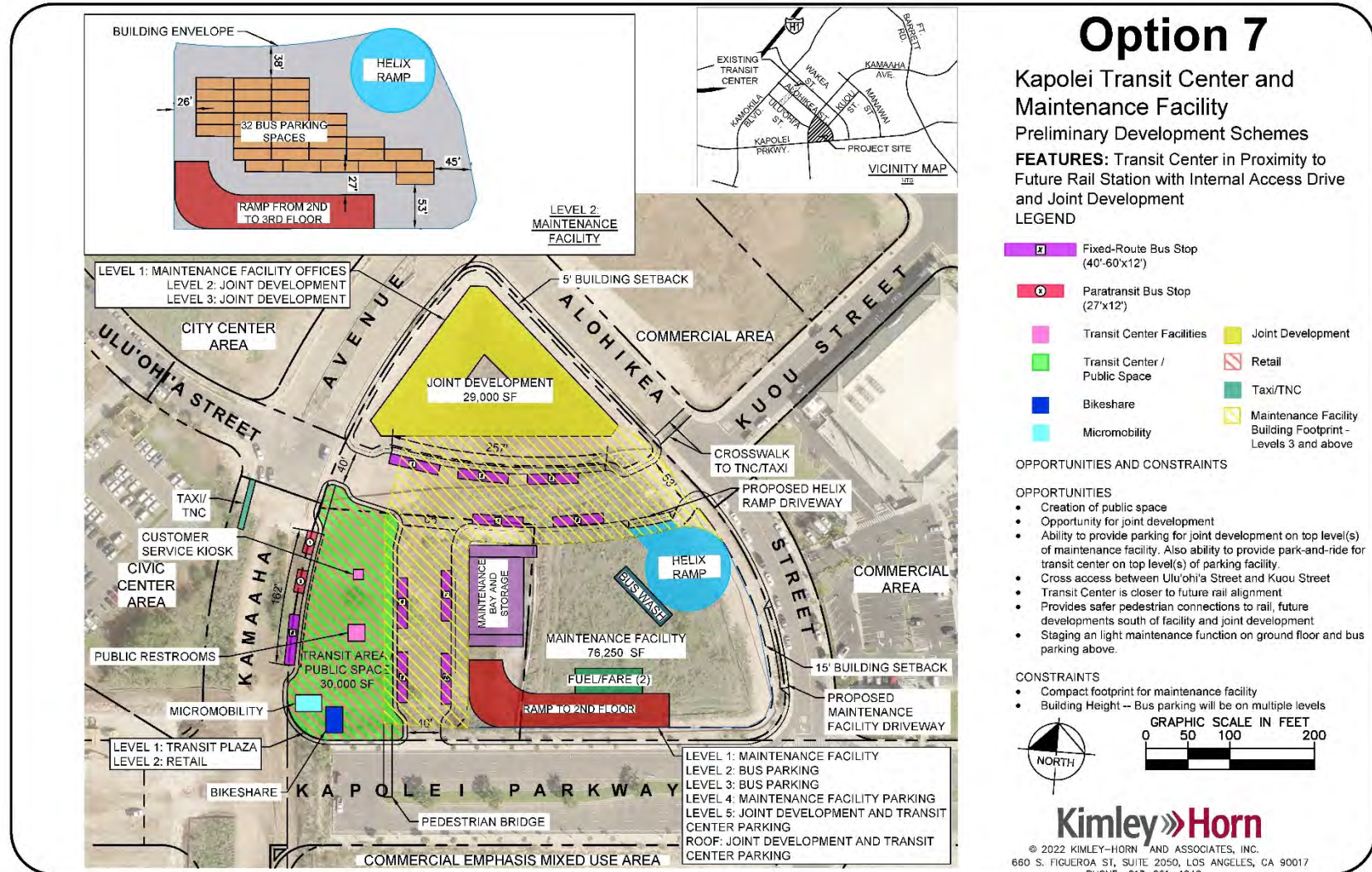
provide east-west and north-south internal access drives to provide enhanced flexibility for bus circulation.

Similar to Options 5 and 6, Option 7 (see **Figure 20**) locates the transit center in the southwest corner of the site, which would facilitate transfers to the future West Kapolei HRT station on Kapolei Parkway. This scheme includes a two-way bus-only north-south internal access drive which consolidates bus positions on the transit center site and provides enhanced flexibility for bus operations, although this scheme would require a variance for the right-in/right-out bus-only driveway connection to Kapolei Parkway.

A five-story maintenance facility building is located to the east of the transit center. Light maintenance functions are accommodated on the ground floor (fare collection, bus wash, fueling, maintenance bays, and parts storage), parking/vehicle storage for the bus fleet is provided on levels two and three, and parking for non-revenue support vehicles, staff and visitors is provided on level four. Parking for a joint development building located on the northern portion of the site would be accommodated on the fifth level and the roof of the maintenance facility building. A separate helix (spiral) ramp would provide access to the upper level of the maintenance facility building to access the levels allocated for joint development parking.



**Figure 20: Transit Center in Proximity to Future Rail Station with Internal Access Drive and Joint Development**



## CONCEPTUAL DESIGN FOR REFINED DEVELOPMENT SCHEMES

Three alternative development schemes were advanced for further refinement and conceptual design. Based on the location of the City-owned project site in the Kapolei Urban Design District, factors considered in the refinement of the development schemes included compatibility with the surrounding urban context, opportunities for landscaped buffers and open space/plazas, decorative screening of the light maintenance facility building, and integration of mixed-use joint development. The following pages present refined site plans/floor plans and massing concepts for the three alternative development schemes as follows.

- **Figure 21** presents the refined site plan and floor plans for Refined Option 5: Independent Bus Transit Center and Mixed-Use Development.
- **Figure 22** presents the massing concept for Refined Option 5: Independent Bus Transit Center and Mixed-Use Development.
- **Figure 23** presents the refined site plan and floor plans for Refined Option 6: Integrated Bus Transit Center and Mixed-Use Development.
- **Figure 24** presents the massing concept for Refine Option 6: Integrated Bus Transit Center and Mixed-Use Development.
- **Figure 25** presents the refined site plan and floor plans for Refined Option 7: Bus Transit Center and Mixed-Use Development with Shared Parking.
- **Figure 26** presents the massing concept for Refined Option 7: Bus Transit Center and Mixed-Use Development with Shared Parking.

### Refined Option 5: Independent Bus Transit Center and Mixed-Use Development

Refined Option 5: Independent Bus Transit Center and Mixed-Use Development progresses Preliminary Development Scheme Option 5: Transit Center in Proximity to Future Rail Station with Internal Access Drive. This concept allocates the southern portion of the site for the mobility hub and light vehicle maintenance facility. The portion of the site to the north of the site's internal access drive, which aligns with Uluohia Street and Kuou Street, is allocated for mixed-use joint development.

The layout of this development scheme provides the opportunity to advance the transit facilities and the mixed-use development as separate projects. The scheme for the mixed-use joint development includes retail at the ground level with a residential tower built above a parking podium.

The space reserved for the mobility hub in the southwest corner of the site would facilitate convenient intermodal transfers to the future West Kapolei HRT station on Kapolei Parkway. Space is designated within the mobility hub area for retail, as well as passenger facilities and amenities including bicycle parking and restrooms. The transit plaza area provides open space and opportunities to install benches for seating and canopies for shelter. Seven bus stops are located along the internal access drive between Uluohia Street and Kuou Street, facilitating convenient transfers among bus routes.

This development scheme includes a two-story light vehicle maintenance facility. The ground floor would accommodate the light vehicle maintenance facility functions (vehicle wash, fare collection, fueling, etc.) and overnight parking/vehicle storage for the fixed-route bus fleet. The second level would

accommodate overnight parking/vehicle storage for the paratransit fleet, office space, and employee facilities. Parking for employees would be provided on the third level on the building's roof.

### **Refined Option 6: Integrated Bus Transit Center and Mixed-Use Development**

Refined Option 6: Integrated Bus Transit Center and Mixed-Use Development progresses Preliminary Development Scheme Option 6: Transit Center in Proximity to Future Rail Station without Internal Access Drive. Similar to Refined Option 5, this concept also locates the mobility hub in the southwest corner of the site. However, this concept allocates a larger rectangular-shaped portion of the site for the light vehicle maintenance facility building. The opportunity for mixed-use joint development is provided above the mobility hub.

The layout of this development scheme requires that the transit facilities and the mixed-use joint development are advanced as one integrated project. The scheme for the mixed-use joint development includes liner retail at the ground level with a residential tower built above a parking podium that spans the mobility hub's bus drive aisles/passenger loading area. This approach could facilitate the private sector in building the transit facilities and being a long-term financial partner in the project with the City.

This development scheme consolidates the bus positions on the site which will enhance both transfers between bus routes and future transfers between bus routes and the future West Kapolei HRT station on Kapolei Parkway. A one-way inbound bus-only driveway connection to Kapolei Parkway facilitates the opportunity to provide six to seven bus positions on-site within the mobility hub, but this driveway connection will require a variance. Space is available within the mobility hub for retail, passenger facilities and amenities, and open space.

This scheme includes a two-story light vehicle maintenance facility building. The rectangular shape of the building and larger floor plate facilitate a more efficient layout than for Refined Option 5, providing the opportunity to accommodate overnight parking/vehicle storage for a larger number of buses. The ground floor would accommodate the light vehicle maintenance facility functions and overnight parking/vehicle storage for the fixed-route bus fleet. The second level would accommodate overnight parking/vehicle storage for the paratransit fleet, office space, employee facilities, and parking for employees.

### **Refined Development Option 7: Bus Transit Center and Mixed-Use Development with Shared Parking**

Refined Option 7: Bus Transit Center and Mixed-Use Development with Shared Parking progresses Preliminary Development Scheme Option 7: Transit Center in Proximity to Future Rail Station with Internal Access Drive and Joint Development. Similar to Refined Option 5, this concept allocates the southern portion of the site for the mobility hub and light vehicle maintenance facility. The portion of the site to the north of the site's east-west internal access drive is allocated for mixed-use joint development.

The layout of this development scheme provides the opportunity to advance the transit facilities and the mixed-use development as separate projects. However, parking for the mixed-use joint development would be integrated into the light vehicle maintenance facility building, thus necessitating that the transit facility be completed concurrently or in advance of the mixed-use joint development. The

scheme for the mixed-use joint development includes retail at the ground level lining a residential tower.

This development scheme offers the most flexibility for bus operations by providing a two-way north-south drive aisle for buses connecting with Kapolei Parkway, as well as an east-west drive aisle aligning with Uluohia Street and Kuou Street. Bus positions are provided along both the north-south and east-west drive aisles. Space is available within the mobility hub for retail, passenger facilities and amenities, and open space.

This development scheme includes a three-story light vehicle maintenance facility. The ground floor would accommodate the light vehicle maintenance facility functions (vehicle wash, fare collection, fueling, etc.), office space, and employee facilities. The second level would accommodate overnight parking/vehicle storage for the fixed-route fleet and employee parking. The third level would accommodate overnight parking/vehicle storage for the paratransit fleet and employee parking, and provide additional space for offices and employee facilities. The fourth level (roof) would be used for parking for the mixed-use joint development; park-and-ride spaces for the mobility hub could also be provided on the fourth level. Two separate ramp systems would be provided for the light vehicle maintenance facility, separating (1) bus movements to access upper levels for overnight parking/vehicle storage from (2) vehicular movements accessing maintenance facility employee parking, mobility hub park-and-ride spaces, and joint development parking on the upper levels.

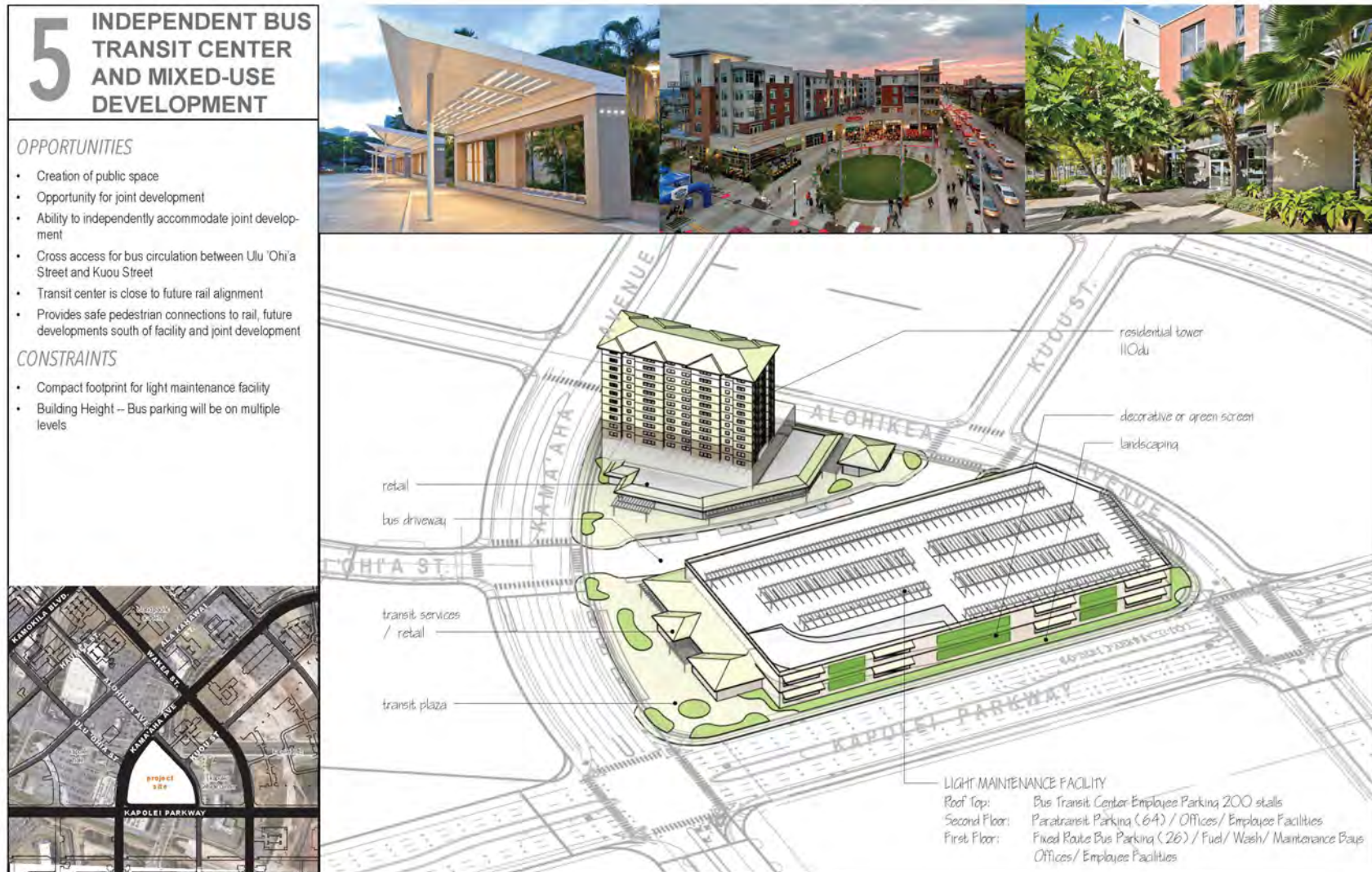


**Figure 21: Site Plan and Floor Plans for Refined Option 5: Independent Bus Transit Center and Mixed-Use Development**



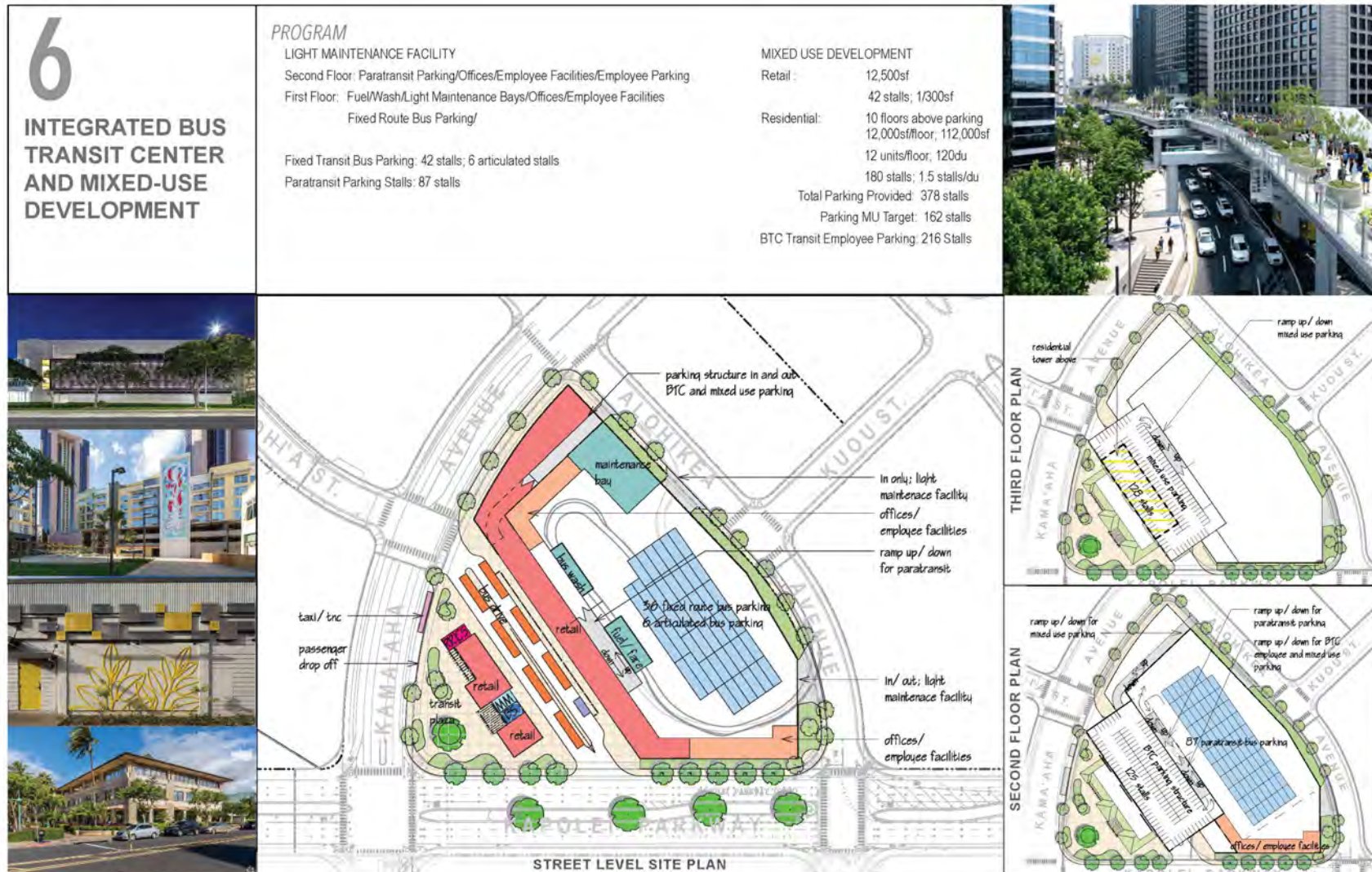


**Figure 22: Massing Concept for Refined Option 5: Independent Bus Transit Center And Mixed-Use Development**



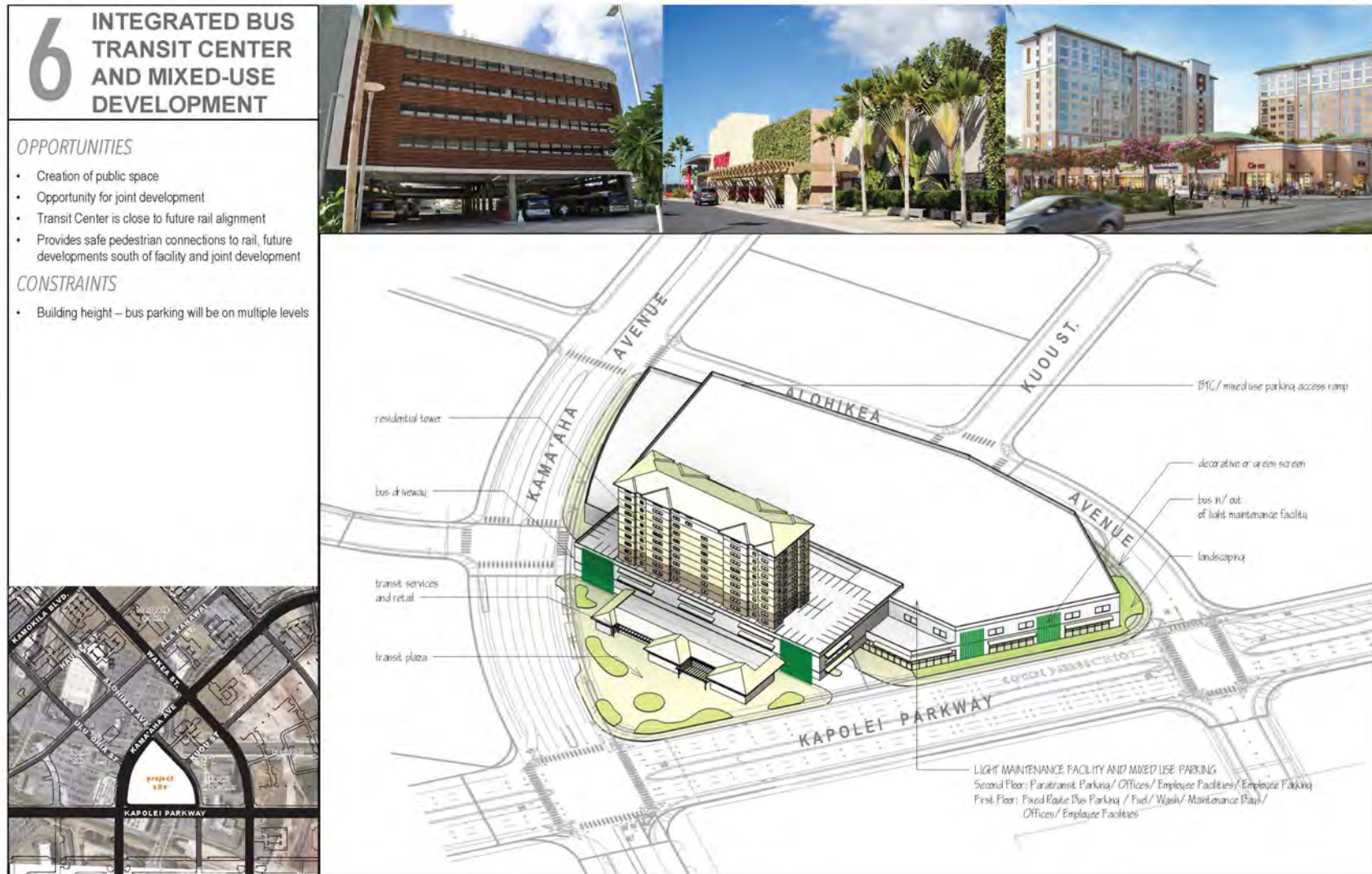


**Figure 23: Site Plan and Floor Plans for Refined Option 6: Integrated Bus Transit Center and Mixed-Use Development**





**Figure 24: Massing Concept for Refine Option 6: Integrated Bus Transit Center And Mixed-Use Development**



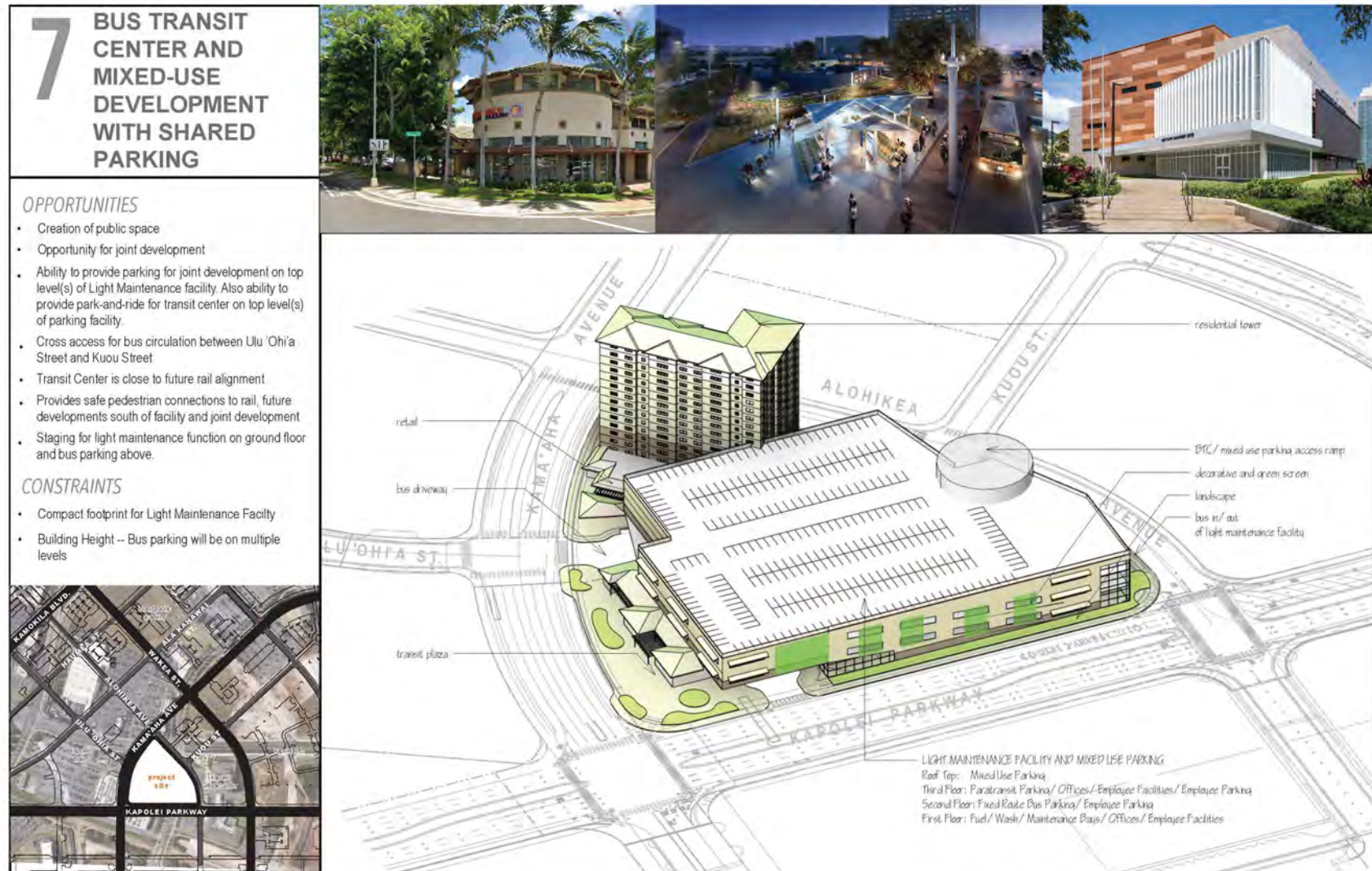


**Figure 25: Site Plan and Floor Plans for Refined Option 7: Bus Transit Center and Mixed-Use Development with Shared Parking**





**Figure 26: Massing Concept for Refined Option 7: Bus Transit Center and Mixed-Use Development with Shared Parking**



## STAKEHOLDER CONSULTATION AND PUBLIC OUTREACH

Kapolei has experienced tremendous growth over the past twenty years. The location of the City-owned land under consideration for the proposed transit center and maintenance facility, in proximity to Kapolei's City Center District, City and State properties, and commercial and residential development, presents an opportunity to evaluate alternative development schemes, including as a stand-alone transit facility or potentially as a mixed-use development with housing and commercial elements.

This AA was supported by a stakeholder consultation and public outreach program. The consultation program during the AA focused on identifying the type of public transportation services, facilities, support functions, and mixed-use development alternatives that are envisioned by project stakeholders.

### Public Outreach Program

The goals and objectives of the public outreach program along with questions to be answered during this AA are presented in **Table 11**.

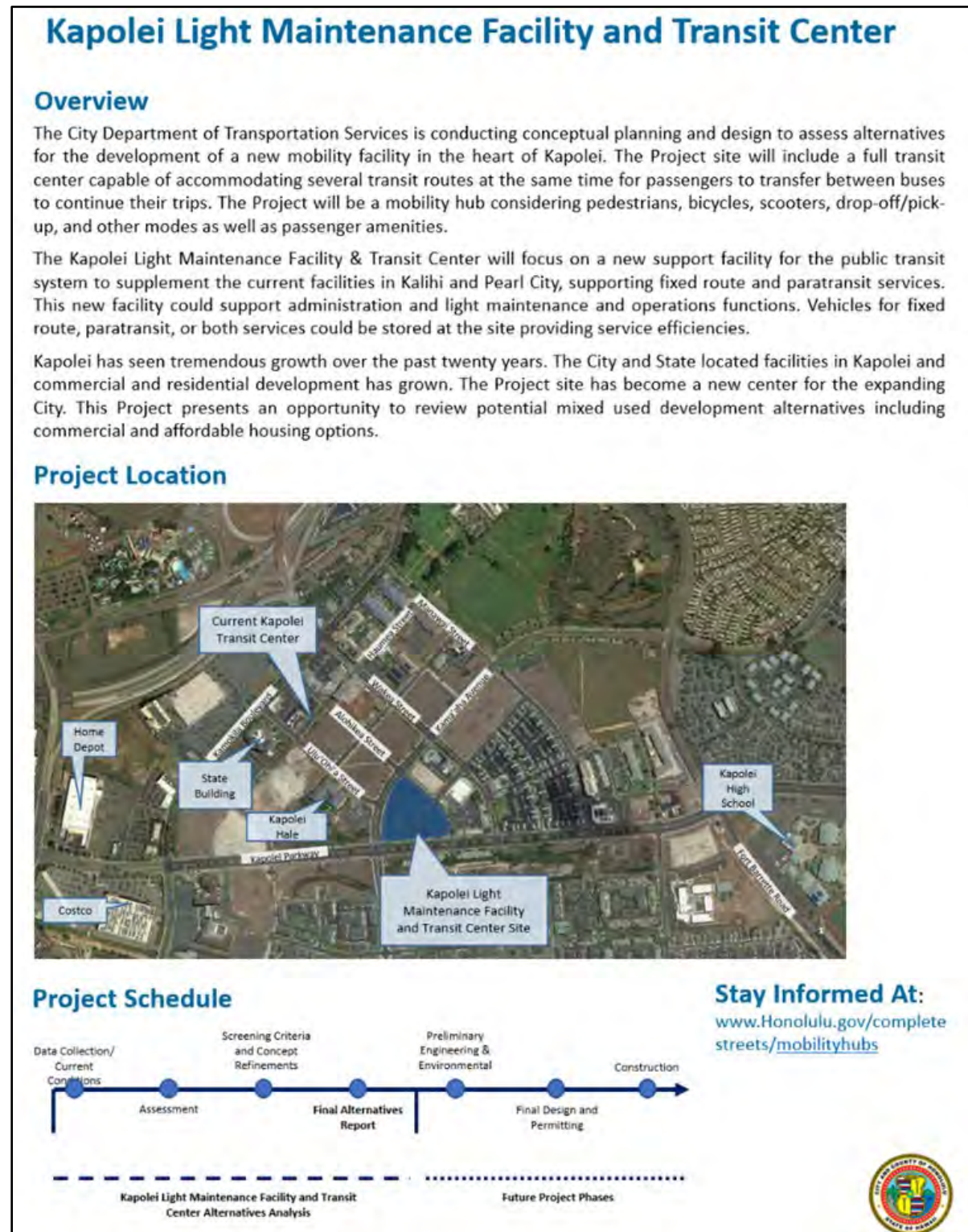
**Table 11: Public Outreach Program Goals and Objectives**

Goals and Objectives	Questions to be Answered
Build understanding for the purpose and need of the project	Why is a transit center/mobility hub and/or bus maintenance facility needed?
Create credibility for the process leading to decisions	How will a new transit center/mobility hub impact travel and destination choices? What options/amenities are available to be considered, such as open plaza, farmers market, or parking?
Establish and maintain working relationships with individuals and organizations interested in the project	Will questions and comments be considered?
Promote early and continuous involvement by agency and public stakeholders in identifying challenges and opportunities while developing achievable and supportable project alternatives	What are the fatal flaws in the alternatives? What elements are missing? How will the facility be used and maintained?
Identify and involve early in the project those who will be responsible for subsequent phases of the project to facilitate implementation	What permits, approvals, funding, environmental studies, and scheduling are needed for project implementation?
Provide information for the public and media	Are public notices and press releases timely and informative?
Maintain a record of public input throughout the project	Are comments, decisions, and issues documented and readily available?

The public outreach program for the AA was conducted under constraints caused by the COVID-19 pandemic. As such, it was not possible to hold in-person public workshops or meetings. However, information about the project has been posted on the City's website under Mobility Hubs at [Mobility Hubs \(honolulu.gov\)](https://www.honolulu.gov/mobility-hubs). Resources include a project information flyer (see **Figure 27**) and additional materials will be added as the project progresses in future phases.



Figure 27: Project Information Flyer





## **Makakilo/Kapolei/Honokai Hale Neighborhood Board No. 34**

The neighborhood board system is an essential part of Honolulu's citizen involvement and engagement process. The Kapolei Maintenance Facility and Transit Center project was introduced to the Makakilo/Kapolei/Honokai Hale Neighborhood Board on April 28, 2021. The following project tasks were described:

- Evaluation of the existing and future site conditions and future multimodal access
- Development of preliminary concepts for the facilities
- Development of evaluation criteria for screening the preliminary concepts
- Identification of a preliminary project timeline

## **Stakeholder and Agency Consultation**

The importance of informing and involving stakeholders in the AA process is fundamental to determining the viability and development potential of the project. **Table 12** lists the stakeholders contacted directly or through the Neighborhood Board during the AA.

**Table 12: Stakeholder and Agencies Contacted**

City and County of Honolulu	Elected Officials
Department of Transportation Services	District Councilmember
Oahu Transit Services	Governor
Department of Design and Construction	State Senators
Department of Environmental Services	State Representatives
Department of Facility Maintenance	United State Congressmembers
Department of Parks and Recreation	<b>State and Others</b>
Department of Planning and Permitting	Department of Hawaiian Home Lands
Honolulu Fire Department	Hawaii Community Development Authority
Honolulu Police Department	Hawaiian Electric Company
Board of Water Supply	James Campbell Company

Stakeholder meetings were conducted on October 30, 2020, March 18, 2021, and January 19, 2022. Topic areas included:

**Mobility Hub:** Next-generation mobility hubs should provide access for pedestrians, bikes, and other emerging mobility modes. Public amenities that should be considered include:

- Paratransit accommodations
- Shelters and benches
- Secure bike parking
- Bike share
- Taxi and ride share drop-off/pick-up accommodations
- Park-and-ride, commuter parking
- Pedestrian access improvements
- Wayfinding
- Real-time information signage
- Customer service kiosk
- Public restrooms
- Security
- Open space/public plaza
- Compatibility with future rail station on Kapolei Parkway

**Transit Support Facility:** A light vehicle maintenance facility has an array of requirements including bus parking and storage; administrative, dispatch, operator, and maintenance staff accommodations; light maintenance service bays and space for secure storage of parts and tools; fueling/electric vehicle charging; bus wash; and fare collection. In addition, light vehicle maintenance facility requirements vary for the fixed-route and paratransit fleets, which must be considered in the development of the facility. A stakeholder meeting was conducted with the Department of Transportation Mobility Division – Fixed Route and Paratransit Operations sections and the Oahu Transit Services to identify the specific needs of fixed-route and paratransit administration, operations, and maintenance.

The stakeholder consultation program will continue to provide opportunities for information dissemination and feedback as this project moves forward into further phases.

**Mixed-Use Development:** Housing is being developed by the Department of Land Management across Kapolei Parkway from the project site, which will include 400 new homes with 60 to 80 percent designated for affordable housing. Additional housing for elderly residents has been developed in the area. Locating an improved transit center near these housing developments will provide a benefit for residents. In addition, the project should be developed to fit within the community context and consider the potential for a mixed-use development component that includes affordable housing.

## NEXT STEPS IN PROJECT PROCESS

This AA for the Kapolei Maintenance Facility & Transit Center has defined a general program of uses for a new mobility hub and a new light vehicle maintenance facility on City-owned property in proximity to Kapolei's City Center District. In addition, there may be an opportunity to integrate mixed-use development with housing and commercial elements on the site. Applicable land use regulations were reviewed to confirm site development parameters and preliminary development schemes were prepared for the transit facilities and mixed-use development. The preliminary development schemes were evaluated, and the highest-rated options were advanced for further refinement. The outcome of this AA is the confirmation that the City-owned property can accommodate a new mobility hub and light vehicle maintenance facility while preserving the opportunity for a mixed-use development component.

The subsequent phases of project development and implementation will include:

- **Project Definition:** The scope of the project needs to be confirmed including the specific elements for the mobility hub, functions of the light vehicle maintenance facility, and requirements for mixed-use development (e.g., affordable housing commitment).
- **Preliminary Engineering/Design Development:** The plans for the project need to be advanced to the level required to develop cost estimates for budgetary programming and to inform required environmental studies.
- **Environmental Compliance:** The project must comply with the requirements of the Hawaii Environmental Policy Act and, if federal funds are applied to the project) with the requirements of the National Environmental Policy Act.
- **Selection of Project Delivery Method:** The method of delivering the project and phasing may vary depending on the project's definition and preliminary design. For example, the project could be built as separate standalone components (e.g. transit facilities and mixed-use development) or as a single integrated development. The project's delivery could also be accomplished via different methods (e.g., design-bid-build versus variations of design-build approaches) based on the project's definition.
- **Final Design and Permitting:** The engineering and construction drawings could be completed by a design professional and subsequently bid for construction (design-bid-build project delivery method) or a design-build team could be procured that would be responsible for completing the design and also constructing the project.
- **Construction:** The construction phase will include the work required to build the project including the installation of improvements to the site before the buildings and other components of the project can be constructed.

**Figure 28** provides a rough timeline of the project implementation process. Note that the steps involved, and timeframes, can vary substantially depending on the project definition and the project delivery method. The timeline presented in **Figure 28** applies most directly to a design-bid-build project delivery method.

**Figure 28: Project Implementation Process**

