



Chapter Four:

4.0 TRANSIT SERVICE RECOMMENDATIONS

The County of Hawai'i is vast, encompassing 4,028.02 square miles of land area. The County has diverse climate, topography, and development patterns. Much of the land area is protected and rural. Because of its terrain, settlement has mostly occurred along the coastal and some contiguous areas, with long swaths of uninhabited and protected areas. The geographic features found within the County have a profound influence on the distribution of population and employment and thus transportation provision. Major employment areas are in Hilo and Kailua-Kona and the South Kohala Resort (SKR) areas while residences are spread throughout the island.

4.1 HELE-ON CURRENT SERVICES

Hele-On provides bus service to all the Districts to varying degrees. Americans with Disabilities Act (ADA) complementary paratransit service is provided in the urban Hilo and Kona areas. Hele-On also provides a shared ride taxi program in Hilo and human service paratransit service islandwide.

Hele-On Bus Routes

The Mass Transit Agency (MTA) operates bus service called Hele-On to most areas of the County. The system map is shown in Figure 4-1. Thirteen routes are operated that can be classified into three categories: Connector, Commuter, and Circulator.

Connector routes provide some circulation within their originating community and destination; howev-

er, their main function is to connect communities to provide commute options. These routes include Volcano, Pāhoā, Honoka'a, and Kailua Kona connecting with Hilo; and, Pahala and North Kohala-Waimea to Kailua-Kona.

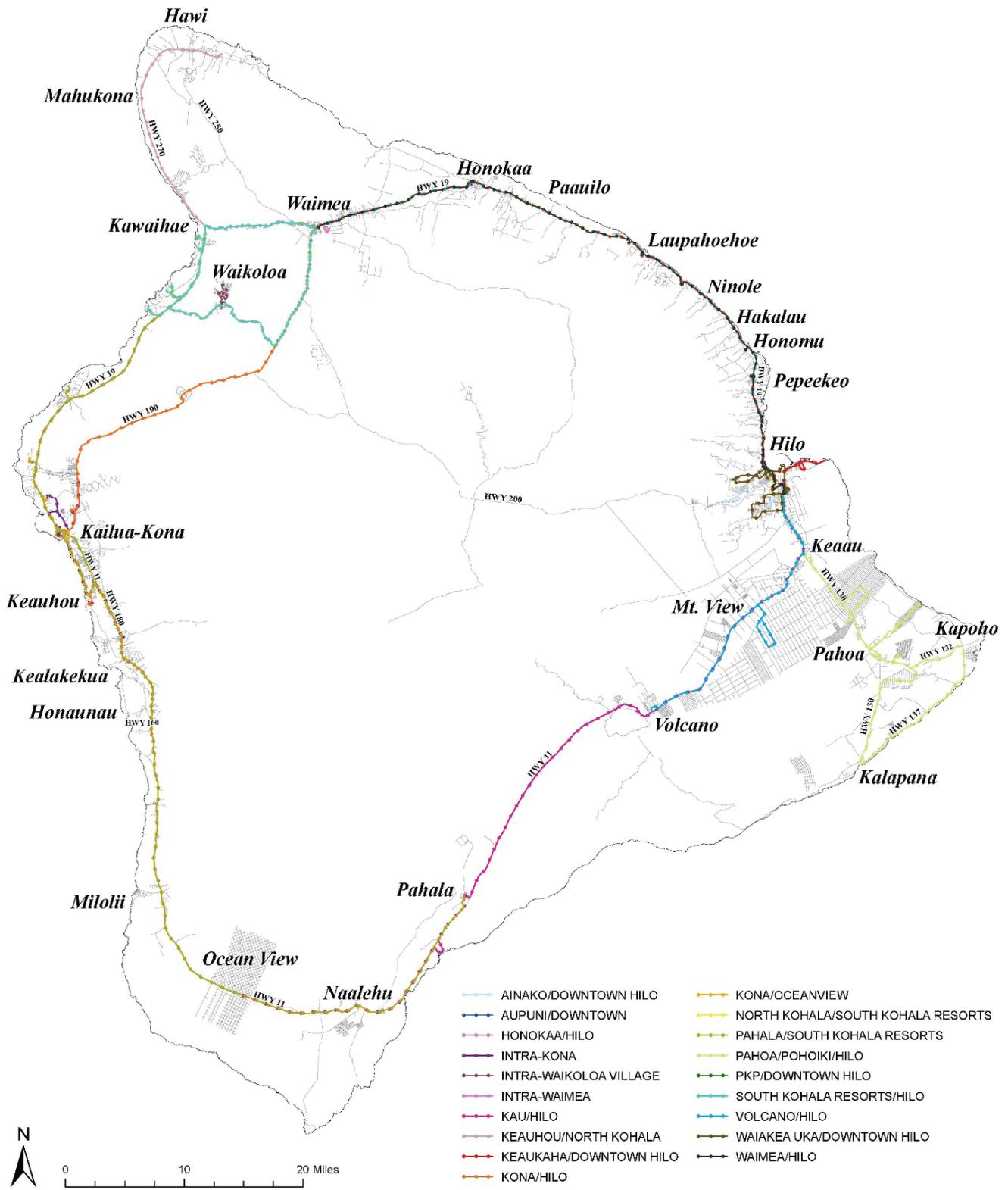
Circulator routes provide circulation within their established community. They connect at a neighborhood hub or transit center after completing their single cycle trip. Community circulators provide timed connections to other circulators and connector routes. These routes stop at all local bus stops and frequently operate with loops and branches. These routes include the three intra-Hilo routes, the intra-Kona route, and the Waimea Shuttle.

Commuter routes serve predominantly home-to-work trips by connecting specific neighborhoods to employment centers. These trips are provided in the peak period, peak direction with minimal scheduled departures. These routes include the Hilo to SKR trips and the North Kohala to South Kohala route.

4.2 RECOMMENDATIONS FOR IMPROVED PERFORMANCE

Recommendations to improve performance range from enhanced customer service information to identifying system performance measures. Some of the recommendations involve setting up programs or initiatives that are meant to collect data in an ongoing manner and monitoring activities.

Figure 4-1. Hele-On System Map



The objectives for these recommended actions include:

- **Improve Customer Information including public schedules and route identification**
- **Improve Schedule Adherence**
- **Improve Safety**
- **Improve Service Design and Monitoring**

4.2.1 Customer Information

Near term recommendations for customer information include updating the public maps and schedules, updating the Hele-On web site, and developing information such that it can be easily incorporated into programs or applications that can be accessed on computers and mobile devices.

Public Schedules and Route Identification

The majority of the bus routes do not have publicly identifiable route numbers as evidenced on the system map shown in Figure 4-1. A numbering scheme for the Hele-On system was developed and is contained in Appendix C. Single digit numbers are major connector routes serving Hilo. Two-digit numbers are the remaining connector and commuter routes. Three-digit numbers are the circulator routes with the first digit referring to a geographic area. The number 1 references Hilo, 2 Kona, 3 Waimea, 4 Pāhoa and so on. With this scheme, it becomes clear that Routes 101, 102 and 103 serve Hilo, Route 201 serves Kailua-Kona, and 301 serves Waimea. Any new circulator routes would pick up on the number scheme. A new Pāhoa circulator would be Route 401. All buses, schedules, maps, and any other public information should use the same route number and description. Route descriptions may be shortened to fit bus header and side signs.

New route maps were developed as part of this TMP that show major trip generators. Arrows were added to show route direction and dashed lines were added to show where route segments have limited service. Time points, shown with letters, match schedules so waiting passengers know when the bus should arrive. These schematics were prepared for all current Hele-On fixed routes and submitted separately to the agency, so they can be implemented immediately and are included in Appendix D.

Hele-On Website

Hele-On is doing a good job in notifying the public via the Hele-On website on daily updates impacting service delivery. These updates include revised routing, trip

cancellations, revised vehicle assignments, and other news. As the website is redeveloped and expanded, passengers should be able to input their contact information to receive service updates via email or text message. The revised route maps should be made available on the website.

Hele-On recognizes that additional languages are necessary to impart information to passengers. The website invites people to contact MTA for assistance via a phone number if information in another language is needed. It would be more efficient to provide the information on the website as shown in Figure 4-2 from Honolulu's TheBus website.

Figure 4-2. Honolulu TheBus Website Language Availability



The US Census reported for the County overall that 18.2 percent speak a language other than English at home. For Hele-On passengers that percent is 33.3 percent (221 of 664 responding to the question on the passenger survey conducted in March 2017). Interestingly only four percent (4%) of the passengers indicated they spoke English less than well (27 of 671 responding to this question). The top languages spoken by Hele-On passengers are similar to those reported by the US Census and should be a link on the website:

- **Ilocano/Tagalog/Filipino** 29.3%
- **Hawaiian** 15.2%
- **Spanish** 14.7%
- **Marshallese** 13.0%

The website should be redesigned in the near term to prominently display a link to getting transit directions. Intending passengers would then be able to input the bus stop number into an App to receive information on which routes serve that stop and when the next buses would arrive.

Figure 4-3. Transit Direction Input Example

Get Transit Directions

Start:

Destination:

Leave or Arrive:

Date:

Time:

Developing App Ready Information

A number of steps are necessary to have the information necessary to develop a computer and mobile device app. A couple of steps have been undertaken by this project. The updated route maps were provided to MTA in a format compatible with app development. Additionally, known bus stops were described with latitude and longitude coordinates.

Bus stop coordinates were provided for each route. Since much of the system is accessed by flag stop, major intersections were listed. Unique bus stop numbers should be assigned to each bus stop. This will assist in the development of an information app that will let people know where their bus is located.

Creating a Hele-On Transit App

One of the most frequent requests from the public was to have a real-time bus tracking and live map with estimated arrival times. This could be integrated with complementary multi-modal transportation options such as bike share, taxis and commercial transportation options using a smart phone app. This needs to be compatible with Android and iOS platforms. Web app that do not require use of an iOS or Android mobile devices should also be available. It is desirable for the app to have features for text messaging as well as connect to personal computers and audio visual displays.

The system must also be ADA friendly with stop announcements to include transfer information, intersection and major destinations, and requested stops. Both Honolulu and Maui counties have systems in use and Hawai'i island should check with them on their experience with various vendors systems, their advantages and disadvantages. Currently the AVL tracking system (CalAmp RSI AVL) uses a 2G technology. New devices use 4G or LTE for the most advanced and fastest connection for mobile

internet. Possible WiFi hotspots on buses would be highly desirable as well as broad band capabilities for the future.

These need to be in line with the National Urban Status NTD reporting requirements such as:

- **Fully automatic passenger counters (UTA counter)**
- **Usage and analytics**
- **Long term data retention**
- **AVL data**
- **Compatibility with Document Image Technology (DIT)**

While waiting to procure and implement its own system, MTA should pursue joining Google Transit. Google Transit is lodged within Google Maps. Google Transit states that their service is available for free to "Any agency that provides publicly available transportation services and operates with fixed schedules and routes is welcome to participate."

There are different levels of interaction within Google Transit. The static level uses scheduled times to indicate when a bus is due to arrive. Static does not provide real time information but relies upon scheduled times. Data required for this service includes:

- **Agency information**
- **Calendar which includes service days (weekdays, Saturday, Sunday)**
- **Calendar dates which identifies if no service is provided on holidays and identifies those holidays or if weekend service is operated on holiday dates (specific dates)**
- **Fare attributes, describing fare media**
- **Fare rules by route (some systems have zone fares)**
- **Frequencies identified by route**
- **Route descriptions including deviations**
- **Shapes include the shape files this project provided**
- **Stops includes the stop name, latitude and longitude**
- **Stop times which are pulled for the public schedules**
- **Transfers including are transfers allowed between stops and transfer time allowance**
- **Trips which identifies by route each trip operated**

Google Transit provides a step-by-step guide on how to provide the information in the required format. The real-time capability requires an Automatic Vehicle Locator (AVL) system which allows for real time updates, service alerts and vehicle positions. Since the real-time function requires an AVL system, implementation may lag for funding.

4.2.2 Schedule Adherence

Two short-term actions that are currently underway include updating the public schedules and upgrading the fleet. Both issues were mentioned by the passengers during the passenger survey. Of the 818 comments hand written on the survey forms by the passengers, almost 33 percent were on these two issues. New/More Buses/Buses that Don't Break Down had 148 written comments and 120 comments were in the Be on Time/Realistic Schedules category as shown in Figure 4-4.

Public Schedules

On-time performance is a high priority for the agency. The two major areas of frustration are vehicle breakdowns and schedules as expressed by riders.

The current public schedules were developed many years ago. Public schedules give estimated departure times for major bus stops known as timepoints. The running times (which can be defined as the amount of time it takes for buses to travel from one stop to another stop) have not been adjusted. Running time is variable based upon certain factors. These include:

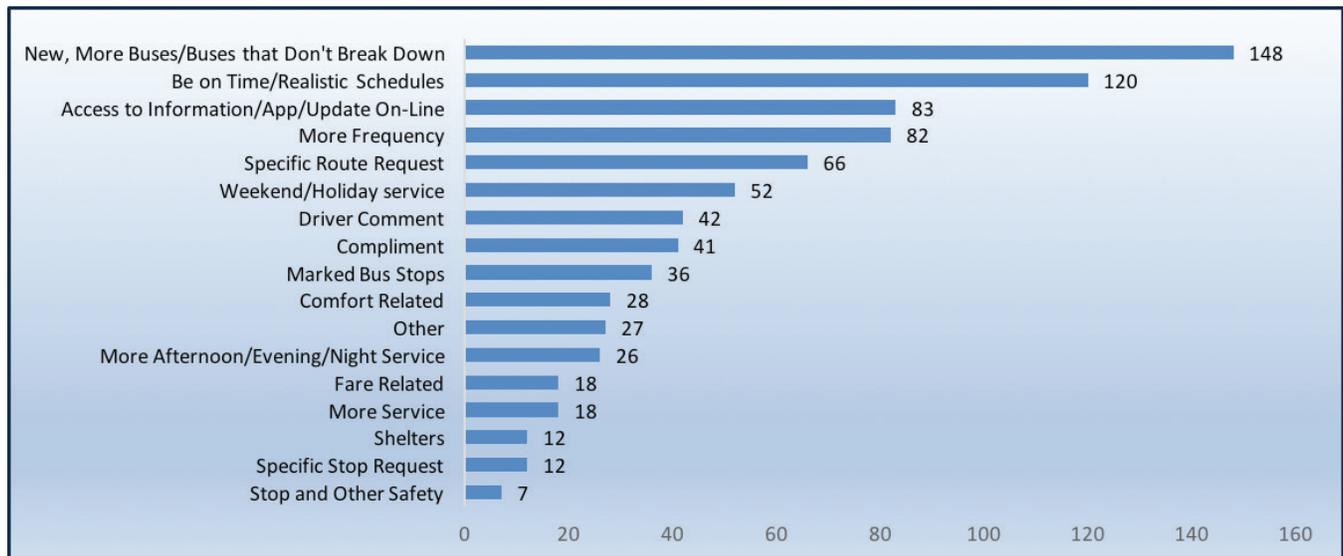
- Route or route segment length
- Number of bus stops
- Number of passenger boardings
- Number of passenger alightings
- Time of day (peak period non-peak period)
- Direction of travel

- Number of intersections
- Number of turning movements
- Weather
- Wheelchair and bicycle loading/unloading
- Road construction and other obstacles; traffic accidents
- Bus mechanical issues

Due to residential growth with resultant congestion and other factors listed above, buses are becoming increasingly behind schedule. Some of the schedules are such that it is almost impossible for a bus to make the trip in the allotted time. Revised schedules were developed as part of the short-term recommendations. Even with these schedules, however, some incidents occur which impact timely performance. These revised schedules are being developed such that they are easy to read and understand.

Revising schedules is not a one-time event. Schedules should be reviewed quarterly and adjusted accordingly. The quarterly reviews are in addition to temporary reroutings due to road construction activities. The vehicles should all have AVL transponders and monitoring system to allow supervisors to monitor schedule performance. Monitoring allows supervisors to identify those areas that exhibit consistent poor schedule performance. This should be done in concert with driver observations.

Figure 4-4. Passenger Survey Results



Upgrade Vehicle Fleet

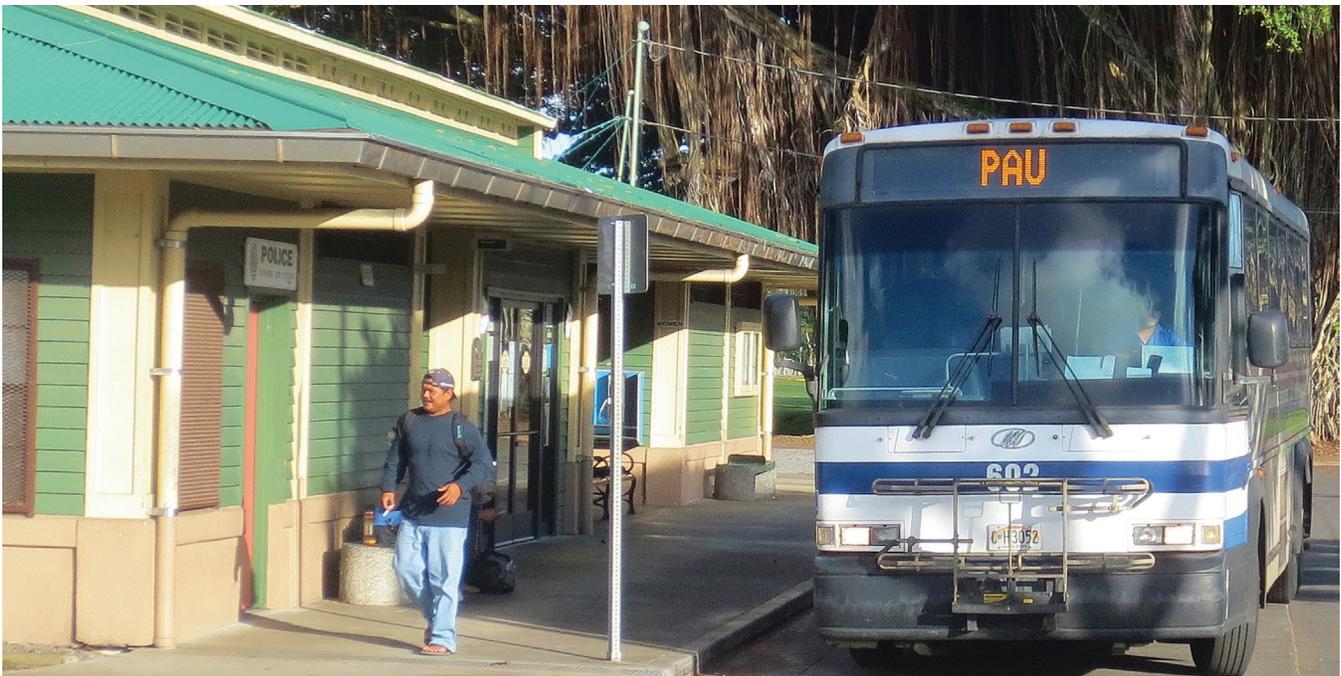
Upgrading the vehicle fleet needs to be MTA's highest priority. Passengers need to know their bus is going to show up. Granted any bus, including new buses, can break down at any time. However, passengers need to be assured that if their bus does break down, a replacement bus or alternative means will be available within a reasonable amount of time. MTA's service area is vast, what is considered reasonable? No passenger should be stranded longer than 30 minutes without knowing when a replacement or other transport will be arriving. Generally, 30-foot buses or larger are planned for a 12-year life expectancy. These vehicles are built on bus or heavy truck chassis. These vehicles frequently have longer life-spans with on-going maintenance procedures, parts replacement and depending upon service terrain and use. Smaller vehicles built on SUV or smaller truck chassis such as paratransit or cutaway vehicles have a 7 to 9-year life depending upon maintenance and use.

Knowing the average life span of their vehicle types, systems create bus replacement schedules. If a system requires 20 larger buses in the peak period, then they should be purchasing an average of two buses a year to maintain an acceptable average fleet age. To maintain a state of good repair, the average fleet age should be about half of the expectant life of the vehicles (average 6 years for the example). Similarly, the smaller vehicles should have an average age of 3.5 to 4.5 years. Hele-On's vehicles have an average age of twelve (12) years. A suggested

bus replacement schedule is presented in the Capital and Financial Plan.

When federal funds are used, the cost of vehicles is split between the local jurisdiction at 20 percent and 80 percent federal government funds. The County budget should include a minimum of \$550,000 a year as set aside for matching funds for vehicles for the next several years. This set aside would match five to six vehicles depending upon size (such as three 40-foot vehicles and three smaller less than 30-foot vehicles). The County needs to purchase buses every year to rebuild and then maintain a working fleet, even if federal funds are not available. Additionally, MTA may want to add to ongoing Honolulu vehicle orders instead of individual procurements.

In addition to federal formula funding which MTA receives through the State, there are federal grant programs that are made available periodically. These are competitive programs that require an application to be submitted. Receiving a grant award is not guaranteed, but MTA should apply when the opportunities arise, and MTA qualifies for the program. MTA should monitor for these new or continuing grant opportunities as was recently done for the Buses and Bus Facilities Infrastructure Investment Program. A good source to monitor for these opportunities is the American Public Transportation Association (APTA). APTA's website provides a wealth of transit related information and should be monitored.



4.3 SERVICE RECOMMENDATIONS

Current fixed route transit services cannot efficiently serve the County’s identified transit needs. Recommended service design guidelines and performance monitoring for Hele-On have been developed in this study and can be found in Appendix E.

4.3.1 New Service Type

Many systems throughout the Country have turned to Flex and Zone services to provide essential life-line services to their more rural populations. New service types are described in the following sections. Additional Express Routes along with a new Vanpool Program and expanded BikeShare provides additional options for intending passengers. Both programs will be discussed in the Financial Plan.

Flex Services

Flex services are bus routes that operate on an identified public schedule with an added paratransit function. Flex services can divert or “flex” off the route to pick up or drop off passengers that are within the Flex service area. This Flex area is defined as up to ¼ mile off the route. The Flex area should be reassessed after one year of service. It may be possible to enlarge the Flex area or if passenger usage is high, realign the route to provide main route service in areas that are showing consistent off-route service demand.

Zoned residential areas are large, have low-density, and frequently have poor roads. The connecting bus routes operate with larger 40-foot vehicles on long bus routes so diverting into subdivisions with poor roads negatively impacts system performance. Routes such as 10 and 40 serving Puna should not divert into these low-density, low-ridership residential areas. These routes should remain on the main roads to maintain a predictable schedule. Additional trips could then be added to these routes. Intending passengers from the low-density residential communities would connect to the mainline bus routes using new Flex or Zone services and community routes.

Reservations are required for off-route stops. Reservation hours are 7:45 AM to 5:00 PM (similar hours of scheduling as the ADA Paratransit reservations). Flex service has the same cancellation and no-show policies as the ADA Paratransit service as it provides the ADA Paratransit service for the area.

Flex service uses smaller buses geared for ADA Paratransit service although the service is available for all passengers. The smaller buses are better able to divert into subdivisions that have poorer road conditions; although, Flex and Zone service will only operate on navigable paved roads.

Figure 4-5. Cutaway Van Size For Shorter Trips



Flex services are not long-haul routes. Passengers will transfer at major hubs, superstops or other bus stops if a hub is not nearby to Connector routes to continue their trip. The hierarchy of bus stops (hub, superstop, bus stop) and their amenities is discussed in the Capital Plan. Stops that passengers will use to transfer to main line routes are identified in the service maps. Days of service for Flex routes will generally be five to six days a week.

Zone Paratransit Services

Zone paratransit service provides limited transit service within rural areas in the County. Similar to Flex service, there are no eligibility requirements for using zone service. Anyone within the identified zone area can request a ride. Service however, is only available to each zone on certain days of the week, generally one or two days a week. As with Flex service, reservations are required with the same requirements as ADA services.

Zone paratransit service provides an opportunity for residents to access shopping, medical, and business services at least once or twice a week. Trips are scheduled around time periods that passengers can access nearby businesses or transfer to Connector routes. For example, trips would occur once in the morning and twice in afternoon. Service would be evaluated after one year. If demand is high and consistent, then the service would graduate to Flex services and potentially into the future, fixed route hub and spoke services or additional days could be added to the service.

4.3.2 Hub and Spoke Service Design

It is recommended that Hele-On redesign connector

routes to provide more predictable on-time performance, so the majority of passengers can be assured the bus will arrive. By doing so, Hele-On will also attract new riders and win back past passengers. Converting services in Puna and Kona to hub-and-spoke will provide that predictability. Hubs are a centralized location within a specific service area. The hub generally has a number of passenger amenities including information, shelter, benches, bicycle storage, restrooms, security, and lighting. Some have parking available and others have concessions such food. Hubs are a location for taxis, Uber, Lyft and demand-response services to meet buses to continue passenger trips.

The hubs are served by transit routes or “spokes.” The spokes are those localized routes providing neighborhood connections to the hubs. Passengers can transfer to other

routes to continue their trip. The routes will serve a hierarchy of bus stops: basic local bus stop, primary local bus stop, park and ride lot, satellite hub, and hub. These stops and associated potential amenities are discussed further in the Capital Program.

Many suggestions, recommendations, and comments were provided during the public meetings held in October and November 2017. Additional comments were submitted by mail and email. Each was carefully considered and the impact on current services was reviewed and operating costs were calculated. Table 4-1 groups the suggestions and comments into categories and provides a brief discussion of how they were addressed in the service proposals. Additional detail on the service proposals is provided by District on the following pages.

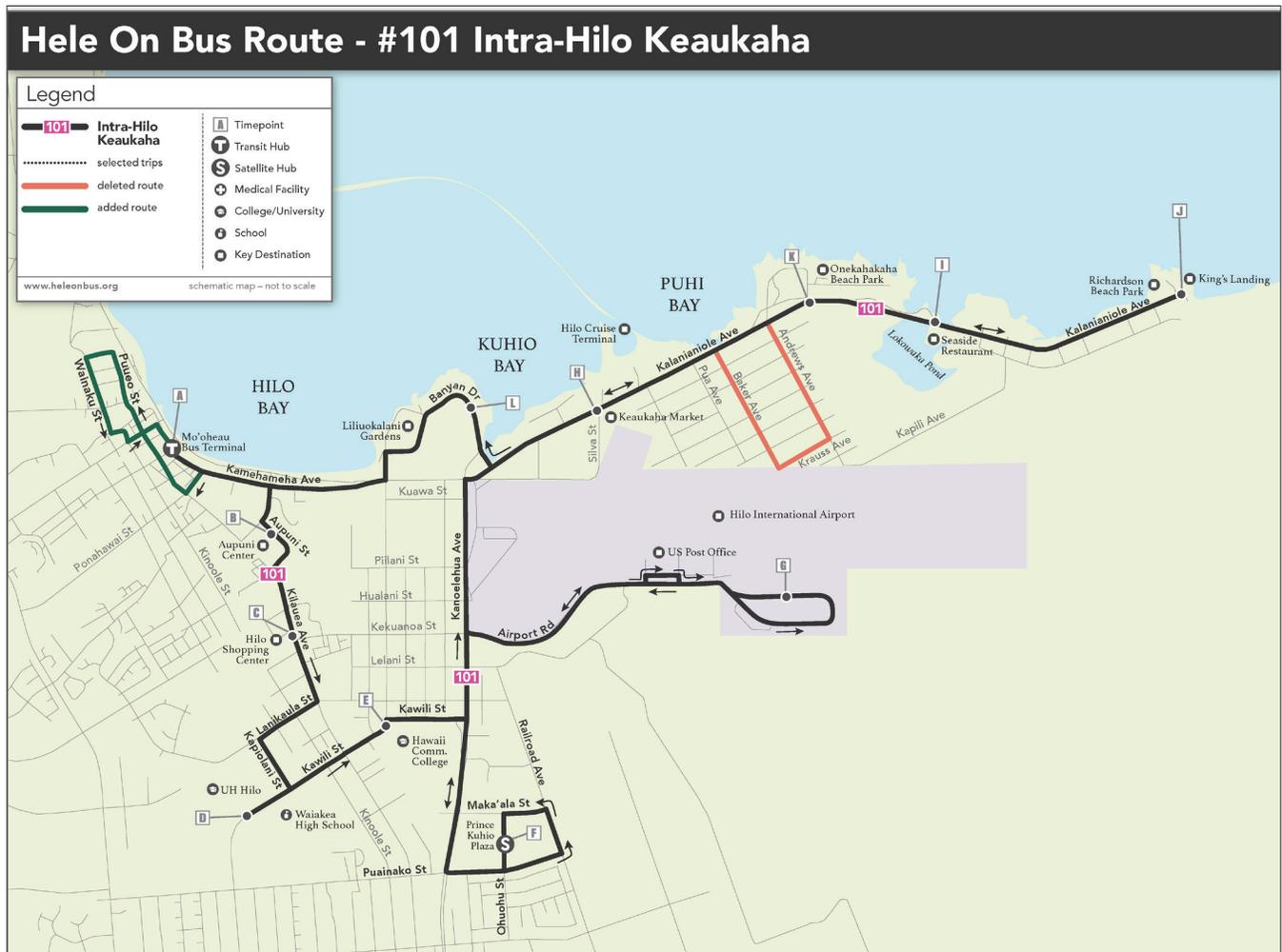
Table 4-1. Public Service Suggestions and How They Were Incorporated Into Proposals

Comment Category	Service Proposals
Provide Express Services	New Express routes are Recommended: <ul style="list-style-type: none"> • Green Line Express with service between Waimea and Kona • Red Line Express with service between Hilo and Volcano • Blue Line Express with service between Hilo and Kona (via Daniel K. Inouye Highway formerly called Saddle Road)
Have Community Routes Serve Commuter Needs	Community routes are all designed to accommodate commuter trips with AM and PM peak period departures. For example: <ul style="list-style-type: none"> • Kaumana City will have a 7 AM departure to MBT with the return scheduled to leave MBT after 5 PM. Additionally, two new bus stops are proposed for Saddle Road at Ua Naele Street for residents to access the Blue Line. • Instead of a 9:40 AM departure from Fern Acres, the new circulator will provide service earlier in the morning and the return will be after 5:00 PM instead of the current 2:30 PM.
Add Community Routes in Large Residential Areas	Recognizing that the Transit Master Plan is a 20-year document, and that the County can upgrade roads for transit, new community routes are proposed for: <ul style="list-style-type: none"> • Fern Forest • Eden Roc • Fern Acres • Hawaiian Acres • Ainaloa • Orchidland • Hawaiian Paradise Park • Hilo
Serve Growing Areas Along Ane Keohokalole Highway	The Kona area continues to grow and the Hub and Spoke services identified for Kona are designed such that they can be altered or expanded as developments come on line. The Kona to Airport circulators identify future alignments when roadways are opened.
Kaū and Oceanview are Isolated with Limited Opportunities to Travel to Kona or Hilo and Back	Additional trips are added: <ul style="list-style-type: none"> • 1 additional trip from Pahala to Kona Hub • 2 trips from Oceanview to Volcano to connect to Hilo
Add Formal Bus Stops	The Capital Program identifies an ongoing bus stop program.
Add Sunday Service	Current Sunday service is offered on selected Hilo to South Kohala Resorts and Pahala to South Kohala Resorts trips. Sunday service would be initially supplemented with the following routes: <ul style="list-style-type: none"> • Hilo-Keaukaha-Airport • Pahoa-Route 40 • Oceanview to Volcano • Volcano-Red Line Express • Green Line Express • Blue Line Express

Route 101 Keaukaha serves the Hilo International Airport with eight trips currently. Two alignment changes are proposed for the route. One is the deletion of service along Baker Avenue (shown in red) and the second is the addition of service to North Hilo (shown in green). With these changes, the route will be able to add one more trip to the airport. The route currently ends at Kings Landing at 5:40 PM. It is proposed that the route complete the trip to the Mo'ohau Bus Terminal ending service at 6:05 PM. In addition, it is proposed service to Kings Landing occur every other trip pro-

viding a quicker ride from the Airport to Banyan Drive and MBT. On those trips, the route would continue to North Hilo via Kamehameha Avenue serving the Bayfront Park and Ride, left on Kilauea Avenue to Keawe, continuing to Puueo Street, left onto Kauila Street, left onto Waimaku Street and returning to MBT via Wailuku Drive, Kinoole Street, and Waianuenue Avenue. Together with Route 103 (Waiakea Uka), this alignment will provide service from the park and ride lot through Downtown Hilo. Route 101 is presented in Figure 4-7.

Figure 4-7. Hilo Route 101 Keaukaha



Span of Service:

6:30 AM to 6:05 PM; Monday through Saturday (reduced route and schedule on Sunday)

Headways:

80-minutes; 60-minutes

Number of Trips:

9 (1 added trip)

Number of Vehicles:

1 40-foot bus - can be operated with cutaway (smaller vehicle).

Implementation

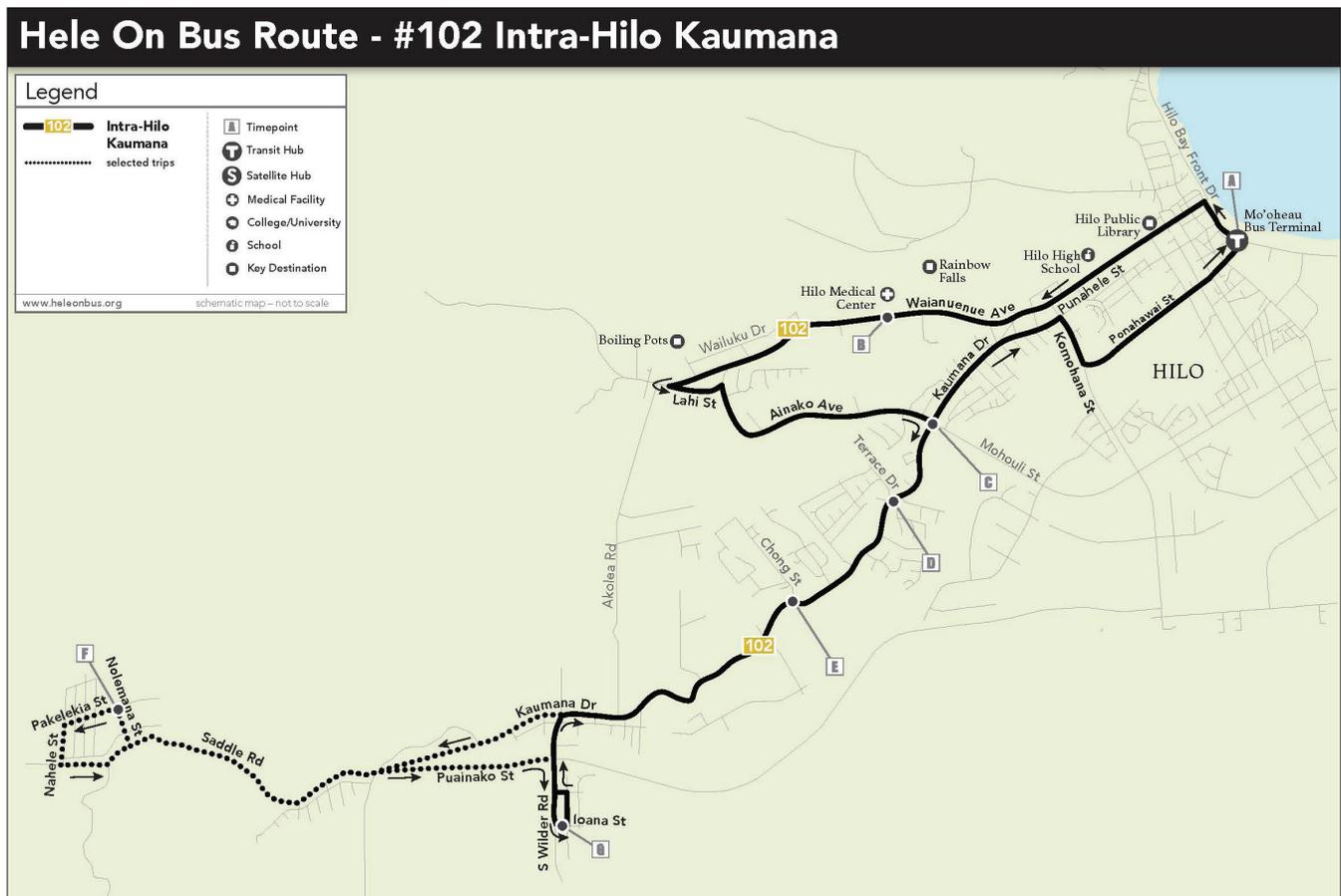
Near-term. Change schedules, passenger notification. Add airport information at PKP.

The current **Route 102 Kaumana** has two distinct service areas. One serves Waianuenue Avenue and Kaumana Drive. The second service area provides service to Prince Kūhiō Plaza (PKP). Six trips depart MBT for the Waianuenue Avenue service and five serve PKP. Three of the PKP trips continue service on the Waiakea-Uka Route. The map to the right shows the initial service suggestions for Route 102.

Service to Kaumana City was recommended for deletion due to very limited ridership. Comments from Kaumana City residents indicated that even though the community was served with three trips, they were not scheduled to allow for people to attend work or school. It was suggested that service to Kaumana City be scheduled such that a person could get to work and back. The proposed new route would serve Kaumana City at 7:00 AM and would depart MBT at 5:15 PM.

The service within Kaumana City is changed from just serving Nolemana Street to turning left onto Pakeleka Street and continuing to left onto Ua Nahele Street to left onto Saddle Road to return to Hilo. This change in routing eliminates the current back up maneuver on Pakeleka Street and provides more coverage within the community. The shared ride taxi program or transportation network companies (Lyft and Uber) would provide a more efficient option for any passengers desiring midday service. Additional comments included that the routes were too complicated and should be simplified and that senior housing and community centers should be served. The initial proposal shown above to extend the route to Mohouli Street did not provide adequate service to new developments occurring along Mohouli Street. This service would be provided by new Route 104. Figure 4-8 shows the proposed route alignment.

Figure 4-8. Hilo Route 102 Kaumana



<i>Span of Service:</i>	7:00 AM to 5:45 PM; Monday through Saturday
<i>Headways:</i>	90-minute
<i>Number of Trips:</i>	7
<i>Number of Vehicles:</i>	1 smaller “cutaway” vehicle
<i>Implementation</i>	Near-term. Change schedules, passenger notification.

Route 103 Waiakea Uka currently has five trips, three of which are operated by the Kaumana Route. One additional trip is added at 1:30 PM. Two alignment changes are shown in Figure 4-9. Observations and discussions with drivers indicated that the Gym did not receive passengers and serving the gym requires a back-up maneuver. Instead, it is suggested the route continue on Haihai Street to Kupulau Road.

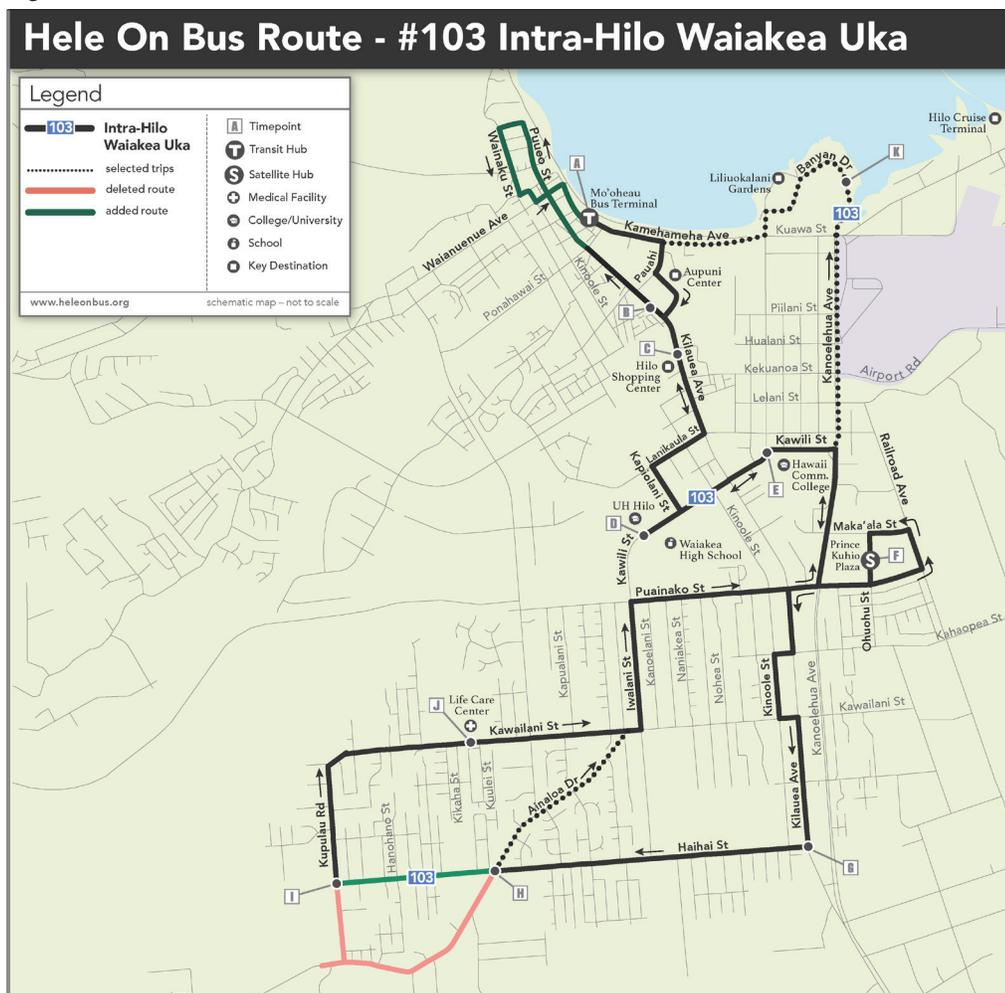
The other routing suggestion is to have the route continue service on Kilauea Avenue to Keawe, continuing onto Puueo Street, left onto Kauila Street, left onto Waimaku Street and returning to MBT via Wailuku Drive, Kinoole Street, and Waiuanuenue Avenue. This

alignment was suggested in the Downtown Hilo Multimodal Master Plan (DHMMP), Public Review Draft, January 2017 as shown in Figure 4-9A.

Figure 4-9A. Hilo Circulator, Potential Route



Figure 4-9. Hilo Route 103 Waiakea Uka



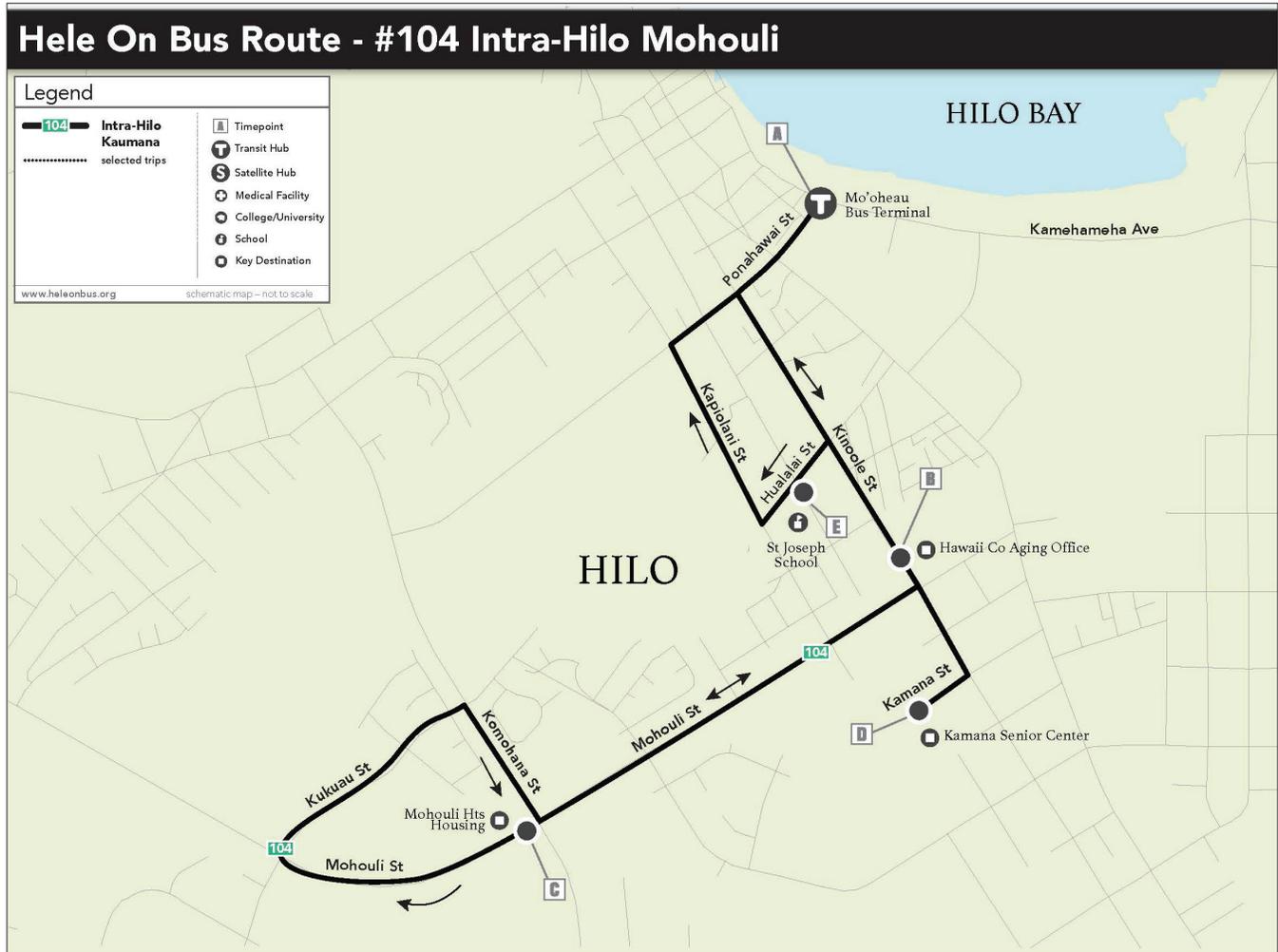
An additional alignment change is suggested for all routes traveling inbound from PKP to MBT via the University. Instead of circling around Aupuni (with three added turning movements), the buses remain on Kilauea Avenue serving a new bus stop (sign, shelter and bench).

<i>Span of Service:</i>	6:45 AM to 6:00 PM; Monday through Saturday
<i>Headways:</i>	90-minute
<i>Number of Trips:</i>	6 trips Waiakea Uka; 3 additional trips to PKP
<i>Number of Vehicles:</i>	1 smaller “cutaway” vehicle
<i>Implementation</i>	Near-term. Change schedules, passenger notification.

Route 104 Mohouli is a new route serving central Hilo and is shown in Figure 4-10. This new route will provide service to the Mohouli Senior Residences and other unserved residential streets along Mohouli Street.

The route will offer new service for senior housing and the Kamana Senior Center on Kamana Street and provide service to St. Joseph’s School. All bus stops would be signed.

Figure 4-10. Hilo Route 104 Mohouli

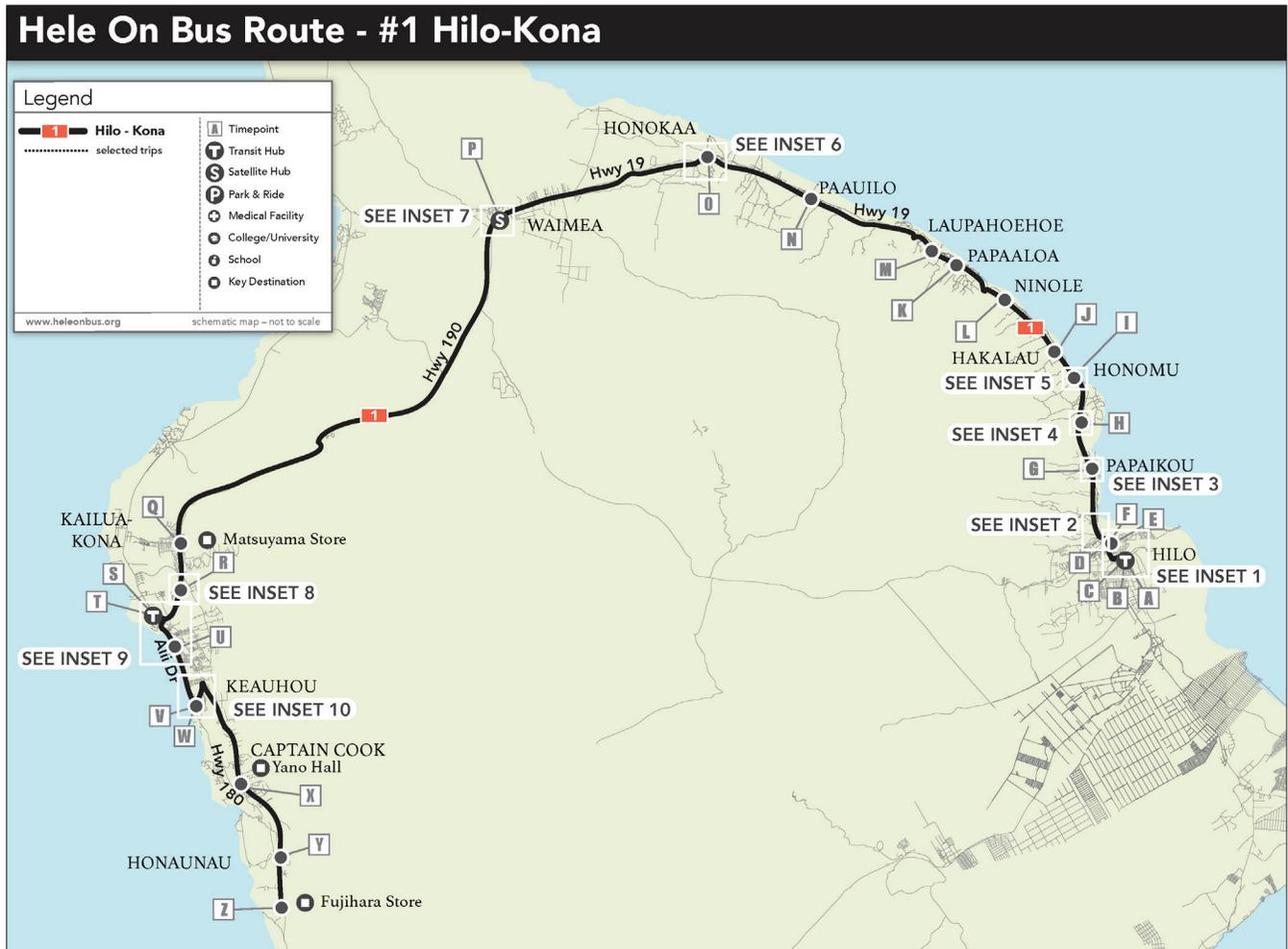


<i>Span of Service:</i>	6:45 AM to 5:30 PM; Monday through Saturday
<i>Headways:</i>	90-minute
<i>Number of Trips:</i>	6
<i>Number of Vehicles:</i>	1 smaller “cutaway” vehicle
<i>Implementation</i>	Near-term. Change schedules, passenger notification.

Route 1 Hilo-Kona and **Route 2 Kona-Hilo** has minor routing changes to take advantage of the new Kona hub (see discussion starting page 34) and the new bus stop on Kilauea Avenue to avoid the circling onto Aupuni Street. This is a long trip from Kona (or south of Kona) to Hilo. However, if a person is on the first trip leaving Kona to Hilo, then they will have about three hours to

take care of business or appointments before the return leaves PKP at 1:10 PM or MBT at 1:30 PM. This route was given the Route 1 and 2 designations as they link the two major centers of the County. Figure 4-11 shows the entire alignment and Figure 4-12 shows the route insets providing more detail in the communities.

Figure 4-11. Route 1 Hilo-Kona



Span of Service: 3:40 AM to 7:00 PM; Monday through Saturday

Headways: N/A

Number of Trips: 3 roundtrips; one is also listed as Intra-Kona and one is listed on the Hilo-South Kohala Resorts schedule

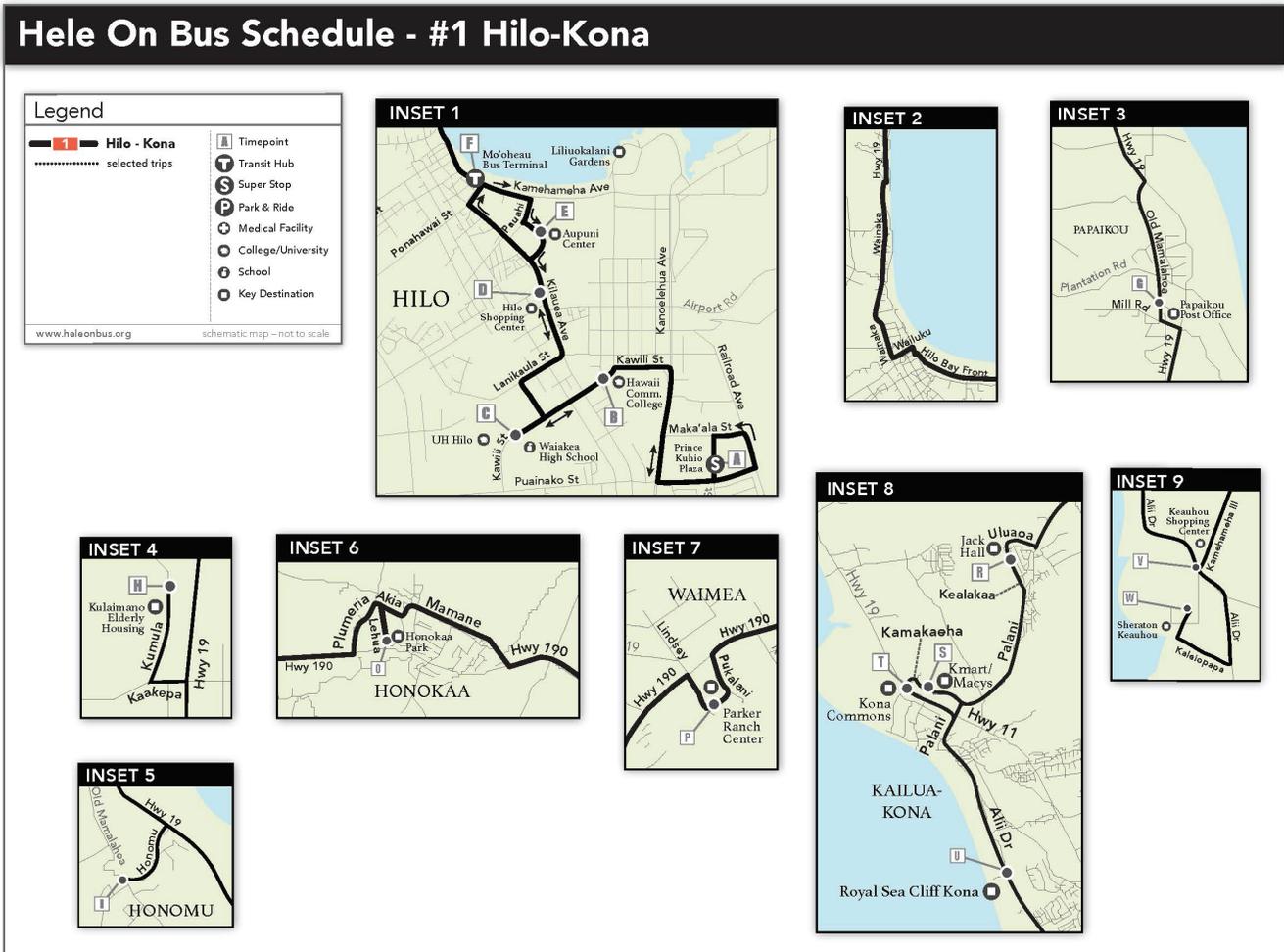
Number of Vehicles: 2 40 to 45-foot vehicles plus 1 SKR vehicle.

There are 10 Hele-on buses required for the Hilo to South Kohala Resorts commuter trips including one that is also on the Hilo-Kona schedule (3:35 AM departure from Bayfront parking).

Implementation

Near term: Change schedules, passenger notification.

Figure 4-12. Hilo-Kona-Route Insets



A route alignment change is proposed connecting Hilo (commuter lot and MBT) with the South Kohala Resorts and Kona using the Saddle Road. The Human Resource offices of the major South Kohala Resorts were contacted and surveyed regarding employee shift times and other transportation issues. Several representatives indicated their properties had difficulties with staffing due to transportation. Table 4-2 presents the shift start and end times for the major reports. The scheduled bus arrival and departure times are shown that are closest to the shift times. The cells highlighted in green indicate those bus arrivals or departures that miss the shift times or are too tight.

Current Hele-On passengers stated they were frequently late to work due to schedules and requested trips using Saddle Road to shorten the travel time. The Blue Line Express will shave 30 minutes from the current travel time to the resorts. Two current Route 80 trips (4:15 AM and 4:40 AM) would use the Saddle Road and Daniel K. Inouye Highway as shown in Figure 4-13. The shortened travel time would allow passengers to reach their destinations in time for work. The return trips would depart the Kona Transit Center at 3:10 and 3:20 PM. It is expected that Hilo passengers would elect to use the Blue Line Express trips which would free up other departures for intending passengers along the Hāmākua Coast and Waimea which currently pass up intending passengers due to full buses.

Table 4-2. South Kohala Resorts and Hele-On Bus Schedule Comparison

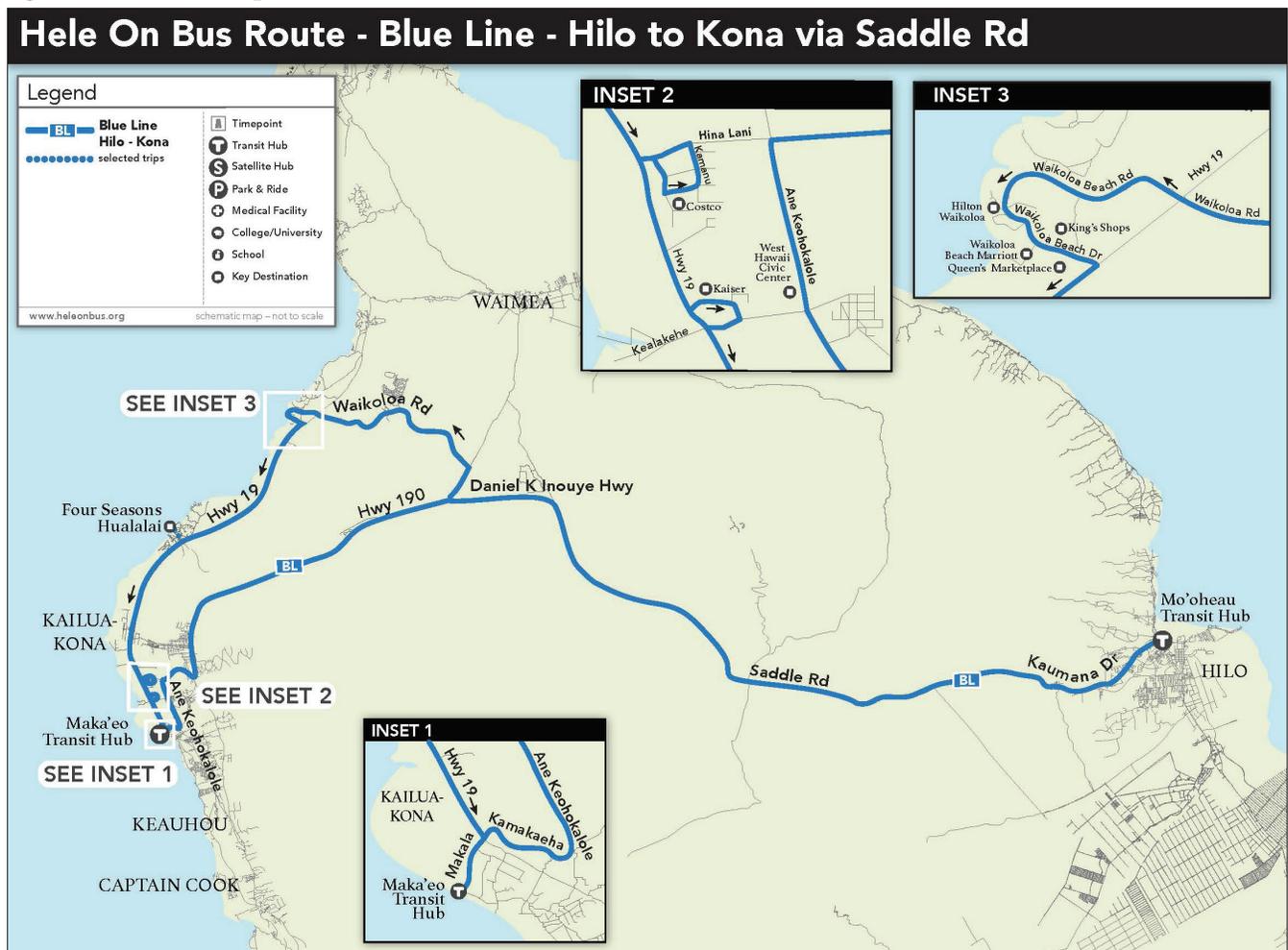
Resort	Shift Start	Bus Arrives		Shift End	Bus Departs			
Mauna Kea Beach	7:30 AM	5:30AM	7:00 AM	3:30 PM	2:50 PM	4:25 PM		
	2:00 PM	--	--	10:00 PM	--	--		
	3:00 PM	--	--	11:00 PM	--	--		
Hapuna Prince	7:30 AM	5:35 AM	7:05 AM	3:30 PM	4:20 PM	--		
	2:00 PM	1:10 PM	--	10:00 PM	11:35 PM	--		
	3:00 PM	1:10 PM	--	11:00 PM	11:35 PM	--		
Hualalai Four Seasons	8:00 AM	6:40 AM	--	4:00 PM	4:10 PM	--		
	10:00 PM	10:00 PM	--	6:00 AM	7:35 AM	--		
Hilton Waikoloa Largest Shift	4:00 AM	--	--	12:00 PM	2:30 PM	--	4:20 PM	4:35 PM
	5:00 AM	5:20 AM	--	1:00 PM	2:30 PM	--		
	6:00 AM	5:20 AM	6:05 AM	2:00 PM	2:30 PM	--		
	7:00 AM	6:25 AM	6:45 AM	3:00 PM	3:30 PM	4:05 PM		
	8:00 AM	7:15 AM	--	4:00 PM	4:05 PM	4:10 PM		
Mauna Lani Bay Food & Beverage	7:00 AM	5:40 AM	5:50 AM	3:00 PM	2:35 PM	3:10 PM		
	8:00 AM	7:05 AM	--	4:00 PM	4:20 PM	--		
	2:00 PM	1:30 PM	--	10:00 PM	11:25 PM	--		
Fairmont Orchid Food & Beverage	3:00 PM	1:30 PM	--	11:00 PM	11:25 PM	--		
	6:00 AM	5:35 AM	5:45 AM	2:00 PM	1:45 PM	2:30 PM		
	7:00 AM	7:00 AM	--	3:00 PM	3:05 PM	--		
	8:00 AM	7:00 AM	--	4:00 PM	4:20 PM	--		
	3:00 PM	1:25 PM	--	11:00 PM	11:20 PM	--		
10:00 PM	9:10 PM	--	6:00 AM	8:15 AM	--			
Marriot (Waikoloa)	8:00 AM	5:25 AM	6:30 AM	4:00 PM	4:05 PM	4:10 PM	4:25 PM	
		6:10 AM	7:20 AM					
		6:50 AM						
7:00 AM	Green denotes a bus miss or very tight arrival or departure from scheduled shift time.							

Bus stops for the SKR Blue Line Express include:

- **New bus stops serving Kaumana City located on Saddle Road and Ua Nahele Street**
- **Waikoloa Village (remaining on highway)**
- **Hilton Waikoloa**
- **Marriott**
- **Four Seasons**
- **Costco**
- **Kaiser**
- **Kona TC**

A new direct connecting route from Hilo to Kona using Saddle Road and Māmalahoa Highway is proposed to be called the Blue Line. It is intended for workers and job seekers. Blue Line Express trips would depart MBT at 6:00 and 8:00 AM for Kona. These two trips would not serve the resorts, but travel Mamalahoa Highway to Hina Lani Street to Ane Keohokalole continuing to the Kona Transit Center. These two trips provide the needed connections for non-resort work opportunities, business, and other trip purposes. The return trips would depart the Kona TC at 5:30 and 7:00 PM.

Figure 4-13. Blue Line Express



<i>Span of Service:</i>	4:15 AM to 7:00 PM; Monday through Sunday
<i>Headways:</i>	N/A
<i>Number of Trips:</i>	4 roundtrips; two of which are from the current Hilo-South Kohala Resorts schedule
<i>Number of Vehicles:</i>	Four 40 to 45-foot vehicles
<i>Implementation</i>	Near term: Change schedules, passenger notification.

Hāmākua District

Most of the population in Hāmākua is in villages along both sides of Highway 19. The major road connection is Highway 19 – Mamalahoa Highway. Most residential access is from mauka/makai streets that are not through streets and many are not suitable for transit provision.

Current bus service, is provided mostly by the Hilo-South Kohala Resorts (SKR)/Kona commuter trips traveling along the highway. However, many of these trips are already full and have limited seats for additional passengers. The limited number of seats has been impacted recently by the continuous canceling of one of the SKR trips. The Hilo/Honokaʻa schedule indicates there are 13 trips to and 13 trips from Honokaʻa to Hilo. All but two of the trips from Honokaʻa are provided by these other routes.

Figure 4-14 shows that the Honokaʻa Route 60 (service not provided by other routes) be converted to flex service. The route would operate along the main alignment

as shown, however, it would be able to divert or “flex” off the route up to ¾ mile to pick up passengers that have made a reservation. Reservation procedures are the same as the ADA paratransit service. The flexing allows Hele-On to expand paratransit service while maintaining a public posted schedule.

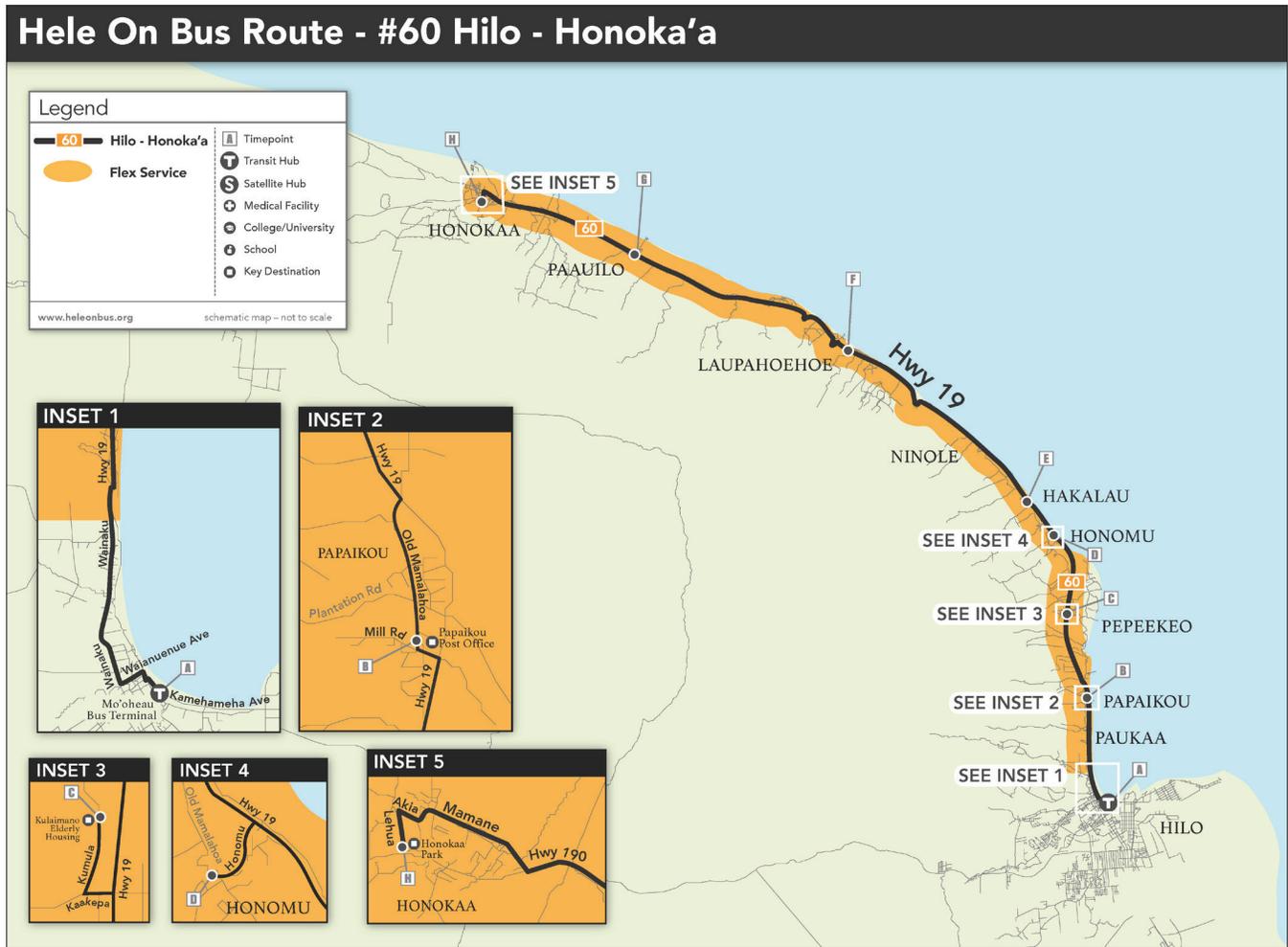
It is approximately 42 miles from Honokaʻa to MBT, one way. Current schedules list about 50-minutes to one hour for the buses to complete that trip. This is not realistic requiring buses to operate averaging 42 miles per hour. The flex service is designed for a 4-hour round trip, allowing time for the vehicle to divert off the route.

Another advantage of offering flex service is that MTA can partner with churches or other organizations that usually do not have maximum use of their parking lots during the weekdays. Commuters can park in these facilities and schedule the bus. Since most churches are off the main highway, this approach allows greater flexibility in providing commuter options.

Figure 4-13A. Conditions Along Highway 19



Figure 4-14. Route 60 Hilo-Honoka'a



<i>Span of Service:</i>	5:00 AM to 7:00 PM; weekdays
<i>Headways:</i>	240-minute
<i>Number of Trips:</i>	4
<i>Number of Vehicles:</i>	1 smaller “cutaway” vehicle (additional vehicle)
<i>Implementation</i>	Intermediate to long-term a second vehicle may become necessary. One additional SKR trip to start service at MBT (4:50 AM trip) bypassing Bayfront Park and Ride Lot. This trip may need to be adjusted to start in North Hilo if bus does not have capacity for passengers along the coast. Change schedules, passenger notification, set up dispatch call center or extend contract with A2B Transportation. This route would be operated by Hele-On, but it could be contracted to A2B or similar organizations.

North Kohala District

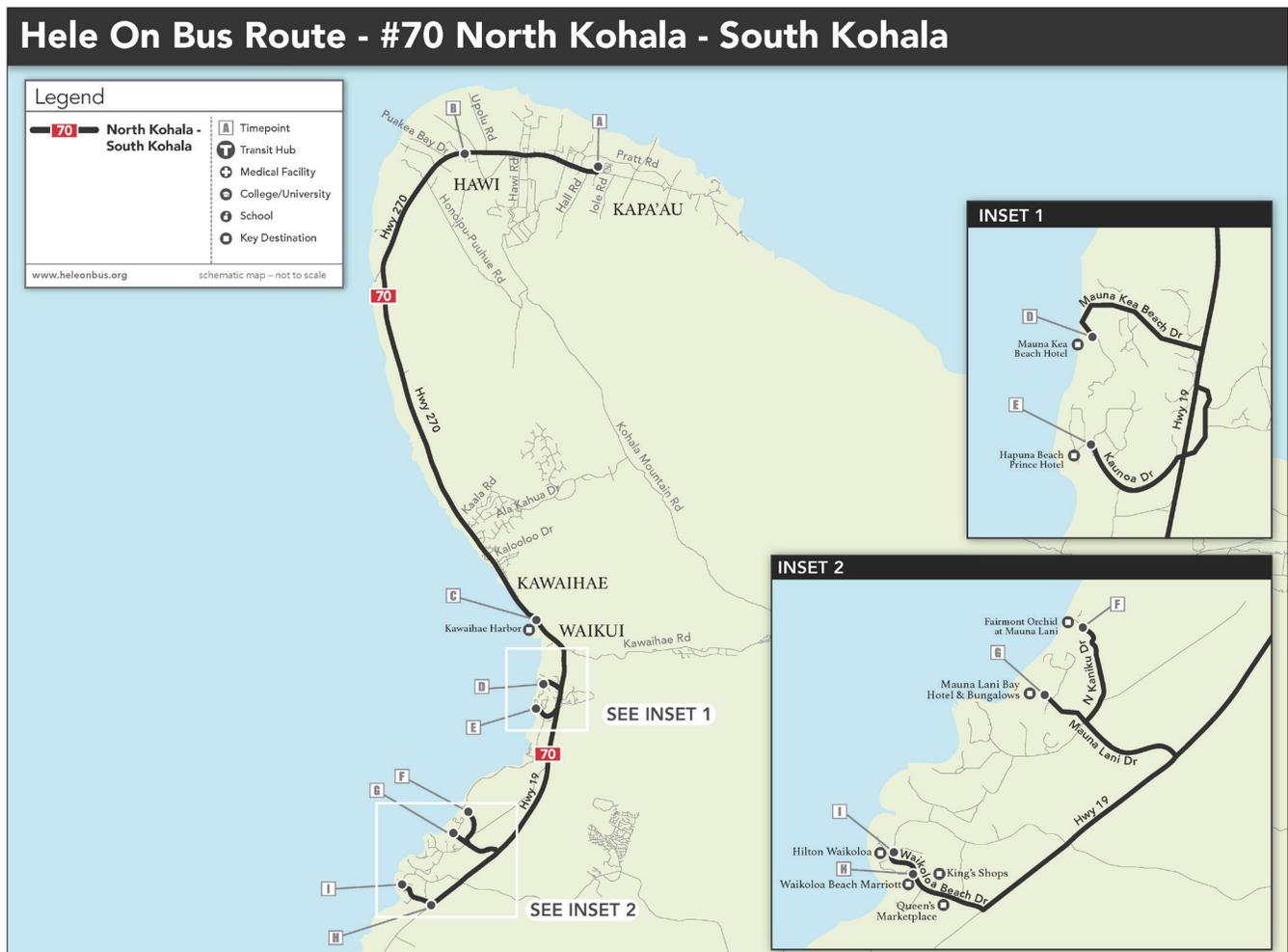
The North Kohala community is rural and residents desire to keep development to a minimum. Densities are low, with a few towns offering some services. Residents commute to jobs and major shopping areas outside the District as there are few available within the District.

North Kohala is served by two transit routes that would emanate from a future Kona maintenance facility. Each route provides one round-trip daily. One route is a commuter run from North Kohala to the South Kohala Resorts (Route 70-Figure 4-15). The second route, North Kohala-Waimea-Kailua-Kona (Route 75-Figure 4-16) has a dual purpose of providing school trips from North

Kohala to Waimea, then continuing to Kona for shopping opportunities. Both routes operate Monday through Saturday, although the North Kohala/Waimea/ Kailua-Kona route does not serve Waimea on Saturdays.

A third route provided limited service from North Kohala to Waimea three days a week. This route was cancelled in 2016 following the demonstration period due to low ridership. Passengers commented during the passenger survey that not enough time was provided for those intending to shop or eat in Waimea on that third route. It is suggested to add Waimea into a revised North Kohala/Waimea/Kailua-Kona Saturday trip that would offer several hours of service in Waimea.

Figure 4-15. Route 70 North Kohala-South Kohala



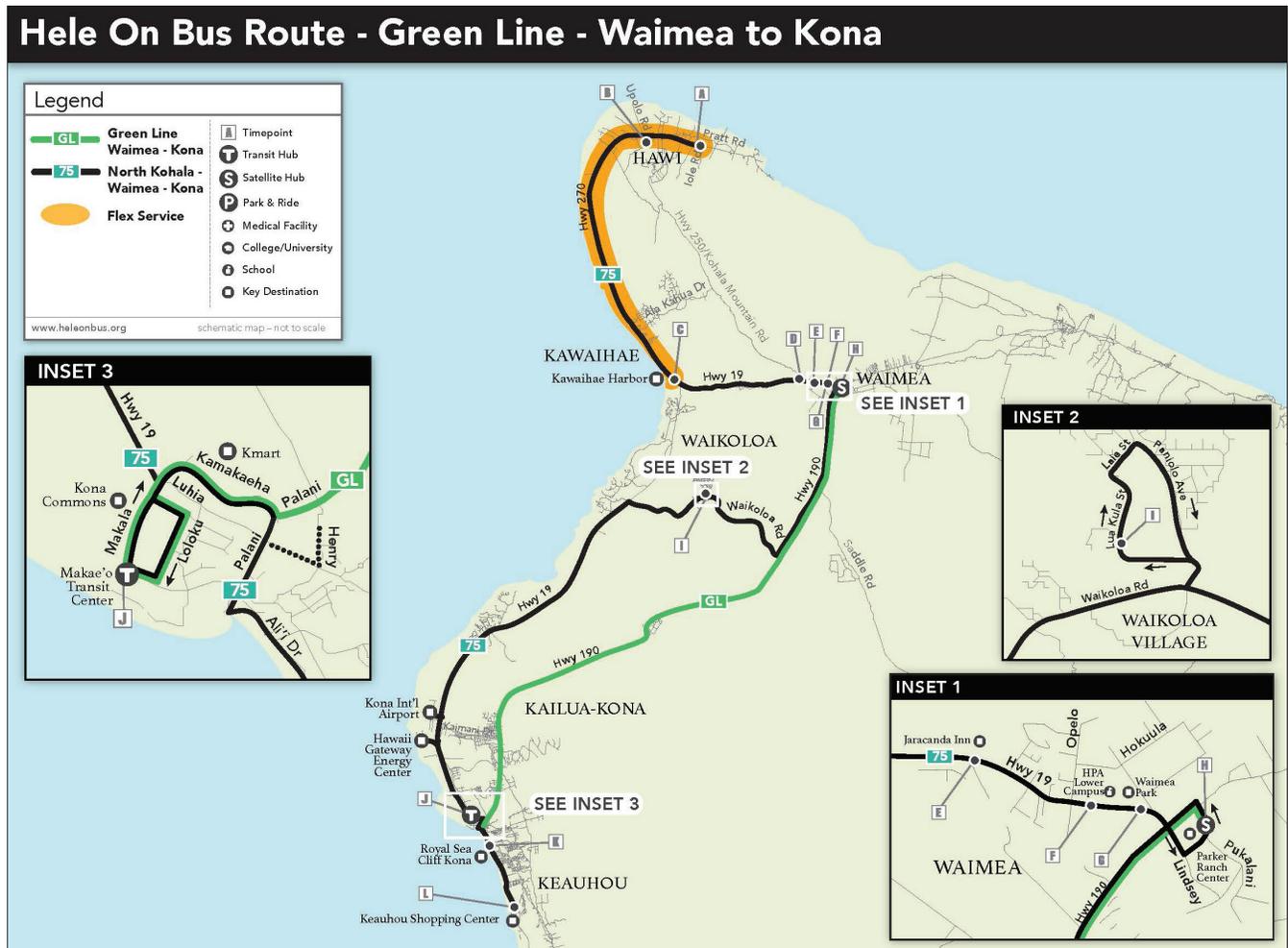
<i>Span of Service:</i>	6:20 AM to 5:35 PM; Monday through Saturday
<i>Headways:</i>	N/A
<i>Number of Trips:</i>	1
<i>Number of Vehicles:</i>	1 40-foot vehicle
<i>Implementation</i>	No change to service

There are no changes recommended for Route 70 North Kohala to South Kohala Resorts. There are five suggestions for Route 75 North Kohala – Waimea – Kailua Kona. Four are near term that can be implemented quickly:

- **Serve the Kona International Airport in both directions. In addition to serving the airport, passengers will have the opportunity to transfer to Route 203 at this location**

- **Serve a new Kona Hub “Makaeo Transit Hub” located at the entrance to the Old Airport Regional Park. The hub is accessed by Kuakini Highway at Makala Street**
- **Add Waimea to the Saturday trip. This will impact the running time by 45 minutes**
- **Add stops on Kawaihae Road at intersection to Ouli Ekahi access Road**

Figure 4-16. Route 75 North Kohala-Waimea-Kailua Kona and Green Line Express



Span of Service: 6:45 AM to 4:55 PM; Monday through Saturday

Headways: N/A

Number of Trips: 1

Number of Vehicles: 1 40-foot vehicle

Implementation Near term – add Kona International Airport, add Kona Hub, add Waimea Saturday service. Change schedules, passenger notification.

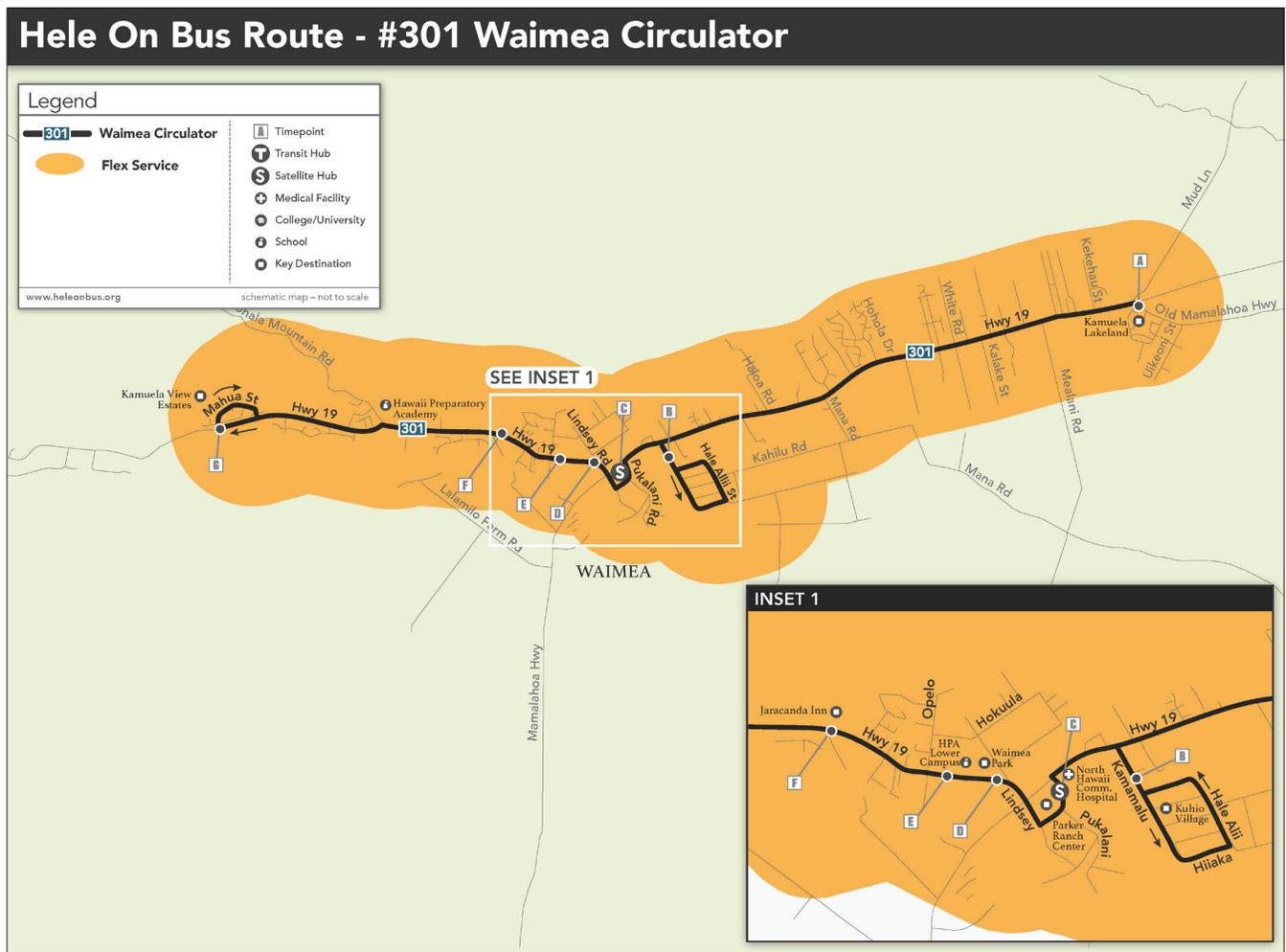
Long-term - set up dispatch call center or extend contract with A2B Transportation. This route would be operated by Hele-On, but it could be contracted to A2B or similar.

The fourth suggestion for Route 75 is to consider flex service for the North Kohala segment of the alignment (shown in Figure 4-15). This would be a long-term recommendation only to be considered if requests for service are continuous and the service has proven successful in other locations (Puna and Hāmākua). The Green Line Express Route will be discussed in the South Kohala section.

South Kohala District

South Kohala has five bus routes running through the District, Routes 1/2, 70, 75, 80, and 90. These routes serve both South Kohala residents and businesses. Route 301 Waimea provides service wholly within the District in Waimea as shown in Figure 4-16. Currently the route provides 11 trips with 60-minute service. The route has limited ridership and is a candidate for restructure. It is recommended that the route convert to flex service. This will accommodate ADA paratransit

Figure 4-17. Route 301 Waimea



<i>Span of Service:</i>	6:30 AM to 5:30 PM in Waimea; Monday through Saturday Green Line Monday through Sunday peak period only trips
<i>Headways:</i>	90 minutes
<i>Number of Trips:</i>	7.5
<i>Number of Vehicles:</i>	1 smaller “cutaway” vehicle 1 40-foot vehicle for the Green Line Express/2 trips in long term
<i>Implementation</i>	Intermediate to long-term. Change schedules, passenger notification, set up dispatch call center or extend contract.

trips which are required as complementary service to a fixed route. Providing more flexible service may also prove to encourage more riders as the service area is expanded. The hours of service are similar to the current schedule, but the number of trips are reduced to 7.5 operating with 90-minute headways to accommodate flexing off the route.

Figure 4-16 on the prior page shows the alignment of the new Green Line Express providing another opportunity for passengers to travel between Waimea and Kona. The initial trip would leave Waimea at 8:30 AM and depart the Kona TC at 5:30 PM to provide the return trip. It is anticipated that demand would create the need for a second trip departing Waimea at 7:00 AM with the return trip departing the Kona Hub at 5:00 PM.

Kona District

Current transit service within Kona is complicated. Kona is served by the North Kohala-Waimea-Kailua-Kona Route (1 roundtrip), the Pahala to South Kohala Resorts route (3 roundtrips), the Hilo-Kona Route (3 roundtrips) and the Intra-Kona Route. The Intra-Kona Route incorporates the trips of the other three routes into its schedule. Timepoints or major locations in the greater Kona area are served intermittently. There is no single location

in Kona where an intending passenger can access the various routes and find information on the system.

Further confusing the situation in Kona is that the Intra-Kona route may be served by different providers (changing day to day) that do not have bike racks, selected trips may be cancelled, and certain destinations may not be served as scheduled. This situation is due to a lack of operating buses which points to a need to establish a second maintenance facility (intermediate or longer-term solution) or contract with one of the private tour companies (short-term) that have a functioning maintenance facility in Kona.

However, Kona continues to grow and will continue to grow. The Kona and Hilo Districts currently provide almost the same number of jobs for County residents. By 2040, Kona is projected to provide 25 percent more jobs than Hilo. Residential and commercial development are expected to continue contributing to further congestion and commute times. For example, Kamakana Villages is a 2,330-home project being developed along Palani Road and Ane Keohokalole Highway (which will be served by Route 203). Developing a transit system focused on Kona will provide an alternative for residents and visitors alike.

Figure 4-17A. Kona Bus Waiting Area

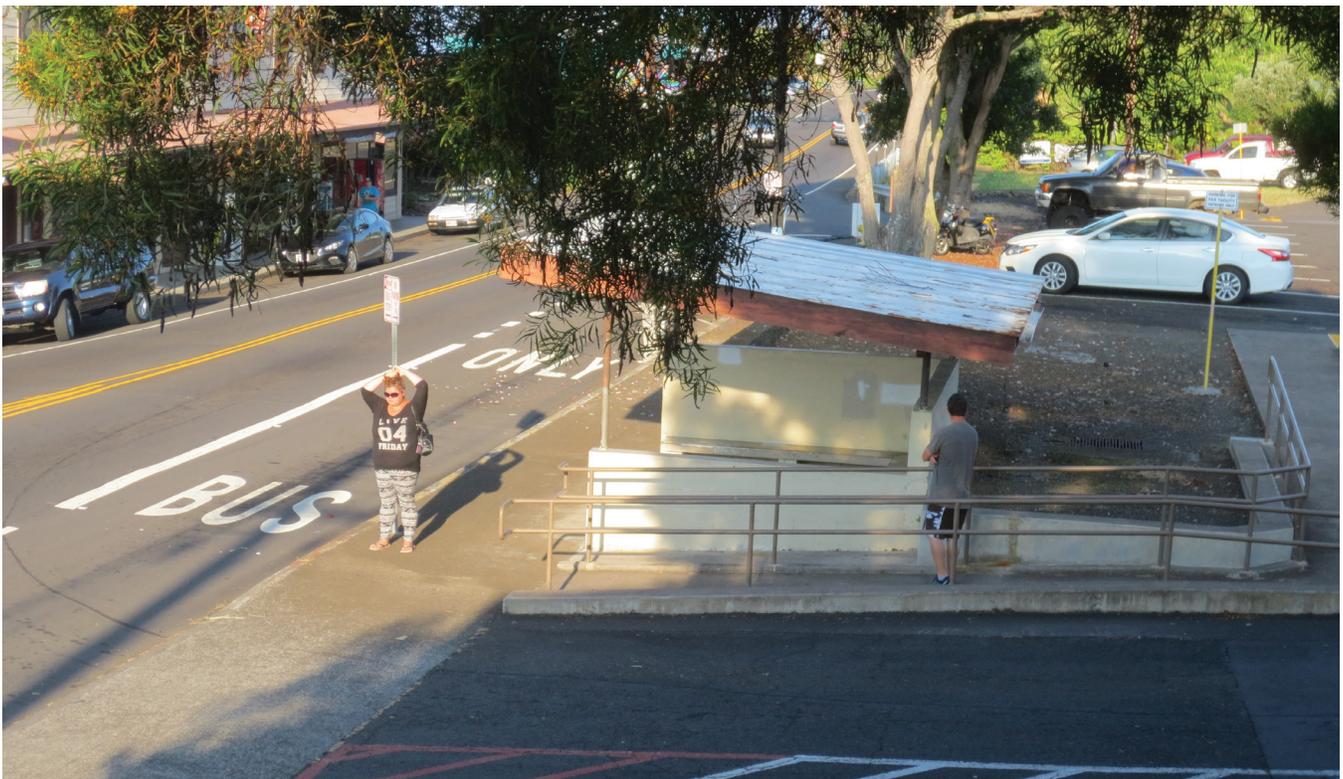


Figure 4-18. Kona Hub and Spoke System

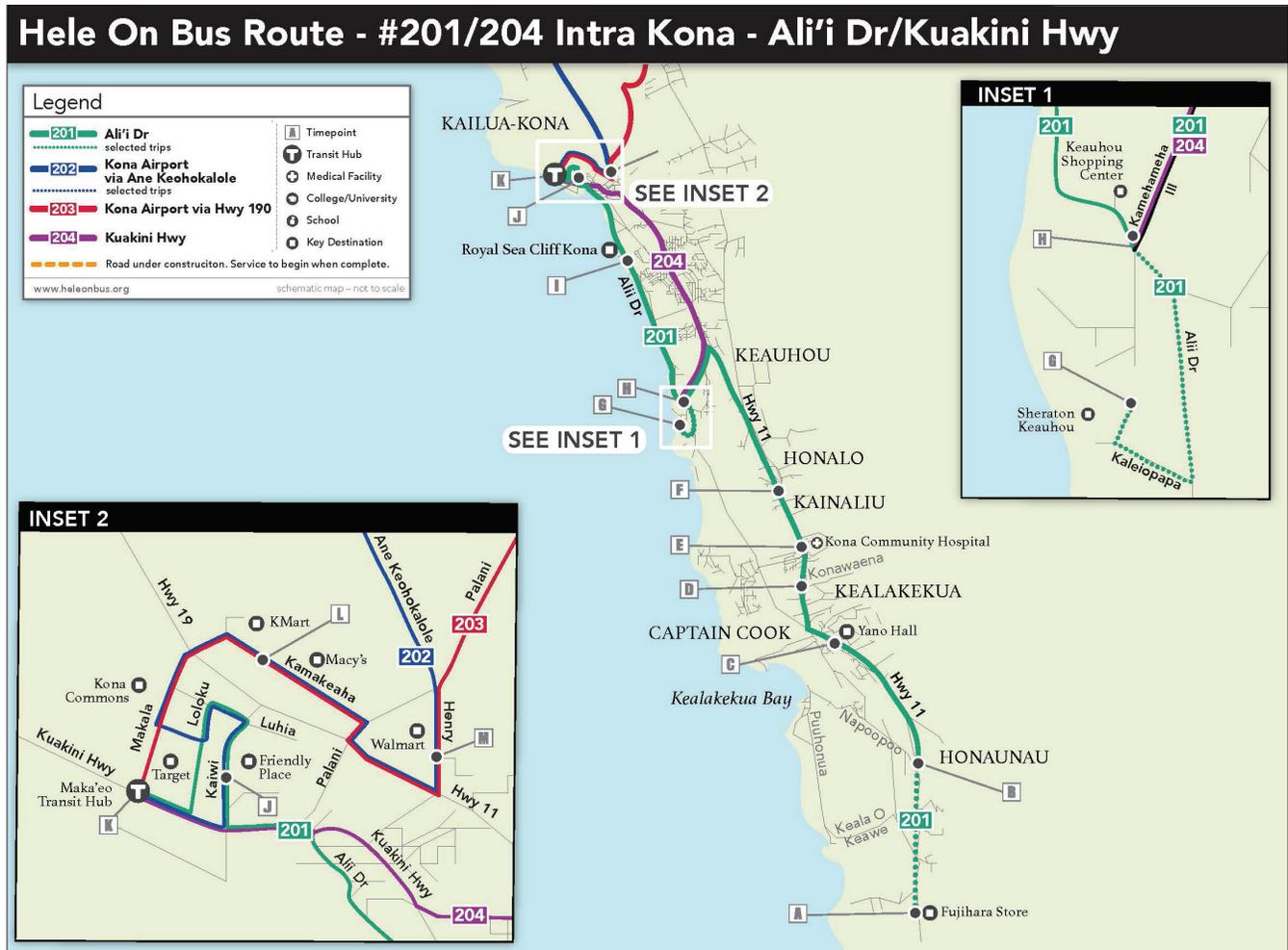


Four routes comprise the hub and spoke system for Kona shown in Figures 4-18 through 4-20. Instead of one route providing a myriad of routing possibilities, a system approach allows the routes to expand with continuing development. Visitors have a difficult time understanding how to use the current bus system. The hub and spoke system requires additional buses to be fully implemented with a minimum of 60-minute service. However, the principles of the system can be started with less frequent service.

Near to intermediate-term implementation requires 3 buses to service the system; one for each route. Route

201 South Kona-Alii Drive will operate on 2-hour headways with service starting in Kona at 7:00 AM and in Captain Cook (Yano Hall) at 8:00 AM. Earlier trips are provided by Route 1 Hilo-Kona and Route 90 Pahala to South Kohala Resorts. Route 201 terminates at the new “Makaeo Transit Hub” located at the entrance to the Old Airport Regional Park. The hub is accessed by Kuakini Highway at Makala Street. Amenities need to be added to this site, but it is workable for the near-term. Route 204 South Kona – Kuakini Highway provides nine trips between 7:00 AM and 7:00 PM connecting the Hub with Keauhou Shopping Center using Kuakini Highway.

Figure 4-19. Intra Kona Routes 201 and 204



Span of Service: 7:00 AM to 9:00 PM; Monday through Saturday

Headways: Route 201 - 120 minutes
Route 204 - 90 minutes

Number of Trips: Route 201 - 7
Route 204 - 9 (7:00 AM to 7:00 PM)

Number of Vehicles: 2 30 to 40-foot vehicles, can be served with “cutaway” vehicles

Implementation Near term: Change schedules, passenger notification if vehicles are available.

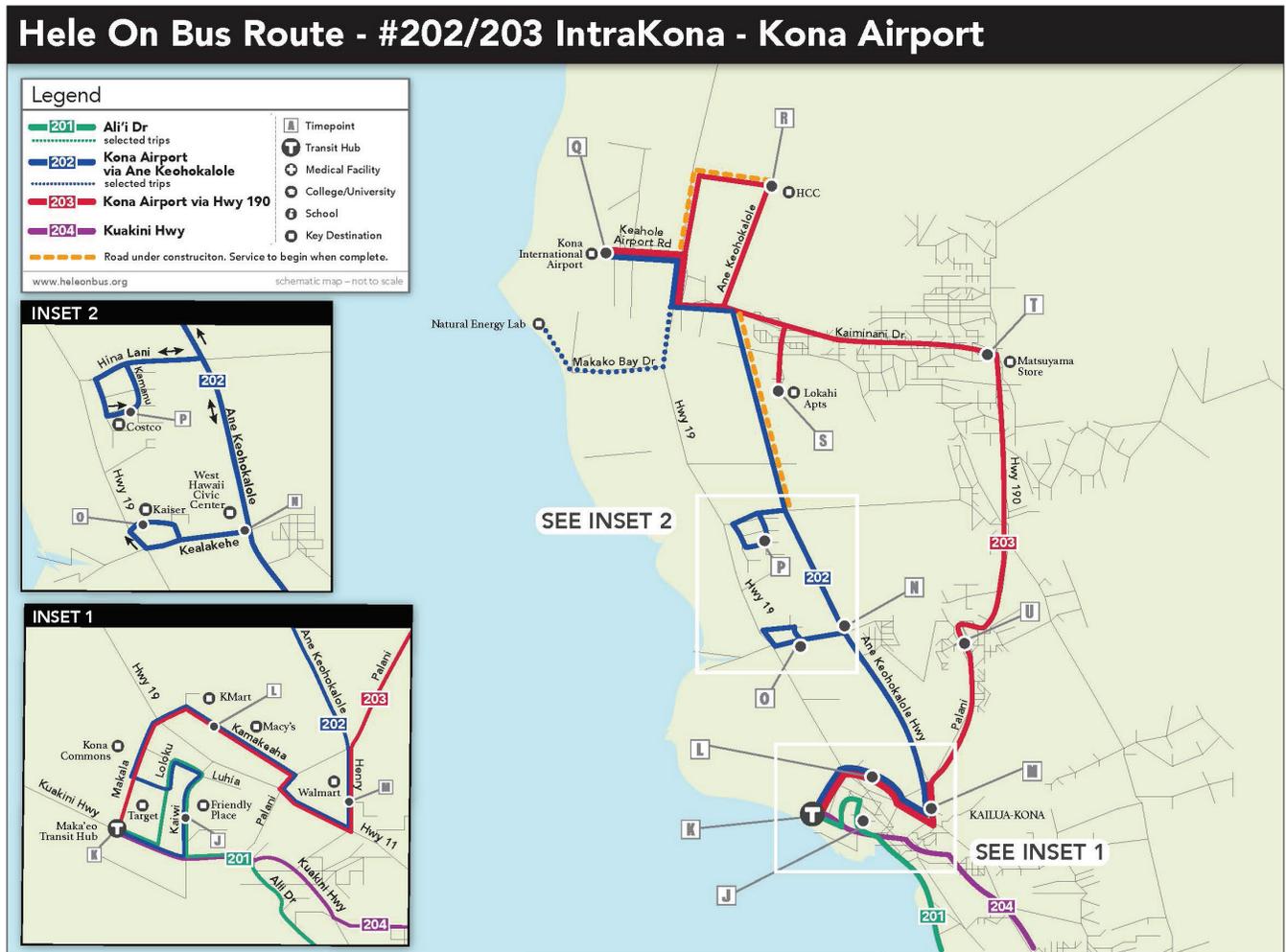
Intermediate to long-term: Add additional route to serve between the Hub and Keauhou Shopping Center via Kuakini Highway (Route 204). This route would be implemented later in the phasing of services.

Develop Transit Hub adding passenger amenities including real-time information, restrooms, bike storage, bike share, security, and perhaps other concessions. Long-term: As Kona continues to grow, add frequency requiring additional buses and operators.

Route 202 Airport via Ane Keohokalole Highway and **Route 203 Airport via Highway 190** provide 90-minute service in clockwise and counterclockwise loops. The routes terminate at the Makaeo Transit Hub and at the Kona International Airport where they are interlined into two one-way loops. Figure 4-20 shows that both Ane Keohokalole Highway and the connect-

ing road from HCC (Route 203) to Highway 190 are not completed. This is depicted with dashed orange lines. Route 202 will continue to the airport via Highway 19 after serving Costco and Route 203 will turnaround at HCC to continue to the airport if they are implemented prior to the road sections being completed.

Figure 4-20. Intra Kona Routes 202 and 203



Span of Service:

7:00 AM to 9:00 PM; Monday through Saturday

Headways:

Routes 202 and 203 - 90 minutes

Number of Trips:

Routes 202 and 203 - 9

Number of Vehicles:

2 30 to 40-foot vehicles, can be served with “cutaway” vehicles

Implementation

Near term: Change schedules, passenger notification if vehicles are available.

Intermediate to long-term: Develop Transit Hub adding passenger amenities including real-time information, restrooms, bike storage, bike share, security, and perhaps other concessions. Long-term: As Kona continues to grow, add frequency requiring additional buses and operators.

Ka'ū District

Ka'ū District is considered an underserved area. Housing is affordable, and lots have been sub-divided. By 2040, the percent growth in housing units is expected to be 64.7 percent over 2015. Ka'ū District has very few jobs available. Ka'ū has the second lowest number of jobs as compared to the other districts; this is not expected to change. Residents must commute long distances to access both jobs and most services.

Hele-On provides commuter service to Ka'ū residents. One roundtrip is provided to Hilo and three roundtrips are provided to Kona/South Kohala Resorts. One park-and-ride lot located in Ocean View is used by both Hele-On commuters and school bus passengers. This is a basic lot with no amenities, including lighting, paving, or restroom facilities.

Figure 20A. Ocean View Park & Ride



With its rural, isolated area, housing is affordable, although spread out. This attracts residents who have limited resources. It also makes serving this vast area difficult. Many roads are private, in poor repair, and some are gated. Challenges to providing a transit circulator or loop route include the large blocks that were laid out in Ocean View. These blocks are quarter-mile square and encompass almost all the community.

Ka'ū has two bus routes serving the District: **Route 10 Ka'ū – Volcano – Hilo** and **Route 90 Pahala – South Kohala**. Route 10 has one roundtrip provided daily starting at the Ocean View park and ride lot. Route 90 provides three roundtrips starting in Pahala.

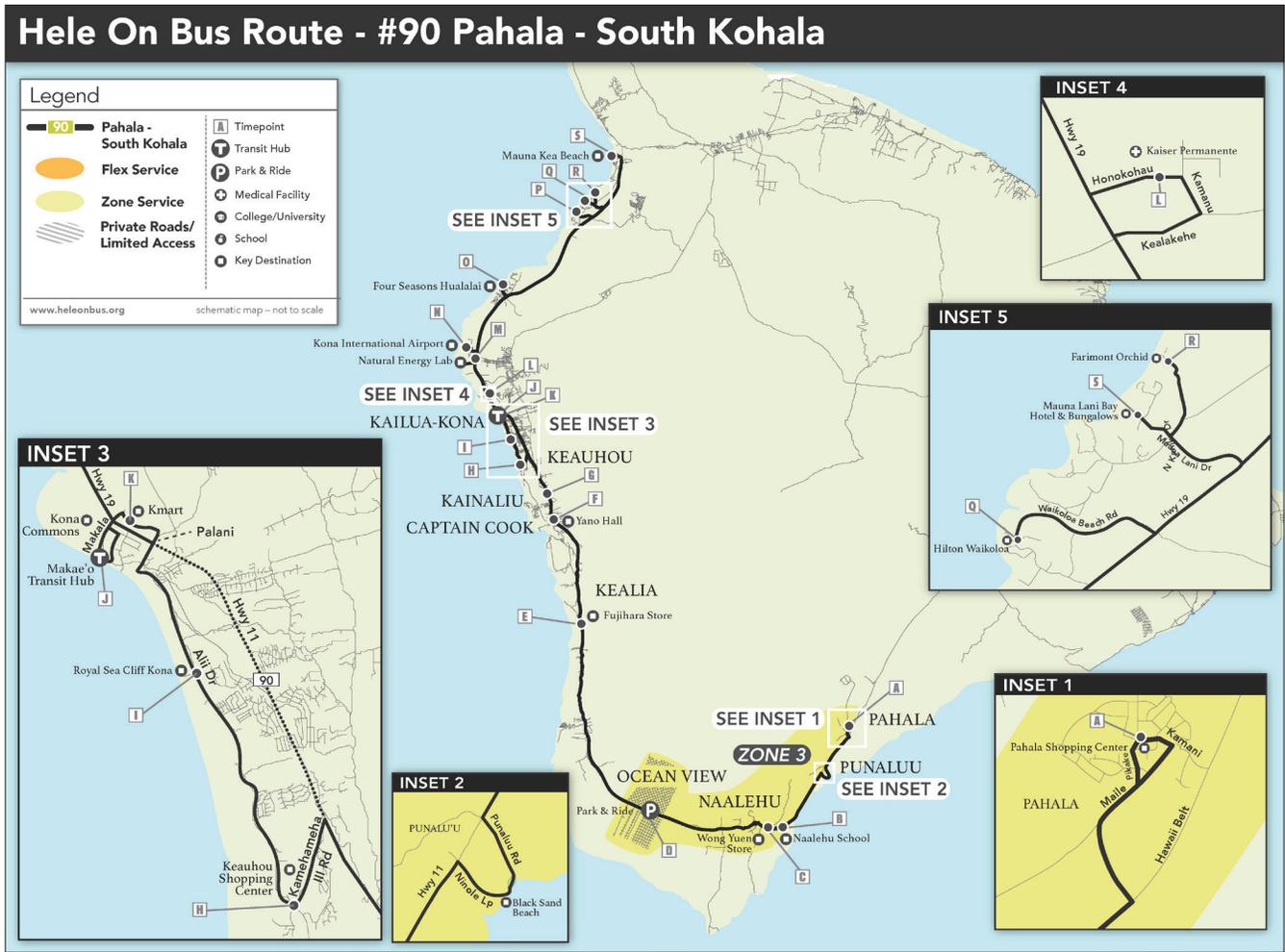
The majority of service recommendations for Ka'ū are intermediate or longer-term as they require additional vehicles. Near term recommendations include minor alignment changes for Route 90. Route 90 will take advantage of the hub location in Kona as shown in Figure 4-21. Route 90 will serve the Kona International Airport on all trips, but will no longer divert to HCC or Kona Palisades (these destinations will be served by new Route 203).

Intermediate to long-term recommendations include adding:

- **One additional round trip on Route 90 (to the Kona Hub)**
- **Two additional roundtrips between Ocean View and Volcano to connect with Route 10. One of these trips would operate on Sunday to match the Red Line Express**
- **On Mondays and Wednesdays, zone service (Zone 3) will be available to anyone within the zone (that has clear, safe access and paved roads). As with paratransit and flex services, intending passengers need to make a reservation at least 24 hours in advance for the pickup and return trips. Trips will be grouped within the zone, so passengers have the opportunity to reach the main route between Ocean View and Volcano**

It is expected that the zone service will gauge the public's demand for additional transit services or service days. A one-to-two-year trial period should be implemented after which a review of the service utilization should be conducted. Requests for community circulation within the communities of Ka'ū have been made. Zone service will allow MTA to see where service is used and in the longer term perhaps upgrade to flex service with more service days. The zone service will share the vehicle with two other zones to start. If additional service days become necessary, then another vehicle would be added assuming all zone services continue to operate.

Figure 4-21. Route 90 Pahala to South Kohala



<i>Span of Service:</i>	3:30 AM to 7:45 PM; Monday through Saturday; 1 trip on Sunday
<i>Headways:</i>	N/A
<i>Number of Trips:</i>	3 – Pahala to South Kohala Intermediate or long term 1 - additional trip Pahala to Kona Hub (9 AM departure); intermediate-long term zone demand response on Mondays and Wednesdays (same description on Route 10 in Figure 4-21)
<i>Number of Vehicles:</i>	3 40-foot vehicles (Pahala to Kona) 1; additional 30 to 40-foot vehicle for added Pahala to Kona trip 1; cutaway (additional) ADA vehicle Mondays and Wednesdays
<i>Implementation</i>	Near term: Change schedules, passenger notification Intermediate to long-term: Upgrade Ocean View park and ride lot. Change schedules, passenger notification, set up dispatch call center or extend contract with A2B Transportation. This service would be operated by Hele-On, but it could be contracted to A2B or similar.

Puna District

Puna's population is expected to continue to grow. Puna has more affordable housing and is within an acceptable distance to Hilo. Puna has multiple town centers including Pāhoa, Kea'au, Kurtistown, and Volcano. New development is proceeding in Pāhoa and a future town center is identified in the Puna CDP for Hawaiian Paradise Park.

Executive Order 12898, issued February 11, 1994, requires Federal agencies to achieve environmental justice by identifying and addressing disproportionately high and adverse human health or environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States. The County as a recipient of federal funds is required to identify environmental justice (EJ) populations to assess the distribution and equity of transportation projects.

An analysis of EJ populations within the county was conducted. Using Census block groups, minority populations and households below the poverty line were plotted using a one standard deviation above mean. For minority population, one standard deviation above mean is 85.0 percent and for households below the poverty line, one standard deviation above mean is 27.7 percent. In this analysis, 16 block groups are selected as EJ for minority population, 19 block groups are selected for households below the poverty line, and one block group is selected based on both characteristics. EJ areas are centered in Puna, Ka'ū, Hilo and Hāmākua. These findings show the importance of making sure transportation services are available in these geographic areas. Appendix B contains the island's EJ maps.

A full hub and spoke system is recommended to serve Puna. Transit services will include express, connector, circulator, flex, and zone routes. However, implementation cannot occur overnight. Infrastructure, vehicles, and drivers are needed. Therefore, services will be phased. Near, intermediate, and longer-range actions to reach the full system are briefly listed below and discussed more fully in the following pages:

- **Near-term:**

Update schedules for on-time performance; introduce flex service for Hawaiian Beaches, Nanawale, and between Pāhoa and Kea'au; install passenger shelters on Kahakai Boulevard for temporary hub; disconnect

residential service along Highway 130 from Route 40; provide circulator/flex service for those areas; initiate installation of formalized bus stops; and, start planning process for hubs.

- **Intermediate:**

Continue planning and design for hubs and start construction; continue formalized bus stop installation; start zone service; add expanded Hawaiian Paradise Park and Ainaloa/Hawaiian Acres service; add expanded Nanawale service; separate Fern Acres from Route 10 and add circulator; and, add additional trips to Route 40.

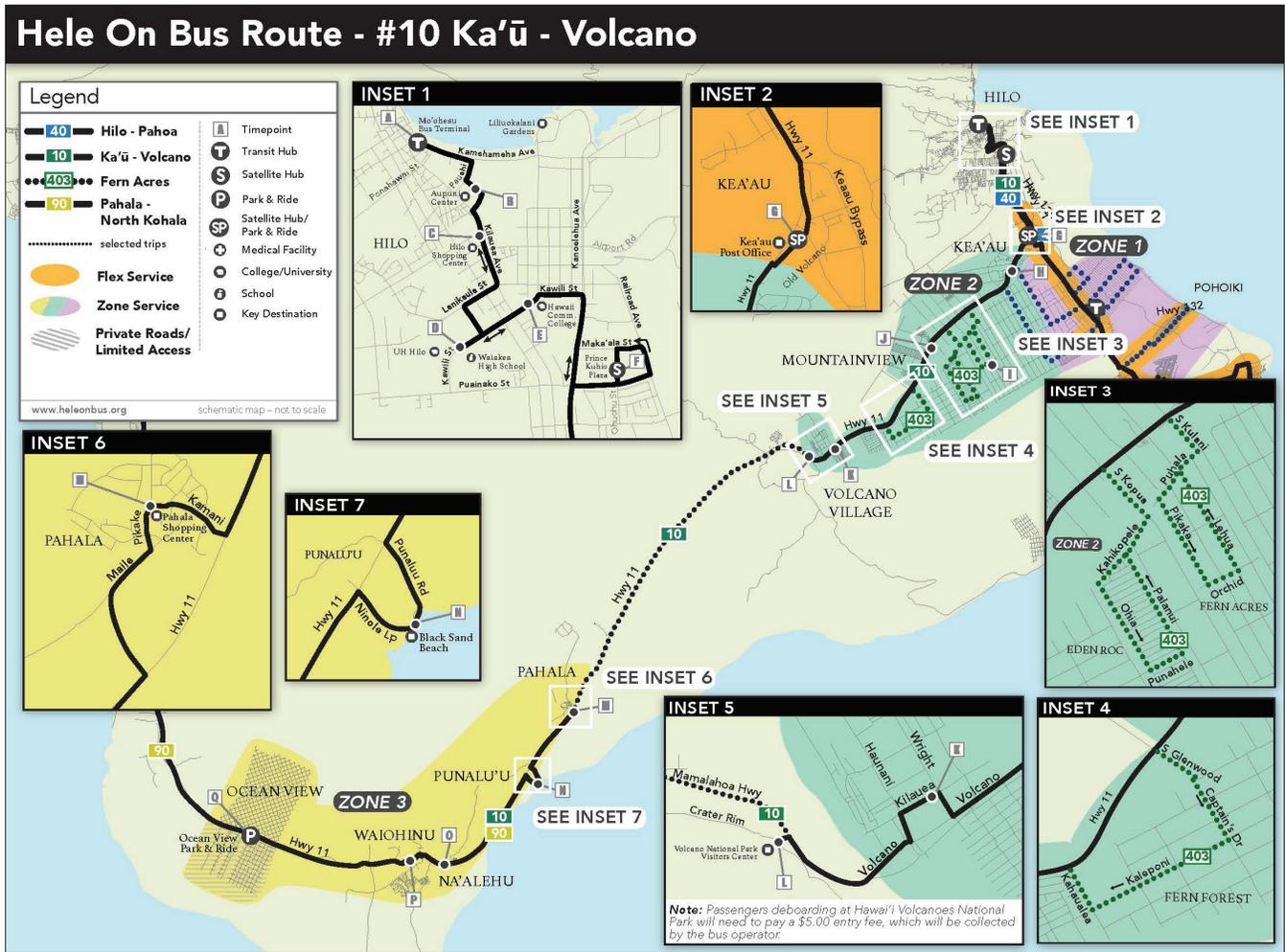
- **Intermediate to longer-term:**

Add Red Line Express; add Orchidland, Fern Forest, and Eden Roc circulator services; add Sunday service to Red Line and Route 40; continue bus stop installation; adjust flex and zone services as needed; and, open fully developed hubs.

Two hubs are planned for Puna one in Pāhoa and one in Kea'au supporting the transit services. Kea'au is recommended to support a park-and-ride lot. Fully developed hubs would be in a longer-term time frame. Puna Kai is under development and will provide 103,600 square feet of retail and business space. This new construction, will add a transit stop in addition to road extensions. It would be ideal to carve out space for a larger Pāhoa hub to include a secure park-and-ride lot. Comments during the CDP process included residents indicating they would share rides and park to access the bus if a secure location were available. Partnering with the new development to provide security would increase transit ridership and allow passengers to shop at the development on the way to and from transit.

In the near-term a temporary hub could be located on Kahakai Boulevard between Pāhoa Bypass Road and Pāhoa Village Road. Buses would remain on-street in this near-term scenario. Working with adjacent businesses may provide the opportunity for shared security and shared use of parking spaces for park and riders. Two passenger shelters should be scheduled for this location. In the intermediate and longer-term, the new Puna Kai development may offer an off-road hub where expanded amenities can be added.

Figure 4-22. Route 10 Ka'ū – Volcano – Hilo and Zone Service



Span of Service:

6:40 AM to 5:15 PM; Monday through Saturday (Ocean View)

Headways:

N/A

Number of Trips:

1 - Ocean View to Hilo near-term
 2 - trips Ocean View to Volcano; intermediate-long term
 Demand response on Mondays and Wednesdays (Zone 3)

Number of Vehicles:

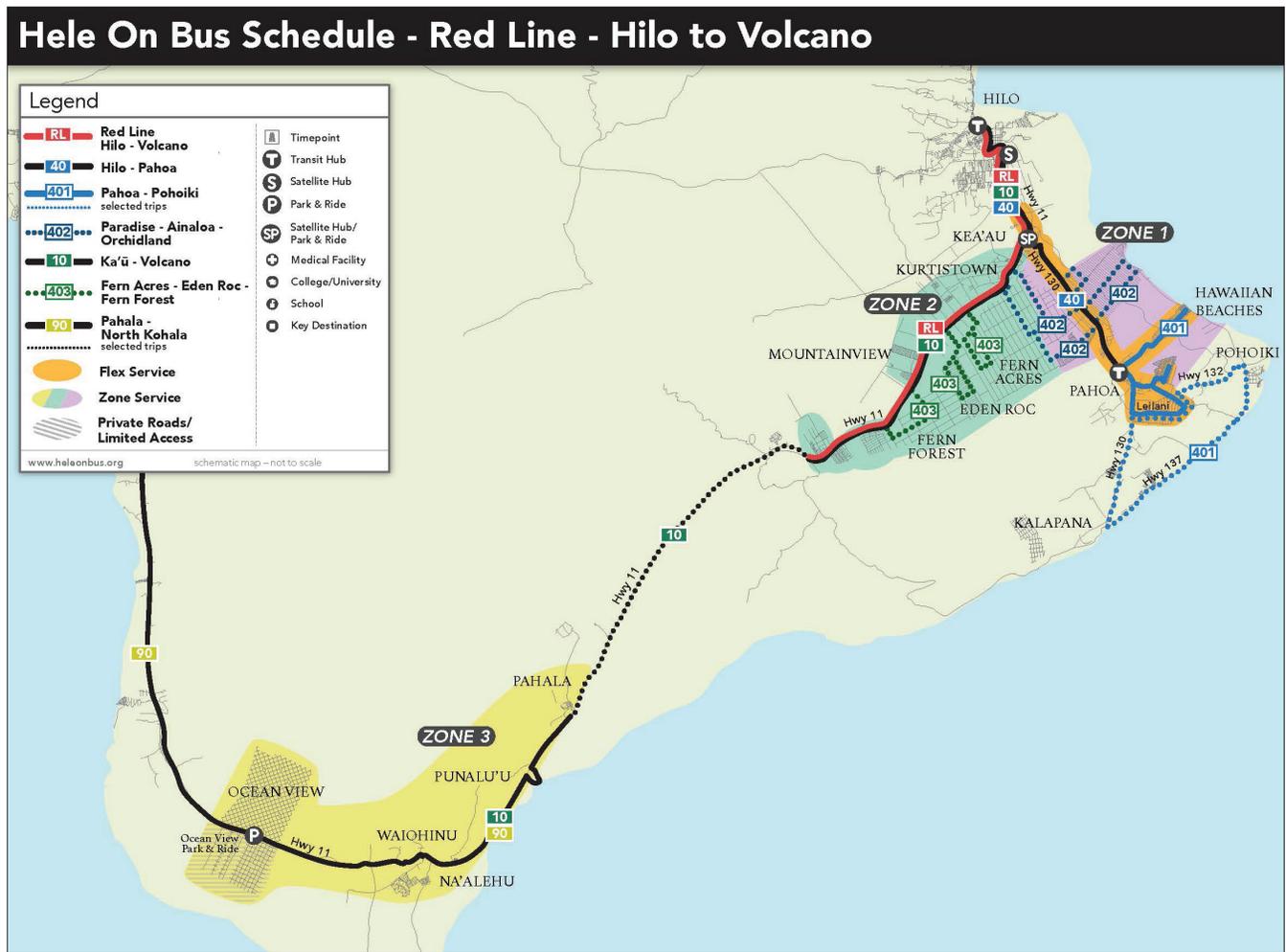
1 40-foot vehicles, near term
 1; additional 30 to 40-foot vehicle (can use smaller cutaway)
 2; cutaways (long term) to serve Fern Forest, Eden Roc, and Fern Acres
 1; cutaway (additional) ADA vehicle Mondays and Wednesdays

Implementation

Near term: Change schedules, passenger notification. Identify connecting services on maps.

Intermediate to long-term: Add service to Fern Forest, Eden Roc, and Hawaiian Acres. Upgrade Ocean View park and ride lot. Change schedules, passenger notification, set up dispatch call center or extend contract with A2B Transportation. This service would be operated by Hele-On, but it could be contracted to A2B or similar.

Figure 4-23. Red Line Express/Route 10/Route 403 Ka'ū – Volcano – Hilo and Zone Service



Span of Service: 6:10 AM to 6:55 PM; Monday through Saturday; Sunday service on Red Line

Headways: N/A

Number of Trips: 5 roundtrips – Volcano to Hilo near-term
 2 roundtrips– Red Line Express
 2 AM and 2 PM trips Route 403 for each community
 Demand response on Tuesdays and Thursdays (Zone 2)

Number of Vehicles: 1 40-foot vehicle, near term
 1 40-foot vehicle for Red Line Express
 1; cutaway (additional) ADA vehicle Tuesdays and Thursdays (same vehicle as used on Mondays and Wednesdays Zone 3)
 2; cutaway ADA vehicles for Route 403

Implementation Near term: Identify connecting services on maps.
 Intermediate to long-term: Change schedules, passenger notification, set up dispatch call center or extend contract with A2B Transportation. This route would be operated by Hele-On, but it could be contracted to A2B or similar.

Puna is served by two Hele-On bus routes: **Route 10 Ka'ū-Volcano-Hilo** oriented along Highway 11 and **Route 40 Hilo-Pāhoa-Pohoiki** serving along Highway 130, shown in Figure 4-22. Both routes are frequently behind schedule due to congestion and route length. Route 10 currently has one diversion to Fern Acres which is recommended to be provided by a new **Route 403 Fern Acres, Eden Roc, and Fern Forest**, shown in Figure 4-24. This will allow Route 10 to remain on the highway. The roads in these subdivisions are not geared for the larger buses. Currently Fern Acres is served with one inbound to Hilo trip at 9:40 AM and one return trip at 2:30 PM. A common discussion point during the public outreach was that these times are not sufficient to serve commuters. Therefore, the revised Route 403 will be scheduled such that commuters from all three communities will be able to access jobs and school in Hilo and return in the late afternoon. Other trips such as medical or shopping trips can be accommodated on the two days that zone service will be offered.

The new **Red Line Express** will provide an additional trip between downtown Hilo and Volcano. The route, operating on the Route 10 alignment, will depart MBT at 8:30 AM. This trip plus the 9:50 AM inbound trip departing Volcano National Park Visitor Center will provide the communities along Highway 11 with another opportunity to access jobs, schools and other services. An evening trip will depart MBT at 5:15 PM providing a commute home option. Routes 10, 40, 402, 403 and the Red Line Express will serve a future park and ride lot in Ke'au proposed by the Office of Planning, State TOD/TRD Strategic Plan. The site for the potential park and ride lot is approximately .18 miles west of the Ke'au Post Office. This will be a good location for flex and zone services in the region to meet for passengers to transfer.

On Tuesdays and Thursdays, zone service (Zone 2) will be available to anyone within the zone (that has clear, safe access and paved roads). As with paratransit and flex services and as discussed for Zone 3, intending passengers need to make a reservation for the pick-up and return trips. Trips will be grouped within the zone, so passengers have the opportunity to reach the main

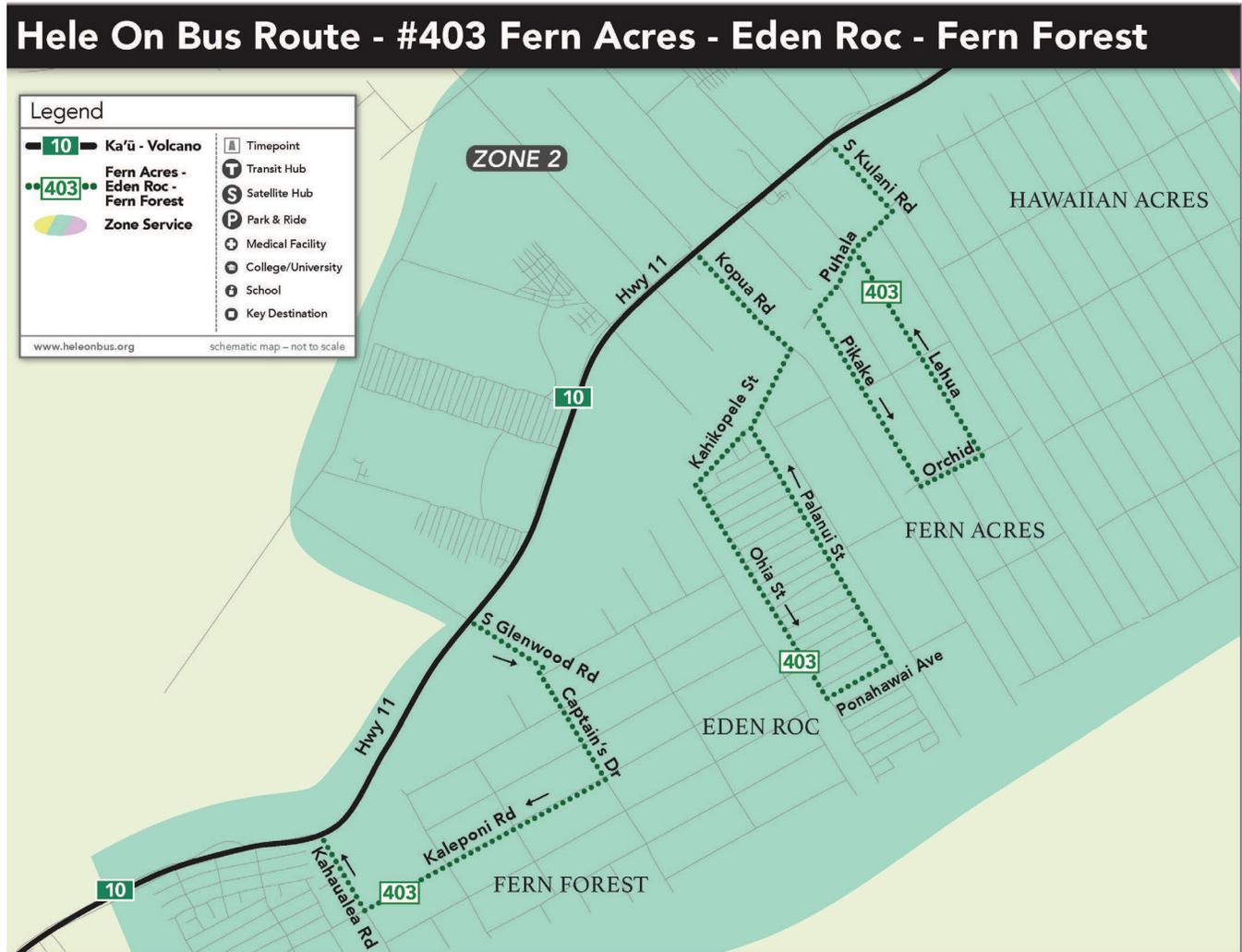
route for a timed connection. It is expected the zone service will gauge the public's demand for additional transit services or service days. A one-to-two-year trial period should be implemented after which a review of the service utilization should be conducted. Zone service will allow MTA to see where service is used and in the longer term perhaps upgrade to flex service with more service days.

The zone service for Zone 2 will share the vehicle with Zones 1 and 3 to start. If additional service days become necessary, then another vehicle would be added assuming all zone services continue to operate. Zone 1 will have service on Fridays. One day is suggested since the proposed circulators in Hawaiian Paradise Park will have more coverage than current services.

Many comments were received during the community meetings and from individual mail and email submissions from Puna District residents and from the Councilmembers representing the District. Overwhelming support for expanding service into Puna's large residential divisions was the overall theme of those comments. Most were concerned about the ability to get to jobs and schools in the morning and have return trips in the afternoon and evening. A network of community commuter-oriented services has been designed for Puna District. These routes will connect to the main connector Routes 10 and 40 and the new Red Line Express. The routes are described as follows:

- Route 10 and Red Line Express Hilo to Volcano: Operates between Hilo MBT and Volcano National Park Visitors Center. The routes provide service to Volcano Village via Wright Road, Kilauea Road, Haunani Road and Old Volcano Road. Sunday service will be provided by the Red Line Express
- Route 40 Hilo to Pāhoa: Operates current alignment from Hilo to Pāhoa along Ke'au- Pāhoa Road to Pāhoa Village Road, traveling through the town and turning on Pāhoa Bypass Road to access the Hub on Kahakai Boulevard where the route would meet with the community circulators. Limited number of trips will operate on Sundays. Route 40 is shown in Figure 4-23.

Figure 4-24. Route 403 Fern Forest, Eden Roc and Fern Acres

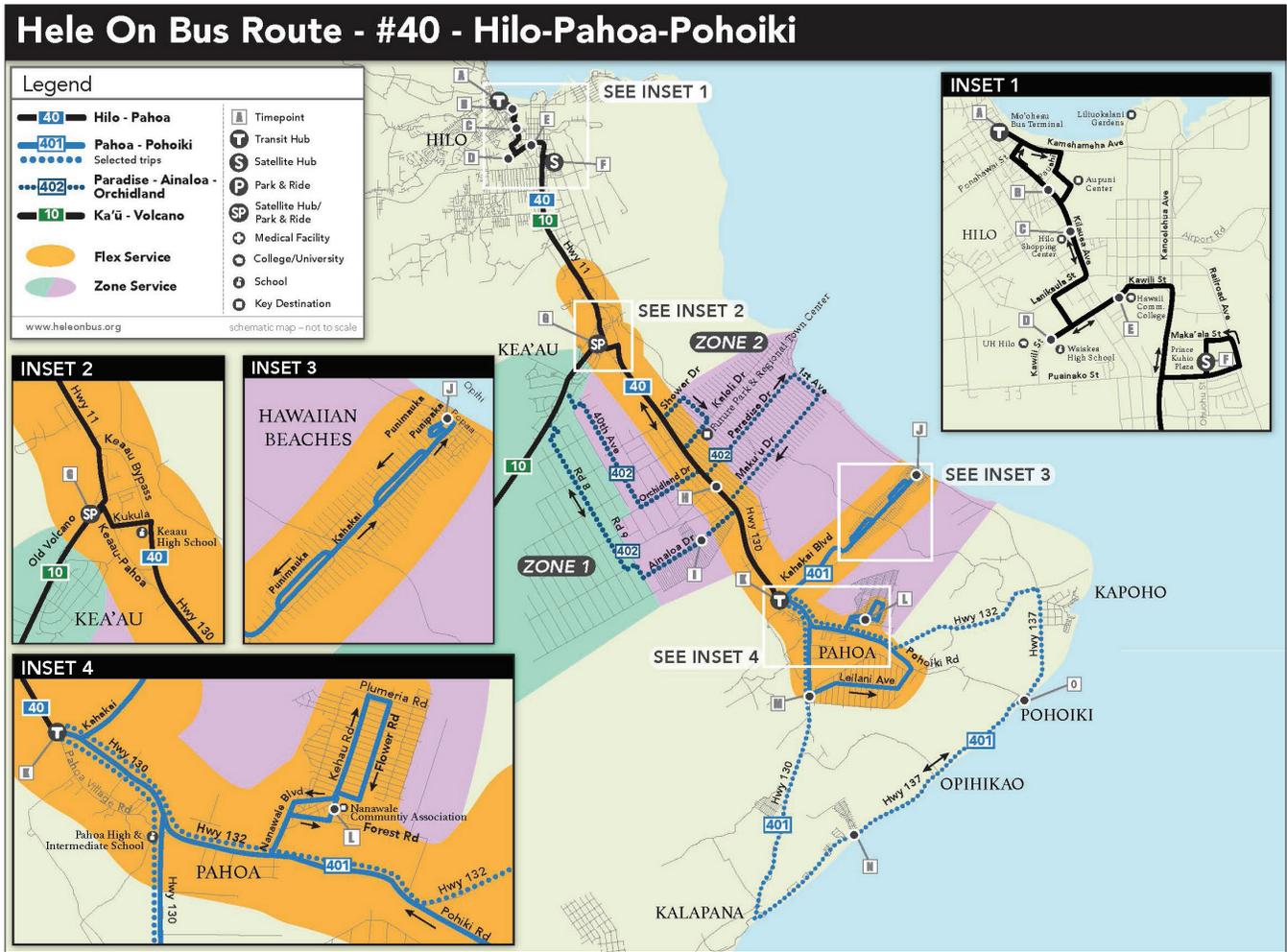


- Route 401 Hawaiian Beaches/Nanawale/Kalapana will use two vehicles serving these communities. The route is shown in Figure 4-25. Flex service will be provided between Kea'au and Nanawale and Hawaiian Beaches. Service within Nanawale is extended along Kehau Road to Mauna Kea (this road may need upgrading to support transit service), then right onto Flower Road continuing to Nanawale Boulevard. This extension further into the community will provide service opportunities to those who currently do not have easy access to transit. Four trips (currently three are provided) will serve the Pohoiki to Kalapana loop; two in the morning and two in the afternoon/evening. The two morning and afternoon trips will operate one in the clockwise direction and one in the counterclockwise direction.
- Community commuter services are expanded in Hawaiian Paradise Park, Ainaloa, Orchidland, and Hawaiian Acres. These communities will be served by Route 402 Hawaiian Paradise Park/Ainaloa-Hawaiian Acres/Orchidland shown in Figure 4-27. Service within Hawaiian Paradise Park has been substantially changed. New service will be provided on Shower Drive from Kea'au-Pāhoa Road (Highway 130) to right onto Ohe Avenue (24th Street) and right onto Kaloli Drive to return to Highway 130. This new routing will provide service to a future Park and Town Center planned for development on Kaloli Drive between 26th and 24th (Ohe) Streets in addition to serving residents. Current service within Hawaiian Paradise Park along Paradise Drive and Makuu Drive will be extended to 1st Avenue
- Currently Ainaloa is served only as far as the Ainaloa Community Association leaving much of the community unserved. Hawaiian Acres is currently not served by transit except from Route 10 operating on Highway 11.
- New Ainaloa/Hawaiian Acres service will extend beyond the Ainaloa Community Association and continue to a right on 9 Road, left on F Road, right onto Moho Road (8 Road), to A Road and a left onto Kuauli Road to Highway 11. This alignment connects Ainaloa and Hawaiian Acres providing service between Highways 11 and 130. The service will provide two AM and two PM trips. Future plans may include a bike and pedestrian connection between the Ainaloa Community Association and Pāhoa allowing users to bypass Highway 130. The new circulator alignment will provide connections for users to extend their trip via bus
- Similar to Hawaiian Acres, Orchidland is not served by transit except from the highway. Two AM and two PM trips will provide service via Orchid Lane Drive from Highway 130, to right onto 40th Avenue and left onto Ola'a Road to Highway 11. This service will be implemented later in the program due to an approximate 2-mile section of roadway that would need to be paved

The Hawaiian Acres and Orchidland trips would connect with Route 10 at the Kurtistown passenger shelter or with Routes 10 and 40 at the Kea'au hub when developed.

The Pāhoa oriented flex service should be implemented to serve ADA qualified passengers and to keep Route 40 on schedule by remaining on the highway and not diverting into the neighborhoods. One additional bus is required to make the hub and spoke system work in Pāhoa.

Figure 4-25. Route 40/401/402 Pāhoā Service Area



Span of Service: 5:20 AM to 10:45 PM; Monday through Saturday; Sunday service on Route 40

Headways: 75-minute with implementation

Number of Trips: 15 roundtrips Route 40
15 trips Flex service
2 AM and 2 PM trips community circulators
Demand response Zone 1 on Fridays

Number of Vehicles: 2 30 to 40-foot vehicles, near term Route 40
4-cutaways for flex services and community circulators
1; cutaway ADA vehicle Fridays (shared Zone service vehicle)

Implementation Near term: Change schedules, passenger notification. Identify connecting services on maps. Formalize temporary hub/bus stop and start discussions with Puna Kai Development.

Intermediate to long-term: Change schedules, passenger notification, set up dispatch call center or extend contract with A2B Transportation. These routes would be operated by Hele-On but could be contracted to A2B or similar.

Figure 4-26. Route 401 Hawaiian Beaches, Nanawale, Kalapana

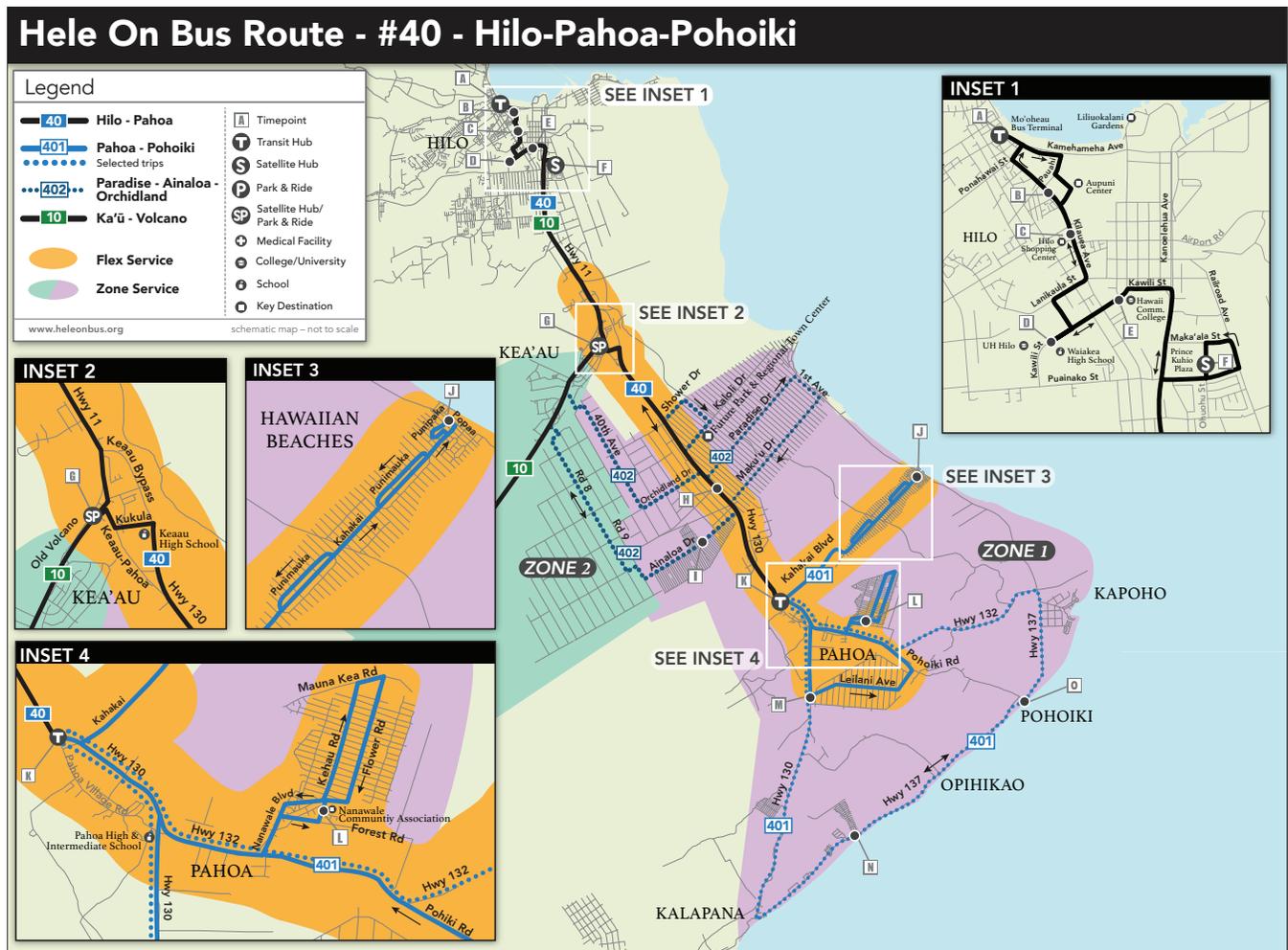
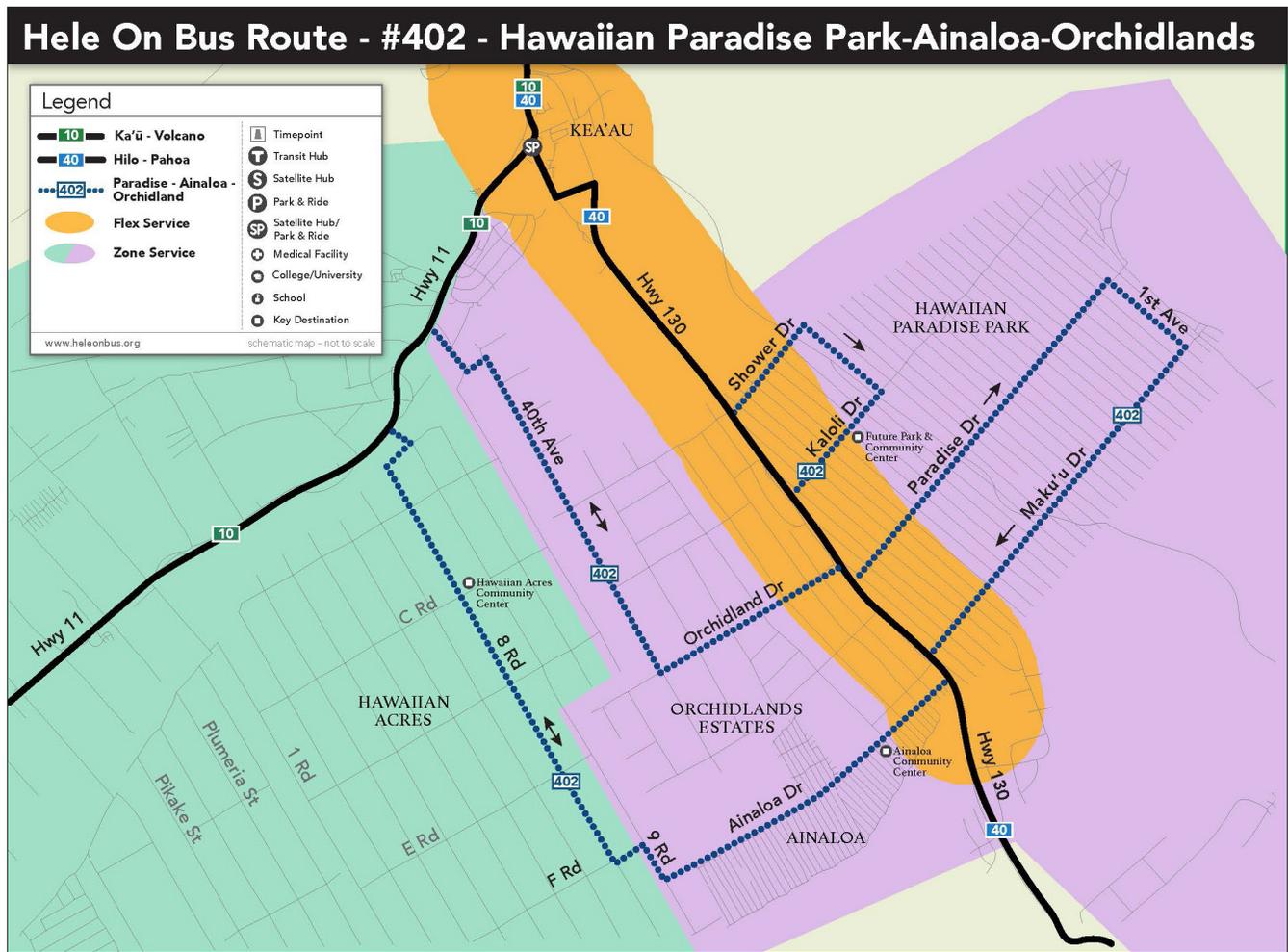


Figure 4-27. Route 402 Hawaiian Paradise Park, Ainaloa, Hawaiian Acres, Orchidland



4.3.4 Summary

Table 4-5 provides a description of the number and types of bus vehicles that are needed to support this service. The fleet information carries over into Chapter 5.2 which discusses the number of vehicles that need to be purchased to increase the fleet size and to replace older vehicles that have reached their useful life.

Many service improvements have been proposed for MTA. These changes have been justified by the technical analysis presented in this report and by detailed comments received from passengers documented during the Passenger Survey. Discussions with bus drivers and passengers have added to assessment of needs. This detailed assessment included a thorough review of the individual District Community Development Plans and the County General Plan. Additional comments and recommendations were provided by stakeholders and the public during a series of community meetings.

The proposed new routes and service concepts summarized in Table 4-4 will require supporting infrastructure including new bus stops, vehicles, infrastructure and additional drivers. The service plan requires operating and capital funds to be available for full implementation. The Financial Plan and Capital Program defines those costs and provides a timeline for implementation phasing.

Table 4-5 provides a listing of which size bus is being recommended according to the service improvement. At full fleet size, there would be ten 20-foot buses, eighteen 30-foot, and thirty-two 35-40 foot vehicles. This fleet size assumes MTA provides all services including commuter, flex and zone paratransit. If MTA contracts commuter or paratransit services, then the vehicle fleet can be reduced.

Table 4-4. Summary of Proposed Services by District

CURRENT SERVICES			PROPOSED SERVICES		
DISTRICT	Hele-On Reference	Number of Trips	Route Number	Number of Trips	Changes/Additions
Hilo	Hilo/Kona	3 OW	1	3 OW	Serves new Kona Hub
	Intra-Hilo Keaukaha	8 RT	101	9 RT	Modifies service to provide every other trip to King's Landing offering a more direct trip to Banyan Drive and MBT from Airport. Adds new service to North Hilo. Sunday service is introduced.
	Intra-Hilo Kaumana	5 RT	102	7 RT	Kaumana City is provided 1 RT departing KC at 7 AM and returning from MBT after 5 PM. 3 additional trips are offered to the Gentry subdivision turnaround and 3 trips serve Waiuanue Ave.
	Intra-Hilo Waiakea-Uka*	2 RT	103	9 RT	6 trips will serve Waiakea-Uka and 3 additional trips will serve as far as PKP. Service to gym is discontinued and service to North Hilo is added.
			104	6 RT	New route serving center Hilo including Mohouli housing, St. Joseph School, Kamana Senior Center and housing and County agencies.
			Blue Line Express	2 RT	Express service between MBT and Kona Hub via Daniel K. Inouye Highway. Sunday service is added.
	Hilo/South Kohala Resorts*	9 RT	80	9 RT	2 trips will travel from MBT to South Kohala Resorts via Daniel K. Inouye Highway.
Hāmākua	Hilo/Honoka'a*	2 RT	60	4 RT	Flex service is introduced to provide access to transit to the villages and small towns along the coast. The route will divert 3/4 mile off route to serve prearranged pickups. Park and ride locations are identified.
North Kohala	North Kohala-South Kohala	1 RT	70	1 RT	none
	North Kohala-Waimea-Kona	1 RT	75	1 RT	Service is added to the Kona Airport. Saturday service to Waimea is added. Longer term flex service is added as demand warrants.
South Kohala	Waimea Shuttle	11 RT	301	7.5 RT	Flex service is introduced. The route will divert 3/4 mile off route to serve prearranged pickups.
			Green Line	2 RT	Express service added between Waimea and Kona Hub. Sunday service is added.
					Waimea Hub is developed.
Kona	Kona/Hilo	3 OW	2	3 OW	Provides service to Kona Hub
	Intra-Kona*	6 RT	201	7 RT	4 Kona oriented circulator routes replace the current Intra-Kona service. All 4 routes connect at a new Kona Hub located in the vicinity of the Old Kona Airport. Route 201 provides South Kona service via Alii Drive.

			202	9 RT	Connects the Kona Hub with the Airport via Ane Keohokalole Highway.
			203	9 RT	Connects the Kona Hub with the Airport via Highway 190.
			204	9 RT	This route serves South Kona via Kuakini Highway.
					New maintenance facility to be located in Kona.
Ka'ū	Pahala/South Kohala Resorts	3 RT	90	4 RT	Added trip between Pahala and Kona Hub for a total of 4 roundtrips.
				2 RT	Two RTs are added between Oceanview and Volcano for residents to connect with Route 10 to Hilo.
			Zone 3	2 Days	Zone paratransit service is added two days a week.
Puna	Hilo/Volcano	5 RT	10	5 RT	Fern Acres service is provided by separate route.
			Red Line	2 RT	2 trips between MBT and Volcano are provided by the Red Line. Sunday service is offered.
			403	2 RT	2 AM and 2 PM trips are provided to Fern Forest, Eden Roc, and Fern Acres communities scheduled to provide commuter service.
	Hilo/Pāhoā/Pohoiki	11 RT	40	15 RT	Service is provided between MBT and Pāhoā without diverting into the residential communities. Sunday service is added.
			401	10 RT	Flex service is added between Kea'au and Pāhoā and Hawaiian Beaches and Nanawale. One new trip for a total of 4 trips are provided to Kalapana via the Red Road operating in alternating directions. This new trip is designed to serve commuters. Service is extended from Nanawale Blvd. to Mauna Kea Road (road improvements may be needed on Mauna Kea) in Nanawale serving further into the community.
			402	2 AM and 2 PM	New service is added in Hawaiian Paradise Park to serve Shower Drive and the future park and regional center on Kaloli Drive. The route is extended from 16th to 1st Avenue between Paradise Drive and Makuu Drive in Hawaiian Paradise Park. Ainaloa service is connected to Highway 11 via Hawaiian Acres and new service is introduced through Orchidland.
					Two hubs are developed; one in Keaau and one in Pāhoā.
			Zone 1	1 Day extending to 5 days	Zone paratransit service is added one day a week for areas along Highway 130. This service is extended to five days as demand warrants.
			Zone 2	2 Days	Zone paratransit service is added two days a week for areas along Highway 11.
* OW RT	Does not include trips operated by other routes. One Way Round Trip				

Table 4-5. Intermediate to Long Term - Service Proposals

ROUTE		Current Vehicle Needs	Master Plan Vehicle Size Needs			
Number	Name		Cutaway 20 feet or less	Cutaway 30 feet or less	35-45 feet	Total Vehicles
1	Hilo/Kona	1			1	1
2	Kona/Hilo	1			1	1
10	Hilo/Volcano/Kau	2			2	2
10	Kau/Volcano			1		1
Red	Hilo/Volcano				1	1
40	Hilo/Pahoa/Pohoiki	4			2	2
60	Hilo/Honokaa	1	2			2
70	North Kohala-South Kohala	1			1	1
75	North Kohala-Waimea-Kona	1			1	1
Green	Waimea/Kona				1	1
80	Hilo/South Kohala Resorts	10			8	8
80	Hilo/South Kohala Resorts via Saddle				2	2
Blue	Hilo/Kona via Saddle				1	1
90	Pahala/South Kohala Resorts	3			4	4
101	Intra-Hilo Keaukaha	1		1	x	1
102	Intra-Hilo Kaumana	1		1	x	1
103	Intra-Hilo Waiakea Uka			1	x	1
104	Intra-Hilo Mohouli		x	1		1
201	South Kona via Alii Drive	2		2		2
202	North Kona via Highway 19			x	1	1
203	North Kona via Highway 190			x	1	1
204	South Kona via Kuakini Highway			1	x	1
301	Waimea Circulator	1	x	1		1
401	Hawaiian Beaches/Nanawale/Kalapana			2		2
402	Hawaiian Paradise Park/Ainaloa			2	x	2
403	Fern Acres/Fern Forest/Eden Roc		2			2
Zones 1-3	Zone Paratransit Service in Kau and Puna		4			4
	Buses required for Maximum Service	29	8	13	27	48
	Spares (minimum 20%)	7	2	3	5	10
	Total	36	10	16	32	58



Chapter Five:

5.0 RECOMMENDED ELEMENTS FOR THE TRANSIT CAPITAL PROGRAM

Chapter Five describes the elements recommended for the MTA Capital Program through text, figures, and tables. The actual multi-year capital plan is presented in Chapter Six. Therefore, it is recommended that the two chapters be read together.

5.1 TRANSIT APP

The top request from riders was for development of a transit application (APP) that would provide real time information. MTA has already started a procurement for such a system by identifying the features it desires. These are: upgrade of the GPS system including the hardware and the software (compatible with existing Calamp). In addition, to have the features with automatic vehicle tracking, APC, and audio/visual displays. The cost for the system is estimated at just under \$500,000, which can be funded over two years.

5.2 TRANSIT FLEET

Far and away the most important capital need for the current transit program is to get a reliable fleet, replacing the current vehicles, and expanding to a fleet that is dependable and suited to the type of services being provided.

The effects on service, rider confidence, and MTA pride due to breakdowns and the non-availability of the equipment and “dead” vehicles has been described elsewhere in this plan and will not be repeated here. As of 2015, Hele-On had 55 vehicles listed in their bus fleet. However, 18 buses were listed as not operable or repairable. This was pared down to 37 in 2016. The current running fleet consists of 19 buses shown in Table 5-1. Of those, seven were gifted this past summer from the City and County of Honolulu from their

retiring fleet. These buses are in good repair, but their useful life is limited. MTA does not directly operate the paratransit services and therefore, does not have a paratransit fleet.

Table 5-1. Hele-On Active Bus Fleet (as of November 2017)

Year	Qty	Make	Bus Numbers	Seating Capacity
1997	8	Gillig	341-347, 667	45
2006	1	Chevy	501	26
2007	2	Gillig	409-410	45
2008	1	Chevy	102	15
2010	3	MCI	601-605	50
2014	1	MCI	610	49
2014	1	Eldorado	803	42
2015	2	MCI	612-613	49
Total	19			

5.2.1 Transit Fleet Size and Composition

The current running fleet is 19 buses, well below what is required to operate current bus routes. The CIP places an emphasis on rebuilding the fleet. Table 4-5 presented a suggested fleet replacement and expansion plan based on the proposed service plan in chapter 4. The number of vehicles needed for current service is 36. The number needed for full implementation is 55, including spares.

As Fiscal Year 2018 is half over, no new vehicles are expected to be added to the fleet.

Starting in Fiscal Year 2019, it is recommended that three smaller and four 40' vehicles be procured and added to the fleet. The following year 2020 should add seven less than 30' vehicles. Table 5-2 is a replacement and expansion schedule which shows the number of vehicles required to operate the service. Currently and over the next several years into the future, MTA will continue to require contracting with private providers for buses. If funds become available, such as additional grant opportunities, then a more aggressive bus acquisition program should be pursued.

The Financial Plan in Chapter Six uses the following estimates for cost of the three types of vehicles needed for service. The estimated cost includes the electronics package described in Section 5.2.3. It averages to about \$19,000 per vehicle.

- 20-foot or less \$220,000
- 25 to 30-foot \$310,000
- 40-foot vehicle \$576,300

These costs listed above are escalated by 1.2 percent per year in the CIP.

5.2.2 Fleet Replacement

By 2027, the fleet size of 58 vehicles required to operate current and expanded services will be procured. This total number includes all vehicles including commuter services currently provided by private operators using their coaches. If MTA desires to continue the commuter service with coaches provided by private operators, then the fleet acquisition plan can be reduced. The vehicle spare ratio will be at 20 percent in 2027.

From 2027 on, MTA should continue to purchase four to five vehicles a year to maintain the fleet. The spare

Table 5-2. Fixed Route Fleet Replacement and Expansion Schedule

Budget Year	Model Year	Bus Description	SIZE (FT)	BUS NO. SERIES	FISCAL YEAR										
					2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
	1997	Gillig	40'	341-347, 667	8	8	8	8	5						
	2006	Chevy-26 pass	25'	501	1	1	1	1							
	2007	Gillig	40'	409-410	2	2	2	2	2	2					
	2008	Chevy-15 Pass	16'	102	1	1	1	1							
	2010	MCI	40'	601-605	3	3	3	3	3	3	3	3	3	3	
	2014	MCI	40'	610	1	1	1	1	1	1	1	1	1	1	
	2014	Eldorado	40'	803	1	1	1	1	1	1	1	1	1	1	
	2015	MCI	40'	612-613	2	2	2	2	2	2	2	2	2	2	
2018	2019	Standard Diesel	40'												
2018	2019	Standard Diesel	<30'				3	3	3	3	3	3	3	3	
2019	2020	Standard Diesel	40'				4	4	4	4	4	4	4	4	
2019	2020	Standard Diesel	<30'				7	7	7	7	7	7	7	7	
2020	2021	Standard Diesel	40'						3	3	3	3	3	3	
2020	2021	Standard Diesel	<30'						3	3	3	3	3	3	
2021	2022	Standard Diesel	40'							3	3	3	3	3	
2021	2022	Standard Diesel	<30'							3	3	3	3	3	
2022	2023	Standard Diesel	40'								3	3	3	3	
2022	2023	Standard Diesel	<30'								5	5	5	5	
2023	2024	Standard Diesel	40'									3	3	3	
2023	2024	Standard Diesel	<30'										3	3	
2024	2025	Standard Diesel	40'										3	3	
2024	2025	Standard Diesel	<30'											2	
2025	2026	Standard Diesel	40'											3	
2025	2026	Standard Diesel	<30'												
2026	2027	Standard Diesel	40'												
2026	2027	Standard Diesel	<30'												
		Total Active Bus Fleet			19	19	26	33	34	35	39	42	47	52	54
		Peak Assignment			29	29	32	35	35	38	40	42	45	45	45
		Spares			-10	-10	-6	-2	-1	-3	-1	0	2	7	9
		Spare Ratio			-34.48%	-34.48%	-18.75%	-5.71%	-2.86%	-7.89%	-2.50%	0.00%	4.44%	15.56%	20%
		30' and 35' Buses			2	2	5	12	13	16	19	19	22	24	24
		40' Buses			17	17	21	21	21	19	20	23	25	28	30
		Total Buses			19	19	26	33	34	35	39	42	47	52	54
		Average Fleet Age in Years			12.2	13.2	10.2	8.8	6.6	3.8	3.5	4.2	4.7	5.2	5.7

ratio may need to increase with the opening of a second maintenance facility in Kailua-Kona. Both maintenance facilities will need sufficient spares to operate the required services. The 40-foot buses have an average useful life of 12 years by industry standard, the smaller vehicles generally have a useful life of 7 to 9 years. If MTA contracts for the zone paratransit and flex service, the fleet acquisition plan can be reduced. Therefore, since MTA will have a fleet composed of over 42 percent smaller vehicles (by 2027), the overall average fleet age should be below six years.

5.2.3 Fleet electronics package

Specifications for all buses should include the following three systems:

- **Mobile Data Router and Validators for a fare system**
- **Automatic Vehicle Locator and Automatic Passenger Counting system**
- **Electronic Signage and Next Stop Announcement system**

These three systems will provide MTA with the data needed to provide both internal monitoring purposes, (passenger counting, boarding by stop, on-time performance) and external information for the public including bus location and next stop announcement for those with disabilities and new to the system. The additional cost of these systems has been included in the estimated costs for vehicles.

The CIP includes investigation of adding wifi on buses. A project is identified in FY2022 to conduct this project. There are three elements to providing wifi on moving vehicles: 1) equipment on the buses, 2) providing the data and 3) connectivity. Providing and installing the equipment costs approximately \$2,000 per vehicle. Many systems

provide wifi at no cost if the provider is allowed to include advertising. The third element of connectivity may be the most difficult to assess. Many parts of the County do not have reliable cell service thereby causing loss of wifi service. The CIP project would identify those areas needing upgrades along with the optimum equipment.

5.3 MAINTENANCE FACILITIES

5.3.1 Hilo Maintenance Facility

For the past two years, MTA has invested in the planning, design, and construction of a new Hilo maintenance facility. The current shared facility with Public Works is outdated and unable to accommodate the needs of the MTA system. The new maintenance facility is due to open in 2018.

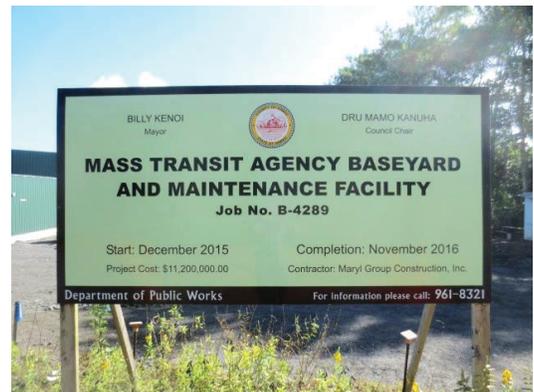
This facility will provide all the maintenance for the fleet. Currently, buses are stored in Kailua-Kona and in Ka'u since the service area is so vast and drivers cannot drive buses to Kona or Pahala from Hilo to start a 4:00 AM trip. Those buses are switched with buses based in Hilo for maintenance to occur.

While the new Hilo structure has already been programmed, it is likely that there will be a need for additional capital expenditures for parts, outfitting the inventory storeroom, software for tracking each bus through preventive maintenance and repairs.

5.3.2 Second Maintenance Facility

Due to the large number of routes operating through the north and west sides of the island, it is recommended that a second maintenance facility be planned. It will likely take several years to go through

Figure 5-1. New Hilo Baseyard Facility



These pictures taken February 2016; Weslin Consulting Services, Inc

the steps of planning, land acquisition, design and construction. Therefore, the capital plan recommends starting as soon as practicable to reserve the desired site. A site near the police department on Hale Mākaʻi off Highway 19 would be a good location. Certainly, a site owned by a public agency will cost less than one that has to be purchased on the open market.

The CIP includes the planning, design, land acquisition, construction, equipment and installation costs for a transit maintenance and operations facility to be located in the Kailua-Kona area. This second facility would be constructed in the longer term as the Kona system continues to grow. Bus base facility needs are created by changes in fleet size, technology advances, shifts in fleet composition, modifications in service delivery characteristics, introduction of new public transportation modes, and new comprehensive initiatives requiring a substantial transit system response.

Extensive planning is required to identify and investigate alternative sites for a maintenance and operations facility. The County may have land available for the maintenance and operations facility, but the suitability of any possible site needs to be confirmed and evaluated against possible alternative locations. Consideration of non-revenue versus revenue service time and miles by route is a critical component of the evaluation because a poorly located facility can contribute significantly to excess operating costs over the life of the facility. When fuel was relatively expensive this was much more of a concern. But now, even with today's lower fuel costs, unnecessary non-revenue mileage should be considered of paramount importance since low fuel cost may not continue.

The size of the site needs to account for the residual possible site configuration after consideration of topographical constraints and creation of reasonable buffer zones between the site and adjoining land uses. Operational efficiency given knowledge of the existing system and how it might evolve, overall community impacts, evident environmental impacts and other obvious or readily available information for a candidate site. Land costs could be significant for a properly located and sized site. Various resources were researched to determine the best screening criteria to identify the most viable sites including:

- **Zoning: industrial use or compatible current use**
- **Size: five or more acres**
- **Accessibility: ingress and egress for buses**
- **Proximity: relationship to revenue service to minimize deadheading**
- **Compatibility: fit with adjacent land uses**
- **Environmental: avoid wetlands, cultural, sensitive areas and other restricted site considerations**
- **Configuration: ability to use site efficiently to support bus service functions**
- **Topography: relatively level terrain**
- **Availability: available for use or sale**

A site with 5 acres of industrial land would have to be acquired if County land is not available. A smaller site may be viable; however, a maintenance facility should be designed with a 50-year life expectancy and it is recommended that the site be able to serve and store 25 buses. Recent examples indicate that construction costs should be around \$200,000 per vehicle or \$5,000,000. This generally excludes equipment, installation and other related costs which have been included in the CIP.

5.4 PASSENGER FACILITIES

For the recommended Hub and Spoke Service program described in Chapter Four, three types of passenger facilities are desirable: Hubs, Sheltered Stops, and Bus Stops. Each has different desirable amenities which are shown in Figure 5-2.

5.4.1 Hubs and Transit Centers

Figure 5-2 identifies two levels of hubs or transit centers: Satellite and Hub. Full Hubs are identified for Moʻoheau Bus Terminal (MBT), Kona, and Pāhoa. These locations, will have buses converging to transfer passengers and need more space for passengers and vehicles. Of these, only MBT is developed, although upgrades are needed.

Hubs, whether satellite or full, provide the most amenities as they serve the most number of passengers. Satellite hubs are those locations that may not have the space for all desired amenities. This would include the current Waimea stop located on Pukalani. This stop is located on street and has a single shelter with seating.

As the system expands, it will become important to have passenger amenities at a Waimea hub, particular-

Figure 5-2. Facility Amenities

AMENITY		TYPE OF BUS FACILITY				
		Basic Local Transit Stop	Primary Local Stop	Park and Ride Lot	Satellite Hub	Hub
Developer and County Agreement	Bus Stop Sign on Post	Essential	Essential	Essential	Essential	Essential
	Route Designation on Sign	Essential	Essential	Essential	Essential	Essential
	Route Schedule on Post	Beneficial in Most	Beneficial in Most	Beneficial in Most	Beneficial in Most	Beneficial in Most
	Passenger Shelter	Beneficial in Some	Essential	Essential	Essential	Essential
	Benches and Stools	Beneficial in Some	Essential	Essential	Essential	Essential
	Leaning Rail	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some
	Fare Media Vending Machine	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential	Essential
	System Map/Fare Info	Beneficial in Some	Beneficial in Some	Essential	Essential	Essential
	Route Map/Schedule	Beneficial in Some	Beneficial in Some	Essential	Essential	Essential
	Refuse Receptacles	Beneficial in Some	Beneficial in Some	Essential	Essential	Essential
	Courtesy Telephone	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential
	Landscaping and Artwork	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential
	Reinforced Concrete Pad	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential	Essential
	Specialty Decorative Paving	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some
	Basic Ambient Lighting	Beneficial in Some	Beneficial in Some	Essential	Essential	Essential
	Multi-Source Lighting	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential
	Bicycle Racks & Lockers	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential
	Information Kiosk	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential
	Real Time Info Display	Beneficial in Some	Beneficial in Some	Essential	Essential	Essential
	Bus Bays or Pullouts	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some
	Drinking Fountain	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential
	Passenger Loading Zones	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential	Essential
	Turnaround for Buses	Beneficial in Some	Beneficial in Some	Essential	Essential	Essential
	Private Vehicle Parking	Beneficial in Some	Beneficial in Some	Essential	Beneficial in Some	Beneficial in Some
	Bathrooms	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some
Vendor	Bicycle Sharing	Beneficial in Some	Beneficial in Some	Essential	Essential	Essential
	Electronic Bulletin Board	Beneficial in Some	Beneficial in Some	Essential	Essential	Essential
	On-Site Management	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential	Essential
	Car Sharing	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential	Essential
	Self Serve Library	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some
	Cash Machine	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential	Essential
	Public Telephone	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential	Essential
	Post Office Vending	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some
	Retail Kiosk	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some
	Day Care Center	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some
	Taxi/Transportation Network	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Essential
	Joint Development	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some	Beneficial in Some

Legend:
 Essential
 Beneficial in Most
 Beneficial in Some

source: Weslin Consulting Services, Inc.

ly electronic information and bike parking. Adjacent land is available to add these amenities. Satellite hubs are identified for Waimea, Ocean View, Kea’au, Prince Kūhiō Plaza, and Honoka’a.

Hub planning and design is proposed to start in Fiscal Year 2020 as shown in the financial plan in chapter 6. Construction would begin in 2021 and continue through 2025. Hubs to be developed and updated are shown in Table 5-3.

The planning, design, land acquisition and construction of these multiple hubs and transfer point improvements have been grouped together in the financial plan as a single transit center development program comparable to the ongoing bus stop and passenger shelter program. Costs for these major improvements will depend upon extensive site location planning and could vary considerably depending upon land costs and site conditions. Cost estimates are based on the experience of Honolulu over the past fifteen years. Upgrades to current facilities, such as MBT, PKP, and Ocean View, are included in the construction column.

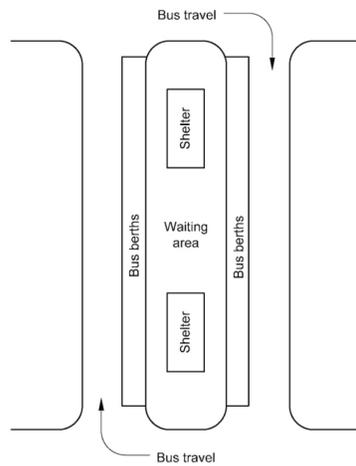
Table 5-3: Recommended Hubs for Hawai’i County

Hub	Year	Description
Pahoa	2021	The initial Pahoa hub would be temporary and located on street and can be implemented in 2019. Two passenger shelters would need to be installed. The permanent Pahoa Hub would be located near the new Puna Kai development and would require more passenger amenities including electronic signage, bike parking, fare machines, restroom.
Waimea	2021	The current Waimea hub is located on street with one passenger shelter. There is insufficient space for additional amenities on the sidewalk. However, adjacent land is undeveloped and may be available for expanded facilities including customer information, bike share, bike parking, fare equipment. Many passengers will cross the street to access shopping opportunities. Therefore, upgraded pedestrian facilities will be appropriate.
Mo’oheau Bus Terminal	2022	MBT is allocated \$500,000 for upgrading facilities beyond normal maintenance. Electronic information, fare machines, bike parking, bike share need secure, covered space.
Ocean View	2022	Ocean View Park and Ride has minimal infrastructure with a gravel lot and sign. Upgraded surface, bathroom (can be portable), access signage, shelter, and seating should be added. Lighting needs to be assessed.
Honoka’a	2023	Honoka’a has two areas for bus traffic, the upper lot and lower lot. Both lots need electronic signage, electronic information, bike parking, adequate shelter and adequate seating.
Prince Kūhiō Plaza	2023	Upgrades include electronic signage, fare machines, and additional shelter and seating.
Kona	2024	The Kona Hub will be substantial and requires additional planning and design. The location would not add land acquisition costs. This Hub should be designed to hold a customer service center, bike share, bike parking, restroom, electronic signage and bus bays for a minimum of 7 buses. Potential for coordination with transit oriented development is available.
Kea’au	2025	The Kea’au Hub will include a park-and-ride lot, as well as enough room for 4 buses and passenger amenities. The hub may require land costs (not shown) if landowners are unwilling to deed sufficient space for the hub.

The types of features to be provided at Hubs will vary by site. All facilities should include passenger shelter, seating, lighting and trash receptacles. Other considerations include:

- **Access:** Including bus-only signs to access the facility. Drop-off locations and commuter parking areas should be clearly signed. Transit facilities should have pedestrian access such as sidewalks or separated walking areas
- **Bus Stop Positions:** There are two prominent designs for the bus positions: straight curb and saw tooth. MBT has a straight curb design. The individual bus stops at a hub should be constructed with reinforced concrete. Park and ride lots are generally built with asphalt

- **Passenger Waiting Area:** There are three types of passenger waiting areas: center island, plaza and sidewalk. The center island is where buses stop on both sides and passengers can transfer between buses without vehicle conflicts. Plaza designs are similar, but the center pedestrian area is built on a larger scale and may include fountains, food kiosks and other services



The third type is the sidewalk, where the majority of passengers are waiting in the sidewalk area. This is envisioned for the initial Pahoehoe hub and currently occurs at Waimea. It is important to make sure this design does not encourage passengers crossing a street to access their next bus

- **Lighting:** A range of lighting treatments are employed at the transit facilities from standard high-mast street lamps to specialized lighting treatments designed specifically for a facility such as in-ground lighting. Passenger shelters at hubs should have overhead lights underneath the shelter roof
- **Passenger Seating:** A variety of seating treatments are provided at the transit facilities. These include individual stools, standard benches, supplemental seating offered by large tree planters and other landscaping features (such as low, decorative walls

- **Bicycle Access and Storage:** These amenities including bicycle racks and lockers will become more important as the County embraces multi-modal transportation. Bicycle access routes will need to be clearly defined. Connecting bicycle facilities to transit centers helps extend the trip length for cyclists and reduces automobile travel. Secure bicycle parking must be provided at or within close proximity to the passenger waiting area. At a minimum, the accommodations can be bike racks or lockers. Bike stations and automated bicycle parking can be located at areas with high levels of transit and bicycle use. Bike Sharing stations should be located near major hubs or bus stops
- **Passenger Shelter:** Passenger shelter should be provided at all major facilities for waiting passengers. Shelters can be the standard sized passenger shelter such as those located in Waimea or Kurtistown. Other facilities can have larger, unique shelter designs matching adjoining land use. For example, a new Kona Hub should be incorporated into the planned Transit Oriented Development design
- **Public Restrooms:** Restrooms should be provided at all hubs
- **Way-Finding Display or Maps:** Way finding should be at all hubs. These tie community destinations to transit and provide information for tourists
- **Vending:** Newspaper/free publication machines, vending snack/drink machines, ATM's, can be considered
- **Communication/Public Telephones:** All transit hubs should have signs indicating which bus routes stop at the individual bus positions. Electronic reader boards indicating bus arrival times are important to the transit user
- **Community Functions:** Available space should be set aside for functions including Goodwill drop offs, staffed customer service offices, recycle facilities, day care center or other community functions

5.4.2 Bus Stops and Shelters

5.4.2.1 Formalizing Bus Stops

Formalizing a bus stop includes determining what type of amenities should be included at the bus stop. The most basic of bus stops would have a sign, route designation, and route schedule. Each bus stop needs to have a unique bus stop number as shown in the example from Honolulu in Figure 5-3. These numbers need to be posted at each bus stop.

MTA is currently in the process of developing a system app which intending passengers would use to get current information including when their bus is expected to arrive. A waiting passenger can then type in the posted bus stop number to get real time information on the next bus arrival time.

5.4.2.2 Bus Shelters and Benches

Amenities include signs, benches, shelter, information, lighting and others identified in Figure 5-2. The planning, design, procurement, land acquisition and construction line items in the CIP are to fund bus stop

locations. The MTA and County need to determine which stops will have benches and/or shelters. Primary Local Stops would add passenger shelters and seating to the basic stop amenities. As shown in Figure 5-2 there are other amenities that might prove beneficial to the passenger. Adding additional amenities would be dependent upon safety and space concerns, as well as passenger usage at that stop and route frequency.

Generally, the more frequent the route the less amenities are needed. For example, if a route has 15-minute service or less, then perhaps real-time information is not necessary as it is known a bus will arrive every 15 minutes. However, if a route has a limited number of trips, such as Route 10 Hilo-Volcano, then it becomes more important to have information and seating, especially if that stop has more than 20 people boarding at that location. Guidelines for stop amenities need to be flexible. It becomes more important if a bus stop serves predominantly elderly passengers such as one located by a senior center, to have shelter and seating even if the number of daily passengers is limited. Figure 5-4 shows a simple bench recently placed on O‘ahu.

Figure 5-3 Basic Stop Identification Sign



Figure 5-4 Simple Bus Bench (O‘ahu)



Figure 5-5 Current Design of Shelters in Hawai'i County (Kuristown)



The type of passenger shelter that Hawai'i County is currently using is shown in Figure 5-5 which is a recent new shelter in Kuristown. Figure 5-6 shows the shelter design and bus pullout used on Ane Keohokalole.

5.4.2.3 Park and Ride Lots

Park and Ride lots require additional amenities; in particular, lighting and bathrooms. Most park and ride lots serve commuters. Hele-On's commuters leave in the early morning hours when it is dark. Lighting adds safety. Bathrooms (even portable) become necessary for many commuters. Commuter trips are long especially Hilo to Kona or Pahala to Kona. In many cases, passengers have driven or been driven over 30 minutes to access the bus (Puna locations to Hilo) and their bus trip may be up to two hours to their job site. Having a bathroom available can make a difference to an intending passenger.

5.5 FARE COLLECTION

Most transit systems now have the ability to use the same fare media for various types of passes and trip based fare payment programs. There are four basic types of pass media used:

- **Non-magnetic Pass:** A single piece of paper, cardboard or some other material without a magnetic strip good for an unlimited number of trips during a specified time period that is not surrendered or altered as each trip is taken.
- **Magnetic Stored-Value Pass:** A single piece of paper, cardboard or some other material with a magnetic strip good for an unlimited number of trips during a specified time period that is altered by machine removal of some or all of the stored value as each trip is taken.

Figure 5-6 Design used on Ana Keohokalole in Kona



- **Magnetic Stored-Time Pass:** A single piece of paper, cardboard or some other material with a magnetic strip good for an unlimited number of trips during a specified time period that is not surrendered or altered as each trip is taken.
- **Smart Cards:** A single piece of material without a magnetic strip but with a small computer chip good for one or more trips that is usually not surrendered but altered by machine removal of some or all of the stored value as each trip is taken.

Most systems are now using some form of magnetic based stored value or time base cards as shown in Table 5-4. Many systems are using multiple types of fare media with 42% reporting they are still using non-magnetic passes. Honolulu is in the process of implementing a smart card fare payment method. The technology chosen by Honolulu is capable of including bike share and parking payments with the same card. Honolulu has discussed having the same technology being able to be used on all transit systems in Hawaii. MTA will need to upgrade their fare collection system in the next ten years and would benefit from joining Honolulu's system.

Table 5-4. National Fare Media Examples

Fare Media Type	# of Systems	% of Systems Reporting
Non-Magnetic Passes	65	42%
Magnetic Stored-Value Cards	52	34%
Magnetic-Stored-Time Cards	79	52%
Smart Cards	44	29%

Source: 2014 American Public Transportation Association Survey of 153 Bus Systems

Fare collection systems are continuously evolving to incorporate new technologies and methods to improve efficiency, reliability and convenience. Use of Smart Card fare media is increasing and replacing older technologies. Over the past year the percent of bus systems using smart cards increased from 25% to 29%. This trend is expected to continue. This is because of the substantial benefits of smart cards. Some of the benefits of advanced fare media systems include:

- **Customer Convenience:** People of all ages and abilities, whether frequent or occasional riders, are offered pricing that fits their personal need using fare products at a variety of prices that are easy to use. Methods of payment for smart cards include the use of devices that only need to be in close proximity to the reading device. Smart cards need not be a “card” but can be a “bracelet” such as shown to the right
- **Service Requirements:** Smart cards can be used on any type of transit service offered in any location. Smart card technology was originally applied to just large rail systems. Those systems then partnered with connecting bus systems. Those applications were expanded to paratransit services. Honolulu is now in the process of procuring a comprehensive smart card system that will start with the bus and paratransit operations before the rail system is operational
- **Complete Data Recording and Processing:** Transit fares comprise a significant portion of transit system funding, so it is critical fare collections systems are accurate, complete and secure in accepting and processing revenue. The fare collection and validation systems provide the ridership data for transit service development and refinements

Figure 5-7 Smart Bracelet

