LOCAL BUS SERVICE DESIGN GUIDELINES

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1. VISION STATEMENT

A high-quality, customer focused bus service operating on a network of local streets and arterials that link local and regional destinations in Santa Clara County with major activity centers and transit hubs in an accessible, efficient, effective, and environmentally-friendly manner.

2. MODAL OVERVIEW

Local Buses are the most common form of public transportation in North America. They typically operate on fixed routes over local street networks, urban grids, and primary arterials. They meet a variety of transportation needs, from providing access to local neighborhood activity centers such as main streets, shopping districts, and high employment centers to long distance cross-county service that connects households to jobs. In addition, Local Bus provides a links to the regional transit network, notably the regional rail and Bus Rapid Transit (BRT). Figure 1 shows an example of a Local Bus.

Local Buses offer a high degree of transit connections to the communities they serve. They are highly flexible and may be modified easily to meet changing demands, given the low levels of infrastructure required to implement service. Because Local Buses operate on local roads and stop frequently to provide a high degree of accessibility, they tend not to have travel time benefits compared to the private automobiles, unless operating with substantial traffic priority treatments such as exclusive lanes or signal priority. Flag stops or call-in/on-demand stops are not considered Local Bus service.

The VTA operates three types of Local Bus routes, as shown in Table 1:
Table 1 Description of VTA Local Bus Service

<table>
<thead>
<tr>
<th>Route Type</th>
<th>Avg. Length (miles)</th>
<th>Other Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Grid</td>
<td>15–20+</td>
<td>Operates on major corridors, providing medium-to-long regional and sub-regional service, and linking with major activity centers and regional transit hubs.</td>
</tr>
<tr>
<td>Secondary Grid</td>
<td>10–15</td>
<td>Operates on lesser-traveled arterial streets, often connecting with high-density housing or employment hubs.</td>
</tr>
<tr>
<td>Feeder</td>
<td>&lt;10</td>
<td>Provides feeder or distribution service to and from major stops, transit centers, activity centers, or rail stations.</td>
</tr>
</tbody>
</table>

3. PLANNING AND IMPLEMENTATION PROCESS

The design, implementation, and operation of all Local Bus service shall result from a comprehensive planning process. Prior to implementation all potential new lines or service changes will be subject to an initial planning study to determine the feasibility and structure, and identify the local commitments and funding necessary. The following Service Design Guidelines are part of this process for planning, designing, implementing and monitoring new service. Specific steps to evaluate existing and proposed service are as follows:

EXISTING SERVICE EVALUATION

The evaluation and implementation process outlined in VTA’s Service Management Plan (SMP) shall guide the evaluation of existing Local Bus service. The performance standard for existing Local Bus service is set at the average boardings per revenue hour by category of Local Bus service (e.g. primary grid, secondary grid, and feeder).¹ The standards and processes in the SMP may be modified pursuant to this or other applicable planning studies or policies. As discussed in the SMP, the evaluation process includes the following steps:

Step 1 – Access existing service versus established service standards
Step 2 – Devise and implement an improvement plan, if necessary

IMPLEMENTATION OF NEW SERVICE

Step 1 – Conduct market research and estimate ridership and revenue potential
Step 2 – Identify and design route alignment
Step 3 – Establish bus stop locations
Step 4 – Design stops, facilities, and street improvements
Step 5 – Develop an operating plan and implementation schedule
Step 6 – Develop a marketing plan and brand management strategy
Step 7 – Monitor service performance (see Existing Service Evaluation)

4. LOCAL BUS POLICIES

4.1 LOCAL BUS PERFORMANCE STANDARDS

Local Bus lines shall be evaluated using the average boardings per revenue hour for each

¹ As defined in VTA’s Service Management Plan.
of the three Local Bus route classifications: primary grid, secondary grid, and feeder. Boardings per revenue hour indicates how well a route is utilized given the amount of service provided (i.e. the total number of revenue hours operated). It also indicates the appropriateness of the transit capacity offered, given the existing demand. Performance standards are developed for the three Local Bus service categories as shown in Table 2. This standard varies by time of day (e.g. peak or off-peak) and by day of week (e.g. weekdays, Saturdays, or Sundays).

An existing line not meeting the standard shall be subject to an Improvement Plan (IP), or a reduction/cut in service to improve operating performance and efficiency. Any modifications to service shall be designed to produce results that work to achieve or surpass the minimum performance standards.

Performance Standards Policy Note
The goal of Local Bus is to achieve a 20 to 25% farebox recovery ratio consistent with VTA’s Board adopted objective for all routes in the system.

4.2 MARKET RESEARCH AND RIDERSHIP POTENTIAL
Prior to the implementation of new service VTA shall undertake a market research to comprehend market needs and ridership potential. The steps shall be to identify the:

- Major trip generators and origin and destination patterns within the community
- Types of infrastructure improvements needed.
- Optimal routing and service design characteristics (i.e. acceptable travel times, origins and destinations, route directness, types of vehicles, service span, days of operation, and fare structure).
- Potential locations along the route that generates maximum ridership and revenues.

Even though a market may exist for a given route, the ridership and revenues may not be sufficient to satisfy VTA average boardings per revenue hour requirements and board approved 20 to 25% fare box recovery goal. Thus, VTA shall conduct a ridership and revenue analyses on potential new routes.

<table>
<thead>
<tr>
<th>Line Type</th>
<th>Avg. Boardings Per Revenue Hour</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weekday</td>
<td>Saturday</td>
<td>Sunday</td>
</tr>
<tr>
<td>Primary Grid</td>
<td>29</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Secondary Grid</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Feeder</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table Note:

- Performance standards based on existing performance in FY 2010.
- Standards will be periodically updated to reflect current performance. Feeder service combined with Secondary Grid in FY10.

2 These are examples of the performance standards as presented in VTA’s annual Route Productivity evaluation. The performance standards will be updated to reflect annual average ridership performance.
and service segments to assure they meet the performance standards. Considerations in these analyses are as follows:

- Ridership estimates shall be developed through a comprehensive planning process using VTA's Countywide Transportation Model, Transit Service Planning Tool (TSP) and other Direct Demand Models. Local jurisdictions shall have access to these tools through the IP Process.

- Line and service levels may be incrementally implemented and expanded as demand and ridership potential increase.

- All Local Bus lines will charge a fare consistent with VTA's fare policy.

- The minimum line ridership shall be sufficient to generate the respective average passengers per revenue hour. If ridership forecasts indicate that the line can achieve the target analysis, but does not meet the one-year target, service will be evaluated for changes including marketing, service, and/or route modifications designed to increase passenger boardings per revenue hour.

4.3 EXISTING SERVICE CRITERIA AND POLICIES

An existing line not meeting the noted standards shall be subject to an IP to build ridership, increase fare revenues, and/or reduce operating costs and inefficiencies. Any modifications to a service must be designed to produce results that achieve the standards.

Existing Service Policy Notes

Existing Local Bus lines that do not meet the ridership and performance criteria for Local Bus services shall be subject to the development of an IP. IPs may include local commitments and VTA responsibilities.

Local Commitments include plans to:

- Incorporate transit friendly-streets and bus stops in new development plans.
- Maps showing adopted land use plans.
- Improve pedestrian and bicycle access to transit facilities.
- Actively promote and support of transit within the community.

VTA Responsibilities include:

- Increase ridership by restructuring the route to better serve key trip generator areas.
- Reduce operating costs by re-routing or eliminating unproductive route segments.
- Reduce service hours or revenue miles operated.
- Relocate bus stops to maximize potential riders based on locations where there is existing high density land uses and developments.
- Redesign bus stops according to Local Bus Section 7—Stop and Facilities Design—to improve passenger amenities and comfort, and enhance pedestrian access from nearby buildings and trip generation areas.
- Temporarily stop service on particularly unproductive segments or to unproductive stations.

In cases where Local Bus service continues to operate below or above the performance standard shall be subject to the following:

- Local Bus lines that do not meet VTA performance standards, and where local plans do not offer improved future conditions, shall be considered for community bus, scaled back to lifeline service levels, or terminated.

3 See VTA's Transit Sustainability Policy for additional information on the Improvement Plan.
• Primary grid lines with 15 minute minimum headways during weekday midday and peak periods that consistently exceed the primary grid standard may be considered for skip-stop or Bus Rapid Transit (BRT) service.

4.4 NEW SERVICE CRITERIA AND POLICIES

All new service shall be provided provisionally, subjected to at least an annual review. New service shall be given two years to reach the performance standards in Table 2, with intermediate performance expectations as shown in Table 3. Lines that do not meet the performance expectations and that do not have an approved Improvement Plan (IP) shall be discontinued, with resources reallocated to services that meet or exceed the standard.

New Service Policy Notes
• Projects and services exceeding the performance standard for new service shall have implementation priority.

• New Local Bus service shall not be provided to residential areas where the Dwelling Units per Acre (DUA) within a ¼ mile buffer of the route is less than 7 DUA except where the:
  » Route segment must pass through a low density community in order to serve a location that generates sufficient ridership to meet the performance standard; and/or
  » Added travel time for riders onboard the bus does not exceed the benefits of serving the location.

• No fixed route Local Bus service shall be provided to residential areas under 4 DUA.

• New service shall not be provided in locations that reduce the efficiency of the route.

• An operating budget must be identified prior to service development. The most productive and cost-effective services shall have funding priority.

5. LOCAL BUS ROUTE DESIGN

Market research will be used to identify optimal routing and origin/destination pairs. In addition to identifying routing, VTA’s Local Bus lines shall follow a design standard, which is as follows, bus lines shall:

• Connect to at least one major transit hub—located at a designated transit center or rail station—community core and/or area of high activity. Figure 2 shows a transit center.

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Route Performance Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time from Implementation (Months)</td>
<td>% Compliance with New Service Standard</td>
</tr>
<tr>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>12</td>
<td>75</td>
</tr>
<tr>
<td>24</td>
<td>100</td>
</tr>
</tbody>
</table>
where transfers from Local Bus to Caltrain occur and Figure 3 shows an example of a transfer point between Local Bus and LRT.

- Be designed for optimal operating efficiency by avoiding circuitous configurations and low productivity segments. Figure 4 shows an example of typical Local Bus service route.
- Generally travel on primary and secondary arterial roads.
- Directly serve major activity centers such as main streets, shopping districts, and concentrations of households and jobs, and not be relegated to the periphery of these areas.
- Integrate with and go through the community, serving as many trip generators as possible. (Note: Jurisdictions that prohibit transit on streets with major trip generators risk losing ridership, and consequently, transit service in those areas.)
• Have routes traveling in pairs (bi-directional). Bi-directional routes are considered the optimal and preferred configuration and shall be the first option pursued. One-way loop routes shall only be considered in the following situations:
  » Physical constraints prohibit bi-directional stop locations;
  » The community prefers a one-way loop route and the one-way travel time does not exceed 20 minutes; and
  » The Local Bus line meets the performance standard shown in Table 2.
• Be designed to facilitate efficient transfers with stop couplets/pairs and quick and direct pedestrian links between intersecting routes.
• Operate on streets that meet the following physical criteria:
  » Turning movements with an inside radius of 25 feet if the bus can use more than one travel lane and 30 feet if it turns onto a two-lane road;
  » Street composition adequate to support the weight of the bus;
  » A maximum lane widths of 12 feet (with narrower widths considered when circumstances warrant and operations can be safely maintained);
  » Minimum overhead clearances of 13 feet;
  » Shall not operate on streets with deep drainage dips that may cause the bottom of the bus to scrape the ground; and
  » Shall not operate on streets with speed bumps or other traffic calming devices that would cause the bus to scrape the ground or operate inefficiently.

Local Bus Design Policy Notes
• Service on private property will be considered only under special circumstances and will require an agreement with the property owner that holds VTA harmless for pavement damages.
• Proposed route changes (such as deviations, extensions, new stops) shall be subject to a technical evaluation to determine if the travel time impacts to on-board riders are outweighed by the benefits of new/additional riders.
Figure 4 Typical Local Bus Route

- Connecting Stop
- Transit Center
- Transit Layover/Rest Area
- Regional Transit Center
- Primary Local Bus Route
- Secondary Local Bus Route
- Feeder Local Bus Route
- Freeway
- Shopping Area
- General Downtown Area
- Main Street/Business District
- School
- Hospital
6. LOCAL BUS STOP LOCATIONS

The bus stop is the most prominent icon of public transit, and with over 4,300 stops in Santa Clara County in 2006. The functionality, safety and visual appearance of stops is critical to attracting and maintaining transit riders in any location. Accordingly, when there are competing opportunities or proposals to implement Local Buses (all things being equal—ridership, operability, and operating speeds), agencies that have shown they are actively working to improve the public perception of transit and access to transit stops shall receive priority for service.

Local Bus stop location guidelines for VTA include the following provisions:

- Stop placement shall be guided by VTA’s Bus Stop Placement Policy found in Appendix A of VTA’s CDT Manual. Two key elements of this Policy include:
  » Existing stops shall remain in their current location unless the requesting party secures an alternate stop location that offers similar or improved ridership benefits without reducing overall service efficiency; and
  » New stops shall be encouraged adjacent to new buildings and in high activity areas. These stops shall have special features, including unique passenger shelter design, curb-bulb out or pedestrian plazas, human-scale lighting, landscaping, and street furniture.

- Stop locations shall be selected to maximize ridership potential and provide direct and safe access between stops and surrounding land uses.

- Stops shall be provided at key locations along the route. Although the exact location of a stop shall be based on the results of planning studies, potential locations include those shown in Table 4.

<table>
<thead>
<tr>
<th>Type of Area</th>
<th>Potential Stop Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial/Public Area</td>
<td>• Adjacent to major trip generators as defined by planning studies.</td>
</tr>
<tr>
<td></td>
<td>• Adjacent to schools, medical facilities, and other community serving public and private facilities. Obtaining optimal stop locations at these facilities may require operations on private rights-of-way such as parking lots or streets; in these situations local jurisdictions will aid VTA in securing appropriate agreements to secure these stops.</td>
</tr>
<tr>
<td>Residential Areas</td>
<td>• At strategic intersections that foster community connectivity and transfer opportunities.</td>
</tr>
<tr>
<td></td>
<td>• As defined by the criteria contained in VTA’s CDT Program Manual of Best Practices for Integrating Transportation and Land Use.</td>
</tr>
<tr>
<td></td>
<td>• Resulting from a City and VTA effort to identify and secure the necessary ROW, facilities, and configuration.</td>
</tr>
</tbody>
</table>
• Far side stops are the preferred location for stops, although the ultimate decision is based on the inherent safety considerations, ridership potential, operational efficiency, ease of connection, availability of space, and compliance with ADA requirements. A typical far side stop is shown in Figure 5.

• Midblock stops may be considered when an activity generator is located midblock and is a considerable walk from an intersection. A typical midblock stop is shown in Figure 6.

• A near side stop may be considered when an activity generator is located midblock and is a considerable walk from an intersection. A typical near side stop is shown in Figure 7.

• Stop spacing shall be determined pursuant to the Community Design and Transportation Manual and Service Management Plan Guidelines.

• Safety conditions and physical constraints shall be considered in determining stop locations.

• Stops shall be provided in pairs—to the extent possible—in locations that do not require more than a five-minute walk apart, including waiting time at an intersection to facilitate efficient transfers (see Figure 8). In areas where pairs cannot be secured, it may not be practical for VTA to provide service to the area.

• Stop location shall have adequate sidewalk width to accommodate ADA standards and requirements.

• Stops shall not be placed on streets without sidewalks or on streets where the sidewalks are not wide enough to meet ADA requirements.

• Stops shall be provided in locations with sufficient right-of-way for related facilities and amenities, including passenger shelters, benches, lighting, poles, informational signage, and trash receptacles.

• Stops shall be provided in locations with sufficient red-curb space for buses to move into and out of the stop.

Parking considerations include the following:

• Optimal bus stop locations, determined by planning studies, shall have priority over on-street parking spaces. In instances where potential high ridership stops cannot be served because on-street parking policies prohibit removing the parking space may result in VTA not serving the area, as this may result in a loss in transit ridership.

• If studies identify there is a need and opportunities for shared parking facilities (including agreements with private parties) adjacent to or within 500 feet of a major stop4 local jurisdictions and VTA shall pursue the opportunity jointly.

• In situations where there are new developments, considerations to place parking behind or in-between adjacent buildings, and locating building entrances close to streets and bus stops should be explored.

Policy Notes

In areas where stop locations that meet the ridership objectives of VTA cannot be secured, those areas may be bypassed or routes may be truncated or redesigned to sustain productivity levels.

4 A major stop is defined as one served by three or more lines and/or serving more than 100 daily riders.
Figure 5 Far Side Bus Stops – Typical Details

Scenario 1: Bulbout Configuration

<table>
<thead>
<tr>
<th>Dimension a'</th>
<th>Straight Approach</th>
<th>After Right Turn</th>
<th>After Left Turn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20ft</td>
<td>75ft</td>
<td>50ft</td>
</tr>
</tbody>
</table>

Notes:
1.) Dimension a' is to be measured from the edge of crosswalk or end of curb radius, whichever is further from the intersection.
2.) For the layout and details of the passenger loading zone, refer to Figure 14.
3.) A 75' loading zone is sufficient for a standard (40') or an articulated (60') bus.
4.) A 55' loading zone is sufficient for a standard (40') bus.
5.) A 120' loading zone is sufficient for serving two standard buses simultaneously.
6.) A 140' loading zone is sufficient for serving a standard and an articulated bus simultaneously.
7.) Unless safety or physical constraints prohibit their implementation, far-side stops are preferred.
8.) The type of stop chosen shall be decided on a case-by-case basis, however, bulbout stops are preferred to facilitate optimal operations (thus a section view is only shown for bulbouts). Conventional curbside stops may be appropriate considering traffic, geometric, and safety conditions. Dockout stops may be appropriate when requested by a local jurisdiction.
Figure 5  Far Side Bus Stops – Typical Details (continued)

Notes:
1.) Refer to previous page for notes.
2.) Duckout taper length varies according to approach speed.
3.) Duckout width is 10’.

Scenario 2: Duckout Configuration

Direction of Traffic

<table>
<thead>
<tr>
<th>Dimension a’</th>
<th>Dimension b’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Approach</td>
<td>20ft</td>
</tr>
<tr>
<td>After Right Turn</td>
<td>75ft</td>
</tr>
<tr>
<td>After Left Turn</td>
<td>50ft</td>
</tr>
</tbody>
</table>

Notes:
1.) Refer to previous page for notes.

Scenario 3: Conventional Curbside Configuration

Direction of Traffic

<table>
<thead>
<tr>
<th>Dimension a’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Approach</td>
</tr>
<tr>
<td>After Right Turn</td>
</tr>
<tr>
<td>After Left Turn</td>
</tr>
</tbody>
</table>

Notes:
1.) Refer to previous page for notes.
Figure 6 Mid Block Bus Stop – Typical Location Details

Scenario 1: Bulbout Configuration

Notes:
1.) The type of stop chosen shall be decided on a case-by-case basis, however, bulbout stops are preferred to facilitate optimal operations (thus a section view is only shown for bulbouts). Conventional curbside stops may be appropriate considering traffic, geometric, and safety conditions. Dockout stops may be appropriate when requested by a local jurisdiction.

2.) For the layout and details of the passenger loading zone, refer to Figure 14.

3.) A 75' loading zone is sufficient for a standard (40') or an articulated (60') bus.

4.) A 55' loading zone is sufficient for a standard (40') bus.

5.) A 120' loading zone is sufficient for serving two standard buses simultaneously.

6.) A 140' loading zone is sufficient for serving a standard and an articulated bus simultaneously.

Typical Section A - A
Figure 6: Mid Block Bus Stop – Typical Location Details (continued)

Scenario 2: Duckout Configuration

Notes:
1.) See previous page for notes.
2.) Duckout taper length varies according to approach speed.
3.) Duckout width is 10'.

<table>
<thead>
<tr>
<th>Dimension b'</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20 mph approach</td>
</tr>
<tr>
<td>20-30 mph approach</td>
</tr>
<tr>
<td>30-40 mph approach</td>
</tr>
</tbody>
</table>

Scenario 3: Conventional Curbside Configuration

Notes:
1.) See previous page for notes.
**Figure 7** Near Side Bus Stop – Typical Location Details

**Notes:**
1. Dimension a’ is to be measured from the edge of crosswalk or end of curb radius, whichever is further from the intersection.
2. For the layout and details of the passenger loading zone, refer to Figure 14.
3. A 75’ loading zone is sufficient for a standard (40’) or an articulated (60’) bus.
4. A 55’ loading zone is sufficient for a standard (40’) bus.
5. A 120’ loading zone is sufficient for serving two standard buses simultaneously.
6. A 140’ loading zone is sufficient for serving a standard and an articulated bus simultaneously.
7. Nearest bus stops shall only be adopted when the placement of a far-side stop is constrained by safety issues or physical limitations or improves operational efficiency.
8. The type of stop chosen shall be decided on a case-by-case basis, however, bulbout stops are preferred to facilitate optimal operations (thus a section view is only shown for bulbouts). Conventional curbside stops may be appropriate considering traffic, geometric, and safety conditions. Dockout stops may be appropriate when requested by a local jurisdiction.
Figure 7 Near Side Bus Stop – Typical Location Details (continued)

Scenario 2: Duckout Configuration

Notes:
1.) Refer to previous page for notes.
2.) Duckout taper length varies according to approach speed.
3.) Duckout width is 10’.

Scenario 3: Conventional Curbside Configuration

Notes:
1.) Refer to previous page for notes.

<table>
<thead>
<tr>
<th>Dimension a’</th>
<th>Dimension b’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Departure</td>
<td>5ft</td>
</tr>
<tr>
<td>Before Right Turn</td>
<td>20ft</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimension a’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Departure</td>
</tr>
<tr>
<td>Before Right Turn</td>
</tr>
</tbody>
</table>
Figure 8 Local Bus Stop Pairs – Pedestrian Connections

Typical Section A - A
7. LOCAL BUS STOP TYPES AND FACILITIES DESIGN

7.1 LOCAL BUS TYPES

Bus stops are the link between the community and the transit service provided, creating a sense of permanence and place for transit. Well-designed stops can make transit service more attractive and inviting, and help to develop ridership.

Bus stops can be placed at the curb, a bulbout (where the curb is extended, allowing the bus to stop in one of the through traffic lanes), or in a duckout (where the curb is taken in and the bus pulls into a bus bay or pocket). The following stop types shall be considered on a case-by-case basis:

- Bulbout stops, in accordance with VTA guidelines shall be located where one or more of the following are present:
  » Urban design opportunities exist or will exist to enhance sidewalks and improve pedestrian circulation around busy stops;
  » Insufficient ROW prohibits the provision of the necessary supporting facilities; and
  » Conditions exist that would delay vehicles by more than 80 seconds from merging back into traffic from a curbside stop.

- Conventional curbside stops, when bulbout stops are inappropriate given ambient traffic volumes and transit operating conditions; and

- Stop duckouts when specifically requested by a local jurisdiction and/or if operations are more efficient and safer than with a bulbout or conventional curbside stop configuration.

7.2 LOCAL BUS FACILITIES

The design of a bus stop shall adhere to the following guidelines:

- Bus stop amenities shall be determined based on ridership levels, available right-of-way, adjacent land uses, and local agency or private contributions.

- The minimum facilities shall include:
  » A bus stop pole with line number sign;
  » ADA accessible dimensions (new and modified stops); and
  » Concrete pad per VTA criteria (new and modified stops).

- Additional facilities/amenities may include:
  » Specialized sign poles;
  » Illuminated line number sign;
  » Passenger shelters (Figure 9 shows an example of a typical VTA bus shelter and an example of a shelter in Chicago);
  » Benches;
  » Trash receptacles;
  » Real-time information panels;
  » Schedule, fare, and service span information;
  » Lighting; and
  » Landscaping.

- Bus stops shall be placed in prominent and easily accessible locations.

- Bus stops shall be designed to facilitate a sense of safety to the extent possible.

- Bus stops designs shall be in accordance with those for near side, midblock, and far side stops as detailed in the CDT Manual.

- Elongated bus stop length shall be provided where BRT services overlap with Local Bus services, to accommodate two buses simultaneously (including articulated and standard buses). Figure 11 Scenarios 3 and 4 illustrates the loading zone required if
multiple buses dock at the same stop.

- Stops shall be well integrated with surrounding land uses and buildings to permit direct pedestrian and bicycle linkages.

- The identity/theme of the stop shall match and blend in with the surrounding buildings and architecture, if possible and appropriate.

- Bus stop amenities shall be pursued at locations where Local Bus routes meet other transit services.

- Bicycle parking is required at all bus stops per VTA’s adopted Bicycle Plan. Bike rack and locker design, placement and number of racks shall comply with the Bicycle Technical Guidelines.

- Shelters shall be placed where adequate rights-of-way exist, passenger usage warrants and VTA resources permit. In addition:
  - Private or city provided shelters shall be considered per VTA’s Shelter Policy contained in the CDT Manual; and
  - For new service requested by a city or cities and meeting VTA’s sustainability goals, the city shall secure developer or other contributions to provide shelters at locations where ridership demand warrants (if VTA’s transit ad shelter program cannot support one).

- Appropriate support facilities (e.g. layover bays, turnaround areas, red-curb space, space for stops, or inter-modal transfer facilities) shall be provided at transfer locations to: (i) allow for safe and easy pedestrian flow; (ii) provide for adequate signage and visual cues; (iii) accommodate waiting transfer passengers; (iv) permit seamless and quick transfers; and (v) accommodate multiple transit modes simultaneously at a single facility.

- Operator break and bus layover facilities (ROW) shall be provided to facilitate easy access and efficient transit operations. This includes locating layover facilities as close as possible to line terminals.

Figures 10 and 12 respectively show examples of bulbout midblock stops and bus facilities designed for layovers and transfers.
Figure 10 Bulbou Midblock Stop

Figure 11 Passenger Loading Zone – Typical Arrangements

Scenario 1

- 60’ Passenger Loading Zone
- 30’ Bus Shelter (Omitted for clarity)
- ADA Lift Area
- Door Clear Area
- Shelter Queuing Space
- Passenger Loading Zone

Notes:
1.) A 60’ passenger loading zone is adequate for a standard (40’) bus.

Scenario 2

- 75’ Passenger Loading Zone
- 45’ Bus Shelter (Omitted for clarity)
- ADA Lift Area
- Door Clear Area
- Shelter Queuing Space
- Passenger Loading Zone

Notes:
1.) A 75’ passenger loading zone is adequate for a standard (40’) bus or an articulated (60’) bus.
Figure 11  Passenger Loading Zone – Typical Arrangements (continued)

Scenario 3

120' Passenger Loading Zone

Notes:
1.) A 120’ passenger loading zone is adequate for a standard (40’) bus and a standard (40’) bus.
2.) For simultaneous arrivals, this configuration assumes that the rear bus will not depart until after the front bus, with a 5’ gap between the front and rear buses. If buses have bicycle racks, this is 9’.
3.) If the rear bus is permitted to leave prior to the departure of the front bus, the pull-out distance between the two buses will vary according to the width of the lane it is entering.

Scenario 4

140' Passenger Loading Zone

Notes:
1.) A 140’ passenger loading zone is adequate for an articulated (60’) and a standard (40’) bus.
2.) For simultaneous arrivals, this configuration assumes that the rear bus will not depart until after the front bus, with a 5’ gap between the front and rear buses. If buses have bicycle racks, this is 9’.
3.) If the rear bus is permitted to leave prior to the departure of the front bus, the pull-out distance between the two buses will vary according to the width of the lane it is entering.

Figure 12  Bus Facilities Designed for Layovers and Transfers (Great Mall Transit Center)
8. OPERATIONS DESIGN AND MANAGEMENT

An operating plan describes how a particular transit service shall operate. It includes specifics on the type of route, and the frequency, service span, and stop spacing. Local Bus operating plans for VTA are shown in Table 5.

9. VEHICLE CHARACTERISTICS

Standard 40-foot coaches are typically deployed for Local Bus service. If demand warrants, 60-foot articulated buses maybe deployed. Most Local Buses are low-floor design for easier and quicker boarding. Typically, Local Buses utilize one of two types of propulsion systems: (i) Internal

### Table 5 Local Bus Operating Plan Details

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Local Bus Operating Plan Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route Type/Structure</td>
<td>All stops, with direct efficient routing, serving major trip generators and transit hubs.</td>
</tr>
<tr>
<td>Service Type*</td>
<td>Fixed route service shall only serve designated bus stops.</td>
</tr>
<tr>
<td>Span of Service</td>
<td>Developed through planning studies and based on productivity and operational efficiency.</td>
</tr>
<tr>
<td>Operating Period</td>
<td>Developed through planning studies</td>
</tr>
<tr>
<td>Minimum Headways</td>
<td>Developed through planning studies and based on productivity and operational efficiency.</td>
</tr>
<tr>
<td>Minimum Operating Speed</td>
<td>~20 mph</td>
</tr>
<tr>
<td>Bus Stop Spacing</td>
<td>Stop location shall be selected to maximize ridership potential and provide direct and safe access between stops and surrounding land uses, and shall be provided at key locations along the line.</td>
</tr>
<tr>
<td>Operating Coordination with Other Transit Providers</td>
<td>Coordinated with other operators to the extent possible, especially during the off-peak period, when frequencies are considerably longer and to facilitate timely and easy transfers.</td>
</tr>
<tr>
<td>Fares</td>
<td>Consistent with VTA policies.</td>
</tr>
<tr>
<td>Bus Stop Maintenance</td>
<td>Performed pursuant to the policies outlined in the CDT Manual and the Ad-Shelter Program. Also, partnerships with local agencies and private parties shall be pursued for bus stop maintenance.</td>
</tr>
<tr>
<td>Cost Recovery</td>
<td>Service levels requested on behalf of private entities shall require 100% cost recovery.</td>
</tr>
</tbody>
</table>

*Flag stops or call-in/on-demand stops are not considered part of local bus services.*
Combustion Engines (ICE—usually diesel or gasoline); and (ii) hybrid electric that allows for regenerative braking and improved fuel efficiencies and reduced emissions. Another propulsion system, fuel cells (typically hydrogen-fueled) have recently been deployed for testing by some operators, including VTA.

For its Local Bus service, VTA currently deploys 35- to 40-foot low-floor conventional standard and 60-foot low-floor articulated buses with diesel internal combustion engines as well as 40-foot standard-floor and 29-foot cut-away with ICEs. VTA has also rolled out some zero emission, hydrogen fuel cell buses. VTA deploys 40-foot and 60-foot buses. See Figures 13 through 15 for examples of Local Bus fleets available in Santa Clara County. Table 6 shows VTA’s Local Bus characteristics for all Local Bus services.

### Table 6 Recommended VTA Local Bus Characteristics

<table>
<thead>
<tr>
<th>Vehicle Characteristic</th>
<th>40-Foot Standard</th>
<th>60-Foot Articulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor Height</td>
<td>Low-floor (14&quot;-15&quot;)</td>
<td>Low-floor (14&quot;-15&quot;)</td>
</tr>
<tr>
<td>Seating Capacity</td>
<td>~ 40</td>
<td>~ 60</td>
</tr>
<tr>
<td>Seating + Standing Capacity</td>
<td>50–60</td>
<td>80–90</td>
</tr>
<tr>
<td>Minimum # of Doors</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Propulsion System</td>
<td>ICE/Hybrid</td>
<td>ICE/Hybrid</td>
</tr>
<tr>
<td>Branding</td>
<td>Matching standard VTA livery</td>
<td>Matching standard VTA livery</td>
</tr>
<tr>
<td>Bicycle Racks</td>
<td>Compliance with VTA Bicycle Policy required</td>
<td></td>
</tr>
</tbody>
</table>

Table Note:

Figure 13 40-Foot Standard Local Bus

Figure 14 60-Foot Articulated Local Bus
10. SPECIALIZED BRANDING/MARKETING

VTA Local Buses shall employ the traditional VTA branding and coloring.