2024 OC TRANSIT VISION

APPENDIX D.
Transit Investment Framework

MAY **2025**

OCTA

OC TransitVISION

Transit Investment Framework

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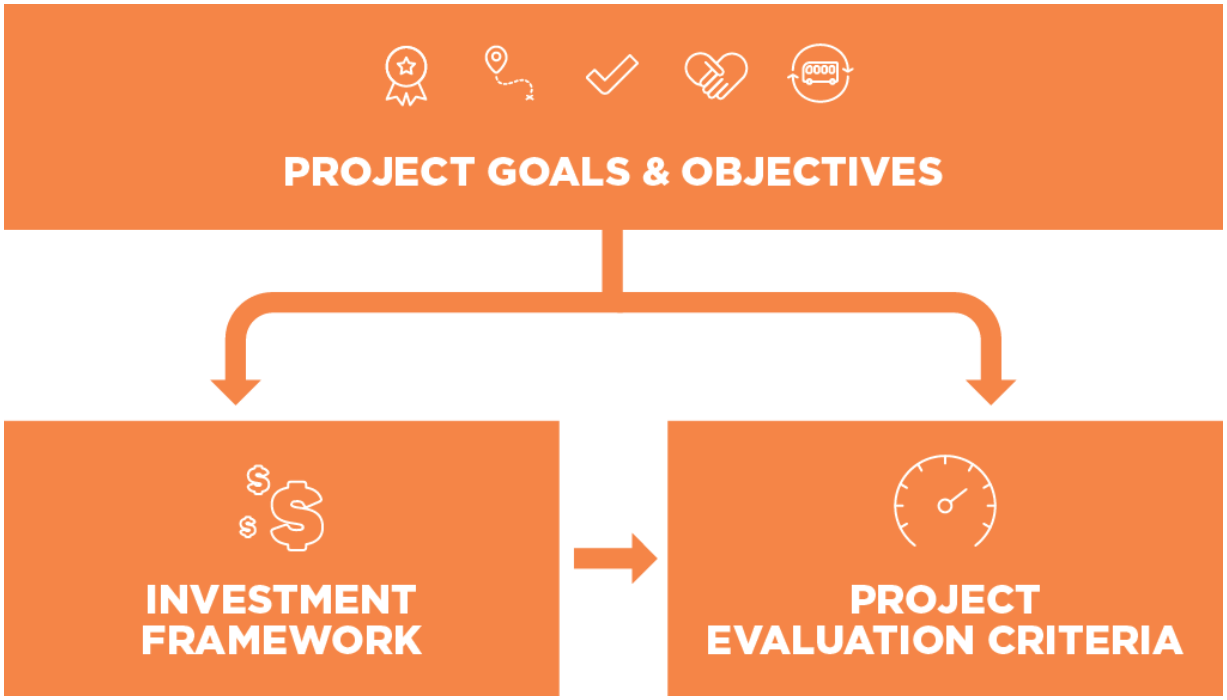
INTRODUCTION

This document describes the Transit Investment Framework developed for use by OCTA as part of the 2024 OC Transit Vision. The primary purposes of the Transit Investment Framework are to provide guidance:

- For OCTA to use in its decision-making processes to allocate fixed-route bus operations and capital resources for high-capacity transit; and
- For Orange County cities and other agencies to use in developing transit-supportive land use, street design, and other transportation policies (along with the *Transit-Supportive Design and Policies* Section in the *2024 OC Transit Vision)*.

The Transit Investment Framework is based on the 2024 OC Transit Vision goals and objectives and provided a basis for the 2024 OC Transit Vision project evaluation criteria used to identify Transit Opportunity Corridors.

FIGURE 1 RELATIONSHIP OF OC TRANSIT VISION ELEMENTS



This document includes the following sections:

- Guidelines for use in making decisions about future investments and allocating operating resources for fixed-route bus service; and
- Guidelines for use in evaluating future capital investments in bus and rail service as well as access to service.

The OCTA Transit Investment Framework's principles and guidelines incorporate industry standards, state and federal discretionary grant program evaluation criteria, and research into existing policies adopted by OCTA and peer agencies, including the Los Angeles County Metropolitan Transportation Authority (Los Angeles Metro), the King County (Washington) Department of Transportation Metro Transit Division (King County Metro), and the South Coast British Columbia Transportation Authority (TransLink).

2024 OC Transit Vision Goals and Objectives

Figure 2 presents the 2024 OC Transit Vision goals on which the Transit Investment Framework is based.

FIGURE 2 2024 OC TRANSIT VISION GOALS

What is our vision for transit?

Provide compelling and competitive transit service that expands transportation choices for current riders, attracts new riders, and equitably supports immediate and long-term mobility in Orange County.

What are our goals for transit?

Enhance — Make it *more desirable* to take transit

Connect — Connect Orange County's people and places with *effective transit*

Simplify — Make transit *easier to use* and more convenient

Collaborate — Make Orange County a *more attractive place* to live, work, and visit by providing transit services that supports community priorities

Sustain — Create a system that is *resilient* over the long term

In addition to the vision statement and five goals mentioned above, OCTA developed objectives to support each goal. Below are the five goals and supportive objectives for the 2024 OC Transit Vision.

Enhance

Make it *more desirable* to take transit

Reliability and Competitiveness:

- Provide convenient services that appeal to a broad cross-section of Orange County residents.
- Make transit travel times in key corridors competitive with automobile travel times.
- Improve the reliability of transit trips.
- Consider expanding the span and service frequency.
- Consider a network of high-capacity or premium services such as bus rapid transit (BRT) and streetcar to provide attractive transit service and support local land use.
- Continue to recruit and train operators to restore transit offerings.

Frequency:

- Develop a service network that provides frequent (15 minutes or better), all-day service from early morning to late night in major corridors and to major destinations.

Quality:

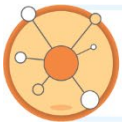
- Improve service quality in the highest-demand transit markets.
- Develop services tailored to the needs of specific markets.

Affordability:

- Provide affordable transit choices for riders.

Facility Design and Passenger Comfort:

- Provide a comfortable and safe environment for transit passengers.
- Improve access to, and the quality of, transit stops and stations.



Connect

Connect Orange County's people and places with *effective transit*

Local and Regional Connections:

- Expand services to currently underserved areas of Orange County that have sufficient transit demand and to emerging areas to support new development.
- Improve connections to major attractions and destinations.
- Improve access to jobs and services to improve economic opportunities for Orange County residents, workers, and visitors.
- Improve transit connections with surrounding counties to develop a stronger regional transit system.

Integration:

- Integrate transit services with other complementary modes.
- Develop new partnerships to help expand microtransit services to residents where fixed-route service is impractical.

Multimodal Access and First/Last Mile Connections:

- Use mobility hub elements to create great places where modes connect to facilitate seamless integration of Orange County's pedestrian, bicycle, and transit networks.
- Strengthen multimodal connections and make it safe and easy to access transit.
- Enhance partnerships with shared mobility providers, including those providing e-assist and e-powered devices.
- Support and participate in efforts to develop complete streets by working with local communities to provide safe corridors for transit and safe streets with connections to transit stops.

Simplify

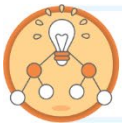
Make transit *easier to use* and more convenient

Legibility:

- Provide service that is easy for people to understand.
- Build upon digital tools and update trip planning and payment options for customers.
- Make it easier for customers to plan door-to-door trips with a seamless menu of travel options among transit services, operators, and other transportation modes using technology.
- Improve signage and information at transit stops.

Education and Information:

- Educate Orange County residents, workers, and visitors about available transit services.
- Continue to provide transit and mobility information that is readily available, accurate, and easy to understand.
- Make real-time schedule information extensively available online and at physical locations such as transit centers and transit stops.



Collaborate

Make Orange County a *more attractive place* to live, work, and visit by providing transit services that supports community priorities

Economy and Development:

- Support economic development, including the development patterns envisioned in local, county, and regional plans.
- Support the vitality of the county's downtowns, local centers, neighborhoods, and job centers.

Environment:

- Provide transit services that relieve congestion, improve air quality, and reduce greenhouse gas (GHG) emissions.
- Transition to Zero-Emission Vehicles (ZEV) to reduce GHG emissions and promote clear air initiatives.
- Use transit as a way to enhance healthy, complete communities and compact, livable neighborhoods.

Equity:

- Use transit to create a transportation system responsive to the needs of people for whom transit is a necessity (e.g., youth, older adults, people with disabilities, low-income populations, people without autos).
- Improve the accessibility of transit for older adults and people with disabilities to support their ability to live independent lives.
- Develop a sustainable model for paratransit services to provide mobility and independence.
- Continue programs to encourage use of transit for youth and older adults—including free and discounted fares.

Sustain Create a system that is *resilient* over the long term

Ridership and Perception:

- Get more people to ride transit.
- Retain existing customers and make it easier for them to take additional trips using transit.
- Improve public perception of transit in Orange County.
- Develop services that achieve a high level of public support.

Productivity:

- Focus services in areas where it can be most effective.
- Develop cost-effective and productive transit services.

Funding:

- Develop reliable and predictable revenue streams that grow with Orange County's economy.
- Invest public resources in a financially responsible manner.
- Identify and pursue opportunities for new funding sources, including leveraging private funds and grants.

Performance Monitoring:

- Continue to measure performance and adjust services and implementation plans, as necessary.

Partnerships:

- Build upon existing partnerships with communities, businesses, and schools to enhance transit offerings.
- Partner with community groups, local businesses, and schools to develop local training programs for future operators.

Flexibility:

- Plan for investments in a way that allows OCTA to respond and adapt to changes in the environment for transit.

Infrastructure:

- Continue to invest in resilient infrastructure to help support OCTA services.

SECTION

2

SERVICE ALLOCATION GUIDELINES

The OCTA Transit Investment Framework consists of two categories: service allocation guidelines and capital investment guidelines. This section describes the service allocation guidelines.

Different service types and delivery models are needed to enhance mobility in Orange County. The guidelines described below should be used to help make decisions about where service types should be implemented or operated.

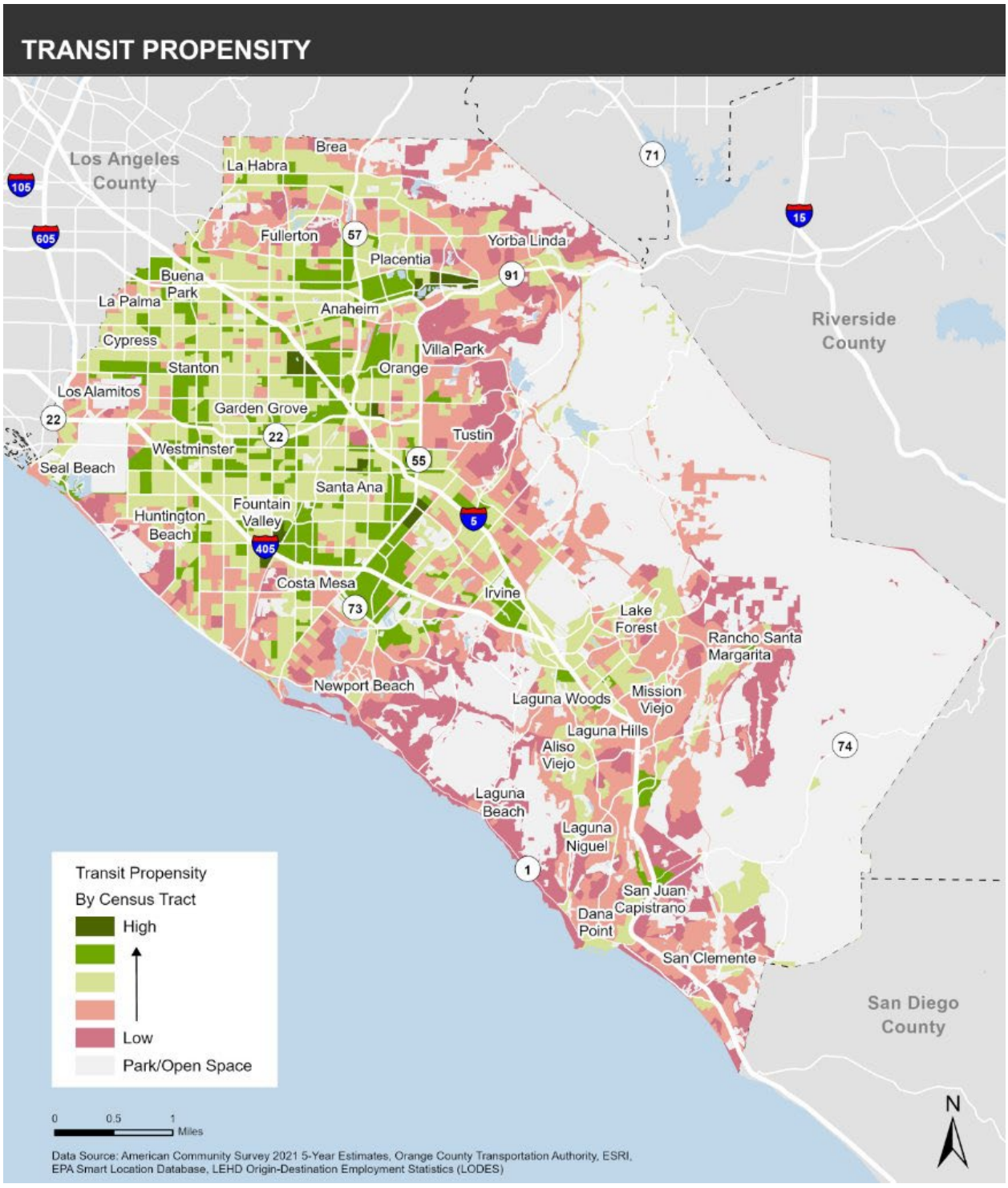
Corridor Characteristics

The service allocation guidelines for fixed-route bus operations are based on numerical targets and other factors associated with seven corridor characteristics, defined as extending one-half mile to either side of the route alignment (and including all units of analysis, such as census tracts, that are at least partly within that radius). The characteristics fall into three categories:

- Land Use Factors
  - Residential Density
  - Employment/College and University Student Density (combined)
  - Other Trip Generators (hospitals and medical centers, retail centers, and other major destinations
  - Traffic Volumes
- Equity Factors
  - Density of Low-Income Residents
- Access Factors
  - Transit Connectivity (stations, transit centers and park-and-rides, and other routes)
  - Intersection Density

These seven characteristics were selected based on a peer review and assessment of their role in demand for transit service in Orange County. Notably, six factors were identified by OCTA to be primary indicators of individual propensity toward transit use—per capita income, traffic volumes, intersection density, employment density, low-income households, and total employment (see Figure 3).

FIGURE 3 TRANSIT PROPENSITY INDEX



Route Categories

Best practice in the development of service allocation guidelines is to define categories or types of transit service to reflect the functions of different routes and varied needs of transit riders. The following are route categories for transit service in Orange County.

- **Major:** These routes typically operate every 15 minutes or better during peak times. Major routes operate seven days a week throughout the day. Together, the Major routes form a grid on arterial streets throughout the highest transit propensity portions of the OC Bus service area, primarily in northern parts of the county. OC Bus Rapid limited-stop services are included in this category.
- **Local:** Local routes operate on arterials within the grid created by the Major routes, but at lower frequencies. Local routes also operate in parts of Orange County with lower transit demand. Most Local routes operate seven days per week, however some operate on weekdays only. Local routes are less productive than Major routes.
- **Community:** Community routes provide service to connect pockets of transit demand with major destinations and offer local circulation. Routes tend to be less direct than Local routes due to service design focused on serving neighborhoods and destinations off the arterial grid. Some Community routes operate seven days per week while others operate on weekdays only. City-operated shuttles funded by Measure M Project V fall into this category.
- **Stationlink:** Stationlink routes are rail feeder services designed to connect Metrolink stations to nearby employment destinations. These routes have relatively short alignments, with schedules tied to Metrolink arrivals and departures. They operate during weekday peak hours only, in the peak direction, from the station to destinations in the morning and the reverse in the evening.
- **Express:** Express bus service was discontinued during the coronavirus pandemic in 2020. They operated on weekdays only at peak times and connected riders over long distances to destinations within and outside of Orange County, often using freeways to access destinations.

Service Allocation Guidelines

Table 1 below describes the fixed-route bus service allocation guidelines—in terms of service category, peak and base (midday weekday) frequencies, and span—based on the corridor characteristics and service types. The guidelines focus on the Major Corridors, Local (Non-Major), and Community service types. Separate guidelines for Stationlink and Express bus services follow Table 1.

The framework also includes "other" and "no transit" categories in which alternatives to traditional OCTA fixed-route bus service, such as locally-administered Program V shuttles or general-public demand-response services, may be appropriate or where publicly funded transit service may not be warranted due to very low demand.

These allocation guidelines are not absolute requirements. Few corridors will have characteristics consistent with just one category, and OCTA must make service allocation decisions on the basis of other factors, including productivity, equity, and funding.

TABLE 1 SERVICE ALLOCATION GUIDELINES

Category	Service Characteristics	Corridor Characteristics
Major	*Frequency*: 15 mins or greater peak, 30 mins or greater base *Span*: 5:00am-12:00am M-F, 6am-12am weekend	*Residential Density:* 10 or more persons per acre *Employment/Enrollment Density:* 8 or more jobs/college or university students per acre *Other Trip Generators:* Serves 5 or more hospitals or medical centers with 50 or more beds, retail centers with 50 or more stores, or other major destinations *Traffic Volumes:* Average combined Average Daily Traffic (ADT) at all major intersections of more than 100,000 per corridor mile *Density of Low-Income Residents (Household Income Below 150% of Poverty Level):* 2 or more per acre *Transit Connectivity:* Connects to 2 or more Metrolink stations, transit centers, or park-and-rides, and to 5 or more Major routes *Intersection Density:* 100 or more per square mile
Local	*Frequency*: 30 mins or greater peak and base *Span*: 5:30am-8:30pm M-F, 7am-7pm weekend	*Residential Density:* 5-10 persons per acre *Employment/Enrollment Density:* 4-8 jobs/college or university students per acre *Other Trip Generators:* Serves 2-5 hospitals or medical centers with 50 or more beds, retail centers with 50 or more stores, or other major destinations *Traffic Volumes:* Average combined ADT at all major intersections of less than 100,000 per corridor mile *Density of Low-Income Residents (Household Income Below 150% of Poverty Level):* 1-2 per acre *Transit Connectivity:* Connects to 1 or fewer Metrolink stations, transit centers, or park-and-rides, and 1-4 Major routes *Intersection Density:* Any

Category	Service Characteristics	Corridor Characteristics
Community	*Frequency*: 60 mins or greater peak and base *Span*: 5:30am-8:30pm M-F, 7am-7pm weekend	*Residential Density:* Fewer than 10 persons per acre *Employment/Enrollment Density*: Fewer than 8 jobs/college or university students per acre *Other Trip Generators:* Serves 1 or more hospitals or medical centers with 50 or more beds, retail centers with 50 or more stores, or other major destinations *Traffic Volumes:* Average combined ADT at all major intersections of less than 100,000 per corridor mile *Density of Low-Income Residents (Household Income Below 150% of Poverty Level):* Any *Transit Connectivity:* Connects to 1 or fewer Metrolink stations, transit centers, or park-and-rides, and 1-4 Major routes *Intersection Density:* Any
Other	*Frequency and Span*: n/a (explore alternatives to OCTA fixed-route bus service)	*Residential Density:* Fewer than 5 persons per acre *Employment/Enrollment Density:* Fewer than 4 jobs/college or university students per acre *Other Trip Generators:* Any *Traffic Volumes:* Any *Density of Low-Income Residents (Household Income Below 150% of Poverty Level):* Any *Transit Connectivity:* Any *Intersection Density:* Fewer than 100 per square mile
No Transit	*Frequency and Span*: n/a (publicly funded service should not be provided)	*Residential Density:* Fewer than 3 persons per acre *Employment/Enrollment Density:* Fewer than 2 jobs/college or university students per acre *Other Trip Generators:* Does not connect to hospitals or medical centers with 50 or more beds, retail centers with 50 or more stores, or other major destinations *Traffic Volumes:* Any *Density of Low-Income Residents (Household Income Below 150% of Poverty Level):* Fewer than 2 per acre *Transit Connectivity:* Does not connect to Metrolink stations, transit centers, or park-and-rides, or to Major routes *Intersection Density:* Fewer than 100 per square mile

Following are guidelines for Stationlink and Express Services.

- **Stationlink:** Stationlink routes provide connections solely between Metrolink stations and nearby destinations such as job centers. They should operate only during peak periods, in the peak direction (from the station in the morning, and to the station in the afternoon).
- **Express:** Express routes serve long trips during peak periods, primarily commute trips to job centers. As they mainly serve commuters who own automobiles, access to these routes is primarily by auto; thus, Express routes rely on proximity to park-and-ride lots as a primary criterion for service.

SECTION

3

CAPITAL INVESTMENT GUIDELINES

This section describes capital investment guidelines in two categories: investments in infrastructure supportive of existing bus operations, and investments in new fixed-guideway lines and stations (bus rapid transit). These standards build on the service allocation guidelines to identify both existing corridors and potential future corridors where capital investments—in addition to potential investments in service—may be justified.

In addition to these investment guidelines, evaluation criteria for investments in transit opportunity corridors were developed as part of the 2024 OC Transit Vision process. These can be found in Appendix C of the 2024 OC Transit Vision report.

Bus Investment Guidelines

Capital investments in existing bus service fall into three categories: 1) vehicles; 2) transit-priority improvements to the right-of-way; and 3) major improvements to stops and stations, including operational improvements as well as enhanced passenger amenities. Some of these can be implemented by OCTA; others, such as transit-priority and operational improvements at intersections, are the responsibility of Orange County cities or Caltrans and would require partnerships with those jurisdictions/agencies.

Vehicles

New vehicles may improve upon the current fleet in terms of capacity, emissions, reliability, maneuverability, comfort, and brand identity, among other factors.

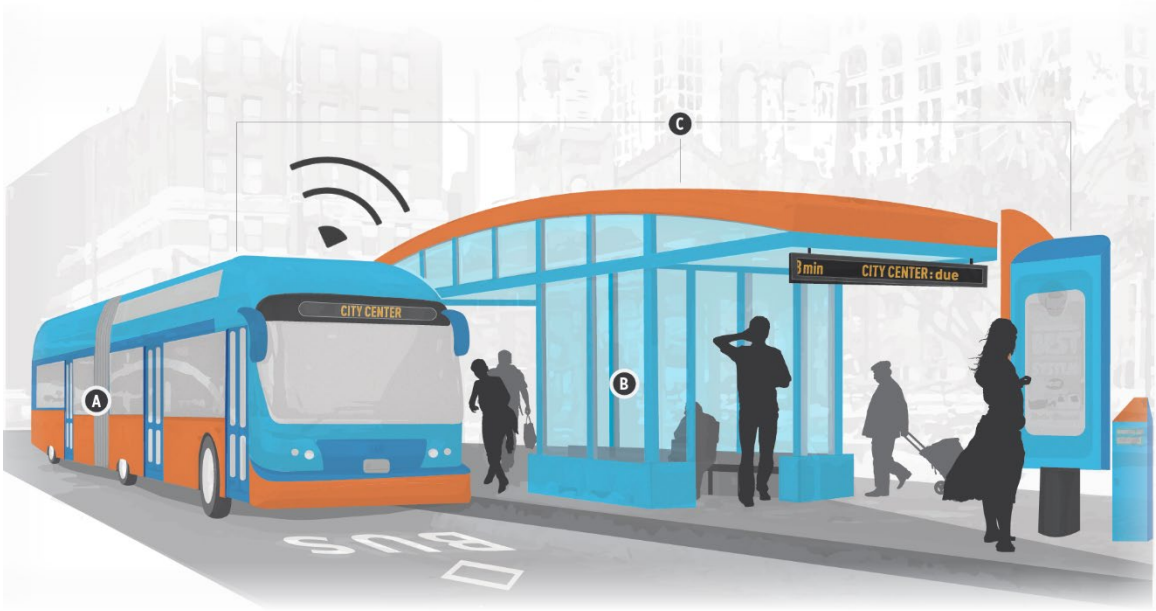
The guidelines for OCTA include (items A through C correspond to labels in Figure 4 on the next page):

A. Vehicle capacity, and the related issue of overcrowding

B. Comfort, both aboard vehicles and while waiting at stops

C. Branding of vehicles, to enhance awareness of specialized and premium services such as bus rapid transit

FIGURE 4 OCTA VEHICLE AND WAITING ENHANCEMENTS

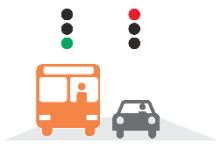


Transit-Priority Improvements

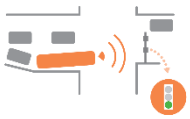
Transit-priority improvements to the right-of-way include:

- Business Access and Transit (BAT) lanes, which prohibit general-purpose traffic through travel but permit right turns and access to businesses and curbside parking; may be 24-hour lanes or peak-only lanes that revert to general-purpose use out of peak periods
- "Queue jumps" or short bus lanes at intersections (often right-turn lanes) allow buses to proceed in advance of general-purpose traffic using a transit-only advance signal phase
- Transit-priority signals
- Changes to signal timing to benefit transit operations

Business Access and Transit (BAT) Lanes



Queue Jumps



Transit-Priority Signals

Signal Timing

Stop and Station Improvements

Major improvements to stop and stations include:

- Operational improvements:
  - "Bulb-out" or curb extension stops allowing buses to stop in the travel lane, eliminating the need to merge back into traffic
  - Relocation of stops to improve operations, for example from the near to the far side of an intersection
  - Removal of parking spaces at or near stops to allow buses to access the curb or create more space to maneuver into and out of stops
  - Off-vehicle fare collection and all-door boarding

Bulb-Out Stop | **Stop Relocation** | **Curb Management** | **Streamlined Fare and Boarding**

- Enhanced passenger amenities such as:
  - Shelters at additional stops, and additional and/or larger shelters at the busiest stops
  - Seating at additional stops, and more seating at the busiest stops
  - Trash cans at additional stops
  - Real-time arrival information displays at stops
  - Maps, schedules, and other information at additional stops

Shelters | **Seating** | **Waste Bins** | **Real-Time Information** | **Maps and Schedules**

The guidelines for capital investment in bus operations are linked to the service types described in the Service Allocation Guidelines. For each service type, a "high," "medium," or "low" levels of investment—defined in terms of service type—is recommended as shown in Table 2.

TABLE 2 BUS CAPITAL INVESTMENT GUIDELINES

Service Type	Investment Level	Investment Types
Major	High	Higher-capacity vehicles Vehicle branding (OC Bus Rapid routes only) All types of transit-priority treatments, including transit lanes Operational improvements to and enhanced amenities at stops Off-vehicle fare collection and all-door boarding
Local	Medium	Signal timing improvements Enhanced passenger amenities at busier stops
Community	Low	Standard bus stop
Express	Medium	Comfortable vehicles designed for longer trips High-occupancy vehicle facilities on freeways and direct access ramps Enhanced passenger amenities at park-and-ride lots
Stationlink	Low	Standard bus stop
Other	Low	Vehicle branding (shuttles only) Technology integration

High-Capacity Transit Investment Guidelines

A number of potential investments in high-capacity modes of transit—including rapid bus and bus rapid transit—were evaluated in the 2024 OC Transit Vision. This section includes additional guidance to be used in the future identification and assessment of potential rapid transit corridors.

In considering investments in high-capacity transit, it is important to first understand the following:

- Rail and (to a lesser extent) bus rapid transit infrastructure requires a sizeable capital investment. High ridership is required to justify these investments, and corridors must have transit-supportive characteristics.
- Research into population and employment density thresholds for investment in high-capacity transit modes has resulted in a range of findings. However, thresholds scale with levels of investment (i.e., capital cost). This means that fully grade-separated rail modes (particularly subways) require higher thresholds than at-grade light rail or streetcars, which in turn require higher thresholds than bus rapid transit.
- High-capacity transit, also, as its name suggests, uses larger vehicles, and investment in high-capacity transit may be called for if ridership in a corridor is so high that it cannot comfortably be accommodated using standard buses, even at relatively frequent headways.

- One of the primary advantages of high-capacity transit is that a single operator can provide service to more passengers, reducing operating costs. While a 40-foot bus can only carry around 50 passengers[1], a 60-foot bus can carry 80 or more, and a 66-foot streetcar may hold more than 120 people. Light rail trains consisting of multiple railcars can carry hundreds of passengers at a time. Since labor costs are the single largest factor in transit operating costs, this can greatly reduce overall operating costs[2].
- Capital costs for U.S. bus rapid transit projects have varied widely, but transit-priority investments in bus routes like those described above are essential elements of BRT projects. Any Major corridor should be considered a candidate for some form of rapid bus or BRT.
- Urban rail projects like the OC Streetcar typically serve both major job centers (e.g., Downtown Santa Ana) as well as relatively dense residential areas, such as neighborhoods in the corridor to the west of downtown.
- Commuter rail lines such as Metrolink may serve a variety of contexts, but typically have major employment centers such as Downtown Los Angeles as a terminus.

Along with the above, analysis of the corridor characteristics identified in the service investment guidelines suggests that, at least for the time being, it would be difficult to make a business case for the highest levels of investment in high-capacity transit (i.e., subways) in Orange County. However, the county has characteristics comparable with peer regions that operate some form of urban rail, including light rail and streetcars, as well as bus rapid transit with exclusive lanes. In Southern California, the Los Angeles Metro system includes light rail and BRT lines in moderate-density areas such as the San Gabriel Valley (the Metro Gold Line) and San Fernando Valley (the Metro Orange Line BRT), while the San Diego Trolley system primarily serves moderately dense suburban areas. Each of these has proven popular, and light rail systems now exist in nearly every large metropolitan area in the U.S. Southwest, including Phoenix, Salt Lake City, and Denver.

In Orange County today, the busiest OC bus routes feature both high loads and, in some cases, on-time performance that could be improved by investments in high-capacity transit, including transit-priority elements. Under current OCTA standards, average peak period loads should not be greater than 130 percent of seated capacity—or 83 passengers on a 60-foot bus—and 85 percent of departures from scheduled timepoints should be no more than five minutes later than scheduled. While improving frequencies can add capacity, this can be expensive. Alternately, larger vehicles can be used to accommodate more passengers at roughly the same cost, and improving the speed of service can allow the same number of vehicles to operate more frequently. Investments in high-capacity transit, then, may pay off over the long term as service is provided more cost-effectively.

By identifying Transit Opportunity Corridors, the 2024 OC Transit Vision has begun to answer the question of where high-capacity transit lines might make sense in Orange County. Corridors with the following

[1] This can vary depending on seating configuration and definitions of "standing room." OCTA defines a "full" 40-foot bus as carrying between 46 and 49 passengers.
[2] Higher-capacity vehicles may be more expensive to operate in other ways, such as required maintenance of rail tracks, which may offset some of the savings from improving the operator-to-passenger ratio.

characteristics should be viewed as future candidates for consideration of high-capacity transit capital investments:

- Corridors with population densities greater than 15 persons per acre (9,600 residents per square mile) and/or employment densities greater than 15 employees or students per acre (9,600 jobs/students per square mile)
- Corridors in which existing service has peak loads greater than 1.0 and peak headways of 12 minutes or less

FIGURE 5 THRESHOLDS FOR CONSIDERATION OF HIGH-CAPACITY TRANSIT