

CITY OF IRVINE

Transit Vision



**OCTOBER 2022
DRAFT**

PREPARED BY

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TMD
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Executive Summary

The Irvine Transit Vision explores mobility needs and travel patterns in the City of Irvine as the world begins to adjust to new habits following the COVID-19 pandemic. Irvine's public transportation network includes long-distance and regional rail services provided by Amtrak and Metrolink, a local and regional bus network provided by the Orange County Transportation Authority (OCTA), and a network of shuttles connecting businesses with trains initiated by the City (iShuttle). These systems serve many people and many different trip purposes, but are somewhat more oriented towards commuters coming into Irvine than towards serving residential travel needs within the City.

In recent years and independent of the pandemic, City leadership and residents voiced a growing need to expand the City's public transportation options and consider local residential circulation needs. Although travel habits continue to evolve as of early fall 2022, there has been a marked shift towards greater flexibility for office workers to work remotely some or all of the time. This could mean fewer workers commuting into Irvine daily, but also means more Irvine residents are likely to be home each day, with travel needs around the City.

In studying travel data from 2019 and 2021 and surveying residents' perception of their own travel habits, the Irvine Transit Vision finds there is a substantial market for local trips between homes and commercial or recreational destinations in the City. Most people in Irvine drive for most of their trips, which creates congestion and parking constraints at peak times. A more frequent and accessible transit network could serve many short trips in Irvine and support the City and State goals to address causes of climate change, traffic congestion, improve health and safety, and continue to support Irvine's growth.

The Irvine Transit Vision considers several neighborhood shuttle concepts that are responsive to the demographic and development patterns that best support transit, the travel data analysis, and community input. At the same time, there are many areas of Irvine both developed and developing where a scheduled bus route would not be the best fit. Recent developments in technology have led to "microtransit," a service that users request a ride using an app or phone call. Microtransit is typically operated with smaller vans that can pick up and drop people off with greater flexibility in location and without requiring a published schedule.

A combination of these two service types creates a long-term Transit Vision for the City in which residents have more choices in how to travel to restaurants, shopping, entertainment, parks, healthcare, jobs, and other desired locations. With more frequent, reliable, and access public transportation options, residents can choose to leave their car at home when they have a short trip within Irvine. The Irvine Transit Vision will support people of all ages in choosing a sustainable and enjoyable means of getting around town.

Introduction

Since 2008, the City of Irvine and partners have offered public transit routes and local circulators such as local and regional OCTA routes and the iShuttle routes serving the Tustin and Irvine train stations. In 2009, the original “Irvine Transit Vision” study formed out of development requirements and the opportunity to link expanding Metrolink commuter rail service with businesses and residents around the Irvine Transportation Center. That study expanded the original iShuttle routes and over time led to the present-day iShuttle network connecting commuters at the Tustin and Irvine Metrolink Stations with employment centers. Since then, community members have voiced a desire for improved transportation options for connections to neighborhood destinations such as shopping centers, the Spectrum, Marketplace, Great Park, and more.

Today, the City of Irvine is home to 308,000 people and about 275,000 jobs, many of which are in the institutional, healthcare and tech industries¹. The City has undertaken the 2022 Irvine Transit Vision Study to evaluate new and improved transportation options to support residents’ mobility within the City, to increase choice in how people access local businesses, relieve parking and traffic congestion, and reduce greenhouse gas (GHG) emissions. **The City’s goals for the 2022 Irvine Transit Vision are:**

- Evaluate sustainable shared-ride transportation options for trips primarily within the City of Irvine
- Improve mobility and increase accessibility through more transit options
- Address social equity and environmental justice through identification and planning for vulnerable communities
- Support the City’s projected growth by maximizing the utility of existing transportation infrastructure
- Protect the environment through the reduction of vehicle miles traveled, greenhouse gases, and air pollutants
- Prepare a final document that will be used by City staff to inform and guide Commissioners and City Council members on the City’s future transit investment decisions.

This study explores the potential transit services in Irvine in the context of a City that continues to grow, while technology and transportation modes have also evolved. As the need to address the causes of climate change become more pressing, shared-ride transportation becomes a more important tool to reduce pollution, traffic congestion and parking demand.

¹ Source: City of Irvine (<https://www.cityofirvine.org/about-irvine/demographics>) accessed 12/10/21. Institutional sector comprises of University of California, Irvine and Irvine Unified School District.

Irvine Transit Vision Study

STUDY PURPOSE

The Study aims to define community transportation needs in Irvine and consider new public transit services in addition to the existing iShuttle and Orange County Transportation Authority (OCTA) bus routes serving Irvine.

This study's focus on circulation is only within Irvine and specifically on residential non-work trips, as OCTA is conducting a separate effort to look at regional

circulation (trips to and from the areas around Irvine) and the City continues to evaluate and adjust iShuttle to serve the needs of commuters coming into and out of the City.

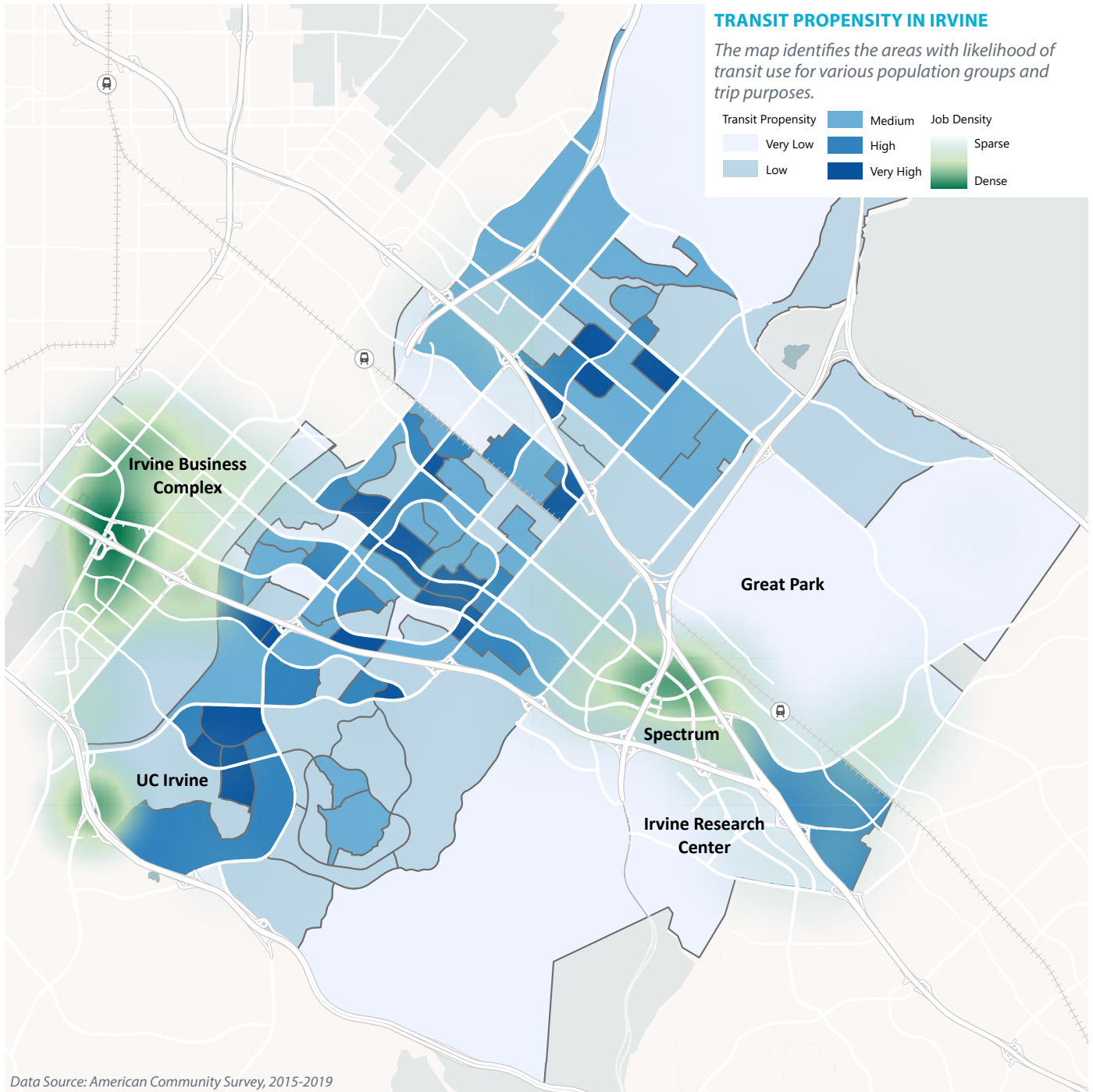
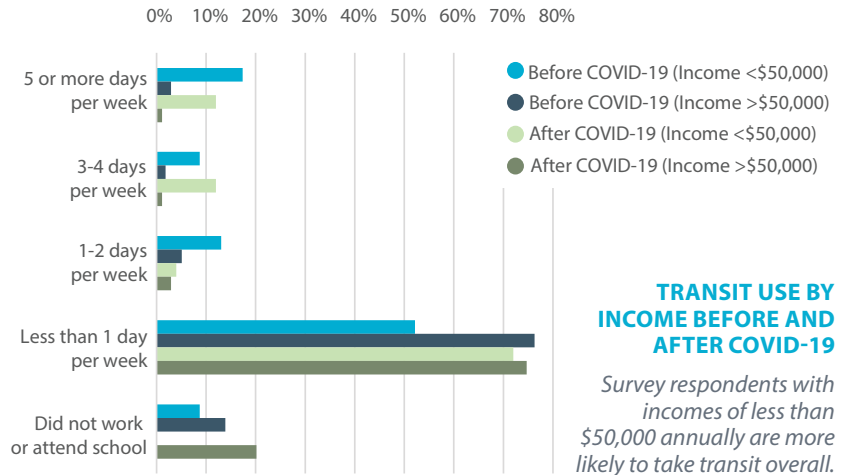
The following pages summarize the key findings from analyzing existing demographic conditions, transit service and use, and travel patterns in and around Irvine. Insights from the key findings along with community input later informed the development of potential transit service concepts in Irvine.



Image Source: Fehr & Peers, 2022

WHO USES TRANSIT IN IRVINE?

- ✓ Few Irvine residents use transit regularly, but people with **low-incomes** are likely to use transit almost daily.
- ✓ University of California, Irvine (UCI), Woodbridge, El Camino Real and Northwood Villages have high transit propensity based on demographics (high population density, limited English proficiency, low income, youth and seniors, and households with zero vehicles), whereas Irvine Business Complex and Spectrum have high job densities.

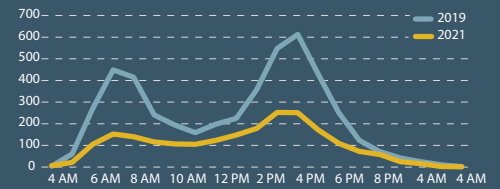


Data Source: American Community Survey, 2015-2019

WHERE IS TRANSIT USED IN IRVINE?

- ✓ Irvine residents are more likely to have used **Metrolink** than any other transit service, although OCTA bus routes account for the most daily service and riders.
- ✓ iShuttle connects **commuters** to workplaces but ridership has substantially declined since the pandemic.
- ✓ OCTA bus service **does not cover** recently developed areas in Irvine.
- ✓ **Perception of transit** among Irvine residents include low frequency, long wait times and service unreliability.

AVERAGE WEEKDAY BOARDING BY HOUR FOR OCTA AND CITY SERVICES IN IRVINE



Peak transit usage before the pandemic was during the weekday commute hours. More recent ridership has had a flatter distribution as many white-collar commuters continue to work remotely.

WEEKDAY TRANSIT RIDERSHIP IN 2019 & 2021

Transit use is concentrated in the IBC, along Alton and Culver drive, but much of the City has no service connecting to these areas.

2019 2021 iShuttle 2019 2021 OCTA BUS

Weekday Average Boardings:

• 1 ● 10 ● 100

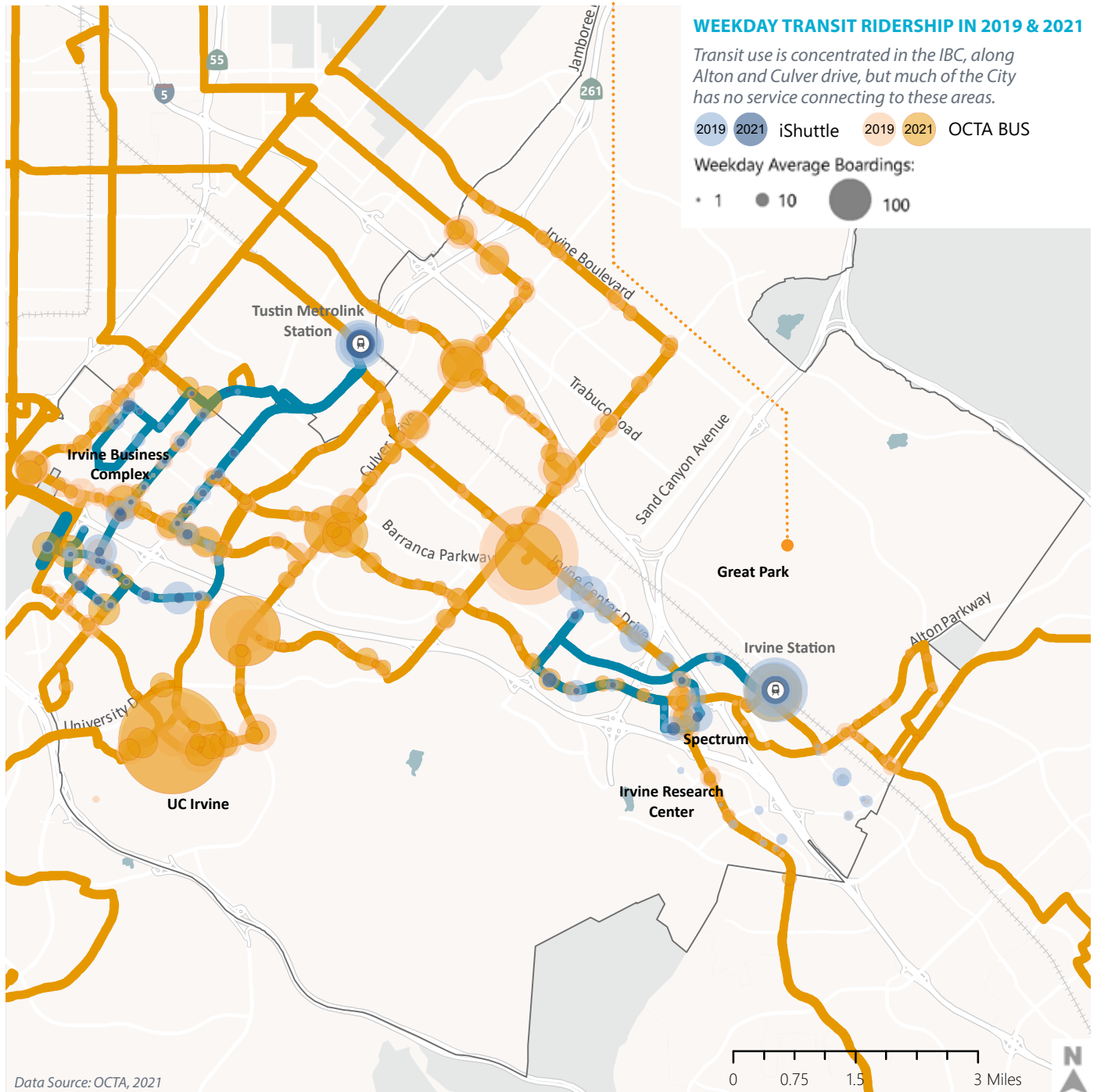




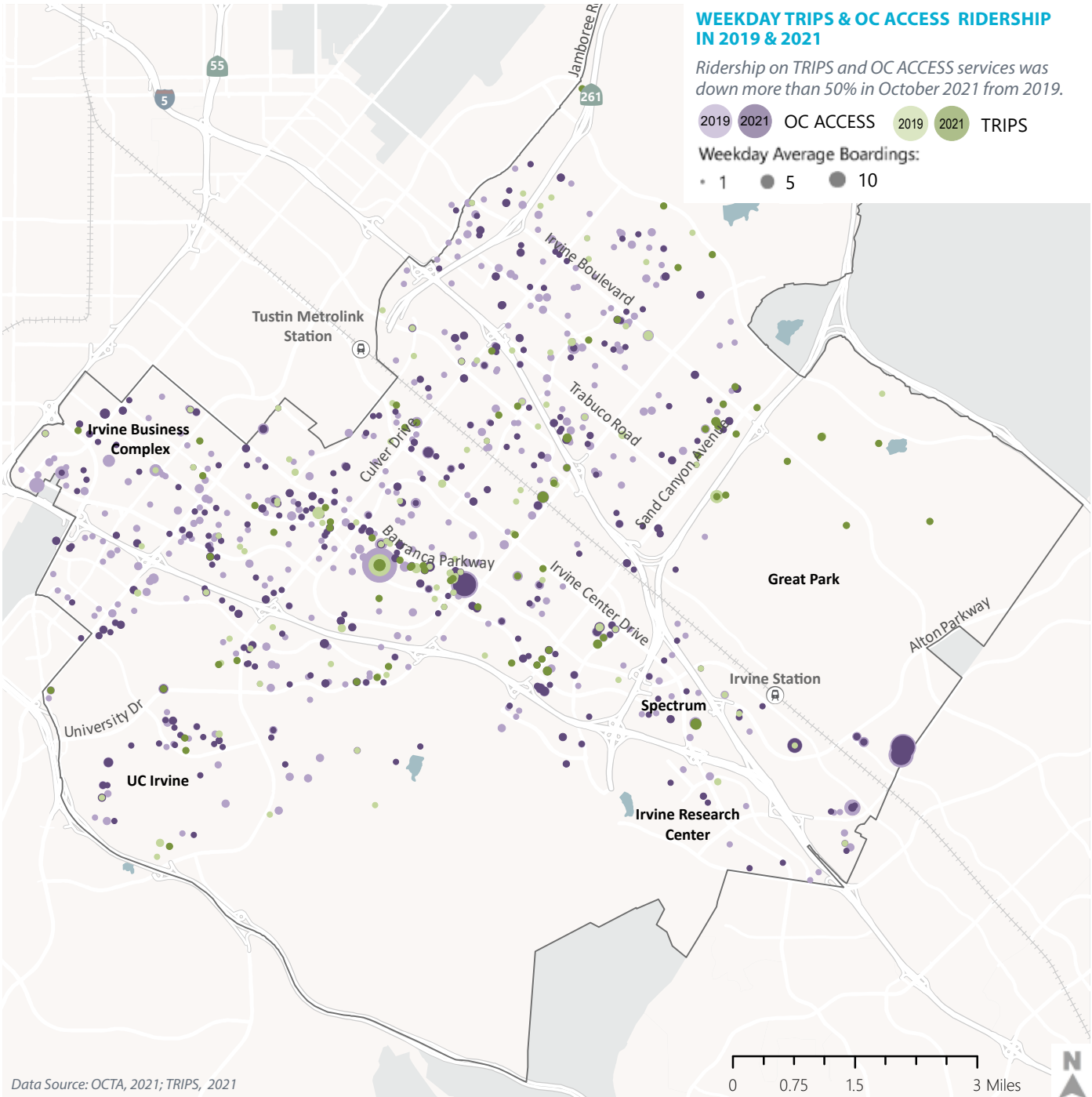
Image Source: OCTA



Image Source: City of Irvine

- OC ACCESS provides on-demand services throughout the OCTA service area including most of Irvine. TRIPS is limited to senior and disabled residents of Irvine. Both services are currently **underutilized** beyond their usual operating hours.

Demand-responsive services for people with disabilities is an important service and trips are distributed throughout the City.

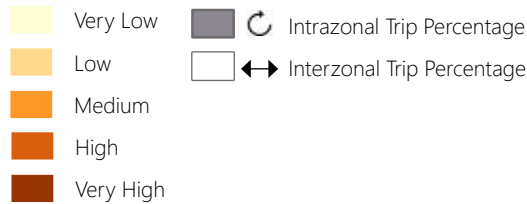


WHERE ARE PEOPLE TRAVELING? HOW HAVE TRAVEL PATTERNS CHANGED DUE TO COVID-19?

- ✓ Based on the demographic, origin-destination assessment, and transit data, **Woodbridge, Spectrum/ Great Park, Irvine Business Complex (IBC), and UCI** have the larger shares of trips within the City.
- ✓ **IBC** is a major destination for residents and the region. Transit is concentrated in the IBC area but most Irvine residents are unlikely to use it because connections from other parts of the City are **infrequent** or non-existent.
- ✓ Many **short vehicle trips** occur in the Villages because common destinations like grocery stores, restaurants, and schools are not in walking distance for many households and there is no “short-hop” alternative.

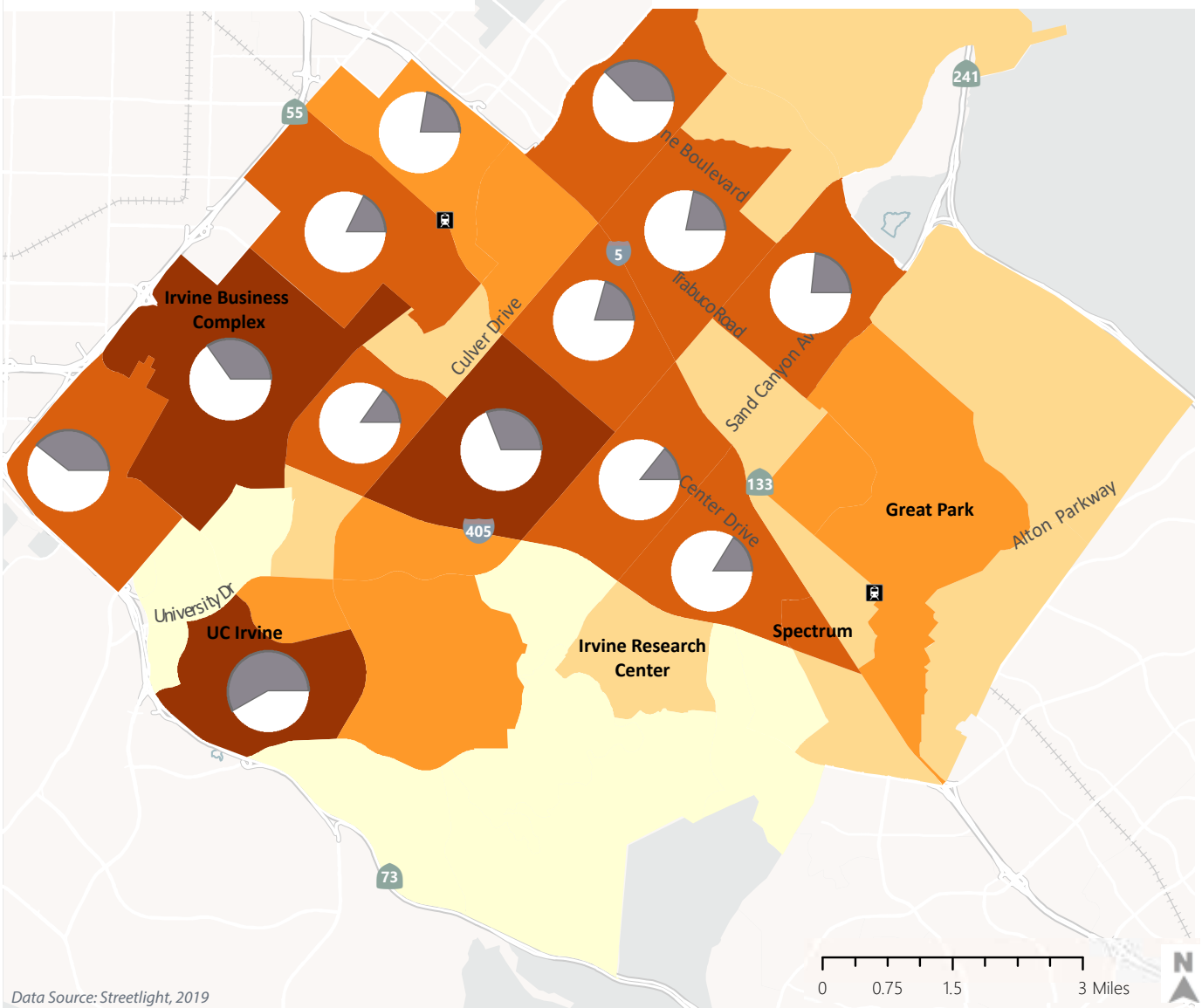
Villages tend to have a very high proportion of trips to another zone (less of the pie chart is shaded in the map below), with major destinations in the IBC, Spectrum, UCI, and Woodbridge.

Trip Activity



OVERALL TRAVEL INTENSITY IN 2019

The daily trip activity (from 6 AM to 10 PM) in 2019 shows the darkest orange zones representing where there are significantly more trips than the others. The prevalence of local trips coming from the Villages makes the residential areas with the larger share of trips and reflects trips to the grocery store, schools and other typical home-based trips.



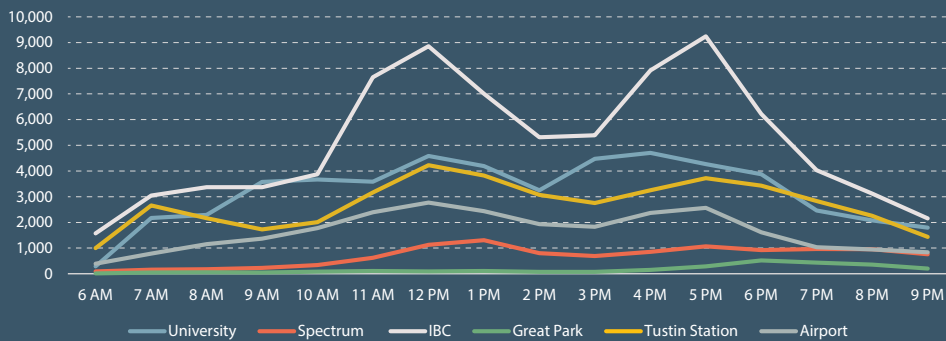
Data Source: Streetlight, 2019

TRIP ACTIVITY (ORIGINS ONLY) AT MAJOR ACTIVITY CENTERS

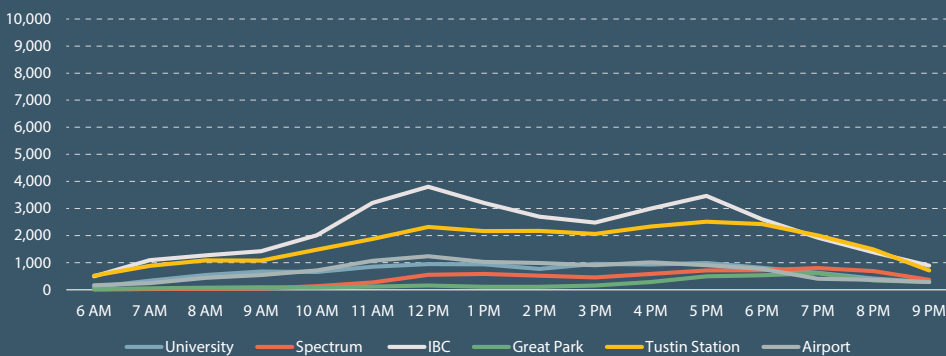
The City of Irvine has several major non-residential activity centers that are also hubs of regional employment: UCI, University Research Park, Spectrum, IBC, and Great Park, and the John Wayne Airport and Tustin Station area right outside the city boundary.

Comparing the 2019 trip activity to 2021, UCI and the University Research Park area showed a 79% decrease due to sessions being online due to the pandemic, IBC showed a 57% decrease, and Spectrum showed a 50% decrease.

2019



2021



- ✓ Prior to the pandemic, there were very high peak times ("**rush hour**") in the early morning and evening. During the pandemic the peaks have been much lower with more sustained activity through the **afternoon and evening**.
- ✓ Most trip types **decreased** significantly. **Residential** trip activity remained 70% of pre-pandemic level. Anecdotal evidence shows that office activity is 25% of pre-pandemic level and recovering slowly.
- ✓ Many people expect their 2021 travel habits to **remain the same** in the future.



SPECTRUM



IRVINE BUSINESS COMPLEX



GREAT PARK



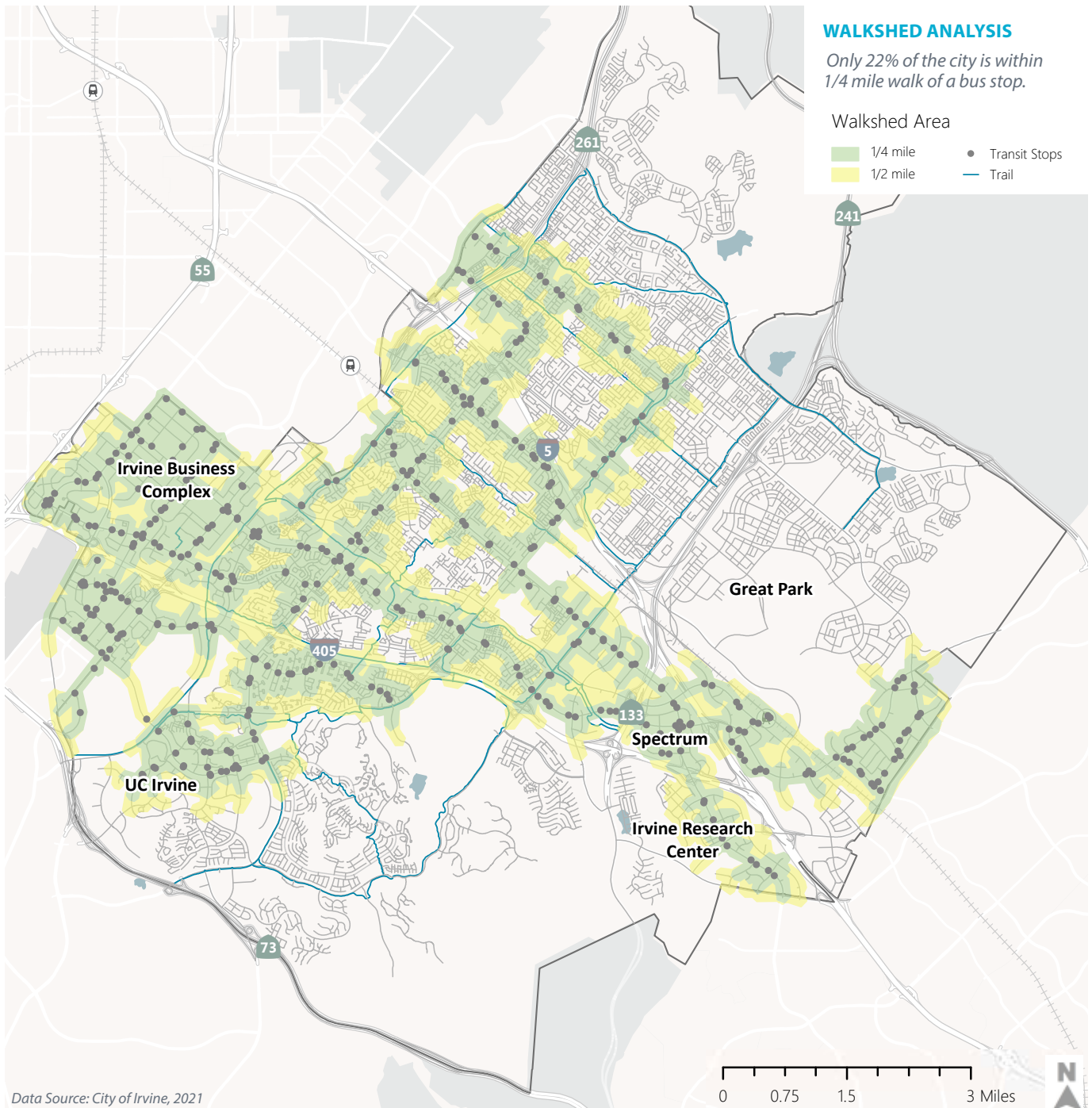
IRVINE STATION



WHAT ARE THE BARRIERS TO USE TRANSIT?

- ✓ **Built environment** is oriented to driving. Irvine has diversity of land uses but they are spread out which makes it difficult to take transit to multiple destinations.
- ✓ City has designated **affordable housing** sites, some of which are not near existing transit.
- ✓ **High-frequency** bus service (better than every 15 minutes) does not currently operate in Irvine. Even the busiest corridor (Culver Drive) is every 35 minutes at peak and hourly at other times.

Even where existing OCTA service operates on Culver Drive and Jeffrey Road, many homes are not within a reasonable walk of a bus stop.





Barranca Parkway



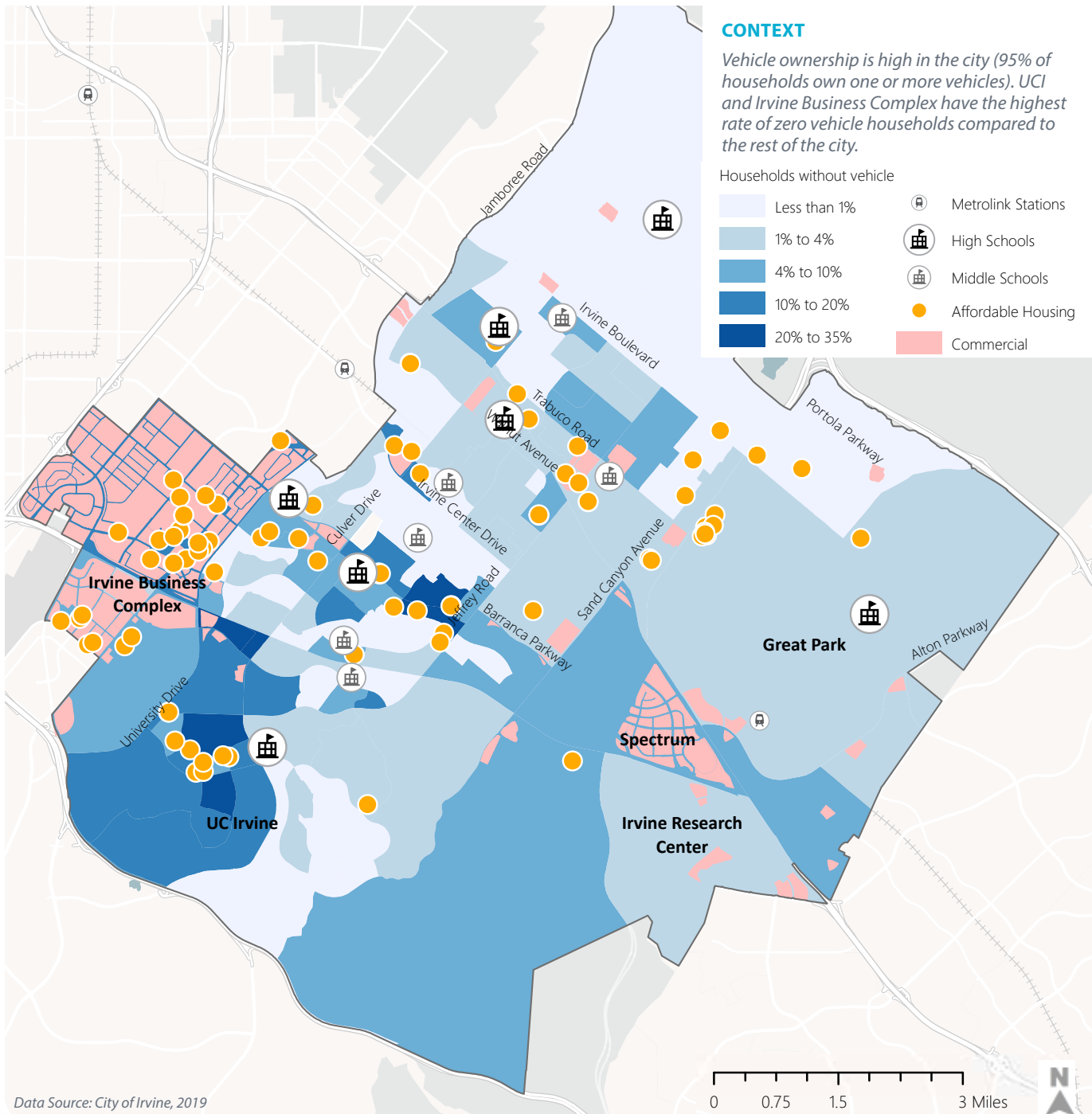
OCTA Stop in Irvine Business Complex



OC Bus Stop on Alton Parkway near Great Park



Trail Crossing on Trabuco Road



Community Engagement

Throughout the development of the Irvine Transit Vision, the community provided input on changing travel habits, the need for more options, and feedback on the service concepts.

In fall 2021, the City conducted an **online community survey** to gather responses regarding transit travel behavior, such as how people get around Irvine, what type of public transit service people use if any, and demographics questions. For respondents who ride transit, questions included common destinations, times they use the service, and why they ride transit. A total of 380 responses were received from this survey. The survey responses provide a glimpse into transit usage in Irvine and insight into how some Irvine residents and stakeholders would like to see transit service improved.

Two **community and business stakeholder workshops** in late 2021 gathered initial input on circulation needs in Irvine. Participants represented City departments, Great Park, The Irvine Company, Spectrumotion, the Irvine Senior Citizen Council, the Greater Irvine Chamber of Commerce, and others.

In summer 2022, Irvine residents were encouraged to take the **Concepts Survey** to provide feedback on the potential transit concepts. The survey asked respondents which potential concept they were interested in, and if they were likely or unlikely to use it. The survey also allowed for open-ended comments on each concept. Over the course of the survey period, a total of 116 responses were received.



The project team held a **virtual community workshop** in June 2022 to gather feedback on the proposed concepts. The workshop presented the draft Irvine transit concepts to the public and used live polling to ask questions about the general interest of each potential concept as well as specific questions relating to frequency, service span, and weekend service. Broader questions addressing frequency versus coverage, key destinations for future transit, and others were

polled as well. Participants were also able to comment in the chat on concepts and other Irvine Transit Vision feedback. The workshop was attended by approximately 24 community members.

An additional community and business stakeholder meeting in June 2022 reconvened representatives from Caltrans, Orange County Great Park, Irvine Company, Chapman University, and others. After the team presented the different concepts, stakeholders were able to dialogue with the project team and discuss the concepts.

Appendix B offers a more detailed summary of the community engagement outcomes.

Needs Assessment and Opportunities

Data analysis of travel patterns, transit use, surveys of travel needs and habits, and community input identified these needs and opportunities for new or improved transit connections within Irvine:


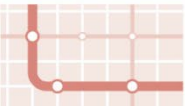
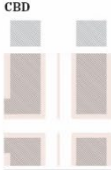



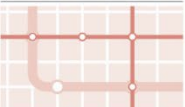
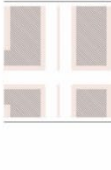


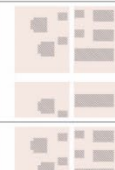



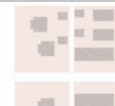








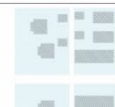






| The Idea | Market Assessment | Opportunity |
|--|---|--|
| Connecting Villages between Culver Boulevard and Sand Canyon to IBC or Spectrum | Analysis of the origin-destination (OD) data found that the highest levels of trip activity circulating within the City are from the Villages in this area and remained relatively strong through the pandemic. | Although there is already OCTA service through this corridor, many households between Culver Drive and Jeffrey Road are still a long walk to the nearest bus stop. A route along Yale Avenue could reduce the walk distance so that most households are within a 1/4-mile walk of bus service. |
| Providing neighborhood connections to schools | Community members have spoken of transportation challenges for middle and high school students including long lines for morning drop-off and difficulty connecting students between after-school activities and home. | School transportation is a complex subject and, in some cases, requires a more specialized approach than community transit. However, students in many communities rely on public transit routes. More frequent and larger buses are needed along corridors with schools to ensure sufficient capacity around bell time. There could be opportunities for transit service to serve after-school travel. |
| Expanding access to jobs in Irvine | Irvine is a major regional jobs center with continued development. | Although a regional jobs center, most Irvine residents work outside the City, and the regional job market in Irvine is already served by Metrolink, the iShuttle and OCTA networks, for the most part. Any improvements in neighborhood shuttle services in Irvine could improve access to local jobs but data suggest the market for these trips is relatively small. |
| Provide on-demand service in IBC | The Irvine Business Center district is a large area with a significant amount of activity and a great deal of short driving trips because the built environment is not conducive to walking. | The IBC was hit hard by the pandemic; trips within the IBC were down 57 percent in 2021 from 2019. As business and in-office work returns, the potential for a daytime circulator or microtransit will improve. Microtransit may be a better fit during off-peak times than scheduled circulators, but at high-demand times such as the lunch hour may require higher capacity. |

| The Idea | Market Assessment | Opportunity |
|---|--|--|
| Improve service between IBC, Woodbridge, Spectrum | The community demographic analysis and OD data identify the Barranca Parkway corridor connecting IBC, Woodbridge, and Spectrum as one of the highest potential transit corridors, including a greater likelihood of people who would use transit in the Woodbridge neighborhood. | Improving transit frequency through areas with the greatest propensity to use transit should lead to strong ridership and even bolster existing transit routes. A scheduled service along Barranca Parkway could improve frequency through an existing transit corridor and attract more and new riders. |
| Create new transit services in the developing Great Park neighborhoods | The Great Park neighborhoods are a rapidly developing area of Irvine with new housing, schools, and businesses. No regular transit service operates through this portion of the City. | As the new neighborhoods grow and become established, new transit services can link to existing key destinations in the City. Services will likely have to adapt in the early years as developments continue to come online and new bus stop infrastructure would be required throughout for shuttles. |
| Improve access to Great Park | As the Great Park matures, demand continues to increase for access to the park without requiring driving, and to alleviate demand for vehicle parking. | Connecting to Great Park on weekends and for special events may be the best, as the park is busiest, and parking is most in-demand when weekend sports are active. Connecting into key transit hubs such as Irvine Station would extend the reach of the park. |
| Provide citywide on-demand service potentially through a partnership with existing app-based service | Certain destinations including the Spectrum, Diamond Jamboree, and other retail centers can be crowded and have limited parking at high-demand times. | Scheduled fixed-route services can get bogged down trying to serve the “front door” of retail/restaurant centers and have difficulty connecting enough residential neighborhoods efficiently. On-demand services work much better for this purpose and similarly alleviate parking demand. |
| Link transit with high-quality bike network | Irvine’s bike network has grown and can extend the reach of transit to connect more people and places. | Modern vehicles can be fitted with bike racks to expand the utility of connecting transit and bike networks. Improving secure bicycle storage at key stops is also a valuable strategy. |
| Improve connections between UCI campus and other areas of Irvine | Prior to the pandemic, UCI was both a major center for travel activity and the largest generator of transit ridership in Irvine. | UCI benefits from both OCTA bus routes as well as its own Anteater Express routes which the students fund and direct. Although UCI was invited to engage in the Irvine Transit Vision, transit connectivity with other areas of the City is primarily the purview of UCI and OCTA. |

A framework that integrates public and privately provided services to serve a multitude of travel markets in an area is shown below.

MOBILITY TYPOLOGIES

What Modes Work Best Where?

| Travel Mode | Routing Style | Appropriate Operating Environments | | | | | |
|---|---|---|---|--|--|---|---|
| | | CBD | Dense Urban | Mid-Size Urban | Inner Suburb | Outer Suburb | Exurb |
| Fixed Route Transit  High Capacity (Rail/BRT) |  |  |  |  | | | |
|  Fixed-Route (OCTA) |  |  |  |  |  | | |
|  Neighborhood/ Specialized Shuttles |  | | |  |  |  | |
| Crowdsource Service  Microtransit |  | | |  |  | | |
| On-Demand Service  Ride-hail (Pooled) |  | | |  |  |  | |
|  Ride-hail (Individual) |  | | | |  |  |  |

- **‘Backbone’ Services:** High-capacity, high-frequency and fast transit network that focuses on serving major origin-destination pairs, including many of OCTA ridership-oriented routes.
- **Crowdsourced Services:** Nimble, small- to medium-sized (5-20 seats) vehicles, with either minor on-demand deviations from a fixed route serving moderate origin-destination pairs, a fixed route alignment that changes over the span of a few days based on “crowdsourced” user requests, or fully dynamic routes within a service area that adjust in real time based on traffic and demand.
- **On-Demand Ride-Hail Services:** Fully demand-responsive solo or pooled ride options for relatively low-volume origin-destination pairs, following flexible routes and guaranteed travel times, while attempting to pool several traveler groups.

Transit Service Concepts

Our transit concepts fall into two categories of service types – fixed neighborhood shuttle routes, or a more customized type of service called microtransit.

Fixed Routes: Neighborhood Shuttles

Neighborhood shuttles follow a specific route and schedule, similar to city buses like OCTA routes, but are typically operated with smaller vehicles on shorter and more frequent routes. Some examples include the iShuttle and MV Shuttle in Mission Viejo as shown in the photos below. Some neighboring cities such as Laguna Beach and San Clemente have their seasonal shuttles styled as trolleys, although in Irvine a neighborhood shuttle would have a more local focus than tourism or seasonal orientation.

Neighborhood shuttle routes provide a dependable, regular service connecting many people to key points in Irvine. These conceptual routes would service areas of Irvine that have little or no OCTA transit service, increasing the number of residents who have a relatively short walk to the nearest bus route. Neighborhood shuttles work well for varying demand throughout the day – when there is a busy time, these vehicles have the capacity to take on larger number of riders and still come on a predictable schedule. The routes are designed for short trips within Irvine; for example, going to the park or going out to lunch or visiting a friend, and could be used to connect with regional OCTA routes.

The following pages illustrate each concept including the key destinations, service span and frequency, resource requirements, projected ridership and productivity, strengths and weaknesses, and community input.

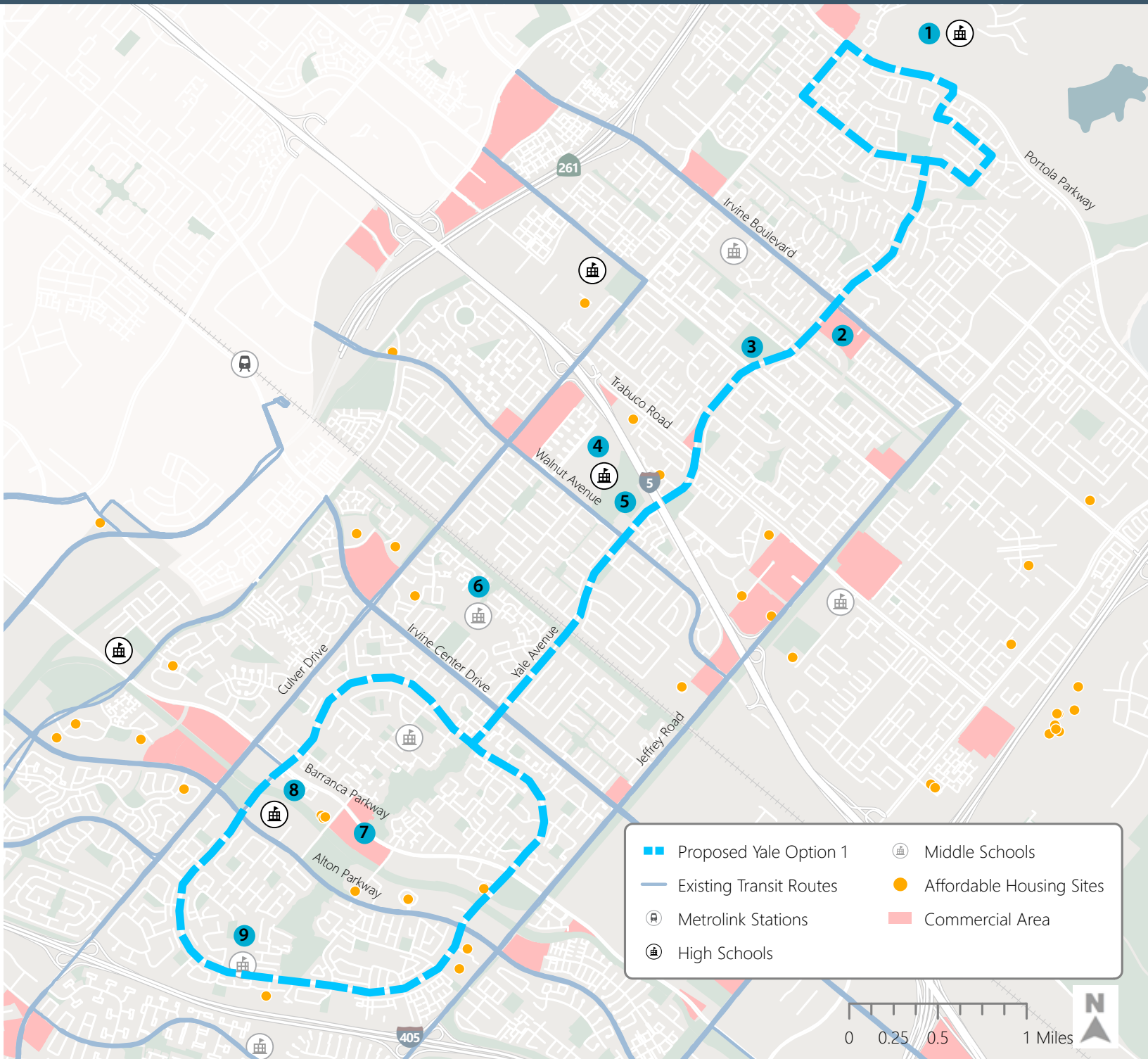


Image Source: Left: OCTA, Right: City of Mission Viejo

YALE OPTION 1 *Northwood to Woodbridge via Yale Avenue (longer route)*

Route Description





A neighborhood shuttle on Yale Avenue connecting villages from Northwood to Woodbridge. A north-south route along Yale serves some of the strongest travel patterns in Irvine along established neighborhoods, and roughly splits the distance between existing OCTA bus routes on Culver Drive and Jeffrey Road, decreasing the walk distance for many of Irvine's residents to the nearest transit service. The route follows the Yale loop around Woodbridge in one direction, in order to maximize coverage of the Village.




📍 Key Destinations

- | | |
|-----------------------------------|--|
| 1 Northwood High School | 6 Lakeside Middle School |
| 2 Northwood Town Center | 7 Retail centers on Alton Parkway and Barranca Parkway |
| 3 Northwood Park/Community Center | 8 Woodbridge High School |
| 4 Irvine High School | 9 South Lake Middle School |
| 5 Heritage Park | |

🕒 Service Span and Frequency

| Time Period | Weekday | | | | Weekend |
|-------------|--|--|--|--|------------|
| | 6am—9am | 9am—1pm | 1pm—4pm | 4pm—8pm | |
| Frequency |  30 min |  45 min |  30 min |  45 min | No Service |

✓ Resource Requirements

| | | | |
|--|--------------|---|------------------|
|  Buses Required per Weekday Peak | 3 |  Annual Revenue Miles | 85,544 |
|  Annual Revenue Hours | 8,670 |  Annual Operating Cost | \$867,000 |

👥 Projected Ridership and Productivity

| | | | |
|--|----------------|---|---------------|
|  Average Weekday Boardings | 570 |  Boardings per Revenue Hour | 16.8 |
|  Average Weekend Boardings | - |  Operating Cost per Boarding | \$5.96 |
|  Average Annual Boardings | 145,350 | | |

✓ Highlights

- ✓ Connects to five middle and high schools.
- ⚠️ Large one-way loops are not ideal because if you are on one side of the loop, you may have to ride the entire route up to Northwood to get back to the other side of the loop in Woodbridge.
- ⚠️ Requires extensive bus stop improvements along Yale Loop for ADA accessibility.

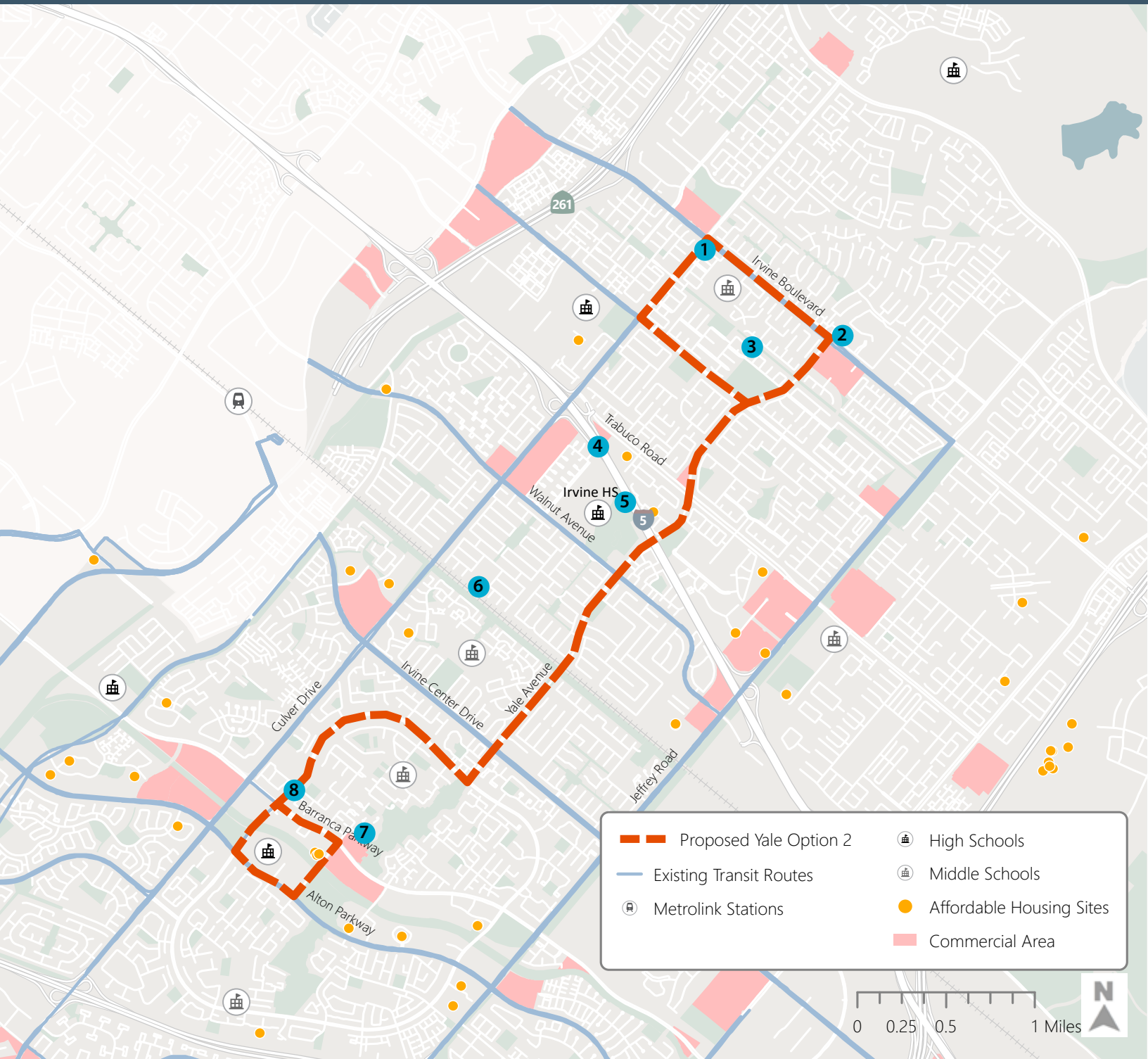


The initial concepts had 60 minutes proposed frequency which the workshop and survey respondents voiced concerns about along with the limited service span. Workshop participants noted that improving service hours should be an important priority.

YALE OPTION 2 *Northwood to Woodbridge via Yale Avenue (shorter route)*

Route Description

The Yale Option 2 is similar to Yale Option 1, but on a shorter route that covers slightly less of the north and south ends of the Yale corridor. It starts in Northwood and only serves the northwest section of the Yale loop. This route would add a connection to OCTA bus service on Culver Drive.



📍 Key Destinations

- | | |
|-----------------------------------|---|
| 1 Sierra Vista Middle School | 6 Lakeside Middle School |
| 2 Northwood Town Center | 7 Retail centers on Alton Pkwy and Barranca Pkwy (less served than Option 1) |
| 3 Northwood Park/Community Center | 8 Woodbridge High School |
| 4 Irvine High School | |
| 5 Heritage Park | |

🕒 Service Span and Frequency

| Time Period | Weekday | | | | Weekend |
|-------------|---------|---------|---------|---------|------------|
| | 6am—9am | 9am—1pm | 1pm—4pm | 4pm—8pm | |
| Frequency | 30 min | 60 min | 30 min | 60 min | No Service |

✓ Resource Requirements

| | | | |
|---------------------------------|-------|-----------------------|-----------|
| Buses Required per Weekday Peak | 2 | Annual Revenue Miles | 54,876 |
| Annual Revenue Hours | 5,100 | Annual Operating Cost | \$510,000 |

👥 Projected Ridership and Productivity

| | | | |
|---------------------------|---------|-----------------------------|--------|
| Average Weekday Boardings | 470 | Boardings per Revenue Hour | 23.5 |
| Average Weekend Boardings | - | Operating Cost per Boarding | \$4.26 |
| Average Annual Boardings | 119,850 | | |

✓ Highlights

- ✓ Provides same frequency and reduced off-peak frequency than Yale Alternative 1 using 40% less resources.
- ✓ Avoids one way routing on Yale loop which has operational issues.
- ✓ Requires fewer bus stop improvements along Yale Loop for ADA accessibility.
- ⚠ Serves less of Woodbridge than Yale Option 1.



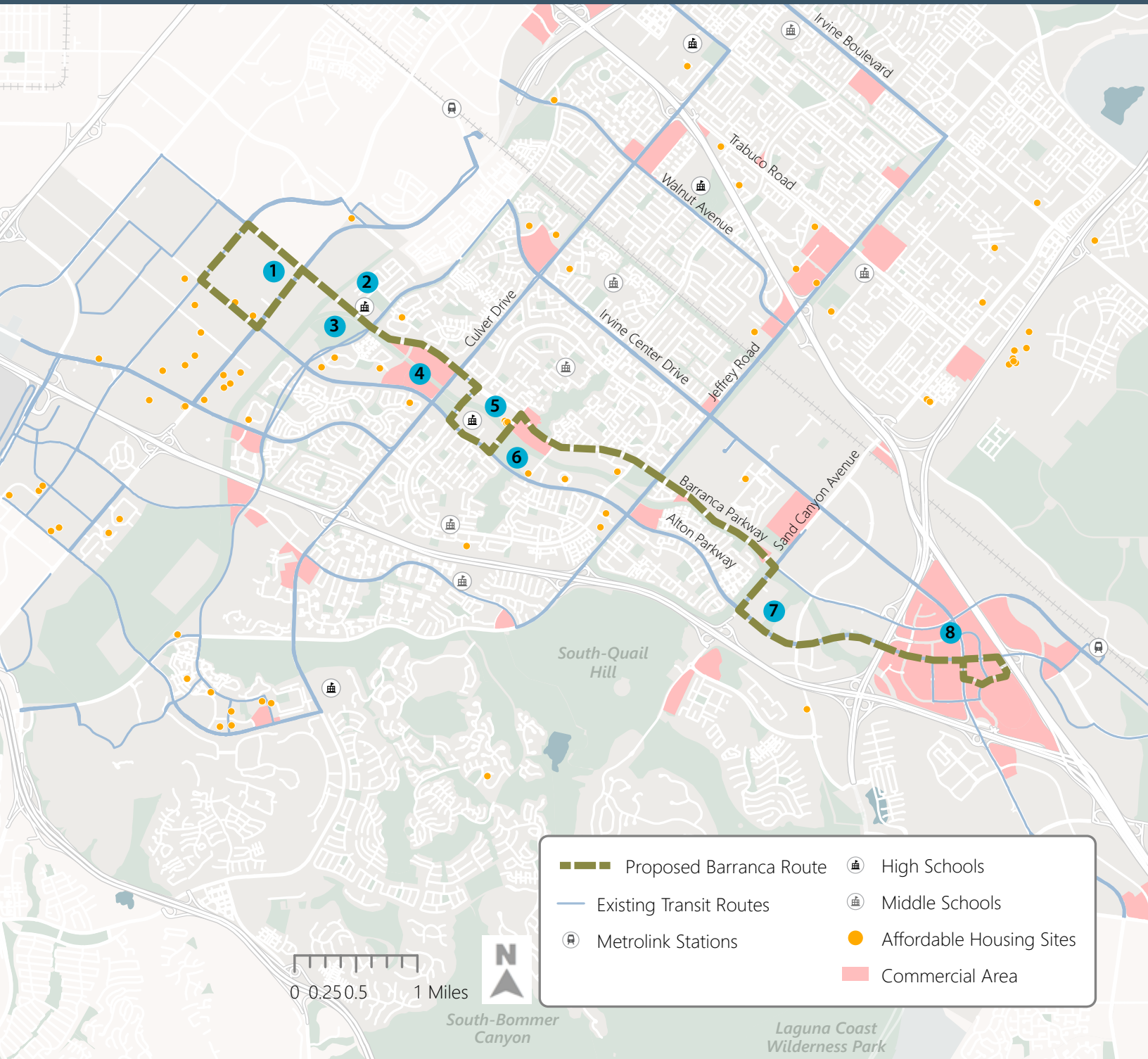
Yale Option 2 was less popular than Option 1 among both workshop and survey respondents due to serving fewer destinations than Option 1. While both Yale options connect to area schools, shopping, and parks, stakeholders noted the lack of employment centers along the routes.

BARRANCA

Diamond Jamboree to the Spectrum Center via Barranca Parkway

Route Description

The Barranca route would connect the Diamond Jamboree shopping center to the Spectrum Center via Barranca Parkway. This route would connect to multiple existing OCTA and iShuttle routes and serve other major destinations along the way including medical facilities and retail centers.



📍 Key Destinations

- | | |
|--------------------------------------|--|
| 1 Diamond Jamboree | 6 Lakeview Senior Center |
| 2 San Joaquin High School | 7 Kaiser & Hoag Hospitals and nearby medical offices |
| 3 Bill Barber Park / City Hall | 8 Irvine Spectrum Center |
| 4 Retail centers on Barranca Parkway | |
| 5 Woodbridge High School | |

🕒 Service Span and Frequency

| Time Period | Weekday | | | | Weekend |
|-------------|---------|---------|---------|---------|----------|
| | 6am—9am | 9am—1pm | 1pm—4pm | 4pm—8pm | 8am—10pm |
| Frequency | 45 min | 30 min | 45 min | 30 min | 40 min |

✓ Resource Requirements

| | | | |
|---------------------------------|---------------|-----------------------|--------------------|
| Buses Required per Weekday Peak | 3 | Annual Revenue Miles | 136,566 |
| Annual Revenue Hours | 12,260 | Annual Operating Cost | \$1,226,000 |

👥 Projected Ridership and Productivity

| | | | |
|---------------------------|---------------|-----------------------------|----------------|
| Average Weekday Boardings | 200 | Boardings per Revenue Hour | 5.8 |
| Average Weekend Boardings | 180 | Operating Cost per Boarding | \$17.32 |
| Average Annual Boardings | 70,800 | | |

✓ Highlights

- ✓ Provides connections to major retail centers for residents in the central part of the City.
- ✓ Service would operate more frequently during the weekday midday and evening when demand may be higher for retail trips.
- ✓ This route would operate on the weekends when retail trips are higher.



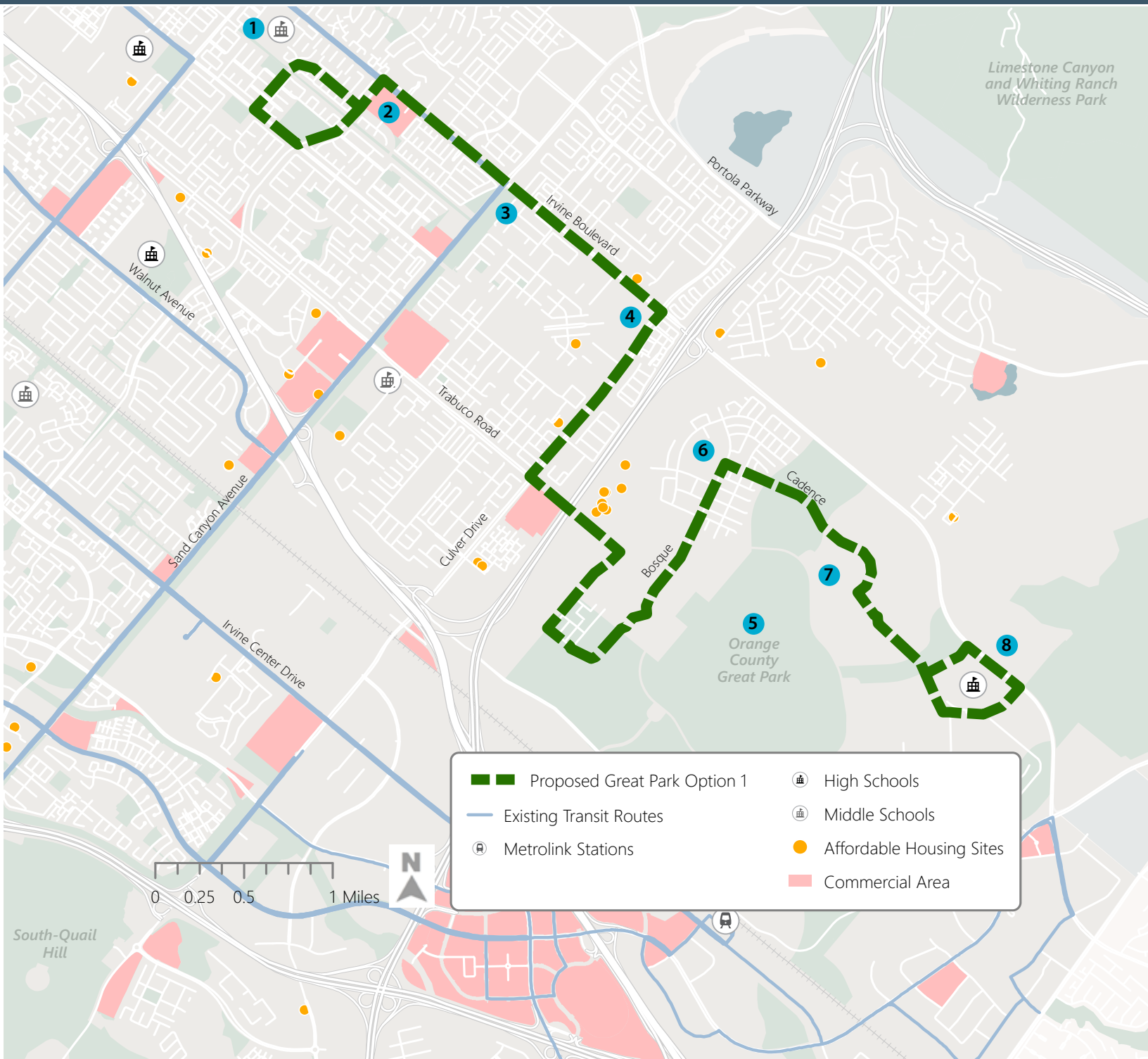
Most popular concept presented at the workshop. Respondents felt that frequency and service span were sufficient and appreciated the addition of weekend service along the corridor. Stakeholders were excited by the prospect of a route connecting the Irvine Business Complex, Irvine Metrolink station and Spectrum.

GREAT PARK OPTION 1

Northwood to Portola High School via Irvine Boulevard and Sand Canyon Avenue

Route Description

This is the first of three options for a route in the Great Park neighborhoods. Option 1 would connect Northwood to Portola High School via Irvine Boulevard and Sand Canyon Avenue providing intermediate service to Woodbury and the OC Great Park.



📍 Key Destinations

- | | |
|------------------------------|---------------------------|
| 1 Sierra Vista Middle School | 6 Beacon Park K-8 School |
| 2 Northwood Town Center | 7 Cadence Park K-8 School |
| 3 Irvine Groves | 8 Portola High School |
| 4 Woodbury Town Center | |
| 5 Orange County Great Park | |

🕒 Service Span and Frequency

| Time Period | Weekday | | | | Weekend |
|-------------|---------|---------|---------|---------|------------|
| | 6am—9am | 9am—1pm | 1pm—4pm | 4pm—8pm | |
| Frequency | 30 min | 45 min | 30 min | 45 min | No Service |

✓ Resource Requirements

| | | | |
|---------------------------------|-------|-----------------------|-----------|
| Buses Required per Weekday Peak | 3 | Annual Revenue Miles | 88,203 |
| Annual Revenue Hours | 8,670 | Annual Operating Cost | \$867,000 |

👥 Projected Ridership and Productivity

| | | | |
|---------------------------|--------|-----------------------------|---------|
| Average Weekday Boardings | 330 | Boardings per Revenue Hour | 9.7 |
| Average Weekend Boardings | - | Operating Cost per Boarding | \$10.30 |
| Average Annual Boardings | 84,150 | | |

✓ Highlights

- ✓ Provides transit service to Woodbury and Great Park Neighborhoods which are not currently served.
- ✓ Connects OC Great Park into regional bus network.
- ✓ Provides connections between four schools.
- ⚠️ Great Park Neighborhoods would require extensive bus stop improvements for ADA compliance.



Of the Great Park options, Option 1 was less popular than Option 2 in both the workshop and the survey. Respondents preferred that if Option 1 were to be implemented it would be alongside Option 2 to provide connections between Orange County Great Park and the Metrolink station/Irvine Spectrum.

GREAT PARK OPTION 2

Great Park to the Irvine Station via Irvine Boulevard and Alton Parkway

Route Description





The Great Park Option 2 would connect the Great Park to Irvine Station and the Spectrum via Irvine Boulevard and Alton Parkway. This route would primarily connect the developing neighborhoods with the Spectrum center and regional transit services at Irvine Station, rather than providing a direct connection between neighborhoods in Option 1.



📍 Key Destinations

- 1 Orange County Great Park
- 2 Beacon Park K-8 School
- 3 Cadence Park K-8 School
- 4 Portola High School
- 5 Retail centers on Alton Pkwy
- 6 Irvine Station
- 7 Irvine Spectrum Center

🕒 Service Span and Frequency

| Time Period | Weekday | | | | Weekend |
|-------------|--|--|--|--|------------|
| | 6am—9am | 9am—1pm | 1pm—4pm | 4pm—8pm | |
| Frequency |  30 min |  45 min |  30 min |  45 min | No Service |

✓ Resource Requirements

| | | | |
|--|-------|---|-----------|
|  Buses Required per Weekday Peak | 3 |  Annual Revenue Miles | 88,203 |
|  Annual Revenue Hours | 8,670 |  Annual Operating Cost | \$867,000 |

👥 Projected Ridership and Productivity

| | | | |
|--|--------|---|---------|
|  Average Weekday Boardings | 160 |  Boardings per Revenue Hour | 4.7 |
|  Average Weekend Boardings | - |  Operating Cost per Boarding | \$21.25 |
|  Average Annual Boardings | 40,800 | | |

✓ Highlights

- ✓ Connects OC Great Park to regional rail and bus network.
- ✓ Provides connections between Great Park Neighborhoods to local schools.
- ⚠️ Great Park Neighborhoods would require extensive bus stop improvements for ADA compliance.



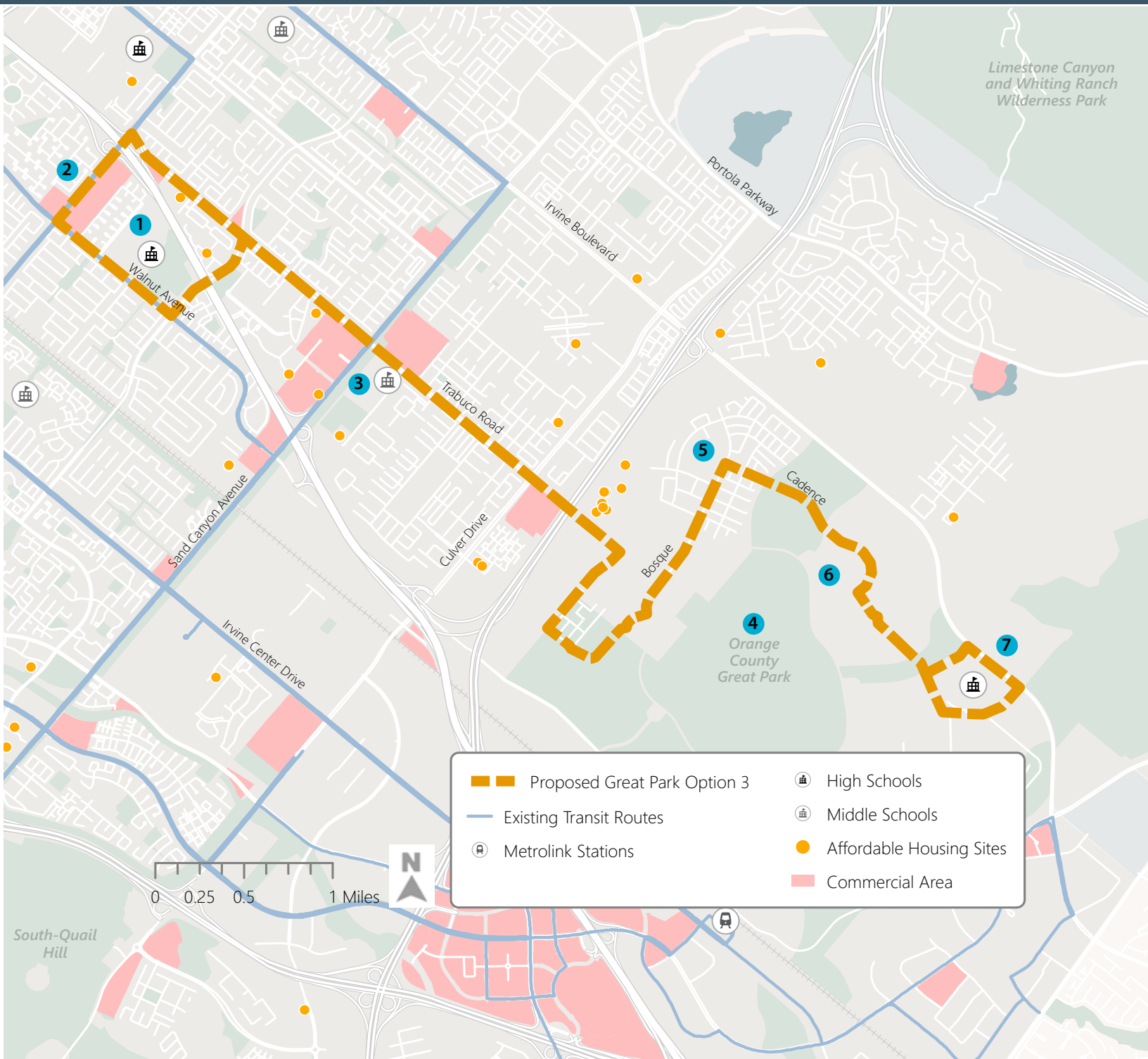
The most popular Great Park option, respondents appreciated the connection between Great Park and Irvine Metrolink. Workshop respondents noted a high need for weekend service, and survey respondents wanted to see shuttles run later in the day to meet more Metrolink trains in the evening.

GREAT PARK OPTION 3

Culver Drive/Walnut Avenue to Portola High School via Trabuco Road

Route Description






Great Park Option 3 would connect Culver Drive/Walnut Avenue to Portola High School via Trabuco Road. This provides a more direct route between established and developing neighborhoods in Irvine and minimizes overlap with existing OCTA service on Irvine Boulevard. It also connects with more established shopping centers compared with the Great Park Options 1 or 2.



Key Destinations

- | | |
|--|----------------------------------|
| 1 Irvine High School | 5 Beacon Park K-8 School |
| 2 Retail center at Culver Drive and Walnut Avenue | 6 Cadence Park K-8 School |
| 3 Jeffrey Trail Middle School | 7 Portola High School |
| 4 Orange County Great Park | |

Service Span and Frequency

| Time Period | Weekday | | | | Weekend |
|-------------|---|---|---|---|---|
| | 6am—9am | 9am—1pm | 1pm—4pm | 4pm—8pm | 8am—10pm |
| Frequency |  30 min |  45 min |  30 min |  45 min |  40 min |





Resource Requirements

| | | | |
|---|---------------|--|--------------------|
|  Buses Required per Weekday Peak | 3 |  Annual Revenue Miles | 131,705 |
|  Annual Revenue Hours | 11,750 |  Annual Operating Cost | \$1,175,000 |

Projected Ridership and Productivity

| | | | |
|---|----------------|--|---------------|
|  Average Weekday Boardings | 340 |  Boardings per Revenue Hour | 10.3 |
|  Average Weekend Boardings | 310 |  Operating Cost per Boarding | \$9.73 |
|  Average Annual Boardings | 120,800 | | |

Highlights

-  Connects to key regional bus routes on Culver Dr and Jeffrey Rd.
-  Provides service to five schools.
-  Potential for weekend ridership connecting Irvine neighborhoods to OC Great Park.
-  Great Park Neighborhoods would require extensive bus stop improvements for ADA compliance.



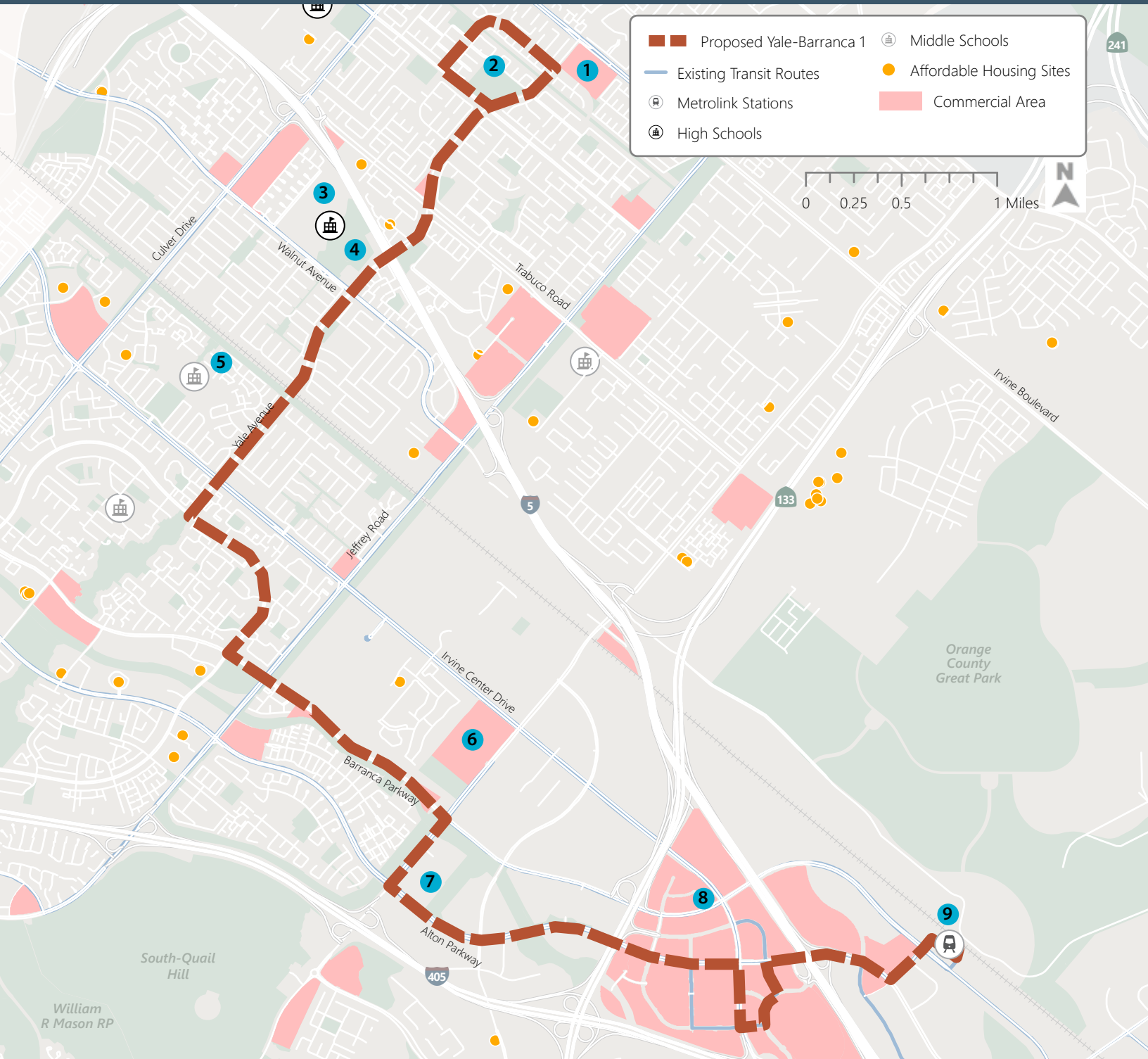
Great Park Option 3 was the least popular concept presented to workshop participants. Survey respondents appreciated the connections Option 3 provided with affordable housing sites but felt the lack of weekend service and lack of a connection with Irvine Spectrum would limit ridership.

YALE-BARRANCA OPTION 1

Northwood to Irvine Station via Yale Avenue, Barranca Parkway, and Alton Parkway (shorter route)

Route Description

The Yale-Barranca options combine sections of the Yale and Barranca routes into one route. Option 1 would connect from Northwood along Yale, serve the northeast portion of the Yale loop, and then provide service along Barranca Pkwy and Alton Pkwy to Irvine Station.



📍 Key Destinations

- | | |
|-----------------------------------|--|
| 1 Northwood Town Center | 6 Retail centers on Alton Pkwy and Barranca Pkwy |
| 2 Northwood Park/Community Center | 7 Kaiser & Hoag Hospitals and nearby medical offices |
| 3 Irvine High School | 8 Irvine Spectrum Center |
| 4 Heritage Park | 9 Irvine Station |
| 5 Lakeside Middle School | |

🕒 Service Span and Frequency

| Time Period | Weekday | | | | Weekend |
|-------------|---------|---------|---------|---------|----------|
| | 6am—9am | 9am—1pm | 1pm—4pm | 4pm—8pm | 8am—10pm |
| Frequency | 30 min | 30 min | 30 min | 30 min | 45 min |

✓ Resource Requirements

| | | | |
|---------------------------------|---------------|-----------------------|--------------------|
| Buses Required per Weekday Peak | 3 | Annual Revenue Miles | 159,964 |
| Annual Revenue Hours | 13,790 | Annual Operating Cost | \$1,379,000 |

👥 Projected Ridership and Productivity

| | | | |
|---------------------------|----------------|-----------------------------|----------------|
| Average Weekday Boardings | 320 | Boardings per Revenue Hour | 7.7 |
| Average Weekend Boardings | 220 | Operating Cost per Boarding | \$13.03 |
| Average Annual Boardings | 105,800 | | |

✓ Highlights

- ✓ Connects many Irvine neighborhoods to local schools, retail, and medical services.
- ✓ Adds key connection to Irvine Station.
- ✓ Parallels some OCTA service but provides a direct single-seat connection between homes and the Spectrum area.
- ⚠️ Route misses some key destinations in Woodbridge.



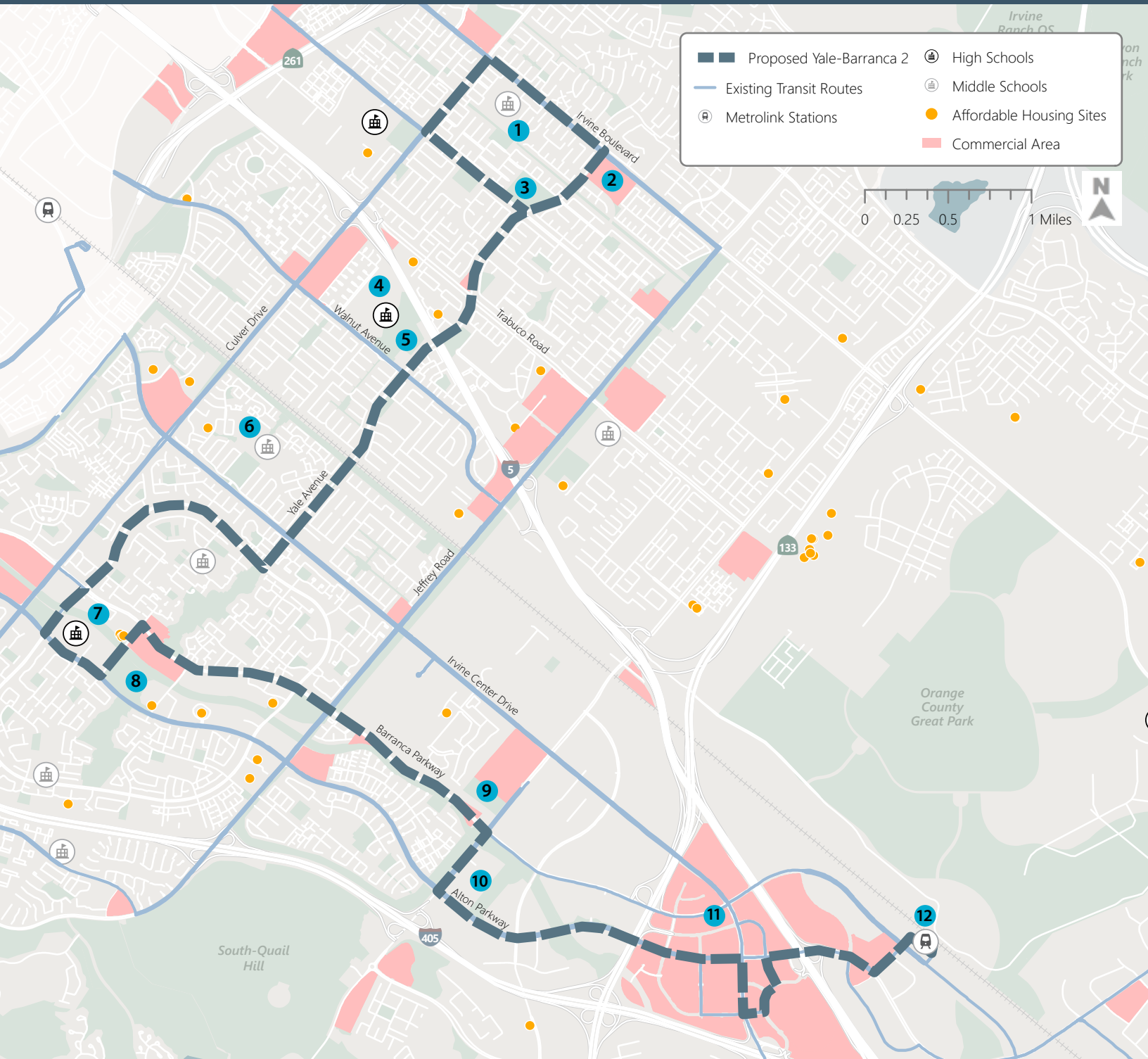
This concept evolved from the community feedback showing great enthusiasm for service along Barranca Parkway, and the data analysis which suggests a high degree of trip activity between homes along the Yale corridor and destinations along Barranca Parkway.

YALE-BARRANCA OPTION 2

Northwood to Irvine Station via Yale Avenue, Barranca Parkway, and Alton Parkway (longer route)

Route Description






The Yale-Barranca Option 2 is a longer version of Option 1. It adds connections to Culver Drive and serves more of Woodbridge along the northwest section of Yale Loop and more segments of Barranca Parkway.






📍 Key Destinations

- | | |
|-----------------------------------|---|
| 1 Sierra Vista Middle School | 7 Woodbridge High School |
| 2 Northwood Town Center | 8 Lakeview Senior Center |
| 3 Northwood Park/Community Center | 9 Retail centers on Alton and Barranca Pkwy |
| 4 Irvine High School | 10 Kaiser & Hoag Hospitals |
| 5 Heritage Park | 11 Irvine Spectrum Center |
| 6 Lakeside Middle School | 12 Irvine Station |

🕒 Service Span and Frequency

| Time Period | Weekday | | | | Weekend |
|-------------|--|--|--|--|--|
| | 6am—9am | 9am—1pm | 1pm—4pm | 4pm—8pm | 8am—10pm |
| Frequency |  30 min |  30 min |  30 min |  30 min |  60 min |

✓ Resource Requirements

| | | | |
|--|---------------|---|--------------------|
|  Buses Required per Weekday Peak | 4 |  Annual Revenue Miles | 201,376 |
|  Annual Revenue Hours | 17,360 |  Annual Operating Cost | \$1,736,000 |

👥 Projected Ridership and Productivity

| | | | |
|--|----------------|---|----------------|
|  Average Weekday Boardings | 520 |  Boardings per Revenue Hour | 9.9 |
|  Average Weekend Boardings | 350 |  Operating Cost per Boarding | \$10.15 |
|  Average Annual Boardings | 171,100 | | |

✓ Highlights

- ✓ Adds connections to Woodbridge High School and Lakeview Senior Center.
- ✓ Parallels some OCTA service but provides a direct single-seat connection between homes and the Spectrum area.
- ⚠ Requires additional bus and operating resources compared to Option 1.
- ⚠ Requires extensive bus stop improvements along Yale Loop for ADA accessibility.

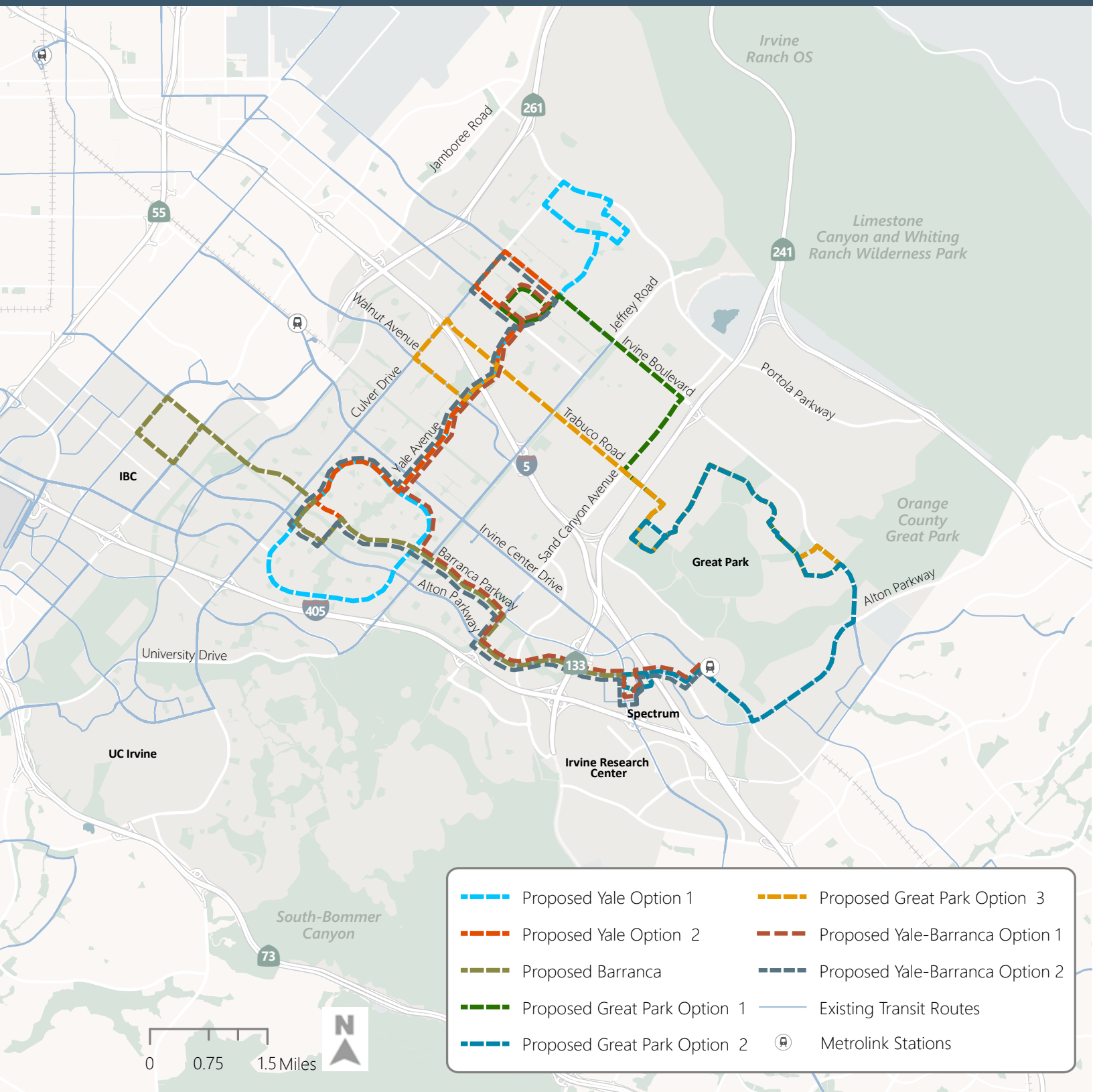


This concept evolved from the community feedback showing great enthusiasm for service along Barranca Parkway, and the data analysis which suggests a high degree of trip activity between homes along the Yale corridor and destinations along Barranca Parkway.

FIXED-ROUTE CONCEPTS SUMMARY

📖 Description

Potential fixed-route concepts were initially developed on Yale Avenue, Barranca Parkway and Great Park area for gathering input from the community and the stakeholders. In response to the enthusiasm for service along Barranca Parkway and the data analysis which suggests a high degree of trip activity between homes along the Yale corridor and destinations along Barranca Parkway, another concept was developed combining the routes on Yale and Barranca.



Fixed-Route Concepts Comparison

| Route Name | Annual Revenue Hours | Revenue Miles | Operating Cost | Boardings | | | Boardings per Revenue Hours | Cost per Boarding |
|--------------------------|----------------------|---------------|----------------|-----------|---------|---------|-----------------------------|-------------------|
| | | | | Weekday | Weekend | Annual | | |
| Yale Option 1 | 8,670 | 85,544 | \$867,000 | 570 | - | 145,350 | 16.8 | \$5.96 |
| Yale Option 2 | 5,100 | 54,876 | \$510,000 | 470 | - | 119,850 | 23.5 | \$4.26 |
| Barranca | 12,260 | 136,566 | \$1,226,000 | 200 | 180 | 70,800 | 5.8 | \$17.32 |
| Great Park Option 1 | 8,670 | 88,203 | \$867,000 | 330 | - | 84,150 | 9.7 | \$10.30 |
| Great Park Option 2 | 8,670 | 93,636 | \$867,000 | 160 | - | 40,800 | 4.7 | \$21.25 |
| Great Park Option 3 | 11,750 | 131,705 | \$1,175,000 | 340 | 310 | 120,800 | 10.3 | \$9.73 |
| Yale - Barranca Option 1 | 13,790 | 159,964 | \$1,379,000 | 320 | 220 | 105,800 | 7.7 | \$13.03 |
| Yale - Barranca Option 2 | 17,360 | 201,376 | \$1,736,000 | 520 | 350 | 171,100 | 9.9 | \$10.15 |

What We've Heard

Stakeholders consistently voiced the desire for more frequent transit service when possible. Workshop participants preferred providing more frequent service over extensive coverage by nearly a 2 to 1 margin. Additionally, workshop participants were nearly split on whether shuttles should deviate into commercial areas or stay on the most direct route. For workshop and survey participants, improving regional connectivity was seen as an important goal.

Community members questioned what the City's target market for transit service was, whether it be seniors, students, workers, or more general trips. Based on the City's objectives, the focus is on residents of all ages and serving trips within Irvine that could include getting to work but was not primarily focused on commuting given the majority of jobs in Irvine are filled by people who live elsewhere.

Additionally, respondents had questions about the vehicles that would be used, including the fuel source and if bike racks would be provided. The State of California has directives to transition public agency fleets to zero-emissions technology for all new purchases beginning in 2023; although the technology is not specified, the choices are essentially between battery-electric or hydrogen fuel cell buses. The vehicle specifications for any service in the Vision are not set, but are likely to include best practice features such as bike racks.

Finally, stakeholders and workshop attendees were curious about the cost of the service and what funding sources had been identified.

Microtransit

Microtransit is a shared-ride, on-demand transit service where you request a ride via a phone call or app. Examples of microtransit are OCFlex available in South Orange County or SacRT SmarT Ride in Sacramento, as shown below. Unlike a neighborhood shuttle route, microtransit has no schedule or specific path it follows. Microtransit instead operates within a zone you can be picked up and dropped off in, but trips outside of the zone boundary are not available. It is similar to Lyft or Uber in its operation, but service is provided by trained professionals using branded vans or small buses. Microtransit services are typically offered at a lower fare per trip than private services like Lyft and Uber.

Residents can request a ride during service hours to almost any location within a neighborhood. Expected wait time for a ride is up to 15 minutes and riders would typically need to walk a short distance to a central location near them for pick-up. Compared with neighborhood shuttles or regular OCTA bus routes, this service is more flexible for your schedule and might require less walking, but can carry fewer people at a time and cannot provide long distance trips.

Examples of Microtransit



Sources: OCTA (left), SacRT SmarT Ride (right)

The following pages outline how a conceptual microtransit zone would work in Irvine. Pick-up locations are shown with the red pins and are typically located at a central point within the neighborhood like the community center, a park, or a shopping center.

For example, someone living in a residential neighborhood and wanting to go see a movie would open an app on their smartphone or call for service and find the nearest pickup point to them is the nearby community park. They then request a trip with the movie theater as their destination, and then walk a minute to the park. The Irvine microtransit van would arrive a few minutes later and pick them up. On the way there, the van makes one more stop along its route at a nearby apartment clubhouse to pick up another passenger, and then continues to drop the first passenger off at the movie theater. When the movie is over, they open the app and make a request for a return trip home.

Potential Microtransit Zones

The project team developed potential microtransit zones covering almost all of the City. The zones were developed using the following criteria:

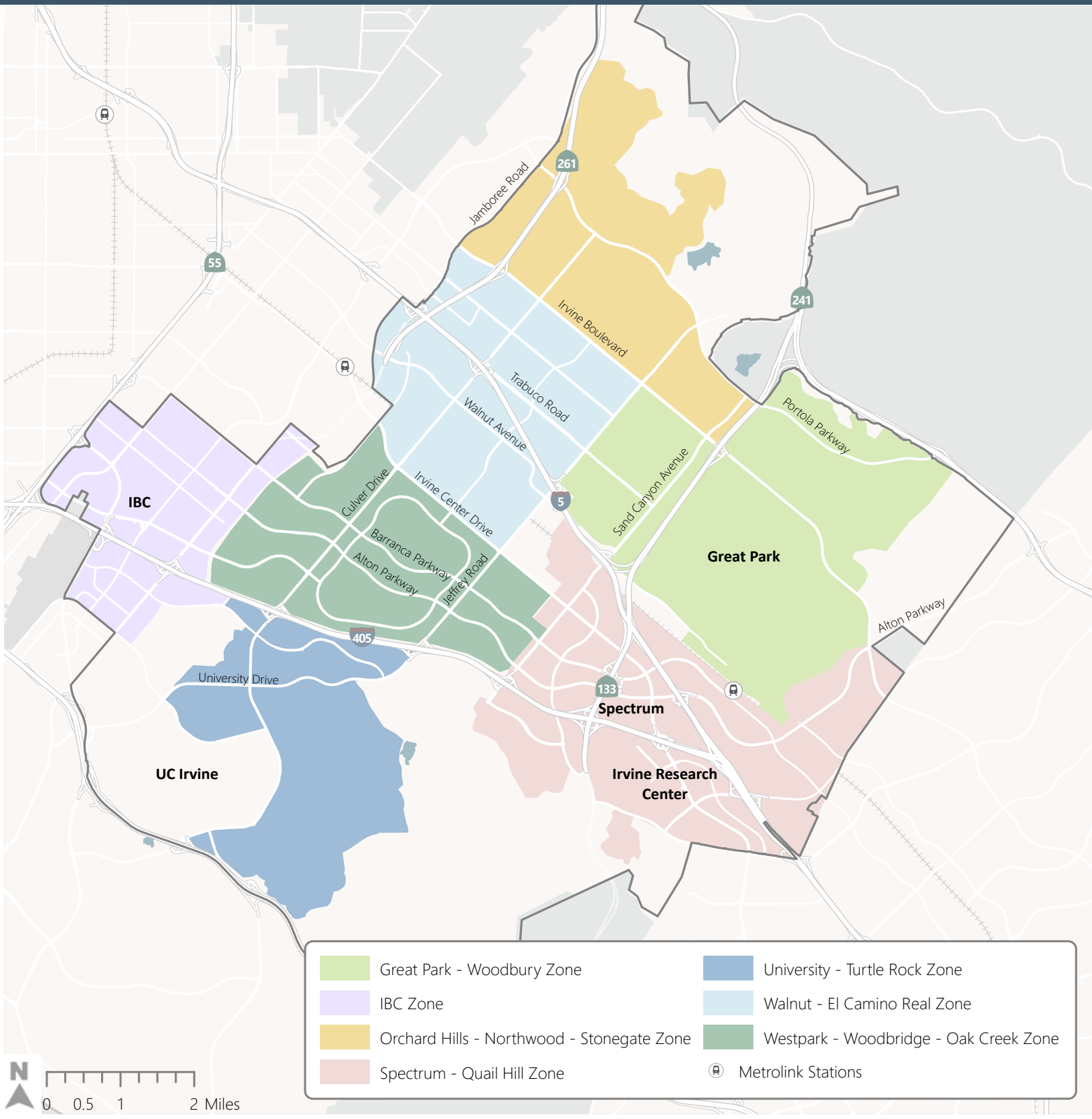
- **Zone Size:** Microtransit zones need to be a manageable size. Big zones can encourage longer trips; this results in needing more vehicles to offer the same response times and less opportunity for shared rides. The zones developed for Irvine were 5 to 10 square miles which keep trips to between 10 to 20 minutes in length.
- **Zone Demand:** The zones also need to have a manageable number of projected trips based on the City's available resources. The zones developed average between 50 and 150 trips per day.
- **Zone Boundaries:** The boundaries of the zones were developed by looking at several factors. First, we used existing Irvine neighborhoods and planning area boundaries. Then we looked at adjacent planning areas to determine where people made the most trips based on cell phone data. There were also some physical boundaries which were considered including freeways, creeks, and train tracks.

The following pages describe the hours of operation and estimated annual ridership for each zone. This is based on analysis of existing trip patterns in the zones and includes a table that compares the resources required including vehicles and annual operating cost.

MICROTRANSIT ZONES

Description

Seven potential microtransit zones were developed. It may not be feasible for the City to operate microtransit in all of the zones because of the cost. Each one of these operate independently and trips would only be allowed within each zone.



Microtransit Zone Comparison

| Microtransit Zone | Weekday Hours | Weekend Hours | Vehicles | Annual Revenue Hours | Annual Ridership | Annual Cost | Cost per Boarding |
|---------------------------------------|---------------|---------------|----------|----------------------|------------------|-------------|-------------------|
| Great Park - Woodbury | 7am—8pm | 9am—9pm | 3 | 10,290 | 27,950 | \$771,750 | \$27.61 |
| Irvine Business Complex | 6am—6pm | 8am—9pm | 4 | 10,355 | 29,570 | \$776,625 | \$26.26 |
| Orchard Hills - Northwood - Stonegate | 7am—7pm | 10am—7pm | 2 | 7,080 | 18,605 | \$531,000 | \$28.54 |
| Spectrum - Quail Hill | 6am—8pm | 8am—9pm | 4 | 14,335 | 44,495 | \$1,075,125 | \$24.16 |
| University - Turtle Rock | 7am—8pm | 8am—9pm | 3 | 10,000 | 30,255 | \$750,000 | \$24.79 |
| Walnut - El Camino Real | 6am—8pm | 7am—9pm | 4 | 17,230 | 56,800 | \$1,292,250 | \$22.75 |
| Westpark - Woodbridge - Oak Creek | 6am—8pm | 7am—9pm | 5 | 18,395 | 60,110 | \$1,379,625 | \$22.95 |

Conceptual Microtransit Zone Example: Woodbridge

- ✓ Conceptual zone shown to the right, covering approximately 6.5 square miles.
- ✓ Could provide up to 50 stops within 5-min walk with connections to parks, shopping centers, and transfer points.
- ✓ Less than 15 minutes response time.
- ✓ Trip Experience:



Book Trip/Walk to Stop



15 min



Ride



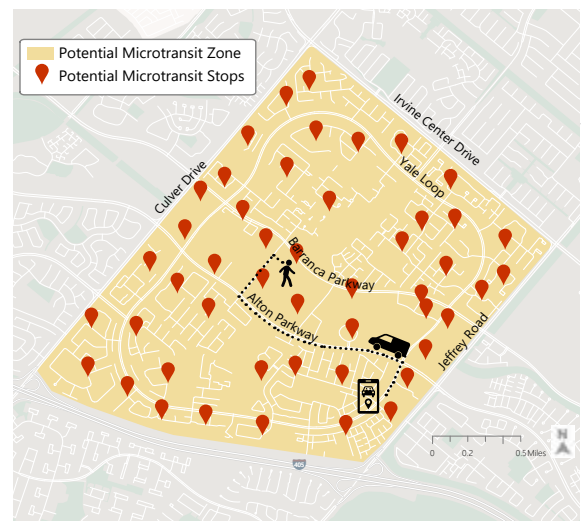
10 min



Walk to Destination



10 min



What We've Heard

Microtransit was well received by workshop participants. In the Menti poll, it scored higher than any shuttle option presented. Weekend service was prioritized over a later service span amongst workshop attendees as well, and respondents indicated they would be willing to pay \$3 to \$5 per trip. The Irvine Spectrum and Great Park zones were the most popular.

Survey respondents had more mixed feelings about Microtransit. Respondents noted concerns about the small service area of each zone and requested that more regional connectivity be provided. Workshop participants agreed that they would prefer larger areas, even if it meant longer wait times for the shuttle. Both survey and workshop participants wanted to ensure that Microtransit was used for longer trips do not undermine cycling within Irvine.

Concept Evaluation

Ridership Estimates

Perhaps the most pertinent question when planning new transit service is, “**how many people will use it?**” Ridership forecasting is a method to estimate the answer to that question by studying the factors that relate to how many people use other, existing transit routes. By examining the number of people, jobs, destinations, and other factors around bus stops across the OCTA network, a statistical regression model can help estimate how significant each of those factors are in predicting the number of riders for a new service. The model for Irvine Transit Vision included the following variables around bus stops:

- Population
- Employment
- Median household income
- Middle and high school population
- Percent of employment in the retail category
- Frequency of all bus service at the stop

Cost Estimates

Operating Cost

Rough operating cost estimates were developed for each of the service concepts. For both the fixed-route and microtransit, the main cost factor is revenue hours which is the total number of hours when service is available to passengers.

For the fixed-route concepts, the revenue hours are a factor of the days of the week, hours of the day, and frequency of the route. The cost for this service was estimated to be \$100 per revenue hour, based on the rate the City currently pays for the original iShuttle routes and rates charged by a vendor providing seasonal trolley services to cities in Orange County. This rate would cover all direct operating costs including the driver, maintenance, and supervision of the service. It does not include the cost of the vehicles, marketing, and City staff time to manage the service.

For the microtransit concepts, the revenue hours are a factor of the days of the week, hours of the day, and response time. The cost for this service was estimated to be \$75 per revenue hour, based on the rate OCTA pays for the OCFlex service and our knowledge of other local microtransit services. This rate would cover all direct operating costs including the driver, maintenance, supervision, and software needed for the service. It also does not include the cost of the vehicles, marketing, and City staff time to manage the service.

Capital Costs

Next to the operating cost, the cost of purchasing vehicles is the next most important cost factor for the service concepts. Fixed-route vehicles range in price from \$250,000 to \$500,000 each depending on the size and robustness. The smaller vehicles should be sufficient for the neighborhood shuttle routes and would carry 30 passengers. The Compressed Natural Gas version of these vehicles cost approximately \$300,000 each. If the City wants to purchase larger or electric buses, the costs would likely be double. There may also be an option to lease new or used buses for a pilot service. As noted in the report, there are some routes which would require significant one-time capital expenditures to improve bus stop locations to meet ADA requirements. Accessible stop needs vary based on the site conditions, but each requires certain minimum dimensions of clear, flat areas from the curb, and access along the sidewalk leading away from the stop to nearby destinations.

The microtransit vehicle cost is lower than the fixed-route vehicles because they are typically modified passenger vans which are smaller sized and carry fewer passengers. The price ranges from \$50,000 to \$100,000 depending on the size and features. For these services we are assuming an average microtransit vehicle cost of \$75,000. We recommend purchasing vehicles which would be similar to the TRIPS fleet as they could be repurposed for this service if necessary in the future.

Performance Measures

The City of Irvine and the project team established a selection of goals and desired outcomes from the implementation of the Irvine Transit Vision. For evaluation of the concepts, these goals were divided into six broad themes.

Improved Mobility

A significant goal of the Irvine Transit Vision is to **improve mobility and accessibility for residents by increasing transit options** by expanding access to transit services citywide and especially to areas of Irvine currently lacking service within walking distance (typically measure as one-quarter mile). Concepts were scored based on the total residents within walking distance, along with a bonus factor for residents who previously had no transit service within one-quarter mile.

Additionally, the number of neighborhood areas with new transit service and the ratio of residential and non-residential destinations for each concept was evaluated to **create mode choice options for short neighborhood trips** of less than three miles. The final component of this factor scored if a concept served an area of Irvine with new and planned development, such as Great Park or Spectrum, to **help support Irvine's future growth**.

Sustainable Options

In ensuring that concepts **offer sustainable shared ride transportation options for trips within Irvine**, routes were evaluated based on estimated ridership projections to approximate the number of trips that would be utilized by the new service and potentially switched from a less sustainable mode.

Additionally, to **promote public health by providing transit options that encourage walking and cycling**, the number of intersecting bikeways was tallied for each Option.

Social Equity

Addressing social equity and environmental justice in the transportation system is an important outcome of the Irvine Transit Vision. As such, concepts were scored based on their ability to connect seniors and communities of color across Irvine. Low-income and car-free households within walking distance of an Option were also considered.

“Keep it Irvine”

Added in response to consistent comments from residents to encourage connections to local commercial spaces and especially schools during the public outreach phase, the **Keep it Irvine approach** measures each Option’s ability to connect residents and visitors of Irvine with important destinations within the community. Concepts scored based on the number of jobs, schools, and commercial districts within walking distance.

Cost Effectiveness

An important aspect in the long-term longevity and financial sustainability of the Irvine Transit Vision, Concepts were scored based on their **cost effectiveness** through a combination of annual operating cost projections, as well as productivity measured in boardings per revenue hour to evaluate overall route efficiency.

Transit Connections

In order to measure each Option’s ability to **complement the existing transit system** across Irvine, the number of OCTA and iShuttle connections for each Option were incorporated into the evaluation framework. Concepts also received a significant bonus if they featured a connection to the Irvine Metrolink station, an important regional transportation hub.

Concept Performance

Yale Option 1

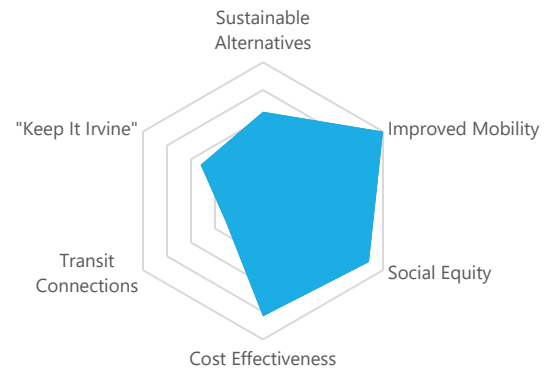
Strengths:

- Improved Mobility: Greatest number of households within walking distance
- Cost Effectiveness: Relatively high boardings per hour
- Keep It Irvine: Connections to local schools

Weaknesses:

- Transit Connections: few intersecting OCTA and iShuttle Routes
- Keep It Irvine: few jobs in walking distance

Yale Alternative 1



Yale Option 2

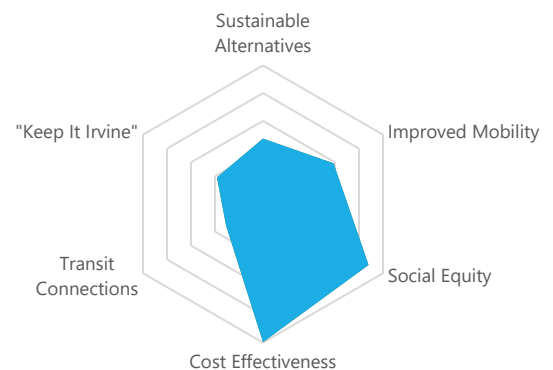
Strengths:

- Social Equity: high percentage of seniors living within walking distance
- Cost Effectiveness: Highest boardings per hour

Weaknesses:

- Transit Connections: few intersecting OCTA and iShuttle Routes
- Keep It Irvine: few jobs in walking distance
- Sustainable Alternatives: low number of intersecting bikeways

Yale Alternative 2



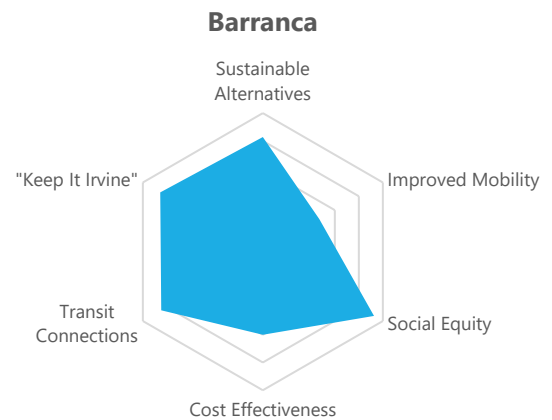
Barranca

Strengths:

- Social Equity: Relatively high percentage of low-income households
- Transit Connections: connects to numerous existing OCTA lines, as well as Metrolink
- Keep It Irvine: high number of jobs and schools in walking distance

Weaknesses:

- Improved Mobility: Limited number of residents with new transit service.
- Cost Effectiveness: High cost per boarding, lower productivity



Great Park Option 1

Strengths:

- Social Equity: Serves a high senior population and several affordable housing sites
- Cost Effectiveness: relatively low cost per boarding

Weaknesses:

- Transit Connections: Very few intersecting OCTA or iShuttle routes. No connection to train stations
- Keep it Irvine: Few jobs and schools within walking distance



Great Park Option 2

Strengths:

- Transit Connections: Intersects OCTA and iShuttle routes, Amtrak and Metrolink
- Social Equity: Serves a relatively high number of households below the poverty line

Weaknesses:

- Improved Mobility: Limited number of residents within walking distance, serves still developing area of Great Park neighborhoods
- Keep It Irvine: Limited access to jobs and schools with walking distance



Great Park Option 3

Strengths:

- Social Equity: High percentage of non-white households, as well as affordable housing sites, within walking distance

Weaknesses:

- Transit Connections: Few intersecting OCTA or iShuttle routes. No connection to train stations
- Keep it Irvine: Few jobs and schools within walking distance



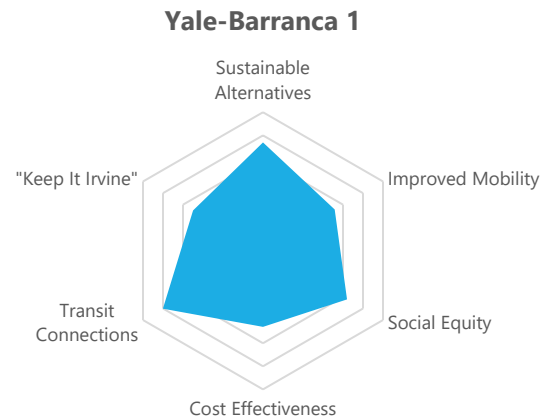
Yale-Barranca Option 1

Strengths:

- Transit Connections: Connects to OCTA, iShuttle, Amtrak and Metrolink
- Sustainable Options: Connections to a large number of intersecting bikeways

Weaknesses:

- Cost Effectiveness: Higher costs per boarding and lower productivity
- Improved Mobility: Does not serve newer/developing areas of Irvine



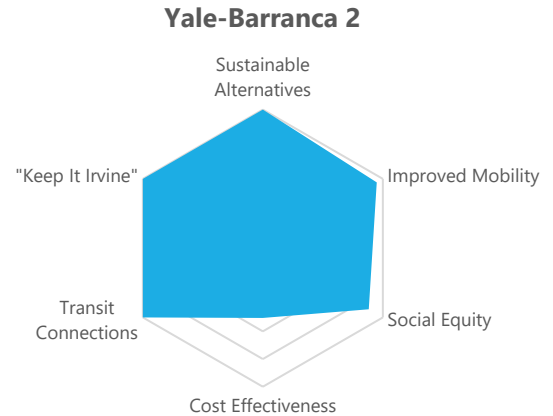
Yale-Barranca Option 2

Strengths:

- Transit Connections: Connects to OCTA, iShuttle, Amtrak and Metrolink
- Sustainable Options: Connections to a large number of intersecting bikeways
- Keep It Irvine: High number of jobs and schools in walking distance
- Improved Mobility: Large number of households within a quarter mile

Weaknesses:

- Cost Effectiveness: High cost per boarding



Microtransit

Microtransit concepts were evaluated using a similar framework as fixed-route concepts, creating relative scores based on the same six buckets. Demographic data was based on all households in the microtransit zone. Certain data inputs were eliminated, such as intersecting bikeways, due to the way that microtransit operates. Microtransit compared with fixed-route neighborhood shuttles are a less sustainable option regardless of zone because the vehicle trips per person are larger for microtransit.

Performance for each microtransit zone based on the evaluation criteria described above is presented on the following page.

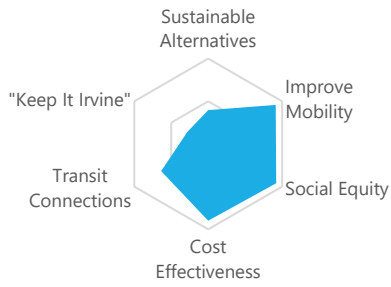
Overall, Westpark-Woodbridge-Oak Creek, Great Park-Woodbury, and Spectrum-Quail Hill score the best and all represent a good balance of benefits across the different evaluation criteria.

Recommended Concepts from Evaluation

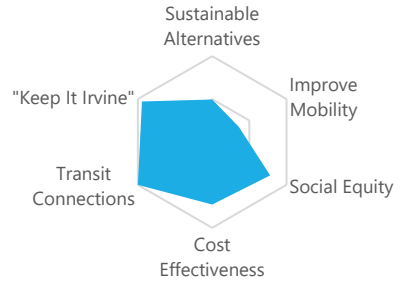
Despite ranking lower on cost-effectiveness, the **Yale-Barranca Option 2 is the recommended fixed-route** option to be implemented on a pilot basis by the City of Irvine. Yale-Barranca Option 2 places many Irvine residents within walking distance to transit, including many households who cannot walk to transit now. This option provides good access to local jobs and schools. It also connects to existing transit routes and the Irvine Metrolink station for regional trips.

Microtransit zones in West Park-Woodbridge-Oak Creek, Great Park-Woodbury, and Spectrum-Quail Hill would be a good supplement to fixed-route service. These zones provide a low-cost option to serve growing areas of the City that may not have the land use or development patterns to support fixed-route transit service.

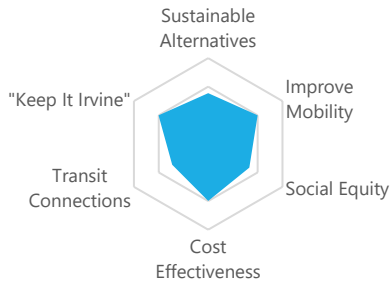
Great Park - Woodbury



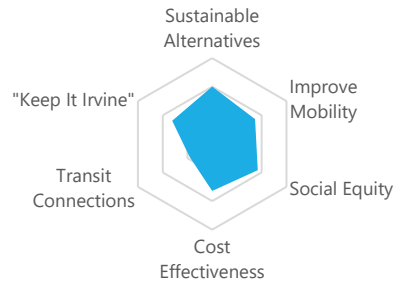
Spectrum - Quail Hill



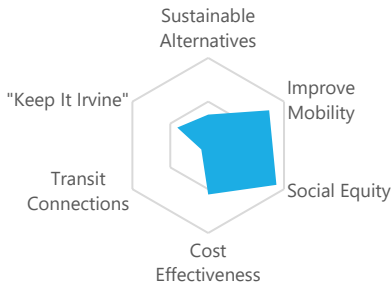
Westpark - Woodbridge - Oak Creek



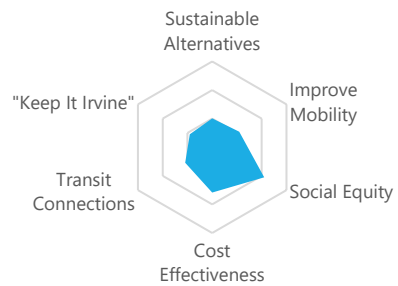
Walnut - El Camino



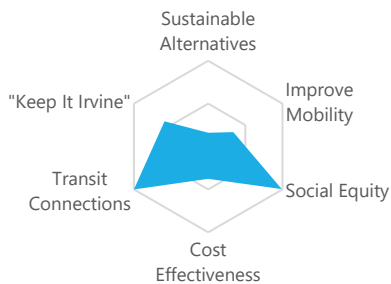
Orchard Hills - Northwood - Stonegate



University - Turtle Rock



Irvine Business Complex



Pilot Implementation

Yale-Barranca Neighborhood Shuttle

The recommended pilot program includes the Yale-Barranca Option 2 (YB2) route, which is the longer of the two variations. The YB2 route offers the greatest balance of coverage between residential, school and community centers, and commercial areas within the City. With a frequency of every 30 minutes during the weekday, the route should be attractive for many users to replace daytime trips within Irvine and could support high school students traveling between school, after-school activities or jobs, and home.

Its route along Yale Avenue builds on an area where residents already use transit by increasing choice. Residents can walk to the stop closest to them, or to the stop where the bus schedule better fits their trip. The Yale-Barranca route also provides a single-seat trip between neighborhoods and the Spectrum, which currently would require a transfer between OCTA routes.

Community members generally favored a route along Barranca Parkway, and travel data and demographic analysis show strong patterns between the Villages along Yale and destinations along Barranca.

The timeline for this pilot implementation is dependent on who would operate the service and what vehicles would be used. The fastest implementation would be to use an existing service contractor with vehicles the City already owns or can quickly lease. Under this scenario, a service could be started within six months of City Council approval. This proposed route is also able to take advantage of existing stop infrastructure, some currently used by other routes and other stops which were previously served by OCTA and are no longer.

The table below provides the estimated budget for the first two years of service. Considerations for implementation of the neighborhood shuttle include:

- **Operating:** The City may contract with OCTA or a local vendor to provide the new fixed-route service. The benefit of contracting with OCTA is that they currently operate and maintain the existing iShuttle fleet. A third-party vendor would give the City more flexibility in making changes to the service during the pilot.
- **Capital:** The budget assumes that new vehicles would need to be purchased for the service. These vehicles can take up to one year to procure and the City would need to consider leasing vehicles in the interim. There may be an opportunity to repurpose existing iShuttle vehicles if not all of the routes return to pre-pandemic service levels. The budget also assumes capital improvements at new bus stop locations to get them up to ADA accessibility standards.
- **Admin:** The new service needs to be marketed to be successful. The budget includes \$50,000 a year for marketing with an additional \$50,000 in the first year for pre-launch marketing. Staff time was not included in this budget and it would need to be determined if managing the service could require additional staff or can be included in the tasks of an existing position.

Neighborhood Shuttle Pilot Cost Estimates

| | Year 1 | Year 2 | Notes |
|---------------------------------------|--------------------|--------------------|---------------------------|
| <i>Operating- Contracted Service</i> | \$1,736,000 | \$1,736,000 | \$100 per revenue hour |
| <i>Capital- Vehicles</i> | \$1,200,000 | - | 4 buses @ \$300,000 each |
| <i>Capital- Bus Stop Improvements</i> | \$300,000 | - | 20 stops at \$15,000 each |
| <i>Admin- Marketing</i> | \$100,000 | \$50,000 | \$50,000 launch marketing |
| Total Cost | \$3,336,000 | \$1,786,000 | |

Great Park – Woodbury Microtransit Pilot

Of the microtransit zones considered, the Great Park-Woodbury zone is a good fit for the more flexible service, shows strong ridership potential, and is the most cost-effective. The zone connects a newer, developing area of the City and established neighborhoods with relatively strong transit propensity.

Implementing a microtransit service may have a shorter lead time than the neighborhood shuttle. The fastest path to implementation is likely using a turn-key vendor to operate and provide vehicles for the service. This may only take three to six months from City Council approval. The table below provides the estimated budget for the first two years of service. Considerations for implementation include:

- **Operating:** The City may contract with a third-party vendor to operate the service. Other alternatives include operating the service with TRIPS staff or with the existing OCTA OCFlex contractor. The third-party vendor provides the most flexibility for a pilot and there are vendors who have already indicated to the City their interest in providing this type of service.
- **Capital:** The budget assumes that three new vehicles would need to be purchased for the service. Microtransit vehicles are more readily available than fixed-route buses, but still would take up to six months to procure. Third-party vendors may have access to vehicles which the City could lease for a pilot.
- **Admin:** Like the neighborhood shuttle, this service would need to be marketed both pre-launch and throughout the pilot. Also, staff time would need to be set aside to manage the service contract and respond to requested changes to the microtransit pick-up locations and zone boundaries.

Microtransit Pilot Cost Estimates

| | Year 1 | Year 2 | Notes |
|--------------------------------------|--------------------|------------------|---------------------------|
| Operating- Contracted Service | \$771,750 | \$771,750 | \$75 per revenue hour |
| Capital- Vehicles | \$225,000 | - | 3 buses @ \$75,000 each |
| Admin- Marketing | \$100,000 | \$50,000 | \$50,000 launch marketing |
| Total Cost | \$1,096,750 | \$821,750 | |

Long-Term Transit Vision

As traffic congestion returns, vehicle collisions rise, and climate change continues to threaten our communities, investment must continue in transit and other shared-ride options. Turnover to electric cars alone will not solve all of these issues, nor does this Vision suggest that people should stop owning cars altogether. A balance should be sought where transit is a convenient, effective and attractive alternative for enough trips to help limit traffic congestion and collisions and improve choice for people.

A Future Network for a Growing City

Of the concepts examined, not all can be implemented at once with the funding available. Over time, the City may desire to expand the initial pilot route into a network of local circulator routes to include the Yale-Barranca Alt 2 (recommended for pilot) and Great Park Option 3. Linking these routes:

- Expands coverage to the developing Great Park neighborhoods
- New east-west service between Culver Drive and Alton Parkway along Trabuco Road via Portola High School
- Provides transit access to the Orange County Great Park
- Creates a network of 30-minute frequency routes across the areas of the City with the greatest propensity for transit
- With timed connections, connections from much of the City to Great Park, train stations, and Spectrum

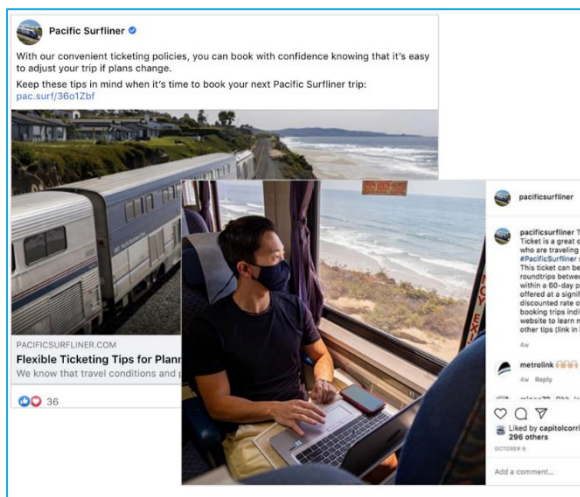


The addition of two routes operating 30-minute frequencies is a significant increase in operating cost. Additionally, most of the Great Park neighborhood roads and sidewalks require infrastructure for bus stops including ADA-compliant zones for picking up people using wheelchairs. Design and installation of these stops would require an up-front capital investment.

Programs to Improve Transit Use

From the pilot implementation onward, the City can employ several strategies to inform and attract new riders. A failing of many otherwise great transit pilot projects is insufficient investment in programs to connect with the intended audience – the “build it and they will come” mentality is not appropriate for transit service in an age where most people own or have access to a car as soon as they are old enough to get a driver’s license.

Marketing the service includes informing people of the details – what, when, how – and getting that information out through every possible means, including websites, social media, physical flyers, and with knowledgeable friendly staff at community events. However, many agencies can get so bogged down in the details about transit that the advertising and marketing campaign becomes inaccessible. Complement an *informational* marketing campaign with one that is simplified, attractive and inviting the reader to learn more. The key information to inform the public is where there are new routes offered and how to find out



more (“Search your trip online at xyz.com or on the Transit App”). Lastly, online presence, searchability, and linkage to related services is critical. It is important that information on the City’s website is easily understood and easily found. Be sure someone can go directly from the City’s transit information to OCTA’s webpage, and work with OCTA to ensure the same is true in the other direction. Connect these resources with the local TMA and similar organizations, as well as any other community organization and even businesses along the route. Find examples of award-winning transit marketing from [APTA’s annual AdWheel Awards](#).

To attract riders and reward people for using the service regularly, consider **rider incentives**. There are many variations on strategies in this category:

- Offer the service for free during the first week or more. Market this heavily in advance of opening day, and refresh the campaign shortly before the promotion ends.
- Offer frequent rider rewards programs –people who ride regularly get x free rides a month, or one free ride for every ten, etc.
- If electronic fare media are used, analyze usage and send promotional messages to riders who haven’t ridden a second time within a week, to encourage users to give it a second chance at becoming a habit. Also use this strategy as an opportunity to gather feedback – don’t intend to ride again? Tell us why!
- Coordinate with OCTA to integrate fare system that is seamless to navigate and use between the operators and service type.

- Link with other City programs or local organizations – if the library on the route offers free Friday movies, connect with the library to co-advertise the ability to get to and from the movie using the route (and of course, be sure that service is available before and after what is being cross-promoted).
- Work with one or two key local businesses to offer a desirable reward, discount or other incentive when demonstrating that you used the transit service. As above, be sure to cross-promote this with a marketing campaign from the business and the City.

Transit is a key means of mobility for high school students across California, opening opportunities to access after-school activities and jobs when students can't or don't want to drive. **Transit in the classroom** attracts riders by connecting with school administrators and teachers to identify after-school programs that can take advantage of the service. Teachers can identify the programs and students who could benefit from the transit service and help them learn how to use it, building real world skills in the process. In some cases, teachers will even identify opportunities to use existing transit routes as a field trip opportunity to extend the classroom into the community.

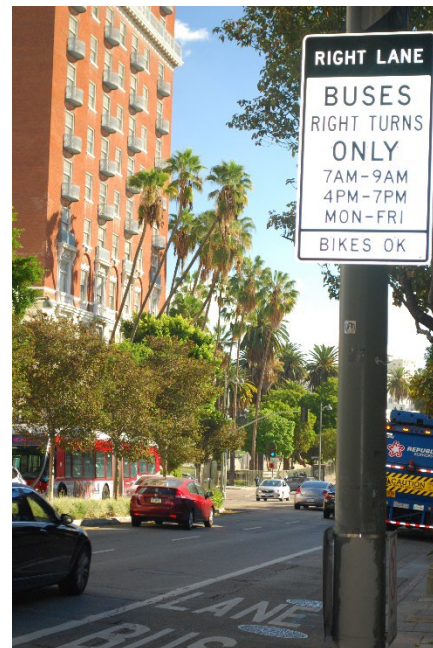
Offering **high-quality bus stops** is a critical component for the success of transit. It's hard to compete against the comfort cars offer, but investing in benches, shelters, and real-time information doesn't just improve the comfort of the transit experience; it is also another means of marketing the service, creating an additional visual cue for people besides the buses themselves, and demonstrating that the City takes the investment in transit seriously. In some communities, transit shelters are also used for advertising to generate revenue, or simply as an opportunity to advertise the transit service itself. The cost of offering real-time information at stops is decreasing as new products are able to rely on solar power and low-energy displays such as LEDs or e-Ink. Find out more about developing high-quality bus stops from TransitCenter's [*From Sorry to Superb: Everything You Need to Know about Great Bus Stops.*](#)



Long-Term Strategies

Develop Transit Priority Lanes

Many communities have invested in “bus only” or “shared bus-bike” lanes to give transit a chance to compete with drive time through congested areas. Bus lanes are designated with signage and striping and restrict access for cars, either during peak periods when congestion is worst, or all-day if warranted. In special cases, a transit priority lane could be an entirely separate facility, but typically they are implemented by restriping an existing road and converting space to become a bus only lane. Sometimes this is done by removing or limiting on-street parking; sometimes it requires repurposing an existing travel lane, or a striped shoulder (breakdown lane). Transit priority lanes are most effective in congested locations, either through a corridor with very high frequency buses and/or several routes, or in short segments as a strategic measure to improve reliability serving key stops even for lower-frequency services. Short stretches of bus lanes in constrained and low-speed conditions can be effectively and safely shared with bicycles, as well. Read more in the [NACTO Transit Street Design Guide](#). No specific locations for bus priority lanes were identified in this study but the City may wish to examine these opportunities over time to give more parity to transportation modes that achieve climate and equity objectives.



Infill Development and Parking Management

In some areas of Irvine, shopping and business center parking lots are so full at peak times that cars queue back onto the street or lots require valet attendants. This is a function of the built-environment problem as well. When the only way to get to the nearest or best stores is to drive, everyone will drive. Over time, Irvine can consider policies for new development and existing developments with over-demand parking supply that would facilitate better transit use. Redeveloping existing parking lots to infill development closer to the main street would help shift destinations closer to bus stops and make the walking environment along streets more pleasant. Recent developments sometimes have this characteristic but are sometimes “inward” oriented with a town-center feel that is admirable but still far from the main road. For existing developments with greater demand than parking supply, the owners and City should turn first towards financial and operational support for transit rather than seeking to build more parking.

Connecting Transit, Biking, and Walking

The City has a growing and highly-used bike and trail network that can extend the reach of transit. Fixed-route transit services should remain on major corridors where they will attract the most riders and operate the most efficiently, while the City closes any gaps in the biking and walking environment connecting to

other areas. The City should prioritize improving safety and comfort along its high-injury network and in relation to transit access, to ensure that as people try to build habits in using the new transit investments they are safe doing so.

Other Service Concepts

The City and its transportation needs are continuously evolving. In 2009, the original Irvine Transit Vision focused its recommendations on a growing need to connect the regional rail and commuter travel patterns with the job centers in Irvine, envisioning future needs for mid-day and evening circulation for lunch hours in the job centers and neighborhood circulators serving the Villages. Today's Irvine Transit Vision focuses on the neighborhood circulation needs that have not truly been tried and tested since 2009. As the Great Park neighborhoods continue to develop, businesses expand, and travel patterns continue to shift following the COVID-19 pandemic, the City should continue to evaluate the potential for these ideas:

| The Idea | Why, When and How |
|---|--|
| Circulators around the IBC and Spectrum Center | Since 2009, there has been a perceived need (and some attempts to offer) lunchtime circulator shuttles around the business centers. Because there are relatively few restaurants within walking distance of any given business, the nearest shopping centers tend to reach parking capacity quickly. Lunchtime circulators have difficulty succeeding because they can require a lot of vehicles (and potentially a lot of routes) for a short 2-hour window in order to be effective. Too few routes and too low a frequency makes it too inefficient for anyone but the closest businesses to use it. If regular daily office attendance returns to pre-2020 levels, consider select routes in partnership with businesses, focusing on those relatively close to the shopping center. Workers further away are likely to continue driving unless they have a dedicated and fast route. |
| Operate iShuttle routes throughout the day | The iShuttle routes have been tailored to directly serve commuters to Irvine on morning and afternoon trains. Metrolink and Amtrak services do operate throughout the day, with fewer trains outside of the commute hours. Expanding iShuttle schedules to serve trains throughout the day could provide more flexibility for commuters whose trips don't fit neatly in the "8 to 5" service window, and could improve connections with the proposed neighborhood shuttle routes to increase access for residents to the train. Doing so should require only 1-2 buses as opposed to the 3-4 per route that are required at peak times. |

| | |
|---|---|
| <p>Offer Microtransit to areas of the City that are not ideal for scheduled bus routes</p> | <p>A substantial portion of the City features low-density housing with neighborhood streets that are too circuitous for neighborhood shuttles to be effective. There could be value in offering microtransit zones in these areas to provide connections to key destinations like the Spectrum, Great Park, and the train stations so residents don't have to use their cars. Such a service is not likely to have a notable effect on reducing traffic volume, but could be effective for minimizing parking demand at busy activity centers, and could provide connections to regional transit.</p> <p>Another means to accomplish this is to partner with an existing ridehail service such as Lyft or Uber and offering a subsidy for trips with an origin and destination in Irvine, or even only between specific areas of Irvine. When developing such a partnership, an agreement must be made to ensure that accessible service for people with disabilities is available, either from the vendor or by serving those trip requests with another service such as TRIPS.</p> |
| <p>Expanding coverage and frequency of regional routes</p> | <p>Although the focus of this study is on circulation within Irvine, most residents and visitors have travel needs that take them to neighboring cities, too. OCTA conducted its own systemwide redesign study concurrently with the development of the Irvine Transit Vision, focused on regional travel demand. The City and residents participated in that study, and OCTA continuously accepts input and reexamines its network to respond to changing demand and to improve efficiency. If Irvine continues to identify underserved regional trips (particularly given that many otherwise-frequent OCTA routes operate only once an hour within Irvine), the City should work collaboratively with OCTA to improve frequency of existing routes. Doing so may overlap with some of the recommended services from the Irvine Transit Vision, and would be cause to reexamine the frequency and/or alignment of these concepts and potentially reallocate those resources or re-route one or more services.</p> |