



# Circulation

## ***ELEMENT B*** **CIRCULATION**

***GOAL: Provide a balanced transportation system.***

### **Description of Circulation Element**

The overall Citywide circulation system can influence the pace of urban development and facilitate interaction among the planning areas. Irvine's circulation system has been designed to:

- Create a hierarchy of roadways.
- Reinforce boundaries of planning areas.
- Respond to conservation, noise, air pollution, and wildlife preservation policies.
- Satisfy City General Plan and Strategic Business Plan objectives.

Four different types of systems compose Irvine's circulation system: air, road, public transit, and trails. This element describes the nature and extent of the existing circulation network, and identifies trends, issues, and public policies relating to the development of a balanced, multi-modal circulation system for Irvine.

### **Existing Conditions**

**Air System.** The air system is comprised of general aviation and commercial flights from John Wayne Airport. Most of the air transportation needs of Orange County are met by John Wayne Airport. The flight schedules of local airlines are regulated by the county to minimize air and noise pollution impacts

**Road System.** The City's arterial roadway system is shown on Figure B-1 and B-2. Figure B-1 illustrates the arterial highway designation for roadways. Both the County of Orange and City of Irvine roadway designations are identified below for reference.

## Arterial Highways (Figure B-1)

Figure B-1 designates the type of roadway facility, which is defined primarily by the number of lanes within the roadway. The facility classifications contained in Figure B-1 are defined as follows:

- **Freeway:** A divided state highway with access restricted to grade separated interchanges. Freeways provide for movement of high volumes of intercity traffic.
- **Transportation Corridor:** A multi-modal facility with restricted access having a median of sufficient width to be utilized for fixed rail or high occupancy vehicle lanes, in addition to general purpose lanes. Transportation Corridors provide for movement of intercity traffic.



### Eastern Transportation Corridor

- **Expressway:** A divided high-flow arterial highway with three or more lanes in each direction and grade-separated intersections and/or access

ramps (Jamboree Road is the only designated expressway).

- **Major Highway:** A divided arterial highway of six to eight through lanes. Major highways provide for the movement of traffic between planning areas and/or the distribution of traffic to and from freeways or transportation corridors.
- **Primary Highway:** A divided arterial highway of four through lanes. Primary highways provide for the movement of traffic between planning areas, the movement of traffic to and from activity centers within planning areas; and/or the distribution of traffic to and from freeways or transportation corridors.
- **Secondary Highway:** An undivided arterial highway of four through lanes. Secondary highways provide for the movement of traffic between planning areas and/or the movement of traffic to and from activity centers within planning areas.
- **Commuter Highway:** A two-lane undivided highway which functions primarily as a collector facility which has the ability to handle through traffic movements between arterials. It is shown on the Master Plan of Arterial Highways (MPAH) because it provides network continuity, or may serve through traffic demand where projected volumes do not warrant a secondary.

## Operational Characteristics Plan (Figure B-2)

Figure B-2 designates the operational characteristics of streets. It addresses specific characteristics of streets in

Irvine, including restricted access, parking prohibitions, and the types of traffic utilizing the street. The functional operational classifications contained in Figure B-2 are defined as follows:

- **Freeway:** See County of Orange definition.
- **Transportation Corridor:** See County of Orange definition.
- **Thruway:** A relatively high speed arterial highway with restricted access supplementing the freeway system and carrying intermediate range trips to or between major nonresidential land uses. A thruway has emergency parking only, and minimal pedestrian interference with traffic.
- **Parkway:** A moderate speed arterial highway abutting and distributing trips to a variety of land uses. This facility primarily serves short-range trips and is a significant urban design element as it borders the activity corridor. A parkway has emergency parking only and will have considerable parallel and perpendicular pedestrian movement.



**Culver Drive**

- **Community Collector:** A medium speed highway abutting similar land uses. The primary function is to

collect and distribute trips within a hierarchy of roads and, secondarily, to carry short trips between adjacent neighborhoods. A community collector has emergency parking only and has a significant amount of parallel and perpendicular pedestrian traffic. Two-lane undivided roadways that exclusively provide for the collection or distribution of local traffic are defined as local roadways and are not shown in Figure B-1.

- **Local Street:** A low speed, low volume roadway primarily for access to residential, business, and other abutting properties. A local street may have parking and a significant amount of parallel and perpendicular pedestrian traffic.

**Public Transit System.** The public transit system is designed to serve regional and local travel needs. Inter-state bus systems operate primarily along the Santa Ana and San Diego Freeways, with most having no stops in the City. Orange County Transportation Authority (OCTA) provides bus service to major destinations within Irvine and surrounding communities. Amtrak and Metrolink trains operate on the Los Angeles to San Diego (LOSSAN) Railroad right of way through the City. Existing stations are located in Irvine, San Juan Capistrano, Anaheim, Fullerton and Santa Ana. Opportunities exist to expand Irvine’s public transit system.

The public transit system is comprised of four hierarchical transit corridors as described on the following page and depicted on Figure B-3.

- **Regional Transit Corridors:** Transit corridors are implemented by the Orange County Transportation Authority or other regional transit agencies, and are envisioned to be serviced by an at-grade, line-haul transit facility.
- **Intercity Public Transit Corridors:** Secondary transit corridors provide connections between Irvine and other destinations serving both inter- and intracity traffic. The corridors are envisioned to be served predominantly by rubber-tired vehicles (i.e., bus, tram). Alternative improvements such as exclusive lanes for high occupancy vehicles (HOV lanes) may also be utilized.
- **Intracity Public Transit Corridors:** Local public transit corridors serve planning areas, providing a feeder system to the intercity and regional transit corridors. The systems envisioned to serve the corridors are low volume transit facilities (i.e., bus, tram, people mover, dial-a-ride) operating within the available public right of way.
- **Intra-City Advanced Transit Corridor:** Corridors connect to the regional transit corridors to serve both inter- and intracity travel needs. The corridors entail the maximum usage of overlapping or multipurpose right of ways, including primarily the flood control right of ways, as well as utility easements, planning area edge buffers, arterial parkways, safety lanes, or similar open space areas, as appropriate to preserve the

opportunity for implementing a future advanced transit system. This system is envisioned to be served by an elevated, grade-separated transit facility.

**Trail System.** The trail system is comprised of a single equestrian trail and numerous biking and hiking trails. These trails provide recreational and commuter



opportunities. Bicycle trails have been developed along the majority of designated trails, connecting the developed areas of the City. The

trail systems are illustrated on Figure B-4.

A master plan for the hiking and equestrian trails was adopted by the City in 1989 which includes concepts for trail surfaces, signage, landscaping and fencing.

## Trends

As the City matures, the City must coordinate the pace of development with the circulation systems. Planned roadway capacities may be exceeded if development continues without effective transportation demand measures, and coordination of alternative transit systems. As such, circulation improvements must be planned to keep pace with development.

**Air System.** Increasing commercial passenger demand in Orange County

will probably not be totally accommodated at John Wayne Airport due to numerous environmental and political constraints. The number of daily departures from John Wayne Airport is limited by a settlement agreement negotiated between the County of Orange, the City of Newport Beach (which lies under the flight path of aircraft taking off from the airport), the Airport Working Group, and Stop Polluting Our Newport. This agreement caps the annual number of passengers at 8.4 million, until its expiration in 2005. It is expected that upon expiration of the agreement there will be opposition to more intensive use of John Wayne Airport. However, due to increases in population, passenger demand is expected to increase in Orange County.

MCAS-El Toro and MCAS Tustin were both closed in 1999. As a result, reuse plans for both bases are currently being developed. Although Irvine is not the lead agency, the City is reviewing these plans.

Objective B-7, Air Transportation System, and its related policies are intended to protect the City as demand for air transportation increases and new land use plans for the closing military bases are adopted.

**Road System.** The City must plan for a doubling of its residential population and tripling of its employment population. As such, jobs-to-housing relationships will play an important part in understanding circulation impacts from development. Due to the large capital outlay already spent and future outlay anticipated, it can be assumed that the automobile will continue to be an

important transportation mode. Recognizing the role of the automobile, the City, correlates the circulation network (Figure B-1) with General Plan land use through its planning efforts, (Table A-1). The City utilizes a computer traffic model to assist in analyzing proposed land use changes. In order to ensure the proper use of the model, the City reviews and updates the land use assumptions, traffic generation rates and other factors utilized in the computer model. Transportation demand management measures (i.e., ride sharing, flexible work hours, telecommuting, etc.) are significant tools to reduce vehicular demand rather than increasing system capacity and are closely coordinated with the City's computer model.

**Public Transit.** Public transit should become an increasingly viable transportation mode as operating costs for private autos increase, roadway congestion increases, and lack of accessibility to private autos for certain groups (i.e., elderly, handicapped, low income) increases. While public transit may never supplant the automobile as the primary mode of transportation, its implementation and use will help alleviate street congestion, as well as provide a more economical means of transportation.



**Irvine Transportation Center**

**Trail System.** It is expected that bicycle/pedestrian trails will continue to be developed concurrent with adjacent development. The hiking and equestrian trails will also be developed as the City grows.

#### **Identification of Issues**

- 1. How can the City plan for a vehicular circulation system which accommodates both local and regional land use and circulation needs?**
- 2. How can the City reduce, eliminate, or mitigate negative environmental impacts of the circulation system?**
- 3. How can the City encourage the use of a more balanced multi-modal circulation system?**
- 4. How can the City preserve opportunities for future advanced rapid transit systems?**
- 5. How can the City maximize the positive attributes of the existing air facilities within and adjacent to the City, while minimizing the negative or potentially negative impacts?**
- 6. To provide adequate circulation capacity, the City should maintain a functional mix of land uses and an adequate relationship between housing and employment opportunities. How can the City provide an adequate jobs-to-housing balance?**
- 7. How can the City enhance alternative transit modes?**

## Response to Issues

The following objectives, and policies have been formulated as policy to respond to circulation issues.

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### ***OBJECTIVE B-1: ROADWAY DEVELOPMENT***

***Plan, provide and maintain an integrated vehicular circulation system to accommodate projected local and regional needs.***

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*The following policies support Objective B-1:*

***Policy (a):*** Use the Circulation, Land Use and Growth Management Elements to determine roadway sizing and phasing.

***Policy (b):*** Use Figure B-1, Master Plan of Arterial Highways, for the purpose of detailed planning of the circulation network.

***Policy (c):*** Develop, on an incremental basis, a vehicular circulation system responding to local and regional access requirements. The following Level of Service (LOS) Standards shall be the goal applied to arterial highways, as shown in Figure B-1, which are in the City of Irvine or its sphere of influence,

and which are under the City's jurisdiction.

LOS "E" or better shall be considered acceptable within the Irvine Business Complex (IBC-PA 36), Irvine Center (PA 33), and at the intersection of Bake Parkway and the I-5 northbound off-ramp.

In conjunction with individual subdivision map level traffic studies for development proposed in Planning Areas 5B, 6, 8A and 9, a LOS "E" standard would be considered acceptable for application to intersections impacted in Planning Areas 13, 31, 32, 34, 35 and 39.

In conjunction with individual subdivision map level traffic studies for development proposed in Planning Areas 30 and 51, a LOS "E" standard would be considered acceptable for application to intersections impacted in Planning Areas 13, 30, 31, 32, 34, 35 and 39.

LOS "E" would be acceptable subject to the following:

1. Preparation, submittal, processing and approval of a traffic study for the specific subdivision map.
2. Level of Service "E" will only be considered acceptable for an intersection that does not contain a residential quadrant. No Level of Service "E" will be accepted along Sand Canyon except at the

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Sand Canyon/I-5 Interchange ramps.

3. Participation/funding to an upgraded traffic signal system as defined in the Traffic Management Systems Operations Study (TMSOS) and/or an Advance Traffic Management System (ATMS), which may be in place at the time of processing of the individual subdivision map traffic studies. The City, in conjunction with the specific subdivision map processing, shall determine the level of participation/funding using criteria and a process developed concurrent with submittal of subsequent subdivision maps.

LOS “D” or better shall be considered acceptable within all other areas.

**Policy (d):** Evaluate the incremental additions to the roadway system through use of the City transportation model.



**Pedestrian Overcrossing**

**Policy (e):** Cooperate with state, county, and local governments to assure orderly development.

**Policy (f):** Work with the county, landowners, and other agencies in developing compatible land use and circulation plans for the area northerly of the sphere of influence, recognizing that new development in this area can have a significant impact on the existing City circulation system.

**Policy (g):** Coordinate with state, county and local agencies to plan and construct public utilities to prevent impact on complete or planned roadways.

**Policy (h):** Monitor major land use and transportation planning issues in southeast Orange County for impacts on major transportation facilities in Irvine. The Development Monitoring program shall identify a list of intersections that do not meet the General Plan level of service standards for intersection capacity. The City shall monitor and coordinate with the county in developing mitigation measures.

**Policy (i):** Actively lobby with appropriate state commissions, committees, and legislators for funding to upgrade the Costa Mesa, San Diego and Santa Ana Freeways.

**Policy (j):** Support programs to increase the vehicle occupancy rate.

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**Policy (k):** Study arterial links listed in this policy to determine that the proposed augmentations, if necessary, are adequate to accommodate traffic demand at build out of the General Plan. As part of any evaluation of an arterial augmentation proposal, travel demand reduction measures shall also be analyzed to determine if they can be implemented in lieu of augmentation. Arterial augmentations include improvements to signal timing or coordination, additional intersection through or turn lanes, auxiliary lanes, intersection grade separations, and eight lane major highways.<sup>1</sup>

Augmentation proposals, other than those that are operational in nature (e.g. signal timing, signal coordination and minor restriping), shall be evaluated and approved by the Transportation and Infrastructure and Planning Commissions. Augmentation proposals related to a development case may be reviewed in connection with the processing of the development case.

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<sup>1</sup> ARTERIAL CAPACITY AUGMENTATIONS

<u>Improvement</u>	<u>Capacity Augmentation*</u>
• Signal timing/coordination	Up to 10%
• Additional right or left turn lanes	10% to 33%
• Additional through lanes at intersection	20% to 35%
• Auxiliary lanes	20% to 35%
• Eight lane major	33%
• Intersection grade separation (flyover)	100%

\*Effective operational capacity augmentation may be significantly less due to variations in intersection traffic flow patterns.

The following list was identified for further study as a result of the Conservation/Open Space General Plan Amendment (GPA-16).

**Alton Parkway** from Jeffrey Road to approximately 2,500 feet east of Jeffrey

**Alton Parkway** from unnamed PA 12 north-south road to Sand Canyon

**Ford Road** from the-San Joaquin Hills Transportation Corridor to MacArthur Boulevard

**Laguna Canyon Road** from State Route-133 to Bake Parkway

**Irvine Boulevard** from unnamed arterial to the west leg of the Eastern Transportation Corridor

**Culver Drive** from Main Street to Michelson Drive

**Sand Canyon Road** from Alton Parkway to Interstate-405

**Bison** from California to MacArthur Boulevard

**Barranca Parkway** from Technology to Irvine Center Drive

**Alton Parkway** from Technology to Interstate

**Bake Parkway** from Rockfield to Interstate-5

**Irvine Center Drive** from Alton Parkway to Bake Parkway

Other arterial links not listed herein may be augmented as necessary in accordance with this implementing action.<sup>2</sup>

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<sup>2</sup> Augmented capacity methodology is detailed in the City of Irvine Conservation/Open Space Traffic Study prepared by Austin-Foust Associates, Inc. (See Appendix A, EIR 82-GA-0016).

**Policy (l):** Implement a transportation management program for the Irvine Business Complex (PA 36) with a goal to reduce p.m. peak hour vehicle trips by 15 percent.

**Policy (m):** Work with the University of California at Irvine, consistent with the City of Irvine and UCI Culver Drive Memorandum of Understanding, to realign Culver Drive west along the University's property, in order to minimize environmental impacts to residential developments in Planning Area 21, adjacent to Culver Drive.

**Policy (n):** Design roadways which ensure safe and efficient traffic flow while also providing adequate and convenient access to retail sites.

**Policy (o):** Monitor and update ITAM Trip Generation Rates as required to maintain consistency with changes in development, as well as with changes in any pertinent regional traffic model. Any changes to trip generation rates shall be analyzed to determine any effects on the Level of Service (LOS) Standards and intersection capacity standards. Such changes shall be reviewed by the Transportation and Infrastructure Commission and Planning Commission, and approved by the City Council.

**Policy (p):** Secure public support for the development of a balanced circulation system through a well-organized public relations program.

**Policy (q):** Ensure development within other planning areas within the City of

Irvine will not be responsible for funding and construction of IBC area-wide circulation improvements, if consistent with the land use assumptions in the IBC Program Environmental Impact Report (PEIR).

**Policy (r):** Pursue local and outside funding for the implementation of the roadway system from sources.

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## **OBJECTIVE B-2: ROADWAY DESIGN**

***Develop a vehicular circulation system consistent with high standards of transportation engineering safety and with sensitivity to adjoining land uses.***

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*The following policies support Objective B-2:*

**Policy (a):** Align roadways in relationship to adjoining land uses to minimize noise and visual impacts.

**Policy (b):** Design roadways to mitigate vehicle noise through:

- Physical barriers, such as berms which would permit residential units to be effectively screened from excessive noise.
- Semi-depressed roadways, in conjunction with berms and belts of trees, where feasible.

**Policy (c):** Design roadways to follow the natural terrain and the least

environmentally damaging routes, particularly in hillside areas.

Irvine Industrial Complex (Spectrum) and Irvine Business Complex.

**Policy (d):** Ensure that existing roadways are designed to complement other circulation networks without the need for major reconstruction.

**Policy (e):** Design roadways which:

- Discourage through traffic in residential neighborhoods.
- Prohibit parking on all thruways, parkways, and community collectors.
- Limit the routes, speeds, and operation types of trucks and buses.

**Policy (f):** Visually enhance the appearance of roadways and parking areas through design techniques and landscaping. Particular attention should be paid to streetscape design and the creation of new, and preservation of existing, view corridors.

**Policy (g):** Include mitigation measures in the approval of all proposed developments to minimize negative impacts of the automobile.

**Policy (h):** Properly space and interconnect traffic signals in order to minimize the number of traffic signals, and the acceleration/deceleration that produces significantly higher vehicular emissions and noise levels.

**Policy (i):** Utilize traffic control device systems that are understandable, attractive, simple, uniform, and visible.

**Policy (j):** Implement Transportation Management Plans developed for

### *Level of Service Standards*

Level of Service (LOS) Standards are defined for intersections and roadway links (Figure B-1) as follows:

**Level of Service “A”:** The volume/capacity ratio ranges from .0 to .60. At this LOS, traffic volumes are low and speed is not restricted by other vehicles. All signal cycles clear with no vehicles waiting through more than one original cycle. For roadway links, this LOS indicates no physical restriction on operating speeds.

**Level of Service “B”:** The volume/capacity ratio ranges from .61 to .70. At this LOS, traffic volumes begin to be affected by other traffic. Between 1 and 10 percent of the signal cycles have one or more vehicles which wait through more than one signal/cycle during peak traffic periods. For roadway links, this LOS indicates flow with few restrictions on operating speeds.

**Level of Service “C”:** The volume/capacity ratio ranges from .71 to .80. At this LOS, operating speeds and maneuverability are closely controlled by other traffic. Between 11 and 30 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods. For roadway links, this LOS indicates stable flow, higher volume, and more restrictions on speed and lane changing.

**Level of Service “D”:** The volume/capacity ratio ranges from .81 to 90. At this LOS, traffic will operate at tolerable operating speeds, although with restricted maneuverability.

More than 30 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic hours. For roadway links, this LOS indicates tolerable conditions, approaching unstable flow, and little freedom to maneuver.

**Level of Service “E”:** The volume/capacity ratio ranges from .91 to 1.0. Traffic will experience restricted speeds, vehicles will frequently have to wait through two or more cycles at signalized intersections, and any additional traffic will result in breakdown of the traffic carrying ability of the system. For roadway links, this LOS indicates unstable flow; lower operating speeds than LOS D and some momentary stoppages.

**Level of Service “F”:** Long queues of traffic, unstable flow, stoppages of long duration where traffic volumes and traffic speed can drop to zero. Traffic volumes will be less than the volume which occurs at Level of Service “E.” For roadway links, this LOS indicates forced flow operation at low speeds where the roadway acts as a storage area and there are many stoppages.

**Policy (k):** Continue to monitor and develop solutions to the Irvine Business Complex (IBC) traffic. This is a mutual effort of the affected agencies (e.g. Caltrans, Orange County Transportation Commission, etc.)

**Policy (l):** Periodically review the impact of increases in the San Diego and Santa Ana Freeway traffic on utilization of parkways in the east-west activity corridor.

**Policy (m):** Require, at the time Campus Drive, University North and California Avenue are proposed to be improved to their General Plan designation, environmental studies that consider alternative roadway designs to at-grade level designs, to ensure that the ecologically significant adverse biotic impacts are avoided, or mitigated to a level of insignificance.

**Policy (n):** List Yale Avenue between University Drive on the south and Yale Loop on the north on the General Plan Operational Characteristics diagram as a “collector” and as a “commuter” (two-lane roadway) on the Arterial Highway Designation diagram. The cross section of Yale Avenue across the San Diego Freeway shall provide for two travel lanes (one in each direction), bicycle lanes and sidewalks. The roadway may widen to meet the existing cross section of Yale Avenue at the Michelson and University intersections. The existing roadway between Yale, Michelson and University may be narrowed, or a median installed, to limit the roadway to two lanes, plus turning lanes.<sup>3</sup>

**Policy (o):** List Yale Avenue between Deerfield Avenue on the south and Edgemere Avenue on the north on the General Plan Operational Characteristics diagram as a “collector” and as a “commuter” (two-lane roadway) on the Arterial Highway Designation diagram. The cross section of Yale Avenue across the AT&SF railroad shall provide for two travel lanes (one in each direction), bicycle lanes and sidewalks. The roadway may widen to meet the existing cross section of Yale Avenue at the Deerfield and Winvale intersections.<sup>3</sup>

**Policy (p):** Construct noise walls (where needed) on Yale Avenue between University and Yale Loop so that no residences along Yale Avenue between Yale Loop and University are exposed to noise levels in excess of City standards.<sup>3</sup>

**Policy (q):** Construct noise walls (where needed) on Yale Avenue between Deerfield and Winvale so that no residences along Yale Avenue between Irvine Center Drive and Walnut Avenue are exposed to noise levels in excess of City standards.<sup>3</sup>

**Policy (r):** Landscape Yale Avenue between Deerfield and Winvale such that off site views of the project are mitigated to City standards.<sup>3</sup>

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<sup>3</sup>Implementing actions n, p, q, r and s have been completed. However, due to a voter initiative, Measure B, they are required to remain in the General Plan.

**Policy (s):** Install traffic signals at the intersection of Yale and Deerfield prior to opening Yale Avenue between Deerfield and Winvale.<sup>3</sup>

*Irvine Ballot Measure “B”*

On June 5, 1990, the residents of the City approved Ballot Measure “B” which amended the General Plan for vehicular overcrossings of Yale Avenue at the AT&SF railroad and the San Diego Freeway (I-405). To date, the vehicular overcrossing at the AT&SF railroad has been constructed according to the following provisions of Measure “B”:

- Between Deerfield and Edgemere, Yale is shown as a collector on the MPAH and as a commuter on the Operational Characteristics diagram. The section at the AT&SF crossing provides for one vehicle lane in each direction, bicycle lanes and sidewalks.
- Yale between Winvale and Deerfield must contain noise walls so that no residences along Yale are exposed to noise in excess of City standards.
- Yale between Deerfield and Winvale must be landscaped so that off-site views of the project are mitigated to City standards.

Policies n, p, q, r and s must remain in the General Plan unless repealed by a Citywide vote.

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**OBJECTIVE B-3:  
PEDESTRIAN CIRCULATION**

***Establish a pedestrian circulation system to support and encourage walking as a mode of transportation.***

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*The following policies support Objective B-3:*

**Policy (a):** Link residences with schools, shopping centers, and other public facilities, both within a planning area and to adjacent planning areas, through an internal system of trails.

**Policy (b):** Require development to provide safe, convenient, and direct pedestrian access to surrounding land uses and transit stops. Issues such as anticipated interaction between pedestrians and vehicles, proposed infrastructure improvements and design standards shall be considered.

**Policy (c):** Design and locate land uses to encourage access to them by nonautomotive means.

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## **OBJECTIVE B-4: BICYCLE CIRCULATION**

***Plan, provide and maintain a comprehensive bicycle trail network that together with the regional trail system, encourages increased use of bicycle trails for commuters and recreational purposes.***

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*The following policies support Objective B-4:*

**Policy (a):** Use the Trails Network diagram (Figure B-4) as a basis for detailed planning of the bicycle trail system. Detailed planning shall occur through the development processes outlined in the City's Zoning and Subdivision Ordinances.

**Policy (b):** Require a system of bicycle trails, both on- and off-street, in each planning area. Such trails shall be linked to the system shown in Figure B-4. The on-street trails shall be designed for the safety of the cyclist.

**Policy (c):** The trail system shall be designed to accommodate cyclists of all levels of experience and shall provide for both recreation and transportation.

**Policy (d):** Require bicycle trail linkages between residential areas, employment areas, schools, parks, community facilities, commercial centers, and transit facilities.

**Policy (e):** Require pedestrian and bicycle circulation plans detailing access to the

subject property and adjacent properties in conjunction with new development.

**Policy (f):** Require that bicycle trip destinations, including community facilities, commercial centers, and transit facilities be equipped with appropriate bicycle facilities including, but not limited to, the provision of showers and bike racks.

**Policy (g):** Require traffic control devices and traffic signal phasing for bicycle crossing, turning, and through movements.

**Policy (h):** Require grade-separated crossings for Class I bikeways at major intersections, wherever feasible, to increase safety and efficiency.

**Policy (i):** Provide off-street bicycle trails in areas with minimal cross traffic, such as open space spine, flood control and utility easements, where possible.

**Policy (j):** Support programs to increase public awareness of bicycle safety and bicycling as an alternative mode of transportation.

**Policy (k):** Incorporate, where appropriate, school and park locations within the design of the bikeway system.



**San Diego Creek Trail**

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## **OBJECTIVE B-5: RIDING AND HIKING TRAIL NETWORKS**

***Plan, develop and maintain a riding and hiking trail network and support facilities to satisfy the needs of riders and hikers.***

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*The following policies support Objective B-5:*

***Policy (a):*** Phase expansion of the riding and hiking trail network consistent with the City's growth.

***Policy (b):*** Locate and maintain riding and hiking trails as illustrated on Figure B-5, Trails Network, and in areas identified as permanent open space, scenic highway corridors, agricultural edges, public utility rights of way and easements, flood control channels, and areas designated for rural and estate density.

***Policy (c):*** Encourage the development of trail facilities that minimize impacts on existing or planned development and wildlife preservation areas.

***Policy (d):*** Provide and maintain equestrian staging areas, rest stops and boarding centers at locations which provide easy access to the trail system and are away from high-density urban areas.

***Policy (e):*** The Master Plan for Riding and Hiking Trails shall include a precise plan for riding and hiking trails to:



### **Pedestrian Trail**

- Identify trail alignments, standards, priorities for development, and recommended support facility locations
- Depict the exact locations where riding, hiking and bicycle trails shall share a common surface
- Provide a mechanism whereby City trails can be submitted for inclusion in Orange County's Master Plan of Riding and Hiking Trails.

***Policy (f):*** Require developer dedication and final improvement of the trail alignments as shown in the master plan.

***Policy (g):*** Monitor and seek funds for trail system development and maintenance from all available sources.

**Policy (h):** Ensure in Planning Area 4 that an east/west trail connection to Hicks Canyon Trail (i.e. County of Orange Foothill Trail) is provided, per the City’s Master Plan of Riding and Hiking Trails.

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## **OBJECTIVE B-6: PUBLIC TRANSIT PROGRAM**

**Work with Orange County Transportation Authority to implement a public transit system for trips within the City and adjacent areas.**

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*The following policies support Objective B-6:*

**Policy (a):** Plan residential, commercial, and industrial areas to enable effective use of public transit.

**Policy (b):** Consider emergency parking lanes on arterial highways potential public transit corridors.

**Policy (c):** Coordinate with OCTA to:

- Implement a bus service network in and to the City as a feasible alternative to the use of the automobile.
- Provide bus service to existing land uses to maximize patronage.
- Pursue additional transit service to the City.

**Policy (d):** Undertake detailed planning of an advanced transit network (including local and activity center systems) encompassing the City and its sphere of influence as illustrated in Figure B-3.

**Policy (e):** Adopt a master plan of potential advanced intracity transit routes which includes a detailed study of transit technologies.

**Policy (f):** Coordinate the development of intracounty and regional transit stops with Irvine’s intracity transit system.

**Policy (g):** Overlay transit routes on planning area edges, parkways, safety lanes, flood control channels, and other open space where feasible. Exclusive transit rights of way may be required where no such overlay is feasible.

**Policy (h):** Encourage the short-term use of rights of way reserved for the various circulation systems for other uses, such as recreational open space.

**Policy (i):** Require the applicants of new developments, at the time of tentative tract map submittal to indicate the precise location of transit routes.

**Policy (j):** Reserve railroad rights of way for regional transit corridors.

**Policy (k):** Nothing in this Circulation Element should be construed as a commitment by the City to establish a separate transportation authority or a City-funded bus system separate from systems run by OCTA or other public and private entities.

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**OBJECTIVE B-7:  
AIR TRANSPORTATION  
PROGRAM**

***Promote improved air transportation for Orange County while minimizing noise and air pollution.***

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*The following policies support Objective B-7:*

***Policy (a):*** Coordinate public and local transit with planning for air transportation.

***Policy (b):*** Support expansion of service at John Wayne Airport as long as all environmental impacts such as noise, air pollution, and traffic congestion can be mitigated

***Policy (c):*** Oppose commercial use of former MCAS El Toro and continue liaison with surrounding communities in organizing and supporting opposition to such use.

***Policy (d):*** Encourage use of Los Angeles and Ontario International Airports for continental and international flights. Explore commercial airport potential of existing and closing military facilities within Los Angeles, San Bernardino, Riverside and San Diego counties, as well as existing commercial airport and general aviation airports which have expansion potential in order to meet the growing passenger demand on a regional basis. Discourage the development or expansion of airfields which are not now operating as commercial airports, or the expansion of existing

commercial airports which would adversely impact existing urban communities.

***Policy (e):*** Develop, in cooperation with the City of Newport Beach, an activity center transportation system to alleviate the ground access congestion related to John Wayne Airport.

***Policy (f):*** Encourage the development of high-speed ground transportation systems to supplement the air system for meeting regional travel needs.

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**OBJECTIVE B-8:  
TELECOMMUNICATIONS  
PROGRAM**

***Promote the use of telecommunications by Irvine residents, employers, employees and students as a means to reduce air and noise pollution generated by automobile traffic.***

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*The following policies support Objective B-8:*

***Policy (a):*** Encourage the private sector to participate in, and to be the primary provider of, telecommunications infrastructure and services for the community.

***Policy (b):*** Ensure that leading edge telecommunication services are available to all businesses and residents within the community, and are considered in the planning of future development and infrastructure improvements.

**Policy (c):** Assume the role of a facilitator to encourage productive communications between public and private sector agencies with regard to telecommunications issues and services.

**Policy (d):** Protect the public's assets (i.e., streets, parks) against unmitigated impacts of telecommunications infrastructure development.

**Policy (e):** Retain and ensure the community's high standards for aesthetics, now and in the future.

**Policy (f):** Ensure that adequate and secure bandwidth for Public Safety and other City communications are continuously considered.

---

***“Everything in life is somewhere else, and you get there in a car.”***

***E.B. White***

---

#### **RELATED OBJECTIVE NUMBERS**

The following objectives are related to the Circulation Element:

Land Use Element - A-3, A-4, A-6, A-7

Housing Element - C-1, C-2, C-7

Noise Element - F-1

Public Facilities Element - G-1

Energy Element – I-1

Safety Element - J-2

Parks and Recreation Element - K-3

Conservation and Open Space Element - L-5, L-8, L-12

Growth Management Element - M-1 through M-5, M-7, M-8

**City of Irvine  
General Plan**



Figure B-1

**MASTER PLAN  
OF ARTERIAL  
HIGHWAYS**

**LEGEND**

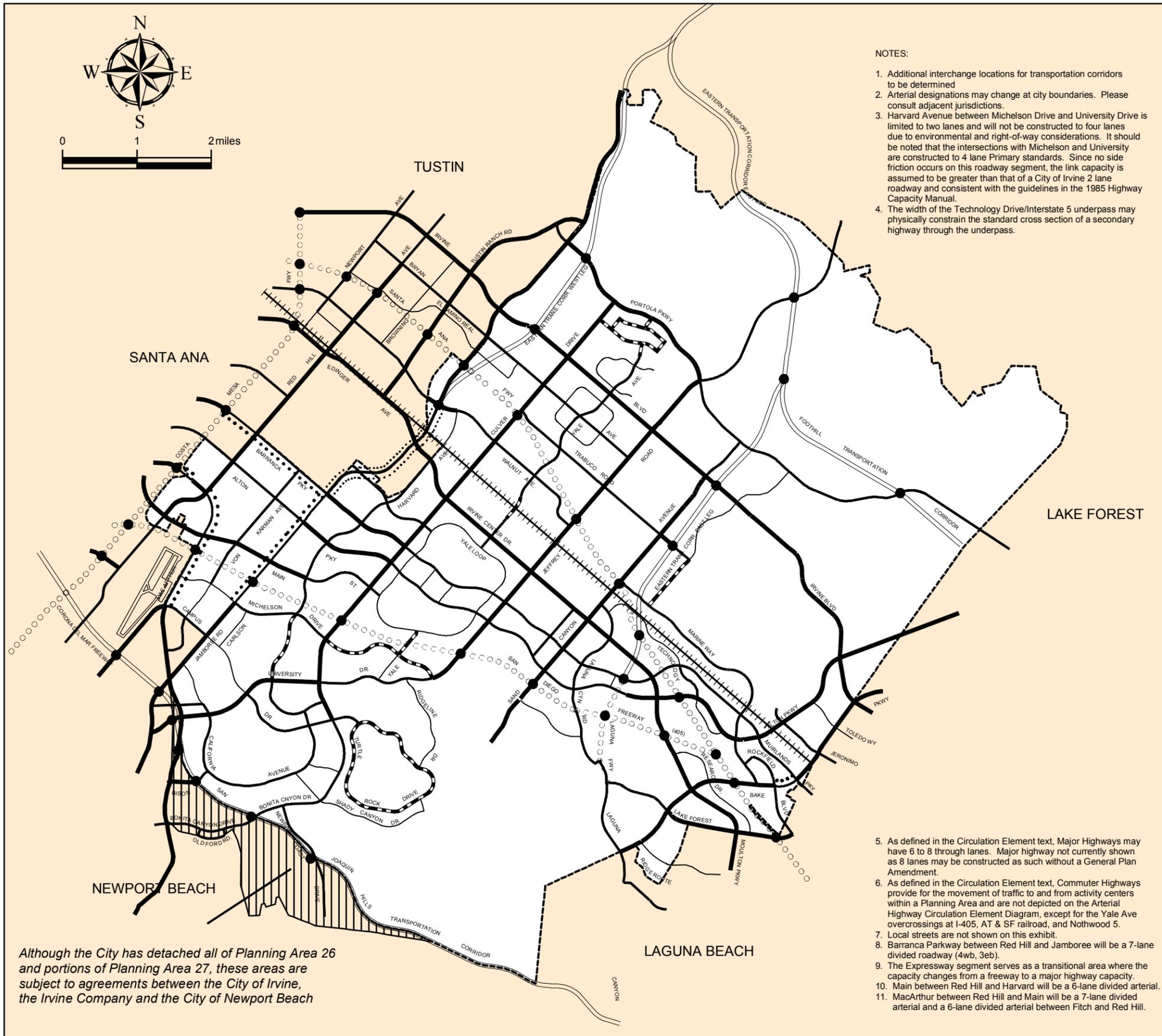
- City Sphere of Influence
- Interchange
- ==== Freeway
- Transportation Corridor
- ..... Expressway
- ..... Major Highway 8-Lanes
- ==== Major Highway 6-Lanes
- ==== Primary Highway
- ==== Secondary Highway
- Commuter Highway

NOTE: Not all commuter highways are shown on the map

NOTES:

1. Additional interchange locations for transportation corridors to be determined
2. Arterial designations may change at city boundaries. Please consult adjacent jurisdictions.
3. Harvard Avenue between Michelson Drive and University Drive is limited to two lanes and will not be constructed to four lanes due to environmental and right-of-way considerations. It should be noted that the intersections with Michelson and University are constructed to 4 lane Primary standards. Since no side friction occurs on this roadway segment, the link capacity is assumed to be greater than that of a City of Irvine 2 lane roadway and consistent with the guidelines in the 1985 Highway Capacity Manual.
4. The width of the Technology Drive/Interstate 5 underpass may physically constrain the standard cross section of a secondary highway through the underpass.

5. As defined in the Circulation Element text, Major Highways may have 6 to 8 through lanes. Major highway not currently shown as 8 lanes may be constructed as such without a General Plan Amendment.
6. As defined in the Circulation Element text, Commuter Highways provide for the movement of traffic to and from activity centers within a Planning Area and are not depicted on the Arterial Highway Circulation Element Diagram, except for the Yale Ave overcrossings at I-405, AT & SF railroad, and Nothwood 5.
7. Local streets are not shown on this exhibit.
8. Barranca Parkway between Red Hill and Jamboree will be a 7-lane divided roadway (4wb, 3eb).
9. The Expressway segment serves as a transitional area where the capacity changes from a freeway to a major highway capacity.
10. Main between Red Hill and Harvard will be a 6-lane divided arterial.
11. MacArthur between Red Hill and Main will be a 7-lane divided arterial and a 6-lane divided arterial between Fitch and Red Hill.



Although the City has detached all of Planning Area 26 and portions of Planning Area 27, these areas are subject to agreements between the City of Irvine, the Irvine Company and the City of Newport Beach



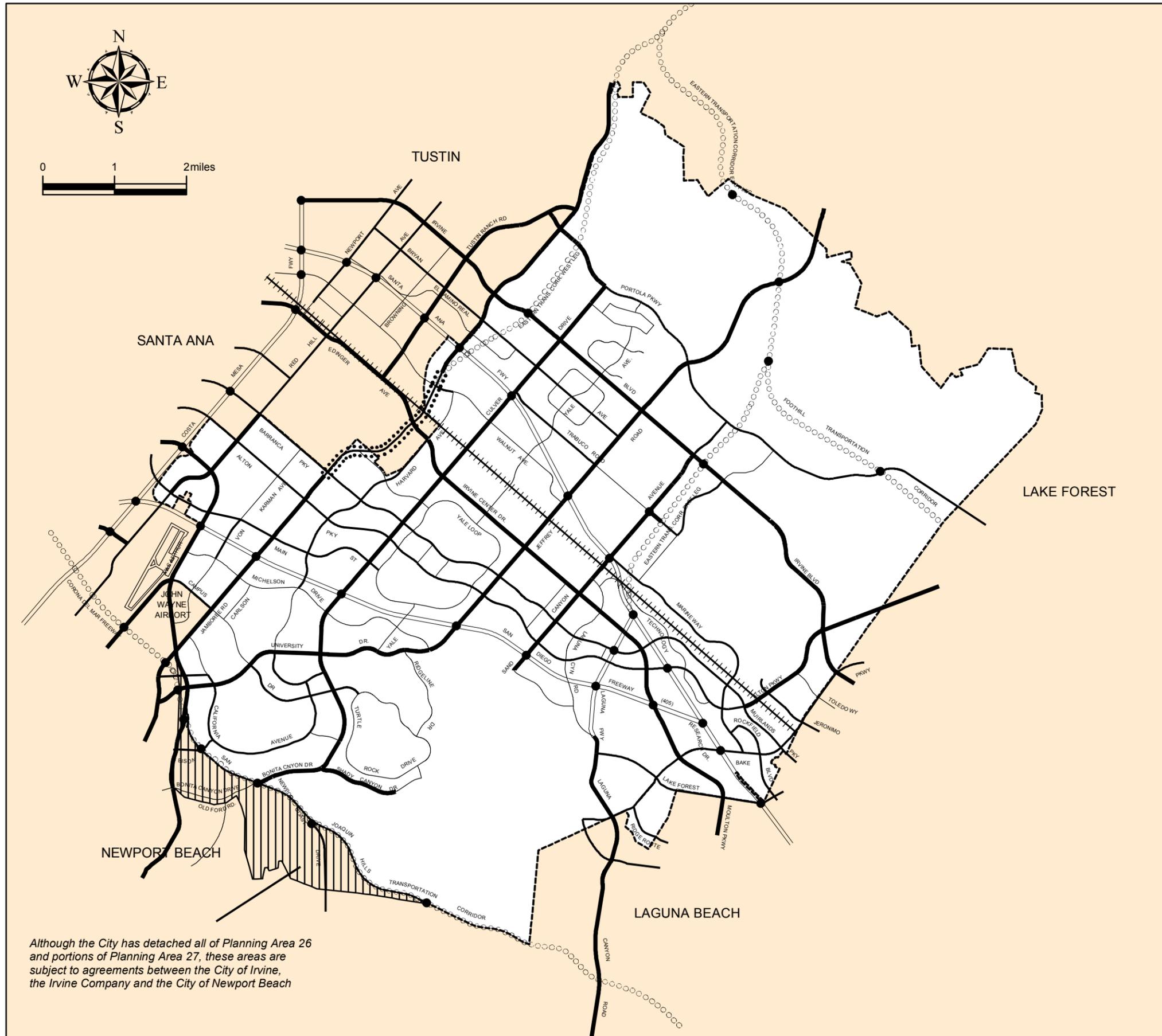
Figure B-2

# OPERATIONAL CHARACTERISTICS

## LEGEND

- City Sphere of Influence
- Interchange
- Freeway
- Transportation Corridor
- Expressway
- Thruway
- Parkway
- Collector

NOTE: Not All Community Collectors are shown on this map



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Figure B-3

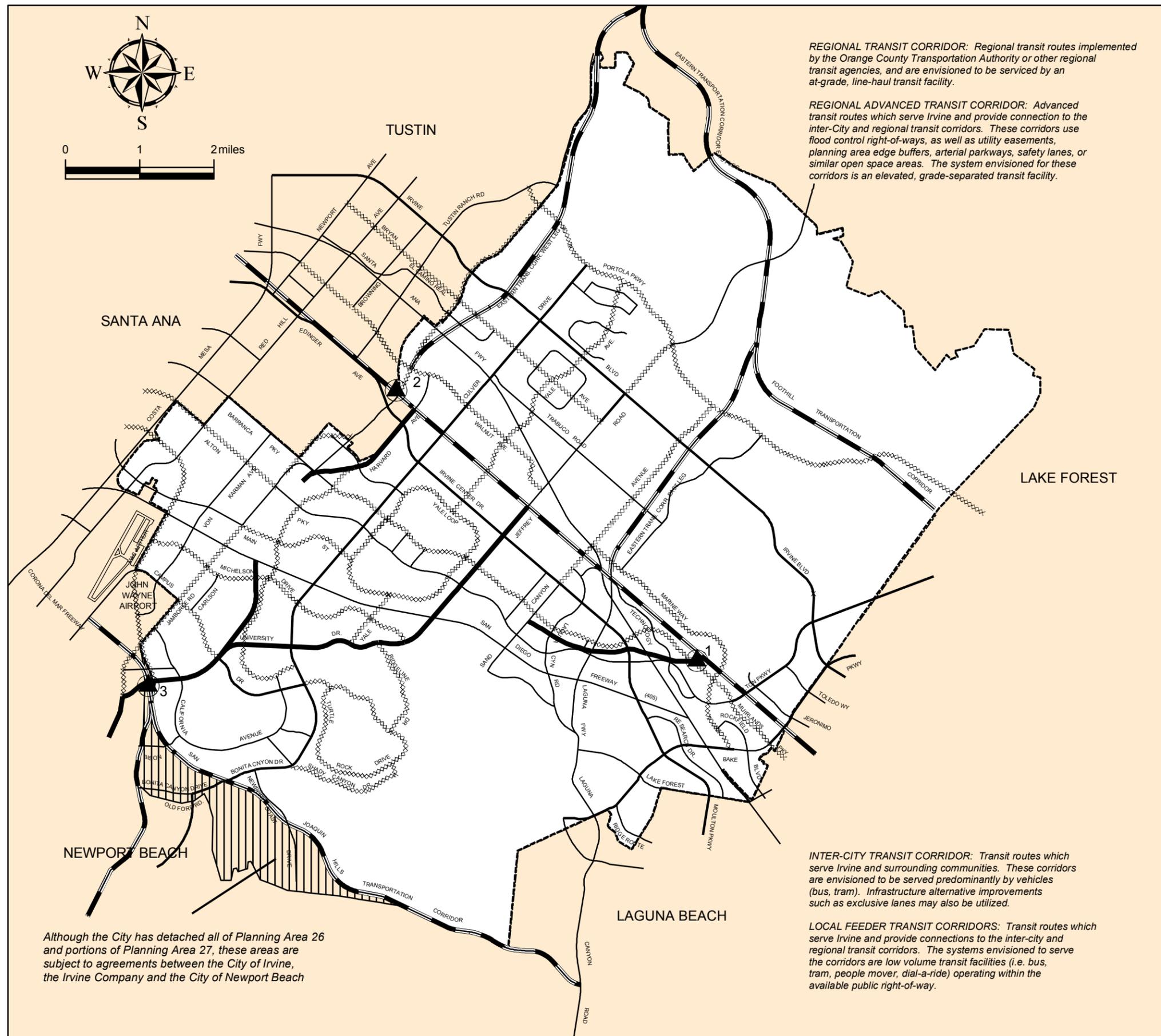
**PUBLIC  
TRANSIT**

**LEGEND**

- City Sphere of Influence
- ▲ Transit Stop \*
- ▬ Regional Transit Corridor
- ▬ Regional Advanced Transit Corridor
- ▬ Inter-City Transit Corridor
- xxxxxx Local Feeder Transit Corridor
- Arterials

\* A Transit Stop is defined as an intermodal transfer facility that typically serves a guideway or railway system and other motorized and non-motorized modes of transportation.  
The facilities shown are:

1. Irvine Transportation Center
2. Commuter rail platform in Tustin
3. Future stop serving UCI, Irvine and Newport Beach



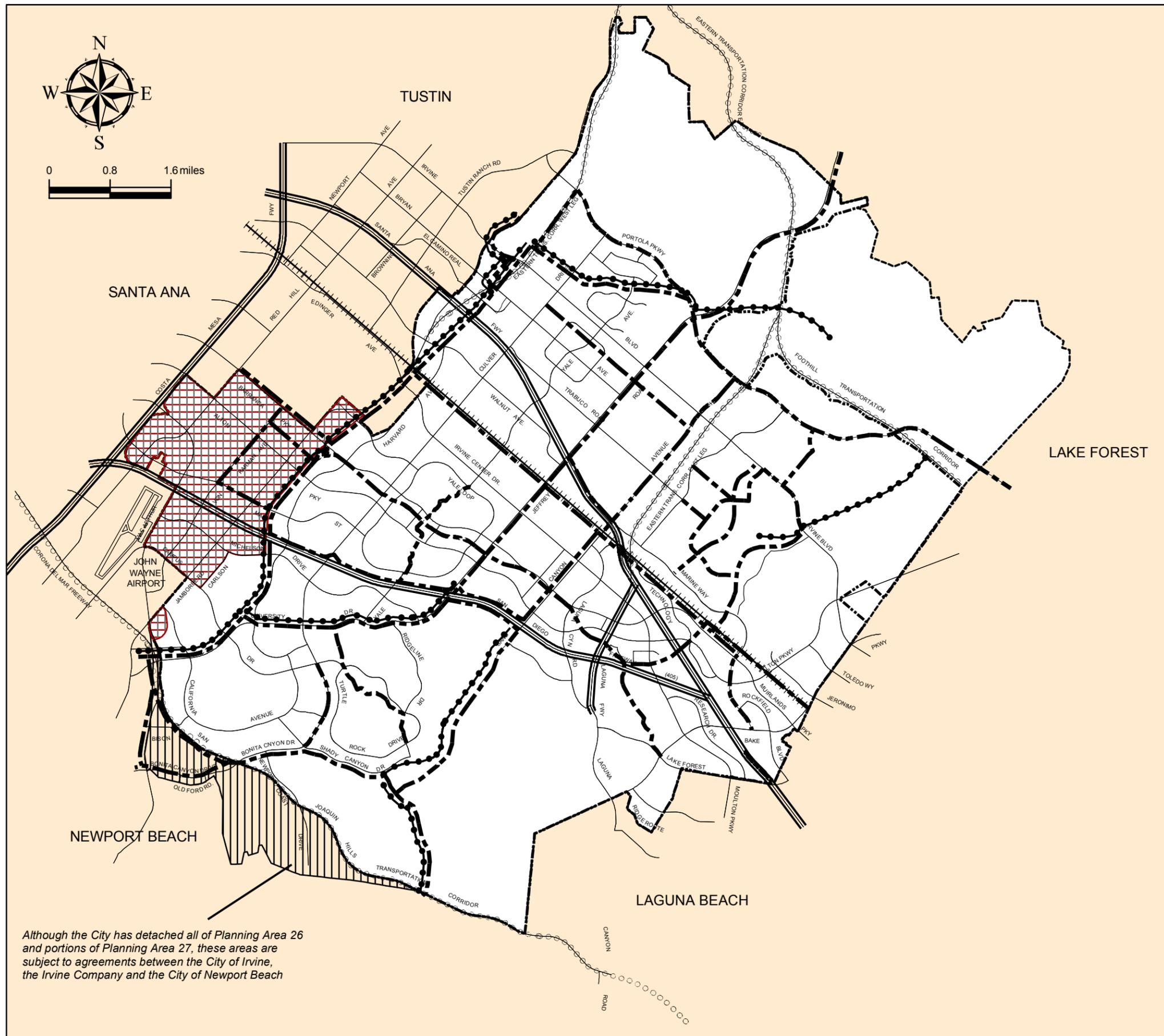
**REGIONAL TRANSIT CORRIDOR:** Regional transit routes implemented by the Orange County Transportation Authority or other regional transit agencies, and are envisioned to be serviced by an at-grade, line-haul transit facility.

**REGIONAL ADVANCED TRANSIT CORRIDOR:** Advanced transit routes which serve Irvine and provide connection to the inter-City and regional transit corridors. These corridors use flood control right-of-ways, as well as utility easements, planning area edge buffers, arterial parkways, safety lanes, or similar open space areas. The system envisioned for these corridors is an elevated, grade-separated transit facility.

**INTER-CITY TRANSIT CORRIDOR:** Transit routes which serve Irvine and surrounding communities. These corridors are envisioned to be served predominantly by vehicles (bus, tram). Infrastructure alternative improvements such as exclusive lanes may also be utilized.

**LOCAL FEEDER TRANSIT CORRIDORS:** Transit routes which serve Irvine and provide connections to the inter-city and regional transit corridors. The systems envisioned to serve the corridors are low volume transit facilities (i.e. bus, tram, people mover, dial-a-ride) operating within the available public right-of-way.

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# City of Irvine General Plan



Figure B-4

## TRAILS NETWORK

### LEGEND

-  City Sphere of Influence
-  Class I (Off-Street) Trails
-  Class II (On-Street) Trails are on all street shown on this exhibit except for Barranca between Jamboree and Redhill, along Mac Arthur between Jamboree Road, northwest to city limits, and along the west side of Jamboree Road between Michelson Drive and the San Diego (I-405) Freeway.
-  See Figure N-4 for Planned Trail Network in Irvine Business Complex
-  Riding and Hiking Trails

NOTE: The Trail Network Diagram is illustrative only and not indicative of precise alignments