UCR Multimodal Transportation Management Strategy

Final Report

July 16, 2004

Submitted to:

University of California, Riverside

Submitted by:

Parsons Brinckerhoff

Foreword

The primary goals of the UCR Multi-Modal Transportation Management Strategy (MMTMS) have been developed in two key areas: quality of campus life and sustainability.

The MMTMS is envisioned to improve UCR's quality of life by:

- Reducing the number of private automobiles coming to and moving within the campus; and
- Creating a campus transportation system which provides users with a high level of accessibility and mobility.

In terms of sustainability, the MMTMS proposes development of strategies that are:

- Fiscally and operationally sound; and
- Protect the environment and promote the wise stewardship of natural resources.

The MMTMS proposes to decrease UCR's reliance on the private automobile for transportation while highlighting alternatives such as walking, bicycling, and mass transit which are healthier, less polluting, and reduce congestion. Other MMTMS strategies such as using alternative fuels in campus transit vehicles decrease the need for gasoline-fueled vehicles, thereby reducing related harmful emissions into the atmosphere. The MMTMS provides the campus with additional opportunities to realize a greener and more sustainable transportation network as UCR enters the 21st Century and its second 50 years.

UCR Multimodal Transportation Management Strategy

Executive Summary

Prepared for

University of California, Riverside

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

July 16, 2004

TABLE OF CONTENTS

ES.0 EXECUTIVE SUMMARY

ES.1 Introduction

The Multimodal Transportation Management Strategy (MMTMS) study was initiated to identify transportation system improvements and policy recommendations needed to respond to a changing and more congested campus at the University of California, Riverside (UCR). Future anticipated enrollment growth presents many challenges for UCR's transportation system. One of these challenges will be to maintain high levels of accessibility and mobility for students, faculty, staff, and visitors in the coming years.

MMTMS study findings and recommendations were developed through a process that relied upon extensive interaction with the campus community. This community input was essential to the formation of a transportation strategy that addressed the concerns and the needs of the campus. To solicit feedback from a cross-section of the campus community, the study used a combination of advisory committee workshops, focus group sessions, and public outreach meetings.

Community input was gathered at key milestones throughout the study. The MMTMS study consisted of the following major steps:

- ***Establish a set of guiding principles***: Guiding Principles were established to specify project objectives and to provide a framework for examining potential improvements and policies.
- ***Identify transportation issues:*** Problems and challenges were identified by evaluating existing and future transportation conditions in the study area as well as from input collected from the campus community.
- ***Identify potential solutions:*** A comprehensive list of candidate transportation solutions was developed for each transportation issue. This list incorporated the results of discussions with campus participants and research of practices at other universities.
- **Develop *a Long Range Strategy:*** Potential solutions were evaluated to determine those transportation improvements that best work together to form a Long Range Strategy for the University.
- ***Design an implementation and phasing strategy:*** Recommended transportation improvements that made up the Long Range Strategy were packaged into phases for purposes of future implementation. Immediate solutions as well as near-term actions needed to respond to pressing transportation problems on campus were identified.
- ***Estimate costs and identify potential funding sources:*** Planning-level cost estimates were developed for the recommended transportation improvements and potential funding sources were identified.
- ***Develop a signage and wayfinding element:*** The MMTMS study includes a signage and wayfinding strategy, which is provided as a stand-alone report.

ES.2 Guiding Principles

The guiding principles were developed at the outset of the study to provide focus to the study effort and to identify a set of criteria with which to evaluate potential transportation solutions.

Mobility: Develop a system that addresses the essential and evolving mobility requirements of persons, goods, and services throughout the campus as the University grows. Key features should include travel time, access, efficiency, and convenience.

Campus Integration: Provide transportation programs and facilities using a variety of modes that integrate all areas of the campus and that provide linkages to the surrounding community, the city, and the region.

"Walkable" Campus: Develop a system which puts the pedestrian at the head of transportation and accessibility needs, and then accommodate other types of transportation.

System Hierarchy: Establish a hierarchy by facility and mode type to the extent feasible (e.g., pedestrian traffic, bicycles, transit, vehicles) to facilitate circulation and to address points of conflict.

Traveler Needs: Focus on user needs, including special users such as emergency, vendors, delivery vehicles, and the disabled. Address complete point-to-point trip needs by providing inter-modal linkages, convenient and secure services, and support facilities. Stress marketing, educational, and/or informational programs for maximum effectiveness.

Multimodal System: Enhance incentives for a range of alternatives such as pedestrians, bicycles, and transit to make those transportation choices more attractive compared to the automobile. If a vehicle must be used, consider alternative fuels.

Aesthetic Design: Include design elements that enhance the user's experience, are functional, and support the vision of the University and add to a "sense of place."

Implementable: The proposed system should be realistic, acceptable to decision-makers and the campus public, fundable over both the short and long term, and adaptable to changing circumstances. The phasing and priority plan should provide opportunities for both near and long-term implementation of plan elements.

Neighborhood Consideration: The proposed strategy should seek to achieve UCR's transportation goals while minimizing potential consequences to neighboring communities.

Safety: Provide a plan that enhances the safety of all travel modes and that addresses the particular demands created by university activities (such as the need for secure multimodal evening travel).

ES.3 UCR's Existing Transportation System

As one of the smallest campuses (in terms of enrollment) in the University of California system, UCR has traditionally granted automobiles high levels of access to the campus. A two-lane campus loop road encircling the campus core allows automobiles to drive within close proximity of most campus locations. This two-lane road is also used by emergency, service and delivery vehicles to reach buildings and service dock areas on campus. Interior surface lots within this loop road allow students, faculty, staff, and visitors to park near campus destinations.

UCR provides an effective campus-run transit system in the form of both fixed route shuttles and demand-responsive vans. Fixed route shuttles, the most commonly used campus transit system, provide service from adjacent private housing units to the edges of the campus. Congestion on the campus loop road constrains the option of providing direct transit service to the campus core.

Within the campus core, an extensive network of malls and pathways provide convenient and well utilized paths for pedestrians. Outside these central areas, pedestrian travel often conflicts with automobiles driving into the campus, especially on the campus loop road.

Most city streets leading to the University include striped bike lanes. However, UCR currently offers no separate bike network within the campus. Inside the campus core, bicyclists share pathways with pedestrians. On campus roadways, bicyclists share lanes with automobiles. The campus loop road does not contain striped bike lanes. Outside of the campus loop road, Aberdeen Drive, Linden Street, and Canyon Crest Drive contain striped bike lanes.

ES.4 UCR's Future Transportation System

The *draft 2004 Long Range Development Plan (LRDP)* outlines UCR's future land use patterns and provides a framework for the development of the campus's facilities, roads, open spaces, and infrastructure. These changes in land use will influence future travel patterns leading to and within the campus. In addition, proposals included in the draft *2004 LRDP* envision shifting campus private vehicular traffic out of the campus loop road. The *draft 2004 LRDP* recommends this shift to reduce congestion within East Campus and to create a more pedestrian- and bicycle-friendly environment.

As part of this shift, the *draft 2004 LRDP* outlines plans to transition from UCR's current parking system of interior surface lots to parking structures located on the periphery of the campus. Peripheral structures will help reduce the need for automobile travel within the campus, and will also open up more land inside the campus core for developing the new facilities required to accommodate UCR's growing population.

ES.5 Transportation Issues at UCR

UCR's transportation system presents a number of transportation problems and issues that need to be addressed in order to realize UCR's future transportation vision. These transportation issues can be traced back to a few major causative factors: travel conflicts and related congestion; gaps in the transportation system; and physical barriers that separate East Campus from West Campus. Costs also need to be considered as potential transportation solutions are discussed and evaluated.

Conflict Points/Congestion: Conflict points are areas where different modes of travel conflict. The most common conflict points occur where pedestrians and bicyclists cross paths with automobiles circulating on the inner campus loop road and on inner campus roadways. At certain locations on the campus loop road, waves of pedestrians traveling to and from campus virtually block the flow of vehicles. This, in turn, causes significant queuing on campus roadways. In addition, high levels of automobile traffic on campus roads compound many of these conflict points. As the campus population grows, greater volumes of these travelers mean greater potential for conflicts and resulting travel delays.

Different types of vehicles also conflict with each other, creating pockets of congestion and contributing to vehicle delay. Automobiles stopping in the midst of traffic to drop-off or pick-up passengers impede other automobiles driving through the loop. Service and delivery vehicles compete with private automobiles on inner campus roadways and in dock areas. Of particular concern, is that emergency vehicles risk having their access blocked due to congested roadways and illegally parked vehicles.

In addition, pedestrians and bicyclists share walkways within the campus core. At certain pinch points leading on to campus and where these non-motorized travelers cross within the inner campus core, conflict points occur. This is a safety problem as well as a mobility problem.

The main causes of conflict points observed on campus are a lack of traffic controls and poorly defined transportation system hierarchies. Unless corrected, this situation will continue to worsen.

Transportation System Gaps: Providing travelers with accessible and convenient multi-modal travel options is important to promoting alternatives to automobile travel. To provide an effective option, transportation routes and facilities must accommodate travelers from the beginning of their trip to the end of their trip.

Gaps in UCR's current transportation system prevent travelers from conveniently traveling between two points using non-motorized travel or transit. Congestion on the inner campus loop road prevents transit from providing service in some areas of the campus. Existing bike lanes are discontinuous so bicyclists do not have a safe path to transition from city streets to campus roadways. Once bicyclists reach campus, it is difficult to find secure bicycle parking in some areas of campus. Pedestrians do not always feel secure, particularly in the evening hours.

Disconnect Between East and West Campuses: The I-215/SR-60 freeway is a barrier that divides the campus. It makes pedestrian and bicycle travel between the East and West Campuses inconvenient and unpleasant. The east-west separation will become even more pronounced as UCR develops housing and academic uses in the largely undeveloped West Campus.

Costs: Transportation solutions must be considered in light of their potential costs, which is a constraining factor. UCR's transition from surface lots to parking structures will significantly increase costs for Transportation and Parking Services (TAPS). Currently, TAPS revenues fund parking lot construction, maintenance, and upkeep and alternative transportation programs. Increased costs incurred through the construction and upkeep of parking structures, will likely require developing alternative funding sources for some programs currently funded through TAPS revenue.

ES.6 The Long Range Strategy

The Long Range Strategy consists of recommended changes to UCR's transportation system that are targeted to resolving the major transportation issues that currently exist and that are predicted to worsen in coming years. First, a comprehensive list of candidate transportation solutions was put together from a variety of sources: technical studies; best practices from other universities; input from the study advisory groups; and feedback received from those students, staff, faculty, and neighbors that attended the public meetings. The study then examined the full array of potential solutions to determine the combination which would address UCR's transportation problems in a way that best achieved the goals and guiding principles adopted for this study.

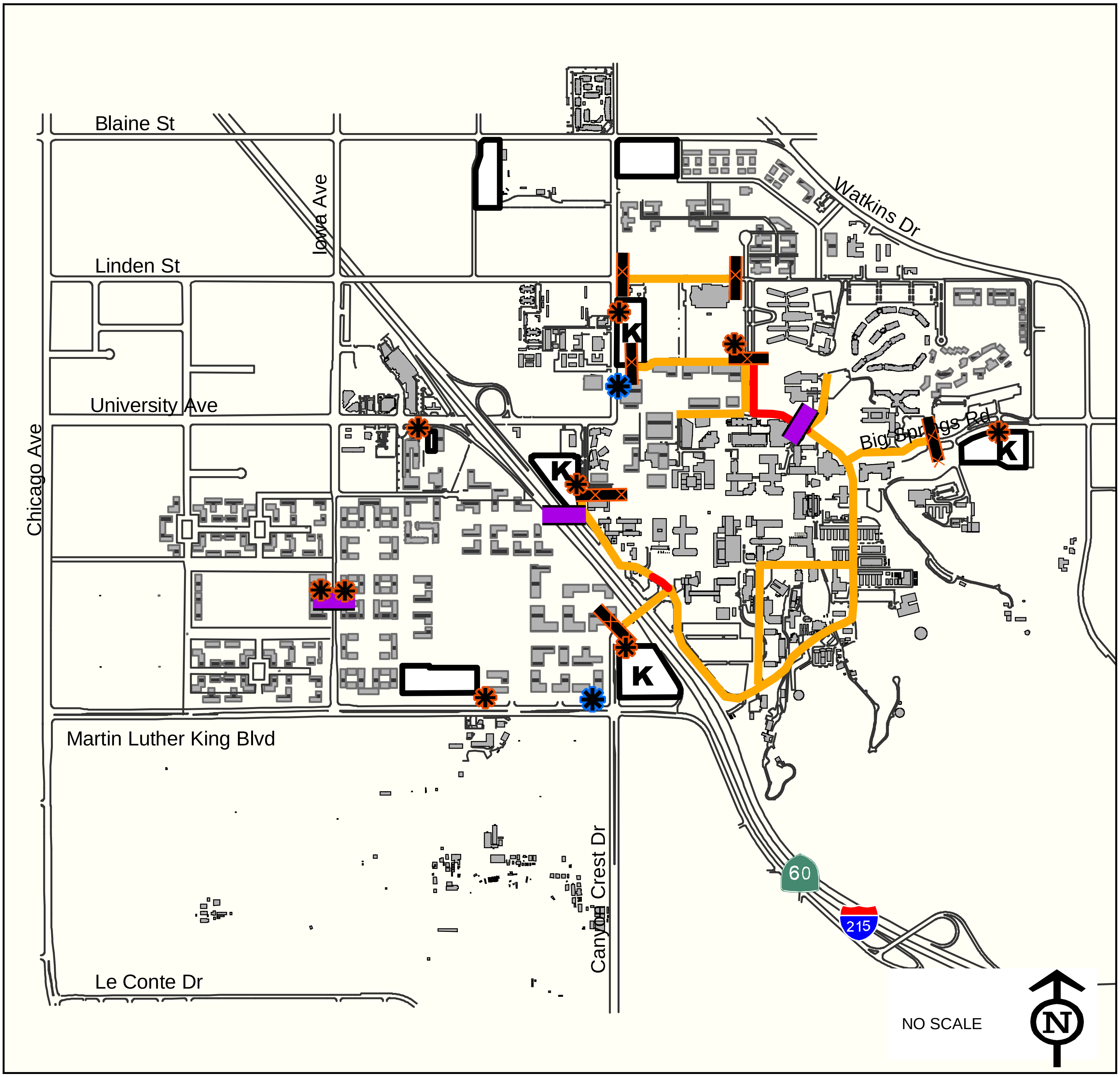
The Long Range Strategy includes transportation improvements and policy recommendations for each of the following transportation systems at UCR: Automobile Circulation; Emergency, Service and Delivery Vehicles; Parking; Transit; Pedestrians; and Bicycles.

ES.6.1. Automobile Circulation

The Long Range Strategy for automobiles uses a combination of access controls and vehicle-free zones to address conflicts between motorized and non-motorized traffic. This system is depicted in Figure ES-1.

Access controls: These access controls will be installed at campus entrances to restrict personal vehicle access into the campus core. Traffic on the loop road will be limited to transit, service vehicles, vendors, delivery vehicles, emergency vehicles, permitted guests, and vehicles used for special events.

The plan contains provisions to allow travelers with legitimate needs to enter the loop road. For this reason, the access controls should accommodate and control the



LEGEND

Buildings

Future Buildings*

Future Parking Structures

*Future Buildings are the proposed buildings from the East Campus Entrance Area Study and from the West Campus Area Plan and the Strategic Plan for Housing (For capacity study only)

Vehicle Circulation

Open to General Purpose Traffic

Closed to Privately Owned Vehicle (POV)

Potential Access Controls

Potential Pick-Up/Drop-Off Points

Potential Pick-Up/Drop-Off Points for Transit

K Potential Information Kiosks (Manned)

Pedestrian Facilities

Vehicle Free Pedestrian/Bicycle Zone (Except for Emergency Service Vehicles)

Pedestrian/Bicycle Overpass

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure ES-1

MMTMS Long Range Strategy For Vehicle Circulation and Pedestrians

passage of both frequent and occasional users. These access controls should also have the capacity to be opened remotely by TAPS.

Evening Permit System: To enhance safety for faculty, students, and staff who must work on campus during the evening, the Long Range Strategy recommends implementing an Evening Permit System. This would enable departments to request access cards for workers and researchers to enter the campus loop road and park in dock areas after 6 PM.

Vehicle-free Pedestrian Zones: Vehicle-free pedestrian zones are recommended along those segments of the campus loop road that experience heavy pedestrian crossings. The zones will provide a continuous path for bicycles and pedestrians traveling to and from the campus core, and substantially reduce opportunities for conflict between pedestrians and service and transit vehicles. These zones also provide an opportunity to enhance campus aesthetics by replacing roads with pedestrian-friendly treatments and amenities. The design for these zones will however also need to accommodate emergency vehicle access.

Increased numbers of kiosks and passenger drop-off points: The Long Range Strategy recommends locating information kiosks and passenger drop-off areas around the perimeter of the campus core near each campus entry. These locations will allow users to enter the campus at the most efficient entrance and will provide a dedicated space for these functions where they are less likely to disrupt traffic.

ES.6.2. Emergency, Service and Delivery Vehicles

The Long Range Strategy recommends the development of a centralized campus receiving facility. It also recommends the use of access controls to manage conflicts experienced by emergency, service and delivery vehicles.

Access controls: The access controls described in *ES.6.1 Automobile Circulation* will cut down on much of the congestion experienced by emergency, service and delivery vehicles in driving through the campus loop road to reach service and dock areas. These access controls will also help to eliminate unauthorized uses of dock spaces that currently delay these vehicles. Emergency, service, and delivery vehicles requiring access to the loop will be provided multiple- or single-use access cards.

Centralized Receiving Area: Consistent with the *draft 2004 LRDP*, the Long Range Strategy recommends development of a centralized receiving area to handle the majority of deliveries on campus. Most routine campus deliveries will be handled to/from the central facility by the campus delivery service and immediate delivery needs can be carried out by the campus courier service. Exceptional needs which require direct delivery by off-campus vehicles can be accommodated with temporary access to the appropriate loading dock. Access controls and vehicle-free zones will require that delivery vehicles take the most efficient route to their destination. By creating a centralized receiving area and having campus personnel deliver materials to individual buildings, UCR will be able to exercise more direct control to achieve optimal routing to service areas.

ES.6.3. Parking

The Long Range Strategy includes a number of strategies that complement the *draft 2004 LRDP* parking plan.

Lot specific permits: Under this system, commuters will purchase a permit that allows them to park in a specific lot. This system will help cut down on campus congestion by eliminating car shuttling between parking lots throughout the day. Lot specific permits also promote more efficient traffic flows. Travelers will be more likely to take the most direct route to a parking space if they know which lot they will park in every day.

Pricing parking based upon proximity: With this pricing strategy, permits for structures near the campus will cost more, while permits for more peripheral parking structures will cost less. This will provide an incentive for commuters to park at more remote parking lots and walk, ride shuttles, or bicycle to their campus destination. Increasing the desirability of these lots will help to minimize traffic in the more densely developed areas of the campus and the community.

Transit service between the campus and each parking structure: The Long Range Strategy recommends that shuttle service be provided to carry commuters between each structure and various campus destinations. During the day and early evening, this transit will take the form of fixed route shuttle service. After these times, Point-to-Point, or demand responsive, vans will carry passengers between the campus and parking structures. The Long Range Strategy also includes demand responsive service to convey those with physical disabilities between parking structures and their campus destination.

ES.6.4. Transit

The Long Range Strategy for transit involves two main elements: (1) reduced headways for existing campus transit, and (2) more extensive transit services that link vital areas of the UCR campus.

Reduced headways: The Long Range Strategy recommends providing 5-10 minute headways on all fixed transit routes.

Increased transit service: The Long Range Strategy recommends that UCR continue to provide transit service between the campus and adjacent student housing, and expand available transit to enable people to use shuttles for longer-distance campus travel (including travel from parking structures to academic areas or between the East and West Campuses). The Long Range Strategy identifies the following vital service links:

- East Campus core with West Campus core
- East Campus core with University Village
- Nearby housing with East Campus core and West Campus core

- Parking structures with East Campus core and West Campus core

The Long Range Strategy also identifies potential routes that would enable transit to meet these service needs without crossing the vehicle-free pedestrian zones.

ES.6.5. Pedestrians

The Long Range Strategy utilizes a combination of vehicle-free pedestrian zones and grade separations to minimize auto-pedestrian conflicts.

Vehicle-Free Pedestrian Zones: Currently, high-volume pedestrian movements from student housing and Parking Lot 30 into the campus core require pedestrians to cross the campus loop road, creating conflicts with automobile traffic flows. As described in *ES.6.1. Vehicle Circulation,* vehicle-free pedestrian zones will enable pedestrians to cross into the campus core without conflicting with automobile traffic. The locations of these zones were selected to correspond with the high-volume pedestrian routes into the campus core.

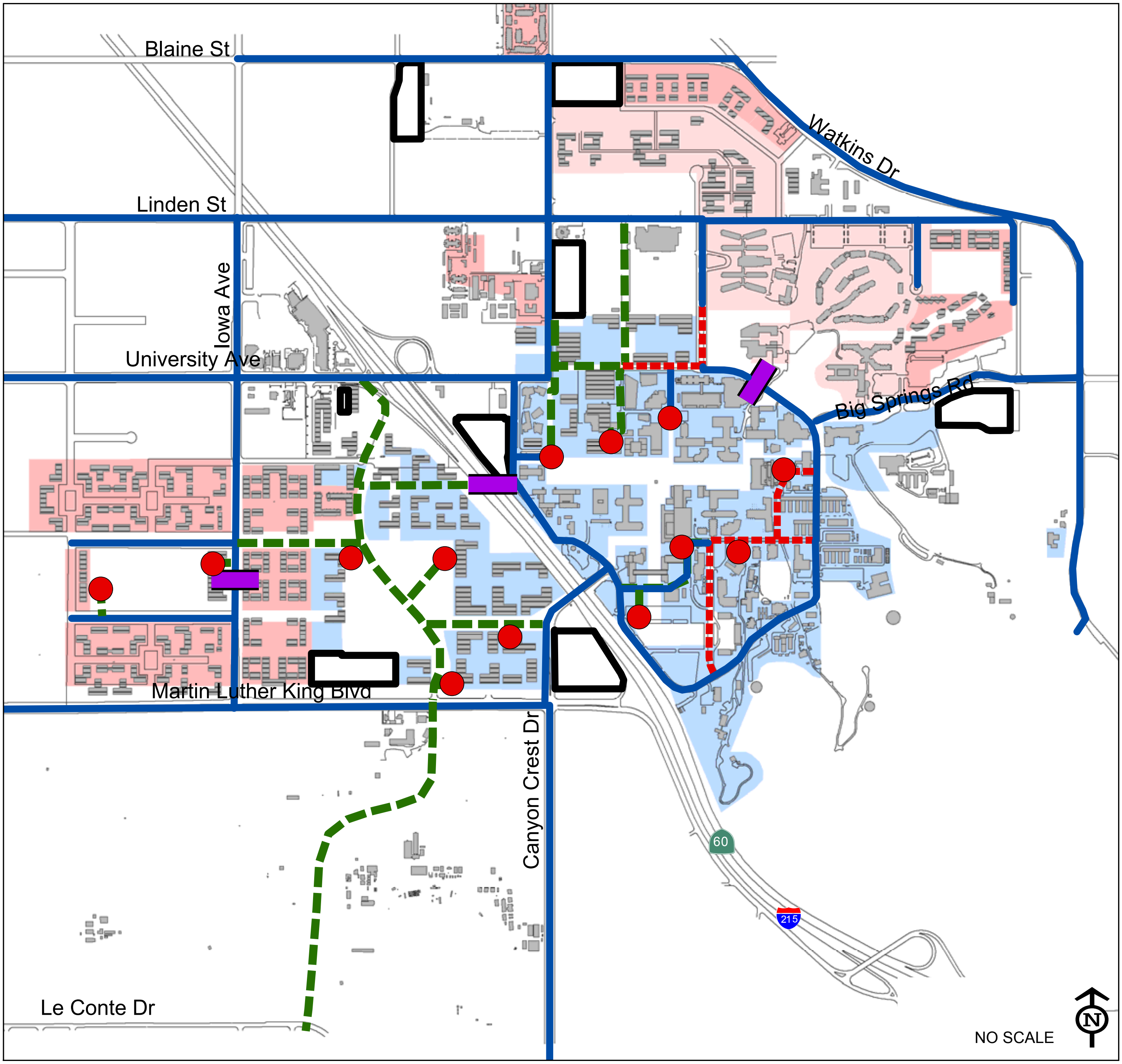
Grade separations: The Long Range Strategy also recommends three roadway overcrossings for pedestrians and bicycles. The plan recommends these grade separations in areas where high traffic volumes present obstacles for pedestrians and bicycles, and where bridges may connect to future buildings or parking structures on either side of the road, such as the freeway.

ES.6.6. Bicycles

The Long Range Strategy proposes a series of bike paths, lanes, and routes to enable bicyclists to penetrate the campus core while still preserving the interior malls exclusively for pedestrian use. To support this strategy, centralized bike parking will be developed at a number of convenient locations around the campus. The bicycle system plan is shown in Figure ES-2.

Bike network: The bike network accommodates most on-campus bicycling needs with formal bike facilities (routes, lanes, and paths), and bike travel is accommodated on other campus streets and paths on an informal basis. The formal bicycle network encircles and enters the campus core, but does not penetrate central campus pedestrian malls that will be designated as bike dismount zones. The formal network is designed to allow bicyclists to ride to most areas of campus and then be able to park their bikes within a three to five-minute walk of campus destinations.

Centralized bike parking: Consolidating bike parking at the end of bike paths will reduce the need for bicyclists to ride inside the campus core. Centralizing parking will also help UCR to take a more systematic approach to improving bike parking and will improve security by facilitating the ability of campus police to effectively patrol bike parking areas.



LEGEND

- Buildings
- Future Buildings*
- Future Parking Structures

*Future Buildings are the proposed buildings from the East Campus Entrance Area Study and from the West Campus Area Plan and the Strategic Plan for Housing (For capacity study only)

Future Land Use

- Academic
- Family, Apartment Housing and Related Support
- Residence Hall and Related Support
- Pedestrian/Bicycle Overpass
- Centralized Bicycle Rack Locations
- Bicycle Lanes (striped lanes on roads or sidewalks)
- Bicycle Paths (roads designated exclusively for bike use)
- Bicycle Routes (roads signed as bicycle routes, but without striped lanes)

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure ES-2

MMTMS Long Range Strategy for Bicycles

ES.7 Phasing and Implementation

Enacting the MMTMS Long Range Strategy requires careful phasing and implementation. Transportation system enhancements and policy changes must be coordinated with gradual land use changes at UCR. Some components of the Long Range Strategy require the establishment of certain prerequisites. The Phasing and Implementation plan outlines the prerequisites – such as specific developments on campus or the prior implementation of other MMTMS recommendations – that must be in place for each MMTMS component

At the same time, many of UCR's most pressing transportation problems require immediate solutions. The Phasing and Implementation plan identifies opportunities to take immediate actions that will help the campus manage the more urgent problems, such as conflicts between automobiles and pedestrians.

The Phasing and Implementation plan outlines three phases for developing the MMTMS Long Range Strategy as well as approximate timeframes:

- **Immediate Phase:** 1-2 years
- **Short-Range Phase:** 3-5 years
- **Long-Range Phase:** 6-10 years

The phased implementation strategy is intended as a guide to gradual and effective implementation of the MMTMS recommendations. The Strategy and Phasing are intended to be flexible, so that the University can respond to changing conditions as they evolve.

ES.8 Costs and Funding

Table ES-1: Summary of Total Capital / Start-up Costs (in thousands of 2004 dollars)

Cost Category	Immediate Actions (1-2 years)	Short-Range Actions (3-5 years)	Long-Range Actions (6-10 years)	TOTAL
Roadway Access & Traffic Control	$510	$715	$964	$2,189
New Transportation Facilities	$0	$394	$9,993	$10,387
Bicycle System Improvements	$361	$721	$566	$1,648
Improved Transit Service	$1,380	$1,878	$2,530	$5,788
Programs, Policies, and Plans	$33	$233	$18	$284
TOTAL	$2,284	$3,941	$14,071	20296*

* Does not include cost of parking structures.

Planning-level cost estimates were prepared for each major MMTMS cost element. Capital costs are summarized in Table ES-1, above. The overall capital cost (in 2004 dollars) is approximately $20 million. Annual operating costs when the system is fully implemented are projected to be approximately $2.4 million.

Potential sources of revenue were identified for funding the various components of the MMTMS. The funding evaluation led to the following conclusions:

- Parking revenues will continue to be a primary source of funding for campus transportation systems. Parking revenues will need to finance construction of parking structures, and be sufficient to fund the essential campus transit system.
- A combination of parking revenues and other funding sources will likely be necessary to fully fund the MMTMS improvements.
- As buildings and parking structures are constructed, UCR should seek to include elevated pedestrian walkways and pedestrian/bicycle overpasses (or appropriate elements thereof) in the building design where appropriate.
- UCR should hire a grant writer (or designate this responsibility to an appropriate staff member) to identify and pursue available grant funding opportunities for campus transportation improvements and programs.
- UCR should partner with the City of Riverside, particularly in regard to its bicycle and pedestrian improvements to facilitate opportunities to obtain transportation funds that are available only to public agencies.
- In order to maximize the utility of the campus shuttle system, fares should not be charged to students, faculty, and staff.
- If other sources are insufficient to fund campus transit services at the desired level of frequency, and if a program can be developed to provide access to RTA and Metrolink services, student fees should be considered in the future as a means of enhancing transit as a viable alternative mode.

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

1.1 Background

From its emergence as a 30-acre experimental orchard to a 1,112 acre campus with approximately 17,000 students (Fall 2003), the University of California at Riverside (UCR) has experienced rapid growth and change.

Much of this growth has occurred over the last decade. Between 1990 and 2000, UCR's student population increased from 8,100 students to almost 12,000 – a growth of 47 percent. This was the highest growth rate of all eight University of California campuses during the 1990s. More recently, UCR's enrollment increased between 6-10 percent each year from 1997 to 2001.

Employment at UCR is also rising. Between 1997 and 2001, the number of faculty members grew from 430 to 613; the number of full-time employees increased from 2,076 to 2,428.

This growth will likely continue into the following decades. With increasing numbers of college-bound students, UCR will play a major role in helping the UC system to meet its obligation – outlined in the California Master Plan of Higher Education – to offer a place for all eligible California students from the top 12.5 percent of high school graduates. In anticipation of this growth, UCR's latest version of its Long Range Development Plan (*draft 2004 LRDP*) prepares for a student enrollment of 25,000 by 2015.

Growth presents many challenges for UCR's transportation system. One of these challenges will be maintaining high levels of accessibility and mobility for students, faculty, staff, and visitors as UCR grows. Campus roads are already beginning to feel the strains of this growth. Congestion and growing conflicts between automobile drivers, pedestrians, and bicyclists create daily travel delays in and around the campus. Increasing numbers of people traveling to and from UCR could further overwhelm the campus' current transportation infrastructure. As the campus physically expands to accommodate growth, distances between various campus destinations will also increase, creating longer on-campus trips.

The Multimodal Transportation Management Strategy (MMTMS) was developed to respond to these existing and future challenges.

1.2 Planning Context

The MMTMS is only one of several planning efforts to help UCR prepare for rapid growth over the next decade. One major priority of the MMTMS project was to design a strategy that could be integrated into other UCR planning efforts. The MMTMS study also used assumptions from many of these planning documents to determine how changes over the next decade will influence the transportation system. The *draft 2004*

Long Range Development Plan, for instance, outlines future land use, an important determinant of campus travel patterns. The following summarizes some of the planning efforts which influenced the MMTMS:

1.2.1 draft 2004 Long Range Development Plan

UCR is currently updating the *1990 Long Range Development Plan (LRDP)* and its associated *Environmental Impact Report (EIR)*. The plan is currently in draft form; UCR expects final approval of the update in late 2004.

The *draft 2004 LRDP* provides a general framework for UCR's future land use patterns and the development of the campus' facilities, roads, open spaces, and infrastructure. The overall goals of the *LRDP* are to:

- Enhance UCR's image and identity;
- Accommodate planned growth to 25,000 students while retaining flexibility for unanticipated needs in the future;
- Recognize teaching and research changes, and encourage interdisciplinary endeavors by identifying a flexible academic zone rather than individual college precincts;
- Increase the size of the on-campus residential community and thereby improve opportunities for social interaction: a living/learning environment;
- Improve university/town interactions and synergy; encourage new development and intensification of activity on University Avenue;
- Emphasize strong connections and ease of access within the campus and with the surrounding community; and
- Create a regional model of planning, design and environmental stewardship, protecting the natural environment and incorporating sustainable planning and design practices.

The *Circulation and Parking* section of the *draft 2004 LRDP* provided the groundwork for the MMTMS. The plan establishes the following goals of UCR's future circulation and parking systems:

- Develop an integrated multi-modal transportation plan to encourage walking, biking, and transit use;
- Expand shuttle or tram service connecting major parking lots and campus destinations, and linking the East and West Campuses. Coordinate this system with RTA routes and schedules;

- Provide a continuous network of bicycle lanes and paths throughout the campus, connecting to off-campus bicycle routes;

- Over time, limit general vehicular circulation in the central campus and provide access for persons with mobility impairments;

- Provide bicycle parking at convenient locations; and

- Implement parking management measures that may include:

    - Restricted permit availability

    - Restricted permit mobility

    - Differential permit pricing.

The *draft 2004 LRDP* also provides general guidance for UCR's future transportation system. The plan, for instance, outlines the future circulation patterns, potential transit corridors, and possible transportation policies. These *LRDP* recommendations are discussed in greater detail in *Section 2.0: Existing and Future Conditions.*

The future land use patterns presented in the *draft 2004 LRDP* affected both the analysis of future conditions at UCR and the decisions about what solutions to include in the Long Range Strategy. The MMTMS study used the *draft 2004 LRDP* land use plan to help determine future trip patterns for all travel modes. The MMTMS also assumed the *draft 2004 LRDP* parking plan, which includes the future location of parking structures and the approximate number of spaces in each.

1.2.2 UCR Strategic Plan for Housing

The *Strategic Plan for Housing* provided another important source for determining future trip patterns of the UCR community. The *Strategic Plan for Housing* outlines UCR's goals to accommodate 50 percent of all students (and 75% of all freshmen) in student housing.

This housing plan will greatly influence travel patterns at UCR. Trips between proximate student housing and the campus core are a significant source of non-motorized travel (e.g. pedestrian and bicycle trips) to and from UCR. The MMTMS study utilized the location and numbers of housing presented in the *Strategic Plan for Housing* to determine how pedestrian and bicycle travel might change in the future.

1.2.3 East Campus Entrance Area Study

The East Campus Entrance Area Study deals with the campus entrance at the University Avenue/Canyon Crest Drive intersection, as well as the surrounding area. This study establishes the location of new facilities and discusses future traffic circulation in this area. The study also lays out future pedestrian walkways and service road access.

Many of the elements in the MMTMS were designed to complement the *East Campus Entrance Area Study.*

1.2.4 City of Riverside Plans

In addition to campus planning efforts, the City of Riverside is currently updating planning documents, including those for its transportation system, which could affect the campus.

Riverside General Plan Update

The City of Riverside has begun to update its General Plan, Zoning, and Subdivisions Ordinances in April 2003. The update is expected to take 18 months. The last General Plan was adopted in 1996.

University Community Plan

This City of Riverside plan covers the campus and the community immediately adjacent to the university, defined as the area bounded by Spruce Street on the north, Box Springs Mountain on the east, Central Avenue (or a line parallel to it) on the south, and Chicago/Kansas/Ottawa on the west.

1.3 Goals of the MMTMS

The primary purpose of the MMTMS study is to provide a long-range transportation strategy that provides accessibility and mobility for the campus community while promoting alternatives to private automobile travel. To do this, the MMTMS study established the following project goals:

- Reduce vehicle trips, noise, traffic, and air quality impacts by providing a multi-modal plan for the transportation of people, goods and services using:
    - Public transportation
    - Private vehicles
    - Alternates such as carpools or alternative fuel vehicles
    - Bicycles
    - Walking

- Ensure continued access for disabled travelers and for emergency, service, and delivery vehicles.

- Deliver a plan that creates a sense of place of the campus as totally accessible by a variety of transportation modes and support elements.

- Provide a signage and wayfinding plan.

- Develop a prioritization and implementation plan.

- Provide a schedule for implementation.

- Create cost data and identify funding strategies.

1.4 Study Area

The study covers the transportation network that falls within the UCR's campus boundaries. This includes the East Campus and the largely undeveloped West Campus. Figure 1-1 shows the area covered in the MMTMS study. The study also addresses local or regional transit links with the campus.

The strategy encompasses the different travel modes or systems that comprise UCR's transportation network. This includes the following components:

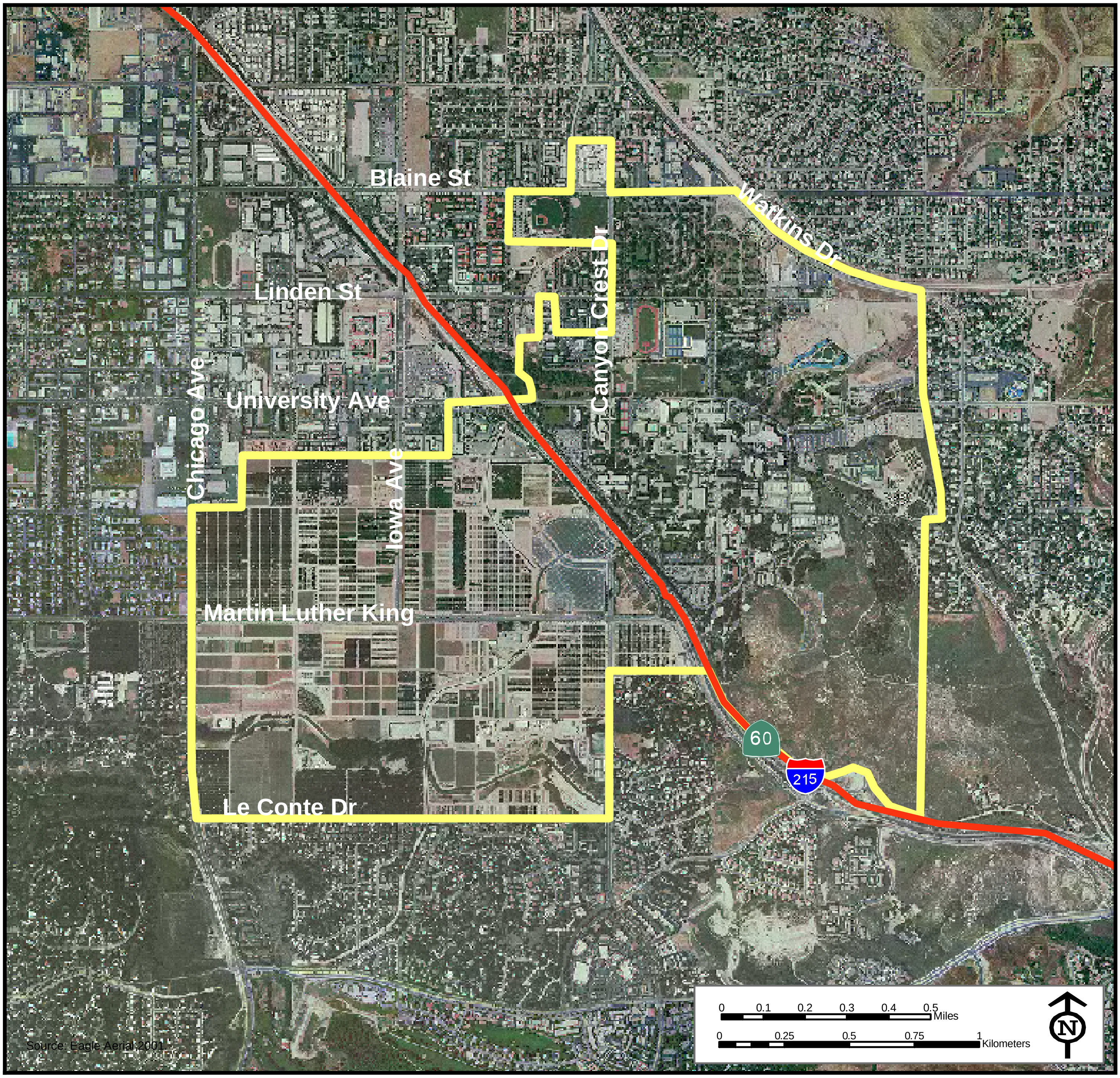
- Automobiles
- Emergency, service, and delivery vehicles
- Parking
- Transit
- Pedestrians
- Bicycles
- Signage and wayfinding system

1.5 Study Process

The Project Team, made up of the UCR Project Management Team (PMT) and a consultant team responsible for day-to-day project activities, guided the MMTMS study. The PMT consisted of staff members from UCR's Capital and Physical Planning (CPP) and Transportation and Parking Services (TAPS).

The MMTMS study drew upon input from the campus community during each step of the project. This community input was vital to ensure the final strategy addressed the concerns and needs of the campus. To solicit feedback from a cross-section of the campus community, the study used a combination of advisory committee meetings, focus groups, and public meetings:

- ***MMTMS Planning Committee:*** The MMTMS Planning Committee, formed by the Executive Vice Chancellor, was a 20-person advisory committee comprised of UCR faculty, students, and staff. The Planning Committee served an advisory role to the MMTMS; they provided input and guidance during each step of the MMTMS process. During the course of the study, the Planning Committee met with the Project Management Team (PMT) and the consultant team every 1-2 months. Minutes from these committee meetings are presented in Appendix A.
- ***Focus Groups:*** Early in the project, the Project Team conducted focus group sessions to obtain detailed information about specific elements of UCR's transportation system. Session topics included: inner campus congestion and parking problems; security and emergency services; special student services; bicycles; and deliverers and vendors. At these meetings, stakeholders in UCR's



LEGEND

STUDY AREA

FREEWAY

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 1-1

Study Area

transportation system – such as students, faculty, emergency service providers, transportation services field staff, bicyclists, and outside delivery services – spoke about the issues affecting various aspects of UCR's transportation system. These meetings also explored potential solutions to these challenges. Minutes from these focus group meetings are presented in Appendix A.

- ***Neighborhood and Community Open Houses:*** Open House sessions were held at two critical stages of the MMTMS. The first round of Open Houses occurred as the project was identifying UCR's transportation issues and potential solutions. During these Open Houses, participants had the opportunity to hear the problems the MMTMS project had identified to date and review some of the potential solutions the project identified. Participants were given the opportunity to identify additional issues, comment on some of the potential solutions, and offer other solutions. The second round of Open Houses was held after the development of the first draft of the proposed Long Range Strategy. At this meeting, community members were able to view and comment on the draft Long Range Strategy. For each set of Open Houses, afternoon and evening sessions were held to allow members from both the campus and neighborhood communities to attend. Minutes from these Open House sessions are presented in Appendix A.
- ***Design Review Board (DRB) and Capital Programs Advisory Committee (CPAC):*** Input and feedback were solicited from the DRB and from the CPAC at two points in the project. The first meeting with each included review of the guiding principles, the transportation issues to be addressed by the MMTMS, the range of potential options to be considered, and the planning process being applied to address and incorporate campus and community input. The second meeting reviewed the recommended plan and phasing program.

The first step in the MMTMS study was to ***establish a series of guiding principles*** for the project. These principles articulated the goals of the MMTMS and steered the entire project by providing criteria to evaluate potential solutions for the Long Range Strategy. Given the critical nature of this step, the guiding principles were developed through discussions between the Project Team and the Planning Committee.

The next step involved ***identifying the transportation issues*** the MMTMS study needed to address. This step relied heavily upon input from the UCR community. The project team held focus group meetings, Planning Committee meetings, and Open House sessions to determine the problems affecting UCR's various transportation systems. During these meetings, the participants also provided examples of transportation problems, and listed specific areas where each problem occurs. An examination of existing and future conditions enabled the project team to identify additional issues affecting the campus. The project team conducted field studies, examined traffic studies, and reviewed planning documents, such as the *draft 2004 LRDP*, to identify other possible issues the MMTMS study needed to address.

The issues identified above provided the foundation for the next step: ***identifying potential solutions to each issue.*** Potential solutions were compiled for each of the issues outlined in the previous step. This process relied upon two major sources:

community input and examinations of other colleges and universities. Having experienced many of these problems on a daily basis, UCR stakeholders possessed significant insights into possible solutions. Faculty, staff, and students who had spent time at other colleges provided examples of the transportation networks on other campuses. The Project Team also identified other universities facing similar issues, and researched how these schools attempted to solve each problem.

During the process of ***developing a Long Range Strategy,*** the Project Team examined each potential solution. Solutions were included in the Long Range Strategy based on three major criteria: how effectively each solution would address the issues; whether or not the solution satisfied the guiding principles; and how well each solution worked with other solutions. The Planning Committee played an important role in this evaluation. At various stages on the project, committee members were asked to respond to the various solutions. As part of this input, committee members were asked why they felt a particular solution should be included in or left out of the Long Range Strategy.

In ***designing an implementation and phasing strategy,*** the Project Team, in consultation with the Planning Committee, determined how to phase each element into the Long Range Strategy. This process involved determining the prerequisites and the time required to implement each long-range strategy component. This step also included identifying immediate solutions to UCR's transportation problems. This led to the creation of three separate phases: an immediate plan (1-2 years), a short-range plan (3-5 years), and a long-range plan (5-10 years).

These three phases were then used in ***providing costing information and identifying possible funding sources.***

UCR's Design Review Board (DRB) provided input during two stages of the MMTMS study. Final review of the MMTMS Long Range Strategy and the phasing and implementation plan came from UCR's Capital Programs Advisory Committee (CPAC). As mentioned above, the Planning Committee served an advisory role throughout the project, including reviewing the first draft of this report. Figure 1-2 summarizes the process used to develop the MMTMS.

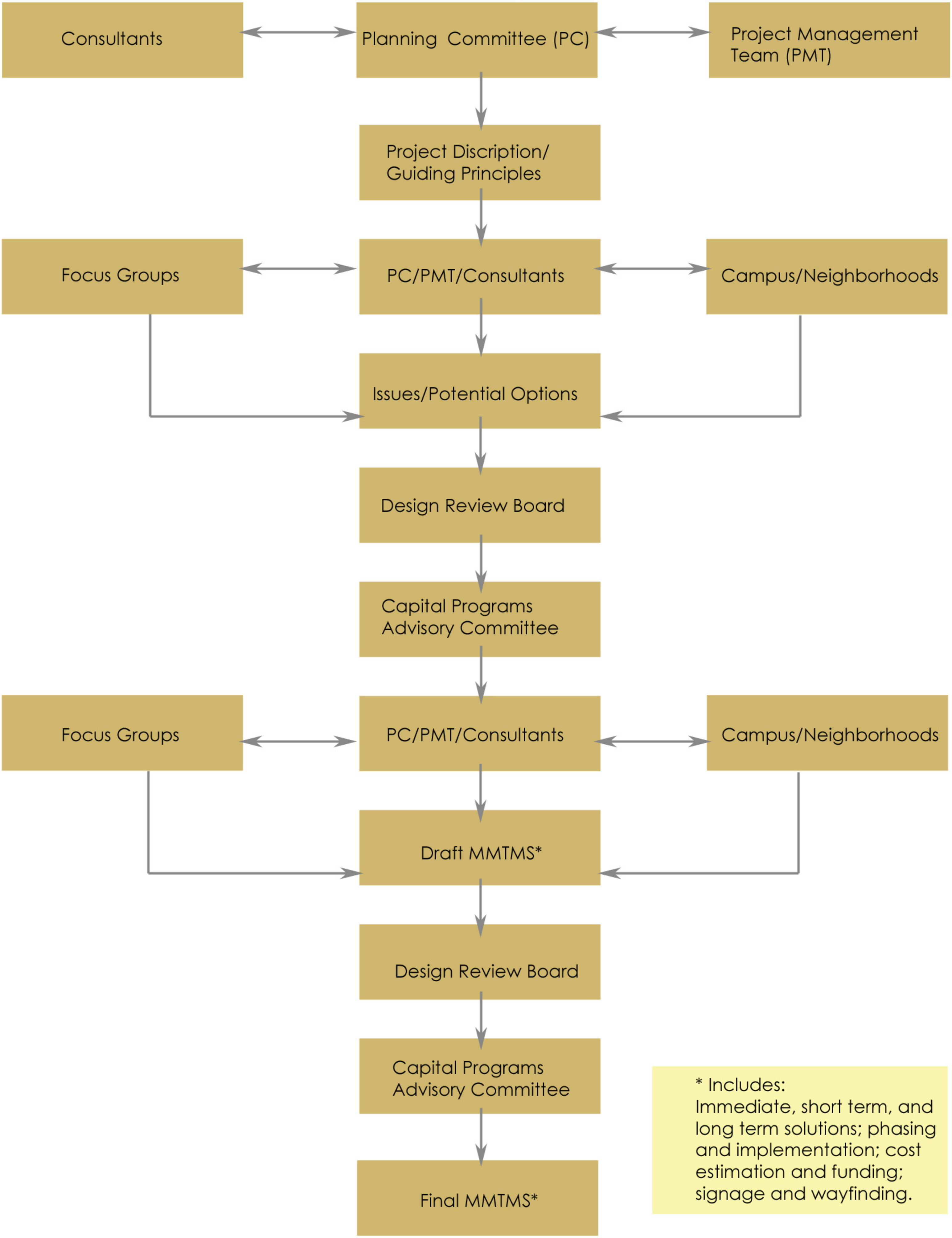
1.6 Guiding Principles

The guiding principles were developed at the beginning of the project to provide the criteria with which to evaluate potential solutions for the Long Range Strategy. These guiding principles encompass the objectives outlined in the LRDP, the expressed goals of campus agencies involved with the MMTMS, and sound transportation planning practices. The guiding principles are as follows:

Mobility:	Develop a system that addresses the essential and evolving mobility requirements of persons, goods, and services throughout the campus as the University grows. Key features should include travel time, access, efficiency, and convenience.

Campus Integration:	Provide transportation programs and facilities using a variety of modes that integrate all areas of the campus and that provide linkages to the surrounding community, the city, and the region.
"Walkable" Campus:	Develop a system which puts the pedestrian at the head of transportation and accessibility needs, and then accommodate other types of transportation.
System Hierarchy:	Establish a hierarchy by facility and mode type to the extent feasible (e.g., vehicles, transit, bicycles, pedestrian traffic) to facilitate circulation and to address points of conflict.
Traveler Needs:	Focus on user needs, including special users such as emergency, vendors, delivery vehicles, and the disabled. Address complete point-to-point trip needs by providing inter-modal linkages, convenient and secure services, and support facilities. Stress marketing, educational, and/or informational programs for maximum effectiveness.
Multimodal System:	Enhance incentives for a range of alternatives such as transit, bicycles, and pedestrians to make those transportation choices more attractive compared to the automobile. If a vehicle must be used, consider alternative fuels.
Aesthetic Design:	Include design elements that enhance the user's experience, are functional, and support the vision of the university and add to a "sense of place."
Implementable:	The proposed system should be realistic, acceptable to decision-makers and the campus public, fundable over both the short and long term, and adaptable to changing circumstances. The phasing and priority plan should provide opportunities for both near and long-term implementation of plan elements.
Neighborhood Consideration:	The proposed strategy should seek to achieve UCR's transportation goals while minimizing potential consequences to neighboring communities.
Safety:	Provide a plan that enhances the safety of all travel modes and that addresses the particular demands created by university activities (such as the need for secure multimodal evening travel).

Figure 1-2: Study Process



2.0 EXISTING AND FUTURE CONDITIONS

2.1 Introduction

This section summarizes technical information compiled to assess the existing and future conditions of UCR's multimodal transportation network. This discussion is broken down into the following transportation systems:

- Automobile Travel
- Emergency and Service Vehicles
- Parking
- Pedestrians
- Bicycles
- Transit

This information is intended to help determine the underlying root causes of travel patterns and issues related to the transportation system at UCR. This section also provides the policy framework for making and considering policy improvements and recommendations. The detailed data about the existing and future conditions of UCR's multimodal transportation system can be found in the *UCR Multimodal Transportation Management Study Technical Memorandum #1: Existing and Future Conditions*, located in Appendix B.

2.1.1 Sources of Existing and Future Conditions

The MMTMS study used the following sources to characterize the existing and future transportation systems:

- Field observations of campus travel
- Traffic studies conducted for the *draft 2004 LRDP Environmental Impact Report*
- The *draft 2004 LRDP*
- Focus groups
- Planning Committee meetings
- Public outreach (campus and neighborhood Open Houses)
- Other planning documents (such as the Strategic Plan for Housing)

The *draft 2004 LRDP* was especially relevant to understanding the university's future conditions, with approximately 25,000 students by year 2015.

2.1.2 Campus Growth

During its 50-year existence, UCR has experienced substantial growth and change. When courses began in 1954, the university had a planned capacity of 1,500 students; in Fall 2003, enrollment was close to 17,000 students. This growth has necessitated a series of long-range plans designed to accommodate increasing enrollment and an evolving community.

UCR expects continued growth over the next decade. UCR's draft 2004 Long Range Development Plan (LRDP) anticipates a student enrollment of 25,000 students by 2015, in addition to significant increases in employment. The *draft 2004 LRDP* is planning for the campus population to double between the 2000-01 school year and 2015-16.

Table 2-1: Draft 2004 LRDP Growth for Students, Faculty, and Staff

Headcount	2000/01	2015-16
Students (3-quarter average, headcount)	12,703	25,000
Faculty and Post-Doc	841	1,742
Staff	2,901	6,174
Other Individuals	1,196	2,624
Total	17,641	35,540

Source: *Long Range Development Plan, August draft 2003*

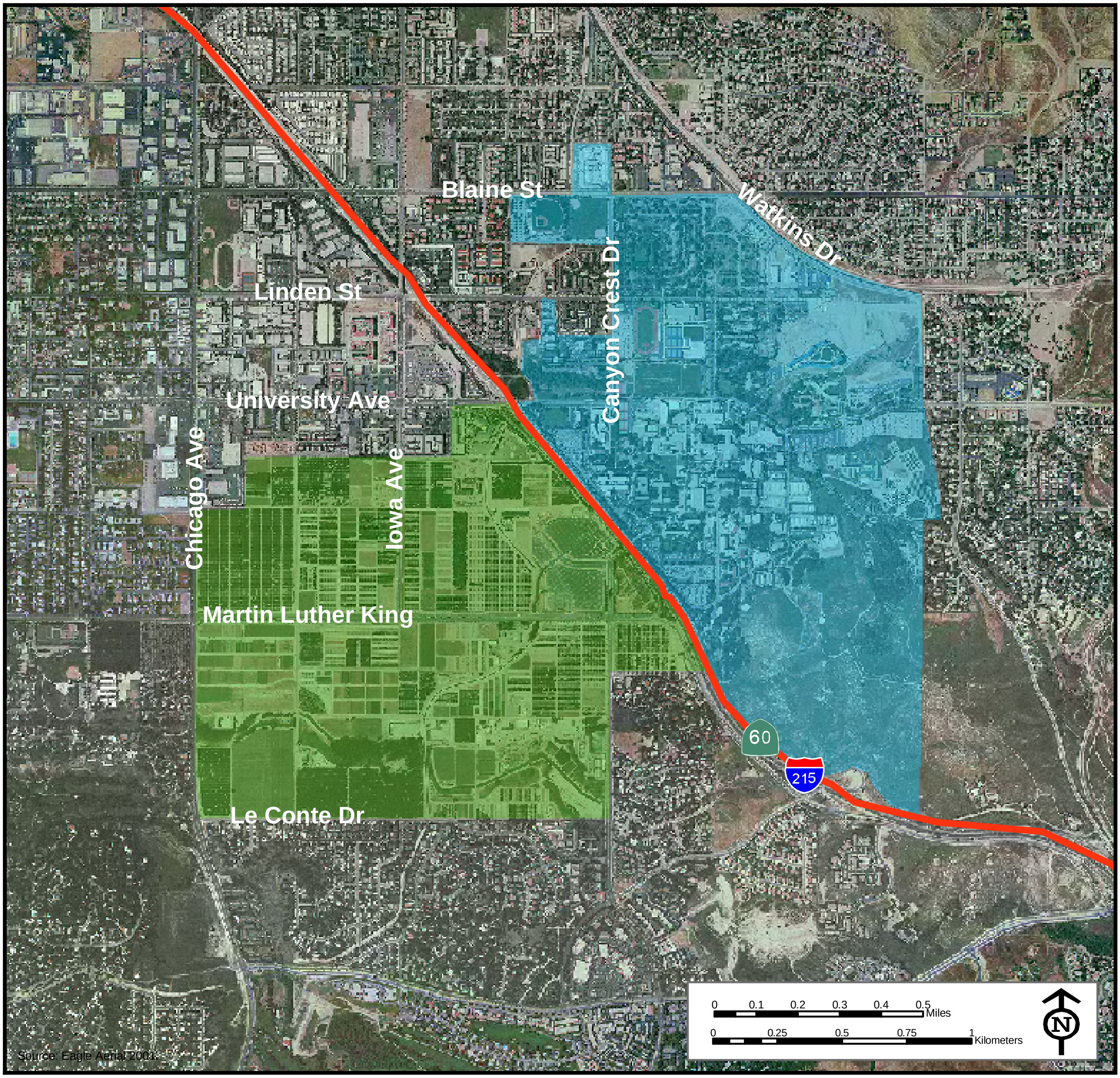
Creating a multimodal transportation network that promotes alternatives to private automobile travel – such as pedestrian, bicycle, or transit trips – is one strategy for dealing with the transportation needs associated with this growth. This strategy, one of the key goals of the MMTMS, will help to reduce congestion around the campus and allow UCR to better manage its future parking demand.

2.1.3 Campus Development

Campus development will also necessitate a more multimodal transportation system. Currently, the majority of academic activity occurs in UCR's East Campus. Over the next decade, however, UCR plans to develop academic, housing, support services, and parking facilities in the largely undeveloped West Campus (see Figure 2-1). Some administrative functions have already shifted over into West Campus. This development expansion will require more extensive pedestrian, bicycle, and transit networks to help travelers make these trips between the East and West Campuses.

UCR's housing plans will also increase the demand for alternatives to automobile travel. Currently, approximately 27 percent of UCR students live in university housing on campus. The university housing units are located to the north and the west of the campus (see Figure 2-2). This proximate housing is a major source of pedestrian, bicycle, and transit trips to the campus. The areas to the north and west of campus also contain privately owned apartment complexes that house large numbers of UCR students.

UCR's *Strategic Plan for Housing* strives to increase the proportion of students living in university-run housing to 50 percent through the development of new student housing and renovation of existing units in several locations on campus. As shown in Figure 2-3, this will increase the number of beds within university-run housing to over 12,500, nearly three times the existing number. A greater number of the students living nearby provides UCR with an opportunity to encourage more students to walk, bike, or take



LEGEND

WEST CAMPUS

EAST CAMPUS

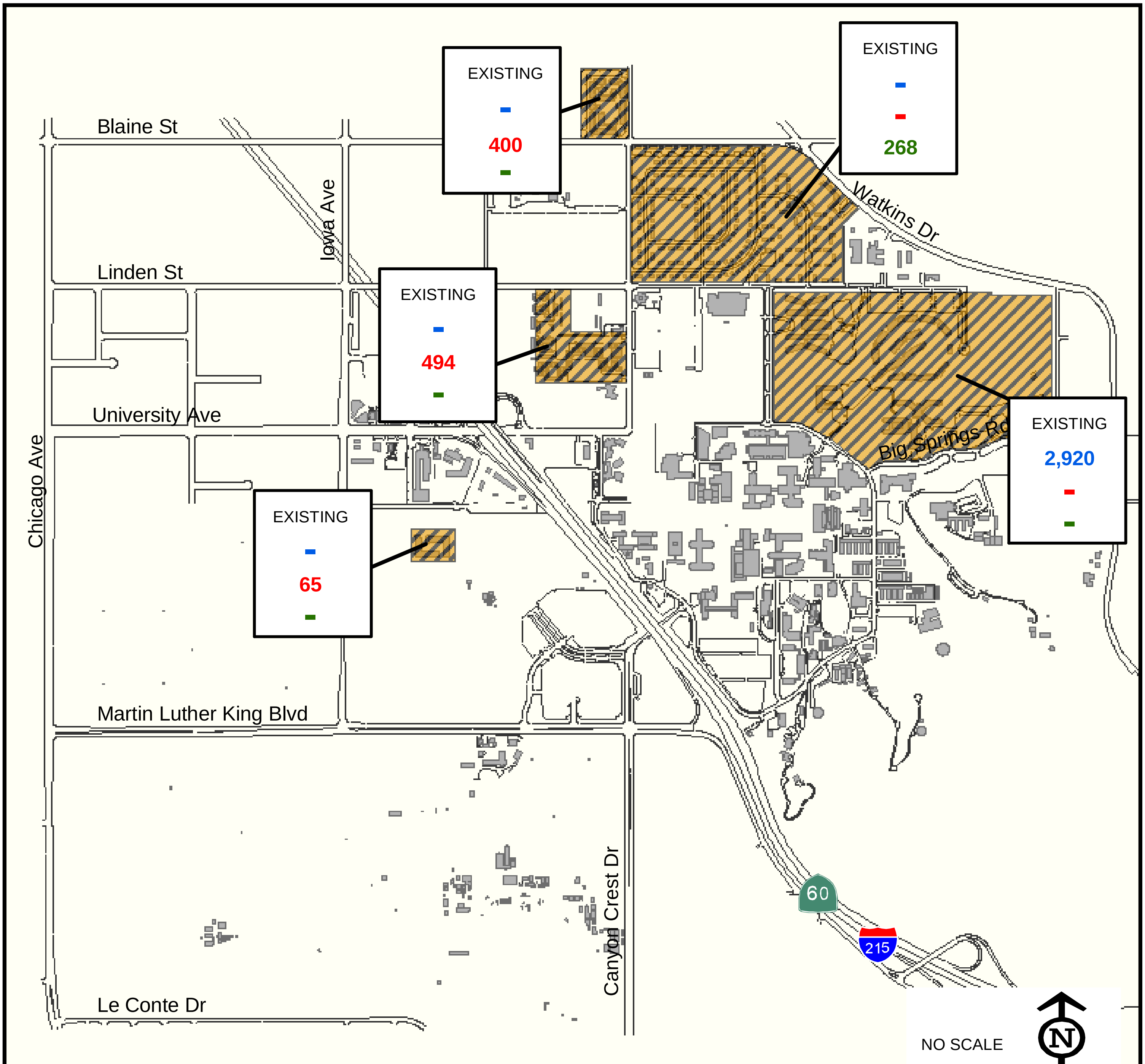
FREEWAY

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-1

East and West Campuses



Source: draft 2004 LRDP.

LEGEND

AREA OF HOUSING

BUILDINGS

NUMBER OF STUDENTS PER AREA OF HOUSING
(Total of 4147 students)

First Year & Transfer Students
Upper Classes & Graduate Students
Students with Dependents

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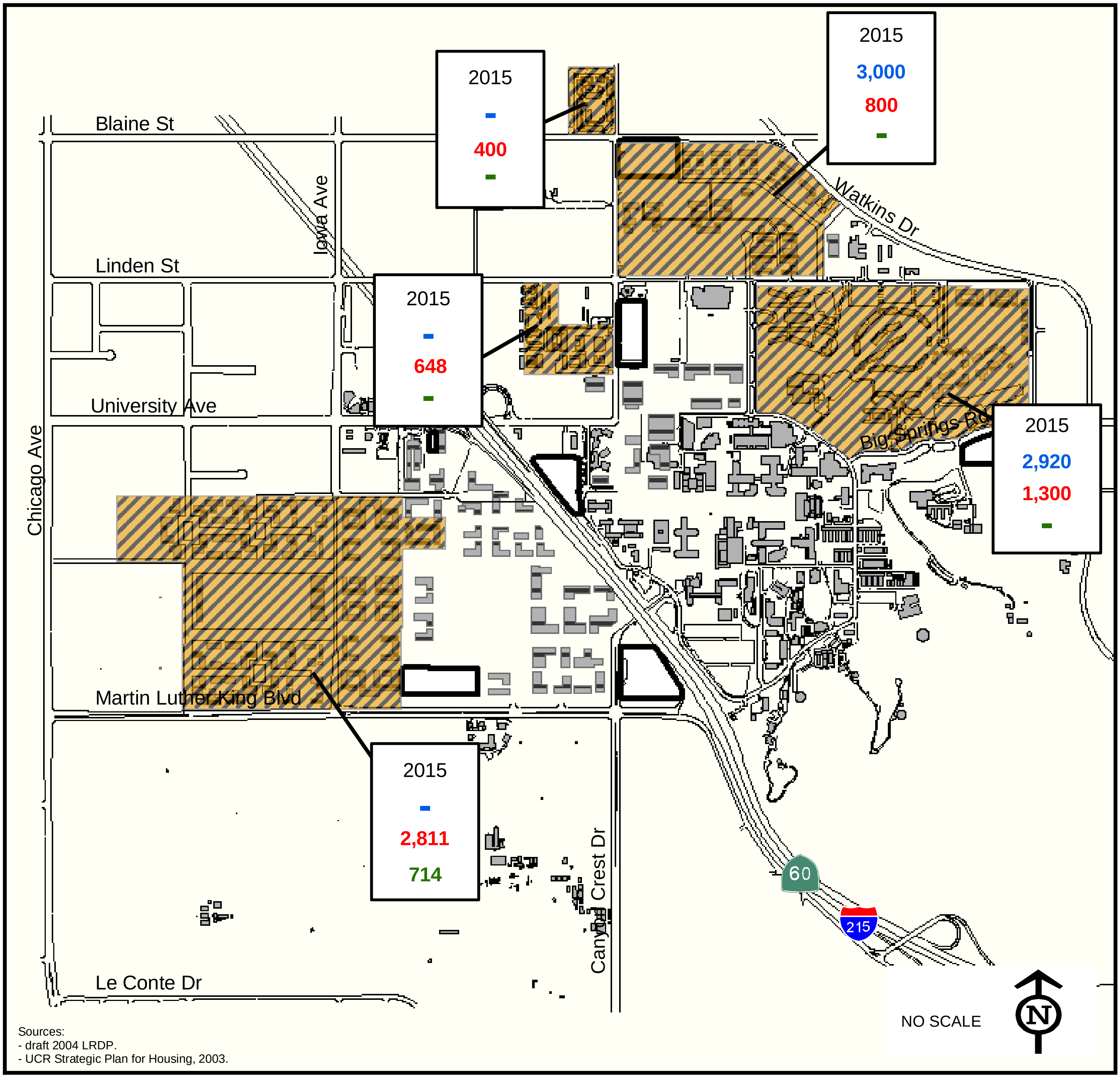
MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-2

Existing Number of Students in On-Campus or Campus Controlled Housing



LEGEND

AREA OF HOUSING*

BUILDINGS

FUTURE BUILDINGS**

FUTURE PARKING

*Parking for on-campus residents includes within housing area

**Future Buildings are the proposed buildings from the East Campus Entrance Area Study and from the West Campus Area Plan and the Strategic Plan for Housing (For capacity study only)

NUMBER OF STUDENTS PER AREA OF HOUSING
(Total of 12593 students)

First Year & Transfer Students
Upper Classes & Graduate Students
Students with Dependents

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-3

Year 2015 Number of Students in On-Campus or Campus Controlled Housing

transit to campus. This growth will also create more pedestrian and bicycle volumes in areas of the campus that already experience pronounced conflicts between motorized and non-motorized travelers. This increase will require a more extensive multimodal transportation network that services bicyclists, pedestrians, and transit users.

2.2 Automobile Travel

2.2.1 Surrounding Road Network

The East Campus is bounded by the SR-60/I-215 freeway to the west and Box Springs Mountain to the east. This limits automobile access to the campus to four major routes. Figure 2-4 illustrates the street network surrounding UCR.

University Avenue is one UCR's major gateways, intersecting with West Campus Drive, which leads to an information kiosk, interior parking lots, and UCR's only designated drop-off point. University Avenue is the major symbolic entrance to the campus and the primary visitor entrance. It also connects with the northern section of Canyon Crest Drive, providing a route to the parking lots and other university facilities at the north end of campus. University Avenue serves a large number of both university and non-university-related traffic. According to traffic studies conducted for the *draft 2004 LRDP*, University Avenue carries some of the largest average daily traffic volumes within the surrounding street network (see Figure 2-5).

Martin Luther King Boulevard provides another major external access route. Martin Luther King Boulevard also carries both university and non-university related trips; UCR traffic field staff found that commuters traveling to and from the area south of the campus often use this road to bypass the often-congested I-215/SR-60/SR-91 freeway-to-freeway interchange. Martin Luther King Boulevard is a major gateway to the campus, intersecting with Canyon Crest Drive south, which provides access to Lot 30 (a large commuter parking lot) and the interior West Campus Drive.

Linden Street and ***Big Springs Road*** provide the two other significant external access routes to UCR. Big Spring Road constitutes the campus' eastern entrance. It leads directly to Lot 13, another large commuter lot, and intersects with the campus loop road. Linden Street leads to UCR's residence halls and the Student Recreation Center. Linden Street also intersects with Aberdeen Drive, another heavily used route into the campus loop road

The six-lane ***I-215/SR-60*** freeway provides regional access to the campus via interchanges at Blaine Street, University Ave, and Martin Luther King Blvd. The interchanges at Blaine Street and University Avenue provide full access; the Martin Luther King Boulevard interchange only provides egress from southbound I-215/SR-60. Caltrans plans to construct a full-access interchange at Martin Luther King Boulevard in the next 2-3 years. Access to East Campus will be provided via the Martin Luther King Boulevard to the Canyon Crest underpass.

A separate network of campus roads provides automobile access to areas within the campus. A two-lane loop road (consisting of East, West, North and South Campus Drive) forms the main component of the internal campus circulation. These four segments of Campus Drive nearly encircle the academic core; North Campus Road ends at a parking lot, preventing the loop from making a full circle by connecting with Canyon Crest Drive just north of the intersection with University Avenue. As Figure 2-4 illustrates, the East Campus academic core is accessible from Canyon Crest Drive (south), Big Springs Road (east), Aberdeen Drive (north) and University Avenue (west).

Citrus Drive and Eucalyptus Drive branch off of the campus loop road and provide access to facilities at the southeast end of campus. Access to facilities at the north end of campus is provided via Linden Street, which reduces to two lanes as it becomes a campus street east of Canyon Crest Drive.

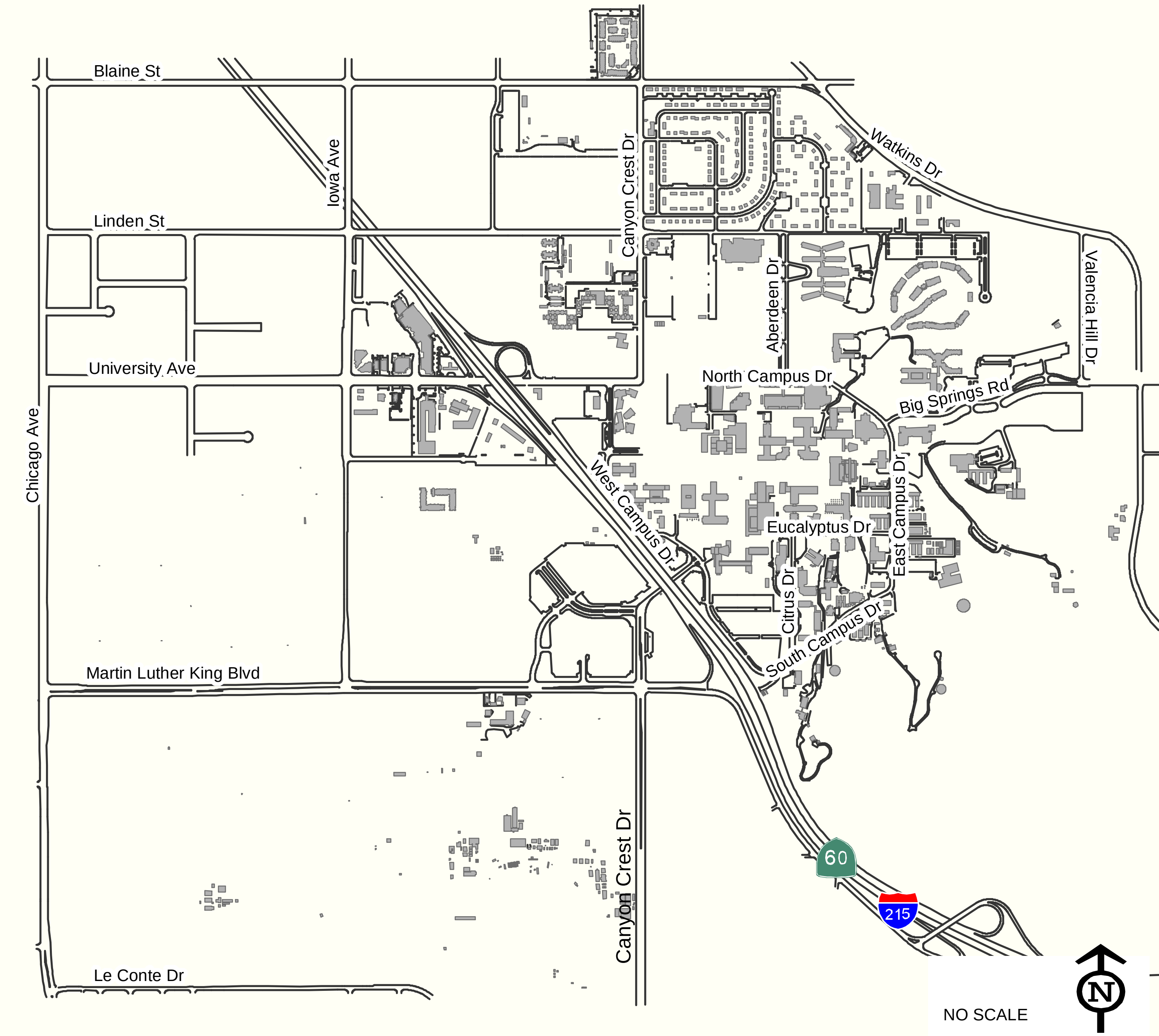
Currently, the campus loop road is used by a variety of vehicles. The loop road provides service, emergency, and delivery vehicles with access to service roads and dock areas within the campus. The loop road is also used by general purpose traffic; many use the road to reach interior parking lots, or to drop-off or pick-up passengers near the campus core. TAPS field staff has stated that the loop road also accommodates some non-University related traffic.

Local Access/Service Roadways provide access to building service facilities, such as dock areas. Primarily intended for service, delivery and emergency vehicles, these roads are often used by private vehicles. Since current TAPS policy allows parking permit holders to park in any lot and within selected dock areas after 4 PM, many drivers use service roads to find evening parking spaces. Dock areas and service roads are also often used as drop-off and pick-up points.

2.2.2 Existing Traffic Delays on Campus

Traffic counts, field observations, and discussions with UCR stakeholders suggest that conflicts between automobile and non-motorized travel cause most of the traffic congestion on campus, as opposed to insufficient roadway capacity.

The *draft 2004 LRDP EIR* measured the existing Level of Service (LOS) ratings for intersections on or near the campus. LOS ratings forecast the delay travelers experience at intersections based upon traffic volumes and the intersection's capacity (see Table 2-2).



Source: CADD drawings provided by UCR Capital and Physical Planning, 2003.

LEGEND

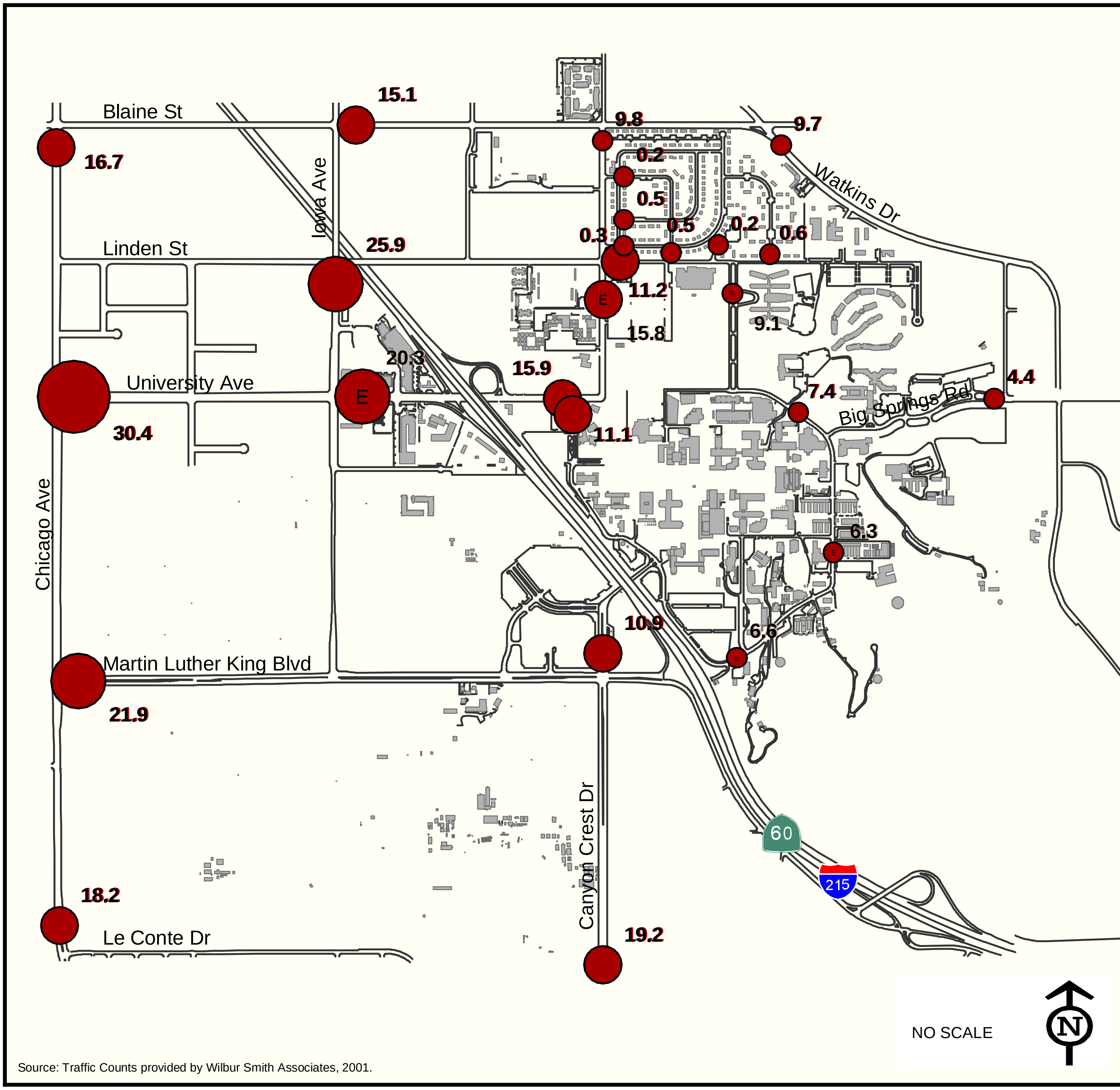
BUILDINGS

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-4

Street Network Surrounding UCR



LEGEND

BUILDINGS

AVERAGE DAILY TRAFFIC IN THOUSANDS

E	0.2 - 10.0
E	10.1 - 20.0
E	20.1 - 30.0
E	30.1 - 30.4

E : Estimated from PM Peak hour turning movments

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-5

Average Daily Traffic

Table 2-2: Level of Service Description

LOS	*Control Delay for Signalized Intersections* (in seconds)	*Average Delay for Unsignalized Intersections (in seconds)*
A	0.1-10.0	0.1-10.0
B	10.1-20.0	10.1-15.0
C	20.1-35.0	15.1-25.0
D	35.1-55.0	25.1-35.0
E	55.1-80.0	35.1-50.0
F	>80.0	>50.0

Figure 2-6 displays the current AM/PM peak hour traffic Level of Service (LOS) for streets leading into the university. Typically, planning and design efforts strive for LOS ratings of D or higher, to ensure acceptable service for facility users. According to these measurements, only two intersections immediately along these campus entrances experience an LOS of E or lower: the southbound approach at I-215/SR-60 and Martin Luther King Boulevard (LOS F in the AM) and the Big Springs Road/Watkins Drive intersection (LOS F in the PM).

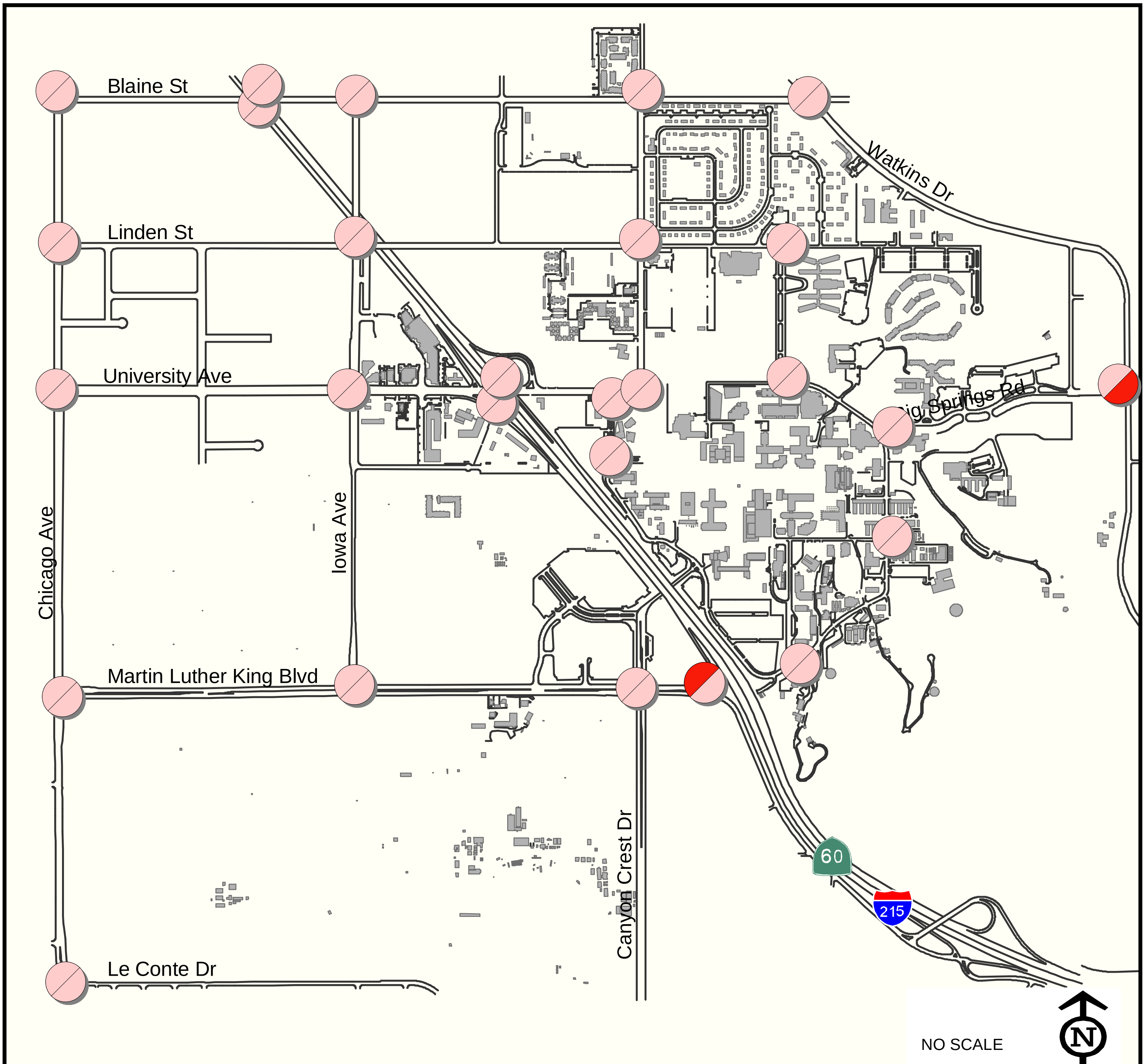
Although the remaining intersections experience a peak hour LOS of D or better, field observations and interviews with the UCR community indicate that many intersections experience recurring peak time congestion. According to interviews, most of the delay occurs when automobiles must wait for pedestrians to cross the inner loop road at unsignalized intersections. This suggests that while traffic volumes on campus roads alone do not cause significant travel delay, conflicting movements between automobiles and forms of non-motorized travel do slow traffic. Informal passenger drop-offs along the inner campus loop also create vehicle queues along Campus Drive. Since the LOS analysis does not capture this phenomenon, actual congestion on the loop road is worse than indicated by the LOS analysis.

2.2.3 Future Traffic

To help reduce this congestion, and provide a more bicycle- and pedestrian-friendly campus environment, the *draft 2004 LRDP* identifies ways to minimize the traffic on campus roads. The future circulation plan presented in the d*raft 2004 LRDP* is an important component in accomplishing this change. This circulation plan also played an important role in the MMTMS study by providing a starting point for developing a Long Range Strategy for vehicle circulation.

The primary loop proposed in the *draft 2004 LRDP* encircles the outer perimeter of both West and East Campuses. (The primary loop is the main route for frequent travelers to UCR – such as commuting students and employees, and vendors). The loop consists of the following streets: Chicago Avenue on the west; Blaine Street on the north; Watkins Drive on the east; and Martin Luther King Boulevard on the south (see Figure 2.7). The LRDP parking plan, discussed below, complements this proposed circulation by locating much of the future parking along this outer loop.

According to the *draft 2004 LRDP*, expanding the primary traffic loop will help keep cars out of the inner campus, creating a more pedestrian- and bicycle- orientated environment. This will open up the inner campus loop for campus transit as well.



Source: UCR Draft 2003 LRDP EIR Traffic Impact Study Draft Report, August 2003.

LEGEND

BUILDINGS

LEVEL OF SERVICE

AM

PM

Level of Service A, B, C or D

Level of Service E or F

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-6

Existing Level of Service

The LRDP secondary loop consists of University Avenue, the section of Canyon Crest Drive between Blaine Street and University Avenue, and Iowa Avenue. These roads will provide access for visitors and provide access to some parking lots/structures.

Because the secondary loop roads lie in between the campus core and future campus developments – such as housing or potential academic facilities – the LRDP predicts the secondary loop will experience significant levels of bicycle, pedestrian, and transit movements. The *draft 2004 LRDP*, therefore, suggests designing the secondary loop to give pedestrians and bicyclists priority upon these roads whenever possible. The East Campus Entrance Area Study also recommends placing a traffic circle at the elbow formed by University Avenue and Canyon Crest Drive, in part to help calm traffic and make the area more amenable for pedestrians and bicyclists. The traffic circle would also create a formal entrance statement for the campus.

Much of the current inner campus loop will become a combination of restricted and unrestricted local access roads (shown on Figure 2-7). These roads will be used for intra-campus uses such as service, delivery, and emergency vehicles, and will accommodate disabled access needs. Local roads will also service student housing areas and, in some cases, provide access to parking lots. The *draft 2004 LRDP* recommends designing these local roads to prevent the use of the inner campus loop for things like travel to and from the campus or parking structures. By minimizing traffic along this inner loop, the *draft 2004 LRDP* hopes to open up this road for pedestrians, bicycles, emergency and service vehicles, and campus transit.

The *draft 2004 LRDP* realizes that additional access controls may be required as the campus changes over time. Increasing travel demand could exceed the capacity of campus roads before land use changes effectively shift travel demand off-campus. Short-term access controls, for instance, may have to restrict traffic until UCR has time to build new peripheral parking. Changes in traffic circulation, therefore, will require a carefully phased implementation.

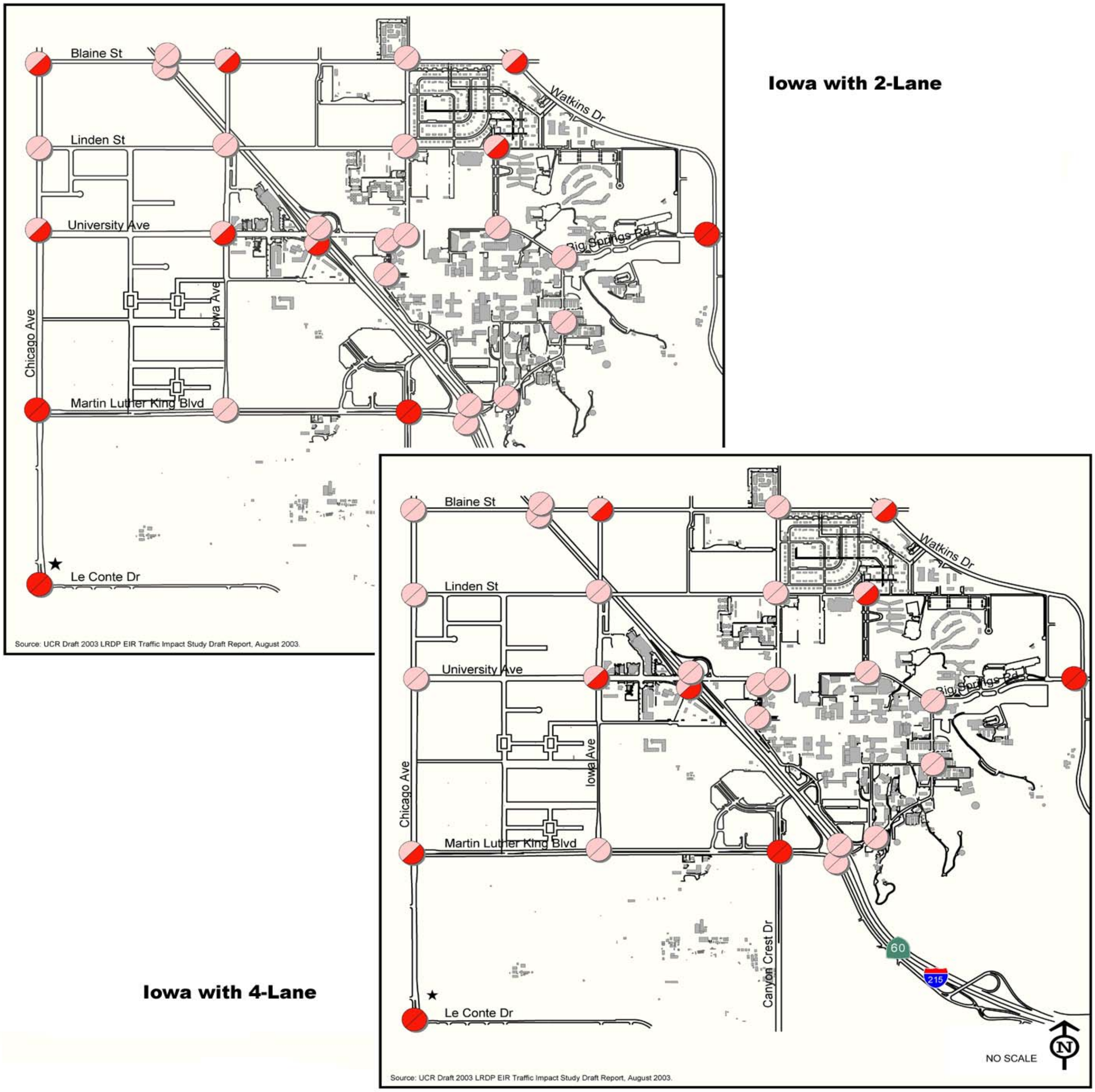
Encouraging alternative modes of travel will become an increasingly important tool to provide campus mobility and accessibility as traffic around the university grows. The *draft 2004 LRDP EIR* traffic study predicts that delay at intersections will increase by 2015. The study looked at two future scenarios.

In one scenario, the segment of Iowa Avenue between University Avenue and Martin Luther King Boulevard has 2 lanes; in the other scenario, this segment consists of 4 lanes. In the 2-lane scenario, all the major arterials leading into the campus have at least one intersection on or near the campus entrance with an LOS rating of E or F. In the 4-lane scenario, at least one intersection at each of the major arterials leading to campus has a LOS rating of E or F in at least one peak hour. Figure 2-8 shows the location of these intersections with an LOS of E or lower for each scenario.

In both scenarios, much of this traffic involves non-university related travel (city/regional travel). The Draft EIR Traffic Impact Study attempted to separate out non-UCR traffic (referred to as background traffic). Even after filtering out university traffic, nearly half of the same intersections would still have E or F LOS ratings.

Figure 2-7: Draft 2004 Long Range Development Plan - Vehicular Circulation System (2015)

Source: draft 2004 LRDP.



LEGEND

BUILDINGS

LEVEL OF SERVIVE

AM

PM

Level of Service A, B, C or D

Level of Service E or F

★ Westbound only

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-8

Future Level of Service (LRDP 2015)

2.3 Emergency and Service Vehicles

A series of service roads and dock areas provide emergency, service, and delivery vehicle access to nearly every building on campus. Figure 2-9 shows the campus network of existing service roads and dock areas.

Most service roads lie off of the inner campus loop. Currently, service roads on campus have no access controls, with the exception of the access road leading to Sproul Hall. As noted, service, emergency, and delivery vehicles frequently share the campus' inner loop and service roads with privately owned vehicles. Dock spaces are often used as drop-off and pick-up points. After 4 PM, some dock space parking areas are open to all valid UCR parking permits. Many dock spaces also contain handicapped parking.

As described in Section 2.2.2 of this report, the *draft 2004 LRDP* recommends using access controls to prevent much of this multiple use of dock areas and service roads. The *draft 2004 LRDP* also recommends shifting the majority of deliveries to a centralized receiving area. University staff would then make deliveries between the receiving area and various destinations on campus. According the *draft 2004 LRDP*, this would provide UCR more control to ensure that deliveries avoid pedestrian areas or occur outside of peak travel times.

2.4 Parking

2.4.1 Existing Parking

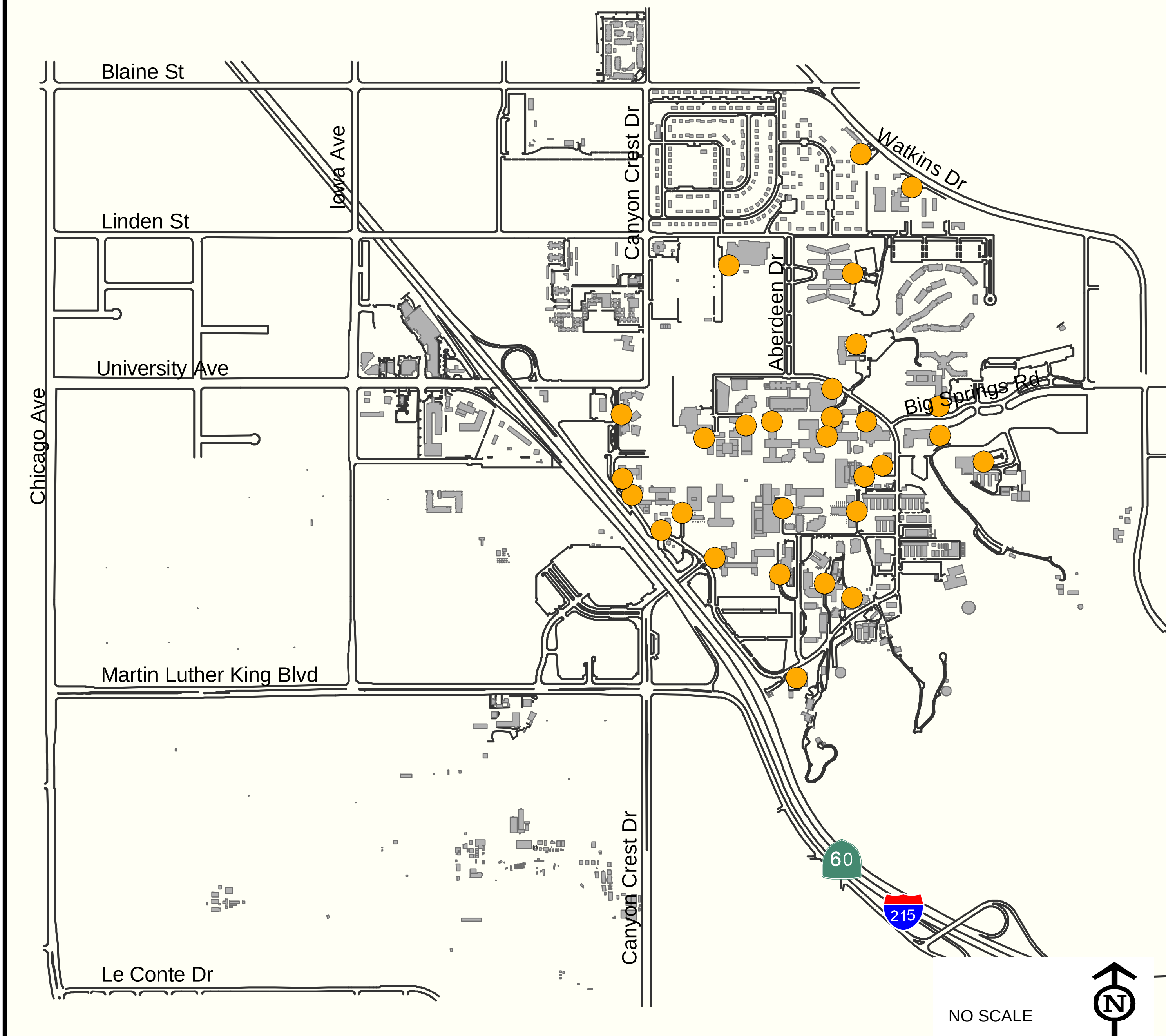
UCR's existing parking system consists of about 27 surface lots located throughout the campus. Figure 2-10 shows the location of UCR's existing parking lots, as well as the number of spaces in each lot. In the 2002-03 school year, these lots provided just over 8,200 spaces[1].

UCR currently uses a tiered parking system. Parking permits are broken down into several categories by cost. The main three categories are Gold, Blue, and Red. Gold permits are valid only in Gold Spaces. Blue permits may be used in either Gold or Blue spaces. Holders of Red Permits may park in Gold, Blue or Red spaces.

Commuting students are eligible for Gold Permits. Gold Permit spaces are generally located in more peripheral parking lots. Students who live on campus may purchase, based upon availability, separate housing permits that allow them to park in lots adjacent to student housing.

Faculty and staff are also eligible to purchase Gold Permits. Based on availability, the university also offers faculty and staff Blue and Red Permits, which allow parking in more proximate, premium lots. Premium permits are reserved for senior administrators at a considerably higher cost. In addition, UCR offers lower parking rates for special

[1] From parking lot inventory provided by TAPS.



Source: CADD drawings provided by UCR Capital and Physical Planning, 2003.

LEGEND

BUILDINGS

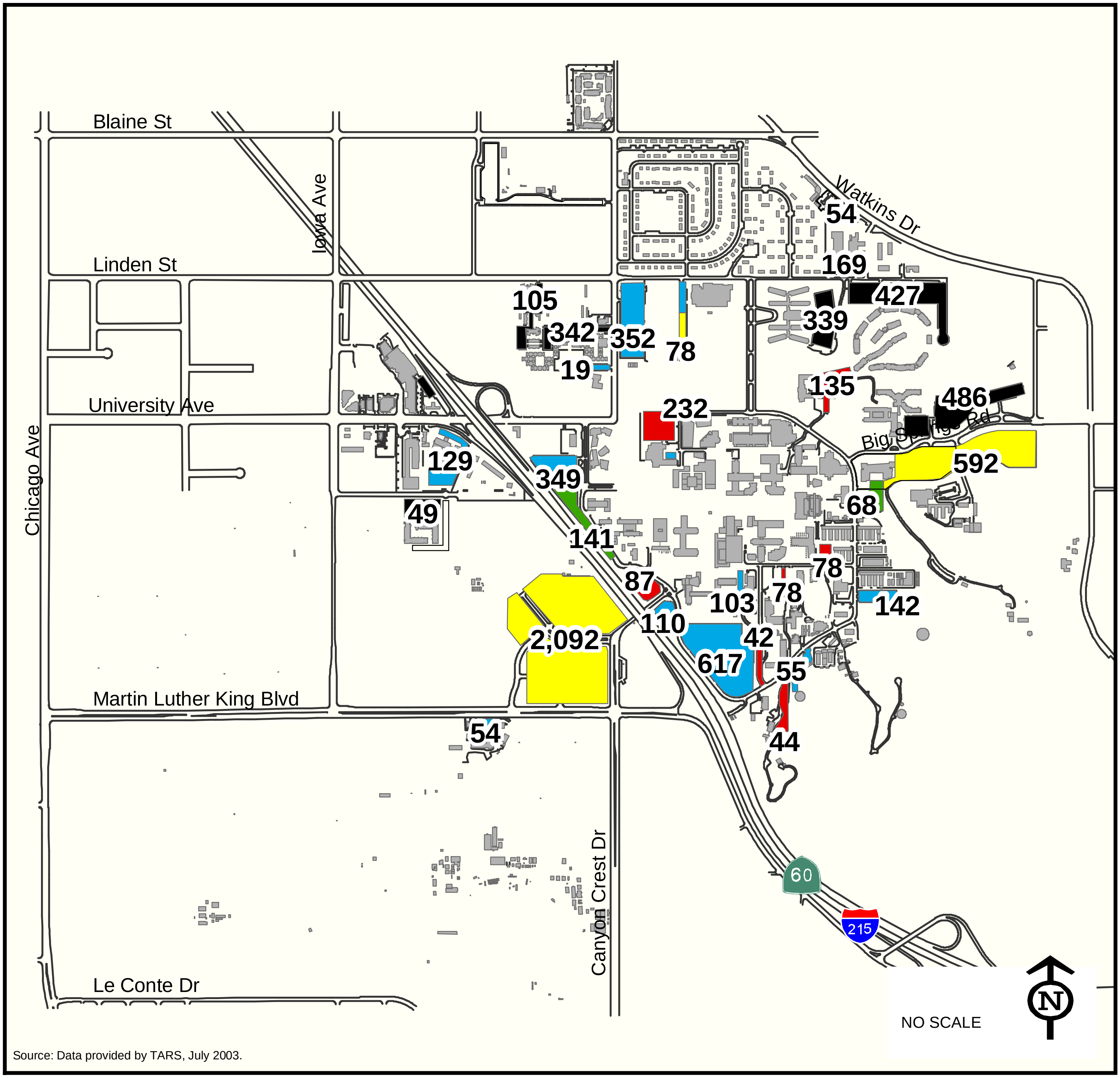
DOCKS AREAS

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-9

Existing Service Roads and Dock Areas



LEGEND

BUILDINGS

PARKING LOTS PER TYPE OF PERMIT

Red Permit

Blue Permit

Gold Permit

Housing

Visitor

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-10

Existing Parking

circumstances. Carpool permits, for example, offer discounted rates. Through night permits, the university also offers lower rates to students, faculty, and staff parking after 4 PM. After this time, the university also opens Blue and Red spaces, as well parking spaces near loading docks, to all permit holders (with the exception of handicapped spaces and spaces with a 24-hour special designation). UCR offers the lowest parking rates of all UC schools in southern California[2]; parking rates are listed in the *UCR Multimodal Transportation Management Strategy Technical Memorandum #1: Existing and Future Conditions* (Appendix A).

2.4.2 Future Parking

The *draft 2004 LRDP* parking strategy focuses on two main issues: providing parking for future demand and determining the location of parking lots/structures. Since the university housing plan seeks to increase the number of students living in university-run housing, the demand for commuter/visitor parking is expected to grow slower than student enrollment. The *draft 2004 LRDP* calls to increase the supply of commuter/visitor parking spaces for from its 2001 stock of about 6,800 spaces to 9,800 spaces by 2015; the *draft 2004 LRDP* projected student enrollment, by comparison, will nearly double.

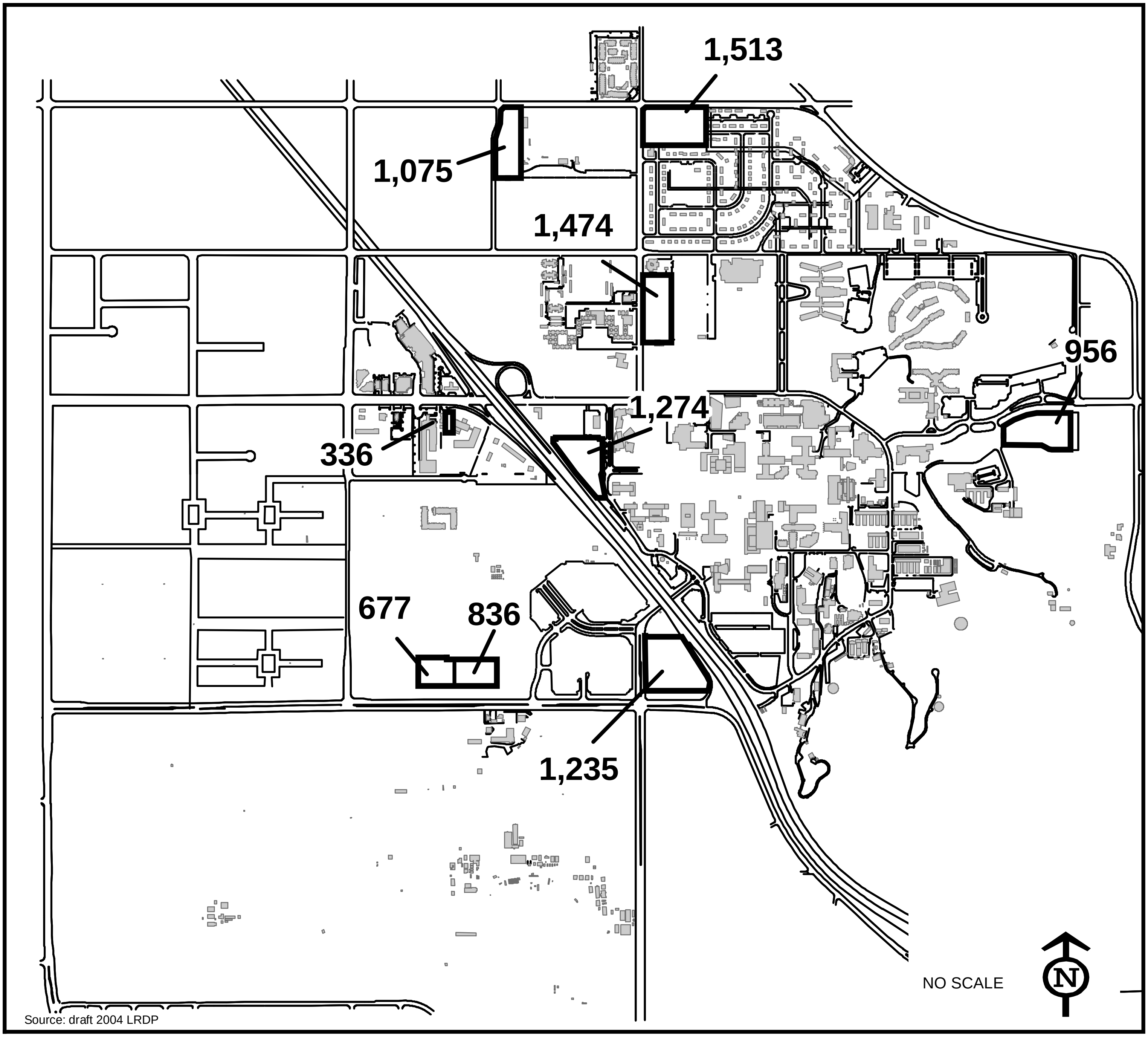
The majority of this parking will be located on the campus periphery. Fitting projected parking demand within this footprint, the *draft 2004 LRDP* states, will necessitate using multi-level structures to accommodate future commuter and visitor parking. Figure 2-11 depicts the location of these new structures and the approximate number of spaces in each. These structures will also provide visitor parking, the majority of which will be located near the campus entrances at University Avenue and at Martin Luther King/Canyon Crest.

Table 2-3: LRDP Parking Plan

Type of Parking	Use	Number of Spaces
Structure	Commuter	8,820
Mix of Structure and Surface Lots	Visitor	980
	Special Permits, disabled, special needs	500
	Campus vehicles/service/delivery	80
	Residents	5,488
	Total	**15,860**

Source: draft 2004 *Long Range Development Plan*

[2] Based on a survey of posted transportation and parking service information provided by UC San Diego, UC Irvine, UCLA, and UCR for the 2003-2004 school year.



LEGEND

BUILDINGS

FUTURE PARKING STRUCTURES FOR COMMUTERS AND VISITORS (Total of 9376)

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-11

Location of Future Parking Structures

In addition, UCR also plans to maintain about 500 spaces (5% of the total parking supply) located inside the academic core. The university will reserve these proximate parking spaces for special permits, disabled drivers, and other special needs. To provide parking for rising numbers of delivery and service vehicles, the *draft 2004 LRDP* calls for doubling the supply of parking spaces adjacent to buildings (for a total of about 80 spaces). Table 2.3 summarizes the numbers of parking spaces – broken down by type of structure and use – envisioned in the *draft 2004 LRDP*.

In addition, the *draft 2004 LRDP* estimates the need to provide a total of 5,488 parking spaces for residents of university-run housing. This parking will consist of a combination of surface lots, structures, and on-street parking near these housing facilities.

The *draft 2004 LRDP* also recommends changing or maintaining certain parking polices to help manage parking demand. This includes continuing the university policy that prohibits the sale of parking permits to students living within three miles of the campus, and replacing UCR's current tiered parking permit system with lot specific permits during peak hours. This latter policy change would discourage people from making cross-campus vehicle trips throughout the day. TAPS currently plans to adopt this policy during the 2004-05 school year.

2.5 Pedestrians

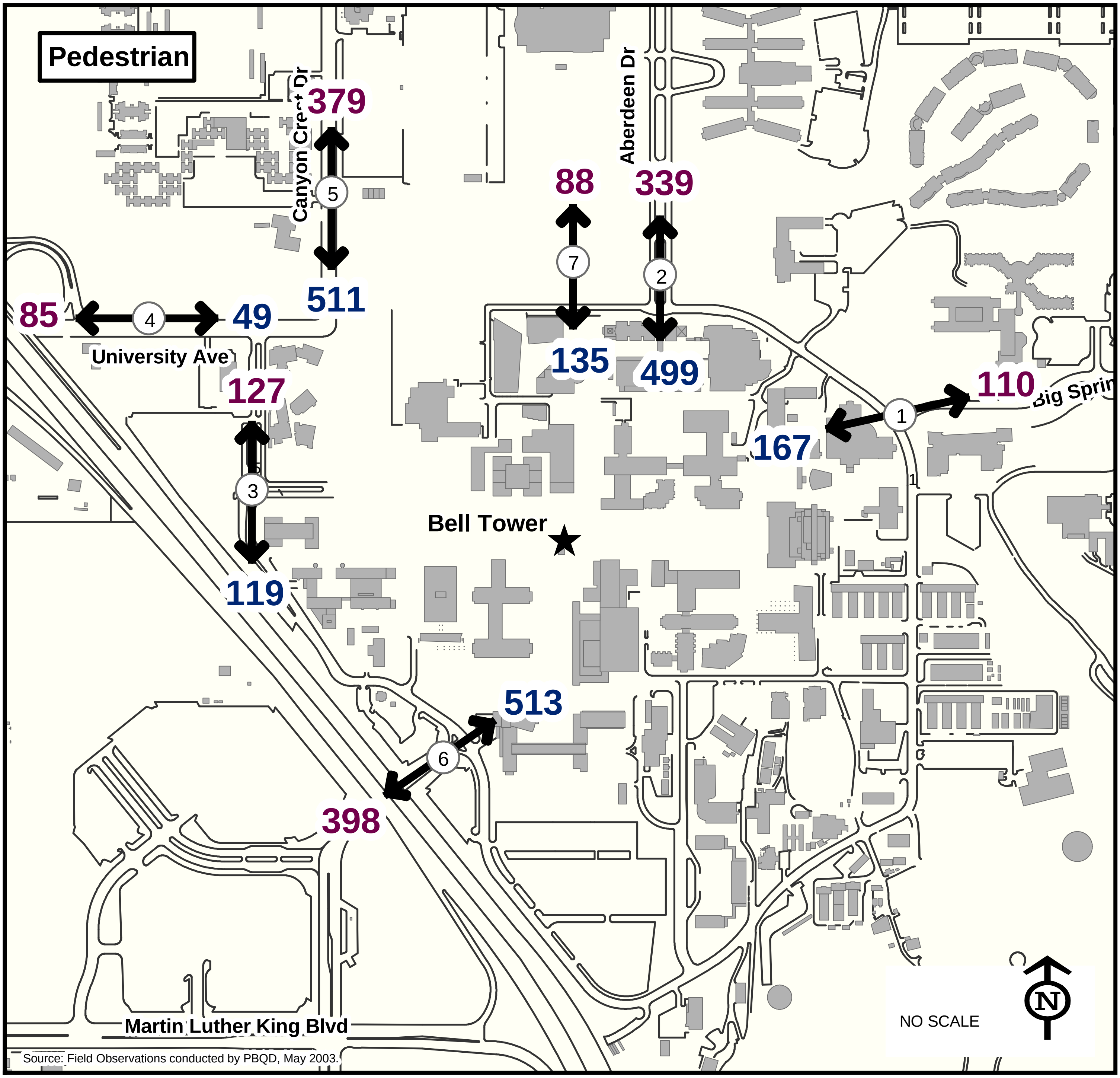
2.5.1 Existing Pedestrian Circulation

Inside the East Campus academic core, a network of pedestrian pathways, malls, and sidewalks provides pedestrians with wide, aesthetically pleasing routes.

In order to travel to and from many destinations outside the academic core, however, pedestrians must often cross city streets or the campus loop road. City streets and the campus loop road separate UCR's academic core from many common generators of pedestrian traffic, such as student housing, parking lots, and transit stops.

Figure 2-12 illustrates some of the major external pedestrian access routes to the campus. The figure also contains peak hour pedestrian counts taken during field observations[3]. Routes linking the campus to parking lots and housing yielded the largest numbers of pedestrians. On the day field counts were taken, the Canyon Crest Boulevard undercrossing experienced the highest volume of pedestrians walking to and from the campus. The sidewalk along Canyon Crest Drive (Point 5) carried the second largest number of pedestrians.

[3] The approaching AM peak hour was identified by determining the 60 minute period between 8:00 – 11:30 AM with highest number of pedestrians walking towards the Bell Tower. The departing AM peak hour was identified as the 60 minute period with the highest number of pedestrians walking away from the Bell Tower.



LEGEND

BUILDINGS

NUMBER OF STUDENTS AT SELECTED LOCATION

Approching (Between 8:30 and 9:30 AM) ← 1 → **Departing** (Between 10:30 and 11:30 AM)

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-12

Pedestrian Movements During AM Peak Hour

The sidewalks along Aberdeen Drive (Point 2) carry similarly high numbers of pedestrians. This walkway provides a path from UCR's residence halls to the campus. The sidewalk also leads the University Lecture Hall and the Surge Building, which contains the Learning Center.

During the period the counts were taken, pedestrian travel in each direction peaked at the beginning of each hour. This reflected students arriving and departing campus throughout the morning at the beginning and ending of classes. This indicates that peak travel occurs throughout the day on campus, not just during traditional peak AM and PM hours.

Poor pedestrian connections between the East and West Campus pose one of the biggest challenges to creating a more pedestrian-friendly campus. In traveling between the East and West Campuses, pedestrians must pass through one of two freeways undercrossings, one at University Avenue and one at Canyon Crest Boulevard (points 4 and 6 respectively on Figure 2-12). At these undercrossings, pedestrians experience narrow sidewalks, frequent high traffic volumes, and (in the case of Canyon Crest Drive) a grade change.

2.5.2 Future Pedestrian Circulation

The *draft 2004 LRDP* predicts that the proposed changes in traffic flow and parking discussed above will create a safer and more accessible campus for pedestrians. Minimizing the level of private vehicles within the inner campus loop, for instance, will reduce conflicts between pedestrians and automobiles. The *draft 2004 LRDP*, however, recognizes the need for continued campus loop road access for emergency, service, and delivery vehicles. One major challenge of the MMTMS study was ensuring access for these vehicles while finding a way to manage conflicts between pedestrians and service and delivery vehicles.

The *draft 2004 LRDP* identifies the need to make walking an attractive alternative to automobile travel, especially as the campus develops. The *draft 2004 LRDP* calls for extending pedestrian malls within the academic core to the north and northeast sections of campus, where new housing and recreational facilities are planned. It also suggests improving the pedestrian facilities at the north end of Canyon Crest Drive by widening the sidewalk, narrowing crosswalks, and providing shade trees.

Other plans include recommendations for providing improved connections between the campus core and new sources of pedestrian travel. *The East Campus Entrance Area Study* recommends a pedestrian bridge spanning the existing athletic fields. *The Strategic Plan for Housing* calls for a pedestrian bridge between the Veitch Student Health Center and the academic core.

These new paths will likely experience high levels of pedestrian traffic. As discussed above, pathways that run between housing areas and the academic core (such as Aberdeen Drive or Canyon Crest Drive north of University Avenue) carry some of the largest volumes of pedestrian trips. As new housing facilities develop north of the campus core, these high volumes of pedestrian travel will increase even further.

The *draft 2004 LRDP* also calls for improved pedestrian connections between East and West Campuses. The planned development of new student residencies and academic facilities will increase the need for safe and convenient pedestrian links between East and West Campus. To create a more pedestrian friendly environment, the *draft 2004 LRDP* proposes extending pedestrian malls to these West Campus residences. Inside these residential areas, the *draft 2004 LRDP* recommends widening sidewalks. To provide for easier pedestrian crossings, the *draft 2004 LRDP* calls for designing a narrow cross-section for Iowa Avenue, a major road running between proposed West Campus housing, and the academic area of the West Campus.

One major component of pedestrian planning for UCR is the disconnect between East and West Campuses, especially on pedestrian pathways bifurcated by the I-215/SR-60. Caltrans currently plans to improve the Canyon Crest undercrossing, one of these paths intersected by the freeway. This project includes widening the undercrossing and providing a raised, separated pedestrian and bicycle path on both sides. At University Avenue, the other major freeway undercrossing between East and West Campus, the *draft 2004 LRDP* recommends providing widened sidewalks, narrowing freeway on-ramps, and eliminating free right turns. Identifying other ways to bridge this disconnect was one of the MMTMS study's primary concerns.

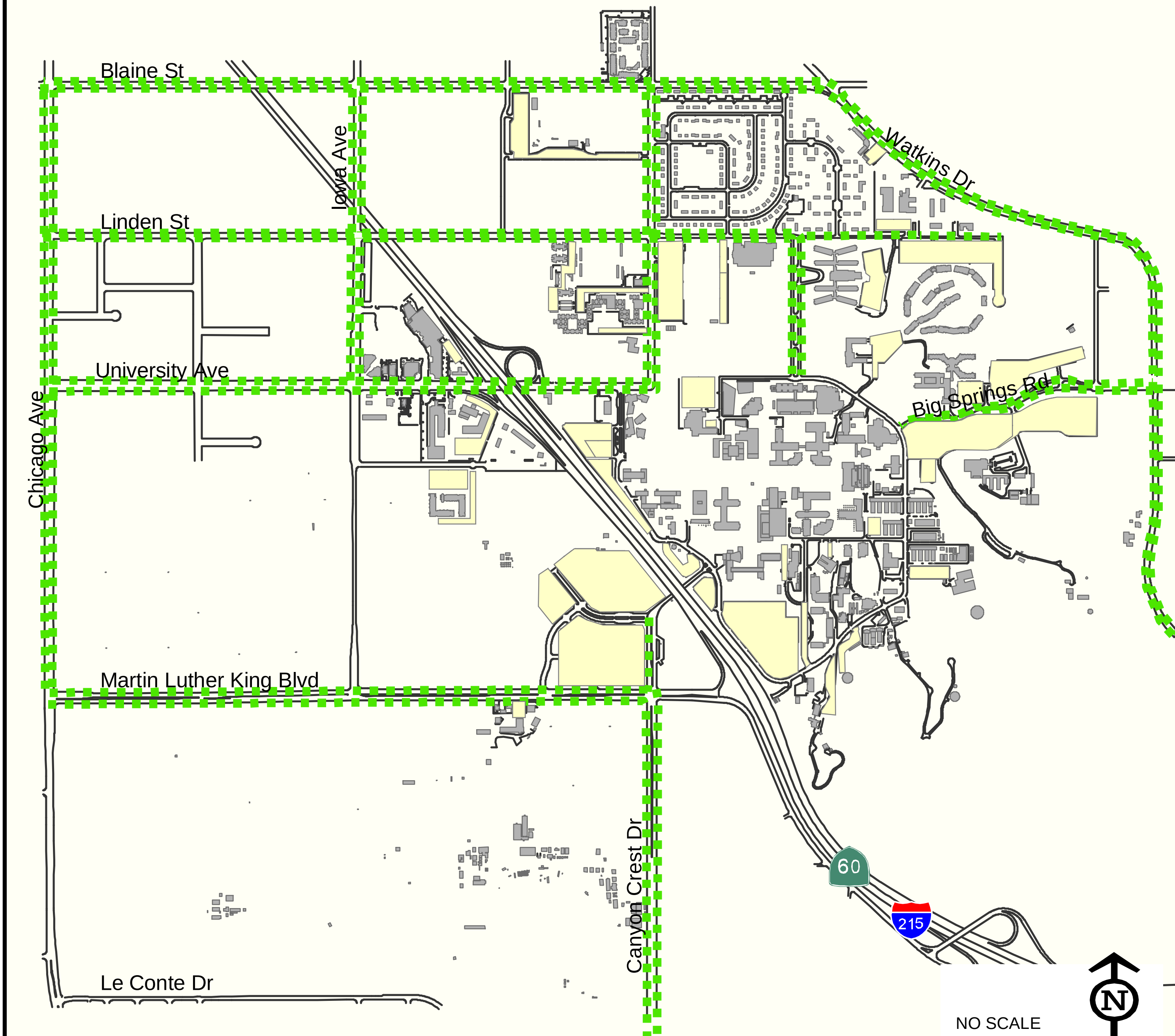
2.6 Bicycles

2.6.1 Existing Bicycle Circulation

The bicycle network in and around UCR consists of a combination of bikes lanes, bike routes, and pathways shared with pedestrians. Most of the city streets surrounding the university provide bike lanes. The inner campus loop road is a designated bike route, but contains no striped bike lanes. Within the campus core, bicyclists are allowed to ride on pedestrian walkways.

Figure 2-13 illustrates the existing network of bike lanes. Most of the arterial and secondary roads leading into the campus contain bike lanes on both sides of the road, with the exception of some sections of Iowa Avenue and the Canyon Crest Drive undercrossing. On the segment of Canyon Crest Drive between West Campus Drive and Martin Luther King Boulevard, bike lanes exist do not exist through the freeway undercrossing but only on the segment south and west of the freeway where Canyon Crest has a wider cross-section.

The *draft 2004 LRDP* notes that the system of bicycles lanes on city streets disintegrates as one enters the campus. The *draft 2004 LRDP* highlights the disconnection between East and West Campuses that the undercrossings create for bicyclists. In addition to the lack of bike lanes at the Canyon Crest Drive undercrossing, bicyclists also must contend with a grade change. While the University Avenue undercrossing does contain bike lanes, these bike lanes are narrow, and the street experiences high traffic volumes.



Source: UCR LRDP EIR Traffic Impact Study Draft Report, August 2003.

LEGEND

BUILDINGS

BICYCLE LANES

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-13

Existing Bicycle Lanes

Bike racks are located throughout the campus. The campus provides a variety of bike rack types, but currently does not offer any bike lockers. Some members of the campus community have indicated that this lack of bike lockers might dissuade some people from bicycling to campus. Showers are available for bicyclists at the Physical Education Building; bicyclists who qualify for the Alternative Transportation (AT) program may use these showers for free.

During field observations conducted in Spring Quarter 2003, routes running between nearby housing and the East Campus experienced the highest number of peak-hour bike trips.[4] As illustrated by Figure 2-14, the north/south route of Aberdeen Drive between North Campus Drive and Linden Street (Point 2 on Figure 2.18) carried approximately 80 bicycle trips approaching the campus core between 8:30 and 9:30 AM, and 30 trips departing the campus core between 10:30 to 11:30 AM. This segment of Aberdeen Drive links the residence halls at the north end of UCR with the East Campus core.

The north/south route on Canyon Crest Drive (Point 5) carried similarly high numbers of bicycle trips: 75 approaching trips between 8:30 and 9:30 AM and 38 departing trips between 10:30 to 11:30 AM. As with the Aberdeen Drive route, this segment of Canyon Crest Drive leads from the edge of the East Campus core to housing (private apartments north and west of UCR).

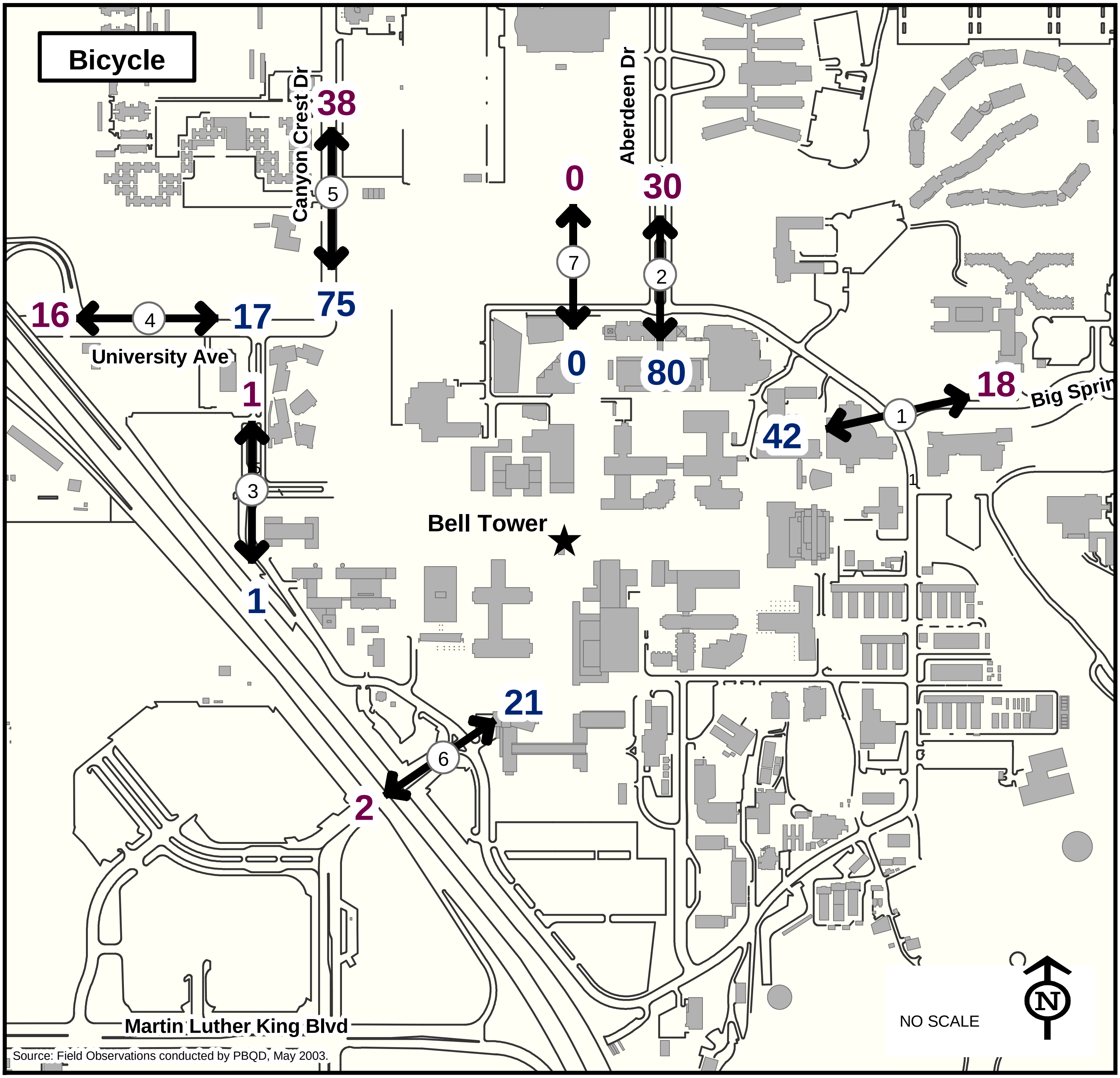
Surveys of bike rack usage – taken at various points within the campus during the same May 2003 field observations – provide some indication of where bicyclists travel once they reach the academic core. Figure 2-15 displays the percentage of rack spaces containing bikes at various locations around the campus. Bike racks for facilities located at the northern perimeter of the academic core were the most highly used. Bike racks outside of the Science Library and the Physics Building were used to capacity.

Ramps located outside the Surge Building and the Science Library might also explain some of the high usage. In both cases, these ramps provide bicyclists with an opportunity to ride into the campus without having to dismount and carry bikes over stairs or curbs. The fact that the East Campus Road experiences a grade change just south of the Science Library might also cause many bicyclists to terminate their trips around the inner campus loop near the Science Library.

2.6.2 Future Bicycle Circulation

Promoting bicycling as an alternative to automobile travel could play an important role in reducing congestion in and around the campus. Many of the goals outlined in the *draft 2004 LRDP* will help to encourage bicycle usage. Changes in the traffic circulation will create greater access for bicyclists. At the same time, the LRDP states, these changes necessitate improvements to the current system. As the university expands

[4] The approaching AM peak hour was identified by determining the 60 minute period between 8:00 – 11:30 AM with highest number of bicyclists riding towards the Bell Tower. The departing AM peak hour was identified as the 60 minute period with the highest number of bicyclists riding away from the Bell Tower.



LEGEND

BUILDINGS

NUMBER OF STUDENTS AT SELECTED LOCATION

Approching (Between 8:30 and 9:30 AM) — 1 — **Departing** (Between 10:30 and 11:30 AM)

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-14

Bicycle Movements During AM Peak Hour

and fewer vehicles are allowed inside the campus, the university must make bicycles a more attractive alternative.

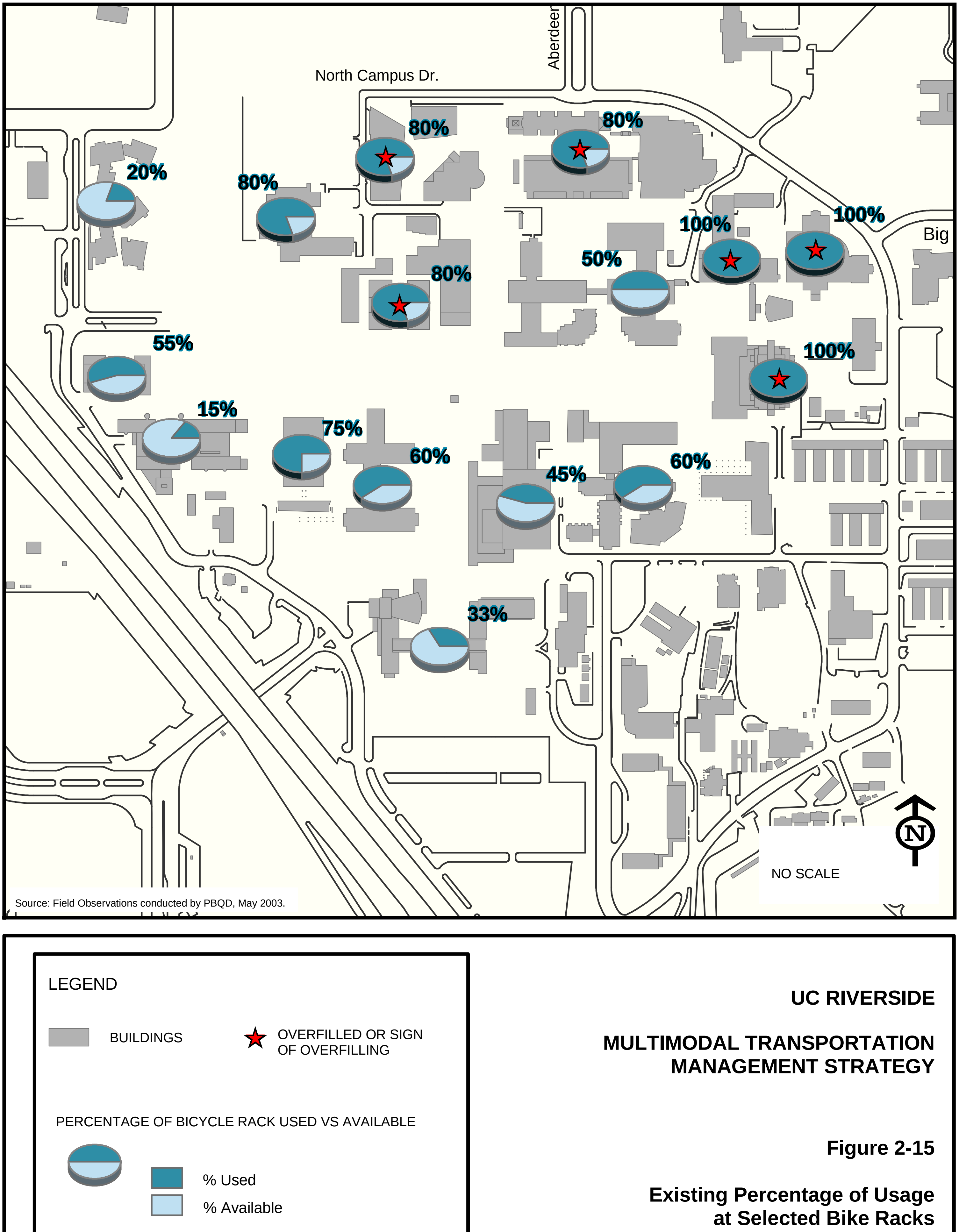
The *draft 2004 LRDP* also recognizes that as bicycling becomes a more popular mode of travel, increased facilities will be required. A rise in the number of student housing units, currently one of the largest generators of bicycle trips, will likely lead to higher bicycle volumes on routes between north campus housing and the academic core.

UCR's student housing plan could also present new challenges. The development of university-controlled housing on the West Campus will likely create more bike trips between the two sides of the campus. These bicyclists will have to deal with the traditional disconnect between East and West Campuses. The bicycle plans outlined in the *draft 2004 LRDP* include a number of measures designed to promote greater connectivity between East and West Campuses. Caltrans improvements to the Martin Luther King Boulevard interchange will take one step toward improving connections between these two areas of campus. As part of this project, Caltrans will create raised bicycle lanes on both sides of Canyon Crest Drive undercrossing, decreasing the grade change bicyclists now experience. The *draft 2004 LRDP* recommends further improving bicycle access by modifying the University Avenue undercrossing to include wider bicycle lanes on each side of the road. The *draft 2004 LRDP* notes, however, that this improvement will require cooperation with Caltrans and the City of Riverside.

The *draft 2004 LRDP* also advocates better connections between UCR's bicycle network and community bicycle facilities. One potential improvement would be to cover the Gage Canal and to use this facility to link UCR with a regional bicycle trail system proposed by the City of Riverside. To better connect the campus bicycle network with the community, the *draft 2004 LRDP* also calls for striping and signing bicycle lanes on all primary roads within the campus.

Increasing the number of bicycle riders will require improvements to the on-campus network as well. Local access roads, according to the *draft 2004 LRDP* bicycle element, should be designed to allow for bicycle use; controlled access routes and service roads, therefore, should remain open to bicyclists. Increased numbers of pedestrians and bicyclists may also necessitate distinguishing between pedestrian and bicycle paths within the inner core of the campus. Although UCR currently allows pedestrians and bicyclists to share paths, conflicts already occur and rising usage could create additional conflicts. The *draft 2004 LRDP* calls for evaluating interactions between pedestrians and bicyclists within the inner campus to determine if future growth will require separate systems. Striping part of the sidewalks for bicycle use is one alternative raised in the *draft 2004 LRDP*. The *draft 2004 LRDP* also discusses the possibility of creating a bicycle dismount zone in certain areas of the campus, such as the Carillon Mall.

Increasing the number of bicycle facilities on campus also plays an important role in the *draft 2004 LRDP* goal to encourage more bicycle usage. The *draft 2004 LRDP* calls for providing ample bicycle facilities near the entrances of frequent campus destinations. In addition to adding more bike racks, the *draft 2004 LRDP* encourages the use of bicycle lockers at these destinations. Bicycle facilities, including lockers, should also be



UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-15

Existing Percentage of Usage at Selected Bike Racks

provided at the major parking facilities, to allow commuters to ride bicycles from peripheral parking into the campus core.

In addition to changes in the bicycle network, the *draft 2004 LRDP* suggests a series of policy changes designed to encourage and support increased bicycle usage. These programs include providing:

- Bicycle clubs,
- Bicycle promotion programs,
- Bicycle rentals and sales,
- Bicycle repair shops,
- Safety seminars, and
- Distribution of information about bicycle retail facilities in the community.

2.7 Transit

2.7.1 Existing Transit

Transit service to UCR consists of a combination of university-run programs and local transit routes. Funded and operated by the Transportation and Parking Services (TAPS) department, UCR provides a variety of transit services for students, faculty and staff. The Riverside Transit Agency (RTA) also runs routes linking UCR with surrounding communities. Table 2.4 summarizes current fares and headway for both campus transit and RTA routes.

Table 2-4: Transit Routes Servicing UCR

Route		Fare/Trip	Monthly Pass	Hours of Operation	Weekday Headway (to and from points at UCR)
RTA	1	$1.00	$34.00*	4:30 AM-10:00 PM	Approx. 20 minutes
	14	$1.00	$34.00*	5:20 AM-8:30 PM	Approx. 65 minutes
	16	$1.00	$34.00*	5:20 AM-10:00 PM	Approx. 30 minutes
Campus Services	Highlander Hauler (Blue Line)	Free (to faculty, students, staff)	N/A	7:00 AM-5:00 PM Mon-Fri.**	Approx. 10 minutes
	Highlander Hauler (Gold Line)	Free (to faculty, students, staff)	N/A	7:00 AM-7:00 PM Mon-Fri.**	Approx. 30 minutes
	Trolley Express	Free (to faculty, students, staff)	N/A	7:00 AM-5:00 PM Mon-Fri.**	Approx. 15 minutes
	Metrolink Shuttle	Free (to faculty and staff)	N/A	7:00 AM-6:00 PM Mon-Fri.	1 morning shuttle (8:00) 6 afternoon shuttles (2-5:30)
	Point-to-Point Shuttle Service	Free (to faculty, students, staff)	N/A	6:20 PM-11:50 PM Mon-Thurs. Mon-Thurs.**	Every 30 minutes from 6:20 PM to 11:50 PM

*Monthly Pass is $17 after UCR ATS subsidy ** UCR shuttles operate only during the academic year

Source: UCR TAPS and RTA websites

University-run transit: UCR provides fixed route shuttle services, flexible evening shuttle services that carry passengers to any point on campus, and shuttles that link the campus with regional transportation.

The three fixed-route shuttle programs – the Highlander Hauler Blue Line, the Highlander Hauler Gold Line, and the Trolley Express – provide frequent service to and from the edge of the academic core and surrounding areas. These routes provide service for residents in private housing adjacent to the campus and university housing. The shuttles also carry students, faculty and staff from the East Campus academic core to facilities on the West Campus, such as lecture halls located in University Village or the UCR Extension Center. Figure 2-16 illustrates these routes.

Other university-run transit provides more specialized services:

The P2P (abbreviation for Point-to-Point) provides evening services from P2P stops to anywhere on campus or to the Highlander Hauler stop closest to a passenger's residence.

UCR also provides shuttle service from the campus to regional transportation facilities. The Metrolink Shuttle runs from the campus to the Downtown Riverside Station. TAPS also offers a shuttle service to four airports in the region: John Wayne Airport in Orange County, Los Angeles International Airport, Ontario Airport, and the San Diego Airport. [5]

Three RTA routes currently provide service to and from UCR. Route 1 runs between Corona and UCR. Route 14 provides service to and from UCR and the western end of the City of Riverside. Route 16 carries passengers from Moreno Valley. These routes are illustrated in Figure 2-17. [6]

2.7.2 Future Transit

As the campus expands, the *draft 2004 LRDP* envisions campus transit playing an important role in the future transportation system. The development of housing and new university facilities west of the freeway will necessitate frequent shuttle services between the East and West Campuses. Peripheral parking will also create a need for efficient shuttle service between structures and locations within the campus.

The *draft 2004 LRDP* recommends the creation of a shuttle system that provides frequent service during peak hours (between 5- to 10-minute headways) and drops passengers off within a 5-minute walk of all campus destinations. To do this, the *draft 2004 LRDP* suggests transitioning from UCR's existing use of buses (e.g. the Highlander Hauler) to more flexible shuttles that carry between 20-30 people.

The expansion of the primary loop and the placement of parking along the campus periphery open opportunities for campus transit to provide this level of service.

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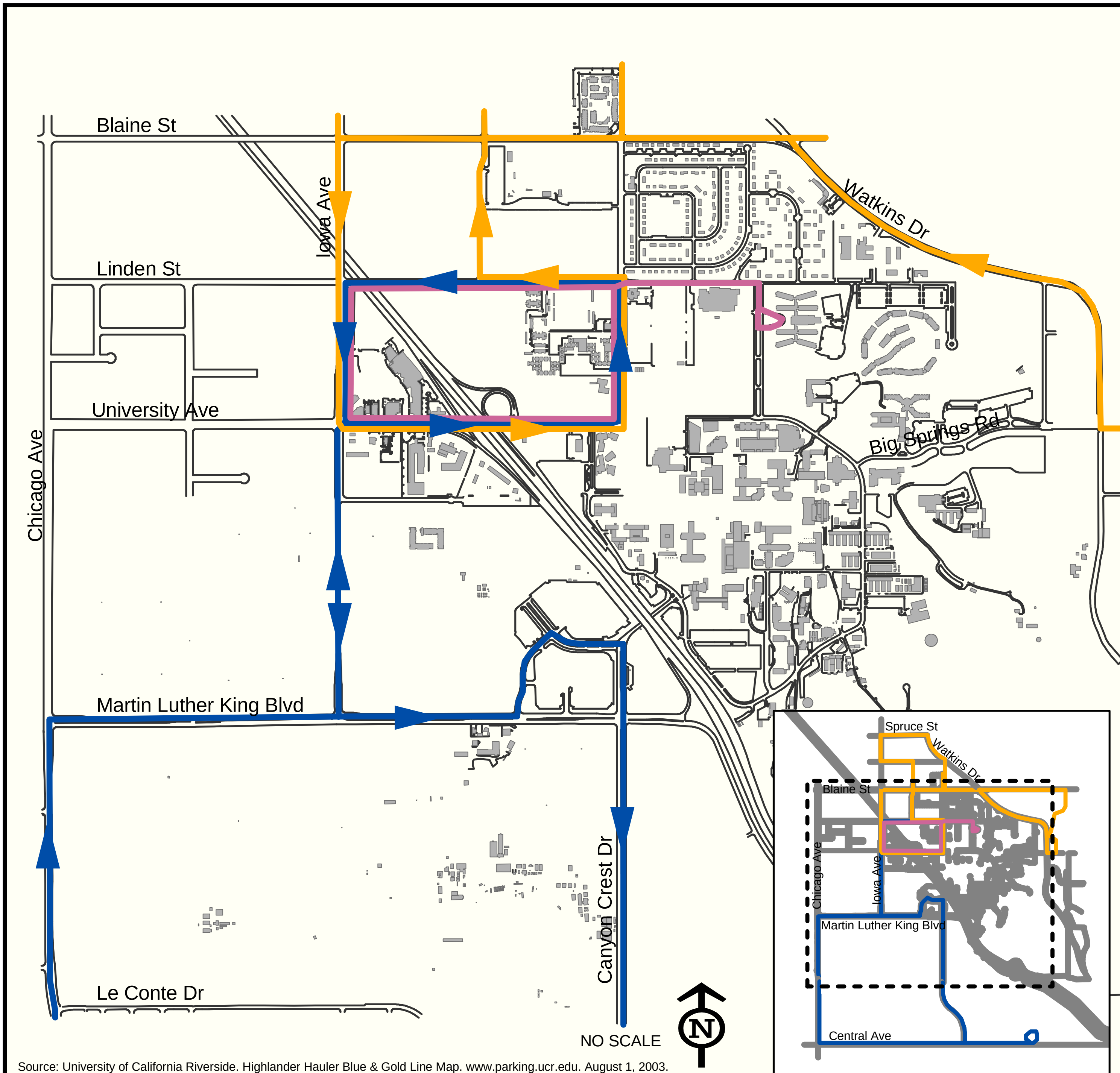
[5] Information on campus transit obtained from UCR TAPS website (http://www.parking.ucr.edu) for the academic year 2003-04.

[6] Information on RTA routes compiled using route schedules and maps obtained from website (http://www.riversidetransit.com/) for 2003.



Source: University of California Riverside. Highlander Hauler Blue & Gold Line Map. www.parking.ucr.edu. August 1, 2003.

LEGEND

BUILDINGS

UCR FIXED ROUTE TRANSIT SERVICE

Highlander Hauler Gold Line

Highlander Hauler Blue Line

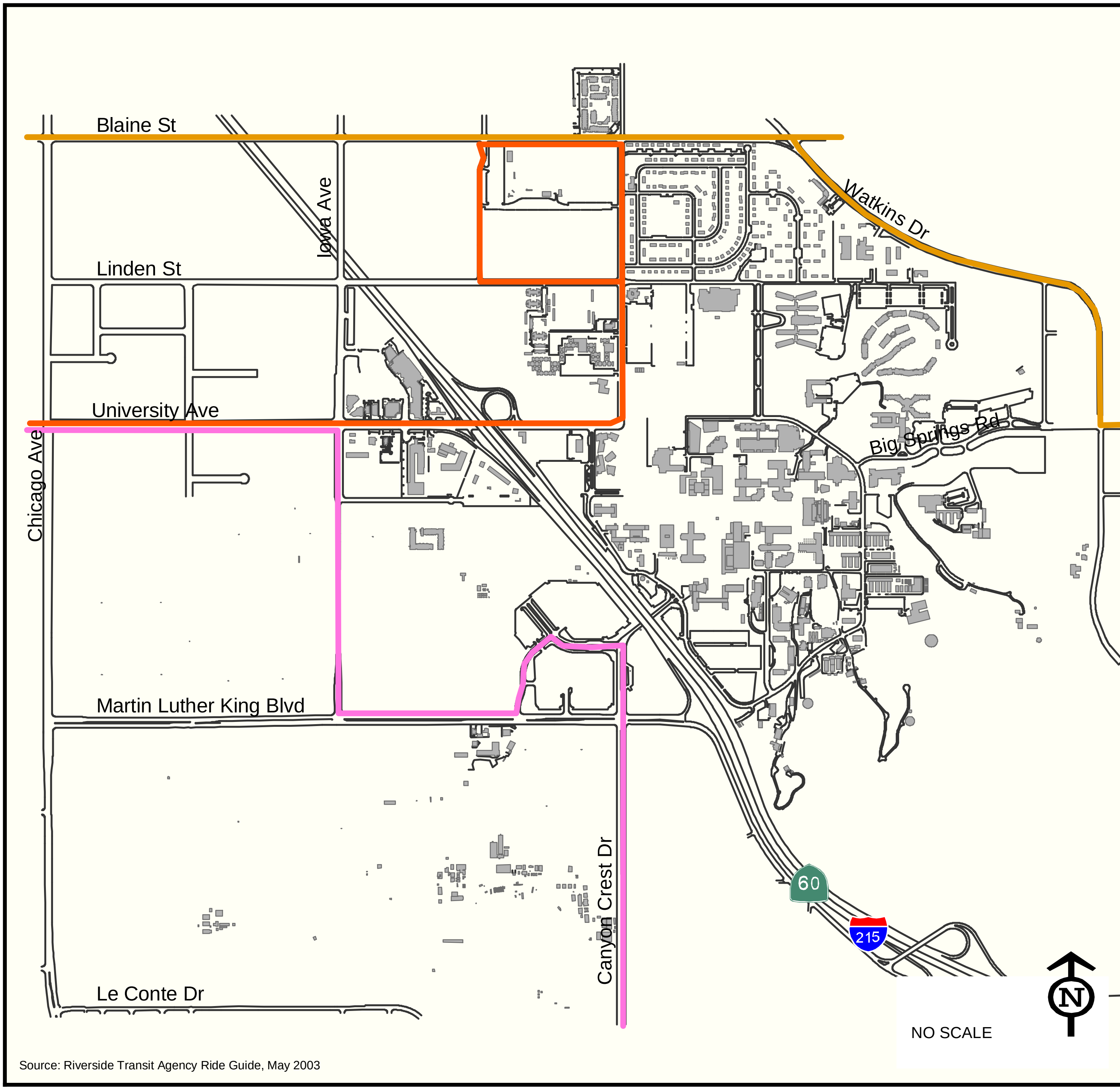
Trolley Express Line

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-16

Existing UCR Fixed Route Transit Service



Source: Riverside Transit Agency Ride Guide, May 2003

LEGEND

BUILDINGS

RTA ROUTE NUMBER

1 UCR/Downtown Terminal to W. Corona Metrolink

14 Blaine & Canyon Crest to Galleria at Tyler - Riverside

16 Main & Russell to March Air Reserve Base

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-17

Existing Local Public Transit

Campus shuttles currently do not enter the campus inner loop. Peak period congestion makes it difficult for campus shuttles to travel through the inner campus loop and still provide efficient service. By redirecting private automobile traffic to the outer loop, the *draft 2004 LRDP* traffic circulation plan opens the inner loop for campus transit.

This vision for improved campus transit also includes linking shuttles with RTA routes at potential transportation hubs located at campus gateways. These links promote transit use for trips between UCR and destinations within Riverside. Better links between campus transit and the RTA, the *draft 2004 LRDP* suggests, also minimizes redundancies between the two systems. Similarly, the planned addition of a Metrolink line connecting downtown Riverside to the City of Perris, with a stop just north of campus (in the vicinity of the intersection of Blaine Street and Watkins Drive), would provide an opportunity to better integrate UCR's transit system with surrounding public transportation systems.

2.8 Other Transportation Systems

2.8.1 Transportation Demand Management

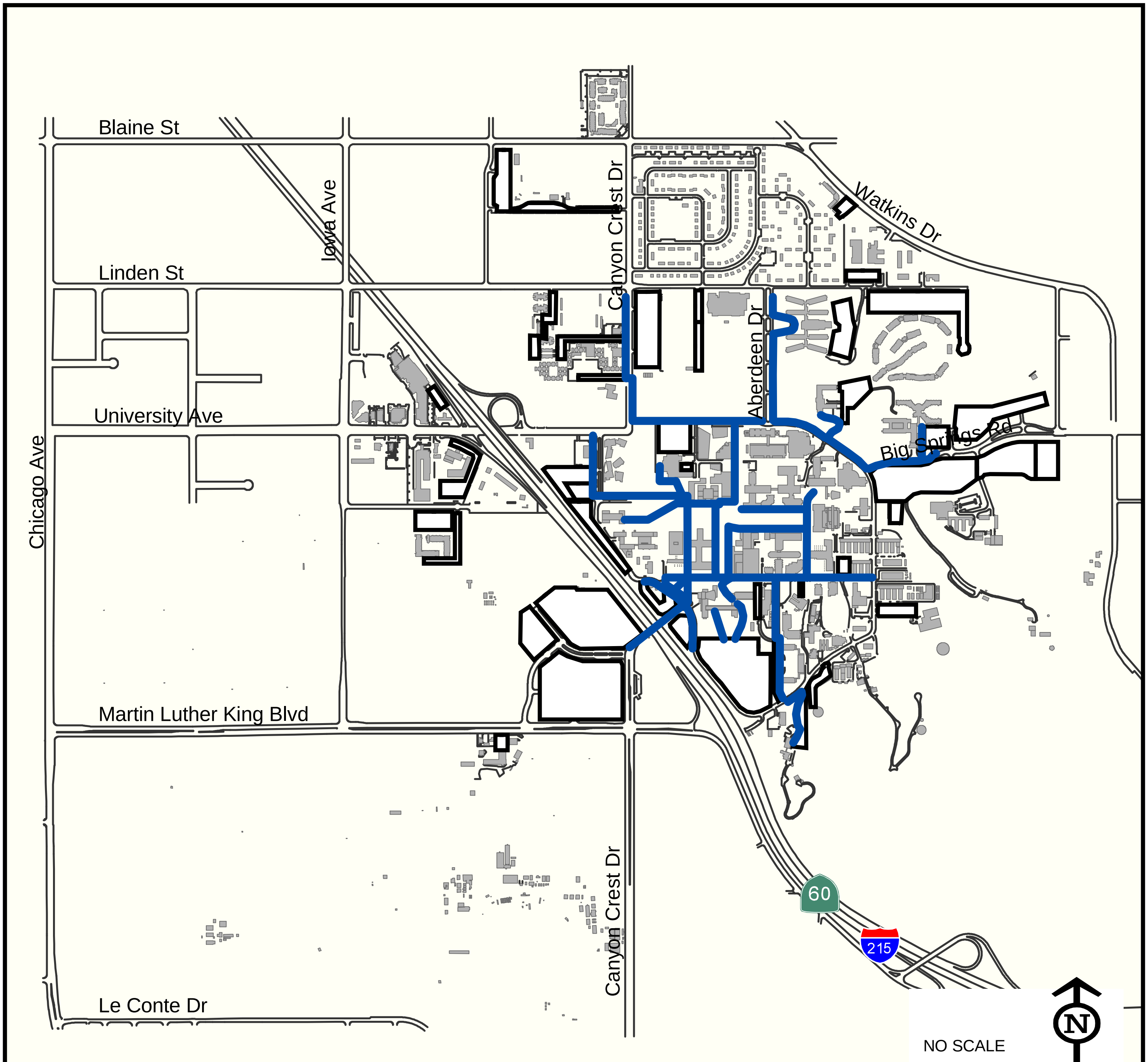
UCR's current Alternative Transportation (AT) program already contains a number of measures designed to reduce automobile use. The program offers both students and employees several alternatives to automobile travel. In addition to the Highlander Hauler and the Metrolink Shuttle (discussed in the previous section), the AT program offers carpool and vanpool programs.

AT provides participants with incentives to use alternate modes of travel. The program provides a specified amount of free parking for eligible AT participants who surrender their parking permits, including, in some cases, those who walk or bike to campus. The program also offers other incentives, such as paying gym fees for shower access for some cyclists or offering "guaranteed ride home" to carpool and vanpool members.

The *draft 2004 LRDP* states that UCR's TDM program must seek to minimize traffic growth in the face of rising employment and student enrollment. Some of the suggestions include managing parking. The *draft 2004 LRDP* suggests implementing a parking pricing system that captures the full cost of parking, and continuing the university policy of denying parking permits to those living within 3 miles of campus. Another *draft 2004 LRDP* measure includes monitoring parking usage to prevent either an over- or undersupply of parking.

2.8.2 Pedestrian Safety Programs

UCR provides a number of services to help ensure safe travel for pedestrian trips across the campus. As described in Section 2.6.1 of this report, TAPS offers a P2P shuttle in the evening. Campus Safety Escort Services provides escorts between 6 PM (8 PM during the Spring Quarter) to Midnight. These escorts accompany pedestrians making trips through the campus. People request a safety escort in the following ways: using one of several phones dispersed throughout the campus, at a dispatch desk in the main library



Source: CADD drawings provided by UCR Capital and Physical Planning, 2003.

LEGEND

- BUILDINGS
- PARKING LOTS
- SAFER WALKWAYS

UC RIVERSIDE

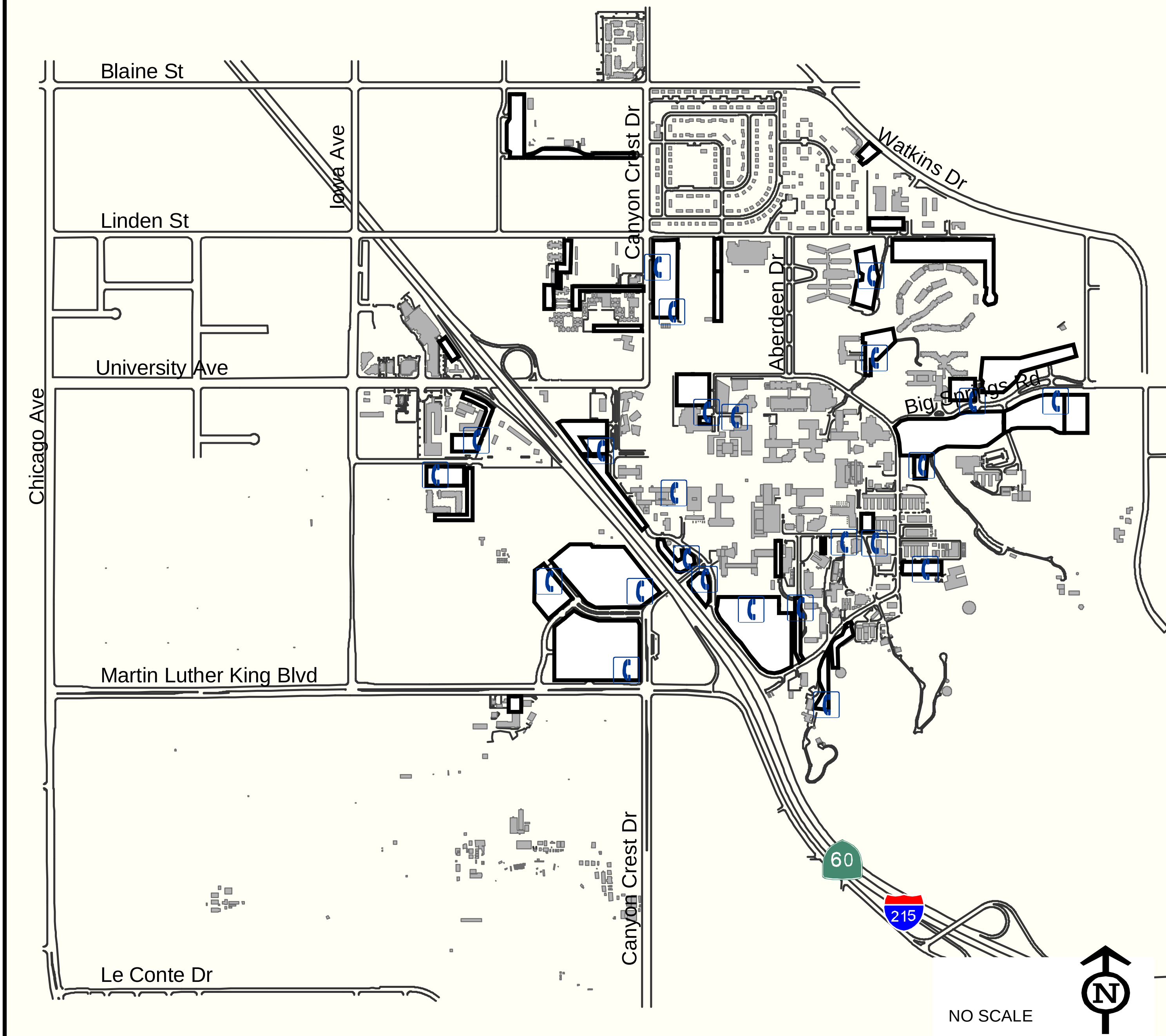
MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-18

Existing Designated Safer Walkways

by making an appointment, or by hailing a safety escort while walking through the campus.

UCR has also created a Safer Walkways Program, which identifies the optimum pedestrian paths on campus, based upon safety considerations such as lighting and visibility. These routes are identified on campus maps; Figure 2-18 illustrates the paths designated as a Safer Walkway. TAPS also installs emergency phones in each parking lot. The locations of these phones are shown on Figure 2-19.



Source: CADD drawings provided by UCR Capital and Physical Planning, 2003.

LEGEND

BUILDINGS

PARKING LOTS

EMERGENCY PHONES

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-19

Emergency Phones on Campus

3.0 ISSUES AND CONSTRAINTS

3.1 Purpose of Issues and Constraints

This section outlines the issues which UCR's Multimodal Transportation Management Strategy (MMTMS) study must address. In addition, this section highlights some opportunities for UCR's transportation system and discusses system constraints that might inhibit the implementation of possible solutions.

The following discussion identifies both existing and future issues. Existing issues include problems UCR's transportation system currently faces. Future issues entail problems the campus transportation network is likely to face in the upcoming decade, based upon factors such as projected growth and UCR's long range plans.

These issues formed the foundation for developing the MMTMS Long Range Strategy. This issues identification served three important functions. Initially, the issues outlined in this document determined what problems the MMTMS needed to solve. Secondly, these issues guided the development of a comprehensive list of possible transportation solutions. Finally, these issues provided a set of criteria with which to evaluate potential solutions for inclusion in the Long Range Strategy.

3.2 Approach Used to Identify Issues and Constraints

The MMTMS study used the following sources to identify both existing and future issues and constraints:

- The *draft 2004 LRDP*
- Planning Committee meetings
- Focus group meetings
- Open Houses
- Field observations
- Other UCR planning documents, such as the *East Campus Entrance Area Plan* and the *Strategic Plan for Housing*

In addition to the technical information summarized in Section 2.0 of this report, the MMTMS study used an iterative approach to help ensure the project developed a comprehensive list of transportation issues. Early in the study, the Project Team used campus input from focus groups, early Planning Committee meetings, and other planning documents to draw up an initial list of UCR's transportation issues. This list also included possible factors that caused or contributed to transportation problems experienced on campus. The Project Team then reviewed this list with the Planning Committee throughout the project for completion and refinement. This continuous review and oversight played a critical role in identifying and prioritizing transportation issues that needed to be addressed.

The Project Team also solicited input from the larger campus community and neighborhoods during Open House sessions. During these community meetings, the Project Team discussed the issues the study had identified so far and received community feedback about further problems with UCR's transportation system.

3.3 Overview of Issues and Constraints

For analytical purposes, the MMTMS study took a systems approach to identify issues and constraints; it examined concerns facing the individual systems that make up UCR's overall transportation system. It is important to keep in mind the entire trip; for example, a bicyclist needs not only a safe route, but also support facilities such as bike racks or lockers.

Due to the interaction between transportation systems at UCR, however, problems with one system often overlap with another system. Some issues span all modes of travel; for example, the need for marketing, policy changes, or consumer education programs could apply to all campus transportation systems.

Although the MMTMS study identified a number of different problems affecting UCR's existing and future transportation systems (see Appendix C for issues), most of the issues fell into one of four general categories based on recurring themes.

Conflict Points/Congestion: Conflict points are areas where different modes of travel conflict. The most common conflict points occur where non-motorized travel crosses paths with automobile travel. Examples include areas on the campus loop road where continuous pedestrian crossings interrupt the flow of automobiles. Conflict points create travel delays, traffic congestion, and increase safety risks. A lack of traffic controls and poorly defined transportation system hierarchies are the main causes of conflict points.

System Gaps: Providing travelers with multi-modal travel options over the course of an entire trip, from origin to destination, is a key component to promoting alternatives to automobile travel. Automobiles often can convey travelers all the way from the beginning of a trip to their final destination. To coax people out of cars, alternative modes of travel must provide the same convenience. In many cases, however, gaps in UCR's current transportation system prevent travelers from conveniently traveling between two points using non-motorized travel modes.

Disconnect Between East and West Campuses: The I-215/SR-60 freeway is a barrier that divides the campus. This makes pedestrian and bicycle travel between the two campuses inconvenient and, in some cases, unpleasant. This disconnection will become even more pronounced as UCR develops housing and academic uses in the largely undeveloped West Campus.

Costs: UCR's transition from surface lots to parking structures, outlined in the *draft 2004 LRDP*, will significantly increase costs for Transportation and Parking Surfaces (TAPS). Currently, TAPS revenues fund parking lot construction, maintenance, and upkeep and alternative transportation programs. Increased costs incurred through the construction and upkeep of parking structures, however, might require developing alternative funding sources for other programs currently funded through TAPS revenue.

The following discussion presents the key issues identified for each component of the campus transportation system. Each issue is identified, followed by a discussion which describes the issue. It is important to note that the issue discussion is organized by mode, so some issues appear in more than one section, while others are specific to a particular travel mode and not others.

3.4 Automobile Circulation – Commuters

3.4.1 Conflict points/Congestion

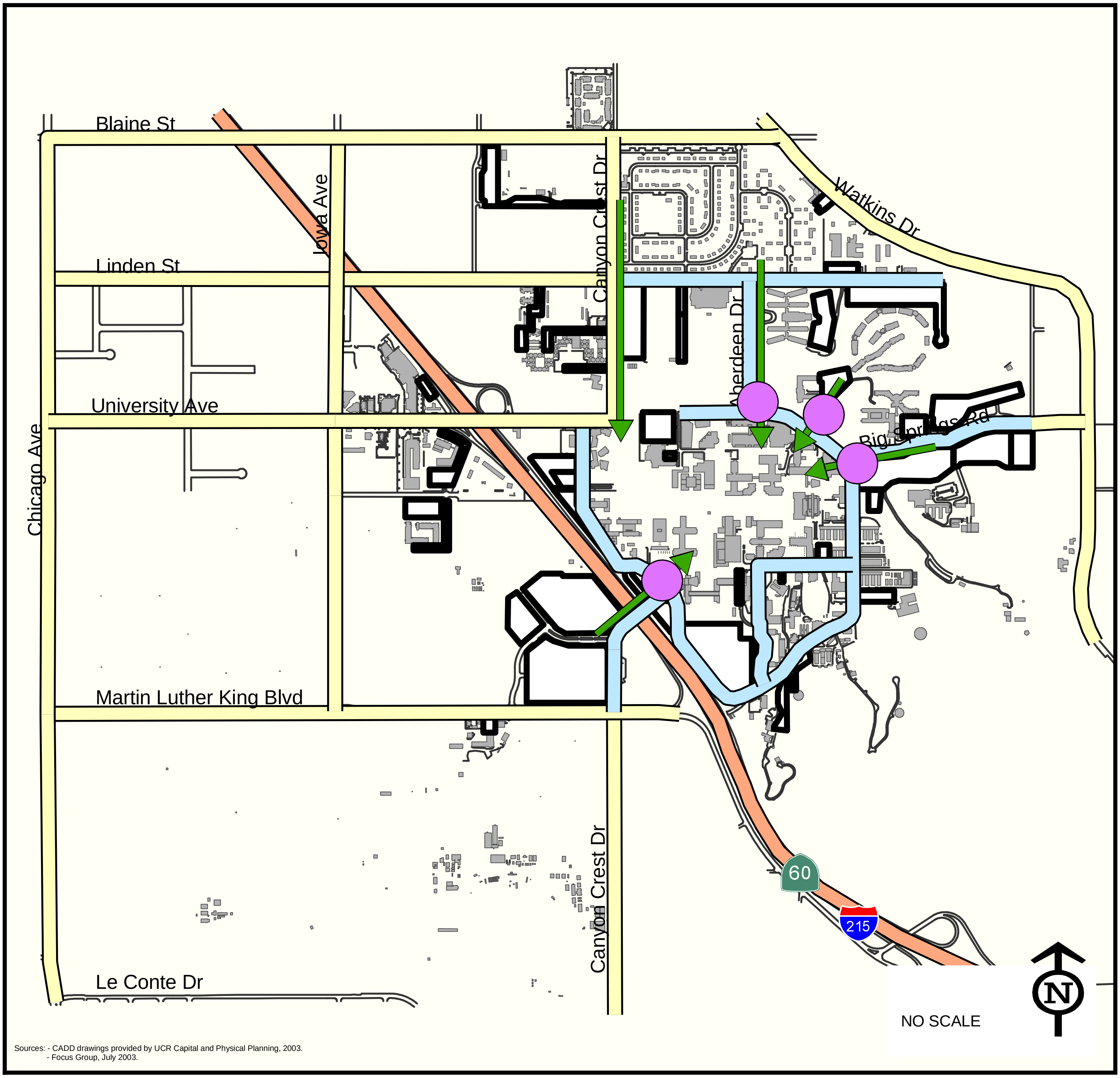
<u>Issue: On campus roadways, pedestrians and bicyclists conflict with vehicles during peak travel times throughout the day.</u>

Like many other travel destinations, UCR experiences peak travel periods in the morning (8:00 a.m.), midday (12:00 p.m.), and evening (5:00 p.m.). Large number of students, faculty, and staff often arrive on campus at the beginning of the workday, make some kind of trip at lunch, and leave campus at workday's end. The unique nature of a university, however, also creates several additional peaks throughout the day. When school is in session, classes begin and end every hour (or every one and a half hours), generating additional peak travel periods throughout the day.

During these peak travel times, different travel modes converge along common routes, creating multiple points of conflict. At the intersections of arterial streets, automobiles conflict with travelers walking or bicycling to the university. Conflicts are especially pronounced on the low-capacity, two-lane inner campus loop, where surrounding land uses draw a mix of travel modes. Proximate parking lots along the inner campus loop attract automobile traffic. At the same time, the inner campus loop used for automobile circulation lies in between UCR's academic core and three large sources of pedestrian and bicycle traffic: 1) remote parking lots; 2) campus transit; and 3) student housing. Automobile traffic develops lengthy queues in areas where large numbers of pedestrians and bicyclists cross the inner campus loop to travel to and from the academic core.

These conflicts are especially a problem at the intersection of Canyon Crest Drive and West Campus Drive. Pedestrian and automobile conflicts also create frequent travel delays and safety risks along North Campus Drive, between Big Springs Road and Aberdeen Drive.

Figure 3-1 illustrates where the some of the major flows of pedestrian and bicycle traffic intersect with campus roads and create conflicts points.



LEGEND

BUILDINGS
PARKING LOTS
CONFLICT POINTS

TRAVEL FLOWS
Non-Motorized Flow
Freeway
City Arterials
On-Campus Roads

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 3-1

Major Motorized and Non-Motorized Travel Flows and Conflict Points

Issue: Future land use patterns will intensify (or in some cases change) existing conflicts.

Housing to the north and northwest of the academic core generates large numbers of bicycle and pedestrian trips that cross city streets or the inner campus loop road. These trips will increase as the numbers of students living in these housing areas grows over the next decade. New housing units planned for development in West Campus will also generate more pedestrian traffic at the West Campus Drive/Canyon Crest Drive intersection as these new residents travel into the East Campus academic core.

Peripheral parking lots will also produce pedestrian trips across the inner campus loop and across some arterial streets. The *draft 2004 LRDP* parking plan includes moving parking to the periphery of campus. This change will lead to more pedestrians (and possibly bicyclists) crossing the same streets vehicles currently use to travel within the campus.

Each of these situations will likely intensify conflicts between vehicles traveling through the campus and pedestrians crossing campus roads. In some cases, these land use shifts will also create new modal conflict points on campus. Future automobile and pedestrian systems will have to provide a way to separate automobile and pedestrian travel along future and existing conflict point hot spots.

Issue: Regional and local traffic contributes to congestion on many of the roads surrounding the university.

During peak hour commute periods, travelers bound for UCR often encounter local traffic. Many of the city streets leading to UCR draw large volumes of non-university related trips. Major arterial streets like Blaine Street, University Avenue and Martin Luther King Boulevard fill with traffic traveling from the I-215/SR-60 to locations on either side of the freeway. These same streets are also used to travel from housing and industrial uses east and north of the campus to areas in western and southern Riverside. Many freeway travelers use major east/west arterials like Martin Luther King Boulevard or University Avenue to travel between the I-215 and the SR-91, thereby avoiding the crowded SR-60/SR-91/I-215 interchange north of the campus.

According to forecasts conducted for the *draft 2004 LRDP*, discussed in Section 2.2.2, these traffic levels in and around UCR will increase.

Issue: Frequent passenger drop-offs and pick-ups cause congestion along the inner campus loop.

Currently, UCR has only one designated drop-off and pick-up point, located across from the information kiosk on West Campus Drive. To deliver passengers to other areas of the campus, drivers often stop along the campus loop road, or in areas such as parking lots or loading docks. Since the inner campus loop is a two-lane road, these stops halt all traffic behind the drop-off. Drivers use these informal drop-off and pick-up locations to get passengers as close to the campus core as possible.

These passenger pick-up and drop-offs conflict with travelers trying to drive reach various destinations along the campus loop road. By drawing more traffic into the loop road, these pick-up and drop-offs also contribute to congestion on campus roads.

Drop-offs in dock spaces also cause problems as stopped vehicles block narrow parking lots or dock entrances. Subsequent blockages can compound into vehicle queues that spill out into the inner campus road. Cars exiting these informal drop-off points also conflict with vehicles trying to enter parking lots or docks.

<u>Issue: The current use of the West Campus Drive information kiosk as the primary source of visitor information contributes to traffic congestion on campus.</u>

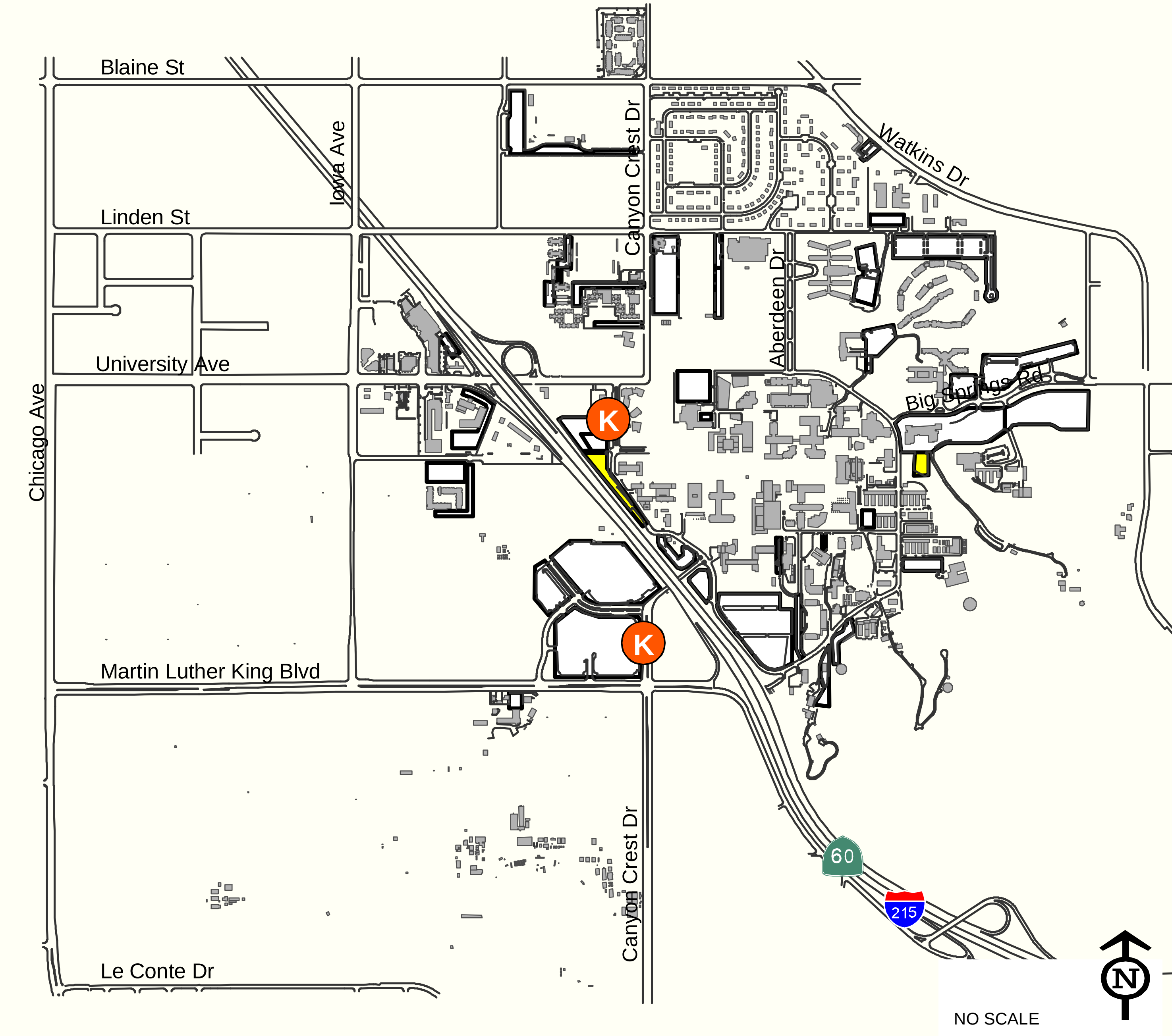
The information kiosk on West Campus Drive lies in close proximity to University Avenue, a major arterial. Figure 3-2 shows the current location of information kiosks and visitor parking on campus. When the information kiosk turnout exceeds capacity (approximately 3-4 vehicles) traffic backs up into the outside southbound lane of West Campus Drive. If this vehicle queue builds up, it can spill over into University Avenue.

The kiosk draws visitors into the campus loop at a point that is often distant from their final destination. In addition, the main information kiosk near University Avenue is located a significant distance from where visitors commonly park. This often draws visitors into the campus and then forces them to drive inside the inner loop to reach their eventual destination. Visitors, for instance, are often directed to parking at Lot 30. Ideally, the most efficient route to Lot 30 for visitors coming from the west is the I-215/Martin Luther King Boulevard off-ramp to Canyon Crest Drive. Visitors using the information kiosk on West Campus Drive at University Avenue, however, must drive through the campus to West Campus Drive and turn right at the frequently congested intersection at the Canyon Crest Drive underpass in order to access Lot 30.

<u>Issue: Moving traffic to the outer loop will require access control methods and a carefully phased implementation.</u>

Access controls must be used until land use changes shift travel behavior. To minimize automobile and non-vehicular conflicts inside the campus, the *draft 2004 LRDP* proposes expanding the primary circulation loop to the perimeter of the campus (discussed in the previous section). The *draft 2004 LRDP* anticipates that changing land use patterns will play a large role establishing this circulation pattern. Plans to create more peripheral parking will remove much of the need for automobiles within the campus loop road. These land use changes, however, will likely be incremental. In the meantime, increasing traffic may surpass the capacity of the inner campus loop before land use patterns can effectively shift travel demand to the periphery of the campus. Future system options should, therefore, include a combination of new access controls and wayfinding systems. These access controls should be phased in as new land uses are developed.

Even as some travel demand moves to the perimeter of campus, the proximity offered by the inner loop could continue to attract private vehicles. Commuters might still try to



Source: CADD drawings provided by UCR Capital and Physical Planning, 2003.

LEGEND

BUILDINGS

PARKINGS LOTS

VISITOR PARKING LOTS

CURRENT INFORMATION KIOSKS

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 3-2

Informaiton Kiosks and Parking at UCR

use the loop, for instance, to drop off passengers. Visitors, unaware that the inner campus loop will offer little parking, might instinctively enter the local road when traveling to campus. To successfully shift the primary campus loop outward, UCR must change travel behavior. Access controls and new wayfinding systems would help develop these new travel habits.

3.5 Service, Emergency, and Delivery Vehicles

3.5.1 Conflict Points/Congestion

<u>Issue: The inner campus loop, upon which service, emergency, and delivery vehicles rely, experiences frequent congestion.</u>

Congestion during peak travel times affects emergency response time or delays deliveries. Service, emergency, and delivery vehicles require both proximate and timely access to campus facilities. Campus service roads and loading and unloading facilities are the main source of this immediate access. To reach these service roads and docks, these vehicles rely upon the inner campus loop.

Any congestion along the inner campus loop, therefore, impedes these vehicles' ability to provide critical services. In traveling to campus destinations, service, emergency, and delivery vehicles must often face the same sources of congestion faced by automobiles. Peak period congestion can slow emergency response times or delay the delivery of important materials. Informal drop-offs and unlawful vehicle stops along the inner campus road halt delivery and service activities. Private automobiles shuttling between parking lots also increase travel times for these special vehicles.

Pedestrian streams also often delay delivery vehicles. Delivery and service vehicles are also susceptible to delay by the same uninterrupted streams of pedestrian travel as automobiles. Focus groups meetings with deliverers and vendors identified conflicts with pedestrians as one of the major sources of travel delay, and because of delays, vendors are becoming less willing to provide delivery services to individual buildings on campus.

<u>Issue: Service, delivery, and emergency vehicles will experience increasing levels of private vehicle traffic and conflict points.</u>

Forecasts predict increased travel on arterials surrounding UCR. According to the *draft 2004 LRDP*, vendor and delivery vehicles will continue to use the primary loop when entering and leaving the campus. In traveling along these routes, future service vehicles will experience heavier volumes of both university and non-university related traffic.

Higher volumes of pedestrian and bicycle travel along the inner campus loop will increase conflict points for service, emergency, and delivery vehicles. Once inside the inner campus loop, emergency and service vehicles will experience numerous points of conflict with non-motorized traffic. As previously discussed, inner campus roads will likely experience larger volumes of pedestrian and bicycle crossings.

In the future, service, emergency, and delivery vehicles will continue to rely upon the inner loop road to reach buildings or to access loading docks. Even with the successful implementation of the LRDP circulation goals, service, delivery, and emergency vehicles could still face delays resulting from peak pedestrian traffic.

Issue: The use of loading docks for multiple activities ties up docks.

A variety of uses not related to service or delivery activities often block or inhibit dock access. Service roads leading into the loading and unloading facilities provide some of the only vehicle access into the inner core. Automobiles often use these roads to drop off passengers next to the campus core. Informal passenger drop-off can block dock spaces or cause conflict points along narrow service roads. The Commons and Bookstore dock areas provide one example of this problem. The service road leading up to these dock facilities allows for passenger drop-offs directly into the Common area, a popular travel destination on campus.

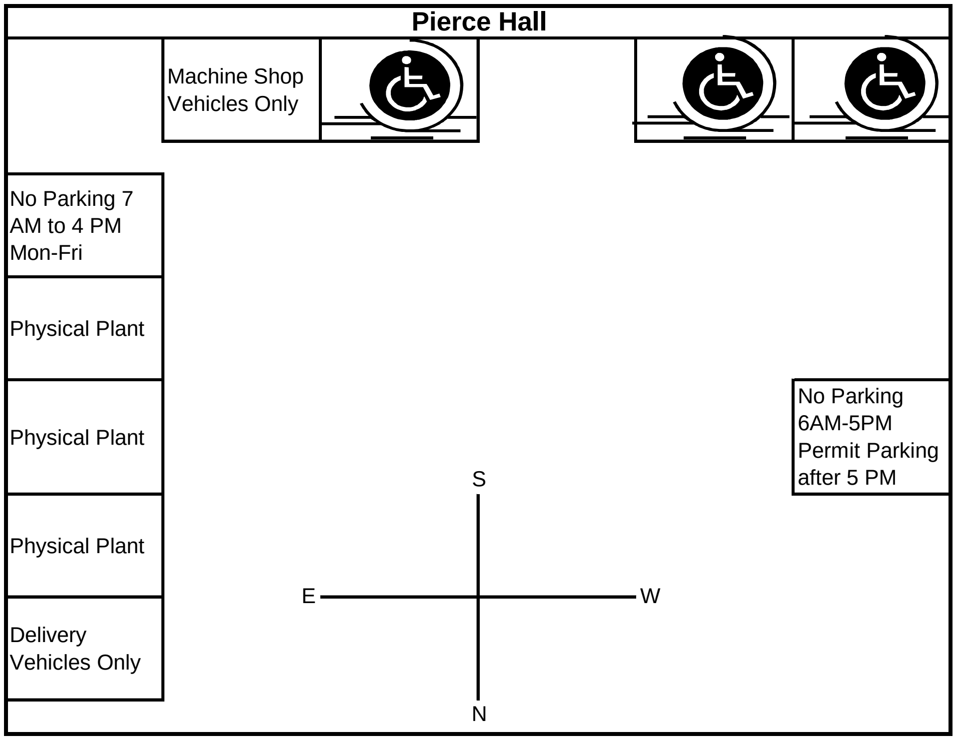
In yet another example, the Geology dock is frequently used for informal drop-offs because it also provides quick access to the academic core, via a small walkway leading from the Geology dock into the north end of the campus core. This walkway both allows drop-offs to enter the campus between the Physics and the Geology Buildings and also allows bicyclists and pedestrians to walk or ride through the service road down into North Campus Drive. This convergence of pedestrians, bicycles, automobiles and service vehicles within this service area creates both congestion and safety hazards.

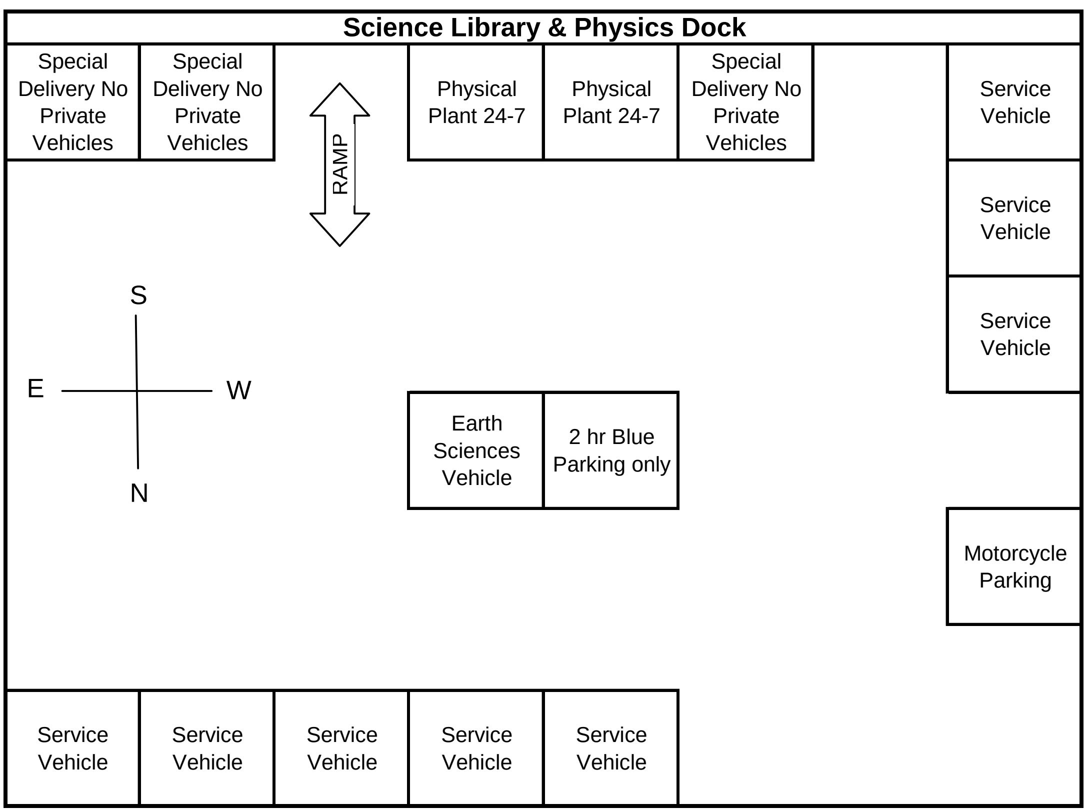
In some cases, dock spaces are used for the long-term parking of personal cars or department service vehicles, or to store equipment. The provision of parking spaces at loading and unloading facilities consumes the dock space available for loading and unloading activities. Dock space is also often used for non-vehicles. Storage bins, dumpsters and large equipment take up space within some loading and unloading areas.

Dock spaces are also often used for handicapped parking, as docks provide some of the closest vehicle access to the inner campus.

Figure 3-3 illustrates some examples of the multiple uses that occur at UCR unloading facilities.

Figure 3-3: Example of Multiple Uses Within Unloading Docks





3.6 Parking

3.6.1 Conflict Points/Congestion

<u>Issue: The current parking system generates trips within the inner core.</u>

UCR's interior parking lots draw traffic into the campus inner loop. Commuters who park in some of the most proximate parking lots, such as Lots 5, 6, 11, or 12, must drive through the inner campus loop in order to reach the lot's entrance. These interior lots indirectly generate traffic. Due to UCR's tiered parking permit system, many permit holders have multiple parking options within the inner core. This encourages commuters to drive around the loop in search of the closest parking, rather than take the most direct route to a particular lot.

Lot 6 provides an example of how interior parking lots can indirectly generate traffic. Commuters seeking a space in Lot 6 often enter the campus at the Canyon Crest Drive gateway. If Lot 6 is full, these commuters frequently will drive to Lot 13, a larger facility. The optimum route to Lot 13 is via the higher capacity Big Springs Road from Watkins Drive. Since their search for a space in Lot 6 has already drawn them into the inner campus loop, however, many commuters will continue driving along South and East Campus Drive to reach Lot 13.

UCR's current parking policy may also motivate students and employees to shuttle their cars around campus, increasing congestion on the inner campus loop. UCR's tiered parking policy is only in effect between 7:00 a.m. and 4:00 p.m. Outside this time, permit holders may park in any space, with two exceptions: spaces marked as 24-hour restricted use and handicapped spaces. This allows holders of Gold permits to move their cars into more proximate parking – such as Blue, Red and dock spaces – after 4:00 p.m. These trips can exacerbate p.m. peak traffic as vehicles patrolling for proximate parking spaces conflict with employees leaving parking lots at the end of the workday.

As discussed earlier, the existence of parking lots within the inner core encourages unofficial drop-offs. These drop-offs create conflicts along the inner campus loop and contribute to congestion on campus roads.

<u>Issue: Visitors often use the same network and parking spaces as daily commuters; this sharing of facilities can hinder the efficiency of visitor travel.</u>

Compared to everyday commuters, visitors have different travel needs and exhibit different travel behaviors. These needs and behaviors can often create conflicts and delays. Commuters, for instance, rely upon quick, efficient travel along familiar routes. Visitors, unfamiliar with the campus, may need to travel more slowly or stop while driving through campus in order to find particular destinations. Ideally, a transportation network would try to segregate these two types of travel as much as possible. In many cases, however, travelers and commuters at UCR share facilities.

The most common path for visitors is to enter the campus at University Avenue, UCR's ceremonial entrance, and then turn onto West Campus Drive to reach the information kiosk. During peak period travel times, this path deposits visitors into the congestion created by both university and non-university commuters along major arterials such as University Avenue.

Visitors also often use many of the same parking lots as commuters. Depending upon traffic and parking conditions, visitors are frequently sent to lots used primarily by UCR commuters, such as Lots 19, 25, and 30. In many cases, spaces designated for visitors are used by students. Students often use the visitor parking system in order to park closer to campus, particularly if they are running late. According to TAPS department estimates, students purchase approximately 70 percent of all designated visitor parking spaces.

<u>Issue: Visitors will encounter increasing traffic as they share facilities with both university and non-university commuters.</u>

According to forecasts, future visitors using the secondary roadways will encounter increased traffic, since forecasts of 2015 level of service (LOS) yielded unacceptable ratings at some intersections along Iowa Avenue and University Avenue.

Future peripheral parking could motivate even greater use of visitor parking by frequent commuters, such as students who drive to campus on a regular basis. While the *draft 2004 LRDP* parking plan recommends maintaining some visitor parking throughout the campus, the majority of visitor parking will be concentrated in future parking structures near the University Avenue and the Martin Luther King entrances. These structures will offer some of the closest parking facilities to the campus core. As stated earlier, commuters who already own daily parking permits frequently purchase visitor permits in order to park closer to the academic core. For many of these daily commuters, these visitor parking lots offer closer parking than the daily parking lot in which their permit allows them to park. As most parking moves further out to the periphery, demand for interior visitor spaces will likely increase, leading to more frequent use by commuters.

3.6.2 Gaps in the System

<u>Issue: The LRDP parking plan will create new challenges for ensuring safety and mobility</u>

The *draft 2004 LRDP* parking plan proposes limiting the number of parking spaces inside the campus interior. The majority of future parking, according to this proposal, will consist of parking structures located on the periphery of the campus.

As parking shifts to the periphery of campus, distances between parking lots and campus destinations will increase. Without new or increased transit services, this relocation of parking will lead to longer out-of-vehicle travel times and, consequently, higher door-to-door commuting times for many students, faculty, staff, and visitors.

Parking near the campus core is one way people minimize the risks involved with walking through campus during evening hours. Parking near a destination is also a way to avoid walking through secluded areas. As parking moves out to the campus perimeter, opportunities to park near campus destinations will decrease. Distances between parking and many campus locations will become longer. These longer distances could also tax UCR's current safety escort programs, requiring expanded service and greater security measures.

The physical nature of multi-level parking structures also present their own concerns linked with visibility and personal safety. UCR's transportation system will have to offer safety features that deal with the personal and property safety concerns associated with parking structures.

3.6.3 Costs

Issue: Parking structures involve much higher costs.

To accommodate the majority of UCR's future parking demand within selected peripheral locations, UCR's LRDP parking plan calls for the construction of multi-level parking structures. Construction and operating costs for multi-level parking facilities are significantly higher than for surface parking lots.

These costs could affect the entire transportation system at UCR. As UCR transitions from surface lots to parking structures, TAPS may have to seek other sources of funding for its transportation programs.

3.7 Transit

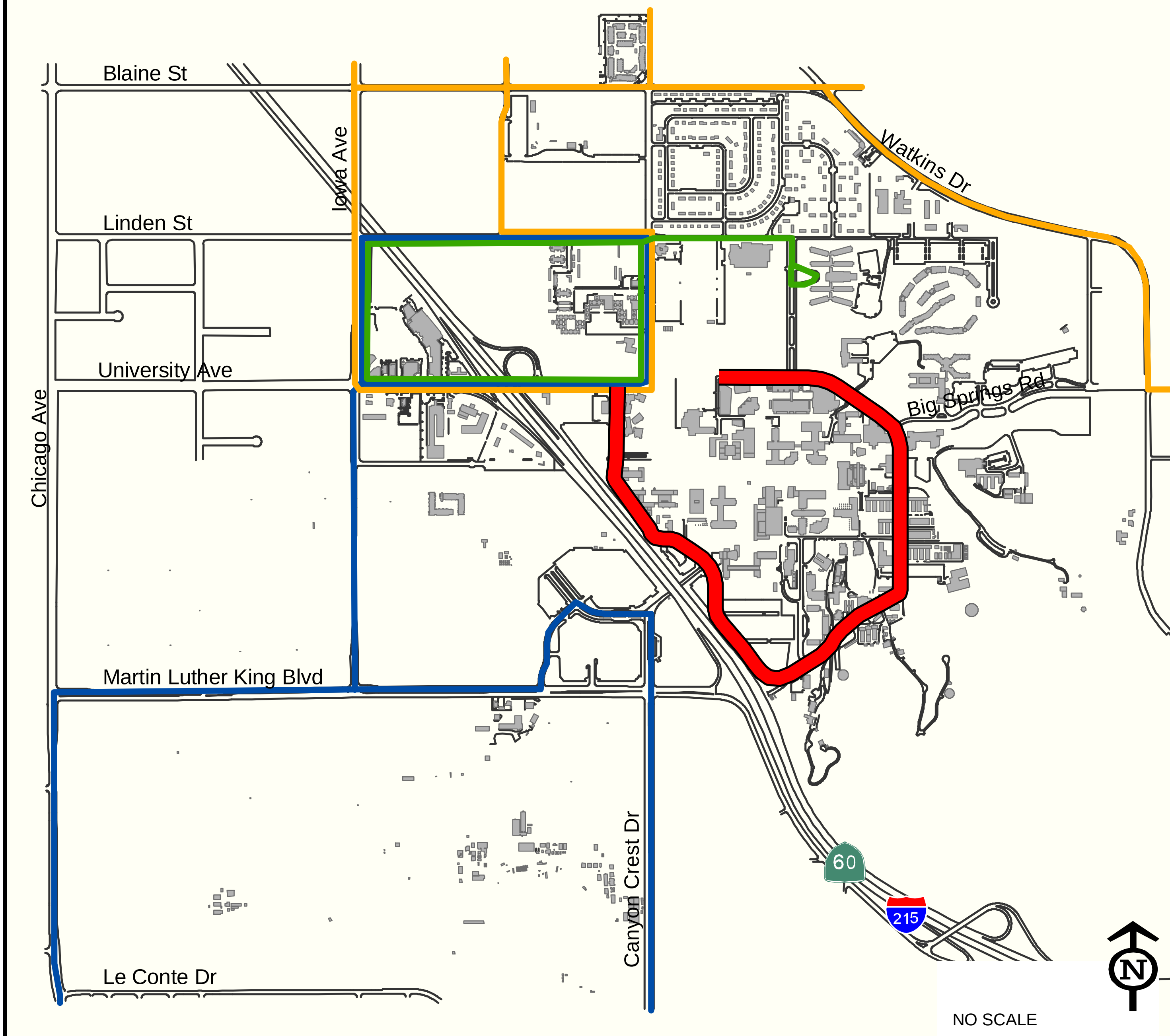
3.7.1 Gaps in the System

Issue: Campus shuttles currently do not serve the inner campus core.

The lack of inner campus service inhibits transit's ability to attract the discretionary rider. At present, transit does not deliver travelers as close to their desired destination as does the automobile. The Highlander Hauler, UCR's main daytime shuttle, runs along the periphery of the East Campus. Through its Blue Line and Gold Line, the Hauler shuttles students from the edge of the East Campus academic core to the retail centers and residential complexes that surround the university. In addition, UCR's Trolley Express provides service between East Campus and University Village, located north of the West Campus on the west side of I-215/SR-60. These shuttle routes provide students with an alternative to making short drives.

UCR's main daytime transit services, however, do not run along the inner campus loop (see Figure 3-4). This lack of an inner loop route limits campus transit's ability to provide a convenient alternative for many of the automobile trips that cause congestion, such as using automobiles to attend meetings or passenger drop-offs near the campus core.

Automobile congestion along the inner campus loop prevents campus transit from providing efficient inner campus service. Any transit service within the inner campus loop would have difficulty maintaining consistent headways, while contending with the congestion and conflict points automobiles currently face. Also, because of the



Source: Riverside Transit Agency Ride Guide, May 2003

LEGEND

- BUILDINGS
- INNER CAMPUS LOOP

LOCAL TRANSITS

- Gold Line
- Blue Line
- Trolley Express Line

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 3-4

Lack of Transit along the Inner Campus Loop

congestion in the loop, potential transit riders can walk faster than they could ride if inner loop service was available.

UCR's future land use will create an even greater need for inner loop service. As parking moves further away from the campus core, university transit will have to provide service between parking lots and the inner campus core in order to maintain door-to-door travel times. By shortening travel times as parking shifts to the periphery, transit can help provide convenience and mobility for all. In addition, transit will have to provide new service as campus housing and academic facilities expand to West Campus**.** New university development will generate demand for longer-distance on-campus trips between the East and West Campuses. Transit could also be used to increase safety for students and faculty traveling to and from peripheral parking spaces in the evening.

3.8 Pedestrians

3.8.1 Conflict Points/Congestion

Issue: Pedestrian and automobile travel converges at campus roads, creating points of conflict during peak travel times.

As previously discussed in *Section 3.4*, pedestrians frequently conflict with motorists at intersections or other crossings. These conflicts are especially pronounced on the inner campus loop. To travel from student housing and remote parking lots, pedestrians cross the campus loop road to enter the academic core.

Two locations are especially problematic. The segment of North Campus Road between Big Springs Road and Aberdeen Drive experiences significant pedestrian/automobile conflicts as people walking between housing and the campus core cross the loop road. In addition, pedestrian travel between Parking Lot 30 and the campus core create recurring pedestrian/automobile conflicts at the intersection of West Campus Drive and Canyon Crest Drive.

These conflicts will likely increase in the future, as future campus development creates more pedestrian trips along many of the same paths that currently experience severe vehicle/pedestrian conflicts. New university housing will increase the number of pedestrians crossing North Campus Road. Peripheral parking will also create more crossings along the inner campus loop, such as the campus entrance at the West Campus Drive/Canyon Crest Drive intersection.

New development could create new conflicts. As the West Campus attains the types of land uses that generate pedestrian trips, such as academic facilities or development of housing, new conflict points could develop as pedestrians travel across an expanded campus. Figure 3-5 illustrates some of the new or increased conflict points that might result from future land use plans.

Issue: Pedestrian noncompliance and a lack of traffic controls create congestion.

Many intersections experience uninterrupted streams of pedestrian traffic. There are no traffic lights within the inner campus loop; stop signs govern intersections along the four segments of Campus Drive. TAPS staff often direct traffic at busy intersections during the morning, afternoon, and evening peaks. At other times, however, uninterrupted streams of pedestrian crossings can halt traffic at intersections for extended periods of time.

Pedestrians often cross at informal "crossing zones" away from signals and crosswalks. Focus groups and field data observations revealed that pedestrians often do not use crosswalks when traveling on roads on or near the campus. Some characterized this behavior as part of a larger disregard for common traffic rules inside the campus. Illegal crossings are especially common on road segments that lie between multiple stop signs or traffic lights. These informal "crossing zones" slow traffic and create congestion on campus. Illegal crossings also present a safety hazard on campus, especially on Canyon Crest Drive between the south Bannockburn Village entrance and Linden Street, and along North Campus Drive.

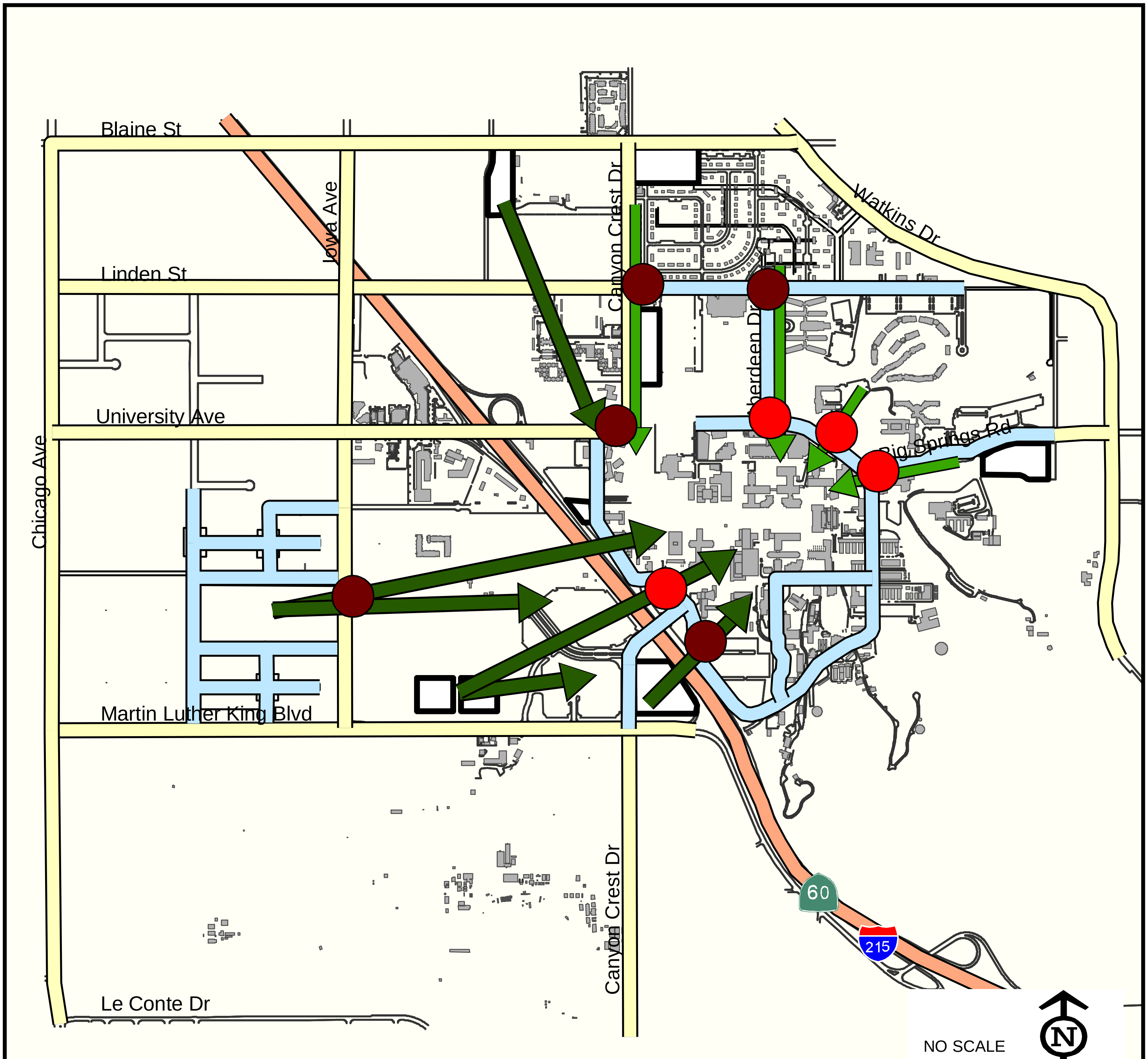
This suggests that more direct routes are needed to link housing and parking lots with safe crossing areas into the campus core.

Issue: The connectivity between East and West Campuses is poor.

The freeway inhibits pedestrian flow between the East and West Campuses. In bifurcating the campus, the freeway stands between the academic core and a variety of pedestrian traffic generators, such as parking, housing, administration buildings, retail, dining, and instruction space. To travel between the West and East Campuses, pedestrians must travel underneath one of two undercrossings, each of which presents obstacles to pedestrian flow. Pedestrians traveling through the University Avenue undercrossing encounter a narrow sidewalk and high traffic volumes. Currently, only the south side has a sidewalk.

The Canyon Crest undercrossing also has a sidewalk on one side, on the north. In addition, this undercrossing contains a grade change. Poor lighting and visibility (a wall stands between the sidewalk and the embankment) reinforce negative perceptions about the safety of this undercrossing. Some focus group members felt that the undercrossing also creates negative perceptions about distance. The distance between Lot 30 and the academic core is comparable to that of other parking lots; however, the existence of the undercrossings creates the feeling that Lot 30 is more remote than most other lots.

These underpasses also force pedestrians to make longer trips, since they have to travel north or south in some cases in order to find a pathway between the East and West Campuses. These inconveniences create incentives for people to use automobiles in order to travel between the East and West Campuses.



Sources: - CADD drawings provided by UCR Capital and Physical Planning, 2003.
- Focus Group, July 2003.

LEGEND

BUILDINGS
PARKING LOTS
EXISTING CONFLICT POINTS
(THAT WILL GET MORE INTENSE IN THE FURURE)
FUTURE CONFLICT POINTS

FUTURE TRAVEL FLOW
New Non-Motorized Flow
Increased Non-Motorized Flow
Freeway
City Arterials
On-Campus Roads

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 3-5

Future Travel Patterns and Conflict Points

As new academic facilities and student housing are developed on the West Campus, the need to provide safe, convenient and attractive pedestrian paths will increase. Programmed Caltrans improvements offer the potential to improve East and West Campus linkages at the Canyon Crest undercrossing by providing a wider, elevated sidewalk/bike path on both sides. The University Avenue undercrossing, however, is not programmed for improvements.

3.8.2 Gaps in the System

<u>Issue: Nature of pedestrian activity on college campuses creates a variety of personal safety and access needs.</u>

UCR facilities serve a variety of purposes. For many, the campus is a workplace, a place of instruction, a residence, or a combination of these functions. Because the campus consolidates these multiple functions within a small area, UCR experiences pedestrian traffic throughout the day and evening. These multiple uses and travel times require the maintenance of a network of safe paths for pedestrians walking throughout the campus. Changes (both design modifications and policy changes) must factor in these safety needs.

The university must also provide accessibility to meet a wide range of user needs, including users with mobility and visual impairments. In addition to providing handicapped parking and building access for the disabled, UCR must provide accessible paths between various facilities; e.g., between classes, places of residence, work facilities, dining halls, etc. Transportation system options must account for these access needs.

As the university expands and develops facilities on the West Campus, the expanded activities will generate increased travel between the various campus activity centers. Many of these can be pedestrian trips, but the freeway barrier between the East and West Campus inhibits pedestrian movements. Transportation system options therefore need to address the need for convenient, safe, and enjoyable movement between the various campus activity centers.

3.9 Bicycles

3.9.1 Conflict Points/Congestion

<u>Issue: Points of conflict and congestion are created when bicycle travel, pedestrian travel, and vehicular travel come together during peak travel times.</u>

Most bicycle trips to and from the campus require cyclists to cross the campus loop road. This creates conflicts between bicyclists and automobiles. Since many of the same land uses that generate pedestrian trips also create bicycle trips, these conflicts most frequently occur in the same areas as pedestrian/automobile conflicts.

Discussions with focus groups and field observations suggest that the conflicts between bicycles and other modes of travel are not as pronounced as those between pedestrians and automobiles. Bicycle conflicts, therefore, play a smaller role in generating campus traffic congestion. These conflicts, however, create possible safety hazards. Many of these potentially hazardous conflicts are concentrated in areas that provide opportunities for bicyclists to cross into the academic core without dismounting or stopping, such as ramps leading from the campus loop road directly into the campus core.

At the ramps near the Commons and Bourns Hall, for instance, bicyclists often make hazardous movements between the core and the loop road. Some bicyclists, having picked up speed on these ramps, ride into the campus loop without stopping or checking for automobile traffic. During field observations, one observer also noted that some bicyclists coming down Big Springs Road made illegal diagonal movements at the North Campus Road intersection. These movements allowed the bicyclists to ride up into the Science Library ramp without stopping; it also allowed bicyclists to use momentum gained from the grade on Big Springs to help get up the ramps.

Bicyclists also frequently make hazardous movements along the north section of Canyon Crest Drive. Legally, bicyclists riding north should ride on the east side of the street with bicyclists heading south riding on the west side. Field observers noticed, however, that southbound bicyclists often rode down the wrong (east) side of the road and northbound cyclists rode on the west (north of the light at Bannockburn). The reverse is true for cyclists going to housing west of Canyon Crest Drive.

The most likely cause for this behavior is the existence of a pedestrian mall at the corner of University Avenue and Canyon Crest Drive, which is directly accessible from the east side of the street. A cutout allows bicyclists to transition from the pedestrian mall to the street without getting off of their bicycle. Bicyclists traveling south on the west side of the road, however, would have to cross University Avenue to continue onto the pedestrian mall. Rather than make this crossing, many southbound bicyclists travel on the east side of the road.

These movements create a number of safety concerns; these bicyclists are moving against the flow of automobiles and other bicycle traffic, creating conflict points. A Highlander Hauler shuttle stop on the east side of the road, near the entrance to the pedestrian mall, creates further hazards for these bicyclists as well as the RTA bus stop in front of Bannockburn.

Each of these movements reflects bicyclists' desire to follow a continuous network that allows them to enter the campus without stopping or dismounting. Since external bicycle networks fade as bicyclists enter the campus, attempts to seamlessly enter the campus often involve potentially hazardous movements. This reflects not just the issue of conflict points, but also gaps in the system (discussed in further detail below.)

These areas of existing bicycle and vehicle conflict are likely to intensify; in some areas, new conflicts will be created. For many of the same reasons that shape future pedestrian conflicts, existing conflict points between bicycles and vehicles will likely increase. Proximate student housing to the north and northeast of campus is a large generator of bicycle traffic as well as pedestrian movements on Canyon Crest Drive. The number of bicycle movements between this housing and the inner campus will rise with increased enrollment. For this reason, the conflicts or hazards discussed above are likely to increase.

New housing and academic uses are also likely to create new conflicts near West Campus. For example, increased student housing and new academic facilities on the West Campus could create more bicycle traffic through the campus gateway on Canyon Crest to the East Campus academic core, resulting in a significant conflict point where bike/vehicle conflicts are not a major problem currently.

Inside the campus, increasing numbers of pedestrians and bicyclists may create conflicts along shared pathways within the academic core. As the increased student housing generates more bicycle commuters – and consequently leads to more bicycles on campus – future conflicts could also arise between pedestrians and bicyclists in the interior of campus. Currently, according to the LRDP, sidewalks along campus malls provide enough capacity for both pedestrians and bicycle use. The LRDP speculates that rising levels of either, however, might require the segregation of bicycle and pedestrian paths within the academic core. The LRDP also mentions the possibility of creating bicycle dismount zones in areas of heavy non-motorized travel.

3.9.2 East/West Connectivity

<u>Issue: The connectivity between East and West Campuses is poor.</u>

The freeway inhibits movements between East and West Campuses**.** Bicyclists traveling from the East to the West Campus must travel under one of the two undercrossings. These undercrossings serve as an obstacle to East/West Campus bicycle travel.

At the University Avenue undercrossing, westbound bicyclists must watch out for automobiles entering the street from the free right turn at the I-215/SR-60 off-ramps. Bicyclists must also contend with narrow bike lanes and high automobile traffic volumes when riding underneath the freeway.

The Canyon Crest undercrossing lacks bike lanes. A bike lane on the southbound side ends just before the undercrossing. The northbound side of Canyon Crest Drive contains no bike lanes. The undercrossing also features a grade change.

Expanding the campus will increase the need to improve links between East and West Campuses. Proposed West Campus student housing and new academic facilities will increase the need to reduce the disconnect between East and West Campuses. As the campus expands across the freeway, students may be required to travel between East and West Campus to attend classes. This could lead to increasing numbers of students using bicycles to make longer trips between classrooms and lecture halls. Programmed improvements to the Martin Luther King Boulevard/I-215 interchange by Caltrans will provide some mitigation at one crossing. As part of this project, Caltrans will construct raised bicycle lanes on both sides of Canyon Crest Drive at this undercrossing. University Avenue, however, is not programmed for improvement, which would present challenges for growing numbers of bicycle riders.

3.9.3 Gaps in the System

<u>Issue: The connectivity between the community bicycle network and the campus network is poor.</u>

Bike lanes on many streets stop at the campus. The majority of city streets leading to the university have painted bike lanes. Some of these bike lanes (such as those on Linden Drive and Big Springs Road) continue as streets enter the campus. These lanes end, however, as bicyclists enter the campus interior. While the four segments of Campus Drive are designated bicycle routes, they do not offer any painted bike lanes. The inside of the academic core also lacks designated bike lanes. Once inside the inner campus, bicyclists share pathways with pedestrians.

This lack of connection between community and campus bicycle facilities deprives bicyclists of a continuous network when commuting to and from campus. Some focus group members pointed out that this disconnection also creates two sets of rules that bicycle commuters must follow, one for riding on city streets and another for riding on campus. On city streets, bicyclists must stay off sidewalks and ride in bike lanes. Inside the campus, however, bicyclists lack these dedicated bike lanes and often share pedestrian pathways.

<u>Issue: Bicycle facilities, such as bike parking, frequently do not meet the needs of many existing and potential bicycle commuters.</u>

UCR lacks bicycle facilities that could encourage more bicycle commuting. Currently, for instance, the university does not provide bicycle lockers for people commuting from outside the university, although dormitory residents may lock their bikes within secured cages. This lack of general use lockers might dissuade some owners of expensive models from bringing their bikes on campus. In the future, this absence of bicycle lockers could also dissuade commuters from storing bikes overnight at parking structures in order to bicycle between peripheral parking and the campus

The bicycle parking areas that do exist do not provide sufficient capacity in key locations. As discussed in the *Section 2*, bike racks often fill up in areas that experience high volumes of bicycle traffic.

4.0 IDENTIFYING AND EXAMINING OPPORTUNITIES AND POTENTIAL SOLUTIONS

4.1 Introduction

The previous section detailed how this study identified transportation problems that the MMTMS study needed to address. This section describes how the MMTMS study developed and evaluated a series of opportunities and potential solutions to create a Long Range Strategy which addresses these problems. Developing this Long Range Strategy consisted of two basic steps. First, an initial list of potential solutions for each identified transportation issue was generated. Second, the Project Team and MMTMS Planning Committee examined these potential solutions to determine which to include in the Long Range Strategy.

4.2 Identifying Potential Solutions

The MMTMS study drew upon a variety of sources to identify potential solutions for each transportation issue at UCR. To produce this list of potential solutions, the MMTMS study relied upon input from the focus groups, Planning Committee, and feedback received during Open House sessions. Research on how other universities have dealt with similar problems provided another source of potential solutions.

The main goal of this step was to create an inclusive list of suggestions from a broad array of stakeholders. Another major aim was to ensure that no ideas were excluded. This produced a list of over 200 possible transportation solutions to address the problems and needs identified by project participants and through technical study. A full list of all the potential solutions is provided in Appendix C. This inclusive list features a wide range of diverse approaches. In dealing with the problem of conflict points and congestion, for instance, suggestions vary from closing down the loop road to increasing roadway capacity. The list of potential suggestions for parking issues includes everything from policies discouraging parking, such as an increase in permit price, to increasing the supply and lowering the cost of parking permits to free parking.

4.3 Examining Potential Solutions

During the next step, the Project Team and Planning Committee examined each potential solution to determine which should be included in a Long Range Strategy. The Long Range Strategy is detailed in Section 5. The remainder of Section 4 discusses many of the reasons why specific potential solutions were or were not included in the Long Range Strategy.

The Project Team used six criteria to assess whether or not to include each potential solution:

1. Did the solution comply with the *draft 2004 LRDP* and sustainable practices;
2. How well the solution satisfied the guiding principles;
3. How effectively it solved the transportation problem;

4. Potential costs per benefits for each solution;
5. How well the solution worked with other possible solutions; and
6. Practical considerations.

In making these assessments, the MMTMS study elicited feedback from several campus sources. In many cases, technical examinations about factors such as vehicle circulation patterns guided assessments of potential solutions. Input from campus stakeholders also played a significant role by ensuring that these assessments factored in travel patterns and behaviors specific to the campus. Campus input also ensured that the assessments of potential solutions considered the values of UCR stakeholders and their long range vision for the campus.

The Planning Committee played an important advisory role in assessing potential solutions. During an October 24, 2004 meeting, the Project Team used a workshop exercise to help assess potential solutions. The Project Team asked Planning Committee members to prioritize and respond to the potential solutions that had been suggested for the UCR transportation system. In addition to the Planning Committee, members of the Campus Safety Committee and members of the Traffic Sub-Committee were invited to participate. The process the participants used to prioritize these solutions is described in the following four paragraphs.

UCR's transportation network was broken down into six systems:

- Automobiles
- Emergency, Service and Delivery Vehicles
- Parking
- Transit
- Pedestrians
- Bicycles

For each system, a matrix listed the various problems (or issues) faced by that particular system. The matrix also listed all of the proposed solutions for each of these issues. Participants were then asked to respond to each matrix. To do this, participants were given a number of green and red stickers. Participants were instructed to place green stickers next to solutions they thought were particularly good ideas and red stickers next to solutions they thought were particularly bad ideas. The results of responses are shown in Appendix C along with the issues evaluated.

After this exercise, participants discussed why they felt a particular solution would or would not work, or was not in the campus' best interest. (The minutes for this meeting are located in Appendix A). Some of the key themes that emerged from this meeting included:

- There is a need to separate conflicting movements between automobiles, bicycles and pedestrians by creating a clear hierarchy of transportation modes.

- Transit service will need to be increased to maintain mobility and accessibility as the campus grows and the locations of parking change.

- Improving pedestrian and bicycle facilities on campus should be a priority in order to encourage alternatives to automobile travel.

The Project Team also discussed potential solutions with members of the campus community and the surrounding neighborhoods during Open Houses. In addition, the MMTMS study also reviewed how certain potential solutions have worked on other campus.

In general, the potential solutions included in the Long Range Strategy were those that helped create a hierarchy of travel modes within the campus, while still maintaining accessibility and mobility for campus travelers. One way the Long Range Strategy maintains this balance was by combining potential solutions that offered people more multimodal travel options, by increasing transit and creating safer and more convenient facilities for non-motorized travel.

The following sections elaborate on the rationale employed by the Project Team and the study participants to determine which solutions to include within the Long Range Strategy. The discussion is divided up into six transportation systems: vehicle circulation; emergency, service, and delivery vehicles; parking; transit; pedestrians; and bicycles.

4.3.1 Assessment of Potential Solutions for Vehicle Circulation

Conflicts between automobiles and pedestrians and bicycles are the most pressing transportation problems at UCR. These conflicts create both travel delay and safety hazards. The prevalence of passenger pick-up and drop-offs inside campus roads exacerbates these problems.

To address these issues, the Long Range Strategy includes potential solutions that separate pedestrian, bicycle and automobile travel without prohibiting people from traveling to places they need to reach. This requires synthesizing a combination of measures, including vehicle access controls, grade separations, and designated pick-up and drop-off points outside the campus loop road.

Specifically, the Long Range Strategy includes creating a series of vehicle-free, pedestrian areas along the loop road where high volumes of pedestrian crossings occur. The only vehicles allowed to pass through these zones will be emergency vehicles and smaller transit vehicles that provide point-to-point service. These vehicle-free zones will eliminate conflicts between pedestrians and automobiles by providing convenient areas for pedestrians to cross into the campus core without conflicting with automobile travel. These vehicle-free zones could also be designed to feature more pedestrian-friendly environments.

In conjunction with these vehicle-free pedestrian zones, the Long Range Strategy also includes measures to limit personal vehicle use along the inner campus loop road. This approach involves placing access controls at each entrance to the campus loop road. These access controls will limit the use of the inner campus loop to emergency, service, delivery, and transit vehicles. Access control cards or transponders will allow these vehicles to open access gates in order to reach the campus core.

Limiting the number of automobiles along the loop road will also help to reduce the number of conflicts between motorized and non-motorized travel. Allowing fewer vehicles along the campus loop road will reduce conflicts between automobiles and pedestrians crossing into the campus. Limiting automobile usage along the inner loop will also provide vehicles which rely upon campus roadways – such as emergency and delivery vehicles – greater mobility when performing vital services.

During discussions with the Planning Committee, creation of these vehicle-free, pedestrian zones and limiting automobile traffic along the loop road emerged as one of the most effective methods of managing conflicts. Both of these measures also support the MMTMS guiding principles.

Vehicle-free, pedestrian-zones, for instance, provide one of the most realistic solutions to the problem of conflicts (meeting the "Implementable" Guiding Principle). As discussed in greater detail below, many other suggestions would require pedestrians and bicyclists to go out of their way. Many study participants felt that pedestrians might simply ignore these facilities. Automobile-free pedestrian zones, however, would be created along direct paths between the campus core and exterior destinations. Aligning these zones with the routes pedestrians naturally use will increase the likelihood that travelers comply with this strategy.

Creating pathways where pedestrians could walk without the intrusion of automobiles also satisfies the guiding principle of a "Walkable Campus." This strategy also establishes a "System Heirarchy" by designating certain routes exclusively for pedestrian uses. Creating automobile-free pedestrians paths has the potential to enhance "Aesthetics", another guiding principle.

In addition to meeting the primary goals of the MMTMS, these zones were also viewed by many participants as the most economical way of managing conflicts. Creating vehicle-free zones provides the same segregation as pedestrian or bicycle overpasses, but at a lower cost.

Limiting automobile traffic along the inner campus loop road satisfies many of these same guiding principles by reducing the volume of traffic along the loop, thereby creating a more pedestrian- and bicycle-friendly environment within the campus.

Many study participants felt that placing access controls along the entire loop, as opposed to only sections of Campus Drive, was the only way to effectively manage conflicts and congestion. Although the *draft 2004 LRDP* parking plan will eliminate many reasons for driving into the loop road, many automobile uses will likely persist if the loop road stays open. Keeping the loop road open, for instance, might promote the continued use of campus streets for passenger drop-offs, improper uses of dock spaces, or travel by drivers who still think there is parking available within the loop. Many MMTMS study participants felt that placing access controls at each entrance to the campus loop road was the only way to prevent these persistent uses.

To further manage conflicts, the Long Range Strategy includes grade separations in the form of pedestrian bridges over select roadways in and around the campus. These pedestrian (and in some cases, bicycle) overpasses or bridges provide an effective way of separating automobiles from non-motorized travel in areas where limiting automobiles is not an option, such as over the freeway.

In reviewing potential solutions, many participants viewed overpasses as the best way to manage conflicts in these areas where there are few other options. Many of these same supporters, however, also expressed reservations about grade separations. For one thing, grade separations are expensive. Many also acknowledged that pedestrians would bypass bridges that required walking up stairs or steep ramps.

In response to this feedback, the Long Range Strategy makes a limited use of grade separations. To mitigate costs, the plan recommends using grade separations almost exclusively over areas where there is no option to limit automobile traffic, such as the freeway. To further reduce costs, the Long Range Strategy recommends grade separations in areas where bridges or overpasses could be built into existing or future buildings on either side of the road. The Long Range Strategy also recommends taking advantage of existing grade changes that would not require pedestrians or bicycles to travel uphill in order to use the bridge.

The Long Range Strategy also includes traffic controls as a possible interim solution to conflicts between pedestrians and automobiles. Access controls along the inner campus loop road will have to be gradually phased in with incremental land use changes. Rising traffic and pedestrians volumes, however, may require the use of an interim solution in areas where land use shifts do not yet accommodate access controls. The Long Range Strategy therefore recommends examining the use of a temporary traffic light at one such section of campus.

In the long run, however, traffic lights do not satisfy the goals of the project. Traffic lights or directors would not give pedestrians the kind of priority embodied in the guiding principles of "Walkable Campus" or "System Hiearchy." Traffic lights along the inner campus loop road could also detract from the aesthetics of the campus. Some members of the Planning Committee also questioned whether or not pedestrians would obey traffic signals, especially when crossing the narrow loop road. For these reasons, the Long Range Strategy includes traffic controls only as a possible temporary measure, not a long term solution.

The Long Range Strategy also includes recommendations to increase the number of designated drop-off points at locations outside the campus loop road. As discussed in the previous section, passenger drop-offs often disrupt traffic inside the campus. To deal with this, the Long Range Strategy recommends placing pick-up and drop-off facilities outside the campus loop road, in areas away from the stream of traffic. Placing these designated points outside the campus loop road allows for continued passenger pick-up and drop-offs in a way that does not congest the loop road. By providing an ample amount of space in several locations, the measure also decreases the likelihood of unpredictable and hazardous impromptu passenger drop-offs.

While the Long Range Strategy incorporated many of the potential solutions developed over the course of the project, some solutions were not included. For example, potential solutions which would increase the capacity of the campus loop road are not in the Long Range Strategy. Increasing capacity – e.g. widening the loop road – would promote increased automobile use inside the campus. This disregards the guiding principles that give pedestrians priority within the campus, such as "Walkable Campus" and "System Hierarchy." Encouraging automobile use also works against the guiding principle to create a more "Multimodal System."

Alternate solutions that allowed passenger drop-offs within the campus loop were also not included in the Long Range Strategy. Interior drop-off points would promote continued use of the inner campus loop road. These drop-offs would perpetuate congestion on campus loop roads. Allowing drop-offs inside the campus would also lead to continuing conflicts between automobiles and pedestrians, or interfere with transit service around the campus loop.

Conversely, potential solutions that sought to eliminate drop-offs entirely were not included in the Long Range Strategy. Eliminating drop-offs could be counterproductive to UCR's goals to promote carpools and to reduce the demand for parking, since discouraging pick-up and drop-off would limit accessibility for people who carpool or get rides to UCR.

4.3.2 Assessment of Potential Solutions for Emergency, Service, and Delivery Vehicles

Conflicts and congestion along the inner campus loop road present a particular problem for vehicles that must reach service areas inside the campus, since congestion can seriously erode emergency vehicle response times. Once inside service areas, both emergency and service vehicles experience additional delay due to the multiple uses that occur within dock areas.

The Long Range Strategy deals with these issues by advocating the creation of a centralized receiving area and limiting private vehicle traffic within service areas.

With a centralized receiving area on or near the campus, most delivery and vendor services would deliver items to a centralized facility. University personnel would then distribute items across the campus. In cases where outside delivery services still need access inside the loop road, TAPS could provide either single or multiple use access cards to enable holders to pass through access controls.

This plan would allow the university to take control of most delivery activity on campus. The university would have the flexibility to deliver materials outside of peak travel times. University staff would be familiar with loop road access controls, and would be able to pick out the most efficient route to a particular dock area.

In addition, the Long Range Strategy includes potential solutions that limit personal vehicles within dock areas. Access controls along the inner campus loop road will help to reserve the campus loop road for emergency, service, and delivery vehicles. Since most dock areas take access from the inner campus loop, plans to restrict access to the campus loop road will consequently limit the use of service areas. To help minimize existing conflicts between people exiting the campus at the end of the workday and people entering the campus core to search for dock space parking, the strategy moves the start of evening parking time from 4:00 PM to 6:00 PM.

The Long Range Strategy does not include potential solutions which entailed expanding service areas. These suggestions received mostly negative responses from members of the Planning Committee and focus groups. In addition to high costs, expanding dock areas and service roads would exacerbate existing conflicts by encouraging even more use of these facilities by personal vehicles.

4.3.3 Assessment of Potential Solutions for Parking

As discussed in the previous sections, the location of parking spaces in the campus core creates conflicts and congestion. The *draft 2004 LRDP* parking plan solves many of these problems by relocating parking to the periphery of campus. But the *draft 2004 LRDP* also leaves open the option of changing policies to further reduce car shuttling and resultant campus congestion.

The *draft 2004 LRDP* also creates new challenges for UCR's transportation system. Without improvements to UCR's transit systems, peripheral parking will increase door-to-door travel times for visitors and commuters. Peripheral parking also creates new safety considerations, and could result in parking on neighboring residential streets surrounding the campus.

The Long Range Strategy builds off of the *draft 2004 LRDP* by incorporating potential solutions that use new parking policies and enhanced transit to address many of these new challenges.

One of these new policies included in the *draft 2004 LRDP* and Long Range Strategy is lot specific parking permits. Under this system, commuters will purchase a permit that allows them to park in a specific lot. This system will help cut down on campus congestion by eliminating car shuttling between lots throughout the day. Lot specific permits also promote more efficient traffic flows. Travelers will be more likely to take the most direct route to a parking space if they know which lot they park in every day. Under the current system, commuters often drive to one parking lot, find it full, and then drive to another lot.

Lot specific parking permits also establish the foundation for another potential solution included in the *draft 2004 LRDP* and Long Range Strategy: pricing parking based on proximity to the campus. Under this pricing policy, permits for lots near the campus core will cost more, while permits for more peripheral parking will cost less. This provides an incentive for commuters to park at more remote parking lots and walk, ride shuttles, or bicycle to the campus. Increasing the desirability of these lots will help to reduce traffic in the more densely developed areas of the campus. This tiered pricing will also give students and employees the option of incurring lower costs if they are willing to park further from the campus core.

The *draft 2004 LRDP* and *Long* Range Strategy also include operation of shuttles from parking structures to the campus core. Running shuttles from parking structures to the campus supports the "Multimodal System" guiding principle and satisfies the "Traveler Needs" guiding principle by providing people with multiple transportation options over the course of an entire trip. As discussed in greater detail in the transit section, the Long Range Strategy recommends routes that link each structure with the campus core. The strategy also includes more frequent transit headways (e.g. 5-10 minutes) in order to provide the level of convenience required by the campus community.

During the entire MMTMS study, participants expressed concerns about the safety of people who perform evening work on campus. To address these concerns, the Long Range Strategy recommends an Evening Permit system. This system would enable departments to request access cards from TAPS that will allow students and employees conducting evening work to enter the campus core and park in loading areas after 6 PM.

During Open House sessions, nearby residents expressed their concerns that peripheral parking structures would encourage some UCR travelers to park on neighborhood streets and suggested that a residential permit parking system is needed in neighborhoods around the UCR. The authority to implement a residential parking permit program lies with the City of Riverside, so the strategy recommend that UCR monitor this situation and encourage the City to implement such a system, if necessary.

The Long Range Strategy does not include suggested strategies to increase the amount of parking in the campus interior. Plans to develop the campus limit the land available for parking. More parking would also increase the level of congestion on campus, and lead to more conflicts between motorized and non-motorized travel

The Long Range Strategy also does not include strategies that limit the amount of parking to certain populations, such as underclassmen or freshmen. This strategy would produce limited results, since many freshmen and underclassmen currently live in university housing, and therefore do not hold commuter parking permits. If they do have cars, their permits are valid only for housing parking lots until 4 PM.

4.3.4 Assessment of Potential Solutions for Transit

Currently, congestion within the inner campus loop inhibits transit from serving that area. As the campus grows in size, and academic uses extend into the West Campus, these gaps will increase. The expansion of academic and housing facilities in the West Campus will also lengthen trips between campus destinations. Future transit will have to provide more service between campus destinations.

The Long Range Strategy includes potential solutions that balance the need to provide these increased services while avoiding areas where shuttles will conflict with pedestrian travel. To accomplish this, the Long Range Strategy recommends providing transit service through much of the campus loop without crossing vehicle-free pedestrian zones.

The Long Range Strategy identifies the need to provide links between the following four areas:

- The East Campus core and the West Campus core
- The East Campus core and University Village
- Nearby housing and East Campus and West Campus cores
- Parking structures and East Campus and West Campus cores

In addition, the Strategy recommends increased frequency of shuttle service to provide more convenience and encourage higher usage.

These linkages enable transit to provide convenient service for the four linkages, while avoiding areas that experience heavy pedestrian crossings. Other service options were considered but did not satisfy the guiding principles as well. Service around the entire inner loop would conflict with heavy pedestrian traffic in some areas and works against the hierarchy established in the guiding principles, which places pedestrians at the top of the transportation system hierarchy.

The Long Range Strategy also includes strategies to provide accessibility for the visually and mobility impaired and to enhance safety for people during the evening. The Long Range Strategy recommends demand responsive (or Point-to-Point) shuttles to carry the visually or mobility impaired between campus destinations. Currently this service is only offered to students through Student Special Services. The Long Range Strategy also recommends enhancing UCR's existing evening Point-to-Point shuttles as both population and the physical size of the campus grow.

The Long Range Strategy also includes strategies to better link campus transit with local public transit. Possible improvements to regional transit, such as potential bus rapid transit and proposed Metrolink service on the San Jacinto Branch line, provide the potential to better link UCR transit with regional public transportation facilities. This was an important goal established in the *draft 2004 LRDP*.

4.3.5 Assessment of Potential Solutions for Pedestrians

Pedestrians experience conflicts with automobiles since they must cross the campus loop road to access the academic core. The freeway provides another obstacle for pedestrian travel by separating the East and West Campuses. Campus growth and shifts in the location of parking will also create new challenges for maintaining convenient and safe pedestrian travel across campus.

As described in the previous sections, the Long Range Strategy includes strategies to create vehicle-free, pedestrian zones and to limit automobile traffic on the campus loop road to deal with these conflicts. The Long Range Strategy also includes pedestrian bridges in a few select areas to overcome conflicts.

To overcome the East/West Campus freeway barrier, the Long Range Strategy includes a pedestrian and bicycle bridge over the freeway. Study participants view a freeway overpass as a good way to significantly enhance access between the East and West Campuses and supplement the constrained underpasses at University and Canyon Crest.

In recommending possible placement for this overpass, the Long Range Strategy considered some reservations participants expressed about this solution. Cost is one of the biggest obstacles to constructing a pedestrian/bicycle overpass. Consequently, the Long Range Strategy advises taking advantage of future or existing buildings or parking structures on either side of the freeway. This could reduce the costs of building the overpass, or provide funding by including construction costs as part of other building projects. Using the overpass to link two structures would also address concerns about making the bridge accessible to disabled travelers by utilizing required mobility elements for the structures to aid in accessing the bridge.

For safety and cost reasons, the Long Range Strategy does not include potential solutions that involve using a tunnel beneath the freeway or underpasses of existing roads.

4.3.6 Assessment of Potential Solutions for Bicycles

Bicycle and pedestrian conflicts currently create safety hazards in areas where bicyclists transition from the exterior bicycle network into the campus. As the campus population grows, conflicts between bicyclists and pedestrian could also become a problem inside the campus. In addition, gaps in UCR's existing bicycle network and facilities may discourage some bicycle travel.

The Long Range Strategy incorporates approaches that balance these needs by providing a way for bicyclists to penetrate the campus core, while preserving campus malls in the core for pedestrian use.

As a first step toward providing a more extensive bicycle network, the Long Range Strategy recommends extension of existing bike lanes into the campus so that campus bicycle networks connect to city bike lanes. The Long Range Strategy also creates a network of bicycle paths, routes and lanes that encircle the perimeter of the campus core and penetrate the outer areas of the campus core, while designating the Carillon Mall as a bicycle dismount zone.

While many involved in the study favored creating a dismount zone, some expressed concerns that dismount zones would be difficult to enforce (violating the "Implementable" Guiding Principle). The Long Range Strategy deals with this concern by incorporating strategies that use both enforcement and incentives to encourage bicyclists to use designated bicycle networks and avoid riding through dismount zones.

One strategy to provide incentives involves developing centralized bicycle parking at multiple locations where campus bike paths terminate inside the core. Consolidated bike parking reduces the incentive for bicyclists to ride inside the campus core and decreases the likelihood that pedestrians will use the bike network to travel the campus.

Bicyclists, faced with the choice of using pedestrian-free paths that run around the campus, or riding through central malls that experience heavy pedestrian traffic, will typically choose open paths free of slower moving walkers. Concentrated parking makes it easier for campus security to monitor activity at campus bike racks and will help UCR ensure: that all bike parking areas provide adequate lighting and visibility; racks accommodate all kinds of locks; ample parking spaces; and a limited number of bike lockers.

To bridge the disconnect between the East/West Campuses, the Long Range Strategy includes provision of bike lanes on the pedestrian/bicycle overpass of the freeway.
The Long Range Strategy does not incorporate suggestions to limit the campus bicycle network solely to the loop road. Restricting bicycle use to the campus loop road forces bicyclists to circumnavigate the entire core to travel across the campus. Suggestions to confine bicycles to the campus loop road would also require cyclists to scale steep grade changes along the southeast portion of the loop road.

At the same time, the Long Range Strategy does not incorporate suggestions to widen sidewalks along pedestrian malls to accommodate both bicycles and pedestrians. In reviewing options to widen walkways, many expressed concerns that allowing bicycles in the main pedestrian malls would lead to conflicts at the intersections of pedestrian pathways. Sources familiar with bicycle use at other universities stated that many campuses that allow bicycle use everywhere on campus suffer from collisions between bicyclists and pedestrians.

4.4 Developing a Long Range Strategy

These assessments served as the starting point for the process of developing a Long Range Strategy. Using the results of the participant's responses to the prioritization exercise, the Project Team sketched a preliminary long range strategy for three critical elements of UCR's transportation system – vehicle circulation, transit and parking. These three systems were chosen because the basic strategies used in each would determine how to approach other transportation systems. After reviewing this preliminary strategy with the Planning Committee, the project team developed a more detailed draft Long Range Strategy.

The project team presented this more detailed long range strategy to the Planning Committee and to the campus and neighborhood communities through Open House sessions. Feedback from each meeting was used to further refine the Long Range Strategy. The Long Range Strategy was then presented to UCR's Design Review Board (DRB) and the Capital Programs Advisory Committee (CPAC) for further review and revision.

This iterative process culminated in the final MMTMS Long Range Strategy, outlined in greater detail in the following section.

5.0 LONG RANGE STRATEGY

5.1 Introduction

The processes described in the previous sections – analyzing existing and future conditions, identifying transportation issues, and evaluating potential solutions – culminated in the creation of a MMTMS Long Range Strategy.

This Long Range Strategy includes both transportation system enhancements and policy changes. The timeline for the Long Range Stategy is 2015, the horizon year established in the *draft 2004 LRDP* for a campus of 25,000 students. This section details the Long Range Strategy for each transportation system.

5.2 Automobiles

The Long Range Strategy for automobiles uses a combination of access controls and vehicle-free zones to address conflicts between motorized and non-motorized traffic. Access controls will prevent the intrusion of private vehicle traffic within the campus loop road. Vehicle-free zones will provide a continuous path for bicycles and pedestrians traveling to, within, and from the campus, and minimize conflicts between pedestrians and service, delivery, emergency and transit vehicles.

UCR should take full advantage of the vehicle-free zones to heighten campus aesthetics by designing more pedestrian-friendly treatments of roads in these areas. These designs should also accommodate emergency vehicle access.

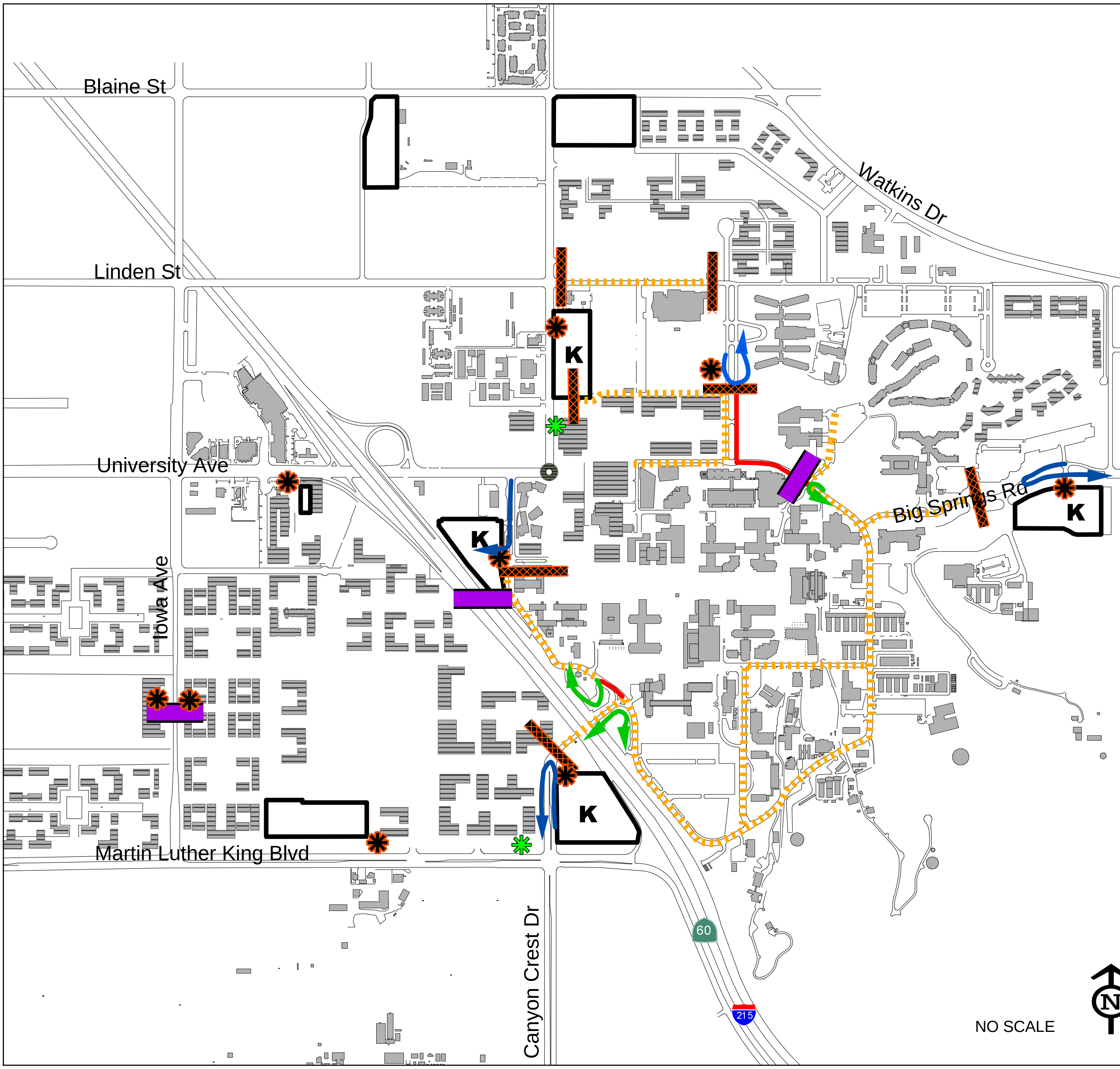
The strategy also contains provisions to allow travelers with legitimate needs to enter the loop road. For this reason, the type of access controls should accommodate and control the passage of both frequent and occasional users. These access controls should also have the capacity to be opened remotely.

Another major feature of the Long Range Strategy includes locating kiosks and passenger drop-offs in areas where they are less likely to disrupt traffic. The strategy places both drop-off points and kiosks around the perimeter of the campus at each campus gateway; this allows users of these facilities to approach the campus at the most efficient entrance.

The Long Range Strategy for Automobiles is summarized below:

- Use access controls to close portions of the inner campus loop road to general purpose traffic and through traffic. Access control locations are shown on Figure 5-1.

- Limit access to portions of the inner campus loop (highlighted in yellow in Figure 5-1) to the following vehicles:



LEGEND

Buildings

Future Buildings*

Future Parking Structures

*Future Buildings are the proposed buildings from the East Campus Entrance Area Study and from the West Campus Area Plan and the Strategic Plan for Housing (For capacity study only)

Components from Possible Long-Term Strategies

Potential Access Controls

Potential Pick-Up and Drop-Off Points

Potential Pick-Up/Drop-Off Point for Transit

Potential Information Manned Kiosks

Vehicle Circulation

Open to General Purpose Traffic

Closed to Privately Owned Vehicles (POV)

Vehicle Free Pedestrian/Bicycle Zone (Except for Emergency Service Vehicles)

POV Traffic Control

Special Vehicle Traffic Control

Pedestrian/Bicycle Overpass

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 5-1

Long Range Vehicle Circulation Strategy 2015

Permitted (with appropriate TAPS approval)	Not Permitted	
Emergency vehicles Transit Students, faculty, or staff holding valid evening permits (from 6pm to 7am) Special guests (by prior arrangement with TAPS) Service vehicles Vendors/delivery vehicles and courier services Vehicles used to set-up for special events	Students Faculty Staff Visitors	When Operating Privately Owned Vehicles

- *Evening permits*: Provide Transportation and Parking Services (TAPS) with a limited number of access cards that will open gates after 6:00 PM. TAPS will issue these permits by special arrangement to students, faculty, and staff who need to perform evening work. These passes will allow holders to enter the campus loop road in order to park in loading and unloading spaces during off-hours. These passes may be coded to provide access for a limited span of time, such as a day, week, or quarter.

- Grant temporary inner loop road access to service and delivery vehicles, campus transit/shuttle vehicles, and department vehicles or visitors with special needs.

- Vehicles which need to regularly access the inner loop road (such as frequent vendors or services vehicles) should be equipped with transponders or access cards; vehicles with one-time or infrequent needs (such as large personal deliveries) should be provided with single-use temporary access cards through kiosks or through TAPS.

- Redesign streets to create vehicle-free pedestrian- and bicycle-friendly crossing zones on the following sections of road (highlighted in red in Figure 5-1):

    - On North Campus Drive between Aberdeen Drive and the future dining center (currently Veitch Student Health Center) access road.

    - On Aberdeen Drive south of the access control, reconstruct the west roadway for two- way vehicle and bicycle travel; convert the east roadway and sidewalk to a pedestrian zone.

- On West Campus Drive, between the intersection with Canyon Crest and existing Parking Lot 4.

- Emergency vehicles, special student services shuttles, and/or point-to-point shuttles for disabled travelers will be allowed to pass through these pedestrian and bicycle crossing zones identified above.

- Develop drop-off and pick-up points in the areas indicated on Figure 1. Provide sufficient curb space so there is enough space available to accommodate vehicles which must wait a short time to pick up their passengers. Drop-off and pick-up points should be convenient to campus shuttle stops.

- Provide parking/information kiosks at each of the four main campus entrances (see Figure 5-2). Kiosk approaches should have sufficient storage to avoid vehicle queuing onto the adjacent street.

- For security reasons, access cards or transponders can record the card number, entry time and exit time for all vehicles entering and leaving restricted zones, day or night.

5.3 Emergency, Service and Delivery Vehicles

Limiting personal vehicle access within the inner campus loop will help reduce conflicts that emergency, service, and delivery vehicles face on a daily basis. By creating a centralized receiving area, and having campus personnel deliver materials to individual buildings, UCR will help ensure that vehicles take the optimum route to service areas at appropriate times. Outside vendors and delivery services, however, may still need to enter the loop for special deliveries such as materials, for instance, that require special handling. The Long Range Strategy contains provisions for these special circumstances.

The long range strategy for emergency, service and delivery vehicles is detailed below:

- Create a centralized receiving facility outside of the campus cores. (The location of this facility should be chosen to draw delivery traffic away from the campus core.)

- Most routine deliveries will be handled to/from the central facility by the campus delivery service; immediate delivery needs can be carried out by the campus courier service.

- Exceptional needs which require direct delivery by off-campus vehicles can be accommodated with temporary access to the appropriate loading dock. This policy provides the following benefits:

    - Consolidates deliveries and, consequently, minimize the number of delivery vehicle driving through campus

- Ensures that delivery vehicles will take the safest and most efficient routes to various destinations by using campus staff familiar with the campus, loop road access controls, and vehicles of the appropriate size for the task.

■ Loading dock access for delivery/service vehicles will be provided primarily via the access routes shown in Figure 5-2.

■ During daytime hours, access controls will prohibit private vehicles from parking in loading docks areas. Limited parking will be available in loading dock areas to accommodate delivery and service needs only.

■ Parking spaces in loading docks will be available for evening use only through permits issued by TAPS. Limiting and tracking the usage of docks at night by private vehicles will:

  - Ensure that available dock parking is reserved for the faculty, students, and staff who need to perform evening work
  - Assist security patrols by providing campus police with a list of what buildings are occupied and what loading areas are being used legitimately.

■ Gradually replace current campus fleet vehicles with electric or alternative fuel vehicles.

■ Over time, replace current campus fleet with vehicles of the appropriate size for use.

5.4 Parking

The *draft 2004 LRDP* outlines UCR's future parking system. Although the *draft 2004 LRDP* identifies the location and amount of parking, it also creates several issues the MMTMS Long Range Strategy must address.

The MMTMS long range stategy for parking contains provisions to discourage car shuttling. It also addresses the need to provide continued mobility by recommending a combination of fixed-route transit and demand responsive shuttles to transport people quickly and safely between parking structures and the campus.

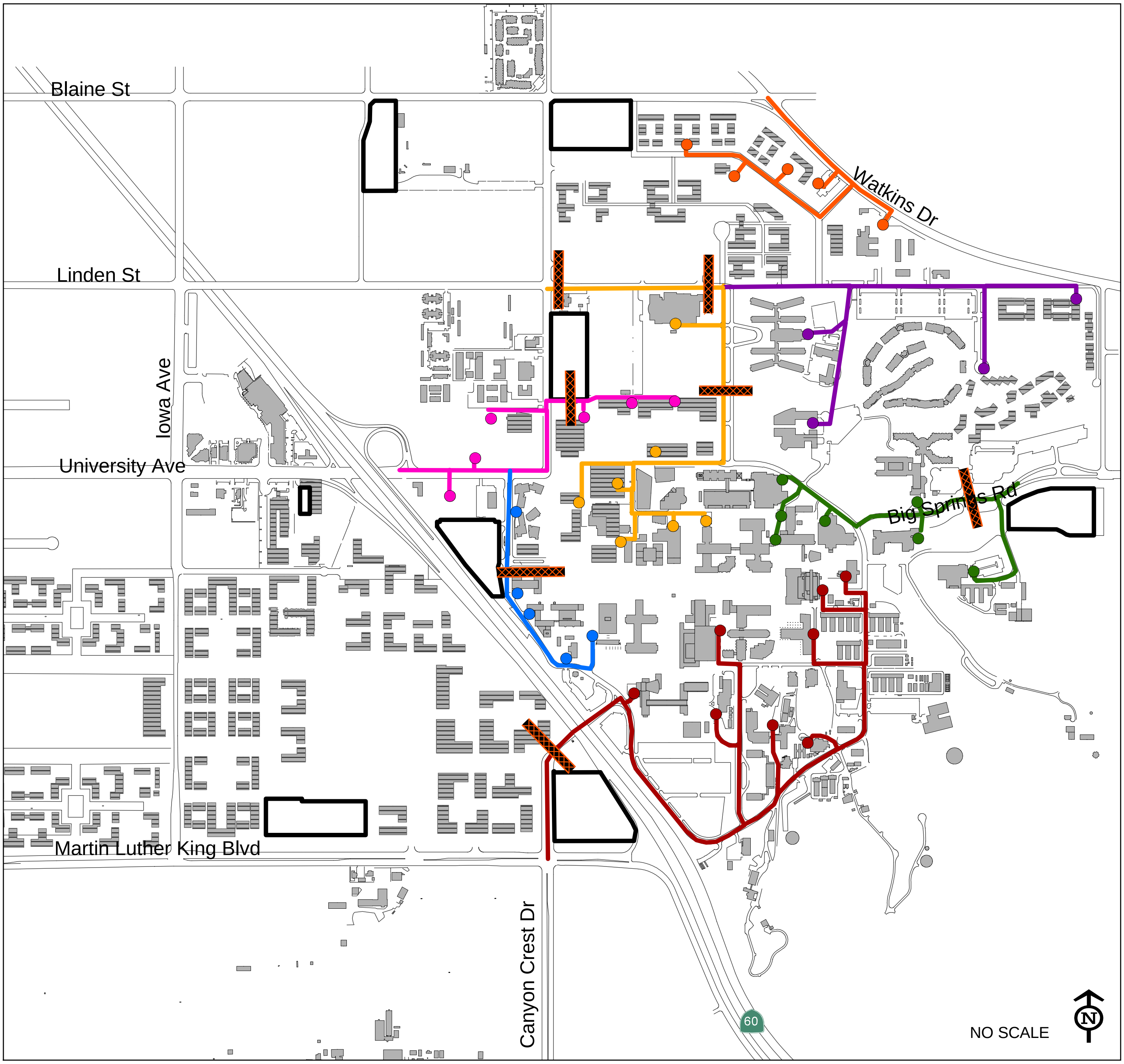
The Long Range Strategy also identifies strategies for optimizing safety within and around parking structures and recommends policies to address the issue of cost.

This strategy for parking is summarized below:

■ Convert student parking permits to a lot-specific permit system.

■ Enforce use of lot-specific permits from 7 a.m. to 6 p.m., Monday – Friday (holidays excluded).

■ Provide shuttle service linking parking structures with East Campus core and West Campus core.



LEGEND

Buildings

Future Buildings*

Future Parking Structures

Potential Access Controls

Service Destination

Suggested Delivery/Service Routes for Optimal Access to Each Dock Area

*Future Buildings are the proposed buildings from the East Campus Entrance Area Study and from the West Campus Area Plan and the Strategic Plan for Housing (For capacity study only)

Note: Delivery/Service routes for West Campus will be defined as the West Campus develops.

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 5-2

Long Range Strategy for Emergency, Service and Delivery Vehicles 2015

- As parking structures are constructed (see Figure 5-1 for location of structures), provide most of the required disabled parking in the structures closest to the East Campus core and to the West Campus core. Provide point-to-point demand-responsive shuttle service to take disabled people from parking structures to their destination.

- Provide visitor parking in each structure, concentrating visitor parking in structures adjacent to West Campus Drive and Martin Luther King Boulevard.

- Provide special guest parking within campus core in Lot 7 (near the proposed new administration building). In addition, provide demand-responsive shuttle service (or point-to-point service) to take special guests from parking areas to their destination.

- Price monthly parking permits and daily parking fees to:
  - Ensure adequate funding for campus parking facilities and to contribute to campus shuttle services.
  - Encourage use of alternate modes for commuting to campus.
  - Discourage use of visitor parking by campus population.
  - Provide less expensive parking permit options for those using remote locations.

- As the construction of parking structures increases costs for TAPS, explore the use of other sources (or a combination of other sources) of transit service funding. Some funding sources used for other university transit services include:

  - User fees

    - Student referendum for transit passes (e.g. student transportation fee referendums passed at UC Santa Cruz and UC Davis).

    - Optional transit pass programs for students, faculty, and staff (e.g. University of Washington's U-Pass Program)

  - Revenue from parking fees and parking fines

  - University general funds

  - Discretionary grant funding

- Design parking structures to optimize security (lighting, surveillance, safety personnel). Encourage mixed uses within or adjacent to structures to raise activity level in or near parking.

- Encourage the City of Riverside to implement residential parking permit zones on neighboring community streets if campus parking becomes problematic.

5.5 Transit

The Long Range Strategy recommends approaches for providing service between vital areas of the campus without traveling through vehicle-free zones that will experience high bicycle and pedestrian crossings. The strategy also explores possibilities for coordinating campus services with local and regional transit.

The Long Range Strategy for transit is as follows:

- Expand Highlander Hauler and Trolley Express to provide frequent (5-10 minute headways) shuttle service which:
  - Links East Campus core with West Campus core
  - Links East Campus core with University Village
  - Links nearby housing with East Campus core and West Campus core
  - Links parking structures with East Campus core and West Campus core

  Figure 5-3 depicts potential routes which could serve these functions.

- Provide a daytime demand-responsive shuttle on campus to provide door-to-door service for the disabled and to take special guests from parking to their destination.

- Provide Highlander Hauler stops that link campus transit with regional/local service, such as at RTA bus stops and the proposed San Jacinto Line Metrolink Station.

- Continue to provide the existing evening and night demand-responsive shuttle program. Expand when demand requires. Coordinate these expansions with evening escort service to maximize safety.

- Continue to ensure that all transit and shuttle vehicles are wheelchair accessible and provide bike racks.

- Consider student fees to support campus shuttles and student access to RTA transit services.

- Include transit information in student orientation packets.

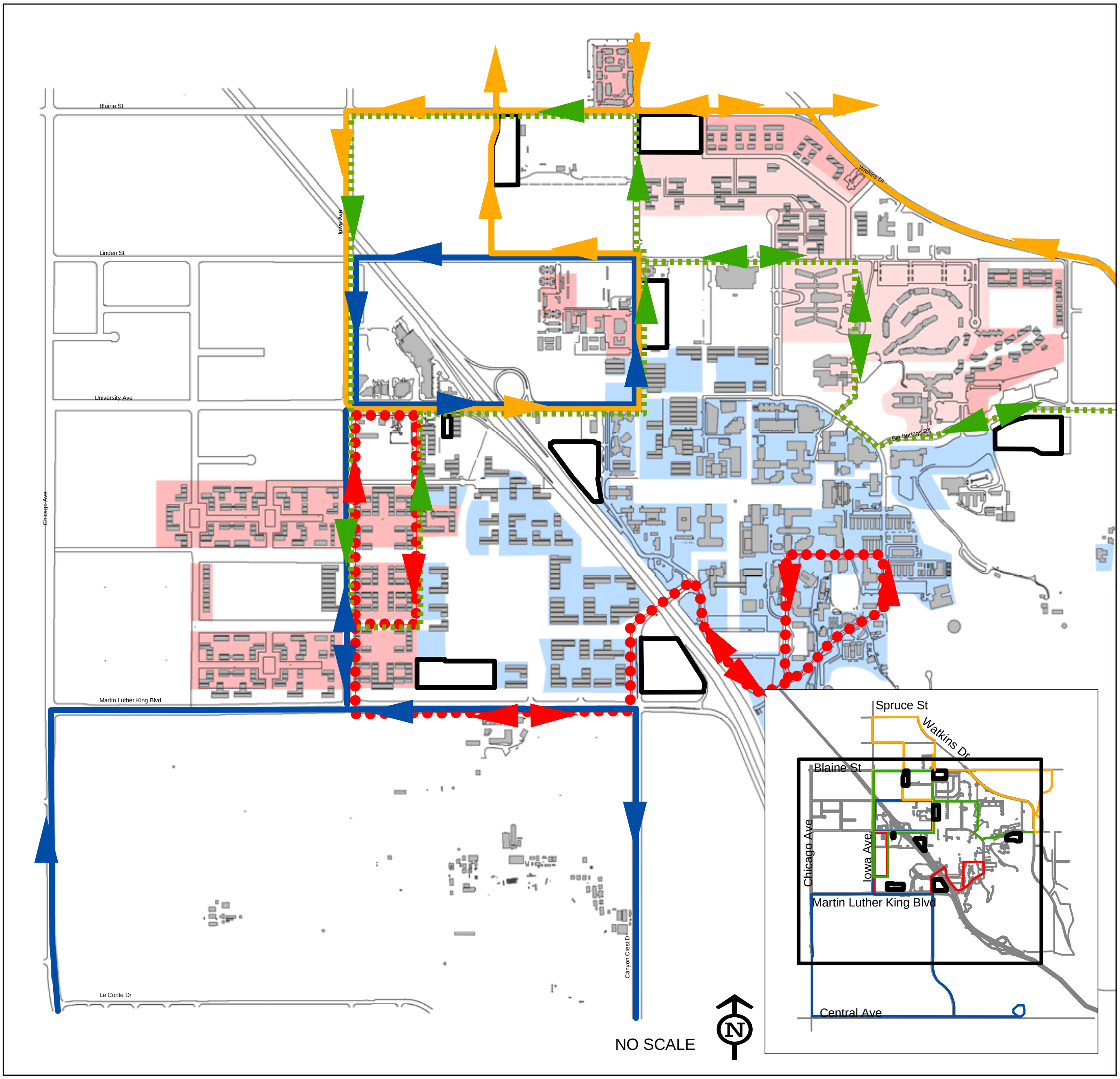
- Create a "Transportation" link on the UCR website homepage which takes people directly to the transportation information currently provided in the TAPS website.

5.6 Pedestrian

The Long Range Strategy uses a combination of vehicle-free zones and strategically placed overpasses to eliminate conflicts between pedestrians and automobiles, and to help bridge the East and West Campuses. The plan also outlines steps UCR should take to further promote pedestrian travel by making walking a safer and more pleasant experience.

The Long Range Strategy for UCR's pedestrian network as follows:

- At major sources of pedestrian and vehicle conflicts, redesign sections of the inner campus loop as pedestrian zones which prohibit the intrusion of all vehicles except emergency vehicles, Special Student Services shuttles, and/or point-to-point shuttles for disabled travelers. These pedestrian zones are highlighted in red in Figure 5-1:
  - On North Campus Drive between Aberdeen Drive and the future dining center (currently Veitch Student Health Center) access road.



LEGEND

Buildings

Future Buildings*

Future Parking Structures

*Future Buildings are the proposed buildings from the East Campus Entrance Area Study and from the West Campus Area Plan and the Strategic Plan for Housing (For capacity study only)

Future Land Use

Academic

Family, Apartment Housing and Related Support

Residence Hall and Related Support

Campus Transits

Gold Line

Blue Line

North Campus Loop

South Campus Loop

Note: These lines represents suggested routes that might be used to provide service between various area of the campus.

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 5-3

Long Range Strategy for Transit 2015

- On Aberdeen Drive south of the access control, convert the east roadway and sidewalk to a pedestrian zone.
- On West Campus Drive between Canyon Crest Drive and the entrance to Parking Lot #4.

■ Develop grade separations to segregate pedestrians and bicycles from automobiles, and to facilitate pedestrian flow in the following locations (shown in purple in Figure 5-1):

- Across North Campus Drive, linking the new dining center with the East Campus core.
- Across Iowa Avenue, linking new campus residential areas with the West Campus core.
- Across I-215/SR-60, linking the West Campus core with the East Campus core.

■ To promote walking as a viable means of travel around the campus, continue to foster a physical environment that provides pedestrians with convenient, safe, and aesthetically pleasing paths. Use the following guidelines as the campus grows:

- As buildings are designed, place sidewalks and paths in places pedestrians are most likely to travel.
- As parking structures are designed, place walkways in places pedestrians are likely to travel and place crosswalks in places where safe crossing can be accommodated.
- Consider second level walkways when appropriate to link parking structures with buildings or with other parking structures.
- Design landscaping and structures to provide shade, such as trees or arcades and provide benches for waiting and resting.
- Develop and implement a systematic lighting plan for the campus.
- Ensure that disabled access to buildings is well lit.
- Enhance the "safe path" program.
- Expand provision of campus maps/wayfinding.

■ Continue and expand, as needed, the campus escort service, and coordinate it with evening/night campus shuttle service.

5.7 Bicycles

One of the challenges in planning for UCR's future bicycle system is to provide bicyclists convenient access to the campus core while minimizing pedestrian and bicycle conflicts within the inner core. The Long Range Strategy balances these factors by providing bicyclists with a series of bike lanes, routes and paths that allow them to park within minutes of various destinations on campus. The inside core of the East Campus, however, is designated as a dismount zone to discourage cyclists from riding in areas that experience heavy pedestrian traffic.

The Long Range Strategy arranges bike paths and routes to encourage bicyclists to avoid dismount zones, relying exclusively upon enforcement would be a labor-intensive, difficult task. Bicycle parking will be located at centralized nodes at the terminus of campus bike paths that lead exclusively to bike racks. These direct bicycle paths will provide cyclists with quicker, pedestrian-free alternatives to riding through crowded central malls.

Centralizing bike parking not only minimizes bicycle use through pedestrian malls, but also benefits bicyclists by offering better security. Centralized bike parking nodes should meet the following criteria:

- Location away from building entrances, especially handicapped entrances.
- Provide adequate lighting.
- Contain bike racks compatible with all types of locks, and include bicycle lockers.

The MMTMS bicycle plan also includes a series of bicycle policies designed to encourage and promote bicycle use. The Long Range bicycle strategy is detailed below:

- Create a system of bike paths, lanes, and routes which link with bike lanes (see Figure 5-4) on City streets and bring bicycles into the campus core, but not in the Carillon Mall.

- Within the campus, create several bike paths or lanes to bring bikes from the loop road into the campus core. These paths or lanes will terminate at bike parking nodes – centralized bike parking areas with secure bike parking and good lighting. These bike parking nodes (shown as circles on Figure 5-4) should be located so that every building within the campus core is within a 2-3 minute walk of a node.

- Bike lanes and paths on campus will not penetrate the campus core beyond the bike parking nodes – the interior of the core will be considered a pedestrian zone and bike dismount area.

- Develop a campus bike map which shows on-campus bike facilities and connections to off-campus bike lanes, and lists campus bike policies and rules.

- Ensure that bike racks are compatible with different types of locks.

- Provide secure bike parking at appropriate multi-modal transfer locations, such as adjacent to parking structures and at the proposed Metrolink station.

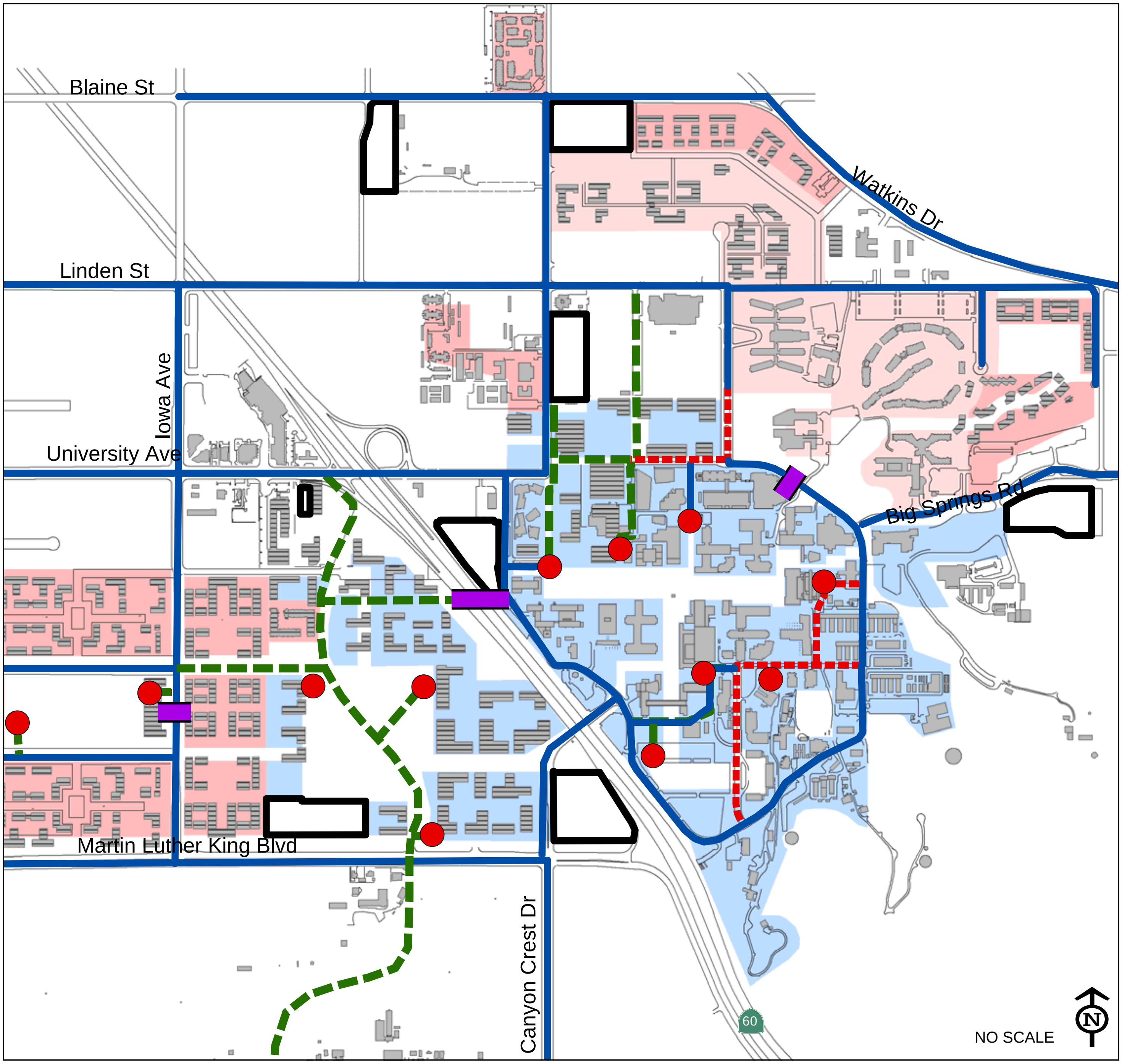
- Create a campus bicycle registration/license program, and offer bicycle safety courses.

- Facilitate a bike shop on campus to provide bike sales, repairs, and maintenance.
- Allow Segways and motorized bicycles to use designated bike lanes and bike paths.
- Develop speed limits on interior campus bike paths.
- In conjunction with secured funding, develop a pedestrian/bicycle bridge across I-215/SR-60 to link the East and West Campuses. The bridge should be designed to be inviting and safe for users, could be integrated with the parking structure to be constructed on Lot 1, and should connect with a bike trail along the Gage Canal west of I-215/SR-60.

5.8 Transportation Demand Management

The MMTMS also recommends a series of transportation demand management (TDM) policies to encourage travelers to find alternatives to automobile travel.

- Continue existing programs to provide incentives for alternative modes (carpooling, transit use, bicycling, and walking) for commuters.
- Adopt campus policies to encourage flexible or staggered work hours for staff.
- Use campus transportation website, registration packets, Scotmail, and other methods to disseminate information about available campus transportation programs and incentives.
- Publicize opportunities and benefits for bicycling and walking on campus as part of a campus wellness program.
- Support RCTC's development of Metrolink service on the San Jacinto Branch line. When in operation, provide campus shuttle service between the nearest station and East and West Campuses.
- Continue to provide campus shuttle service between the Downtown Riverside Metrolink Station and the campus.



LEGEND

Buildings

Future Buildings*

Future Parking Structures

*Future Buildings are the proposed buildings from the East Campus Entrance Area Study and from the West Campus Area Plan and the Strategic Plan for Housing (For capacity study only)

Future Land Use

Academic

Family, Apartment Housing and Related Support

Residence Hall and Related Support

Pedestrian/Bicycle Overpass

Centralized Bicycle Rack Locations

Bicycle Lanes (Striped Lanes on Roads or Sidewalks)

Bicycle Paths (roads designated exclusively for bike use)

Bicycle Routes (roads signed as bicycle routes, but without striped lanes)

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 5-4

Long Range Bicycle Strategy 2015

6.0 IMPLEMENTATION AND PHASING

6.1 Introduction

Enacting the MMTMS Long Range Strategy will require a phased approach to implementation. Transportation system enhancements and policy changes must be coordinated with gradual land use changes at UCR. Some components of the Long Range Strategy require the establishment of certain prerequisites. This section outlines an implementation and phasing strategy that helps to ensure the plan corresponds to changes in the campus, student enrollment, and physical conditions. This implementation and phasing strategy also identifies prerequisites – such as specific developments on campus or the prior implementation of other MMTMS recommendations – that must be in place for each MMTMS component.

An implementation and phasing strategy enables UCR to begin implementing immediate solutions to urgent problems. The 2015 timeline for the MMTMS was established to develop a long-term vision for transportation to serve the student and employment growth outlined in the *draft 2004 LRDP*. The implementation and phasing strategy identifies a logical sequence of steps to move from current conditions to full implementation of the Long Range Strategy.

The implementation and phasing strategy has three different phases:

- **Immediate Phase:** 0-2 years
- **Short-Range Phase:** 3-5 years
- **Long-Range Phase:** 6-10 years

The following sections detail the implementation and phasing strategy. This discussion includes both transportation system components (*Actions*) and recommended policy changes (*Policies)* that should be implemented during each phase. This section also identifies prerequisites that must be in place prior each action or policy change.

6.2 Immediate Phase (0-2 years)

The phase seeks to eliminate one of UCR's most pressing transportation problems, conflicts between motorized and non-motorized travel, by limiting access to the loop road. This strategy, however, requires the ultimate completion of long-term land use changes, such as shifting from interior parking lots to peripheral parking structures for maximum results.

Full implementation of these changes in UCR's parking system will take years. In the meantime, interior parking lots will still necessitate some access to the inner campus loop. For this reason, the Immediate Phase leaves the majority of the loop road open. To minimize conflicts, the Immediate Phase limits personal vehicle access in certain sections of the inner campus loop road. These access controls and restricted turning movements are illustrated in Figure 6-1.

The Immediate Phase also identifies opportunities to implement a series of policy changes that lay the groundwork for UCR's long range goals to shift to a more multimodal, pedestrian-friendly transportation network.

6.2.1 System Improvements

Action	Prerequisites
1a. Implement peak period access controls on West Campus Drive, Aberdeen Drive, and North Campus Drive.	None
1b. Implement permanent access controls on West Campus Drive, Aberdeen Drive, and North Campus Drive.	None
2. As interior parking lots convert to building sites, begin creating centralized bicycle parking by placing some bicycle parking on former lots.	Interior parking lots on campus convert to other land uses.
3. Take out speed bumps from the campus loop road to reduce wear on transit vehicles.	As personal vehicle traffic is removed from the inner campus loop.
4. Begin implementation of sign program for new construction.	Sign program

6.2.2 Policies

Action	Prerequisites
5. Develop sign program	None
6. Implement lot-specific parking permit system.	None
7. Enforce use of lot-specific permits from 7 a.m. to 6 p.m.	None
8. Explore with the City of Riverside improvements to the University Avenue intersection with Canyon Crest.	Concept plan for East Campus Entrance Area Study.
9. Gradually replace current campus fleet vehicles with electric or alternative fuel vehicles.	As new or replacement fleet vehicles are needed.
10. Over time, replace current campus fleet with vehicles of the appropriate size for use.	As new or replacement fleet vehicles are needed.
11. Provide 5-10 minute headways on Highlander Hauler and Trolley Express transit loops.	In conjunction with increasing demand and available funding.
12. Monitor and adjust service routes and headways of Highlander Hauler to maintain optimal transit service to campus from nearby housing areas.	In conjunction with residential patterns of campus population and available funding.
13. Develop a transportation opportunities funding plan every 3-5 years. Pursue transportation funding grants.	Grant writer.
14. Continue to ensure that all campus transit and shuttle vehicles are wheelchair accessible and	As new or replacement vehicles are needed.

provide bike racks.	
15. Include transit information in student/staff/faculty orientation packets.	None
16. Continue to implement evening and night demand-responsive shuttle on campus, coordinated with evening escort service.	In conjunction with evening parking permit system for East Campus core.
17. Design parking structures to optimize security.	As structures are designed.
18. Create a campus bicycle registration/license program, and offer bicycle safety courses.	None
19. Develop and distribute a campus bike map.	None
20. Ensure that new bike racks being installed are compatible with different types of locks.	None
21. As buildings are designed, place sidewalks and paths in places pedestrians are most likely to travel.	In conjunction with building design.
22. As parking structures are designed, place walkways in places pedestrians are likely to travel, and place crosswalks in places where safe crossing can be accommodated.	In conjunction with design of parking structures.
23. Consider second level walkways when appropriate to link parking lots with buildings or with other parking lots	In conjunction with design of parking structures.
24. Design landscaping and structures to provide shade and seating for pedestrians.	As part of building design and campus master plans.
25. Ensure that handicapped access to buildings is well identified and well lit.	As part of building design.
26. Continue, enhance and periodically update the "safe path" program.	None
27. Continue the campus escort service, and coordinate it with evening/night campus shuttle service. Expand when demand requires.	None
28. Continue and periodically update programs to provide incentives for alternative modes for commuters.	None
29. Adopt policies to encourage flexible or staggered work hours for campus staff.	None
30. Develop a "transportation" link on the campus website home page that leads to TAPS website.	None
31. Expand dissemination of information about available campus transportation programs and incentives.	None
32. Include promotion and benefits of walking and bicycling on campus as part of a campus wellness program.	Development of a campus wellness program in connection with recreation programs.
33. Support Riverside County Transportation Commission's (RCTC) development of Metrolink service on the San Jacinto Branch line.	None

34. Implement a policy of no parking of personal cars/vehicles at loading areas from 7 a.m. to 6 p.m., and then only with an evening permit.	None
35. Limited access to dock areas begins in areas behind loop road access controls.	Provide access controls
36. Implement evening permit system in dock areas with access controls.	Provide access controls
37. Encourage the City of Riverside to implement residential parking permits zones on neighboring community streets.	As parking moves out of the campus core and if parking in neighborhoods becomes a problem.

6.3 Short-Range Phase (3-5 years)

The Short-Range Phase begins to more fully address the problem of conflicts on campus. The plan assumes the elimination of some interior parking lots on campus. As a result, the Short-Range Phase includes closing additional sections of the campus loop road to personal vehicle traffic. These access restrictions are illustrated in Figure 6-2. If pedestrian/vehicle conflicts persist, the plan recommends examining the need to signalize an intersection in the interim while the loop remains open; reduced traffic from access controls, however, may be sufficient that a traffic signal will not be needed.

The Short-Range Phase takes advantage of reduced traffic on the inner campus loop to begin to implement the MMTMS long range bicycle network. Lower volumes also allow the initiation of increased transit services recommended in the MMTMS Long Range Strategy. The Short-Range Phase further phases in policies designed to encourage alternatives to automobile use.

6.3.1 System Improvements

Action	Prerequisites
38. Retrofit and/or implement sign program on existing facilities.	None.
39. Signalize intersection of North Campus Drive with Big Springs Road if needed to provide required timing for pedestrian flow and vehicles.	Monitor conditions at this location with implementation of access controls (#1).
40. Develop auxiliary funding sources (such as grants or student fees) to assist in supporting the campus transit program.	Grant writer/ student referendum
41. Conduct feasibility design study of I-215/SR-60 freeway overcrossing for bicycles and pedestrians.	In conjunction with design of parking structure for Lot #1 site.
42. Implement additional access controls on: • West Campus Drive near Lot #1. • Linden Street.	 • Parking structure on Lot #1 • New housing north of Linden
43. Create pedestrian/bicycle zone on West Campus Drive west of the Canyon Crest undercrossing.	Access controls on West Campus Drive at Canyon Crest Drive undercrossing.
44. Create pedestrian/bicycle zone on east side of	Access controls on Aberdeen

Aberdeen Drive/North Campus Drive.	Drive and on North Campus Drive.
45. Develop passenger loading/dropoff zones and parking/information kiosks.	In conjunction with adjacent parking structures.
46. Create a centralized campus receiving facility.	In place prior to access controls on Big Springs and Canyon Crest.
47. Extend Trolley Express (north campus transit loop) to serve parking structures on northern half of campus.	As parking structures are constructed.
48. Extend Trolley Express to serve West Campus core.	As West Campus core is developed.
49. Implement south campus transit loop to link East Campus core with West Campus core and parking structures along Martin Luther King Boulevard.	As West Campus core is developed and parking structures are constructed.
50. Develop bike lanes and routes in East Campus core.	None
51. Finish developing bike parking nodes in East Campus core.	East Campus bike lanes and routes.
52. Develop West Campus bike lanes, paths, and parking nodes.	In conjunction with development of West Campus.

6.3.2 Policies

Action	Prerequisites
53. Consider student fees to support campus shuttles and student access to RTA transit services.	After development of transportation improvement program and funding strategy.
54. Provide secure bike parking adjacent to campus parking structures.	In conjunction with construction of parking structures.
55. Facilitate a bike shop on campus that provides sales and repair services.	None
56. Allow designated Segways and motorized bicycles to use designated campus bike lanes and bike paths.	Development of campus bike lanes and paths.
57. Develop and implement a systematic lighting plan for the campus.	None

6.4 Long-Range Phase (6-10 years)

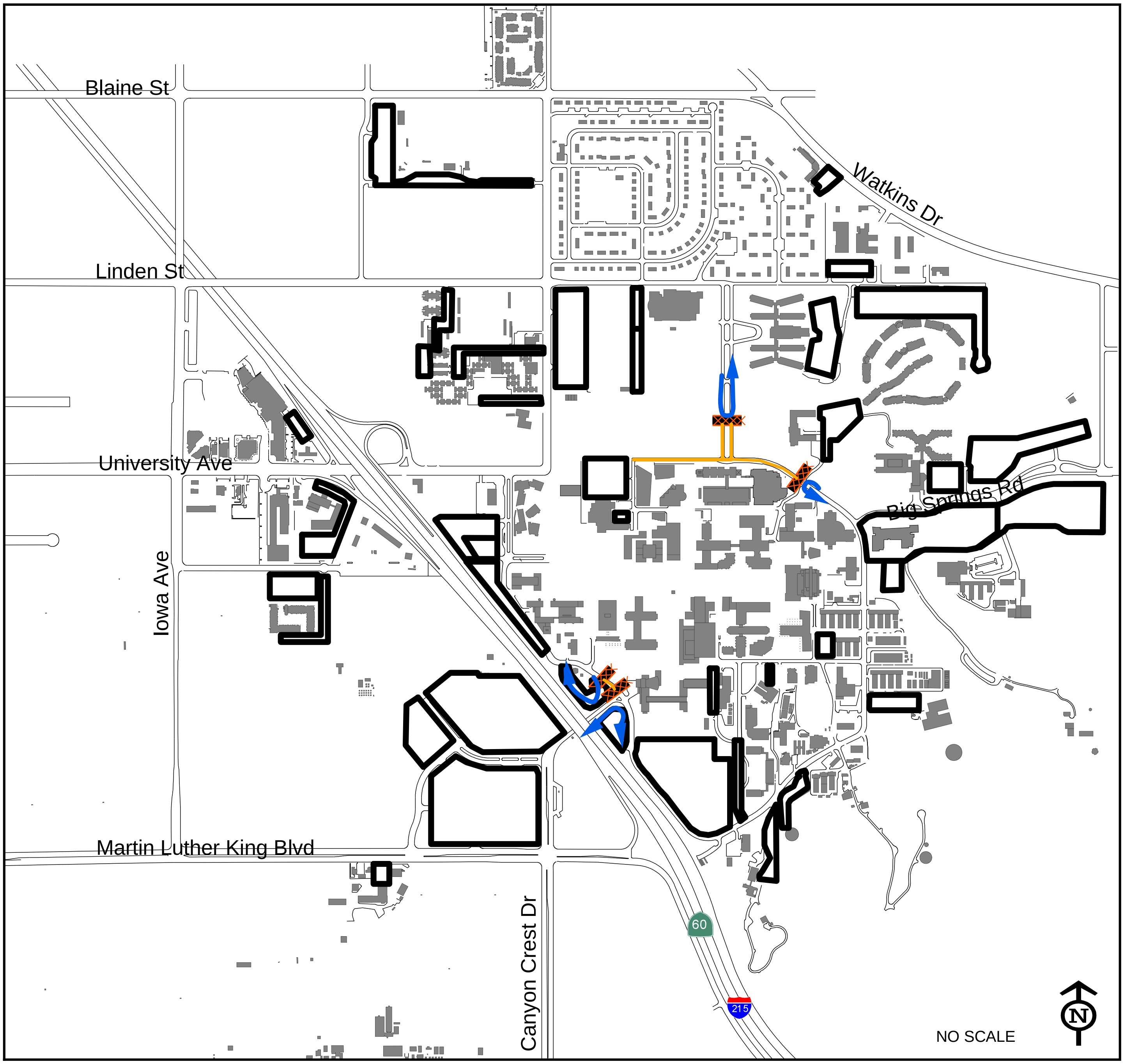
The long range strategy phases in the remaining items that constitute the MMTMS Long Range Strategy. Elements of the Long-Range Phase are shown on the Long-Range strategy maps (Figures 5-1 through 5-4 in Chapter 5).

6.4.1 System Improvements

Action	Prerequisites
58. Implement additional access controls on: • Canyon Crest at I-215/SR-60 going east. • Big Springs Road.	• Adjacent parking structure; closure of Lot #6; in conjunction with Big Springs closure. • Adjacent parking structure; in conjunction with Canyon Crest.
59. Construct I-215/SR-60 bicycle/pedestrian overcrossing.	In conjunction with development of parking structure on Lot 1.
60. Construct Iowa Avenue bicycle/pedestrian overcrossing (if Iowa is widened to 4-lanes).	In conjunction with development of West Campus.
61. Construct bicycle/pedestrian overcrossing of North Campus Drive.	After development of main dining facility and adjacent access road.
62. Implement a daytime demand-responsive shuttle on campus to serve the visibility and mobility impaired and special guests.	In conjunction with implementation of new loading dock access, parking policies, and closure of interior lots.
63. Implement shuttle to UCR from new Metrolink station on San Jacinto Branch Line.	When Metrolink service begins operation on this line.
64. Take out speed bumps from the campus loop road to reduce wear on transit vehicles.	After personal vehicle traffic has been removed from the campus loop road.

6.4.2 Policies

Action	Prerequisites
65. Fully implement loading dock access controls and related parking policies for East Campus core	Access controls on Aberdeen, West Campus Drive, Canyon Crest Drive, Big Springs Road.
66. Fully implement evening parking permit system for East Campus core	Access controls on Aberdeen, West Campus Drive, Canyon Crest Drive, Big Springs Road.



LEGEND

Buildings

Parking Lots

Potential Immediate Action Items

Potential Access Controls

Vehicle Circulation

Open to General Purpose Traffic

Closed to Privately Owned Vehicles (POV)

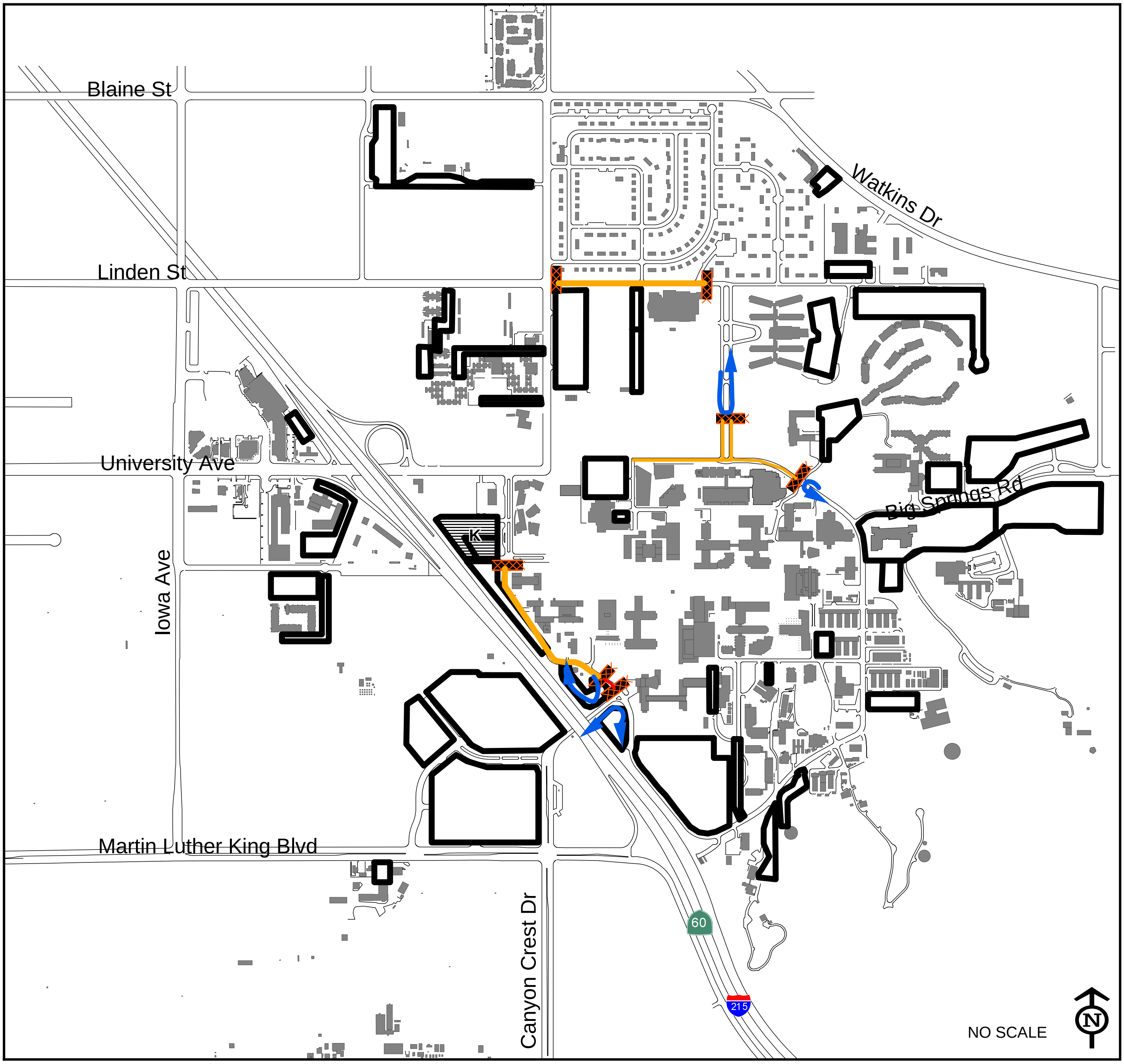
POV Traffic Control

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 6-1

Immediate Action Items



LEGEND

Buildings

Parking Lots

Parking Structures

Potential Short-Range Action Items

Potential Access Controls

K Manned Information Kiosk

Vehicle Circulation

Open to General Purpose Traffic

Closed to Privately Owned Vehicles (POV)

Vehicle Free Pedestrian/Bicycle Zone
(Except for Emergency Service Vehicles)

POV Traffic Control

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 6-2

Short-Range Action Items

7.0 COST ESTIMATES AND FUNDING

Section 7 presents estimated costs of the proposed MMTMS, as well as potential sources of funding. Estimates of capital costs, as well as operations and maintenance (O&M) costs, are summarized and described for the three timeframes listed in the MMTMS phasing plan: (a) Immediate actions (0-2 years), (b) Short-Range actions (3-5 years), and (c) Long-Range actions (6-10 years). All costs are shown in current year dollars (2004).

These costs are concept-level estimates developed using sketch planning methods. Their purpose is to inform decision-makers and study participants of the financial implications of the various transportation improvements. In addition, these cost estimates provide the basis for identifying and pursuing potential sources of funding identified in *Section 7.3*.

At this early stage in the project development process, a great deal of uncertainty exists as to how the proposed transportation improvements will be designed and eventually constructed. Consequently, several assumptions were applied to provide the necessary level of definition for the proposed actions. For those transportation improvements where the level of uncertainty is especially high, liberal contingencies were added to account for future, unanticipated costs.

The assumptions used to develop the planning-level cost estimates, as well as costing methodologies, are described in the following subsections. Detailed cost information, including quantities and unit costs, are provided in *Appendix D* of this report.

7.1 Capital Costs

In the MMTMS Study, capital costs represent a change or addition to the existing transportation infrastructure, such as new bike paths, pedestrian overcrossings, dedicated pick-up/drop-off zones, or street closures. In some instances, capital costs denote physical assets with a life of five years or more, such as bus vehicles and new access control gates. In a few cases, the capital cost estimates account for the one-time labor costs associated with starting up and implementing a new program – for example, a bicycle registration/license program or a program to determine appropriate pricing for parking.

In developing the cost estimates, efforts were made to identify the major expenses attributable to a particular course of action. Smaller or detailed capital expenses are grouped together and accounted for in the unit cost estimates for each major cost element. For example, the implementation of centralized bicycle parking areas on campus encompass items such as signing, striping, lighting, and some landscape treatments as part of the overall unit cost.

Further, costs are only shown for those transportation actions listed in *Section 6.0* of this report and that, by definition, would entail an additional capital expense to the university beyond what is already planned or expected to occur through other university planning and development efforts. This avoids double-counting costs associated with transportation infrastructure improvements already identified by the *draft 2004 LRDP*, the *East Campus Entrance Area Study*, or the *Strategic Plan for Housing*

For purposes of consistency, total capital costs are shown in current year dollars (Year 2004), in thousands.

7.1.1 Capital Cost Summary

In the MMTMS study, capital cost estimates were developed for a wide range of proposed transportation improvements, which cover a multitude of transportation projects, operational strategies, programs, policies, and plans. It is important to note that many of the proposed transportation improvement policies have no or very minimal capital expenses associated with their implementation. Consequently, these items were not costed. Examples of these actions include: policies to enforce the use of lot specific parking permits in the evening hours, adoption of policies to encourage flexible or staggered work hours for campus employees, or provisions that allow Segways and motorized bicycles to use designated bicycle lanes, among others. Nearly all of the policy recommendations fall into this "no capital cost" category.

Other proposed transportation improvements represent actions that would normally be accounted for in the proposed design of new campus buildings and new parking structures to be developed at some future date. These types of items include recommendations to consider second level walkways to link parking structures with buildings; pedestrian walkways and design elements; or parking structure designs that optimize security. These recommended actions were treated as policy guidance since the capital costs associated with these features would typically be represented in the capital budget for each project. These items are, therefore, not reported in the capital cost estimates presented in *Section 7.1*.

This leaves a number of capital expense items that can be grouped into five general cost categories for the overall Multimodal Transportation Management Strategy:

- Roadway Access & Traffic Control
- New Transportation Facilities
- Bicycle System Improvements
- Improved Transit Service
- Programs, Policies, and Plans

Table 7-1 presents this capital cost information in summary form for the three timeframes (Immediate, Short-Range, and Long-Range) based on these five cost categories in order to provide a "big picture" look at the range of estimated costs. A more detailed breakdown of each capital cost category is provided in *Sections 7.1.2* through *7.1.6*. Not surprisingly, the category with the highest cost is New Transportation Facilities, which encompasses items such as new information kiosks, pedestrian/bicycle overcrossings, and dedicated pick-up and drop-off areas for transit and carpools. The lowest capital cost category is Programs, Policies, and Plans, which covers administrative start-up costs associated with implementing new programs.

Table 7-1: Summary of Total Capital / Start-up Costs (in thousands of 2004 dollars)

Cost Category	Immediate Actions (0-2 years)	Short-Range Actions (3-5 years)	Long-Range Actions (6-10 years)	TOTAL
Roadway Access & Traffic Control	$510	$715	$964	$2,189
New Transportation Facilities	$0	$349	$9,993	$10,387
Bicycle System Improvements	$361	$721	$566	$1,648
Improved Transit Service	$1,380	$1,878	$2,530	$5,788
Programs, Policies, and Plans	$33	$233	$18	$284
TOTAL	$2,284	$3,941	$14,071	$20,296

7.1.2 Roadway Access & Traffic Control

Table 7-2 provides a breakdown of the major capital cost items associated with implementation of the vehicle circulation and traffic control measures. These measures involve three principal strategies that relate to managing the interface between vehicles, pedestrians, and bicyclists on the inner campus loop road: (1) traffic signals; (2) a series of automatic gates that bar personal vehicles from entering the inner campus; and (3) pavement removal and reconstruction of key sections of the inner campus loop road to provide pedestrian/bicycle zones.

A traffic signal is proposed as an interim solution at a problem location (Big Springs Road) on the inner campus loop road as a Short-Range action item. Ultimately, this signal may not be needed due to proposed vehicle access controls at other locations and the resulting shifts in future travel patterns, but since it represents a potentially large cost item it has been included in the cost calculations. The cost represents that of a typical traffic signal for a T-intersection with vehicle and pedestrian actuation.

The second strategy involves implementing vehicle access control measures at various locations along the inner campus loop road and on some roads leading into campus. Only vehicles with electronic transponders or card keys would be permitted to enter. At these locations an automated gate (or bollards) will prohibit entry by unauthorized vehicles. Some access control gates will be provided in the immediate time frame, but the majority of the access control points will be implemented in the immediate and short-range timeframes, and all will be in place in the long term. Gates and landscaping will be used to prohibit entry by unauthorized vehicles. At each access control location, signing and striping must be provided, and in some locations room for vehicle turnarounds will be needed to enable vehicles not familiar with the campus traffic circulation system to turn around and find an alternate route.

The cost for each access control location includes these items, assuming automated bollards (the most expensive option) are used for access control gates. In addition to the physical gates, hardware, and electronic controls at each access control point, the system will also require transponders and smart cards for vehicles authorized to enter, as well as an operating system for distributing and monitoring the cards. The cards could be semi-permanent (plastic) or temporary (paper) depending upon the user or the conditions of their use. In addition, there will be administrative labor expenses associated with program start up – for example, identifying and tracking authorized users (e.g., campus maintenance vehicles) as well as provisions for temporary users (e.g., evening graduate student permits or visitors). These are considered to be one-time, set up costs that may be contracted out or may be an in-house activity. The costs for operating the vehicle access control system are accounted for in *Section 7.2, Operating and Maintenance Costs*.

Capital expenses associated with the third strategy, Establish Pedestrian/Bicycle Zone, are largely construction activities that will involve removing portions of existing roadways and replacing those sections with new pavement for pedestrians and bicyclists as well as landscaping. These costs are estimated on a square foot basis. In addition, some signing, striping, and hardscape design features will be required to direct pedestrian and bicycle travel within these areas and to provide advanced warning to vehicles not to enter these areas.

Table 7-2: Roadway Access & Traffic Control
Estimated Capital / Start-up Costs
(in thousands of 2004 dollars)

Roadway Access & Traffic Control Cost Elements	Immediate Actions (0-2 years)	Short-Range Actions (3-5 years)	Long-Range Actions (6-10 years)	TOTAL
New Traffic Signal	$0	$98	$0	$98
Implement Vehicle Access Control				
Gates/Equipment	$300	$300	$300	
Installation/Control System	$120	$120	$120	
Signing/Minor Improvements	$68	$68	$68	
Removal of Speed Bumps	$4	$0	$4	
Program Start-up	$18	$0	$0	
Subtotal	$510	$488	$492	$1,490
Establish Pedestrian/Bicycle Zone				
Street Removal	$0	$6	$21	
New Pavement/Landscaping	$0	$113	$422	
Signing/Striping/Miscellaneous	$0	$10	$29	
Subtotal	$0	$129	$472	$601
TOTAL	$510	$715	$964	$2,189

7.1.3 New Transportation Facilities

Table 7-3 illustrates the capital costs associated with implementing new transportation facilities including overcrossings, information kiosks and dedicated pick-up/drop-off areas for carpoolers.

Table 7-3: New Transportation Facilities
Estimated Capital Costs
(in thousands of 2004 dollars)

New Transportation Facilities Cost Elements	Immediate Actions (0-2 years)	Short-Range Actions (3-5 years)	Long-Range Actions (6-10 years)	TOTAL
Dedicated Pick-up/Drop-off Areas	$0	$119	$358	$477
New Information Kiosks	$0	$75	$225	$300
New Overcrossings				
Over I-215 Freeway	$0	$200	$6,160	
Over North Campus Drive	$0	$0	$2,500	
Over Iowa Avenue	$0	$0	$750	
Subtotal	$0	$200	$9,410	$9,610
TOTAL	$0	$394	$9,993	$10,387

For the dedicated loading/unloading zones a prototypical design concept was identified that would allow sufficient space for vehicles to pull out of street traffic, wait to drop-off or pick-up passengers, and then re-enter the traffic stream. Storage for approximately 7 vehicles was assumed. A lump sum unit cost was then developed for the prototypical concept based on widening a portion of the roadway, new pavement, signing, striping, curb and gutter. The cost to acquire additional land was not included in the estimate. This lump sum cost was applied based on the number of dedicated pick-up/drop-off areas proposed to be implemented in each timeframe.

Four new information kiosks are proposed as part of the short-term action plan. It is assumed that these information kiosks will be located either within or in the vicinity of new parking structures proposed under the Long Range Development Plan. Cost estimates for the kiosks were based on UCR's cost experience.

A cost estimate for developing a Centralized Receiving Facility has not been developed since the university would implement it incrementally over time, and it could ultimately be located in one of several locations on campus or remain in the existing corporation yard with some expansion.

A conceptual construction cost estimate was prepared for the three overcrossings shown in Table 7-3 based on the estimated length and width of each facility, approximate grade differentials, and the relative complexity of each project. For example, a new pedestrian/bicycle overcrossing that spans the I-215/SR-60 freeway will require the cooperation and approval of Caltrans. The expense associated with construction of new overcrossings is chiefly structural and thus costs were developed using an assumed bridge type derived from other, similar applications. See Appendix D for additional details. It is assumed that both pedestrians and bicycles will use the proposed structures and that the bridge design will need to accommodate handicapped access as well as provide for adequate lighting and pedestrian security. Actual construction will take place as part of the long term plan, however, a feasibility study is also proposed as a short-term action item for the I-215/SR-60 overcrossing that will delineate the specific location and design concept for this particular structure.

7.1.4 Bicycle System Improvements

The cost to construct and implement proposed bicycle system improvements is shown in Table 7-4. These capital expenses fall into two general categories: (1) New / Added Bicycle Facilities and (2) Bicycle Support Facilities.

Table 7-4: Bicycle System Improvements
Estimated Capital Costs
(in thousands of 2004 dollars)

Bicycle System Cost Elements	Immediate Actions (0-2 years)	Short-Range Actions (3-5 years)	Long-Range Actions (6-10 years)	TOTAL
New/Added Bicycle Facilities				
Bike Paths (Separate Path)	$36	$179	$143	
Bike Lanes (Striping)	$9	$18	$9	
Bike Routes (signing only)	$6	$2	$0	
Subtotal	$51	$199	$152	$402
Bicycle Support Facilities				
Bike Racks	$199	$332	$266	
Fully Secured Bike Lockers	$8	$13	$10	
Centralized Bike Parking Areas	$103	$172	$138	
Bike Dismount Zone Signing	$0	$5	$0	
Subtotal	$310	$522	$414	$1,246
TOTAL	$361	$721	$566	$1,648

The first category, Bicycle Facilities, addresses the provision of new bike routes, bike lanes, and bike paths. Capital costs for these types of facilities are generated on a "per linear foot" basis. Bike routes have the lowest capital cost because these bicycle facilities primarily involve the implementation of signage on existing local streets or campus roadways in order to identify these roadways as designated bike routes. Bike lanes have a slightly higher cost because they involve adding striping to existing roadways as well as spot roadway improvements or pavement repair to provide a protected area for bikes to travel. It is assumed that sufficient roadway width is generally available on identified streets to add a 5' to 8' bike lane. Bike paths are the most capital intensive since they entail the construction of new pathways, approximately 10' wide, to be used exclusively by bikes. Primary cost elements for bike paths are grading and new pavement. In addition, the cost factors used for bike paths assume a combination of open space, landscaping, physical barriers, signing, and striping to clearly delineate these bikeways and to discourage intrusion by other users or by cross traffic.

The second category, Bicycle Support Facilities, encompasses adding additional bike racks and bike lockers in addition to establishing bicycle dismount zones and centralized bicycle parking areas. Costs for bike racks and bike lockers are calculated on a "per space" basis. The number of additional spaces that will be needed for each type (bike rack versus secured bicycle locker) were estimated for each of the three timeframes (Immediate, Short-Range, and Long-Range) based on anticipated campus growth and mode shift (new bicycle users) and then multiplied by the appropriate unit cost factor to come up with these costs. On the other hand, costs associated with the provision of centralized bike parking areas mostly involve items such as pavement or open space, security features, lighting, screen landscaping, pavement markings, and signage. The locations of these areas are identified on Figure 5.4 in *Section 5.7*. Costs for these areas were estimated on a lump sum basis. The purpose of the pavement markings and signage is to inform bicycle users where to leave their bikes and also to discourage them from riding beyond the bicycle parking area and through the campus interior (Carillon Mall area). Note that the cost of providing bike racks in the centralized parking areas are accounted for as a separate cost item. Bicycle dismount zones refer to those relatively large areas within the campus core where bicycle riding is prohibited. The capital costs associated with bicycle dismount zones are relatively small since signage at the boundaries and intermittent interior locations is the primary expense.

7.1.5 Improved Transit Service

The capital cost needed to implement increased transit service generally consists of the cost of purchasing new transit vehicles and the provision of transit stops along new routes. Costs associated with operating the transit service are discussed in *Section 7.2* of this report.

Two transit vehicle types were assumed for the future years: (1) small buses/shuttles for fixed route service such as the Trolley Express, Highlander Hauler, and Metrolink Shuttle; and (2) vans for point-to-point or demand response service. The cost estimates assume that the fleet of transit vehicles will operate on alternative fuels, will be handicapped accessible, and will include bike racks. Only the cost needed to expand the transit vehicle fleet to accommodate the proposed increases in transit service was included in the cost calculations. A spare vehicle ratio was assumed in the capital cost estimate for transit, starting with an existing spare vehicle ratio of 7:4 (4 spares to 7 operating buses) decreasing to a long-term ratio of 12:5.

Table 7-5: Transit System Improvements
(in thousands of 2004 dollars)

Cost Category	Immediate Actions (0-2 years)	Short-Range Actions (3-5 years)	Long-Range Actions (6-10 years)	TOTAL
Fixed Route Vehicles (Small Buses)	$1,380	$1,610	$2,070	$5,060
Pt. to Pt. Transit Vehicles (Vans)	$0	$200	$400	$600
New/Added Transit Stops	$0	$68	$0	$68
New Transit Stop with Turnout	$0	$0	$60	$60
TOTAL	$1,380	$1,878	$2,530	$5,788

In addition, it is estimated that approximately 28 new transit stops will need to be provided along new routes to facilitate transit use. These would include signs, benches/shelters, and sufficient sidewalk space for wheelchair loading areas. At one location, a bus turnout area will be required in addition to the transit stop. A lump sum unit cost was developed for each of these two facility types and applied based on the number of transit stops that would be required under each of the proposed timeframes.

7.1.6 Programs, Policies, & Plans

Although relatively low cost compared to the other categories, the implementation of some of the proposed programs, policies, and plans included in the Multimodal Transportation Management Strategy will require some start up costs. These costs are called out in Table 7-6. With the exception of the lighting plan, it is assumed the university will contribute the necessary administrative resources to initiate these programs. Therefore cost estimates were derived based on the amount of labor (FTEs) that would likely be required to get the program up and running. Only brand new or potentially complex programs are included in Table 7-6. If the proposed program or policy is generally an extension or expansion of a service already provided by the university, these additional costs are accounted for in *Section 7.2*.

The parking pricing program is potentially complex because it will involve establishing thresholds for optimal balance with regard to parking supply, equity, parking revenue, and transportation objectives such as encouraging the use of alternative transportation modes and use of remote parking areas. Specific parking policies will need to be developed and monitored for different groups of users. Parking supply will need to be tracked and mechanisms put into place so that prices can be adjusted for various user groups based on relative parking demand and related transportation objectives. It is anticipated that there will be some administrative cost to initiate this program.

Table 7-6: Programs, Policies, and Plans
Estimated Capital / Start-up Costs
(in thousands of 2004 dollars)

New Program Start Up Cost Elements	Immediate Actions (0-2 years)	Short-Range Actions (3-5 years)	Long-Range Actions (6-10 years)	TOTAL
Parking Pricing Program	$18	$18	$18	$54
Bicycle System				
Bicycle Registration Program	$10	$0	$0	
Bicycle Safety Courses	$5	$0	$0	
Campus Bike Map	$0	$15	$0	
Subtotal	$15	$15	$0	$30
Lighting System Plan	$0	$200	$0	$200
TOTAL	$33	$233	$18	$284

On the other hand, the bicycle programs are relatively straightforward: develop a campus bike map; implement safety educational courses; and initiate a bicycle registration program.

It is envisioned, although not required, that the study and design of a system-wide, lighting plan for the campus would be contracted out. The cost estimate presented in Table 7-6 for this item does not include actual construction or implementation.

7.2 Operating and Maintenance Costs

Operations and maintenance (O&M) cost estimates were developed for the three timeframes: Immediate, Short-Range, and Long-Range. Similar to the capital cost estimates, O&M costs are shown in current year dollars (2004). However, due the different nature of O&M costs, these cost estimates are summarized into cost categories by major transportation system as shown in Table 7-7. The category "General Items" captures those O&M cost elements that cross-cut all transportation modes.

- Roadway System Improvements
- Parking System Improvements
- Bicycle System Improvements
- Transit System Improvements
- Pedestrian System Improvements
- General Transportation Items

Table 7-7: Estimated Operating and Maintenance Costs
(annual cost, in thousands of 2004 dollars)
(costs in addition to existing O&M costs)

Cost Category	**Immediate Actions (0-2 years)**	**Short-Range Actions (3-5 years)**	**Long-Range Actions (6-10 years)**
Roadway System Improvements			
Inner Campus Access Program	$9	$18	$18
Information Kiosks	$0	$0	$80
Subtotal	$9	$18	$98
Parking System Improvements			
Parking Pricing Program	$35	$35	$35
Subtotal	$35	$35	$35
Bicycle System Improvements			
Bicycle Registration Program	$10	$10	$10
Bicycle Safety Courses	$7	$7	$7
Subtotal	$17	$17	$17
Transit System Improvements			
Fixed Route Service (Shuttles)	$770	$951	$1,435
Point-to-Point Service	$0	$272	$513
Metrolink Shuttle Service	$0	$0	$91
Subtotal	$770	$1,223	$2,039
Pedestrian System Improvements			
Expand Campus Escort Service	$10	$50	$100
Subtotal	$10	$50	$100
General Transportation Items			
Transportation Funding Plan	$50	$50	$50
Information/Promotional Materials	$18	$18	$18
Subtotal	$68	$68	$68
TOTAL	$909	$1,411	$2,357

The O&M cost estimates shown in Table 7-7 represent the difference between the future baseline scenario and the proposed transportation actions outlined in Sections 5 and 6 of this report. This means that the cost estimates generally do not include added operations and maintenance transportation cost items that would naturally occur on campus without the recommendations included in the MMTMS. For example, the university currently funds the operation of two information kiosks on campus. The MMTMS recommends a total of four information kiosks in the future years. Therefore the O&M cost estimates shown in Table 7-7 only shows staffing costs for two additional information kiosks. Further, O&M costs shown in the "Short-Range Actions" column are also presumed to be in place in the long-term along with the "Long-Range Actions." Therefore, the O&M costs are additive and tend to increase from left to right in Table 7-7 as future transportation actions are brought into play.

In general, only the major O&M cost items were included in the costing effort. In addition, the O&M cost estimates presented in Table 7-7 emphasize new operations costs that would be incurred by the university as opposed to everyday maintenance for these items. For example, O&M costs associated with maintaining equipment, facility upkeep, landscaping, and striping touchups of pavement areas introduced by the MMTMS were not estimated as this represents such a small piece of the campus's overall budget for these types of items.

The cost estimates presume that university staff would operate and maintain the facilities and programs included in the proposed actions. Therefore, O&M costs were derived based on average university department labor costs and the number of FTEs or hours that would be required to operate and maintain the various transportation improvements. By far, the largest component of O&M costs is attributable to labor.

In identifying potential O&M costs, the Multimodal Transportation Management Strategy introduces some actions or areas that would likely require additional enforcement. These include items such as enforcing informal drop-offs, discouraging illegal pedestrian movements, monitoring bike dismount zones, and added enforcement in outlying or remote parking areas. However, the measures taken to limit vehicle access to the inner campus loop will likely relieve the university from having to provide staff for purposes of traffic control and enforcement. Therefore, the O&M cost effort presumed that these actions taken together would offset each other, resulting in no net added O&M costs for enforcement.

O&M costs listed in Table 7-7 are further discussed in the following sections by major cost category. Cost items that have been included and general cost methods are outlined.

Roadway System Improvements: O&M costs associated with operating and managing the proposed roadway system improvements include monitoring the inner campus access program to determine which motorists and user groups are authorized to access and park within the inner campus loop; and staffing for the information kiosks.

Parking System Improvements: For the parking system, the only program that is envisioned to result in added O&M cost, beyond TAPS typical responsibilities and beyond the parking proposals discussed in the Long Range Development Plan, is the parking pricing program, which will be conducted in tandem with TAPS other parking management activities and which also will require active monitoring and adjustment to balance parking supply and parking revenue, while achieving other transportation objectives.

Bicycle System Improvements: Bicycle improvements are not expected to result in a significant increase in O&M costs. There will be some labor costs associated with running new bicycle program initiatives such as the bicycle registration/license program and safety courses, which could be further offset by greater use of student volunteers.

Transit System Improvements: By far, the largest O&M expense will be transit system operations. Future transit O&M costs were calculated based on the estimated number of additional vehicle service hours that will be required to operate the fixed route service (Highlander Hauler, Trolley Express, and Metrolink Shuttles) and the point-to-point / demand response service in the evening hours, for visually or mobility impaired persons, or for special guests. It is assumed that the university would operate all of these transit services. For the fixed route service, increases in vehicle service hours are driven by proposed improvements in transit vehicle frequency, extended hours, and new routes. Point-to-point transit service estimates are based on the number of vehicles in service and the hours of operation. O&M cost estimates for transit do not include farebox revenue.

Pedestrian System Improvements: The new O&M costs associated the pedestrian system improvements involve the expansion of the campus escort service to provide a greater level of security in the evening hours, particularly in the more remote areas of campus. The O&M cost estimates for this measure also assume that the positions of campus escorts would be paid (student workers) rather than strictly voluntary. It is assumed that the program would expand by adding 0.25 FTEs in the Immediate timeframe, 1.25 FTEs in the Short-Range and 2.5 FTEs in the Long-Range.

General Transportation Items: This O&M cost category includes those items that cannot easily be tied to just one transportation mode or system. In order for the proposed transportation programs, policies, and actions to be effective these improvements and changes must be marketed to the university and the surrounding community. Several of the MMTMS recommendations involve the development and distribution of informational or promotional materials. All of these educational / marketing activities have been grouped together under the cost item entitled "Information / Promotional Materials." The costs required to develop, update, and disseminate these materials are largely staffing. Lastly, it is recommended that the university update the Transportation Funding Plan about once every five years. The cost to produce these Transportation Funding Plan Updates has been prorated to provide an estimated annual cost.

7.3 Funding

Implementation of UCR's planned transportation system will involve a significant investment of funds. Construction of parking structures will be the primary capital investment, and construction and operation of the various elements of the MMTMS will require substantial additional funding to pay for the $19.9 million dollars of capital projects anticipated over the next 12 years and the ongoing operational cost which is projected to reach $2.4 million annually (in 2004 dollars) with full implementation of the MMTMS.

Currently, parking revenues are used to pay for transportation and parking operations (including parking lot maintenance, shuttle services, kiosk attendants, and evening escort service) as well as construction of new surface parking lots. As the university begins to construct parking structures to accommodate the parking needs of a growing campus population, more and more parking revenues will be required to finance the structures. As a result, UCR will need to generate additional funds from parking revenues and from other sources to fund additional, needed transportation improvements.

The purpose of this section is to identify potential sources of revenue for funding the various components of the MMTMS. The discussion below identifies potential funding sources, the system components they could fund, and some of the issues and requirements for obtaining these funds. This information will be a starting-point as UCR develops its first transportation opportunities funding plan and identifies potential sources of grant funding.

7.3.1 Parking Revenues

Parking revenues (parking fees and fines) are currently the primary source of funds for campus transportation systems, and that is expected to continue even as UCR begins to construct parking structures to accommodate growing demand on a limited land base. Parking revenues could be used to fund any of the improvements and services included in the MMTMS. Currently UCR charges some of the lowest parking fees of any of the University of California campuses. Parking services at UC campuses are auxiliary services, so parking costs must be paid by fees in a self-supporting system. As a result, parking fees will necessarily be adjusted over time to achieve the revenue stream required for the parking structures.

Other transportation needs are related to parking, and could be partly or fully funded by parking revenues. The Highlander Hauler provides service to neighboring residential areas, so that on-campus parking need not be provided for those who live nearby. The Trolley and future on-campus shuttles provide on-campus mobility, so that the university public can travel around campus without shuttling personal cars between parking lots. Bicycle and pedestrian facilities make these modes of travel more viable as an alternative to the automobile, so that fewer people will need to drive their personal autos to campus.

The MMTMS includes a policy which will help set the direction for future pricing of parking. It states that monthly parking permits and daily parking fees should be priced to:

- ♦ Ensure adequate funding for campus parking facilities and to contribute to campus shuttle services.
- ♦ Encourage use of alternate modes for commuting to campus.
- ♦ Discourage use of daily parking by the campus population.
- ♦ Provide less expensive parking permit options for those using remote locations.

Implementation of these policies would mean that parking charges would need to be high enough to ensure that an adequate transit system is provided and to make alternate modes attractive, while providing a tiered price structure based on location.

These factors will need to be balanced with revenue needs, equity considerations, and other factors as the university sets parking pricing policy to meet future needs.

7.3.2 University General Funds

University general funds could be used to fund any of the improvements in the MMTMS. However, in most cases general funds are a very unlikely source of funding for transportation improvements because of the competing demands on university general funds. Competition for general fund monies is severe, and transportation projects often do not compete well with other university projects with funding needs simply because transportation projects have another available source (parking revenues) which is essentially devoted to transportation uses.

7.3.3 Housing Fees

Some universities charge a transportation fee as part of their fees for on-campus housing, to help fund the shuttle services which carry students between on-campus housing and their classrooms and other university facilities. Such fees are rare, and would increase the cost of on-campus housing, thereby working against the UCR objective of housing more students on campus. Since a greater percentage of on-campus housing will help to make the campus transportation system more efficient, housing fees are not considered to be an appropriate source of transportation funding in this situation.

7.3.4 Transportation Improvements as Part of Building Programs

Elevated pedestrian walkways or ped/bike overpasses over roadways may be incorporated into new buildings or parking structures. This may provide transportation or design advantages, as in the case of the proposed ped/bike crossing of I-215/SR-60 which could utilize elevators in structures at either end to accommodate visually and mobility impaired access and vertical circulation while using less land to achieve the necessary clearance over the freeway. It could also provide opportunities for helping to fund these components of the transportation system, since all or part of these elements will need to be constructed as part of the building project, or it may be possible to use construction of these building elements to provide local match for discretionary funds. When buildings or parking structures are developed in areas where an elevated walkway or overpass is desired, the building design project should include plans showing how these pedestrian elements will be incorporated into that portion of the campus.

7.3.5 Discretionary Grant Funding

Grant programs represent an untapped potential source of funding for transportation improvements. Grants can be used to help fund capital or operating costs of various types of projects, though they are typically most appropriate for capital expenditures since they do not represent an ongoing source of revenue.

Grant funding for transportation projects comes primarily from State and federal sources. The federal Transportation Equity Act for the 21st Century (TEA-21), adopted in 1998, included discretionary and competitive grant funding opportunities, and the current reauthorization being developed by Congress can be expected to have similar opportunities. In California, federal and State transportation funds are distributed by the respective county transportation commissions and congestion management agencies, so Riverside County Transportation Commission (RCTC) is the agency that controls distribution of funds that may be available to UCR. These funds are usually designated for public agencies, so UCR will need to collaborate with the City of Riverside to be able to pursue many of these sources, so UCR should begin immediately working with the City particularly to incorporate the university's bicycle network and major pedestrian facilities into City transportation plans, and work together to obtain funds for these projects and include them in the City's capital improvement program.

The following section lists current funding sources which could be potential opportunities for UCR. As the new federal transportation legislation is passed and other conditions change, UCR should work closely with RCTC and other potential sources of funds to understand and monitor current grant opportunities, their requirements, and criteria for selection.

<u>Federal Sources</u>

- Surface Transportation Program (STP): The STP provides flexible funding that may be used by states and localities for projects on any federal-aid highway, including the NHS, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities. Much of this funding is allocated to public agencies on a formula basis, though there are setasides for safety, transportation enhancement (see below), and urban areas. These funds are distributed by RCTC. The freeway ped/bike overcrossing of I-215/SR-60 may be eligible for STP funding since it would cross a federal-aid highway.

- Transportation Enhancement (TE) Activities: This grant program under TEA-21 was designed to fund environmental and alternative transportation projects. It is funded through a 10% setaside of STP monies. UCR's proposed pedestrian and bicycle improvements would qualify for this type of funding. However, RCTC has already programmed all TE funds that were available through the TEA-21 legislation. The TE program has now been incorporated into the State Transportation Improvement Program (STIP), under which each county has the option to program TE funds. With state transportation funds in short supply, future TE funds may be spent on capacity enhancement projects, rather than the traditional type of TE project. UCR will need to monitor the status of these funds through RCTC, and collaborate with the City of Riverside in order to compete for future funds.

- Congestion Mitigation and Air Quality (CMAQ): These funds are targeted at transportation projects that mitigate both congestion and air quality. Projects must undergo an air quality analysis demonstrating emissions reductions. In general, projects that add capacity are not eligible under this program. The TEA-21 CMAQ program provided over $8.1 billion dollars in funds from 1998-2003 for State Departments of Transportation (DOTs), Metropolitan Planning Organizations (MPOs), cities, and transit agencies to invest in projects that reduce criteria air pollutants regulated from transportation-related sources. UCR would need to partner with a public agency to be eligible.

- Transportation and Community and System Preservation (TCSP) Pilot Program: States, local governments, and metropolitan planning organizations are eligible for discretionary grants to plan and implement strategies that improve the efficiency of the transportation system; reduce environmental impacts of transportation; reduce the need for costly future public infrastructure investments; ensure efficient access to jobs, services, and centers of trade; and examine private sector development patterns and investments that support these goals. A total of $120 million was authorized for this program in FY's 1999-2003. The grants are competitive, and applications are evaluated by a team of representatives from various federal agencies. UCR would need to partner with (most likely) the City of Riverside, Southern California Association of Governments (SCAG), or the State in order to compete for these funds. It is not known whether this program will be continued in the new federal transportation authorization.

- Recreational Trails Program: This is an assistance program of the Federal Highway Administration (FHWA). Federal transportation funds are made available to the states to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses. Cities, counties, districts, state agencies, and non-profits with management responsibilities over public land are eligible. Because these funds apply specifically to recreational trails, the trail along the Gage Canal is likely the only UCR facility which might qualify for these funds.

<u>State Sources</u>

- SB 821 Bicycle and Pedestrian Facilities Program: Each year 2 percent of the State Local Transportation Fund (LTF) revenue is made available for use on bicycle and pedestrian facility projects through RCTC's SB 821 Program. All of the cities and the county are notified of the SB 821 program estimate of available funding and are requested to submit project proposals. Eligible projects include sidewalks, bike paths (Class I), bike lanes (Class II), bike routes (Class III), and access ramps or curb cuts. A call for projects is issued annually in April and funds are allocated each July. An evaluation committee comprised of members of RCTC's Technical Advisory Committee and Citizens Advisory Committee review and rank the projects based on evaluation criteria approved by the Commission. The criteria currently include potential use, safety, importance as a transportation alternative, connectivity, matching funds, and population equity. The evaluation committee makes recommendations for projects and funding award amounts to the Commission for their final approval. UCR would need to partner with the City of Riverside to compete for these funds.

- Petroleum Violation Escrow Account (PVEA) Funds: These are fines/forfeitures collected by the state from major gas and oil companies. These funds are intended for transportation-related purposes, particularly projects related to clean air transportation, and are applied for through a local legislator to the California Energy Commission.

- Caltrans Bicycle Transportation Account: Provides funding for projects that improve the safety and convenience of bicycling. Cities or counties that apply for these funds must have a qualifying bicycle transportation plan, so UCR would need to have its bicycle facilities incorporated into a qualifying City or County of Riverside bike plan.

- Office of Traffic Safety (OTS) Grants: The State OTS has a grant program for projects designed to reduce motor vehicle fatalities and injuries, including bicycle and pedestrian safety programs. Political "subdivisions" of the state are eligible to apply for and receive OTS grant funding. In FY 2003, OTS funded 182 grants totaling $30.3 million. OTS mails requests for concept papers in November of each year, and they are due by January 31.

<u>Other Sources</u>

- Bikes Belong: Bikes Belong is a bicycle advocacy group, and has a grant program which can fund up to $10,000 for facility, capacity, and education projects. Proposed programs or projects must be measurable, and must facilitate ridership growth, leverage funding, build political support, and promote cycling. Applications are accepted and reviewed four times a year.

- Robert Woods Johnson Foundation: This foundation is a health care philanthropy organization, and its mission is to improve the health and health care of all Americans. The Foundation funds projects of many types, including service demonstrations, the gathering and monitoring of health-related statistics, training and fellowship programs, policy analysis, health services research, technical assistance, public education, communications activities, and evaluations. The Foundation awards grants through several competitive national programs, and it accepts unsolicited proposals that address one of its focused portfolios.

7.3.6 Transit User Fees

Currently the Highlander Hauler and the Trolley provide free shuttle service to faculty, students, and staff. Some universities charge users a fare for campus shuttles, though most do not – a study of 30 campus transit systems by the Transportation Research Board (TRB) found that only 1 of the 30 charges all passengers a fare, and two others charge a fare with a reduced fare for students, faculty and staff. In almost three-fourths of those surveyed, the campus population (students, faculty, and staff) ride free – for 53% the service is completely free, and for another 20% a fare is charged to non-campus riders.

When fares are charged, they typically recover a small percentage of the operating cost, and are a deterrent to some potential users. Since the purpose of the shuttle system is to enhance the ease of campus travel via alternative modes, charging a fare for this service would work counter to the purpose of the service. To best achieve the MMTMS objectives for campus mobility, fares should not be charged for the shuttle services.

7.3.7 Student Transportation Fees

Numerous universities use student transportation fees to help pay for campus transit services. UC Davis and UC Santa Cruz are examples of universities which have approved such a fee through a student referendum. The fee at UC Davis is $24.50 per quarter and funds 58% of the transit system cost. (Much of the remainder is funded by federal and State transit operating assistance funds, obtained because the Unitrans system is operated in collaboration with the City of Davis and therefore qualifies as a municipal system.) The fee at UC Santa Cruz is $59 per semester and funds 93% of the shuttle system cost.

The University of Washington (in Seattle) has taken a unique approach to using student fees to help fund its U-Pass program. The U-Pass enables the user to ride: all area bus and commuter rail services for free; use the campus Night Shuttle and emergency ride home service; and obtain vanpool subsidies and parking discounts. Faculty and staff may purchase a U-Pass for $49 per quarter. Students are charged a fee of $35 per quarter with their tuition; however, if they do not wish to keep and use the U-Pass, they may return it for a full refund. This refund provision enabled the university to charge students the fee without holding a referendum.

If student fees are charged for transportation, they should be used to improve the transportation available to students, and can be one component of a strategy to limit the number of high-cost spaces that UCR needs to provide in parking structures. For example, a student fee could be used to help fund a partnership program between UCR, Riverside Transit Authority (RTA), and RCTC/Southern California Regional Rail Authority (SCRRA) that would increase the frequency of campus shuttles, provide free rides on RTA and Metrolink services, and provide students with other financial incentives to use alternative modes. Such a fee should be considered when UCR begins to construct parking structures, increase coverage and frequency of shuttle service, and provide greater incentives for alternative travel modes.

7.3.8 Conclusions

From the evaluation of potential funding sources, the following conclusions can be drawn relative to funding the MMTMS:

- Parking revenues will continue to be a primary source of funding for campus transportation systems. Parking revenues will need to finance construction of parking structures, and be sufficient to fund the essential campus transit system.

- A combination of parking revenues and other funding sources will likely be necessary to fully fund the MMTMS improvements.

- As buildings and parking structures are constructed, UCR should seek to include needed elevated pedestrian walkways and pedestrian/bicycle overpasses (or appropriate elements thereof) in the building design.

- UCR should hire a grant writer (or designate this responsibility to an appropriate staff member) to identify and pursue available grant funding opportunities for campus transportation improvements and programs.

- UCR should partner with the City of Riverside, particularly in regard to its bicycle and pedestrian improvements. The university's proposed bicycle and pedestrian facilities should be included in the City's General Plan and capital improvement program (as funds become available) to facilitate opportunities to obtain transportation funds that are available only to public agencies.

- In order to maximize the utility of the campus shuttle system, fares should not be charged to students, faculty, and staff.

- If other sources are insufficient to fund campus transit services at the desired level of frequency, and if a program can be developed to provide access to RTA and Metrolink services, student fees should be considered in the future as a means of enhancing transit as a viable alternative mode.

8.0 SIGNAGE AND WAYFINDING PLAN

8.1 Introduction

The MMTMS is designed to define, detail, and implement the campus transportation system as envisioned in the draft 2004 LRDP. As part of the MMTMS, a signage and wayfinding plan has been developed to support the MMTMS. UCR's campus growth and recent construction activities have resulted in a current system that is sometimes incomplete or misleading and, as such, does not adequately direct or inform travelers. In response, this campus wide signage and wayfinding plan has been developed to welcome, guide, inform, and direct the campus community and visitors, as well as emergency, service and delivery providers.

8.1.1 Purpose

The purpose of this chapter is to identify a hierarchy of signage that will: define a system of routes; clearly guide travelers to their destination; and contribute to a coherent campus image and sense of place. The following sections include: an evaluation of the existing system; the goals used to guide the development of a signage and wayfinding plan; the general outline or hierarchy for the new plan; a discussion of components for each mode of transportation and for buildings; and the strategy for implementing the new plan. The signage and wayfinding plan outlined in the following chapter is intended to ensure consistency in design and facilitate implementation of a coherent and comprehensive informational and directional plan for all campus users.

8.1.2 Existing Systems

A series of focus group meetings were held during July 2003 and January 2004. Signage and wayfinding were discussed with: Transportation and Parking Services staff (TAPS); vendors and delivery personnel; emergency, security, and Student Special Services; and bicycle groups. As a result, a series of issues were identified that focused on four general areas of signing and wayfinding. These areas included:

- Entry or arrival points
- Directional information
- Safety issues
- System hierarchy

Entry/Arrival

Several groups identified that the first visit or initial entry and arrival to the campus takes place heading east at University Avenue and the I-215/SR-60 freeway. They felt that this, the formal entry to the campus, lacks clear direction and a sense of place. Many of those first time visitors miss the entrance to the campus loop road at West Campus Drive and continue driving east and then north on Canyon Crest Drive. It is then that they realize that they are probably lost and have missed the "main entrance." Those new visitors that do make the turn and enter the campus loop road often find themselves queuing in line for the information kiosk. This sometimes results in traffic backing up onto University Avenue.

Directional Information

The current campus policy is for informational signage to blend-in with the campus environment. As a result, signs are difficult to see because of earth-tone colors or positions too low to the ground. In addition, in some areas, mature vegetation obscures signs and construction activities have eliminated others. For the most part, existing campus directional signage is inadequate due to its appearance and physical location. It also lacks in presentation of information; it needs a hierarchy or tiered system of information that gets more specific as the traveler approaches his/her destination. Other deficiencies include hard-to-see or missing building signage. Building signage is often limited to one sign per building and is normally oriented towards the campus interior. This means that it is not visible to the motorist and can be difficult for a pedestrian to see because it's limited to one side of the building and is usually located at the top of the building face where it is often obscured by landscaping. Maps and other directional information are primarily available at information kiosks and there are limited pedestrian-oriented directional signs and limited night-time sign systems.

Safety

Existing signage and wayfinding systems on campus provide only limited information on right-of-way for mixed-use routes (mixtures of modes on the same path), information or presence of dedicated routes (bicycles only or pedestrians only), and warning mechanisms for upcoming route or mode conflicts. These deficiencies increase the potential for misdirected trips and travel mode conflicts. The campus also lacks a comprehensive night-time signage system to guide emergency personnel or others unfamiliar with the campus.

System Hierarchy

Some feel that there is a "hodge podge" of signage on the campus and that there does not appear to be a standard for signs or location and type of information stated. In most cases, traveling to a campus destination is not aided by signage or is confusing because signage occurs in some instances, and not in others. A comprehensive tiered signage system needs to be developed so that all signage information is layered according to type of information given and the transportation mode the sign is assisting.

8.1.3 Program Goals

To address current system deficiencies and to develop a signage and wayfinding hierarchy that would ensure clear and concise access to the campus for the public now and into the future, six primary goals were developed. These goals deal with access points, directional information, and safety, and the prime areas of concern regarding the existing signage and wayfinding system. The following goals also provide an avenue for the signage and wayfinding plan to be integrated into the MMTMS. It was anticipated that by using the established goals to guide the signage and wayfinding plan, concepts and proposed elements of the system could be evaluated for how well they fit into the overall intent of the MMTMS and draft 2004 LRDP. Each component of the signage and wayfinding plan was evaluated based on the established goals to determine their viability and strength in meeting campus needs.

- Develop a signage and wayfinding plan that supports the Long Range Development Plan (LRDP) and Multimodal Transportation Management Strategy (MMTMS)
- Support and enhance UCR's public image through distinct, attractive signage that clearly and effectively assists in campus wayfinding through a hierarchy of signage information systems
- Develop a wayfinding and signage plan that considers the directional and informational needs of all campus users and presents the information to selected modes of travel at appropriate locations while allowing for up to the moment or "real time" changes where feasible
- Increase campus safety through the use of signage and wayfinding that promote safety in campus navigation
- Meet city, State, and federal sign standards and implement best international practices
- Develop an on-going sign implementation strategy to facilitate signage and wayfinding needs in the future

8.2 Signage and Wayfinding Plan

The term wayfinding refers to the ability to determine one's current location and to plan the best route to and from a destination based on information provided by external sources. A well developed wayfinding system can assist travelers in experiencing an environment in a positive way and can facilitate travelers getting from point A to point B. When executed successfully, the system can reassure users and create a welcoming environment, as well as answer questions before users even ask them. Developing a hierarchy of signage and information is a critical component of wayfinding.

8.2.1 Signage Types

Developing a UCR signage and wayfinding system consists of organizing the general elements on a broad scale – such as campus identification - and then accommodating the various modes of travel used within and around UCR. These types of signage are provided for each mode and are based on the decision making needs, location, and intent for each type of sign within the overall transportation system. It was also important to consider the user for each location, facility, and system. Each modal user may have different needs and requirements. For example, there may be unfamiliar motorists that are first time visitors while faculty/staff are familiar motorists.

The general elements of a typical wayfinding system include the following:

- Announcement – Announcement signage helps the traveler recognize their arrival at their intended destination. It makes the statement "Here is the Entity" be it a building, campus or state.
- Orientation – Orientation signage allows the traveler to determine their current location. This may be characterized by the typical "you are here" dot on a map with a directional arrow indicating the compass direction.
- Direction – Once the traveler understands where their current location is, they need a clear indication of where to go from there. Directional signage can be displayed in a number of ways including color-coded routes or successive steps in a text format.
- Destination Identification – Destination identification is critical to concluding the trip. This information alleviates any misunderstanding of where the person is. Destination identification may consist of any sign or monument that states the place name.
- Situation Identification – Situation identification advises the person of any condition that is currently occurring, or will occur (i.e. parking lot closed or a scheduled event).
- Object Identification – Object identification advises the person of an object's presence and its potential to affect them personally (i.e. speed bumps, uneven surfaces, etc.)

8.2.2 Signage Hierarchy/Information Tiers

An effective wayfinding system presents information in a concise, easily understood format that follows a dissemination of information from the general to the specific. It provides only the information necessary at each phase of the journey to establish clear direction for the next phase and finally to the traveler's end destination. Information provided within the wayfinding system must answer specific needs for different transportation modes, a variety of travel speeds, and other situational or locational constraints. Information should flow from the general to the specific on a "need to know" basis. For example, motorists cannot digest large amounts of information while driving. Therefore text on a vehicular-tiered sign, seen from a distance and at increased speeds, must be as descriptive and brief as possible. Since pedestrians are traveling at much lower speeds, the opportunity to provide more detailed information about specific destinations can be accommodated at that tier.

As campus travelers transition from the freeway to major city arterial roadways to parking or the campus perimeter loop road, to pedestrian walkways, and ultimately to their building destination, their informational needs change from broad to more specific directional information. Signs at the periphery of campus should provide a singular message that welcomes, informs, and sets the tone for the campus image in a simple but elegant format. Signs located closer to the interior of the campus should provide detailed mapping information while maintaining the same character and image as the initial campus welcoming signs. It is important to relay only the information required at each point so that the signage system does not become too cluttered or confusing. The hierarchy of information provided at each step and at critical decision points throughout the traveler's journey should be part of a comprehensive wayfinding system that appropriately guides and informs campus users.

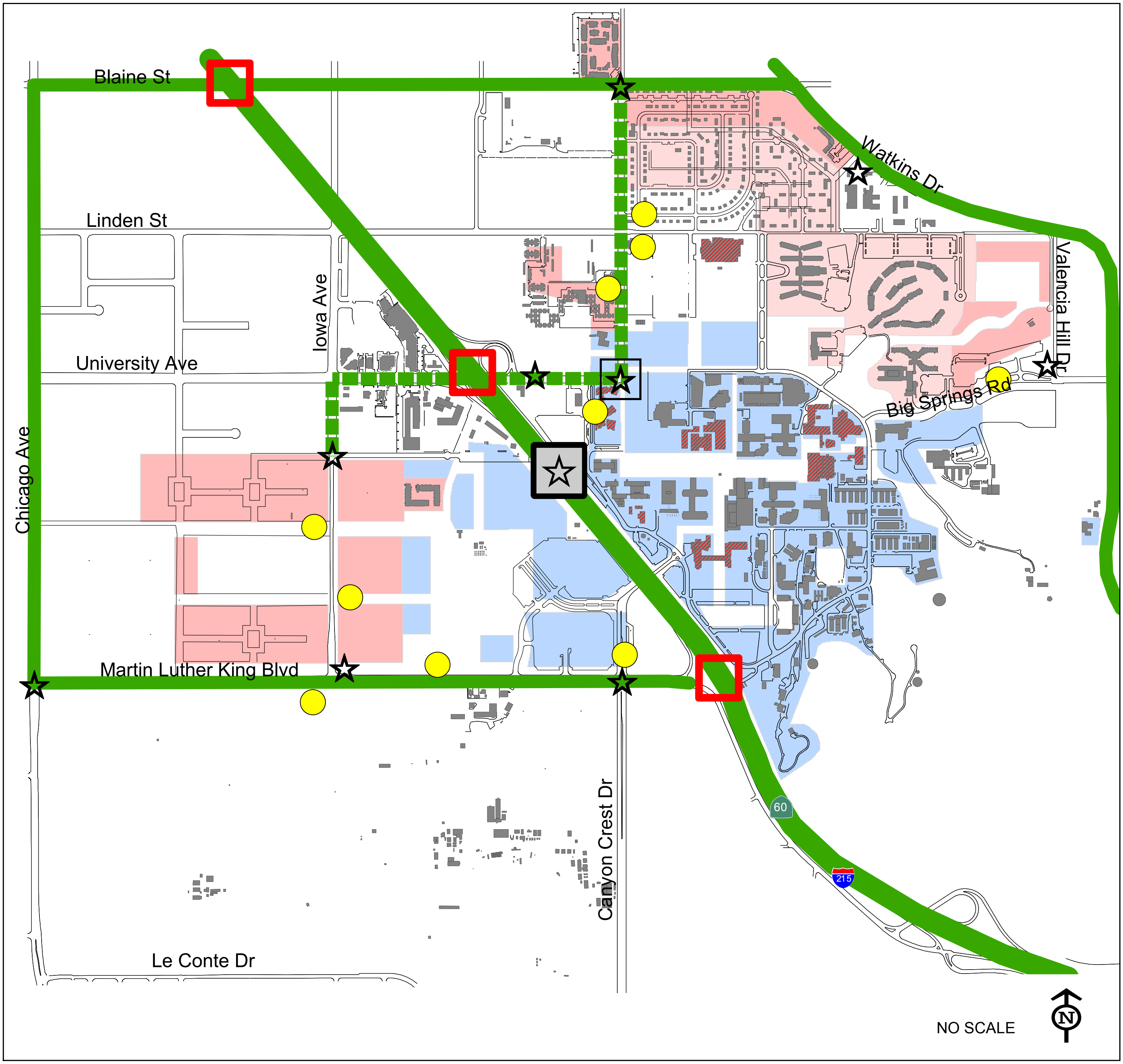
8.2.3 Backbone System

This chapter of the MMTMS discusses the backbone system for signage and wayfinding at UCR. The backbone system consists of a preliminary structure or core system of signs proposed to inform a future Campus Sign Program which would develop actual signage design, placement, etc. The following are key elements of the backbone system of the highest order and include: major regional identity signs; major monument signs; and LED (Light Emitting Diode) and/or minor monument signs. Figure 8-1 shows the primary access routes to UCR and the core system of signs that announce and identify UCR. All other signs on the campus are tiered down from this group but maintain a coherent design and hierarchy for consistence and ease of understanding. The lesser signs will be discussed within the framework of the individual needs of each mode of transportation and within building needs.

Regional Identity Signs

The first level or tier of information is provided on the freeway and at access points along the freeway with information announcing the UCR campus and exits. The freeway is a major route to the Campus. Located on both the east and west side of I-215/SR-60, UCR has a unique opportunity for identifying regional access as well as promoting public awareness of the campus location. Working with Caltrans, the campus should be announced on freeway signs notifying motorists that they are approaching a university campus. Additional signage occurs on exit ramps directing visitors to the campus. In addition to freeway signs, a Major Regional Identity Sign is proposed to be placed within the campus adjacent to the Caltrans right-of-way. This Identity Sign would be located centrally within the UCR frontage and would have visibility from the freeway corridor from both directions. The Identity Sign would be a pole or structure mounted reader-board identifying the UCR Campus and providing up-to-date information on campus events and conditions.

Besides the reader-board along the freeway, there is the potential for another Regional Identity Sign to announce UCR's location within the community and to promote its image within the region. This additional signage would be part of the proposed pedestrian/bicycle bridge over I-215/SR-60. It could be used for displaying UCR's colors, logo, or other campus character images.



LEGEND

- Building
- Building used for special event
- Academic
- Family, Apartment Housing and Related Support
- Residence Hall and Related Support
- Freeway
- Primary Vehicular Access Route
- Key Visitor Access
- Regional Access
- LED Monument Sign
- Regional Major Identity Sign
- Major Monument Sign
- Monument Sign

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 8-1

Signage Hierarchy

Major Monument Signs

Also key to promoting a campus presence and welcoming travelers is to emphasize the main or formal campus entry. The primary or formal entry to the UCR campus is from I-215/SR-60 at University Avenue. Upon arriving at the East Campus, a Major Monument Sign would be located at or near the University Avenue/Canyon Crest Drive roundabout and would be a major landmark for the campus. The roundabout and the area surrounding it would be designed to project a strong university presence as well as an image of collegiate significance to the majority of motorists who have reached the formal gateway to the campus as well as to the campus and neighboring community.

Light Emitting Diode (LED) and Minor Monument Signs

The next level of information is provided at the campus perimeter with monument signs informing travelers of their arrival at the campus edge. These Minor Monument Signs help to identify the campus perimeter and help indicate to motorists that they have arrived at the campus. Key perimeter access points are at Martin Luther King Boulevard at Chicago, Canyon Crest and the freeway, Blaine Street at Canyon Crest Drive, Iowa at Martin Luther King and at Everton Place, and Big Springs Road at Valencia Hill Drive as well as University Avenue. Minor Monument Signs are secondary to the Major Monument Sign, but are also designed to project a strong campus presence and to help reaffirm a sense of arrival for motorists. These Minor Monument Signs serve to reinforce the perimeter of the campus and are intended to emphasize gateways to the campus. At key locations Monument Signs can be constructed using an LED (Light Emitting Diode) display to show upcoming campus events, parking information, and general campus updates and advertising. All LED signs should have the capability to be updated remotely by TAPS.

8.3 Modal Components

UCR's signage and wayfinding plan will have to support the draft 2004 LRDP and facilitate the transportation system outlined in the MMTMS. Signage systems will have to guide first time visitors from perimeter parking into the campus core. The signage and wayfinding plan will be pivotal in providing more support for pedestrians and bicyclists. They will also be important in providing updated information regarding campus changes and continued development. UCR's signage and wayfinding plan is anticipated to create an entire network of signage and wayfinding elements to enhance the ability of users to utilize perimeter roads, parking, service and emergency routes, bicycle paths, pedestrian walkways, and building identification as an integrated wayfinding system. In order to accomplish this, the signage and wayfinding plan provides directional and informational sources for all components of the MMTMS including buildings. The following components and their support structures were considered in the development of the signage and wayfinding plan. Please note that signage types overlap within the individual modes of travel and, therefore, there will be repetition in the discussion of each mode, but there would be one signage type serving both modes. This is where consistency and signage hierarchy are so very important.

8.3.1 Vehicle

Vehicle Oriented Signage

In order to accommodate the pedestrian oriented campus as envisioned in the LRDP, the vehicular signage and wayfinding system needs to be geared towards directing motorists to appropriate parking structures or lots which will be relocated to the perimeter of the campus over time. It is here at the perimeter of the campus where they can begin the pedestrian experience of moving about the campus core. The vehicular signage and wayfinding system focuses on identifying the regional access points to campus, announcing the campus at the campus perimeter, and guiding motorists to the location of parking structures and/or surface lots.

Once motorists have arrived at the campus perimeter, directional signage located between the campus edge and parking structure entrances will guide motorists to their desired parking venue which may include in special instances, navigation of the campus perimeter road. Directional signage will be provided at major decision points along the local city arterials including Iowa Avenue at Martin Luther King Boulevard, Iowa Avenue at University Avenue, Blaine Street and Rustin Avenue, Watkins Drive at Big Springs Road, and University Avenue east of I-215. Directional signage will be located prior to major intersections to allow motorists time to decide on a current route or make a directional change. If the only available location for Directional Signage is at or near a parking structure entrance, then the parking structure entry should also be indicated. Information presented on Directional Signage should be simple, clear, and concise. Major visitor destinations should be listed with an arrow indicating the direction of their location. These destinations located on the campus loop road or near other campus roads include: manned kiosks, Hinderaker Hall (Administration), Science Library, Botanic Gardens, UCR/City Sports Center, Student Recreation Center, and the University Theater. The Rivera Library is located in the East Campus academic core and is not directly accessible from a campus street or parking venue. As the campus continues to expand and additional buildings are constructed, additions and deletions to this list are expected. Only nearby or relevant destinations should be included on the sign to avoid overwhelming motorists with information that they don't need since vehicles must maintain a minimum speed so as not to impede traffic. More specific and detailed directional information is anticipated to be provided at the parking structures, surface lots, or special parking areas. Directional Signage should include an easily identifiable image or color to indicate whether the motorist is on the East or West Campus.

Vehicle Oriented Signage Guidelines

Vehicle oriented signage and wayfinding is designed for motorist visibility and provides directional information along major feeder roads to guide motorists to parking locations. They include:

- **Freeway Access Signs** – In conformance with Caltrans standards these signs would be located on I-215/SR-60 prior to Campus exits. These signs would guide motorists from the freeway to major access points at the campus perimeter. They would also provide an opportunity for informing travelers of the campus location within the region.
- **Monument Signs** – These signs serve as the primary gateway identifier and help to define the identity of the Campus. They are intended to project a strong University presence to the majority of motorists. A Major Monument Sign should be placed at the main or formal entry gateway on University Avenue and West Campus Drive.
- **LED Monument Signs** – Secondary to the Monument Signs, the LED Monument Signs can provide dynamic, real time information using a dynamic display. Upcoming campus events, changes in traffic patterns, and parking information can be provided to motorists arriving to campus. LED monuments should be used at intersections with heavy vehicle traffic and should have remote updating capabilities.
- **Directional Signs** – These signs are intended to direct travelers to parking structures/lots located in close proximity to their final destination. More detailed information will be provided such as a listing of the major destination points within the vicinity, available parking structures/lots, and where possible, information on adjacent facilities.

8.3.2 Parking

UCR's draft 2004 LRDP provides locations for parking structures to meet the parking needs for a student enrollment of 25,000. These structures are located around the perimeter of the campus. Currently, UCR is utilizing surface parking lots only. It is anticipated that the new parking structures will generate issues not associated with the current parking system. Signage and wayfinding systems integrated into the future parking structures will help address issues of congestion, mobility, safety, and access. Some of the components of the system will include structure and lot identification, directions to parking facilities, and information kiosks.

In developing an appropriate signage and wayfinding system for the new parking structures, it was important to consider purpose and type of signs or systems that may be utilized and their location in context with potential users. One level or tier of the signage and wayfinding system gets the traveler to the parking structure; others get him/her out of the structure and on their way to their campus destination. Each of these events requires signage and wayfinding systems that adequately address each informational and directional need.

Arrival

Parking facilities should be identified with an arrival sign such as the Minor Monument Sign on the associated major feeder roads so that the motorist can easily find parking entrances. Electronic sign boards/LEDs could be an integral part of the parking arrival signs providing both permanent and temporary information. Electronic sign boards are effective in informing patrons of campus events and are a versatile method for providing real time messaging. If real time messaging is used to advertise events, parking related to the event can also be announced.

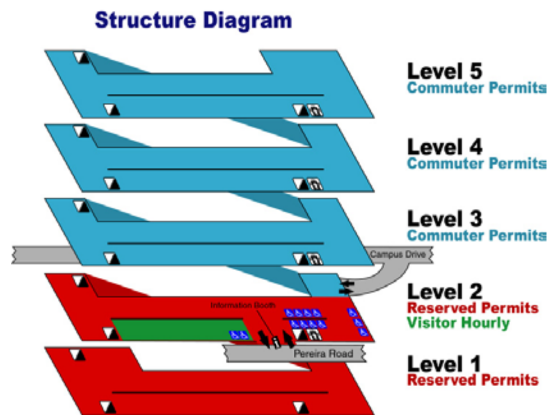
Entry

Information provided to motorists upon entry to a parking structure should aid in their understanding of the structure and use thereof. This information should include confirmation of their location by identifying the structure name or number, a map or level designations that allow them to navigate the structure, information on use and restrictions of the structure, and information for personal safety and liability. Information should also include which patrons are permitted to use the facility, any time or use restrictions, methods of parking, location of metered parking, parking rates, and any other regulatory information about what is allowed or restricted in the structure.

Four of the seven planned parking structures are proposing manned kiosks where patrons can retrieve maps, ask for information, and pay for daily/hourly parking permits. In addition, all other parking structures are anticipated to have automated kiosks that will provide maps, directions, and daily/hourly parking permits. Any additional information such as liability signs or special parking instructions should also be posted or made available at the kiosks.

For maximum mobility and safety, electronic traffic flow and diversion signs could be used to convey real-time information about parking structure status or assist with traffic flow. These signs are used to guide, warn, or regulate the flow of motorists and pedestrians within the parking structure.

Parking



The task of finding a parking spot can be one of the most frustrating aspects for a visitor or commuter coming to a university campus. Parking spaces within a parking structure should be located strategically to facilitate their use while complying with all university, State, and federal standards so that when a motorist navigates different parking structures, they are not confused. Parking spaces should be divided into categories of disabled, priority (which can include faculty/staff), student, visitor, vendor/service, resident, and motorcycle. Stalls should be clearly marked as to which patrons can use them. There are many ways to mark parking stalls including placards, pavement striping/marking, or curb painting.

Pedestrian

In many parking structures, the environment is not designed for the pedestrian. Once a motorist becomes a pedestrian, it is important to have signage and wayfinding systems in place to facilitate the transition from motorist to pedestrian and to start the pedestrian experience of navigating the campus in a positive manner. With adequate lighting, stairwell, and elevator design, the actual movement of the pedestrian through the structure can be designed to address safety and aesthetics. Pedestrian paths leading from cars via pedestrian circulation routes to specific points of destination can be designed to provide clear wayfinding as well as a pleasant pedestrian experience. Signs directing pedestrians to elevators and exits should be clearly visible. When a motorist leaves their car, it is important that they be able to navigate their way back to their vehicle. In a parking structure, the levels should be designated with a letter or number on columns, near exits and at elevators. Kiosks should also be accessible by pedestrians. All available resources should be easily accessible to guide patrons to their final destination and back. Permit dispensers should have regularly up-dated maps as well. Maps could be computer generated to provide a visitor with a diagram showing his/her destination with appropriate route from the parking structure.

Handicapped

In addition to providing required parking facilities for handicapped users, parking structures must also accommodate the signage and wayfinding needs of this group.

Appropriate signage is a key tool in assisting people with disabilities in locating parking, information sources, additional transportation services, and accessible facilities. The use of International Symbols of accessibility should be used to identify disability access features within the parking structure. Directional signage should also be used to assist handicapped users in finding access features.

Signage specific to this user group should be incorporated into each parking structure and placement of those signs should carefully consider the users access requirements. Facilities, features, and wayfinding systems designed for the handicap user should be located on the shortest possible accessible route of travel. These travel routes should not cross lanes of traffic however, where crossing traffic is necessary, the route of travel should be designated and marked as a crosswalk.

Parking Oriented Signage Guidelines

External

- **Arrival Signs** – These signs are anticipated to be freestanding, monument-type signage located at parking entry points from the main circulation system. Parking arrival signs should be general in nature, clear, and concise while keeping with the character and standards of the university signage. Arrival signs should identify the parking entrance and parking structure. Information on parking or events will be provided in a real-time format (LED).
- **Structure Identification Signs** – The Parking Structure Identification Sign marks the entrance to the parking facility and provides the motorist with the structure name, number or letter. Parking structures should be systematically named or numbered for easy identification and consistency should be maintained in how each parking structure is referred to, whether on maps, in other information sources or when providing directions. It is possible that these signs may list destinations for which parking venue is convenient, and may direct patrons to additional parking (if the parking facility is full).

Internal

- **Augmenting Signs** – This sign type would specify the use of the structure to motorists. Regulatory information about what is allowed or restricted in the structure should be posted clearly and concisely. Information should include which patrons are permitted to use the facility and any time restrictions.
- **Kiosks** – In addition to informational signs, kiosks may serve to provide a number of informational sources including maps, transit schedules, brochures and telephone directories. In some cases kiosks may be staffed with personnel or operated electronically. Kiosks on the UCR campus could contain information on building and parking structure locations, shuttle stops, campus recreation facilities, pedestrian locator maps, etc. For additional information on kiosks, refer to Section 3.3, Pedestrian.
- **Traffic Flow and Diversion Signs** – These signs should be strategically placed and made clearly visible throughout the parking structure. To prevent confusion, guiding, warning, or regulatory messages should not be on the same sign. For safety, a height clearance sign would be put at the entrance to all parking structures. Signs should be placed as necessary for safety and proper regulation of traffic. Signs should be consistent with the university parking and design standards. Signs should meet all university, State, and federal standards.
- **Parking Signage** – This type of signage would identify the allowed patronage for a certain stall or stalls. Parking stalls can be identified by placards, pavement striping/marking, or curb painting. In parking structures with mixed patronage,

whole levels can be designated with a stripe of color on columns to designate which permits are allowed on that level. Stall markings shall be in compliance with all university and ADA standards. Signage or markings should be similar for all parking facilities.

- **Pedestrian Signage** – Identification of clear pedestrian paths leading from their cars to pedestrian circulation paths should be provided within parking structures. Signs directing pedestrians to elevators and exits should be clearly visible. Levels within the parking structure should be clearly designated using letters, numbers, or color coding on columns, near exits, and at elevators to facilitate pedestrians locating their cars upon return to the parking structure. Kiosks should also be accessible by pedestrians. For additional information on Pedestrian Signage refer to Section 3.3, Pedestrian
- **Handicap Signage** – Information specific to this user group should be provided at appropriate points throughout the parking system. Identification of accessible facilities and travel routes should be provided in close proximity to designated parking. Facilities specific to the handicap user should be identified with signage and should consider the use of International Symbols of Access in addition to other forms of communication including tactile and auditory.

8.3.3 Pedestrian

At the pedestrian scale, the level of information provided reinforces direction and helps orient the visitor. The pedestrian wayfinding system not only directs, it also graphically implies the layout of the campus. Initially, only a limited number of pedestrian signs may be planned for the campus, but it is important to think in terms of the overall system which begins to take shape along the campus perimeter. Pedestrian signage and wayfinding is a supplemental tool to the vehicular signage providing an updated source of information and directing travelers through a variety of locations to their ultimate destination. The hierarchy of pedestrian signage is information maps, directional signs, and building identification.

When determining the pedestrian signage location, it is important to think about where people park and where people begin walking when they arrive on campus. Since pedestrians are traveling at much slower speeds, the opportunity to provide more detailed information about specific destinations can be accommodated. However, the university should be careful to limit the extent of the detail, so that the signs do not become cluttered with extraneous information. They must also provide for constant updating as new buildings are constructed and circulation paths change.

The pedestrian signage and wayfinding system should provide an updated source of information capable of directing pedestrians through major intersections on their way to different buildings, facilities or events. The pedestrian signage system should provide the user with efficient, succinct directional and informational assistance, building identification, and regulatory assistance. The system should create an easily discernable sequence from the campus entry to a final destination. The signage elements can be divided into four categories:

- **Informational** – these provide campus wide information through an overall map and facility directory. These will be positioned near the main entries/exits, and by all of the public parking areas to assist in an overall understanding of the campus to the first time visitor. Other informational signs include information about the campus and the buildings and would enable the visitors to more fully appreciate the history and beauty of the campus.
- **Directional** – these signs provide information to the pedestrian that will aid in their directional decision making process. It is anticipated that this type of signage will be located at pedestrian pathway intersections and will follow a specific methodology throughout the campus. They will subscribe a linear decision-making process that will provide information in a progressively more specific manner.
- **Identification** – these identify a place, facility or structure.
- **Regulatory/Prohibitive** – these signs communicate regulations and restrictions as they pertain to pedestrians.

Pedestrian Oriented Signage Guidelines

- **Pedestrian Kiosk** – Located at each of the parking structures, the pedestrian kiosk offers travelers information pertaining to their current location and anticipated destination. At four of the parking structures the kiosks will be manned. All of the other kiosks are anticipated to be interactive and will be capable of providing up-to-date pedestrian locator maps, campus information, parking permits and information, shuttle bus schedules and stops, and other information important to the pedestrian on campus.
- **Key Locator Map** – The Key Locator Map will provide a campus directory and pedestrian orientation information. These will be free standing directories that will provide a "you are here" map and information indicating the location of buildings, sites, and events in relation to the viewer's position. The maps should be rotated to the direction which the viewer is facing, with a designation to provide the viewer with a means of orienting themselves. In addition to "placing the viewer within the campus" with a more comprehensive map, the Key Locator Maps would illustrate the immediate reality in detail, including all public destinations, building names, parking structures, shuttle stops, and campus facilities. Key Locator Maps should

be provided at major campus gateways and near major pedestrian activity centers (such as Science or Rivera libraries, Student Commons, Carillon Mall and University Theater).

- **Pedestrian Directional Signs** – The primary function of the Pedestrian Directional Sign is to direct pedestrians to major destinations within the campus. They are meant to provide critical destination and wayfinding information at strategic decision points along pedestrian pathways. In the majority of locations, these signs will have information on both sides, to maximize their effectiveness. Color-coding should increase visibility and comprehension of information, allowing pedestrians to follow only signs that are relevant to them at a given moment. Pedestrian signage should be strategically placed to be visible from most major pedestrian pathways in order to efficiently and effectively guide the flow of pedestrian traffic.

- **Building Identification** – Building Identification informs pedestrians that they have reached their final location and confirms the information provided in the campus maps. For more information on Building Identification, refer to Section 3.6, Building.
- **Regulatory/Prohibitive Signs** – Regulatory signs are intended to instruct all people on campus about general rules to abide by while on campus. Regulatory signs have different levels of legal status, enforcement regime, and penalties under violation depending on their governing authority.
- **Campus Safety/Hazard Signage** – This sign type would be used to ensure safety in case of an emergency. These signs should be consistent with the university and building design standards. Signs should be visible and well lit. Signs should be placed as necessary for safety and proper response in case of an emergency. Signage should meet all university, State, and federal guidelines.

8.3.4 Bicycle

UCR is dedicated to promoting the use of bicycles as an alternative method of travel to campus. With the anticipated growth in campus population, UCR plans on providing services and routes for cyclists to create a more bicycle friendly campus. The bicycle signage and wayfinding system will provide the support structure for promoting the use of bicycles for travel to campus. Signage and wayfinding will indicate the presence and location of bicycle facilities, dedicated routes, and potential conflict points. The signage and wayfinding system for bicyclists will focus on providing appropriate signage to direct cyclists to their destination in the shortest amount of time, with the least amount of confusion. The intent is to increase safety and efficiency for bicycle travel and resolve some of the existing bicycle travel issues. Some of these issues are as follows:

- Lack of connectivity between the city bicycle network and the campus network;
- Lack of connectivity between the East Campus and West Campus;
- Safety issues between bicycles, pedestrians, and vehicles during peak on-campus travel times; and
- Lack of efficient signage to direct bicyclists to their destination.

To address these issues the bicycle signage and wayfinding program intends to focus on the following goals:

- Provide signage that will clearly identify the connections between the city bicycle network and the campus bicycle network;
- Provide signage that will clearly identify the connections between the East Campus and the West Campus;
- Provide signage that will better direct bicyclists to campus destinations; and
- Improve bicyclist safety on campus by providing warning signs and right-of-way identifiers.

Welcoming signs and campus edge identifiers in the form of entry monument signs not only orient and welcome the motorist but also orient and welcome the cyclist as they enter the campus from the city roadway system. Signage specific to the cyclist will be provided along bicycle routes and at key decision points along those routes. Bicycle signage will be geared toward identifying the connections between city and campus cycle routes and guiding the cyclist to convenient bicycle parking locations where they can safely store their bicycles and then continue their travel experience as a pedestrian. In addition to the directional and informational systems that will be in place on campus as part of the vehicle and pedestrian signage and wayfinding programs, bike routes, service locations, secure parking areas, and other information pertinent to the cyclist will be provided at kiosks, key locator map locations, and through the university website to help guide and inform the cyclist.

<u>Bicycle Oriented Signage Guidelines</u>

- **Bike Route Signs** – These signs help to identify bicycle routes, connections to other systems, and the location of bike services and secure bicycle parking areas. Bike Route Signs on campus are anticipated to have a specific color so as to be easily identified by cyclists as route signs. Symbols and numbers should also be considered for use in the bicycle signage system to facilitate on-campus wayfinding for the cyclist. Bike Route Signs will also provide information to indicate whether the cyclist is on the East or West Campus. Consideration should be given to providing two types of Bike Route Signs, freestanding post-type signs that provide the kind of information discussed above, and pavement markings that indicate the type of route the cyclist is on, such as bike-only, bicycle/pedestrian route or bicycle/service vehicle route. The pavement markings could be color-coded or symbols could be used to indicate each route type. Bicycle signs should be located in close proximity to bicycle routes but should not interfere with bicycle circulation.

- **Bike Parking Location Signs** – The location of bicycle parking should be provided along bike routes allowing cyclist to locate convenient parking in close proximity to their final destination. The Bike Parking Location Signs should be provided at bike route entries and at major decision making points along bike routes to help guide cyclists as quickly and efficiently as possible to secured bicycle parking facilities.

- **Bike Parking Area Signs** – Each bike parking area should be identified with a sign that indicates its location on campus and its relationship to surrounding academic buildings. These signs should assist cyclists in determining whether they have reached the desired parking location and assist in locating their bicycles upon departure from campus. The Bike Parking Area Signs could be color-coded or use a numeric or graphic system for identifying the parking area's location and relationship to surrounding areas.
- **Bike Safety Signs** – Signs that control conflict points, identify right-of-way, list route restrictions, etc. should be provided along bike routes to improve safety for cyclists. Bike Safety Signs should be provided far enough in advance of decision points to allow cyclists to adjust their speed, change directions, or dismount as appropriate to the situation.

8.3.5 Emergency/Service

The following discussion includes not only emergency personnel and service vehicles, but also includes delivery vehicles and evening permit holders including faculty, staff, and students. The term emergency/service will be used throughout this section to refer to the above users who will need access to the inner campus loop road system. Although the inner campus loop road system will be closed to general purpose traffic, access to the inner loop road will still be needed. Limited access, based on authorization from TAPS, will be given to emergency personnel, service vehicles, vendors, delivery vehicles, transit, faculty, staff, or students holding valid evening permits.

Designed to facilitate emergency response, delivery schedules, and off-hour needs, the Emergency/Service/Evening Permit signage and wayfinding system will provide support to the access-controlled internal circulation system, which is designed to accommodate these special uses and services. To assist emergency/service vehicles in locating their destination, a specific wayfinding system within the inner loop system was developed to help navigate the roadways and identify final destinations. It is anticipated that there will be three levels of signage provided along the loop road, Primary Directional Signs, Secondary Directional Signs, and Dock Identification Signs.

Signage Guidelines

- **Primary Directional Signs** – Located at the main access points to the inner campus loop road, Primary Directional Signs will provide the first tier of information enabling emergency/service vehicles to determine the best route for accessing various parts of the campus. The Primary Directional Signs will indicate which buildings on campus can be reached from that access point and the general direction of those buildings.
- **Secondary Directional Signs** – Within the campus loop road system the Secondary Directional Signage will provide more specific details on building and dock names and locations. These signs will be located at road junctures to assist emergency and service vehicles in making routing decisions.

  Once driving on the local service road, they would know where to park or make their delivery by looking for Dock Identification Signs posted on building structures.
- **Dock Identification Signs** – Following the same signing system as developed for Building Signage (refer to Section 3.6), the Dock Identification Signs will provide emergency/service vehicles with the building name and dock location and identification information. The Dock Identification Signs will provide both daytime and nighttime readability so that the dock area can be identified and located during all hours.

8.3.6 Transit

With the anticipated growth in campus population, UCR is considering the expansion of the existing campus shuttle system and potentially developing new routes to accommodate an expected increase in transit use. In order for the new transit system to be fully utilized, it is important to provide transit users with appropriate signage to direct them to their destination in the shortest amount of time and with the least amount of confusion. Adequate signage will not only ensure safe and efficient transit usage, but will also encourage ridership.

Currently the campus shuttle system consists of the blue and gold lines. UCR plans to close off private vehicle circulation on the inner campus loop. Only service/emergency vehicles and possibly shuttles would be allowed on the inner East Campus roads. Expansion of the Highlander Hauler and Trolley Express will provide links to frequent shuttle service for: East and West Campus cores; East Campus and University Village; nearby housing and East and West Campus cores; and parking structures and East and West Campus cores.

Transit Oriented Signage Guidelines

- **Transit System Kiosk** – These kiosks would be located at the major transit centers, and would guide users to major access points of the system. They could be interactive or they could just be placeholders for maps and other campus information. However, they would provide complete information of the UCR transit system as well as RTA and links to Metrolink and nearby airports or places of interest. Kiosk information would also inform the traveler of transit routes, departure/arrival times, days of service, etc. Information should be updated as the system changes and be consistent with the most current electronic and paper versions of system maps. In addition to the Transit System Kiosk, pedestrian oriented signage and wayfinding systems should be located near transit stops that point the pedestrian to the nearest pedestrian map or sign system.

- **Route Sign** – This sign type would be located at pick-up/drop-off points. These signs should be separate freestanding signs. It is possible that these signs may list destinations for which visitor destination, parking venue, or transit transfer is served by the route. The shuttle route and all routes passing that location should also be indicated on the sign. Route Signs should include route frequencies and hours of operation. The route can be indicated by distinguishing the blue/gold or trolley express by color. The indication of route or destination on the signs would reduce the number of users taking the wrong route. The location of signs should be consistent with the system map.
- **Vehicle Signs** – For transit to be fully utilized, signage must occur on and in the vehicles as well as on the routes. Transit signage should be located on the front, side, and back of transit vehicles and should include colors, typography or symbols that can be easily read from a distance. The interior of each transit vehicle should also include signage that provides route information, route frequencies, and hours of operation for that route. In addition, information about other routes and transportation hubs should be provided to enable the rider to switch to another form of transit, if desired.

8.3.7 Building

An important component of the campus wayfinding program is Building Signage which identifies one's final destination, facilitates emergency and delivery services, and streamlines vehicular movements on campus. As a final destination identifier, the Building Signage will bridge the end-destination informational gap by providing identification signs that are visible to all transportation modes and are functional during all service hours.

Currently most of the building signage lacks visibility either from the campus road system, pedestrian walkways or both. Most building signs also lack nighttime visibility. In addition, some inconsistencies exist in the way buildings are identified and in the graphic format that is used. The objective of building identification is to provide motorists and pedestrians with an effective destination information system so that they can complete their journey in a timely and efficient manner. All informational and directional systems provided prior to the arrival at final destination points should build on the end location with identification of the final location being confirmed through proper signage. Building Signage is also a great method for reinforcing and communicating the campus identity in a consistent manner.

In order to achieve timely and efficient movement of pedestrians and vehicles within the campus environment and promote a positive campus image, each permanent facility on campus should display identifying information that confirms a structure's location within the campus and its relationship to the user's intended destination, with consistency and uniformity of information. Building identification should confirm to the pedestrian or motorist that they have reached their final destination and it should support the campus identity. Building identification should meet the following objectives:

- Building signage should be visible from both the campus roadway system and pedestrian walkways.
- Consistency in size, proportion, and design of each building sign should be used to support the overall campus identity.
- Both permanent and temporary facilities should have a building identification sign that displays standard text with the facility's proper name. In some cases, it may be necessary to display the building name and another line of text to denote a function within the building.
- Nighttime visibility should be considered for all building signs, particularly at loading docks and emergency and evening access points.

<u>Building Oriented Signage Guidelines</u>

Every permanent structure on campus should be identified by at least two types of signage; Wall-Mounted and Freestanding Signs.

- **Wall-Mounted Building Sign** – This sign will identify the building by its proper name. Preferably, the sign will be displayed on the front side of the building but could also be placed elsewhere for visibility. Wall-Mounted Signs should be visible from the surrounding campus roadway system regardless of traveling direction. Where appropriate, additional signs should be placed on walls facing different directions to maximize building identification and visibility. Building signage should only contain information pertinent to the identification or recognition of a particular facility and should maintain simplicity of design to clarify a structures location or function. Building signs should focus on legibility with consideration of the contrast between sign letters and their background. Wall-Mounted Building Signs should be reviewed in terms of their relationship to the building entry, height of sign fascia, or size of wall where the sign is to be installed and the relationship to other signs on a building, as well as visibility from adjacent streets and pedestrian walkways.

- **Freestanding Building Sign** – These signs identify the buildings proper name as well as any other pertinent information such as the buildings function. Free-Standing Building Signs should be sited so that they are clearly visible from adjacent pedestrian pathways without interfering with pedestrian circulation. All freestanding signs should be of a style, material, and design compatible with the overall signage and wayfinding program and with the established building signage template identified in the campus design guidelines.

8.4 Implementation Strategy

8.4.1 Signage and Wayfinding Plan

The quality of UCR's signage and wayfinding plan will determine how well people will be able to navigate their way around the campus. Carrying out a comprehensive plan for signage and wayfinding will not only help people get around campus, but it will also more clearly define the campus boundaries, establish a uniform look for the campus, and enhance UCR's identity and sense of place.

The next step in the advancement of the campus signage and wayfinding system is a more comprehensive evaluation and expansion of the backbone system in the form of a comprehensive sign program. Continued development and analysis of the backbone system should provide information on key access points for each mode of travel to help identify high priority locations for the informational and directional systems established in the MMTMS. In addition, the development of component elements will help to evaluate where and how each element of the signage and wayfinding system would best be utilized to fill in any system gaps.

8.4.2 System Components

For each mode of travel, key signage and wayfinding components have been identified for UCR. Continued development of the components would include evaluation and selection of specific elements that best meet the informational and directional needs of the specified user within a given situation. In order to provide signage and wayfinding components that are relevant to the user, and environmental context, it's important to understand any potential constraints. Potential user constraints may include language barriers, visual acuity, visual range, peripheral vision, and hearing. An example of a resulting sign may be the use of text messages versus graphic media to relay information. Not all users will understand verbal or written communication, therefore consideration of graphic methods of communication should also be considered. Visual acuity (range and peripheral vision) and hearing are more difficult to determine, yet signage systems should consider location, method of communication, and size of sign to account for user constraints. Signs should be placed in well lit, unobstructed areas, with attention given to the text or graphic size and color. Attention should be given to travel specific signage, such as placing a sign far enough before a shared intersection containing vehicles, bicycles, and pedestrians to alleviate conflicts. Potential situation constraints may include lighting, glare, angles, hills, speed, landscape coverage, changed route conditions, and construction-related detours. With any signage installation, sun angles, night time lighting and headlight glare should be taken into account to ensure that signage systems will be visible at all times.

Final selection of component elements that considers potential constraints will be more effective when considering benefits versus costs and maintenance. Final selection of component systems will have to be reviewed and approved by the UCR Design Review Board (DRB) and the Capital Program Advisory Committee (CPAC) and would be the result of a detailed sign.

8.4.3 Signage Design Guidelines

Well designed signs can help unify campus architecture, orient people, and create a sense of order. Signs can also provide color, interest, and detail to enhance campus image. A consistent use of themes, colors, fonts, and materials in development of the signage and wayfinding system will allow the entire system to be recognized as one comprehensive program and will provide the campus with a professional, easily recognized, and aesthetically pleasing public image. A variety of signage types and wayfinding methods can be used to support and augment a travelers understanding of the system and their travel process. As stated before, the type of signage or wayfinding system to be used is dependant on the situation, environment, and message being conveyed.

Information pamphlets, text directions, maps, fixed signs and adaptable signs may be fairly effective separately, but have been proven to be very effective when used in conjunction with one another. Uniform coding systems using graphics, icons and text that are tied into all forms of the wayfinding media provide a cohesive approach to campus travel. This approach allows the user to easily tie their mental picture to the physical environment. For example, if the blue and gold color schemes and bus icons were represented in all wayfinding media related to the Blue Line and Gold Line campus shuttles, the riders of these lines may find it easier to locate stops, routes, and trip times.

Further development of the specific details related to campus signage and wayfinding media will allow the initial system to work more effectively. The use and selection of materials and graphic elements should be determined through coordination and input from a variety of campus stakeholders so that the selection of materials will not only meet the campus signage and wayfinding needs, but will also address the specific needs of campus stakeholders. This will be accomplished through a comprehensive sign program. However, a single board or entity, such as the campus Design Review Board, should have final approval on all aspects of the signage and wayfinding system from component selection to graphic design, so that the overall theme and image of the system holds consistency and thoroughly addresses campus issues.

The following should be considered in further development of the design guidelines for UCR's signage and wayfinding program

- Graphic layout for all of the elements that will be displayed on each sign type must be thought out first. The manner in which each of these elements is arranged on the sign panel determines the look of the sign. Once the relationship of the graphic elements is decided upon, the layout should be employed for each sign type.
- Universities often use their school color system as a basis for signage systems. A color system should be selected to provide proper contrast between the background

and letters. When there is a hierarchy of information to be conveyed, it may be used to employ additional colors for impact.

- Consider the use of graphics and text to improve comprehension of the information being conveyed.
- Coordinate the use of colors, images, and icons to provide uniformity and increase recognition.
- Use a variety of signage types and wayfinding methods to support and augment a traveler's understanding of the signage and wayfinding system, such as campus maps that support on-campus signage.
- Materials, method of fabrication, and sign construction should be reviewed and guidelines established for the UCR program. Type of reflective material can have an effect on issues such as need for lighting and installation orientation. Use of laminated panels, extruded channels, and/or porcelain will have an impact on cost and performance of signs.

In addition to the general guidelines listed above, the following design and location criteria should also be implemented in the development of the sign program.

Design

- All signage components shall comply with UCR's Design Guidelines, in addition vehicular and parking signage shall be consistent with the Transportation and Parking Services rules and regulations.
- All signage systems shall conform to university, city, State, and federal sign standards and guidelines.
- Signage design shall comply with ADA standards. The Society for Environmental Graphic Design (SEGD) should be consulted for a list of approved ADA compliant type faces. Once a typeface is selected and approved, it should be used consistently throughout the signage and wayfinding system to create a unified image.
- All signage systems should reflect the overall image, tone, and goal of UCR's signage and wayfinding program. Selection of sign materials should consider the character they convey and a design aesthetic and palette of materials which complement the campus image should be considered.
- Signage materials and fabrication should respond to economy, durability, aesthetics, and be tamper-proof and weather resistant while providing for ease in upgrade and maintenance, and have flexibility for expansion during campus growth.
- Signage systems shall be clear, simple, and concise with a consistent hierarchy of design, materials, and information in relation to location and purpose.
- Signage systems shall be of uniform size, proportion, and design while allowing for maximum readability based on sight lines and distances. Signs must be visible at all times of the day or night.
- Nighttime visibility of signs should be considered in the form of lit signs, light sensing mechanisms, or other forms of illumination. Illuminated signs should be bright

enough to ensure readability at night time, without causing glare that would affect adjacent uses.

Location

- Signage systems shall be strategically placed to efficiently and effectively guide traffic flow
- Signage systems shall be placed in areas where travelers can read information presented in a timely fashion with adequate time for proper response and without having to park or otherwise leave their mode of travel.
- Sign systems shall be placed to effectively direct various travel modes to the closest entrance for their destination priority.
- Sign systems shall be set back from roadways, driveways, intersections, and other pathways in accordance with university and city standards
- Sign systems shall be provided along routes that consider accessibility for those with impaired mobility.
- Sign systems shall be strategically located at key intersections and nodes as defined by the network of major travel routes that cover the highest concentration of travelers, key destinations, and historic patterns of travel.

8.4.4 Phasing and Maintenance/Installation Protocol

Prior to implementing any new signage or wayfinding systems, it is important to complete the backbone system analysis, select the component elements that best meet user and situation needs, and develop the specific design guidelines that will guide development of the entire system. With these elements in place, the signage and wayfinding system can be implemented along with new construction, phased circulation changes, and with financed upgrades to existing facilities. The overall phasing of the signage and wayfinding should consider the following points:

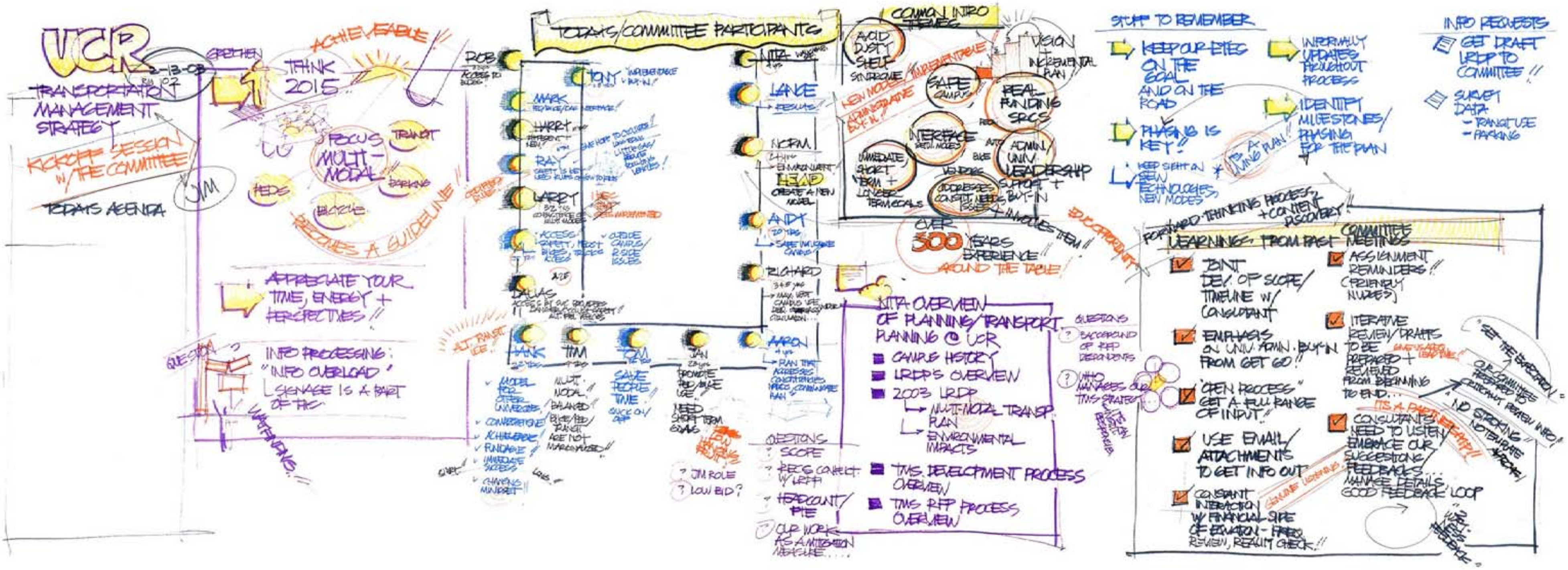
- First priority is to develop a comprehensive sign program for the campus
- Maps and sign systems should be updated in conjunction with campus changes.
- Design and construction of new facilities, paths, and circulation routes should consider the need for and incorporate the placement of signage and wayfinding systems.
- As funding becomes available, the installation, replacement, or repair of signage systems within the existing East Campus should be considered.
- On-going assessments of existing signage and wayfinding systems should be conducted to evaluate maintenance and replacement needs. Minimally this should be done on an annual basis, with intermediate updates if substantial changes occur on or adjacent to campus.

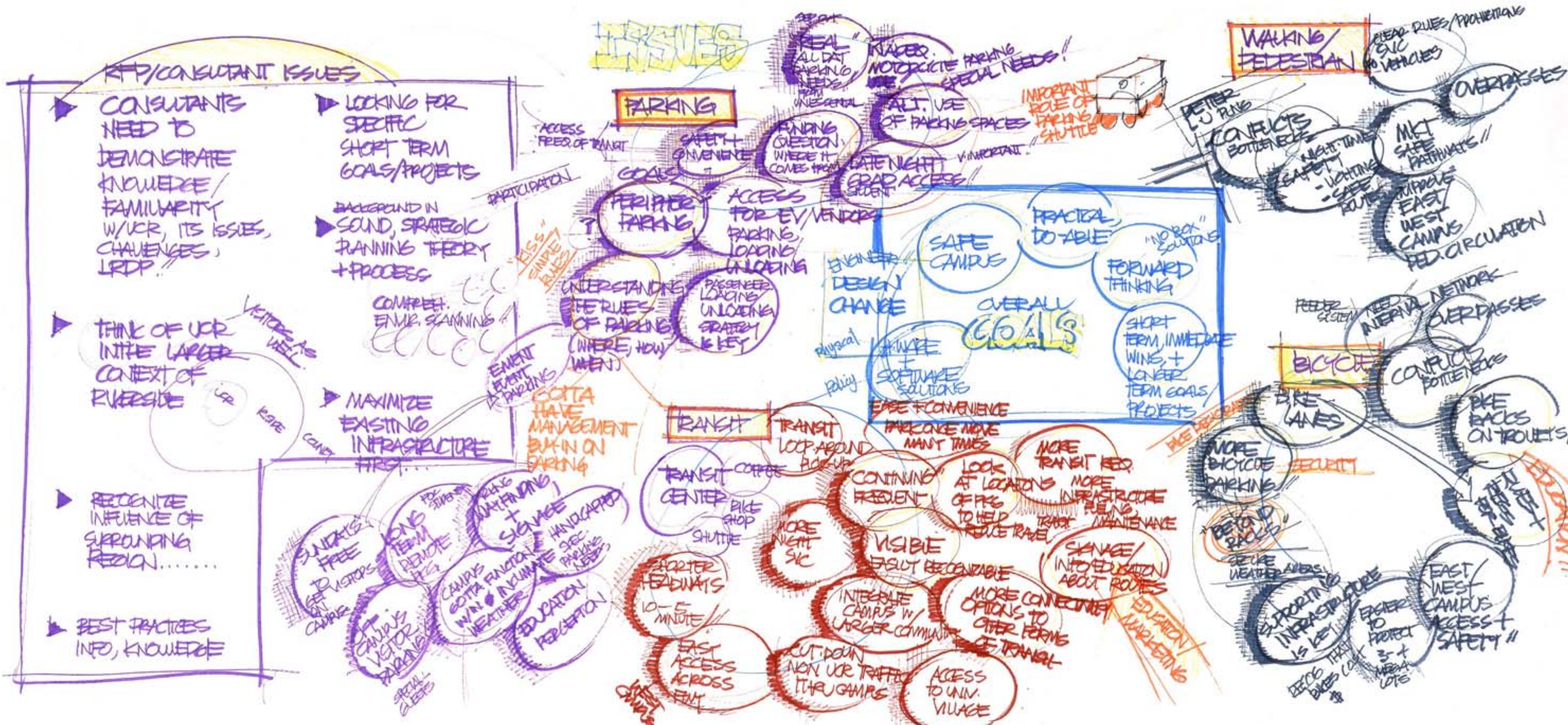
Wayfinding is a system of information; therefore, for wayfinding to be successful, elements of the system must be well maintained. A strategy and plan for maintenance is as critical to success as the design. With ever-improving technology and navigational tools like the Global Information System (GIS) and the Global Positioning System (GPS), a wayfinding element can be as small as a wristwatch. Once implementation of the signage and wayfinding system has begun, a maintenance schedule of the various systems should be developed. The entire signage and wayfinding system should be continually maintained and updated. In addition, system needs should be identified, addressed, and consistently provided for.

A protocol for the creation, installation, and maintenance of all campus signage and information systems, including identification of an entity that is responsible for the complete system, should be developed to ensure conformance with required codes and regulations. An established protocol will also help to ensure consistency in campus sign systems and UCR's identity. The signage and wayfinding system should be continually maintained providing consistent and updated information. A maintenance and installation protocol, with identified responsibilities, will help to see that the signage and wayfinding system needs are identified, addressed, and consistently provided for.

Appendix A:

UCR MMTMS Planning Committee Meeting Minutes


UCR
2-13-08
TRANSPORTATION MANAGEMENT STRATEGY
KICKOFF SESSION W/ THE COMMITTEE
TODAYS AGENDA
JIM
GRETCHEN
THINK 2015
ACHIEVEABLE!!
FOCUS MULTI-MODAL
TRANSIT
PEDS
BIKES
PARKING
BECOMES A GUIDELINE!!
APPRECIATE YOUR TIME, ENERGY + PERSPECTIVES!!
INFO PROCESSING: "INFO OVERLOAD"
SIGNAGE IS A PART OF THE
QUESTION
TODAYS/COMMITTEE PARTICIPANTS
ROB
TONY
MARK
HARRY
RAY
LARRY
DALLAS
HANK
TIM
JAN
NITA
LANCE
NORM
LEAD
CREATE A NEW MODEL
ANDY
RICHARD
AARON
MODEL FOR OTHER UNIVERSITIES
MULTI-MODAL, BALANCED
SAVE PEOPLE TIME
NEED SHORT TERM GOALS
QUESTIONS
SCOPE
RECS CONFLICT W/ LRDP
HEADCOUNT/ FTE
OUR WORK AS A MITIGATION MEASURE....
? JIM ROLE
? LOW BID?
COMMON INTRO THEMES
AVOID DUSTY SHELF SYNDROME
VISION
INCREMENTAL PLAN
NEW MODES
IMPLEMENTABLE
SAFE CAMPUS
REAL FUNDING SRCS
INTERFACE
IMMEDIATE SHORT TERM + LONGER TERM GOALS
ADMIN/ UNIV. LEADERSHIP SUPPORT + BUY-IN
ADDRESSES CONSTIT. NEEDS ISSUES
OVER 300 YEARS EXPERIENCE AROUND THE TABLE!!
EDUCATE PEOPLE
NITA OVERVIEW OF PLANNING/TRANSPORT. PLANNING @ UCR
CAMPUS HISTORY
LRDP'S OVERVIEW
2003 LRDP
MULTI-MODAL TRANSP. PLAN
ENVIRONMENTAL IMPACTS
TMS DEVELOPMENT PROCESS OVERVIEW
TMS RFP PROCESS OVERVIEW
QUESTIONS
? BACKGROUND OF RFP RESPONDENTS
? WHO MANAGES OUR TMS STRATEGY
STUFF TO REMEMBER
KEEP OUR EYES ON THE GOAL AND ON THE ROAD
PHASING IS KEY!!
KEEP SIGHT ON NEW TECHNOLOGIES, NEW MODES
INFORMALLY UPDATES THROUGHOUT PROCESS
IDENTIFY MILESTONES/ PHASING FOR THE PLAN
IT'S A LIVING PLAN!!
INFO REQUESTS
GET DRAFT LRDP TO COMMITTEE!!
SURVEY DATA - TRANSIT USE - PARKING
FORWARD THINKING PROCESS, + CONTENT DISCOVERY!
LEARNINGS FROM PAST COMMITTEE MEETINGS
JOINT DEV. OF SCOPE/ TIMELINE W/ CONSULTANT
EMPHASIS ON UNIV. ADMN. BUY-IN FROM GET GO!!
"OPEN PROCESS" GET A FULL RANGE OF INPUT!!
USE EMAIL/ ATTACHMENTS TO GET INFO OUT
CONSTANT INTERACTION W/ FINANCIAL SIDE OF EQUATION - FREQ. REVIEW, REALITY CHECK!!
ASSIGNMENT REMINDERS!! (FRIENDLY NUDGES)
ITERATIVE REVIEW/ DRAFTS TO BE PREPARED + REVIEWED FROM BEGINNING TO END...
IT'S A PARTNERSHIP!!
CONSULTANTS NEED TO LISTEN/ EMBRACE OUR SUGGESTIONS/ FEEDBACKS... MANAGE DETAILS "GOOD FEEDBACK" LOOP
SET THE DIRECTION
NO SMOKING



RFP/CONSULTANT ISSUES
CONSULTANTS NEED TO DEMONSTRATE KNOWLEDGE/ FAMILIARITY W/UCR, ITS ISSUES, CHALLENGES, LRDP
LOOKING FOR SPECIFIC SHORT TERM GOALS/PROJECTS
BACKGROUND IN SOUND, STRATEGIC PLANNING THEORY + PROCESS
THINK OF UCR IN THE LARGER CONTEXT OF RIVERSIDE
MAXIMIZE EXISTING INFRASTRUCTURE FIRST
RECOGNIZE INFLUENCE OF SURROUNDING REGION.......
BEST PRACTICES INFO, KNOWLEDGE
ISSUES
PARKING
SAFETY + CONVENIENCE
PERIPHERAL PARKING
ACCESS FOR EV/VENDORS PARKING, LOADING UNLOADING
UNDERSTANDING THE RULES OF PARKING (WHERE, HOW WHEN)
PASSENGER LOADING UNLOADING STRATEGY IS KEY
LATE NIGHT GRAD ACCESS
ALT. USE OF PARKING SPACES
MOTORCYCLE PARKING
SPECIAL NEEDS!
IMPORTANT ROLE OF PARKING SHUTTLE
GOTTA HAVE MANAGEMENT BUY-IN ON PARKING
EDUCATION PERCEPTION
SIGNAGE
TRANSIT
TRANSIT CENTER
TRANSIT LOOP AROUND
CONTINUING FREQUENT
MORE TRANSIT REQ.
MORE NIGHT SVC
SHORTER HEADWAYS 10-15 MINUTE
VISIBLE EASILY RECOGNIZABLE
SIGNAGE/ INFO/EDUCATION ABOUT ROUTES
INTEGRATE CAMPUS W/ LARGER COMMUNITY
MORE CONNECTIVITY OPTIONS TO OTHER FORMS OF TRANSIT
EASY ACCESS ACROSS
CUT-DOWN NON UCR TRAFFIC THRU CAMPUS
ACCESS TO UNIV. VILLAGE
EDUCATION/ MARKETING
OVERALL GOALS
SAFE CAMPUS
PRACTICAL, DO-ABLE
FORWARD THINKING
SHORT TERM, IMMEDIATE WINS, + LONGER TERM GOALS, PROJECTS
ENGINEER DESIGN CHANGE
HARDWARE + SOFTWARE SOLUTIONS
EASE + CONVENIENCE
WALKING/ PEDESTRIAN
OVERPASSES
CONFLICTS BOTTLENECKS
NIGHT TIME SAFETY - LIGHTING - SAFE ROUTES
MKT SAFE PATHWAYS
IMPROVE EAST/ WEST CAMPUS PED. CIRCULATION
INTERNAL NETWORK
BICYCLE
BIKE LANES
CONFLICTS BOTTLENECKS
BIKE RACKS ON TROLLEYS!
MORE BICYCLE PARKING
SECURITY
BEYOND RACKS
SUPPORTING INFRASTRUCTURE IS KEY
EASIER TO PROTECT
EAST/ WEST CAMPUS ACCESS + SAFETY
EDUCATION!!

"MULTI-MODAL TRANSPORTATION MANAGEMENT STRATEGY KICKOFF"

UCR Transportation Management Strategy Kickoff Session with the Committee - 2/13/03
Jim Oswald, facilitator

Gretchen Bolar (Vice Chancellor of Academic Planning and Budget)

- Think 2015
- Focus on a multi-modal plan which includes transit, pedestrians, bicyclists, and parking
- Provide a strategy that becomes a guideline
- Make it achievable
- The campus appreciates your time, energy and perspectives!
- Most people coming to the campus are faced with Information processing and overload from the beginning, so signage is a part of the plan to provide for good wayfinding to and while on campus

Today's Committee Participants - Over 500 years of experience around the table

- Rob (33 years on campus) – Access to buildings
- Tony (1.5 yrs) – Implementable and buy-in
- Mark – Pedestrian/bike/car interface
- Harry (10 yrs) – Different, new
- Ray (6 yrs) – Safety is key, need rules on how to ride, give hope to cyclists, long term, little gas/reduce polluting vehicles!
- Larry (32 yrs) – coexistence of multi-modes, one that gets implemented
- Al (35 yrs) – access, safety, pedestrian/bikes/trucks access, outside campus – Riverside issues
- Dallas (25 yrs) – access by svc providers, danger/cyclist safety, alternative fuel vehicles
- Hank (22 yrs) – model for other universities, comprehensive, achievable, fundable, immediate success, changing mindsets
- Tim (4 yrs) – multi-modal, balanced, bike/pedestrian/transit are not marginalized
- Tom (35 yrs) – save people time, quick on and off
- Jan (23 yrs) – promote pedestrian/bike use, need short term goals – low hanging fruit
- Aaron (4 yrs) – plan that addresses constituent needs, communicate plan
- Richard (34.5 yrs) – max west campus use requires additional over pass or underpass circulation
- Andy (20 yrs) – same, walkable campus
- Norm (24 yrs) – lead – create a new model, environment
- Lance – wants results!
- Nita (4 yrs) – walkable, access everywhere

Questions

Scope
Recognize comp with LRDP

Headcount vs. FTE
Our work as a mitigation measure

Introduction - Common Themes
- Avoid dusty shelf syndrome
- New model, implementable
- Administrative buy-in
- Immediate short term and longer term goals
- Interface between modes
- Safe Campus
- Vision + incrementable plan
- Real funding sources
- Administration/University leadership buy in and support
- Addresses constituent needs, issues and involves them
- Educational opportunity

Nita Bullock, Campus Physical Planner - Overview of Planning/Transportation Planning at UCR
- Campus History
- LRDP Overview
- 2003 LRDP
    - Multi-modal transportation plan
    - Environmental impacts
- Transportation Management Strategies development process/overview
- Transportation Management Strategies Request for Proposal overview
- Questions
    - Background of RFP Respondents – transportation planners/engineers
    - Who manages the UCR Transportation Strategy – It is an institutional responsibility
- Stuff to remember
    - Keep our eyes on the goal and on the road
    - Phasing is key
    - Keep sight on new technologies, new modes
    - It's a living plan
    - Informally updates throughout process
    - Identify milestones/phasing for the plan
    - Information Request
        - Get draft LRDP to Committee
        - Survey Data (TAPS)
            - Transit use
            - Parking

Learning from Past Committee Meetings

- Forward thinking process + content discovery
- Joint development of scope and timeline with consultant

- Emphasis on university administration buy-in from the get go
- Open process, get a full range of input
- Use e-mail and attachments to get information out
- Consultant interaction with financial side of equation – frequent review, reality check!
- Assignment reminders – friendly nudges
- Iterative review/drafts to be prepared and reviewed from beginning to end – give us adequate lead time
- It's a partnership - consultants need to listen, embrace our suggestions, feedback , manage details, good feedback loop, 2-wayness feedback
- Set the expectation – the committee prepared to critically review info – no stroking – no template approach

"MULTI-MODAL TRANSPORTATION MANAGEMENT STRATEGY KICKOFF"

RFP/Consultant Issues:

- Consultants need to demonstrate knowledge/familiarity with UCR and its issues, challenges, LRDP
- Think of UCR (visitors as well) in the larger context of Riverside
- Recognize influence of surrounding region
- Best practices/information knowledge
- Looking for specific short term goals/projects
- Background in sound, strategic transportation planning theory and process
- Maximize existing infrastructure first

Issues:

- Overall goal – engineer/design changes/physical policy
- Hardware and software solutions
- Safe campus
- Practical, do-able
- Forward thinking (no off-the-rack solutions)
- Short term/immediate wins, plus long term goals/projects

Parking:

- Access, frequency of transit
- Safety & convenience
- Peripheral parking
- Understand of differences of parking (where, how, when)
- Got to have management buy-in on parking
- Event parking
  - Sundays free to get visitors on campus
  - Off campus visitor parking – special guests
- Long term remote parking for students
- Campus must function in inclement weather
- Handicapped – special parking needs
- Education perception
- Parking wayfinding and signage
- Passenger loading/unloading strategy is key
- Access for vendor parking/loading and unloading
- Funding question- where does it come from
- Real all day parking needs from unreal needs
- Alternative use of parking spaces
- Importance of parking shuttle
- Late night grad student access to campus

Transit:

- Access, frequency of transit
- Safety & convenience
- Loop around pick-up
- Transportation centers with bike shop, shuttle, coffee
- Shorter headways – 10 minute
- Easy access across freeway – West Campus
- Cut down non UCR traffic through campus
- Access to University Village
- Easy and convenient
- Look at locations
- More connections to other forms of transit
- Signage/education about routes
- More transit required, more infrastructure being maintained

Pedestrian/Walking:

- Clear rules prohibition student/vehicle conflicts
- Overpasses
- Market safe pathways
- Improve East/West campus pedestrian circulation
- Nighttime safety
    - Lighting
    - Safe routes

Bicycle:

- Need internal network
- Overpasses
- Resolve conflicts/bottlenecks
- Support infrastructure is key
- East/West Campus access and safety
- Easier to protect 3-4 large lots than many small ones
- More short term parking with security
- Bike lanes

UCR MMTMS Planning Committee Meeting
July 8, 2003
Bannockburn J-102
2 PM to 5 PM

Minutes

Introductions/Review of Agenda

Nita Bullock opened the meeting. Self-introductions were made of those present. The sign-in sheet is attached.

Project Overview

Nita Bullock provided an overview of the MMTMS project. The University has been growing rapidly in recent years, by about 1,000 students per year. Congestion on campus is a problem. In addition, the University will soon build its first on-campus parking structure. The LRDP is still being finalized, but the Vice-Chancellor thought it was important to kick-off the transportation plan. A Metrolink station is planned adjacent to the campus. The campus has been fairly compact so far, but that is going to change.

As part of this project the consultant will produce:
- signage plan for way-finding
- prioritization plan for improvements
- implementation plan
- schedule for implementation
- cost data
- alternative funding strategies

Parking revenues cannot fund everything. The plan should provide a sense of place for the University as well as make it open and accessible. We are also looking for some unique attributes to the program.

Identification of issues

Julie Rush (PB) presented a summary sheet of notes from the Planning Committee Kick-off Session (February 13, 2003), which included a summary of common themes and a listing of issues, goals and needs grouped under the headings of parking, pedestrians/ walking, transit, and bicycles. The group confirmed the elements on the list provided, and the following additions/changes were made to the list of issues, goals, and needs. The updated list is provide with these minutes.

<u>Parking</u>

- Event parking
  - Saturdays and Sundays free to provide incentive for integration with community
  - Alternate use of parking (e.g., vendor sales and events in Lot 30) provides a revenue source
- Visitor and special parking needs should be considered separately from handicapped parking.
- Vendor parking, loading, and unloading should be considered separately from emergency vehicle access.
- Consider needs for university vehicles – providing multiple services (mail, police, food, EH&S), generally need to park close, and are treated differently than vendors in parking policies; alternate fuel vehicles being added to the fleet have unique needs
- Policies/rules should be developed, communicated, and enforced.

<u>Vehicle access</u>

- Emergency vehicles and vendors need access to center of campus. Policies need to address access issues – some policies exist but not always enforced.

<u>Pedestrians/Walking</u>

- Drop-off points are important because they promote carpooling. Issues of safety, enforcement, and location need to be addressed.
- Conflicts:
  - Address the key conflict points on campus (perhaps 6-12 locations)
  - Conflicts are mostly between autos and pedestrians.
  - Some bike/pedestrian conflicts.

<u>Bicycling</u>

- Exclusive paths for bikes needed.
- Address cross-street and crossing issues
- Use signing/striping to communicate to bicyclists.
- Connect with City bike lanes/paths to develop more of a network.

<u>New Modes</u>

- Segways
- skateboards

Transit

- Gridlock prohibits a true periphery/loop route because a schedule can't be maintained.
- Link parking and destinations.
- Transit links to housing.
- Follow future land use.
- Need a steady source of funding.
- Lot 30, or a parking structure, could be a potential future hub.

Transit Demand Management (TDM) Strategies

- Staggered work hours

Needs

- Policies are important
  - Where can people travel and park?
  - When?
  - How enforced?
- Plan for growth
- State-of-the-art solutions

Planning Principles

Julie Rush explained the role of planning principles in helping the consultant team focus on the most important objectives and issues as the transportation strategy is developed. She asked each of the participants to identify their top issues and objectives. From this discussion, the following list was developed and refined:

- Minimize the number of motor vehicles on campus
- Optimize safety (eliminate auto conflicts, ensure personal safety on campus)
- Develop strong, clear east-west campus links
- Identify funding sources for the transportation system, particularly transit
- Provide movement for service vehicles (all providers, including shuttles & trams)
- Optimize the flow of persons
- Provide accessibility to all points of campus
- Provide convenient transportation for users
- Eliminate student/vehicle conflicts
- Provide access for emergency vehicles
- Enhance bicycle travel
- Identify policies to achieve compliance

- Determine how to accommodate electric vehicles (where to drive and park)
- Identify needs for marketing and education (to target different group needs)

Examples of best practices

Julie Rush asked the group for examples of universities which have exemplary transportation systems or elements, which the consultant team could investigate as possible examples of transportation for UCR. The following were identified:

- City of Boulder transit [note: apparently the City of Boulder likes it, but not the University; officials from the City of Riverside and RTA visited Boulder]
- UC Davis, bike element
- UC Santa Barbara, bike element
- UW, U-Pass program and relationship with local transit
- UCLA, vanpool program

Project Scope

JD Douglas (PB) provided an overview of the MMTMS work scope, schedule, and outreach components. The consultant team will be meeting with the MMTMS committee a total of five times at key milestones throughout the project.

Upcoming meetings

The next MMTMS Planning Committee meeting is planned for late September.

UC Riverside – Multimodal Transportation Management Strategy
Emergency Services, Security Services, and Student Special Services
Focus Group – July 30, 2003
Bannockburn J-102

Transportation Problems	
Congestion	Worst Locations • The intersection of Aberdeen Drive and North Campus Drive is a particularly bad one due to multiple trip movements and conflicts. At this location there are pedestrians, bikes, car back ups, and drop-offs occurring all at once. • The entrance to the Commons dock area is another problematic location due to the mix of trucks, cars, pedestrians, and informal drop offs.
Informal Drop Offs	• Students, faculty, staff are frequently dropped off at locations that are problematic; these drop-offs inhibit circulation and contribute to congestion. .
Safety	Emergency Response Times • Congestion during the day inhibits emergency response times for police, fire, and emergency vehicles. Congestion tends to build at the intersections. At some locations, the roadways are not wide enough for emergency vehicles to pass. Bicycles • There is a lack of bike lanes on campus. We expect bike volumes to grow and we need to manage these interfaces. • Bicycles are locked or parked at locations that are inappropriate. This especially poses problems for sight or mobility impaired travelers. Currently, there is no system in place to have these bikes removed. • Bicycles speed in certain areas in the inner campus (e.g., near Bourns Hall, on the southside of the Library near the loading ramps). Bike (and skateboard) speeds are also too high on the internal paths within the campus core area. • Bicycles ignore traffic controls (do not stop). Pedestrians • Pedestrians walking across roadways are a problem, particularly during peak travel times. • Pedestrians ignore traffic controls and cross anywhere. • The sidewalk that crosses under the 60 freeway is too narrow and oftentimes bikes and pedestrians are forced out into the road. • The route between Olmstead Hall and Lot 6 feels unsafe (personal security issue). The public restroom in this area also feels unsafe. This is largely a perception problem, but attention to this issue is warranted. Vehicles • Cars speed on the interior campus roadways (where there are no speed bumps) and in parking lots.
Emergency Access	• In general, access near Bourns is difficult. • For some buildings it is difficult to get fire equipment in and out. In the past there have been problems getting close at loading

	areas or with people parking where emergency vehicles need to access.
Signage	• Emergency services do not know where to go. Current University practice is to dispatch someone to meet the responding emergency vehicle at the campus entrance(s).
Enforcement	• The University does not have enough staff to do as much enforcement as they would like (labor cost issue). Wherever possible, it is desirable to engineer solutions so that they do not need to devote as much staff to enforcement and traffic control. • The narrow, two-lane roads along the inner campus loop make it difficult for police to pull vehicles over.
Student Special Services	• People will leave their cars parked on sidewalks. Handicapped students cannot get through. • Congestion prevents special service vehicles from getting close to their destination to drop off and pick up handicapped students. • At many buildings, the loading docks are used for handicapped spaces and to pick up and drop off students. These could be improved. • Access to some buildings and to the walkway system within the inner core of campus presents extreme elevation challenges to some students. For example, the area between Pentland Hills and the inner campus is a problem. These students cannot negotiate the hilly areas on their own. • Often times, the safest, most convenient entrances to buildings are not the same entrances that are handicapped accessible.
Construction Activities	• During times of construction, barriers are removed that guide or prohibit access (pedestrians, vehicles). This results in conflicts among modes that wouldn't ordinarily exist at these locations.
Suggested Transportation Solutions	
Traffic Control	• Additional pedestrian cross walks and signals are desired. • It would be advisable to coordinate with the City on some signal improvements or additions such as left-turn arrows or scramble pedestrian crossings. • Whenever possible, use engineering solutions to control traffic or enforce rules.
Access Control	• The campus needs a system for managing gates and who has access to those gates. There should be greater use of Knox boxes. Nobody really knows where these are located and who has access. • Reduce the number of vehicles that are using the inner campus roads. Any measures that try to inhibit or discourage inner vehicle traffic, however, should not impede emergency vehicle access. Barriers, for instance, should be easily removable for emergency services. • Provide an outer loop road for vehicles.
Student Special Services	• Handicapped parking and access could be better at several buildings as routes are circuitous and not well let. Main entrances of buildings should be wheel chair accessible. The problem is mostly at the older buildings that would require

	retrofitting. • Handicapped access should be more direct and well lit. • All transit buses should be chair accessible, including special extended services (like added shuttle vans run during finals week). • If elevators are proposed or provided, then handicapped students need safe alternatives (lighted, ramps) at night or during off hours when elevators are not available. • Escort Services has a “safe path” program that would be more effective if it were to be enhanced. • Escort service should be funded rather than strictly volunteer. Perhaps introduce the use of vehicles so that escorts do not have to travel on foot. • As transit service is expanded (e.g., point to point service, late shuttles) make sure that the vehicles and the service is wheel chair accessible. • The campus should come up with a Master Mobility Plan.
Pedestrian Facilities	• Provide pedestrian overpasses. • There are some bad sidewalk areas that could be improved, for example near the telecommunications building. • Additional benches should be provided as rest places for handicapped students and for pedestrians in general. Logical locations would be near handicapped parking, at transit stops, or at set distances. • Add fencing or planting along sidewalks or at drop-off points to guide pedestrians to crosswalk locations.
Lighting	• For purposes of personal security, a systematic implementation of lights / lighting would be beneficial. There are several gaps in campus lighting as these are typically put in on an incremental basis. Should be linked to the system of pedestrian walkways and paths throughout the campus.
Signage	• Signs should be posted on buildings so that emergency vehicles can locate them. Note that buildings have multiple sides that should be visible from different vantage points. It is important that emergency vehicles also locate the correct access route and entrance. Also, so that they can locate the correct hook-ups (fire equipment). • One suggestion would be to create street addresses or a numbering system for the buildings that outsiders can understand (Thomas Brothers). • Signs for buildings can be developed based on color (or by group or category). For example, identifying signs for shopping malls are obtrusive, but they work. • Signs for wheel accessible facilities would be helpful. Also, consider advanced technology information signs or audio-visual equipment at crossings and at bus stops. • Information should be provided for first-time handicapped visitors. Have kiosks or information booths where one can use map quest to get directions on campus (e.g., Advanced Traveler Information Systems). • Provide a campus map and directory locations, similar to shopping malls.

	• Provide directional signs.
Emergency Access	• Should have a map of the emergency access system.
Dedicated Drop Off	• Provide dedicated drop off facilities so that cars do not continuously stop in the middle of traffic.
Bike System	• Provide infrastructure for bikes (paths, lanes, support facilities). • Bike parking should be located away from pedestrian walkways and entrances. It would be best to cluster bike parking in logical zones within the campus (and away from pedestrians). • May have to limit bikes on campus. Provide bike parking lots and then use transit to get them to the inner campus. Or provide dismount zones in the inner campus areas.
Transit Service	• Get transit closer to the inner core of campus. Perhaps shuttle or trolley on the mall itself.

Other Discussion Items	
Future Transportation Concerns	• When the construction of Engineering II is completed, there will be additional pedestrian traffic in this area. • Need to do a better job of managing construction impacts to traffic, to access, to parking. • As the University introduces new types of vehicles (e.g., Segways, small electric vehicles) these need to be managed: routes, access, maintenance, and parking.
Ideas from Other Schools	• Use of an elevated walkway system to eliminate pedestrian-auto conflicts. Outer auto loop system. • Fences that control pedestrian movement (e.g. UCSB or CSULB)
Other Stakeholders	• Involve physical plant staff in proposed transportation solutions.

UC Riverside – Multimodal Transportation Management Strategy
Bicycle
Focus Group – July 30, 2003
Bannockburn J-102

Existing & Future Conditions	
Major Travel Patterns	• Of the University population (students, faculty, staff), there is no one group that are predominant cyclists. At present, an even proportion of these groups use their bike to get to campus. Bicyclists generally live five miles or less from campus. • Bicycles are used to get to and from campus, rather than for purposes of internal circulation (e.g., getting from point to point within the campus). If the trip distance on campus can be covered in 10 minutes or less, then cyclists prefer to walk. If more than 10-15 minutes, then cyclists will use their bike. • The destinations that tend to attract high numbers of cyclists include: the Surge Building; the libraries; University Lecture Hall; the Physics Building; the Commons; in between Sproul Hall and Olmstead Hall; the Life Science Building; and large lecture halls in general. • Bike ramps located near the bookstore and Science Library draw bicycle traffic. • Outside of campus and leading onto campus, bike access is provided on city streets. On campus, bikes must share the same paths as vehicles. Major bike patterns/routes onto campus include: (1) Watkins Drive (SB) through family housing to Linden Street (WB) to Aberdeen Drive (SB); (2) Linden Street (EB) to Canyon Crest Drive (SB); (3) Canyon Crest Drive (NB) under 60 Freeway to West Campus Drive (although underpass narrow roads limits bicycle travel); and (4) Big Springs Road (WB) to East Campus Drive (SB). • Several city streets already have bike lanes: University Avenue, Linden Drive, Martin Luther Kind Boulevard, Aberdeen Drive, Big Springs Road. However, these bike lanes terminate once you get onto campus. • Internally, bicyclists share the sidewalks with pedestrians.
Future Conditions	• Caltrans is developing a project that will include elevated bike lanes (e.g., a grade-separated pathway) at the Canyon Crest undercrossing in the future.
Potential Travel Markets	• The best travel markets to encourage more bike usage are those students, employees, and faculty members that live between 2 and 5 miles from campus. It might be possible to attract a few that live in the 5 to 10 mile range. When viewing these distances, a major consideration is topography. The big hill in the southeast quadrant of campus tends to discourage bicycling. Therefore, major residential areas such as Mission Grove and Moreno Valley are somewhat limited as major bike travel market. The areas west and north of campus are relatively flat. High traffic volumes, however, west of campus can make biking uninviting and the area north of campus is largely industrial.

	• Because of the higher numbers, students represent a good target market, particularly apartment dwellers near campus or students who do not have access to cars.
Transportation Problems	
Lack of Bike Paths	• City bike lanes end at the outskirts of campus. The lack of bicycle paths or lanes that lead directly into the inner campus discourages bike riding. • The 60 Freeway also poses a barrier to bike travel onto campus from the west.
Crossing Conflicts	• Bicyclists prefer to maintain speeds. Existing traffic lights are not actuated by bicycles and rather than wait, bicyclists will move on through. Bicyclists do not stop at the stop signs. • Autos stopping in the middle of the traffic stream to drop off passengers inhibit bike movements. • Conflicts frequently occur in areas where bike ramps lead to the inner campus road.
Recurring Congestion	• Pedestrian congestion and conflicts with pedestrians inhibit bike trips. Construction activities have made this situation worse. But the problem occurs all day long and is particularly bad during class changes.
Inadequate Support Facilities	• Bike parking is insufficient and there is demand overflow at existing bike racks. • Most of the existing bike racks do not work well with high security locks and people are afraid to leave their bikes out in the event they are stolen. • The only shower facilities are located at the gym. People do not want to ride their bikes because there is no place for them to shower and change near their destination points on campus. The extremely hot weather at UCR is a disincentive to bicycling unless these facilities are provided.
Safety	• Internally, bike conflicts with pedestrians are a safety concern. There are key “choke points” on campus where bicycles and pedestrians must funnel through the same narrow gaps or where bikes use the down ramps at high speeds. Specific problem locations are: (1) corner of University Avenue and Canyon Crest Drive (bikes often ride on wrong side of road); (2)Canyon Crest and University undercrossings; (3) near the Surge Building; (4) near the Library; (5) the Commons area; and (6) where ramps lead into the inner campus loop. • Oftentimes cars park in the bike lanes. In areas where the width of the roadway is tight, autos will not respect the bike lanes.
Suggested Transportation Solutions	
Bike System	• The University lacks an integrated bike system. There are gaps in the bike facilities onto campus. There is a need for system continuity from where the city bike lanes end into the campus core. • Bike paths (separate from pedestrians) that lead directly onto campus would be highly desirable. If possible, consider bike paths (two east-west, one north-south) through the mall area.

	• System hierarchy - there are some locations where bikes should be given priority. • A map of the proposed bicycle system should be developed. The map should identify bike routes and facilities. • Provide bicycle support facilities (bike racks, lockers, showers, etc.) • Expand transit coverage and frequency so that bike users do not feel trapped on campus and so that they can get around on campus without an automobile. • Bike system should support intermodal transfers (e.g., bike racks on buses, bike parking at Metrolink station). • Bicycle actuated traffic lights

Traffic Control	• The traffic rules for bicyclists should be the same on campus as they are off campus (e.g., one set of traffic rules). • Rules should be enforced. Violators should be ticketed.
Signage	• Warning signs should be provided that advise motorists to “take care” on campus roadways or at locations of high bike crossing movements. • Signs that advise bicyclists as to who has the right of way would be helpful. • Welcome signs as you enter campus. • Locator or directional signs to key destinations or bike facilities or bike routes. • Possibly consider street stencils (e.g., bike icons, roadway striping, locations of bike facilities) to direct bicyclists.
Bicycle Parking	• The type of bike racks should be upgraded to work with “u” locks or bike lockers should be provided. • Additional bicycle parking should be provided (high density lots or bike racks), particularly at those buildings that draw high numbers of students. • Centralized locations for placement of bicycle parking is preferred (easier to enforce). Within the campus core, desired walking distance from bike parking to destinations is 5 minutes or less. Perhaps five or six centralized parking racks could provide this coverage. • Bike parking and lockers should be provided at locations to facilitate intermodal linkages. For example: (1) proposed Metrolink station; (2) large parking lots/parking structures; (3) transit hubs.
Shower Facilities	• Shower facilities should be provided at logical locations throughout the campus. At a minimum, one should be located at the top of the hill. Some of these facilities could tie in with locations of centralized bike parking. [Note: The cost of building these facilities as well as operations and maintenance need to be accounted for.]
Bicycle Programs	• A bike registration program should be implemented. It makes it easier to enforce/manage risk of bike theft; handle abandoned bikes; or bikes left in unsafe locations. • A bicycle education program should be provided to bicycle users, which covers registration, “rules of the road,” and locations of routes and facilities. One suggestion would be to

	make this part of orientation at the beginning of the school year. • Consider a subsidy program for electric bikes.
Suggested Long-Term Improvements	• Different pavement treatments on campus to indicate paths for pedestrians (concrete) and paths for bikes (asphalt). • Provide a shower facility and changing area in every building on campus. • Provide wider sidewalks for the inner campus. • Prohibit vehicle traffic on the interior roadway system. • Provide a bicycle shop on campus (sales, rental, repair). A possible location could be in the proposed parking structures or the student bookstore. • Work with the City of Riverside and the surrounding communities to promote bicycle awareness and usage. • Link the campus bicycle network to the planned regional bike path along the Gage Canal.

Other Discussion Items	
Implementation	• Need administrative "buy-in" for any proposed changes. • Need to pursue funding sources to cover the cost of implementation. Possibilities include: federal grants, Congestion Mitigation Air Quality (CMAQ) Improvement Program funds, "livable communities" funds. • Need to identify who has jurisdictional responsibility for bikes on campus. Right now these responsibilities are split among different departments. A centralized authority would be best.
Standards / Future Development	• Provision of bicycle facilities (minimum acceptable standards and requirements) needs to be considered and formally integrated into planning process for the development of new facilities and buildings. The "value engineering" phase is a typical stumbling block.
Other Bicycle Stakeholders	• Project team should talk to undergraduate students.
Other Sources of Information	• Look at practices at UC Davis and UC Santa Cruz.

UC Riverside – Multimodal Transportation Management Strategy
TAPS
Focus Group – July 30, 2003
Bannockburn J-102

<table>
<tr><td colspan="2">Existing & Future Conditions</td></tr>
<tr><td>Major Travel Patterns</td><td><u>Auto Access to Campus</u>:
Key entry points are: (1) University Avenue (EB) to West Campus Drive (SB); (2) Canyon Crest Drive (NB) to West Campus Drive; (3) Big Springs Road (WB) to North Campus Drive; and (4) Linden Street (EB) to Aberdeen Drive (SB) to North Campus Drive.
Lot 6 generates much traffic within inner campus loop road. Students prefer to park in Lot 6. If they learn that this lot is full, then they will circle the campus using Campus Drive to get to Lot 13. For purposes of traffic management it is preferable for the students to proceed directly to Lot 30 via Martin Luther Drive, which is located on the other side of the freeway.
<u>Drive Through Traffic</u>:
During the a.m. and p.m. peaks, local traffic will cut through UC Riverside along Martin Luther King Boulevard Drive to Canyon Crest Drive, or will parallel the 60 Freeway along Sycamore Canyon Boulevard / Box Springs Boulevard as an alternative route to avoid freeway traffic congestion. Commuters frequently use Canyon Crest Drive and Martin Luther King to reach the SR-91 on the west (approximately 3 miles), thereby bypassing the SR-91 and I-215/SR-60 Interchange.</td></tr>
<tr><td>Future Travel Conditions</td><td><u>Changes in Existing Circulation</u>
Caltrans will build a new local access interchange for SR-60 at Martin Luther King.
<u>Key Concerns</u>
As the campus grows, congestion is going to get worse and the congested periods are going to expand in duration.
As parking is moved out into the periphery of campus there will be more (or different) points of conflict between pedestrians trying to move from the parking areas onto campus and autos circulating on the “inner” loop roads.
As residential areas are developed in other locations surrounding the campus (e.g., near Watkins Drive, near Iowa Avenue / Martin Luther King Boulevard) there will be more (or different) areas of conflict between pedestrians trying to move onto campus and vehicles circulating on the “inner” loop roads.</td></tr>
<tr><td colspan="2">Transportation Problems</td></tr>
<tr><td></td><td><u>Time of Day</u>:
At present, congestion on campus occurs in 20-minute surges throughout the day, roughly between 8:00 a.m. and 5:00 p.m. These surges occur between classes (i.e. on the hour Monday, Wednesday, Friday, and alternately on the hour and half-hour</td></tr>
</table>

Recurring Congestion Recurring Congestion	Tuesday and Thursday). The highest surges occur at 8:00 a.m., 12:00 p.m. and 5:00 p.m. The worst time period is during the p.m. peak (around 5:00 p.m.) as traffic queues last about 30 minutes at this time of day. In the early morning (before 7:30 a.m.) and in the evening (after 6:30 p.m.), congestion is not perceived to be a problem on campus. - The western sections of East Campus tend to experience more constant congestion throughout the day, especially from 9:00 a.m. to 1:00 p.m. <u>Locations of Congestion</u>: • Vehicles queues routinely develop along: Linden Street and Aberdeen Drive between Canyon Crest Drive and Campus Drive (approx. 3 blocks) and along University Avenue between the entrance at West Campus Drive and Cranford Avenue (approx. 3 - 4 blocks). <u>Causes of Congestion</u>: • A major contributor to recurring congestion is the conflict between vehicles circulating into and through the campus and students crossing their path between the residential areas (north of Linden, northeast quadrant of campus) and the campus core. Students streaming onto campus during these “high movement” time periods provide no breaks for vehicles to get through. Other than stop signs at street intersections, physical traffic controls do not exist at these auto-pedestrian points of conflict. However, the University does provide traffic control officers at selected locations during peak travel times. The top three (i.e. “worst”) locations for auto / pedestrian conflicts are: (1) Canyon Crest Drive & West Campus Drive; (2) Aberdeen & North Campus Drive; and (3) Big Springs Drive & North Campus Drive. • Another contributing factor to congestion is vehicles that stop at undesirable locations in the midst of the traffic stream to drop off students. These drop-offs occur at several locations around North Campus Drive and West Campus Drive anywhere there is a stop sign or whenever cars are stopped or at U-turns. - UCR currently has only one dedicated drop-off zone, on West Campus Drive. This often operates at over capacity. • TAPs staff has observed that a great deal of “shuttling” takes place where students, faculty, and staff will use their cars to travel between different points on campus during the day. Although not a major cause of congestion, these multiple, “mini” trips exacerbate an existing problem, particularly at bottlenecks (intersections, parking lot entrances). Reasons cited for car shuttling include: time, distance, convenience, personal security, to avoid the unpleasant walk under the freeway, and not enough transit. - Frequently, this type of shuttling congests the area near Lot 19, as students seek parking spaces close to the Commons. • The narrowness of the inner campus loop road complicates

	enforcement efforts to deter illegal drop-offs. Since there is no space for vehicles to pull-over, stopping vehicles for citations can exacerbate congestion.
Non-Recurring Congestion	Special Events: • The University does have procedures in place to manage traffic and parking overflow for special events on campus, including traffic control personnel, routing, and signing. Special event parking overflow is typically guided to Lots 30, 25, and 19; however, there is no lot dedicated exclusively to special event parking. Problems occur when these events coincide with daily travel movements and congestion (e.g, special events that occur during the school day). • The Recreation Center is a frequent visitor destination. This often presents a problem since the center is next to the Canyon Crest Family Student Housing (although family housing will be moving according to the LRDP). Gates have been installed on Linden to discourage student or event parking in Family Housing. Visitors / Information Kiosks: • Information kiosks are the first, single point of contact for first time visitors. These kiosks are located too close to city streets; vehicle queues at information kiosks can back up into city streets. Parking permits are distributed from the information kiosks and through machines located within various lots. For visitors, a reservation system is employed, where the hosting department makes arrangements for their visitors to pick up permits through the information kiosk. The host also determines where their visitors park. Approximately 75% of the daily parking permits are purchased by students, often because they are late or because they want to get closer to their destination. • The information kiosk at University Avenue may cause some visitors to take a circuitous route to reach parking. Many visitors end up parking in Lot 30, but get off at University Avenue to reach the Information Kiosk on West Campus Drive. This forces visitors to drive through campus to reach Lot 30 (as opposed to getting off at the Martin Luther King off-ramp).
Safety	Modal Conflicts • Conflicts between autos and pedestrians, between autos and bikes, between bikes/skateboarders and pedestrians, and among autos are perceived to be the biggest safety problem on campus. Bikes and pedestrians frequently do not obey existing traffic controls (stop signs, traffic lights, cross walks, pedestrian paths) while on campus. Worst Locations • Locations of specific safety concern include: (1) intersection of Aberdeen Drive & North Campus Drive; (2) intersection of Canyon Crest Drive & West Campus Drive; (3) and the two freeway undercrossings (especially at Martin Luther King, which suffers from poor lighting and walls that offer potential hiding places) (4) the entire segment of South Campus Drive runs down hill and along a curve and thus presents "line of sight"

	problems, particularly at access points along the roadway. Many faculty members must walk this route in order to access the CNAS Dean's Office in the College Building North. • Police Department personnel also identified the following areas as locations for accidents or "near misses": the Lot 13 construction area; Lot 1; Canyon Crest in the vicinity of Bannockburn; the Tomas Rivera Loading Dock; the south side on Canyon Crest (bicyclists on wrong side of the road).
Signage	Vehicles / Parking • There is no real sense of arrival at UCR, even along the ceremonial entrance along University Avenue. Although University Avenue is the formal entrance to UCR, it is actually a bypass road, not a main road dedicated to the campus. • There is almost a complete lack of directional signs and those that do exist are too small, covered with vegetation, are too low, are earth tone in color, are too far apart, or are too difficult to read because the text is too small. Directional signs often point people in a certain direction, but then provide no follow-up or further instructions. Most of the signs that do exist are geared towards parking enforcement. Current standards require that signs "blend in," which means that people don't see them. • Buildings lack signs and cannot be located by street address. • The information kiosks are the only place to get maps or directional information. • It is not easy to get agreement on the specific text that needs to go on the parking enforcement signs or where to locate them. Should be consistent and reinforce University parking policies. • Current signage fails to provide clear information about weekend or evening parking policies. Pedestrians • Once on campus, there are few directional signs for pedestrians (no walking directions or maps). In addition, buildings are not signed and/or building names are not easy to see. • Many of the signs that formerly existed were lost to new building construction.
Suggested Transportation Solutions	
Traffic Control	• Traffic-actuated signals in lieu of set timing/phasing. • Minimize auto-pedestrian conflicts. • Consider a roundabout near the campus entrance.
Access Control	• One-way streets. • Street closures (permanent, only during the day). TAPS has already looked into specifically closing the section of North Campus Road between Big Springs Road and Aberdeen Drive. • Limited access gates to "inner" loop that allow campus, emergency vehicles only. • Eliminate cars in inner campus entirely. • Eliminate non-campus, drive-through traffic. • Provide a main entrance to the University (sense of place).

Parking	• Lot-specific parking permits rather than the gold, blue, red tiering system that is currently used. • Concentrate campus parking to just a few locations. Makes it easier to enforce, to provide security, and to provide transit service. - Although, in the case of Lot 30, the distance and location gives off the perception that it is unsafe. • Employ "congestion pricing" for premium parking locations.
Dedicated Drop-Off Locations	• Provide dedicated drop-off zones. These need to be located in areas that are convenient to the students (e.g., where they want to go) and that do not interfere with vehicles that need to circulate through campus or affect campus shuttle headway. In many cases, this would entail roadway design changes. These dedicated zones would need to be integrated with a system that manages the internal circulation system and access points. These could be joint locations with transit hubs and transit drop-off sites. Drop-off zones might also be created in future parking lot structures. • Added enforcement that prohibits casual drop-offs.
Signage	• Variable message signs for vehicles to advise best route and where parking is available, in real time. • Automated, interactive information kiosks (for pedestrians) that show best route on screen or that print maps, based on selection of desired destination. • Permanent campus "you are here" display maps at key pedestrian entry points, like in shopping malls. • Create milestone maps. • Administration needs to create and adopt new design standards.
Other Discussion Items	
Implementing Changes	• Need to consider how new policies or changes will be marketed to the University population. Students are easier because they are more of a transitory group. The more difficult audience will be long time faculty members and staff. • Proposed solutions also need to take into account the cost of funding new programs. For example, operating and maintenance costs or loss of citation revenue. There may be an opportunity with mitigation funds for transportation provided by Caltrans due to their freeway projects. This has already been negotiated, but there is some flexibility.
Surrounding Community	• The surrounding neighborhood is already sensitive to and vigilant about transportation issues associated with the University. TAPS staff fields many complaints from the community: University traffic on residential streets or University parking overflow. The city residents also do not like buses through their neighborhoods. There will need to be community outreach to the surrounding community to educate them as to changes and to handle negative perceptions.
Other Transportation Needs or Challenges	• University transit vehicles – congestion slows these vehicles down and thus people are less apt to use transit in lieu of their cars.

	• Peak traffic and parking requirements for special events. • New vehicle types on campus (University vehicles) that don't easily fit into other categories and thus travel ways (e.g., Segways).

UC Riverside – Multimodal Transportation Management Strategy
Deliveries and Vendors
Focus Group – July 31, 2003
Bannockburn J-102

Existing & Future Conditions	
Major Travel Patterns	• At present, the following locations on campus are primary attractors of delivery and vendor trips: the Commons, the Geology and Physics Buildings, Lothian Residence Hall, Aberdeen-Inverness Residence Hall, Administration, the Barn, Spieth loading dock area, and construction sites (temporary condition). • Key routes that delivery vehicles follow to enter campus on a routine basis are: (1) Linden Street (EB) to Aberdeen Drive (SB); (2) Big Springs Road (WB) to North Campus Drive (WB); (3) Watkins Drive through Corporation Yard (SB) to Linden Street (WB) to Aberdeen Drive (SB), (4) University Avenue (EB) to West Campus Drive (SB); (4b) University Ave (EB) to Canyon Crest Drive (NB) to Linden Street (EB); and (5) Canyon Crest Drive (NB) to West Campus Drive (SB). • The University has just one street address (officially two fictitious addresses) and several packages and deliveries come to a centralized shipping and receiving center (the Corporate Yards). University staff then distributes these packages to their final destination on campus. • First time delivery vehicles tend to use University Avenue and are then directed to their desired destination. • The campus is constantly undergoing some form of construction activity which attracts trucks and deliveries. These patterns occur on a site specific basis and cannot be predicted from one year to the next.
Transportation Problems	
Congestion	<u>Conflicts with Pedestrians</u> • Congestion that occurs throughout the day attributable to pedestrian movement across the path of vehicles was cited as the top problem experienced by delivery vehicles. Delivery vehicles and vendors have time constraints (e.g., FedEx, UPS) and these lengthy delays pose a problem. Most of these delivery firms cannot adjust the timing of their deliveries to avoid these surges of congestion. Along Campus Drive at the Surge Building, at Bourns Hall, in front of the Science Library, and in front of Administration are the very worst areas. The University utilizes a staff of seven to direct traffic during these peak times at 8:00 a.m., 12:00 p.m. and 5:00 p.m. (perhaps 10 minutes in duration). <u>Competition with Private Vehicles</u> • Faculty, staff, and students frequently take up loading/unloading space to park their private vehicles. In some cases, legitimate users take longer in the spaces than is necessary. In other cases, they are parking at these locations

	because it is simply more convenient than parking further away and they are pushing the limits (e.g., Exempt vehicles are used for personal business). At some buildings (e.g., Geology), demand greatly exceeds available space and a domino effect occurs where delivery trucks are forced to use turnaround and roadway access space to park and offload. This, in turn, exacerbates the congestion problem. In addition, campus maintenance staff cannot reliably access buildings to bring in power generators in times of emergency power outages. • Students use delivery roadway access and dock areas to drop off and pick up passengers. Students also use the roadway system (Campus Drive) as informal drop-off locations; this is a particular problem in Lot 19, where frequent drop-offs conflict with service vehicles requiring access to the Commons. • Autos using campus roadways during peak periods (in the morning, at noon, in the late afternoon, and between classes) contribute to the congestion problem. Campus Drive is heavily utilized throughout the day. • There is not much enforcement, especially when it comes to Exempt vehicles parked in loading and unloading facilities. • Many departments have granted 'Sweetheart" deals which allow faculty and staff to park in or near loading/unloading facilities.
Inadequate Dock Access	• At several buildings, dock facilities are insufficient either because there are not enough spaces, because the docks are not the right height, or because there is simply not enough physical linear space. In some cases, dumpsters are in the way or space is being used to store items or vehicles. Another issue is that multiple activities are occurring at these problem locations in addition to deliveries - handicapped parking, building maintenance access/parking, trash pick-up. For some buildings, this is problem all day long (6:30 a.m. – 4:30 p.m.). • At some locations, the roadway design is not suitable for trucks as the access is too narrow and too tight. A good example of this is the loading dock for the Arts Building. • As buildings are designed and developed on campus, aesthetics and cost considerations can outweigh the need for sufficient dock space, access, and facilities. This was an issue with Bourns Hall. Frequently, long term needs for operation and maintenance of the buildings are not taken into account, resulting in dock facilities that are undersized.
Future Concerns	• As land use changes on campus and as new residential areas develop on the periphery, pedestrian / vehicle conflicts will shift and perhaps increase. This could make the existing congestion problem worse. New housing north of the campus, for instance, could increase pedestrian/vehicles conflicts along Aberdeen. • As the Commons expands, student groups may need to set up for more activities within the area, leading to increased usage of Lot 19 as a loading/unloading zone.
Signage	• Signage was not raised as a chief concern. Lack of signage

	and directional signs present some problems for first time deliveries, but most of the vendors and staff already know where they are going.
Suggested Transportation Solutions	
Loading Facilities	• Develop standard specifications for loading areas (height, size, provision for unusual activities). • Improve roadway access to and circulation within these areas. • Separate (or establish a priority system) for multiple activities that are occurring at the loading facilities. For example, eliminate circumstances where building occupants are using loading space for storage or providing separate places for faculty / students to load and unload items. • Prohibit cars from parking in the loading areas all day long either through restrictions or access controls or through added enforcement. [Note: students are already required to get special permission to use these spaces to load and unload items. This is a system that seems to be working.] • Move handicapped parking and access away from the building loading and unloading areas. • Provide lifts at docks to accommodate vehicles of different sizes (this is common among food service trucks).
Vehicle Access Control	• Take private vehicles off of Campus Drive. Restrict vehicle access on the internal roadway network to only University or delivery vehicles. • Restrict vehicle access at key locations (e.g., Bookstore) through the use of gate arms that can only be opened by allowed vehicles. • Develop an internal and external roadway system to separate and give priority to certain vehicles. Take into account different campus vehicle types (delivery trucks, electric vehicles) and purposes. • Issue lot-specific parking permits to cut down on congestion (vehicles searching for optimal parking spaces) and to permit enforcement of parking infractions.
Pedestrian Movement	• Construct a pedestrian overcrossing at Aberdeen Drive and North Campus Drive. Consider other locations for elevated pedestrian walkways that might be appropriate. • Put in fencing or landscaping that guides students to designated crossing locations. • Provide added traffic controls (cross walks, lights). • Plan for and make provisions for pedestrian movement during periods of construction.
Centralized Receiving Area	• A system similar to UCLA's was proposed for discussion. Under this scenario, all packages and most all deliveries are sent to a centralized receiving area for distribution by University staff and vehicles. One outstanding question is how would this additional service be funded (FTEs) as many of these services are currently provided by private delivery firms and vendors (e.g., FedEx, UPS, vendors) at no cost to the University. In addition, University vehicles would still need to follow the same routes (and, possibly, times) and thus would experience many

	of the same problems as the private delivery firms. Another issue is that some of these deliveries can be quite bulky or are specialized and the University does not have the staff or equipment to handle these types of deliveries. A centralized receiving facility might also not work for food service deliveries. A suggested approach for moving towards a more centralized, internal delivery system could involve classifying packages or items by weight. • Establish a centralizing receiving area at a location outside the inner campus core or move additional shipping and receiving activities to an outside location (e.g., Bookstore).
Enforcement	• Provide additional enforcement for those who do not follow the traffic and parking rules (e.g., pedestrian crossing locations, loading area parking infractions). Heightened enforcement activity would be especially beneficial at the beginning of the year. • Clean-up dock areas.
Off-Peak Deliveries	• Encourage or shift timing of deliveries to the evening hours (after the p.m. peak). Note: this would likely result in some cost impacts as after hours labor is more costly. • There may be more potential for shifting Sysco trucks into the off-peak compared to the other, more time-sensitive delivery firms. This would involve a relatively few number of trucks, however, the loading time can be extensive (3 to 4 hours). [Note: The University is already taking steps to contract with fewer vendors, which should cut down on the number of trucks that come in and out.]
Dedicated Drop Off Locations	• Provide dedicated drop-off locations for students such that they do not block or slow vehicle circulation on campus. Or consider one-way traffic loops to provide space and circulation for these drop offs.
Other Discussion Items	
Proximity of Parking	• It is difficult to say what minimum distances would be acceptable between the parking area and the delivery location. A more critical item is the need for ramps and lifts. Focus group participants consider anything in the range of 100 yards to be an unreasonable distance. A good example is the Science Library, which provides ramps for use when docks are full.
Signage	• It would be helpful to have signs on the buildings or to have a numbering system on the buildings. However, if delivery access routes are clearly labeled, then it tends to attract private vehicles to these areas. • For staff at shipping and receiving, they are often presented with packages with incomplete or incorrect delivery addresses. A method or system for labeling packages with a more precise address would be desirable.
Standards / Future Development	• Increase level and quality of input during design review of proposed buildings and facilities to ensure that access and loading docks are adequate.

UCR MMTMS Planning Committee Meeting
September 26, 2003
Bannockburn J-102
12 PM to 3 PM

Minutes

Introductions/Review of Agenda

Nita Bullock opened the meeting. Participants provided self-introductions.

Guiding Principles

Julie Rush (PB) reviewed the latest version of the Guiding Principles. These principles are based upon input from the last Planning Committee meeting and from the transportation objectives of the 2003 Draft LRDP. The Guiding Principles consist of the following items:

- Mobility
- Campus Integration
- "Walkable" Campus
- System Hierarchy
- Traveler Needs
- Multimodal System
- Aesthetic Design
- Implementable
- Neighborhood Consideration

Members of the Planning Committee recommended the following additions to the Guiding Principles:

- Include "Safety" as its own separate principle.

- Add a principle describing UCR's ultimate goals concerning campus growth. This principle could also include a discussion about the need for a flexible transportation plan that gradually phases in system improvements as the campus grows.

Existing and Future Conditions

JD Douglas (PB) briefly reviewed some of the major existing travel patterns at the university. He also described anticipated future travel patterns, based upon existing circulation and future land uses. As part of this discussion, JD outlined some proposed changes to local and regional transportation systems.

Identify Possible Solutions to Transportation System Issues

JD Douglas reviewed the major UCR transportation system issues that the MMTMS study has identified so far. After briefly describing each issue, JD asked the committee members to provide possible solutions. The discussion was broken down by travel mode (e.g. automobiles, transit, parking, bicycle, pedestrian, etc.) The issues and possible solutions discussed at the meeting are summarized in the attached *Solutions and Issues Discussed at September 26, 2003 MMTMS Planning Committee Meeting.* .

Next Steps and Upcoming Meetings

Nita Bullock outlined the next steps in the MMTMS study:

- Campus/Neighborhood Open Houses (October 1, 2003)
- Design Review Board (DRB) review of transportation system options (November 18, 2003)
- Capital Programs Advisory Committee (CPAC) review of system options (November25, 2003)

The next planning committee meeting will occur October 29, 2003.

Issues and Solutions Discussed at September 26, 2003 MMTMS Planning Committee Meeting

AUTOMOBILE – COMMUTERS

Issues	Potential Solutions

Conflict Points	• Add more bike paths on campus
	• Add traffic lights/traffic controls along campus loop road
	  o Traffic lights or controls in place of signs
	  o Signalized crossings
	  o Separate traffic lights for bicycles
	• Provide separate pedestrian walkways
	  o Elevated sidewalks
	  o Guided walkways
	• Keep vehicles out of campus
	  o Make exceptions for emergency and service vehicles
	  o Exclude personal vehicles from campus
	• Ways to remove private cars from inner campus loop:
	  o Card access gates
	  o Remote controls
	  o Electronic arms
	  o Human traffic controls at some locations

Congestion	• Resolve spot queues
	• Move parking to the periphery
	• Implement flexible work hours and other TDM strategies
	• Eliminate non-university traffic that "cuts through" the university
	  o Use traffic calming devices to discourage inner campus loop trips
	• Prevent queues outside of parking structure entrances by:
	  o Using a transponder system to allow for quick ingress and egress
	  o Providing optimum access from freeway ramps to structure entrances
	  o Employing other "speed parking" techniques and designs

Drop-Offs	• Create more dedicated drop-off points
	  o e.g. Add drop-off point on Canyon Crest, near softball fields
	• Suggestions for new drop-off points:
	  o Separate from traffic streams
	  o Convenient locations for pedestrians, transit riders
	• Place drop-off points in parking lots
	• Convert some existing parking lots (e.g. Lot 6) into a passenger drop-off and turn around point
	• Eliminate drop-off points and provide increased transit services instead

Issues and Solutions Discussed at September 26, 2003 MMTMS Planning Committee Meeting (continued)

	Issues	Potential Solutions
EMERGENCY, SERVICE, AND DELIVERY VEHICLES	**Congestion/ Conflict Points**	• Limit access to campus loop; provide special vehicles with transponders to gain access • Implement lot specific permit system to prevent car shuttling • Create congestion pricing for premium lots • Finance transit service to provide service to outer lots (will discourage driving inside the loop) • Extend the tiered parking system from 4 pm to 6 pm each day • Stagger staff working hours • Enhance the night shuttle program to provide an alternative to car shuttling

	Loading Docks	• Place electronic access controls in docks
		• Expand loading dock areas to accommodate more vehicle types or activities, such as:
		  o Short-term parking for service/emergency vehicles
		  o Deliveries
		  o Handicapped parking
		• Limit functions at existing docks:
		  o E.g. minimize private vehicles or handicapped parking in loading docks
		• Replace handicapped parking in docks with demand response shuttles (e.g. shuttles that take people from cars to buildings)
		• Design docks specifically to meet the needs of each department

	New Vehicles Types	• Reduce the speed limit on some city streets to allow for use by electric vehicles, e.g.:
		  o Canyon Crest
		  o Watkins
		  o Iowa
		  o University
		• Replace current campus vehicles with more electric vehicles and alternative fuel vehicles
		  o Look into expanding existing pilot programs
		• Continue to try and raise average vehicle occupancy rates – new service vehicles will still compete with bikes and pedestrians
		• Enact weight/size limits for campus vehicles on sidewalks or barriers to encourage the use of GEMS in place of heavier

Issues and Solutions Discussed at September 26, 2003 MMTMS Planning Committee Meeting (continued)

<table>
<tr><th rowspan="5">PARKING</th><th>Issues</th><th>Potential Solutions</th></tr>
<tr><td>Internal Congestion</td><td>• Limit/stratify parking by size of vehicle
• Extend the tiered parking system from 4 pm to 6 pm each day
• Use the following to constrain the parking supply and encourage alternative travel modes:
o Limit the number of spaces
o Use pricing discrimination
o Establish neighborhood parking permits (City of Riverside)
• Improve intersections at parking entrances/exits:
o Consolidate entrances and exits
o Use separate entrance/exit locations to disperse and channelize traffic</td></tr>
<tr><td>Managing Parking Needs (Short-Term)</td><td>• Create temporary lots to defer parking structure construction costs
o Note: these lots must be lighted properly to provide security</td></tr>
<tr><td>Mobility/Safety</td><td>• Ensure adequate lighting
• Provide security within structures
o Cameras
o Officers
• Provide secure bike parking at parking structures; provide bike lockers
• Consolidate handicapped spaces in one spot – run shuttle to specific destinations within the campus
• Immediately begin shuttle services to campus destinations; start providing service from Lot 30 to campus destinations</td></tr>
<tr><td>Costs</td><td>• Fund new costs via a student fee referendum
• Defer construction costs by using temporary lots for as long as possible</td></tr>
</table>

Issues and Solutions Discussed at September 26, 2003 MMTMS Planning Committee Meeting (continued)

TRANSIT	Issues	Potential Solutions
	No Inner Loop Service	• Run transit along the inner loop; eliminate personal traffic within the loop • Create paths for trams or shuttles that run inside the campus (e.g. a shuttle to the Bell Tower) o Use trams to provide "easy on/off" service • Design cut-outs for transit drop-offs • Create transit "micro-hubs" in loading dock areas • Provide point-to-point service from parking to academic buildings on campus • Clear interior roads for transit by making the campus loop a one-way road • Create a transit circulation system so that people use transit to get around on campus • Frequent headways and hours of operation are the key to transit playing an important role on campus • Develop a people mover/monorail • Place cut-outs or loops in parking lots to allow buses or shuttles to use lots as drop-offs • Remove speed bumps after the loop is closed (to prevent damage to buses) • Create a hierarchy of transit vehicles, with bigger vehicles running routes that circle the campus (e.g. loop road) and smaller vehicles providing service inside the campus • Design transit service to meet a maximum walk-time limit between any two points on campus (e.g. 10 minutes)
	Need for Increased Service	*See discussion above for "**No Inner Loop Service**"*

	Costs	• Apply for transit service grants
		• Use transit facilities to generate advertising revenue
		• Do not limit transit service funding just to parking revenues
		    o Fairness issues – not all transit users come from parking lots; university should remove arbitrary connection between transit and parking funds
		    o Have parking funds subsidize – but not wholly fund – campus transit
		    o Use some of university's budget to fund transit
		• Expand large surface lots – such as Lot 30 – instead of building new structures
		• Use a student referendum to fund increased transit– start marketing program to students
		• Increase the price of parking citations

Issues and Solutions Discussed at September 26, 2003 MMTMS Planning Committee Meeting (continued)

PEDESTRIANS

Issues	Potential Solutions
Conflict Points	***See discussion on "Conflict Points" in*** **Automobile – Commuters** • Use walkways/paths to manage pedestrian flow on the inner campus and to minimize the number of pedestrians who walk through buildings to travel across campus • Create tunnels and elevated walkways between buildings • Add pedestrian crossing lights at popular pedestrian crossings as a quick fix (e.g. at crossing near Bourns Hall)
Lack of Access Controls	• Use fencing/landscaping/medians to control pedestrian flow • Enact lower speed limits on key streets (to help increase pedestrian safety)

East/West Connectivity	• Create pedestrian crossings over the freeway:
	  o Bridge
	  o Tunnel
	• Provide transit services that transport pedestrians across freeway undercrossings

BICYCLES

Issues	Potential Solutions
Conflict Points	***See discussion on "Conflict Points" in*** **Automobile – Commuters** • Create bike paths separate from pedestrian and automobile paths, especially in areas where bicyclists enter the campus • Open up the loop roads for bicycle use • Add more bike lanes/paths on Iowa Avenue • Add traffic control for bikes; create bicycle stopping points
Support Facilities	• Provide bike lockers • Provide a bike shop on campus • Examine how UC Davis has developed a bicycle culture on its campus • Provide adequate bicycle parking • Provide increased security for bicycle parking

VISITORS

Issues	Potential Solutions
Competition/Shared Facilities	• Provide separate parking lots/ structures for visitors; offer transit services from visitor parking to campus destinations
Kiosks	• UCR needs to provide kiosks at multiple entry points • Parking revenues should not have to pay for kiosks • Kiosks should utilize Advanced Transportation Information Systems, such as automated print out maps • Improve signage for visitors

Multi-Modal Transportation Management Strategy
Campus Open House
October 1, 2003
International Lounge, UC Riverside
11:30 AM – 1:30 PM

Minutes

Nita Bullock, the Campus Physical Planner, provided the background for the Multi-Modal Transportation Strategy (MMTMS). The purpose of the MMTMS is to identify both short- and long-term multimodal transportations improvements to enhance mobility and accessibility for students, faculty, staff, visitors, and service providers.

Nita Bullock then introduced Parsons Brinckerhoff Quade & Douglas (PBQD), their consultant for the project. PBQD has been working with the MMTMS Planning Committee, a group of about 20 members of the UCR community appointed by the Executive Vice Chancellor, to identify some of the transportation issues that the MMTMS needs to address. The Planning Committee has also provided the consultant with some possible solutions to these issues.

The Open House had two main purposes:

1) Share with the campus and neighborhood communities the issues and potential solutions the project has identified so far; and

2) Receive further input on what problems the MMTMS needs to address, as well as suggestions for dealing with these problems.

The Open House began with a brief presentation. JD Douglas of PBQD detailed the goals of the study and outlined the planning principles. These principles will guide the evaluation of transportation options considered in the MMTMS. The presentation continued with a summary of some of the key transportation issues the study has so far identified.

A brief question and answer period followed the presentation. Questions, comments and *[responses]* included:

- Will the study look into what the city is responsible for fixing? Will the study identify ways of funding the programs so that any transportation improvements do not dry up university funds? *[If the study identifies* *possible solutions that involve city streets, the university will communicate these findings to the city. As part of the study, the project team will search for possible external funding sources for improvements to the university's transportation system).*

- There is a lack of handicapped spaces on campus; even people with permits have difficulties finding handicapped spaces.

- Changes to the parking and transportation system could result in time costs for university employees, such as additional time spent getting to work or traveling to meetings.

The Open House session followed the presentation. The Open House session consisted of 5 stations describing the following transportation elements:

- Vehicles
- Bicycles
- Pedestrians
- Transit
- Parking

Each station included a map of the system, a list of key issues, and a list of suggested solutions the study had so far heard. Members of the consultant team manned each station to answer questions and write down comments or suggestions. These comments are detailed in the attached *Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (11:30 AM – 1:30 PM).*

Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (11:30 AM – 1:30 PM)

Vehicles

Issues

- Employees from the West Campus often must attend meetings on the West Campus, and vice versa; automobiles are the quickest way to make these trips.
- Closing off the campus loop road – i.e. eliminating link connecting North Campus Drive to University Avenue – has created more congestion on campus.
- Vehicles making left hand turns out of the UCR Extension parking lot or University Village conflict with pedestrian crossings.
- Bicyclists and skateboards exiting the campus using the Science Library ramp dart into the campus loop road at a blind corner.

Potential Solutions

- Reconnect the campus loop road with University Avenue.
- Place pedestrian walk lights on the campus loop at places of conflict.
- Focus on immediate, low-cost solutions that do not deplete university funds or require student fee increases.
- Fix blind corners where skateboards and bicyclists ride down ramps and dart into the campus loop road.
- Identify city streets that pose safety hazards for university travelers; have the city make improvements to these streets.
- Create underground parking in place of parking structures.
- Widen existing sidewalks in some areas (both on and off campus) to accommodate both pedestrians and bicyclists.
- Determine popular pedestrian and bicycle routes and create new paths along these routes.

Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (11:30 AM – 1:30 PM)

Bicycles

Issues

- Older style of bicycle racks does not allow cyclists to secure their bikes in a way that will prevent theft.
- Conflicts between cyclists, other cyclists, and pedestrians are also an issue.

Potential Solutions

- UC Santa Barbara uses bike turnarounds and divided paths to reduce bike/bike and bike/pedestrian conflicts
- Well defined bike and pedestrian paths, as well as directional signage on bike paths, would help to reduce bike/pedestrian and bike/bike conflicts.
- Offer a bike shop of campus; in addition to bike repair and supply services, consider offering classes on bike safety and repair through the shop.
- Bike access may need to be limited within the interior of the campus in order to reduce bike/pedestrian conflicts.
- Consider placing bike facilities, such as well-lit bike storage areas, where bike access ends on campus.
- Consider the use of bike compounds to prevent bike thefts.
- Locate bike racks so that they do not interfere with entrance ways or main pedestrian paths.
- Discuss with the City of Riverside the opportunity to provide continuous bike lanes south of Iowa.
- Use whole-frame bike locks instead of bike lockers, which are aesthetically less pleasing and require higher maintenance.
- Provide sufficient lighting at bike storage areas to improve safety and visibility.

Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (11:30 AM – 1:30 PM)

Pedestrians

Issues

- The location of the ramps to and from the freeway combined with pedestrians walking along University Avenue creates congestion and is also a hazard.
- Foliage/vegetation blocks pedestrian access and walkways on campus.
- The intersection where the traffic enters University Village from University Avenue is unsafe as pedestrians are forced to cross University Avenue at that point.
- Bikes traveling on Canyon Crest ride on the wrong side of the road. This poses conflicts for both pedestrians and automobiles.

Potential Solutions

- Address the barrier to pedestrians posed by the freeway:
  - Separate pedestrian flow from traffic at University Avenue with either an overpass or an underpass. Add room for bikes. Or, place a pedestrian overpass at the corner of University Village and University Avenue.
  - Build a pedestrian underpass under the freeway at Martin Luther King Boulevard.
  - Build a pedestrian overpass over the freeway at a point between University Avenue and Martin Luther King Boulevard (e.g., the old LRPD concept).
- Create more pedestrian walkways:
  - Follow most direct routes.
  - Develop a consistent lighting program in the campus core; eliminate shadow areas on campus.
- Lower the speed limit along the University Avenue underpass as far as the campus entrance to reduce noise. Or, use sound absorbent materials in the underpass.
- Improve the pedestrian walkway asphalt and lighting along Big Springs Road (south side of street along Parking Lot 13).
- Bench design should be sensitive to handicapped or visually impaired:
  - Remove obstacles
  - Provide handholds
  - Situate benches away from the walkway so that they do not present an obstacle to the visually impaired.
- Add/use landscaping and structural design elements to provide shade (e.g. trees, arcades)
- Provide flashing lights on the street pavement at major pedestrian crossings.

Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (11:30 AM – 1:30 PM)

Transit

Issues

- Signage is poor.

Potential Solutions

- Provide transit shelters.
- Do not place advertisements over the windows of transit vehicles (this makes it difficult for riders to look out)
- Add a transit connection to Ontario Airport.
- Create transit centers; use them as focal points for campus transit services.
- Make transit wheelchair accessible.
- Create better integration between RTA and campus shuttles.
- Expand the “intellishare” flex car program.
- Use color-coded routes and numbered stops with campus transit; use this system to provide wayfinding to buildings.
- Fund transit programs with student fees, then provide fare-free transit.
- Integrate improved transit system with parking relocation and any vehicle access limitations to the campus core.
- Create transit routes along the inner campus loop and into the campus core.
- Devote a parking lot to handicapped parking and provide continuous shuttle service from this lot directly to campus destinations.

Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (11:30 AM – 1:30 PM)

Parking

Issues

- Peripheral parking adds time, inconvenience.
- Parking prices are too high for lower paid employees.
- There are no reduced parking rates for evening and weekend parking, or for part-time employees.
- Jobs and/or classes require movement across the campus.
- State vehicles can park for free; these vehicles take up spaces from red permit holders.
- Neighborhood concern: Visitors of mosque park along red-curbed sections of street.

Potential Solutions

- Build underground parking lots under new buildings.
- Charge premium prices for event parking.
- Charge lower prices for evening parking.
- Provide free parking on the weekend.
- Create a graduated parking pricing program for lower paid employees.
- Create a campus transit program that makes transit the “first choice” for students.
- Establish more a more realistic number of handicapped spaces on campus (e.g. there are not enough spaces across from Humanities).
- Establish residential permit parking on neighboring streets.
- Provide a cart system, similar to those used at airports.
- Establish a single center for delivery services.

Multi-Modal Transportation Management Strategy
Campus Open House
International Lounge, UC Riverside
October 1, 2003
6:00 PM – 8:00 PM

Minutes

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Nita Bullock then introduced Parsons Brinckerhoff Quade & Douglas (PBQD), their consultant for the project. PBQD has been working with the MMTMS Planning Committee, a group of about 20 members of the UCR community appointed by the Executive Vice Chancellor, to identify some of the transportation issues that the MMTMS needs to address. The Planning Committee has also provided the consultant with some possible solutions to these issues.

The Open House had two main purposes:

1) Share with the campus and neighborhood communities the issues and potential solutions the project has identified so far; and

2) Receive further input on what problems the MMTMS needs to address, as well as suggestions for dealing with these problems.

The Open House began with a brief presentation. JD Douglas of PBQD detailed the goals of the study and outlined the planning principles. These principles will guide the evaluation of transportation options considered in the MMTMS. The presentation continued with a summary of some of the key transportation issues the study has so far identified. (Note: A copy of the power point presentation – which lists the goals, principles and issues discussed above – is available online).

A brief question and answer period followed the presentation. Questions, comments and *[responses]* included:

- Is this study part of the LRDP process? *[No]*.

- Is this study a continuation of a past project? *[No. The MMTMS is a new project.]*

The Open House session followed the presentation. The Open House session consisted of 5 stations describing the following transportation elements:

- Vehicles
- Bicycles
- Pedestrians
- Transit
- Parking

Each station included a map of the system, a list of key issues, and a list of suggested solutions the study had so far heard. Members of the consultant team manned each station to answer questions and write down comments or suggestions. These comments are detailed in the attached Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (6:00 PM – 8:00 PM)

Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (6:00 PM – 8:00 PM)

Vehicles

Issues

- Students park along Watkins Drive; this creates traffic congestion.
- There is a lack of police enforcement on local streets, especially at the intersection of Watkins Drive and Big Spring Roads.

Potential Solutions

- Prohibit freshmen from bringing vehicles to campus.
- Extend Linden Street so that it curves southward and provides access to proposed future residence halls; or build road that branches off to the south of Linden. These streets would:
  - Ease traffic on Watkins Drive by providing additional access to the dorms via Linden Street.
  - Potentially redirect traffic off of Valencia Hills.
  - Ensure access to residence halls as the number of dorms on north campus increase.
- Increase funding for traffic enforcement so that campus police can better patrol the area north of campus.
- Use police bike patrols to cover campus.
- Place traffic lights in areas where pedestrian travel peaks (e.g. Canyon Crest and West Campus Drive; Big Springs Road and North Campus Drive; Aberdeen Drive and North Campus Drive). These could act as stops lights during peak periods and blinking red stop signs during non-peaks.
- Offer official drop-off points at the three main entrances to campus.
- Consolidate residence hall parking and place it in an areas slightly removed from residence halls.
- Provide better marketing of campus electric vehicle program, or provide better access to this program on campus.
- Create better signage and naming for the campus loop roads. Since they now all have the same name, it is confusing.

Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (6:00 PM – 8:00 PM)

Bicycles

Issues

- Campus topography is prohibitive to cyclists.
- Bike racks on campus are not conducive to properly securing bikes.
- Vehicles park in front of the bike racks at University Village.
- The parking of vehicles along Watkins Drive poses a problem for bicyclists.
- The construction of the Science Library and Bourns Hall has interrupted the natural bicycle path between the campus and housing.

Potential Solutions

- Use Gage Canal to provide additional bike access from housing located to the north and south of campus.
- Use different-colored surfaces for bike paths and pedestrian paths.
- Create bike paths inside the campus core which provide access to common destinations inside the campus. (Note: this comment was accompanied with drawings showing selected locations for bike paths running through the campus).

Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (6:00 PM – 8:00 PM)

Pedestrians

Issues

- In addition to the locations shown on the map, there are additional pedestrian flows from north and east of Blaine Street and Watkins Drive into campus along Aberdeen Drive and along Big Springs Road. Also, quite a few pedestrians travel into campus up Canyon Crest from the south.
- Trips along East and South Campus Drive are dangerous for bicyclists and pedestrians (especially between parking lot 19 and the campus core) due to curves and vegetation blocking driver's view.

Potential Solutions

- When considering transportation improvements, think in terms of three dimensions. For example, provide elevated walkways between buildings.
- As buildings are designed, place sidewalks and pathways where pedestrians are most apt to use them. Suggested method would be to be observe natural paths that pedestrians take and then put in the walkways along those lines.
- Create pedestrian tunnels or overpasses under/over the freeway.
- Provide pedestrian bridges at the midway point between University Avenue and Canyon Crest Drive.
- Design pedestrian walkways to provide direct and aesthetically pleasing pathways.
- Add traffic calming devices.
- Rehabilitate the Arroyo riparian corridor into a greenbelt and also use it as a pedestrian corridor into the campus.
- Increase enforcement of traffic rules.

Transit

Potential Solutions

- Adopt more sensible bus routes (e.g. do not waste resources with Blaine and Watkins Gold Line route).
- Offer more bus routes in the evening and in the nighttime.
- Create connections between existing transit (e.g. Metrolink) and Ontario Airport.

Issues and Solutions Presented at the October 1, 2003 MMTMS Planning Committee Meeting (6:00 PM – 8:00 PM)

Parking	Potential Solutions
	• Provide adequate parking at the right price (i.e. free) • Put buildings on top of parking structures (and vice versa). • Fund parking structures by charging users. • Change the culture; minimize free or cheap parking. • Raise the cost of parking in order to dissuade people from driving to campus. • Offer free parking on Sunday. • Place a roundabout on Big Springs Road and Watkins Drive. • Establish a single center for delivery services. • Encourage the use of alternate modes by pushing parking out to the periphery. • Parking restrictions needed for street sweeping. • Allow people to park closer to campus at night (especially after 6 pm). • When parking structures are developed, consider mixed uses such as commercial or retail for the levels above the parking (e.g., the Beverly Center). • Constrain parking supply by controlling how many permits are issued to encourage alternative modes of travel. • Charge a higher price for the more desirable parking areas to better balance parking supply with demand.

UCR MMTMS Planning Committee Meeting
October 29, 2003
Bannockburn J-102
12 PM to 3 PM

Minutes

Introductions/Review of Agenda

The primary purpose of the meeting was to elicit input on a series of potential transportation solutions for UCR.

During her introduction, Nita Bullock, UCR's Campus Physical Planner, indicated that the meeting included several new participants. Past meetings consisted of the MMTMS Project Management Team, the Planning Committee, and the transportation consultant Parsons Brinckerhoff Quade & Douglas (PB). For this meeting, the Project Management Team also invited members of the Campus Safety Committee and the Traffic Sub-Committee. Nita noted that representatives of Riverside County Transportation Commission and the Riverside Transit Authority were also invited. Because this meeting included several new participants, Nita asked everyone to provide a brief self-introduction.

Background Information

Nita then discussed the origins of the MMTMS study. Conflicts between various modes of travel on campus have produced increased congestion at UCR. Campus growth threatens to magnify this congestion and create new challenges for UCR's transportation system. In response, UCR must improve and, in some cases, change its transportation system. The MMTMS will provide UCR both short and long-term guidance in this process.

Nita continued by reviewing the goals of the project. She also briefly discussed the Guiding Principles that will steer the creation of a transportation strategy.

Potential Solutions to Transportation Issues

JD Douglas, the PB team project manager, described how the consultant team had identified a series of potential solutions to many of the issues facing UCR's existing and future transportation system. In compiling these solutions, the consultant drew upon multiple sources, including:

- Focus groups with various campus constituencies
- Past meetings with the MMTMS Planning Committee
- Input from public outreach activities such as Open Houses
- Discussions with PB planners experienced in campus transportation planning
- Research into transportation systems at other universities

Committee Process

Julie Rush, transportation planner with PB, described the process by which the participants would prioritize and respond to the potential solutions that have been proposed for UCR transportation system.

First, UCR's transportation network was broken down into six systems:

- Automobiles
- Emergency, Service and Delivery Vehicles
- Parking
- Transit
- Pedestrians
- Bicycles

For each system, a matrix listed the various problems (or issues) that particular system faces. The matrix also listed a series of proposed solutions for each of these issues.

Participants were then asked to respond to each matrix. To do this, participants were given a number of green and red stickers. Participants were then instructed to place green stickers next to solutions they thought were particularly good ideas and red stickers next to solutions they thought were particularly bad ideas.

To help prioritize the solutions, participants were given fewer stickers than the number of solutions at each station. Each participant was limited to four green and four red stickers per station; each station contained between 20-46 proposed solutions.

Solution Prioritization

For about 90 minutes, participants prioritized the proposed solutions for each transportation system using the process described above. The results of this exercise are summarized in the attached *Planning Committee Responses to Full List of Proposed Solutions* (Appendix C)

Summary of Committee Preferences

After the prioritization exercise, Julie summarized the results with the committee. During this session, Julie also asked committee members to provide explanations for why they responded positively or negatively towards particular solutions. The following section highlights some of the committee's comments about selected solutions.

Automobiles:

Solutions that received mostly positive responses

"Close sections of the inner campus loop road that experience heavy pedestrian and bicycle crossings during peak period hours"
- *Could eliminate the need to provide expensive grade separated crossings for pedestrians and bicyclists*

"Provide grade-separated pedestrian walkways over major arterial streets and arterials at major conflict areas"
- *Must be implemented in a safe and smart manner; people will only use the walkways if they are designed with a gentle grade change*

Solutions that received mixed responses

"Make the campus loop road a one-way road and use the extra lane for drop-offs"
- *Could delay or complicate emergency vehicle response time*
- *Might just encourage more private vehicle use on the inner loop road*
- *Will be unnecessary once parking lot 6 closes*
- *Will force campus transit to drive longer distances*
- *Will have little effect on bicycle travel, since many bicyclists do not spend much time on the inner loop road*
- *Works well for temporary events, such as commencement*

Solutions that received mostly negative responses

"Widen the inner campus loop road to two-lanes in each direction"

- *Too expensive*
- *Contradicts the principles outlined in the Long Range Development Plan*
- *There are too many utilities adjacent to the inner campus loop road*

<u>Emergency, Service, and Delivery Vehicles:</u>

Solutions that received mostly positive responses

"Create a centralized receiving area for all packages; then have university staff deliver materials to each department"
- *Could be used in conjunction with gate access controls at unloading docks; transponders would be distributed to university delivery personal*
- *Will still require someone to deliver materials into campus*

"Eliminate private vehicle parking inside unloading docks entirely"
- *If unloading space parking is eliminated, the point-to-point shuttle should expand evening service*

Solutions that received mixed responses

"Encourage or shift timing of deliveries to the evening hours"
- *Who will be around in the evening to receive materials and sign forms?*

Solutions that received mostly negative responses

"Expand unloading docks so that they can accommodate multiple uses"
- *Would be costly*
- *Just increases the problem by encouraging use of unloading docks by private vehicles*
- *There is no place for docks to expand*
- *Docks will just full up again over time*

"Enact weight and size limits for sidewalks and pathways inside the campus to encourage the use of smaller utility vehicles in place of larger trucks"
- *Lowers productivity and will require more service vehicle trips on campus; smaller service vehicles can not hold as much equipment*
- *May contradict larger goal of reducing pedestrian/vehicle conflicts on campus*

<u>Parking:</u>

Solutions that received mostly negative responses

"Eliminate the color-coded system by setting aside parking for faculty and staff in each lot and allocating the remaining parking on a 'first-come, first-served basis'"

- *Will create more traffic in the inner campus loop*

"Do not allow freshman to park within a ½ mile radius of the campus"
- *Would be difficult to enforce*

"Provide free parking on the weekends"
- *Will encourage the use of UCR parking lots for things such as camping, automobile sales, truck parking, etc.*
- *Parking lots are often empty on weekends anyway*
- *Many view UCR as a public space*

"Charge premium prices for event parking"
- *Could hurt community relations*
- *People do not expect to pay high parking prices in the City of Riverside*
- *Most event parking occurs during the off-peak*

"Use student referendums to fund new costs associated with parking"
- *Presents an equity issue: not all students drive*

<u>Transit:</u>

Solutions that received mostly positive responses

"Seek out and apply for transit service grants"
- *Grants are more appropriate for one-time costs, not ongoing operational expenses*

Solutions that received mixed responses

"Fund transit with student fees; then provide 'fare free' transit"
- *Depends on timing; now is not a good time since students already are facing fee hikes due the state's fiscal situation*
- *Proposing a student referendum may become more plausible when parking shifts to the periphery and campus transit becomes more of a necessity*

Solutions that received mostly negative responses

"Clear the campus for transit service by making the campus loop road a one-way road; use the extra lane for transit"

- *Campus transit will probably not consist of large buses, but of smaller vehicles such as vans*
- *Use cut-outs instead*

"Use color-coded routes and numbered stops in campus transit system; use this system to provide wayfinding to buildings"

- *UCR is not big enough to justify the cost*

Pedestrian:

Solutions that received mostly negative responses

"Create pedestrian tunnels that run underneath the freeway"

- *Pedestrian tunnels pose significant safety hazards*

Bicycle:

Solutions that received mostly positive responses

"Create bicycle lanes along the inner campus loop road"

- *Why not just build paths inside the campus core so that some bicyclists can bypass the campus loop road*

Solutions that received mostly negative responses

"Centralize bicycle parking in four or five locations located to achieve a minimum walk time between bike parking and destinations on campus"

- *4 or 5 lots may be too sparse; 10-12 might be a better quantity*
- *Consolidated bike parking makes it easier to protect property*
- *Consolidated bicycle parking may work if a maximum walk time of 5 minutes between bicycle parking and any destination on campus can be maintained*

"Create bicycle dismount zones in certain areas of campus and consolidate bicycle parking lots on the periphery of the campus core"

- *Many would ignore these dismount zones; would require enforcement*
- *Instead of dismount zones, place bicycle parking in areas where you want to prevent or eliminate bicycle travel*
- *Another option would be to segregate bicycle and pedestrian paths*

"Place bicycle lockers in parking structures"

- *Could create conflicts between bicycles and automobiles or pedestrians within parking structures*
- *Space within parking structures in very valuable*
- *Bicycle parking should be placed outside of parking structures*

"Bicycle showers should be provided throughout the campus; at the very least, one more shower should be available at the hilly section at the southern end of the campus"

- *Would be a waste of money*
- *Although not popular among committee members, idea could be a more popular among bicyclists; people who want showers may not be attending this meeting or members of the committee*

"Provide bicycle actuated traffic lights"

- *Waste of money relative to other proposed solutions*
- *Many bicyclists ignore signals*

Next Steps and Upcoming Meetings

Nita Bullock outlined the next steps in the MMTMS study:

- Design Review Board (DRB) review of transportation system options (November 18, 2003)
- Capital Projects Advisory Committee (CPAC) review of transportation system options (November 25, 2003)

UC Riverside
Design Review Board
Meeting Minutes for November 18, 2003

Distribution and Attendance (A = Attendance, N = Not in Attendance)

Board Members		
Professor Robert Clare	Physical Resources Committee (Academic Senate)	(A)
Professor David Eastmond	Cell Biology and Toxicology (CNAS)	(A)
Professor John Ganim	English (CHASS)	(A)
AVC Daniel Johnson	Design and Construction (VC - Administration)	(A)
AVC Timothy Ralston	Capital and Physical Planning (VC - APB)	(A)
Steven Ehrlich, FAIA	Steven Ehrlich Architects	(A)
Kathy Garcia, ASLA	Wallace, Roberts, and Todd	(A)
Charles "Duke" Oakley, FAIA	Altoon-Porter Architects	(A)
Presenter(s)		
Dan Johnson/Ted Chiu	Design and Construction (VC – Administration)	(A)
Nita Bullock	Campus Physical Planner (UCR)	(A)
James "JD" Douglas	Parsons-Brinkerhoff	(A)

1.0 Meeting Agenda. The November 18th meeting of the Design Review Board (DRB) was to review a) Psychology Building - Schematic Design, and b) Multi-Modal Transportation Management Strategy – early options. The following agenda was reviewed prior to the presentations:

- 1.1 Psychology Building Schematic Design (Shepley Bulfinch Richardson Abbott/Chiu, Carrazana)
- 1.2 Multi-Modal Transportation Management Strategy (Parsons-Brinkerhoff/Bullock)
- 1.3 Board Internal discussion to develop recommendations
- 1.4 Board Recommendations to SBRA, Parsons-Brinkerhoff

2.0 Preliminary Observations and Recommendations.

2.1 Psychology Building (Schematic Design). In response to feedback from a Design Review at the UC Office of the President on November 14th, AVC Johnson presented a status update of the Psychology Building schematic design issues. Shepley Bulfinch Richardson Abbott (SBRA) representatives were not present for the discussion. The purpose of this session was not a formal review by the Board, but to apprise the DRB of issues raised at the November 14th review, and preliminary direction being given to the SBRA team by UCR. In response to the status update for this project, the Board had the following observations:

2.1.1 Concept Site Development. Site plan/development issues discussed included the project's orientation and relationship to proposed pedestrian malls in this portion of the campus (e.g. Library Mall, Citrus Mall). It was observed that the project needs to be sensitive to future development opportunities, including the future malls which are to the West and South of the project site.

2.1.2 Efficient Use of Land Base. It was observed that the project should more closely integrate the vivaria function with the rest of the project. One observation was to pursue opportunities to bury or partially bury the viviaria into the slope at the eastern edge of the site, given that this space does not require natural light. All of the above were to encourage UCR to give direction to SBRA to find ways for the project to more efficiently use its site and not squander valuable core campus land.

2.1.3 Building Site Gestures vs. Campuswide Gestures. The internal courtyard included as part of the scheme presented to the Office of the President was deemed to be proportionately too tall and narrow to realize significant outdoor benefits (i.e. would be shaded too much of the time). It was observed that the project should make a larger courtyard gesture toward the rest of the campus, similar in intent to the gesture proposed by the CHASS Instruction and Research Facility.

2.1.4 Façade Development. It was observed that the facades of the scheme presented lacked a cohesive sensibility. The facade treatments also did not appear to take advantage of relationship to solar gain, and related sustainability opportunities. Lastly, it was observed that the scheme appeared to have a high ratio of façade/skin to floor plate. AVC Johnson was also directed to encourage the SBRA team to give some additional thought to how the mechanical penthouse/screening would be realized for the project.

2.2 Multi-Modal Transportation Management strategy (early options). Campus Physical Planner Nita Bullock, and JD Douglas provided an overview principally of process and data gathering todate for this study. Process highlights included a visioning kick-off in February 2003, Committee Meetings, On- and Off-Campus Community meetings, and Project Management Team brainstorming sessions. Since there were no findings as such, the Board did not provide recommendations. The following summarize some of the observations made in response to the presentation:

2.2.1 Service/Deliveries. The next refinements to the study need to identify strategies and findings for all the issues identified (e.g. Service/Deliveries). The Board anticipates that these will be part of the second DRB presentation on the study in late winter/early spring.

2.2.2 Business as Usual vs. New Models. The Board observed that the consultant team needs to be cautious of projecting/exacerbating existing flawed conditions in developing its findings vs. proposing entirely new approaches to certain issues (e.g. disabled access).

2.2.3 Regional Transit Systems. The Board encouraged the study team to understand and develop synergies where possible with regional transit systems. To date the study has included input from representatives of regional transit authorities/agencies at key moments in the planning process.

2.2.4 Partnering with City of Riverside. In a similar vein, the study team of was encouraged to pursue partnership opportunities with the City of Riverside to foster the objectives of the study (e.g. joint development of parking management plans for city streets adjacent to UCR).

3.0 Follow up and Next Steps.

3.1 The DRB will meet next on December 9th to review the Psychology Building (schematic design) w/the SBRA team.

3.2 DRB members are also invited to participate in the finalist concept presentations for the Commons Expansion project on December 18, 2003. A draft agenda for the December 18th will be distributed at the December 9, 2003 meeting.

The following constitutes a summary of topics presented to or discussed by the DRB on November 18th. Recipients of these minutes are encouraged to apprise the author of any errors or omissions.

UC Riverside
Capital Projects Advisory Committee
Meeting Minutes for November 25, 2003

Distribution and Attendance (X = attendance)

Standing Invitees		
C Cordova	Chancellor	
EVC Jury	Executive Vice Chancellor	X
VC Bolar	Academic Planning & Budget	X
VC Webster	Administration	
VC Sandoval	Student Affairs	X
VC Luben	Research	X
Interim VC Nava	University Advancement	
VC Azzaretto	Public Service and International Programs	X
Dean Angle	College of Natural & Agricultural Science	X
Dean Obrien	College of Humanities, Arts & Social Sciences	X
Dean Tripathi	Bourns College of Engineering	X
Interim Dean Byus	Division of Biomedical Sciences	
Interim Dean Duffy	Graduate School of Education	
Interim Dean Chung	A. Gary Anderson Graduate School of Management	
Ruth Jackson	University Librarian	
Irwin Sherman	Chair, Academic Senate	
Other Attendees		
Linda Gryniuk	Physical Plant	X
Laurie Sinclair	ASUCR	X
Travis Randel	ASUCR	X
Chuck Rowley	Computing & Communications	X
Dan Johnson	Office of Design & Construction	X
Fernand McGinnis	Office of Design & Construction	X
Tricia Thrasher	Office of Design & Construction	X
Andy Plumley	Housing	X
Hank Rosenfeld	UCPD	X
Tim Ralston	Capital & Physical Planning	X
Nita Bullock	Capital & Physical Planning	X
Bill Schmeckel	Staff Assembly	X
Robert Clare	Academic Senate – PRD Committee	X
Dan Rockholt	Capital & Physical Planning	X
Atira Harris	ASUCR	X
Kieron Brunelle	Capital & Physical Planning	X
Adrianna Davis	ASUCR	X
Bill Johnson	Capital & Physical Planning	X
Presenter(s)		
VC Bolar	Academic Planning and Budget (APB)	X
CPP Bullock	APB-Capital & Physical Planning	X
JD Douglas	Parsons Brinkerhoff Quade & Douglas	X

UC Riverside
Capital Projects Advisory Committee
Meeting Minutes for November 25, 2003

Dennis Farmer	Parsons Brinkerhoff Quade & Douglas	X
Director Plumley	Housing	X
Sr Ed Plnr Brunelle	APB-Capital & Physical Planning	X
Ricky Binder	R. L. Binder FAIA Architecture and Planning	X

1. Introductory Remarks (Bolar)

2. West Campus Family Student Housing – Program
(Brunelle, Plumley/R.L. Binder FAIA Architecture and Planning)
   a. Plumley – The project will provide 360 new units of family housing on the West Campus which is critical in the overall housing plan. In order to build new residence halls on the East Campus, the current site of family housing, currently built at a low density, will need to be demolished. Currently family housing is 50/50 undergraduate and graduate students. There is a waiting list for family housing so the need for more housing is there.
   b. Question – Is there enough parking?
   Answer – Yes, parking is provided at 1.5 spaces per unit with additional parking spaces for visitors, the Child Development Center and users of the Recreation Fields.
   c. Question – What is the status of the Iowa two lane vs. four lane issue?
   Answer – The campus is still discussing that issue with the city.
   d. Comment – Glad that there is another Child Development Center planned. It is a good recruiting tool and also good for retention.
   e. Comment – The campus police department is still concerned with on-street parking and issues with traffic and the potential for small children to be hurt.
   f. Question – What is the budget for the project and will the new units be affordable.
   Answer – The total project cost is about $64 million and for ecomony of scale, the original unit number was raised from 300 to 360 for a better per unit cost. The construction schedule is anticipated to be about 33 months with a price for a three bedroom unit in the neighborhood of $1,000 to 1,500 per month. About one third of the units are three bedroom and two thirds two bedroom with one bedroom units planned in the next phase. Current demand is for two and three bedroom units. The plan is to accommodate couples in existing apartments. The big issue is to get the price down so that it is affordable so the project is looking at every aspect to do that.
   g. Question – What and where will there be undergraduate housing?
   Answer – The Arroyo Student Housing will be used as undergraduate residence halls until family housing units in the Canyon Crest area can be

demolished. Then Phase 1 of new residence halls will be built on the east end with a central dining component.

3. Multi-Modal Transportation Management Strategy – Issues and Options (Bullock/Parsons Brinkerhoff Quade & Douglas, Inc.)

   a. Bolar – The project is at the ideas/issues and beginning options stage right now. Many issues have been identified and come up again and again like limiting access on the Campus Loop Road, constructing bridges over or tunnels under the freeway. The committee will be looking at options that make sense. Bullock – Over the 45 to 50 year history of UCR, growth has been fairly slow and regular and the campus has been able to assimilate the growth without creating to many problems with circulation and parking. However, with the rapid growth of 1,000 students per year recently, the campus has developed several areas of congestion at peak times of the days which are gradually spreading from peak hours to all day. This as well as escalating traffic around the campus has created the need for a Multi-Modal Transportation Management Strategy. This strategy will be developed to deal with campus accessibility by increasing numbers of people, vehicles, goods and services.
   b. Question – What is the thinking about the East –West Campus connectivity and will the Gage Canal play a role, for instance.
      Answer – The project is not at that stage yet, however, moving groups of people from one place to another will be part of the strategy. We are beginning to look at options and how they relate to needs, cost and effectiveness.
   c. Comment – A research university such as UCR needs to be accessed at all hours of the day and night. If you eliminate parking next to research buildings, you create issues with safety at odd hours. It also creates issues with researchers doing field research and bringing samples back to the inner core of the campus and their labs. We cannot cut off that accessibility. Also hope that Iowa can be taken care of.
   d. Comment – Access for special events and the increased need for professional classes held at night and weekends must be addressed. You must layer into the strategy thinking about who would be using the campus and at what times.
   e. Question – The East Campus Entrance Area Study looked at drop-off points. Is this being discussed in the transportation study.
      Answer – Yes, both projects have informed each other and there will be consideration given for formal drop-off points as well as the flexibility to remove barriers after hours to ensure access for those that need it.
   f. Question – There is still concern that students will not be able to drop things off in the inner core – is a cart system being considered?
      Answer – Yes, options for those kind of issues are still on the table.

g. Question – Is there still talk of improvements to turning movement signalization at the crosswalk between UNEX and University Village? Answer – Yes, improvements to the signalization for left turns at that intersection are now on the city's traffic improvement list.

4. Five Year Capital Program Update

a. Bolar - The majority of the 2004 General Obligation Bond for UC would go to UCR projects. Approximately $101 million for projects is at stake.

b. Question – What support is there from system wide for the bond? Answer – UCOP wants bond to stay in play but will be treading lightly with the new government in Sacramento. The Bio-Science Building construction, Psychology planning and working drawings and CHASS I&R Building construction were in the last bond, however, Psychology construction as well as PWC for Geology and Physics renovations and Materials Science and Engineering as well as pre-planning for Environmental Health and Safety Expansion and Student Academic Support Services Building are in the next bond (that $101 million amount).

Attachments:

Agenda 11-25-03
West Campus Family Housing Power Point Presentation
Multi-Modal Transportation Management Strategy Power Point Presentation
Five-year State and Non-State Capital Improvements Programs
Facilities Programmed in the next Bond Measure

Recipients of these minutes are encouraged to apprise the author of any errors or omissions.

UCR MMTMS Planning Committee Meeting
December 16, 2003
Pentland Hills B-107
12:30 PM to 3:30 PM

Minutes

Introductions/Review of Agenda

The meeting had two primary purposes:

1) To brief the Planning Committee on the MMTMS project team's approach to providing a signage and wayfinding element, and

2) Discuss the major strategies that will shape the final MMTMS Long Range Plan.

Signage and Wayfinding

Theresa Dickerson, a planner with the consultant Parsons Brinckerhoff Quade & Douglas (PB), provided a Power Point presentation which outlined the process the project team is using to create the MMTMS signage and wayfinding plan.

The first step was to identify UCR's major signage and wayfinding issues. To accomplish this step, the project team drew upon the following sources:

- Focus group sessions with different campus stakeholders,
- Planning Committee meetings,
- Campus and Neighborhood Open Houses, and
- Consultations with Transportation and Parking Services (TAPS) personnel who deal with signage and wayfinding issues on a daily basis.

The project team then grouped the issues into categories that related to various types of signs, such as arrival, wayfaring (includes directional, informational, etc.) or access control signs. This step helped to identify where UCR's existing wayfinding system needed improvement or restructuring so that the final wayfinding system could be tailored to the specific needs of the campus environment.

The next steps entail developing a hierarchy of wayfinding information, identifying special uses or districts within the UCR campus (both existing and future), and establishing information zones to facilitate the wayfinding hierarchy and to fit the specialized needs of the UCR campus. A hierarchy of wayfinding information helps to establish the role signage plays as a traveler progresses from one point to another. Information zones work to identify the level of information a traveler needs at various locations within the wayfinding system. Together, wayfinding hierarchy and information zones facilitate the layout of information systems and determine the level of information that should be provided and at what point within a traveler's journey.

The wayfinding presentation was concluded by outlining the level and type of information that would be provided in the final signage and wayfinding plan. The final plan is anticipated to include the following four major elements:

- *An Implementation Plan* – acts as the plan of action for working through the process of developing a wayfinding and signage system that supports the MMTMS and establishes a strong image for the UCR campus.
- *General Guidelines* – establishes the framework for signage system locations, identification of information zones, and importance of a campus image as part of the wayfinding system.
- *Protocols* – outlines the process for evaluating system needs, establishing a design image for special districts and specific signage elements, and maintaining and updating information systems and elements.
- *Identification of Signage Elements* – provides a first tier level of detail on the specifics of signage elements that could be provided within the wayfinding system.

Following the presentation, Kathleen Peach, Assistant Vice Chancellor of Marketing and Strategic Communications, briefly spoke about the importance of building and maintaining a brand image for UCR. An important component of this, she stated, is providing people with consistent messages and images as they interact with UCR.

During the question and answer session, several committee members discussed the use of new technologies in UCR's signage and wayfinding system. Members suggested that the project consider recommending the use of innovations such as interactive automated kiosks, wireless technology, and variable message signs to provide travelers with more detailed and real-time information. Some members also suggested establishing a radio station to provide travelers with information about things such as available parking, construction, or traffic conditions on campus.

Many of the technologies mentioned above, committee members pointed out, could also be used to distribute information about the campus or campus events. The committee also identified the possibility of installing a message sign adjacent to the freeway to expose large numbers of travelers to information about UCR.

Overall Strategy for the Long Range Plan

JD Douglas, PB team project manager, led a discussion with the Planning Committee concerning the overall strategy for the MMTMS Long Range Plan. JD noted that the project team had received over 200 suggestions – through venues such as focus groups, Planning Committee meetings and Open Houses – for potential solutions to solve many of the transportation issues UCR faces.

The project team determined that there were three driving factors which will shape the MMTMS:

- Treatment of the inner campus loop road,
- Transit, and
- Parking.

These three are considered driving factors because the preferred strategy for dealing with them will significantly determine what solutions are feasible for dealing with the other issues.

The project team identified initial long-term and short-term strategies which address these issues in a way that supported the MMTMS Guiding Principles.

At this stage in the project, the project team was seeking feedback from the Planning Committee on these potential strategies.

Inner campus loop road

<u>Long-term</u>

Conflicts between automobiles, bicycles, and pedestrians on the campus loop road constitute a major source of congestion at UCR. These conflicts also present safety concerns and create a less walkable campus.

JD identified one possible strategy for dealing with these conflicts in the very long-term: limit access to the inner campus loop. Access controls would prohibit general vehicle traffic to the inner campus loop road. These access controls, however, could still permit the use of the campus loop road by certain vehicles:

- Transit
- Service and delivery vehicles
- Emergency vehicles
- Vehicles used to provide greater campus access to the mobility impaired

This strategy relies upon certain UCR long range land use plans, such as the relocation of the Veitch Student Health center and the transition of parking lots to structures. This strategy would also work best if UCR tried to consolidate as many of its deliveries in a centralized receiving area as practicable.

As part of this plan, areas of the loop that experience heavy pedestrian crossing – such as the section of North Campus Drive between residence halls and the Academic Core – could be re-designed to create a more pedestrian friendly environment.

The project team discussed limiting traffic through portions of the inner campus loop that experience frequent conflicts. Leaving a portion of the loop open, however, would continue to permit many trips that currently create conflicts on the campus roads, such as travelers using the loop road for non-university related travel or passenger drop-offs along West Campus Drive.

With the strategy to limit access to the entire loop, passenger drop-off points would be located near each major access point to campus. One possibility would be to design drop-off spaces in or near future parking structures.

Some committee members questioned how this strategy would affect campus access in the evening. One member noted that graduate students frequently conduct work on campus in the evening. Another noted that undergraduates frequently travel to and from campus in the evening; this number will likely increase with the Commons Expansion.

JD answered that the details of this strategy would have to account for the safety needs of evening travelers. Possible accommodations include lifting access controls during the evening, or increasing the service of UCR's existing Point-to-Point Shuttle Service.

Short-term

The suggested short-term solution involves maintaining access to most of the loop, but uses access controls to prevent automobile movements through certain intersections.

This strategy places an access control on the north leg of the intersection of West Campus Drive and Canyon Crest Drive. Cars entering the intersection from Canyon Crest Boulevard would be forced to turn right on Canyon Crest Drive. Cars approaching the intersection from the south leg would have to turn left onto Canyon Crest Drive at this intersection; cars traveling south on the north leg would have to turn around in Parking Lot 4.

Pedestrian traffic will be directed on the north side of the intersection. This access control eliminates the conflict between automobiles and bicyclists and pedestrians at this intersection.

Access controls on Aberdeen Drive (near the drop-off circle at A & I Residence Hall) and on West Campus Drive (just west of the driveway leading up to Veitch Student Health Center) will eliminate conflicts between automobiles and pedestrian and bicycle traffic along North Campus Drive. To deal with conflicts at the intersection of Big Springs Road and East Campus Drive, a traffic signal could be installed as a short-term measure.

Some committee members pointed out that temporary uses of this strategy at the Canyon Crest/West Campus Drive have been successful in dealing with event-related traffic, such as graduation ceremonies.

One committee member stated that a traffic light at the Big Springs Road & East Campus Drive intersection might be unnecessary. Closing off North Campus Road to through traffic, the member stated, would drastically reduce traffic through that intersection.

Transit

Limiting automobile access on Campus Road provides an opportunity to run campus transit service along the inner campus loop. Currently, automobile congestion within the loop prohibits transit's ability to run along this road and still provide adequate headways.

One strategy for transit would be to take advantage of this new access and run transit along the inner campus loop. JD identified three types of transit service that could incorporate the campus loop into their routes:

- Routes carrying residents of surrounding housing to the campus,
- Shuttles running from parking structures to the campus core, and
- Shuttles that carry passengers between different points within the campus

Having these three routes overlap within the inner loop results in frequent shuttles running through the inner loop.

Some committee members questioned the necessity of running transit through the inner loop. Many of the planned parking structures will be within walking distance of the campus. The planned structures that are more remote, one person stated, lie within the path of existing Highlander Hauler routes that run from housing to the campus. Stops along these routes would enable existing Highlander Hauler routes to service people parking in more remote lots. Some committee members envisioned point-to-point service for the mobility impaired as the only necessary transit through the inner loop.

A number of committee members also noted that, even with most automobile traffic out of the inner campus loop, conflicts between transit and pedestrians or bicycles would continue to delay shuttles or buses. Running transit through a major pedestrian thoroughfare also poses safety hazards.

Other members cautioned against ruling out transit along the campus loop. Some committee members recommended that the project establish an acceptable walk time or distance, and see which trips exceed these limits.

Parking

If access to the loop is limited, travelers needing access to the loop would obtain an access card through Transportation and Parking services or one of the information kiosks. This raises the question of where these people will park. According to the LRDP land use plan, much of the space currently used for interior parking will become future building sites. A few lots may remain within the core. A structure planned where Parking Lot 1 now stands will continue to provide interior parking. If the administration building moves from Hinderaker Hall to the Graduate School of Management building, the adjacent parking lot can continue to provide parking for VIPs and visitors to administration.

Another question is how the university will continue to provide accessibility for handicapped students, faculty, staff, and visitors. Options include:

- Providing handicapped parking at the most accessible locations within parking structures closest to the traveler's destination.
- Providing the mobility impaired with a point-to-point shuttle service from parking structures to destinations on campus.
- Continuing to allow for some handicapped parking within loading and unloading docks.
- Maintaining some surface parking lots exclusively for handicapped parking.

Determining how to provide this accessibility will be one of the key elements of the MMTMS parking strategy. One committee member noted that there are two standards to consider when determining how to provide access for handicapped travelers: 1) legal requirements and 2) what UCR as a community feels it's necessary to provide. The member noted that the second standard may dictate a higher level of service and access than the law requires.

Short-term

The suggested short-term strategy consists of switching from UCR's current tiered parking system to lot-specific permits. This would reduce inner loop traffic by reducing the numbers of people driving around the loop road looking for the closest available parking lot. Currently, TAPS plans to switch over to lot specific permits by the next academic year.

East/West Disconnect

As part of the long-term strategy, it is suggested the MMTMS include a pedestrian and bicycle overpass over the freeway between Martin Luther King Boulvevard and University Avenue (shown on the Possible Long-Term Strategies Map), possibly incorporating the elevation change provided by the parking structure planned on Parking Lot 1.

Bicycle and Pedestrian Conflicts

JD also presented a general strategy for dealing with bicycle and pedestrian conflicts within the academic core of the campus. Increasing numbers of students and bicyclists traveling within the pedestrian malls (e.g. the Carillon Mall) could require some kind of separation of these two modes in the future. Possible approaches for dealing with these conflicts include:

- Providing a separate bike network.
- Prohibiting bicycle travel within certain areas in the academic core.
- Use striping or surface treatments to divide existing pedestrian paths into pedestrian walkways and bicycle paths.

One approach the project team presented to the committee involved developing a series of bicycle paths that lead from the campus loop road to bicycle parking areas. Bicyclists would travel near their eventual destination using bicycle lanes provided on the campus loop road. Once near their destination, bicyclists would then ride down a separate bikeway that enters the campus core and terminates at a bicycle parking area. Locating bicycle parking at the end of these nodes would discourage bicycle trips within the pedestrian malls of the campus.

At the same time, these paths would provide bicyclists with a separate network along which they could ride partially into the campus, and near their eventual destination, without conflicting with pedestrians (examples of these paths are illustrated on the Possible Long Term Strategies Map). Using these parking areas to consolidate parking would also enable the university to provide more secure bicycle parking facilities.

Some committee members stated that bicyclists along the inner loop may still have to contend with relatively high volumes of vehicle traffic, even if access controls limit general vehicle traffic. The volume of service vehicles alone, one member said, might complicate bicycling along the inner campus loop road. The committee member recommended providing bicyclists with some alternative to circumnavigating the campus loop road in order to travel across the campus, such as an east/west or a north/south path that runs through the interior.

Conclusion

Nita Bullock, Campus Physical Planner for Capital and Physical Planning, closed the meeting by reviewing the next steps in the MMTMS project. The meeting schedule for the project is as follows:

- Planning Committee meeting on implementation (January 22, 2004)
- Open House (January 27 or 28, 2004)
    - Campus Meeting – International Lounge, 11:30 AM to 1:30 PM
    - Neighborhood Meeting – Highland Elementary School, 6 to 8 PM
- Design Review Board (DRB) – February 3, 2004
- Capital Programs Advisory Committee (CPAC) – February -17- Bannockburn J-102, 10 AM to 12 Noon – Committee members should attend this meeting.

The schedule for the plan is as follows:

- March 15, 2004 – Administrative Draft (PMT review)
- March 30, 2004 – Draft (Committee review)
- April 12, 2004 – Planning Committee comments to Nita
- April 20, 2004 – Final Plan submitted to UCR.

UCR MMTMS Planning Committee Meeting
January 22, 2004
Humanities and Social Science Building, Room 1500
8:30 AM – 11:30 AM

Minutes

Introductions/Review of Agenda

The meeting had three primary purposes:

1) To update the Planning Committee on the MMTMS project team's signage and wayfinding plan,

2) To present the Draft Long Range Plan and the Draft Phasing/Implementation Plan to the Planning Committee; and

3) To obtain Planning Committee feedback on both draft plans.

Nita Bullock, UCR's Campus Physical Planner, began the meeting by emphasizing the importance of the Multimodal Transportation Management Strategy (MMTMS). As the campus grows, Nita stated, UCR will need a strategy that enables the university to provide access and mobility for all modes of travel.

Nita indicated that this was the last MMTMS Planning Committee meeting. She asked the committee to review the Draft Long Range Strategy and the Draft Implementation Plan and forward any comments to her. She also told the committee that they would have another chance to comment on the MMTMS when they received the administrative draft of the project report in March.

Nita and Jan Martin, the Director of Transportation and Parking Services (TAPS), both urged committee members to attend Capital Planning and Advisory Committee (CPAC) meetings and voice their support or their concerns about the MMTMS. Jan stated that UCR administrators will have to make some important decisions concerning UCR's transportation system. Knowing the committee's level of involvement in this plan might help campus administrators make these difficult decisions.

Signage and Wayfinding

Theresa Dickerson, a planner with the project consultant Parsons Brinckerhoff (PB), provided a Power Point presentation which discussed the hierarchy outlined in the signage and wayfinding plan. This hierarchy will form the basis for the recommendations provided within the plan.

Regional access points constitute the first level in the hierarchy. These are points where signage informs travelers of the presence of UCR. These regional access points lie at the I-215/SR-91 offramps near the campus. Although the freeway is often viewed as a barrier to campus travel, it also provides an opportunity to notify large numbers of travelers about the existence of UCR. The proposed pedestrian or bicycle overpass also presents an opportunity to the alert travelers to the existence of the campus.

One committee member asked if these regional access signs included variable message reader boards. Theresa responded that the regional access hierarchy level helps establish the campus image and tells travelers that they have arrived at the campus. Reader boards, on the other hand, provide information about the university once travelers have entered the campus. She also stated that reader boards might not be compatible with the kind of image the campus desires to project.

The planning committee member responded that reader access boards can be part of that “you have arrived” message. He stated that people often drive by the university without even knowing it. Reader boards could alert travelers to the presence of UCR and get people excited about the events the campus offers.

JD Douglas, Project Manager for PB, asked the committee if there was a consensus about the use of reader boards. In response, one committee member expressed concerns about the aesthetics of variable message reader boards. He stated he did not want campus signage to resemble that found along Auto Center Drive. Others pointed out that Caltrans had strict rules about moving text on signs that are visible from the freeway.

Theresa stated that this discussion pointed out two potential roles for reader signs. Within the campus, reader boards provide information about the campus. At another level, reader boards act as an “arrow in the sky”, alerting travelers to the presence of the campus. She stated that the plan would identify opportunities for both uses of reader boards, and then weigh the aesthetic and financial trade-offs of these uses.

At the next level in the hierarchy, monument signs or campus identifiers mark the beginning of the campus. Theresa stressed the importance of providing monument signs that are visible both at night and during the day. She stated that these signs should include some kind of lighting or illumination.

Once travelers have arrived on campus, Theresa continued, signs must inform them of where they can park. One committee member asked if signage identifying parking structures could also let travelers know which structures are full. Theresa answered that this could be one form of information included on parking signs. Another committee member suggested using a low frequency radio station to provide information about available parking.

The next level of signage provides directional information to pedestrians. Kiosks are one way to provide this information. The proposed long range transportation strategy recommends that the university provide three manned kiosks, one at each campus entrance. At these kiosks, attendants could answer questions or provide directions to visitors. At other parking structures, unmanned kiosks could provide maps of the campus. Interactive computer kiosks might also be used to provide customized maps for travelers.

Pedestrian direction signs would work in conjunction with campus maps to help travelers find their final destination. These directional signs would be located at key decision points (areas where pedestrians must make a choice between different paths). Theresa provided some examples of some of these key decision points. These signs could use color schemes, for instance, to represent different kinds of destinations. Signs might also use different symbols to differentiate the East Campus from the West Campus. As with monument signs, Theresa also stressed the importance of providing directional signs that are visible at all times of the day.

Signs must also provide information to bicyclists. In many cases, bicyclists will use the same signs as motorists or pedestrians. Other signs would be tailored to serve the needs of bicyclists, such as signs identifying bikes lanes, routes or paths, cautionary signs, and signs pointing out the way to bike parking.

(Note: During the signage presentation, some committee members asked questions about the locations or uses of bicycle facilities. These questions are detailed in the bicycle section of the *Draft Long Range Plan.*)

Campus signage and wayfinding must also provide information for emergency and service vehicles. Since these vehicles often need to directly access dock areas, UCR must provide navigational directions to each building. The signage system must also inform emergency and service personnel when they have arrived at a particular building or service dock. This signage system could use either names or a numbering system to identify each building and direct service and emergency vehicles to each location. As with all other levels of signage, these signs should be illuminated to ensure that they are visible at all times.

One member asked if the committee should make a choice at this meeting about whether to use names or numbers for buildings and navigation directions. Many other members responded by saying that they preferred to use building names. One member explained that the campus has traditionally used names to identify dock areas, but that UCR just has not done a good job providing signs at all dock areas or ensuring that dock signs are illuminated.

Another committee member recommended developing campus maps that provide Global Positioning System (GPS) coordinate systems. He predicted that more emergency vehicles will eventually navigate using this system.

After the presentation, many committee members asked about the next step in the MMTMS Signage and Wayfinding element. Some also asked about what kinds of information the final plan would contain. Theresa stated the first step would be to make decisions about many of the questions raised in this meeting. She went on to say that the plan will identify general locations for the different types of signs discussed at the meeting. The plan will then provide guidelines for each type of sign, including what kinds of information it should provide. Nita Bullock further explained that after the Long Range Development Plan was completed, UCR's design and landscape guidelines would be updated to reflect desired changes in the design and placement of UCR signage.

One committee member asked what the final decision was on digital signs. Theresa said the meeting identified two basic uses for digital signs: 1) to provide information about campus events and 2) to alert travelers to the presence of the campus. Theresa said the final plan will identify opportunities for using digital signs for both purposes. She went on to say the plan would look at the costs (both financial and aesthetic) of these opportunities.

Another committee member asked when these final decisions would be made, and if members would have another chance to provide feedback about the signage plan. Nita stated that the administrative draft will contain the signage and wayfinding plan. Committee members will have an opportunity to comment on the signage plan when they review this draft.

Draft Long Range Plan

JD Douglas, Project Manager for the PB team, discussed the proposed draft of the long range transportation plan. Committee members were provided with copies of the draft plan prior to the meeting. The majority of this discussion consisted of committee member feedback concerning the draft plan. The following paragraphs summarize these comments.

Vehicle Circulation

Some committee members felt the access control on Aberdeen Drive was too far north. One member did not like using the drop-off driveway for the A & I Dorms as a turn around for automobiles. Members suggested moving the access control further south on Aberdeen Drive.

Other members also wondered how these access controls should be implemented. The *UCR Multimodal Transportation Management Strategy Phasing/Implementation Plan* recommends leaving the loop road open in the short term (1-2 years), but placing access controls along the campus loop road to prevent vehicles from driving through areas that experience heavy volumes of pedestrian crossing. Some committee members commented on the access controls on West Campus Drive, west of the intersection with Canyon Crest Drive.

Some committee members worried that these access controls might create a negative experience for first-time visitors. Visitors who enter the campus at Canyon Crest Drive and hope to turn left on West Campus Drive, for instance, would be forced to turn around and re-enter the campus from University Avenue.

In response to these concerns, some members raised the possibility of using a traffic signal at the West Campus Drive/Canyon Crest Drive intersection to control conflicts, in the short-term, rather than using access controls. One member stated that the Caltrans improvement to the Martin Luther King offramp would be a good opportunity to introduce a traffic light.

JD Douglas stated that the project team would look at ways to accommodate visitors unfamiliar with access controls, including using traffic lights in place of access controls. He also suggested one way of dealing with this problem: providing kiosks with one-time-use access cards that would allow visitors unfamiliar with the campus to pass through these controls.

Another committee member highlighted the need to have adequate signing in place before access controls are installed to notify drivers that some campus roads are not through streets.

Bicycles

During the signage presentation, one committee member asked if bicycles will have to share lanes and paths with certain powered vehicles, such as Segways or electric bikes. Theresa stated that some bike paths and lanes would be available for use by these vehicles.

Another planning committee member asked about bicycle parking for West Campus housing. He recommended placing bicycle parking on both sides of the recreation field, but leaving the locations of bicycle parking for residents up to the designers of housing complex. (Note: The online version of the draft plan has been updated to reflect his comment).

Some members also stated that different areas of campus experience different demands for bike parking. One committee member stated, for instance, that the areas north of campus, such as the Commons or the Surge Building, draw large numbers of bicycle riders. Other areas, such as the south campus, do not create as much demand for bicycle parking.

The committee also discussed the trade-offs between safety and convenience when determining the number and location of bicycle parking. Fewer bicycle parking areas are easier to monitor or patrol, but would require bicyclists to walk further. Members asked a committee member who frequently rides his bike to estimate an acceptable walking distance between bicycle parking and a destination on campus. The committee member answered that 5-10 minutes seemed reasonable.

Transit

One committee member asked if the project team conducted any kind of simulation to determine where people traveled and what routes they needed. JD responded that the plan does not intend to provide that level of specificity, i.e. designing specific routes. The transit routes depicted in the plan show possible ways of linking important origins and destinations within the campus.

JD then asked the committee if the level of service provided in the plan was sufficient, or if more connections should be provided between different areas of campus. One committee member responded that the routes presented in the plan seemed sufficient, as long as they were supplemented with a Point-to-Point shuttle for users with special needs.

Phasing/Implementation Plan

JD Douglas then reviewed the *Phasing/Implementation Plan*. The description below summarizes the Committee's comment on the *Phasing/Implementation Plan*.

<u>*Short Range Actions (3-5 Years*</u>

One committee member suggested implementing bicycle parking sooner. The plan could do this, he stated, by using sections of existing parking lots (such as Lot 19) for bicycle parking. As parking lots close down to accommodate the construction of new buildings, a portion of these lots could be converted to bicycle parking. This would allow the campus to implement its bicycle programs sooner by taking advantage of UCR's existing infrastructure.

<u>*Long Range Actions (6-10 Years)*</u>

A committee member commented that policies limiting dock access could be implemented in the short-term. He stated that even if it takes a few years to fully implement, this strategy in the short-term phase provides UCR the option to start enacting new dock policies sooner.

Conclusion

Nita Bullock closed the meeting by reviewing the next steps in the MMTMS project. The meeting schedule for the project is as follows:

- Open House (January 27, 2004)
    - Campus Meeting – International Lounge, 11:30 AM to 1:30 PM
    - Neighborhood Meeting – Highland Elementary School, 6 to 8 PM
- Design Review Board (DRB) – March 2, 2004, 11:00 AM – 2:00 PM, Bannockburn J-102.

- Capital Programs Advisory Committee (CPAC) – March 16, 10:00AM – 12:00 PM, Bannockburn J-102.

The schedule for the plan is as follows:

- March 19, 2004 – Administrative Draft (PMT review)
- March 30, 2004 – Draft (Committee review)
- April 12, 2004 – Planning Committee comments to Nita
- April 20, 2004 – Final Plan submitted to UCR.

Multi-Modal Transportation Management Strategy
Campus and Neighborhood Open Houses
January 27, 2004
International Lounge, UC Riverside and Highland Elementary School, Riverside
11:30 AM – 1:30 PM & 6:00 PM – 8:00 PM

Minutes

The purpose of the Open Houses was to provide the campus and neighborhood communities the opportunity to review and provide feedback on preliminary strategies proposed for UCR's Multimodal Transportation Management Strategy (MMTMS).

Jan Martin, Director of Transportation and Parking Services, opened the meeting by providing the background for the MMTMS. The MMTMS is an important element of campus discussions about how to handle increasing enrollment. These rising enrollments will present challenges for the university's transportation system. People are already beginning to see the effects growth has had on campus travel.

The MMTMS will help determine how the campus will maintain mobility and accessibility in the face of this growth. Additionally, the strategy will deliver an implementation schedule for campus transportation improvements and identify possible funding sources.

Jan described how the MMTMS has been a highly collaborative effort among the MMTMS Planning Committee members. The Planning Committee, a group of about 20 members of the UCR community appointed by the Executive Vice Chancellor, worked closely with the project consultants and the campus project team. The topics discussed at these Planning Committee meetings, such as parking, are usually hot button issues; everyone enters the debate with their own agenda. Over time, however, committee members began to reach an agreement over what actions UCR should take. Jan also explained how the project had sought the input of groups beyond the immediate UCR community, such as vendors and delivery companies (through focus groups) and surrounding neighborhoods (through earlier Open Houses).

Jan then introduced JD Douglas, Project Manager for Parsons Brinckerhoff (PB), UCR's consultant for this project. JD highlighted the importance of creating a transportation strategy that serves the needs of UCR. He stressed the need for the campus community to provide feedback on the project by talking to planners at the Open Houses or by submitting comments to Nita Bullock, UCR's Physical Planner.

JD followed with a brief Power Point presentation that discussed the goals of the study, the study process, and the key issues the MMTMS is attempting to solve.

The Open House sessions followed the presentation. The Open House sessions consisted of 5 stations describing the following transportation elements:

- Vehicles
- Bicycles
- Pedestrians
- Transit
- Parking

Each station included a list of the key issues the strategy sought to address and a map detailing the proposed transportation strategies for each system. Members of the consultant team were available at each station to answer questions and write down comments or suggestions. These comments are detailed in the attached *Comments Presented at the January 27, 2004 MMTMS Open House Sessions*.

Summaries of the preliminary proposed transportation strategy were also handed out at the meeting.

Comments Presented at the January 27, 2004 MMTMS Open House Sessions

Comments on Proposed Vehicle System Strategies

- Maintain access for large, infrequent, and/or occasionally unplanned deliveries or transfer of materials during the daytime (8 AM to 5 PM) and sometimes in the evening.
- Cut off traffic on West Campus Drive at Canyon Crest in short-term plans.
- Cut off traffic at Aberdeen Drive and North Campus Drive in the short term to solve conflicts in this area.
- Explicitly address strategy for frequent (e.g. daily) "special needs" access. For instance, will the campus provide these travelers with access to the interior, or with demand response shuttles?
- Provide a passenger drop-off point at Bourns Hall.
- Consider a road extending east from University Avenue into the campus loop road for service vehicle use only.
- Use UCR website, signing, and activity boards to educate the general public about:
    - Campus access
    - Transit
    - Visitor Parking
    - Special Events

Comments on Proposed Parking System Strategies

- Work with city to implement residential neighborhood parking permits to discourage university parking on local city streets.
- Provide metered short-term parking at some areas (e.g. interior parking lots).
- Provide tiered or free parking for university events to encourage public participation and better community relations.
- Ensure that handicapped spaces remain open during the evening.
- Evaluate if proposed parking strategy is compatible with ADA requirements.
- Place access controls at the exits of parking lots, rather than at the entrances, to prevent vehicles entering lots from backing up into adjacent streets.
- Reverse the flow of traffic in Lot 4.
- UCR needs to buy parking spaces within the University Village parking structure.

Comments Presented at the January 27, 2004 MMTMS Open House Sessions

Comments on Proposed Transit System Strategies

- Provide a stop at the future San Jacinto Line Metrolink station.
- Provide a Highlander Hauler stop near the Commons.
- Provide transit service between areas of the main campus and Highlander Hall.
- Run a north/south transit line from Lot 30 to North Campus (e.g. library, student center).
- Provide higher frequency shuttle service in the inner loop and lower frequencies for routes that run further away from the campus.
- Ensure that the Highlander Hauler maintains frequent headways.
- Road closures at Aberdeen Drive could interrupt Services for Students with Disabilities van routes between housing and parts of the campus.
- More "open" tram service, providing limited stops and easy passenger on/off access.
- Provide a campus monorail.
- Provide bus shelters, shade, and benches at transit stops.
- After traffic has been limited within the inner campus loop, remove speed bumps to allow transit to achieve more frequent headways.

Comments on Proposed Pedestrian System Strategies

- Consider implementing the proposed access controls on Aberdeen Drive and North Campus Drive sooner in order to immediately solve conflicts at this area of campus.
- Consider implementing the proposed access controls at the intersection of Canyon Crest Drive and West Campus Drive sooner in order to immediately solve conflicts at this area of campus.
- Work with the City of Riverside/Caltrans to explore options for grants/redevelopment for I-215/SR-60 overpass.
- Grade changes around the Student Health Center and the housing north of Big Springs Road make it difficult for students in wheelchairs to access these areas.
- When designating safe paths, consider which routes are wheelchair accessible.
- Provide benches and seating along all pedestrian routes.
- Consider additional lighting, pedestrian activated lights, or reflective tape in the crosswalk between student housing and the recreation center (an area that experiences significant pedestrian crossings in the evening).
- Will lighting on campus be considered as part of this plan?
- Did the study look at building a tunnel under the freeway rather than a pedestrian/bicycle overpass.

Comments Presented at the January 27, 2004 MMTMS Open House Sessions

Comments on Proposed Bicycle System Strategies

- Work with city/Caltrans to explore options for grants/redevelopment for I-215/SR-60 overpass.
- Pay careful attention to areas where bike lanes or paths intersect with pedestrian walkways. Campuses like UCSC or UCSB use design features such as pedestrian islands or turning circles to minimize pedestrian/bicycle collisions at these intersections.
- Provide bike lanes or routes in the housing areas north of Linden.
- Bike paths need to funnel bikes into the campus core.
- Consider restricting bicycles within the inner campus core during peak periods only, not during the entire day.
- A lack of routes through the core of the campus – especially routes that allow bicycles to cut through the central core – could discourage people from bicycling.
- Provide bicyclists with some inner campus bike routes; just make sure to keep them out of the central mall areas.
- Instead of forcing bicyclists to use the path where Parking Lot 6 now stands, offer a closer path that runs just south of the theater and curves downward between Olmstead Hall and the Physical Plant before connecting to Citrus Drive.
- Placing centralized bicycle parking in front of buildings may contradict existing aesthetic practices. Ribbon-style bike racks are often used in front of buildings. But these racks do not have enough capacity to meet the parking demands of centralized bicycle lots.
- Plan still does not address the problem of bicyclists who have to cross into the campus at the elbow formed by Canyon Crest Drive and University Avenue.
- In project maps, show where the Gage Canal continues on the north side of campus.

UC Riverside
Design Review Board
Meeting Minutes for March 2, 2004

Distribution and Attendance (A = Attendance, N = Not in Attendance)

Board Members		
Professor Robert Clare	Physical Resources Committee (Academic Senate)	(A)
Professor David Eastmond	Cell Biology and Toxicology (CNAS)	(A)
Professor John Ganim	English (CHASS)	(A)
AVC Daniel Johnson	Design and Construction (VC - Administration)	(A)
AVC Timothy Ralston	Capital and Physical Planning (VC - APB)	(A)
Steven Ehrlich, FAIA	Steven Ehrlich Architects	(N)
Kathy Garcia, ASLA	Wallace, Roberts, and Todd	(A)
Charles "Duke" Oakley, FAIA	Altoon-Porter Architects	(A)
Presenter(s)		
James "JD" Douglas	Parsons-Brinkerhoff	(A)
Dennis Farmer	Parsons-Brinkerhoff	(A)
Nita Bullock	UCR Project Management Team	(A)
Jan Martin	UCR Project Management Team	(A)

1.0 Meeting Agenda. The agenda for March 2nd meeting of the Design Review Board (DRB) reviewed the Multi-Modal Transportation Management Strategy (MMTMS) draft recommendations and findings. Previously the DRB had reviewed the early alternatives for the MMTMS at the November 2003 meeting. The following agenda was reviewed prior to the presentations:
- 1.1 MMTMS presentation (Parsons Brinkerhoff/UCR Project Management Team)
- 1.2 Formulation and recap of recommendations to PB/UCR Team
- 1.3 Preview of future DRB agendas (Johnson, Ralston)

2.0 Preliminary Observations and Recommendations.
- 2.1 MMTMS. In response to the PB/UCR team presentation, the Board had the following observations *(Note: A copy of the Parsons-Brinkerhoff powerpoint presentation to the Board is being transmitted concurrent with these minutes to provide reference and context)*:
  - 2.1.1 Pedestrian Core of the East Campus and future West Campus should be prioritized and maintained for all aspects of the plan.
  - 2.1.2 Guidelines for specific elements of the plan should be refined:
    - 2.1.2.1 Overcrossings. These opportunities should be leveraged to tie into existing/planned buildings or other infrastructure developments the campus is planning to implement.
    - 2.1.2.2 Bicycle Parking Areas. Should be designed to anticipate and accommodate (where appropriate) other types of personal transportation (e.g. Segways, scooters, etc.)

2.1.3 Incentives. The Board encouraged the campus and project team to consider a portfolio of parking related incentives to satisfy many of the plan's objectives. Some examples include preferred rate/sticker status or subsidies for those participating in:
2.1.3.1 Carpooling
2.1.3.2 Alternative Fuel Vehicles
2.1.3.3 Transit (bus, train) instead of private automobile

2.1.4 Signage. The Board encouraged the project team to consider this element of the MMTMS in depth as a stand alone master plan/study in the near future.

2.1.5 Committee Kudos. The Board encouraged the project team to congratulate the MMTMS Committee on a job well done.

3.0 Future DRB Agendas.

3.1 AVC's Johnson and Ralston apprised the Board of the next several agendas, which are summarized below. In addition, AVC Johnson, provided the Board with an update regarding the Regent's Design Approval for the Psychology Building.

3.1.1 *April agenda:* Commons Expansion preliminary schematic design (information only – 1 of 3); Arroyo Flood Control Project (information only)

3.1.2 *May agenda:* Commons Expansion preliminary schematic design (information only – 2 of 3); Student Academic Support Services Building (pre-design); Environmental Health & Safety Expansion (pre-design);

3.1.3 *June agenda:* Commons Expansion schematic design (3 of 3)

3.1.4 *July agenda:* Genomics Building pre-design (information only)

The following constitutes a summary of topics presented to or discussed by the DRB on March 2nd. Recipients of these minutes are encouraged to apprise the author of any errors or omissions.

UC Riverside
Capital Projects Advisory Committee
Meeting Minutes March 16, 2004

Distribution and Attendance (X = attendance)

Standing Invitees		
C Cordova	Chancellor	X
EVC Jury	Executive Vice Chancellor	X
VC Bolar	Academic Planning & Budget	X
VC Webster	Administration	X
VC Sandoval	Student Affairs	X
VC Luben	Research	X
Interim VC Nava	University Advancement	
VC Azzaretto	Public Service and International Programs	X
Dean Angle	College of Natural & Agricultural Science	X
Dean Obrien	College of Humanities, Arts & Social Sciences	X
Dean Tripathi	Bourns College of Engineering	X
Interim Dean Byus	Division of Biomedical Sciences	
Interim Dean Duffy	Graduate School of Education	X
Dean Banker	A. Gary Anderson Graduate School of Management	X
Ruth Jackson	University Librarian	X
Irwin Sherman	Chair, Academic Senate	
Other Attendees		
Linda Gryniuk	Physical Plant	
Laurie Sinclair	ASUCR	X
Travis Randel	ASUCR	X
Chuck Rowley	Computing & Communications	X
Dan Johnson	Office of Design & Construction	X
Fernand McGinnis	Office of Design & Construction	
Tricia Thrasher	Office of Design & Construction	X
Andy Plumley	Housing	
Hank Rosenfeld	UCPD	X
Tim Ralston	Capital & Physical Planning	X
Nita Bullock	Capital & Physical Planning	X
Bill Schmeckel	Staff Assembly	X
Robert Clare	Academic Senate – PRD Committee	
Dan Rockholt	Capital & Physical Planning	
Atira Harris	ASUCR	
Kieron Brunelle	Capital & Physical Planning	X
Adrianna Davis	ASUCR	
Jason Day	UCPD	X
Dallas Johnson	Service Enterprises	X
Ted Chiu	ODC	X
Eileen O'Connell-Owens	Capital & Physical Planning	X
Tom Miller	Academic Senate Representative	X

UC Riverside
Capital Projects Advisory Committee
Meeting Minutes March 16, 2004

Lance Danks	TAPS	X
Jan Martin	TAPS	X
Norm Ellstrand	MMTMS Planning Committee	X
Larry Zahn	MMTMS Planning Committee	X
Rob Lennox	MMTMS Planning Committee	X
Robert Heath	Biology & Plant Sciences	X
Luis Carrazana	Capital & Physical Planning	X
Deborah McCoy	Career Services	X
Bill Johnson	Capital & Physical Planning	X
Presenters		
VC Bolar	Academic Planning and Budget (APB)	X
Dean Angle	CNAS	X
CPP Bullock	APB-Capital & Physical Planning	X
JD Douglas	Parsons Brinkerhoff Quade & Douglas	X
Dennis Farmer	Parsons Brinkerhoff Quade & Douglas	X

1. Introductory Remarks (Bolar)

2. College of Natural and Agricultural Sciences Vision Presentation (Dean Steven Angle)

3. Multi-Modal Transportation Management Strategy (Bullock/Martin, Parsons-Brinkerhoff)

   a. Comment - The concept of central delivery system seems to have cost implications with need for special deliveries.
      Answer – During the focus group meetings the planning committee talked with outside delivery groups and they are becoming less inclined to deliver to inner campus due to time delays. Getting private vehicles out of the campus core would decrease time delays, however it is the intent of the plan to decrease the number of vehicles within the core.
   b. Comment – How about a bicycle program that would provide bikes for people to use within the campus. The bikes would be available for anyone to use to get to their destination and then it would be available for someone else.
      Answer – This program was tried twice and even though the bikes were painted bright pink, they disappeared in a short time. There is no consideration of repeating this program in the future.
   c. Comment – Concern about limiting private vehicles within the campus. There are needs for drop off, need for quick access to private vehicle, need for people to work at night.
      Answer – The plan has flexibility for special needs like working at night.

d. Comment – When you take traffic outside the campus you still have transit on campus. You will no longer have your car outside your office.
e. Comment – People will use car to come to campus and the plan does not provide access to buildings.
Answer – The goal of the transportation plan is to make the campus more pedestrian in nature. Parking is moving to the perimeter and people will have to walk more.
f. Comment – What about the employee who works in College Building North and parks in Lot 30. The plan needs to address ability of people getting from remote lots to their destination safely.
Answer – That will be part of the shuttle service provided. TAPS is working on an expanded point-to-point service as well including expanding service to 12:30 AM.
g. Comment – Should close off Campus Drive over by Big Springs Road. A lot of traffic cuts though campus coming from there.

4. Five Year Capital Program Update
(Bolar)
No presentation made – ran out of time.

Attachments: CNAS Vision Power Point Presentation
MMTMS Power Point Presentation

Recipients of these minutes are encouraged to apprise the author of any errors or omissions.

Appendix B:

Existing and Future Conditions

UCR Multimodal Transportation Management Strategy
Technical Memorandum #1: Existing and Future Conditions

Prepared for

University of California, Riverside

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

September 8, 2003

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 BACKGROUND AND PLANNING CONTEXT

1.1. Introduction

From its emergence from a 30-acre experimental orchard to a 1,100 acre campus with over 16,000 students, UCR has experienced substantial growth and change. This growth has, in turn, necessitated a series of long-range plans designed to accommodate increasing enrollment and an evolving community.

In 1907, the University of California's College of Agriculture established an experimental orchard and research station at the base of Mt. Rubidoux. Ten years later, the University of California, requiring larger facilities, established the Citrus Experiment Station on 307 acres of land at the eastern end of Riverside, at the base of Box Springs Mountain. This site became the starting point for UCR when, in 1948, the State Legislature recommended the development of a liberal arts college adjacent to the Citrus Experiment Station.

The need for long-range planning immediately followed. When classes began in 1954, the university had a planned capacity of 1,500 students. Anticipating growth, the 1955 Campus Master Plan prepared for a projected enrollment of 5,000 students. The 1964 Long Range Development Plan (LRDP) assumed an enrollment of 10,000 students.

Although growth slowed in the 1970's and early 1980's, UCR burgeoned from about 4,700 students in 1983 to around 8,200 in 1988, a growth of 76%. In response to this rapid growth, the 1990 LRDP recommended plans to accommodate over 18,050 students by the 2005/2006 academic year.

UCR expects continued growth over the next decade. Increasing numbers of college age students guarantees that UCR will play a major role in helping the UC system to meet its obligation – outlined in the California Master Plan of Higher Education – to offer a place for all eligible California students from the top 12.5 percent of high school graduates.

To accommodate this anticipated growth, UCR's Draft 2003 LRDP plans for an enrollment of approximately 25,000 students by 2015. Designing a transportation system that can efficiently handle this profound growth is a key component of this planning.

The Draft 2003 LRDP contains a circulation and parking plan that seeks to maintain high levels of personal accessibility and mobility in the face of this future growth. At the same time, the LRDP strives to capture opportunities to minimize dependence upon the private automobile. To accomplish this, the LRDP outlines the following parking and circulation planning principles:

- Develop an integrated multi-modal transportation plan to encourage walking, biking, and transit use;
- Expand shuttle or tram service connecting major parking lots and campus destinations, and linking the East and West Campuses. Coordinate this system with Riverside Transit Agency bus routes and schedules and with Metrolink services;

- o Provide a continuous network of bicycle lanes and paths throughout the campus, connecting to off-campus bicycle routes;
- o Over time, limit general vehicular circulation in the central campus, but allow transit, service, and emergency vehicle access, and provide access for persons with mobility impairments;
- o Provide bicycle parking at convenient locations;
- o Implement parking management measurements that may include:
    - o Restricted permit availability
    - o Restricted permit mobility
    - o Differential permit parking.

1.2. Role of the Multimodal Transportation Management Strategy

The Multimodal Transportation Management Strategy (MMTMS) will provide a roadmap for transitioning from UCR's existing transportation system to that envisioned within the LRDP. Specifically, the MMTMS will provide a refined circulation system plan that is compatible with the 2003 LRDP, including a signage and wayfinding plan. The MMTMS will also identify what enhancements UCR should make to its transportation programs and provide a plan for linking campus transit with the Riverside Transit Agency (RTA) system.

In addition to identifying the specific components of UCR's future transportation system, the MMTMS will provide guidelines for implementing this new program. This guidance includes providing a schedule, an implementation plan, cost estimates and funding strategies – outside of parking revenues – for these transportation system components.

1.3. Guiding Principles

Throughout its development, the MMTMS will rely upon a series of guiding principles. These principles will provide one criteria with which to evaluate various components of the MMTMS, including individual transportation system enhancements, long range plans, and implementation strategies. The guiding principles were developed through discussions with the MMTMS Project Management Team (PMT) and the MMTMS Planning Committee. These guiding principles encompass the objectives outlined in the LRDP, the expressed goals of campus agencies involved with the MMTMS, and sound transportation planning practices. The guiding principles are as follows:

Mobility:	Develop a system that addresses the essential and evolving mobility requirements of persons, goods, and services throughout the campus as the university grows. Key features should include travel time, access, efficiency, and convenience.
Campus Integration:	Provide transportation programs and facilities using a variety of modes that integrate all areas of the campus and that provide linkages to the surrounding community, the city and the region.

"Walkable" Campus:	Develop a system which puts the pedestrian at the head of transportation and accessibility needs, and then accommodate other types of transportation.
System Hierarchy:	Establish a hierarchy by facility and mode type to the extent feasible (e.g., vehicles, transit, bicycles, pedestrian traffic) to facilitate circulation and to address points of conflict.
Traveler Needs:	Focus on user needs, including special users such as emergency, vendors, delivery vehicles, and the disabled. Address complete point-to-point trip needs by providing inter-modal linkages, convenient and secure services, and support facilities. Stress marketing, educational, and/or informational programs for maximum effectiveness.
Multimodal System:	Enhance incentives for a range of alternatives such as transit, bicycles, and pedestrians to make those transportation choices more attractive compared to the automobile. If a vehicle must be used, consider alternative fuels.
Aesthetic Design:	Include design elements that enhance the user's experience, are functional, and supports the vision of the university and adds to a "sense of place."
Implementable:	The proposed system should be realistic, acceptable to decision-makers and the campus public, fundable over both the short and long term, and adaptable to changing circumstances. The phasing and priority plan should provide opportunities for near-term implementation of plan elements as well as long-term.
Neighborhood Consideration:	The proposed strategy should seek to achieve UCR's transportation goals while minimizing potential consequences to neighboring communities.
Safety:	Provide a plan that enhances the safety of all travel modes and that addresses the particular demands created by university activities (such as the need for secure multimodal evening travel).

1.4. Purpose of Existing and Future Condition Memorandum

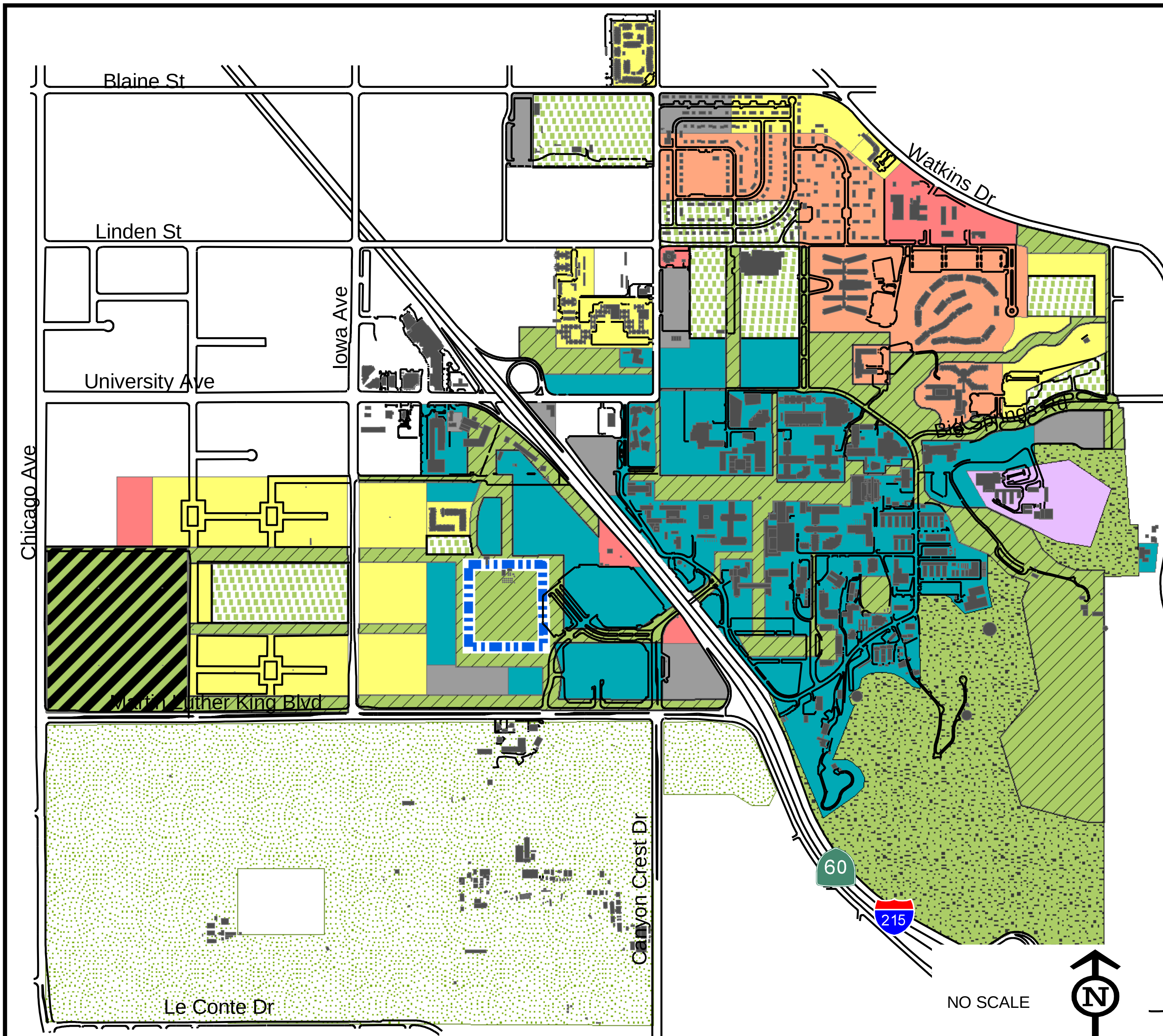
This Technical Memorandum supplies a snapshot of UCR's existing and future transportation system. The document uses field data and information obtained from UCR planning documents to depict the campus' current parking and circulation system. To envision the university's future system, the memorandum employs growth forecasts as well as LRDP descriptions of UCR's future transportation system and land uses (see Figure 1-1.)

The information presented in this document will be used in conjunction with focus groups and other discussions with the UCR community to identify the issues, opportunities, and constraints the MMTMS must address. Specifically, the materials in this document are intended to be used to:

- Understand UCR's transportation system,
- Help visualize changes to the parking and circulation system,
- Inform discussions with members of the UCR community, and
- Develop a comprehensive transportation plan for the future growth of the campus.

Although the identification of issues will occur in the next step, this memorandum does highlight some factors that should be considered in accomplishing this next step. These factors are listed at the end of each section, under the heading *Implications for the MMTMS.*

In addition, this technical memorandum compares UCR's existing transportation system with the vision set forth in the Draft 2003 LRDP. As part of this comparison, this document begins the process of identifying some of the components the MMTMS must include in order to help UCR transition from its current system to the one envisioned in the 2003 LRDP; these are listed as *MMTMS Components* at the end of each section.



Source: LRDP Draft, August 2003.

LEGEND

- Academic
- Agricultural, Teaching, and Research Fields
- Family, Apartment Housing and Related Support
- Non-Institutional Agencies
- Open Space
- Open Space Reserve
- Parking
- Residence Hall and Related Support
- Athletics and Recreation
- Campus Reserve
- Support
- Special Academic Building Area

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 1-1

UCR LRDP Landuse

2.0 EXISTING AND FUTURE CONDITIONS

2.1 Demographics

2.1.1 Existing Demographics

With a 2001-2 total year-average, full-time equivalent enrollment of 13,238 student (11,762 undergraduates, 1,477 graduates), UCR has the seventh largest enrollment of the eight University of California (UC) campuses that offer both graduate and undergraduate degrees. Although Riverside is one of the smallest UC's in terms of enrollment, the college has experienced one of the largest growth rates over the past decade. From 1990-2000, the average Full-Time Equivalent Enrollment increased by 47%, from over 8,100 full-time students to nearly 12,000[1].

Employment at UCR over the past decade has also grown. In 1997 UCR employed 430 faculty members and 2,076 full time equivalent employees. By 2001, these numbers had risen to 613 faculty members and 2,428 staff members.[2]

Many of the students live in close proximity to the campus. Figure 2.1 shows the location of UCR within the larger community. 26% of the students reside in university-controlled housing as of Fall 2002. Figure 2.2 shows the location and number of students living in university housing. As the figure illustrates, 4,147 students live in university owned housing[3].

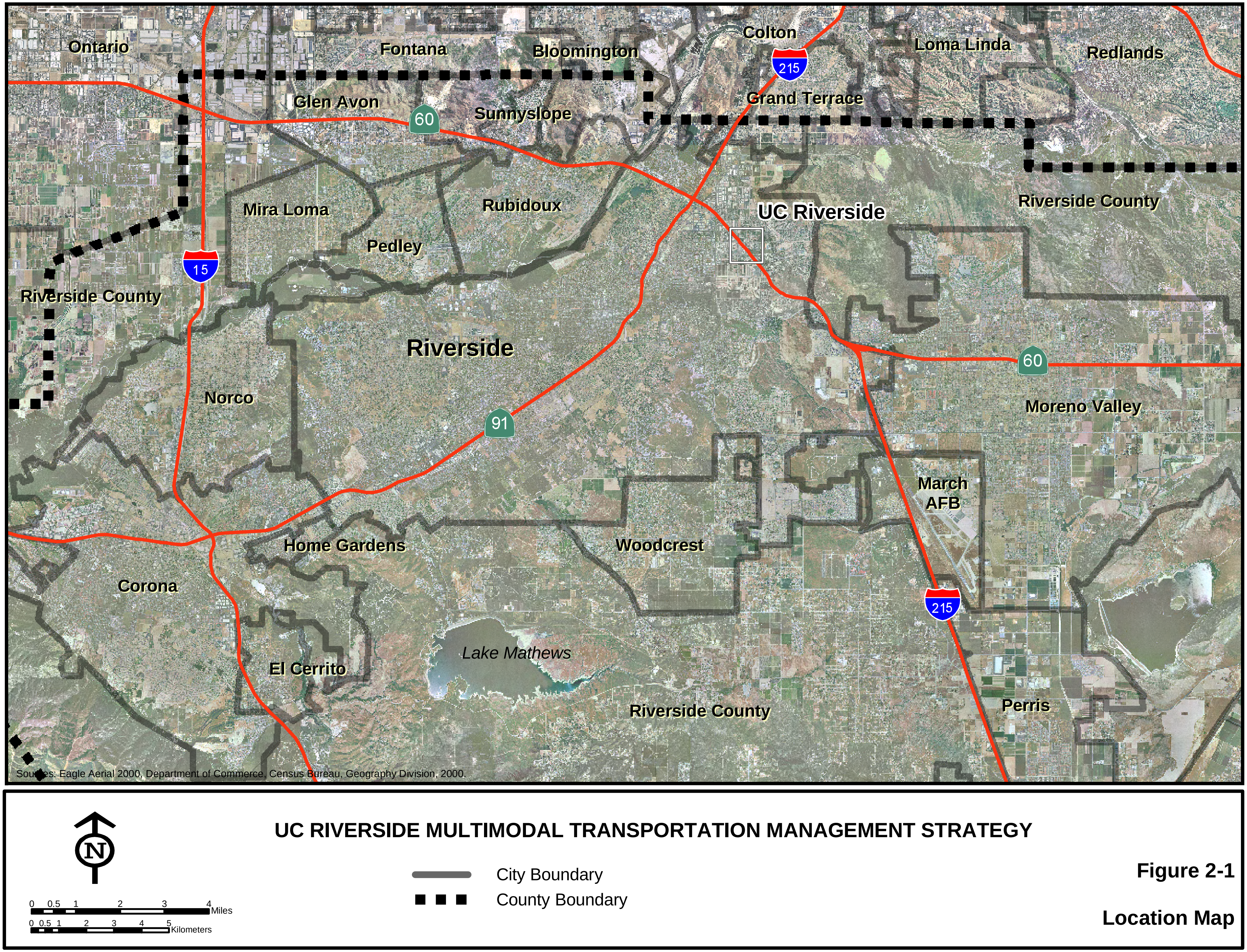
Between these university-owned student residencies and privately run housing complexes surrounding the campus, approximately 70% of all students live within five miles of the campus. The remaining 30% of students commute from surrounding communities.[4]

Figure 2.3 illustrates the distribution of commuters using zip codes from parking permit purchases. As the map illustrates, the majority of commuting students and employees purchasing permits live in the area of Riverside immediately encircling the university. Significant numbers of UCR commuters also reside in Moreno Valley. Several Inland Empire communities further out from the campus – like Redlands, Colton, or Corona – contain between 201-500 commuters (per zip code). Table 2.1 lists the numbers of commuters purchasing permits in each zip code.

2.1.2 Future Demographics

The 2003 LRDP anticipates a dramatic growth in the number of students, faculty and staff by the horizon year 2015. The total student headcount cited in the LRDP is 25,000,

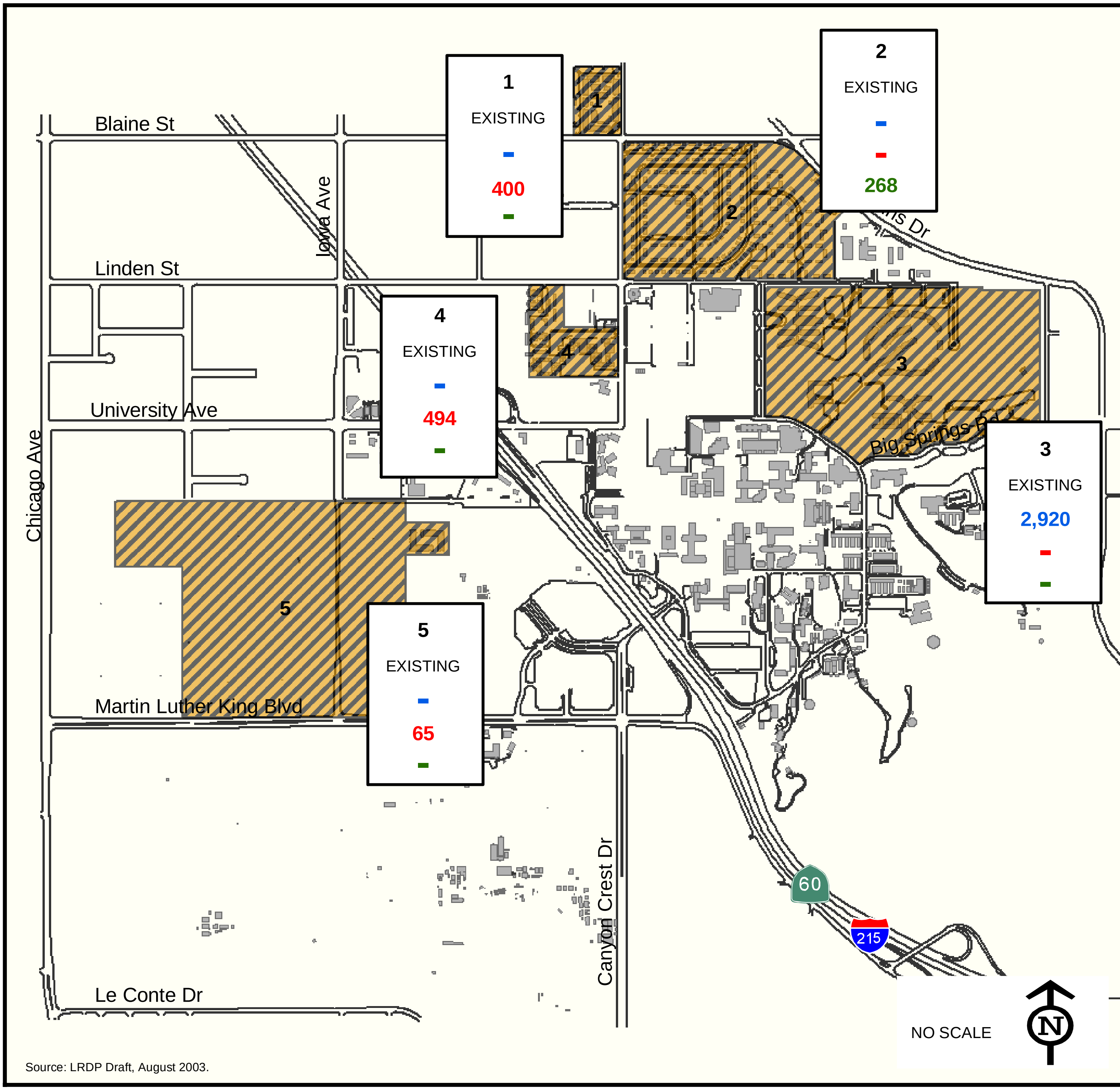
[1] From the University of California Budget Office website (http://budget.ucop.edu).
[2] From UCR Office of the Executive Vice Chancellor website (http://www.growth.ucr.edu).
[3] *Long Range Development Plan, August Draft 2003.*
[4] Ibid.



UC RIVERSIDE MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-1

Location Map



Source: LRDP Draft, August 2003.

LEGEND

AREA OF HOUSING

BUILDINGS

NUMBER OF STUDENTS PER AREA OF HOUSING

First Year & Transfer Studends

Upper Classes & Graduate Studends

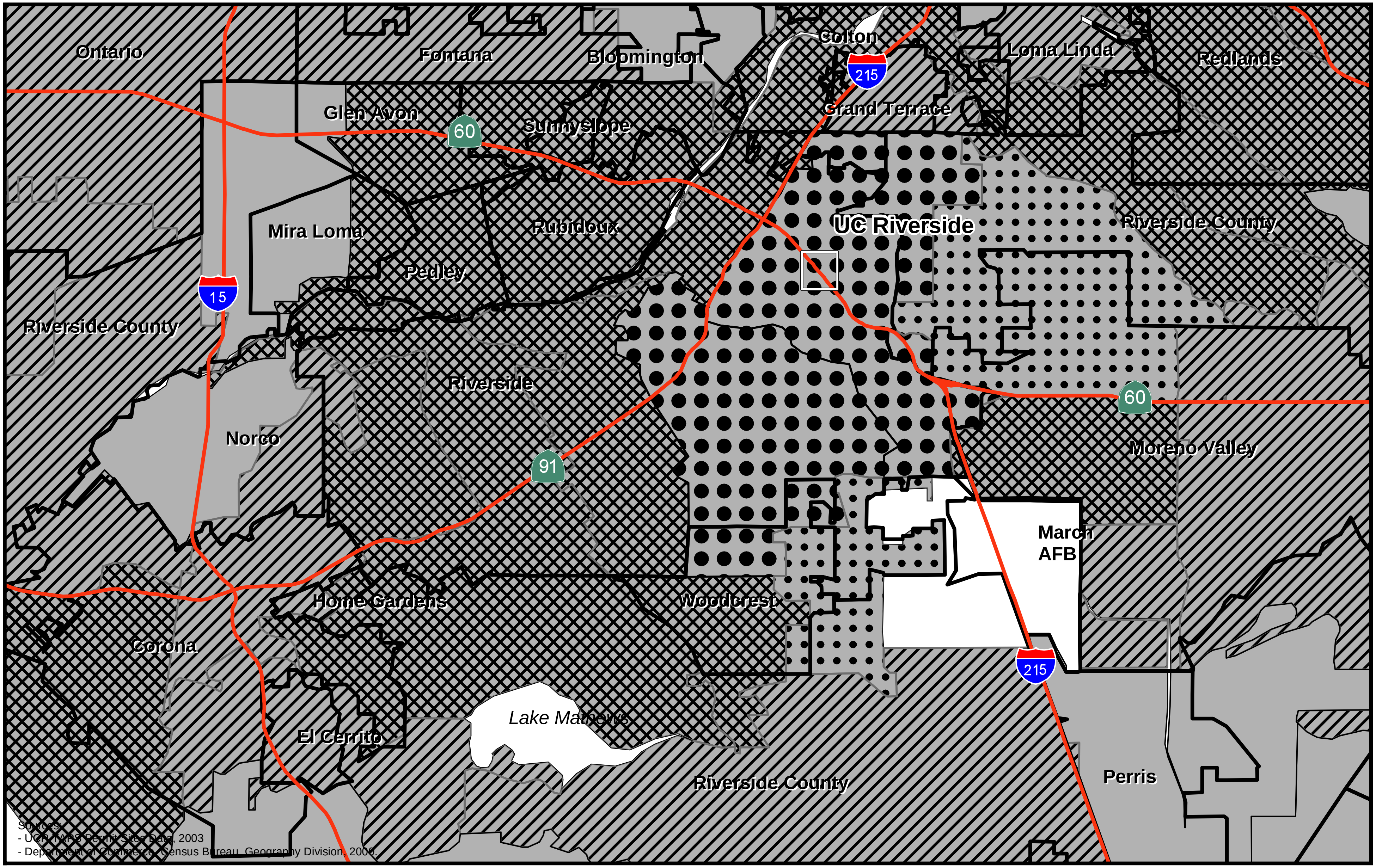
Students with Dependents

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-2

Existing Number of Students Per On-Campus Area of Housing



UC RIVERSIDE MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

N

0 0.5 1 2 3 4 Miles

0 0.5 1 2 3 4 5 Kilometers

NUMBER OF PARKING PERMITS SOLD BY ZIP CODE

0	201 - 500
1 - 100	501 - 1000
101 - 200	1001 - 8000

Figure 2-3

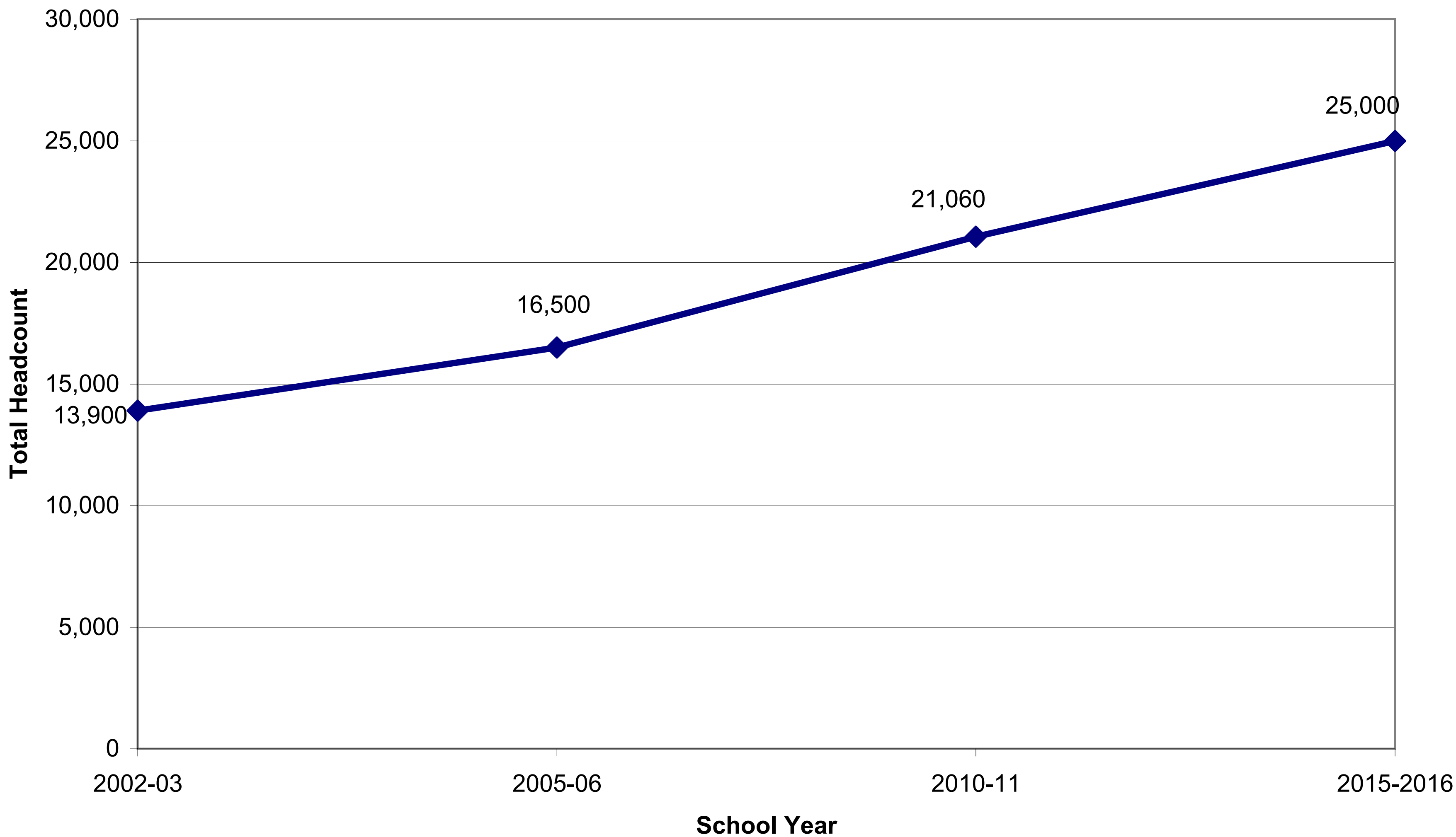
Parking Permit Sales by Zip Codes

Table 2-1: Parking Permit Sales by Zip Code

Zip Codes	Permits Sold	City or Community Name
Riverside County		
Zip Codes	**Permits Sold**	**City or Community Name**
92507	7,225	Casa Blanca, University City, and Highgrove
92506	1,087	Riverside
92557	650	Riverside
92508	634	Woodcrest and Orange Crest
92503	498	Arlington
92553	487	Moreno Valley, Edgemont and Sunnymead
92504	433	Arlington Heights
92509	398	Belltown and Rubidoux
92501	316	Riverside
92505	257	La Sierra
92882	246	Corona
92551	200	Moreno Valley
92879	175	Corona
92555	159	Moreno Valley
92880	127	Norce
92881	112	El Cerrito
92570	108	Mead Valley, Perris, Glen Valley, and Good Hope
91752	94	Mira Loma
92860	74	Norco
92571	74	Perris
92883	49	Glen Ivy Hot Springs
92567	27	Juniper Flats, Nuevo, and Lakeview
92320	20	Calimesa
San Bernardino County		
Zip Codes	**Permits Sold**	**City or Community Name**
92324	210	Colton
92374	206	Redlands and Crafton
92373	201	Redlands
91761	194	Ontario
92354	154	Loma Linda
91710	129	Chino
92337	113	Fontana
92313	106	Grand Terrace
92316	85	Bloomington
92408	58	San Bernardino

Source: Permit Sales Data Provided by UCR TAPS, 2003

Figure 2-4: Growth in General Campus FTE, 3-Quarter Average (2002/03-2015/16)



Source: UCR Office of the Vice Chancellor website (2001-2011) and 2003 LRDP nearly double existing figures. Figure 2.4 shows the projected annual rise in the total student headcount from the 2000-2001 school year to 2015-2016[5]. The Draft 2003 LRDP also expects that employment growth will more than double. Table 2.2 breaks down the overall growth of both students and employees anticipated within The Draft 2003 LRDP.

Table 2-2: Draft 2003 LRDP Growth for Students, Faculty and Staff

Headcount	2000/01	2015-16
Students (3 quarter average)	12,703	25,000
Faculty and Post-Doc	841	1,742
Staff	2,901	6,174
Other Individuals	628	1,100
Total	17,073	34,016

Source: *Long Range Development Plan, August Draft 2003*

To help reduce the traffic generated by this growth, the Draft 2003 LRDP establishes a goal of housing 50% of students within university-controlled housing. According to the university's *Strategic Plan for Housing*, new student housing complexes (or renovations of existing facilities) will increase the number of residents living in university-controlled housing to approximately 12,500. This is over three times higher than the current university housing residency.

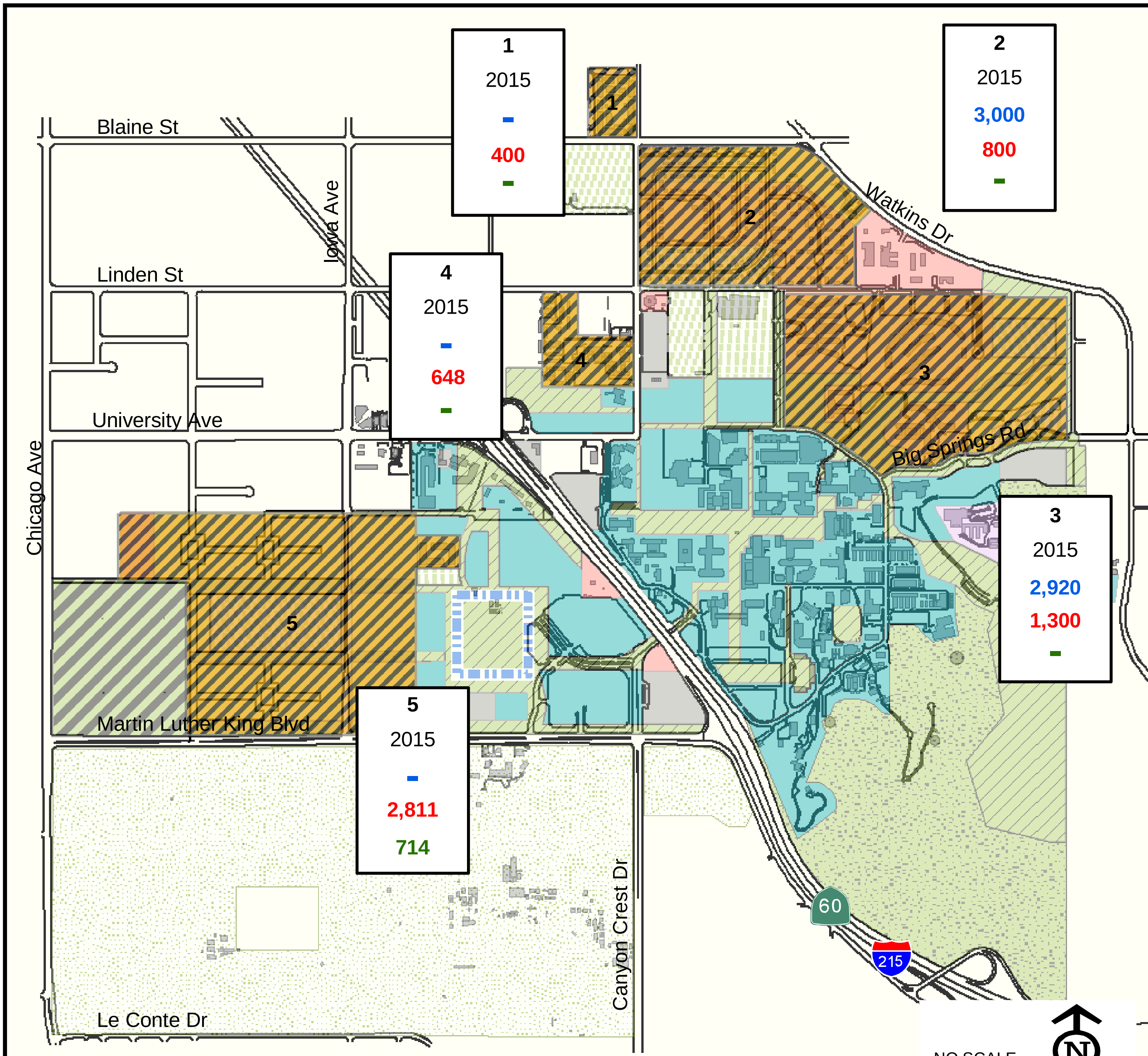
Figure 2.5 illustrates the projected distribution of students within planned university housing. Significantly greater numbers of students, for example, will be living in the area immediately north of campus. The construction of new residence halls and apartments will create 3,800 new residents north of Linden Street (Area 2 in Figure 2.5). This construction will also change the type of students living in that area. Currently, Area 2 consists of 268 units of family student housing. Housing plans include moving family student housing units to West Campus and replacing them with a 3,000 bed residence hall (mainly for first-year and transfer students) and an 800-bed apartment complex designed for upper class and graduate students. The construction of another residence hall (in Area 3) will add an additional 1,300 students to the housing area north of the academic core[6].

The numbers of students living at the western end of East Campus (Area 4) will rise as well. Currently, 494 students live in apartments in either Bannockburn or University Plaza. Planned renovations to Bannockburn will increase this number to 648.

The *Strategic Plan for Housing* also includes constructing additional student housing on West Campus (Area 5). The addition of new student apartments will increase the number of units in West Campus university-controlled housing. This plan demolishes 268

[5] From UCR Office of the Executive Vice Chancellor website (http://www.growth.ucr.edu) and the 2003 LRDP.

[6] Numbers derived by adding numbers for existing university run housing from 2003 LRDP with new developments detailed in the *Strategic Plan for Housing* *(http://ucrapb.ucr.edu/capital_and_physical_planning/documents/documents.htm.)*



Sources:
- LRDP Draft August, 2003.
- UCR Strategic Plan for Housing, 2003.

LEGEND

AREA OF HOUSING

BUILDINGS

NUMBER OF STUDENTS PER AREA OF HOUSING

First Year & Transfer Students

Upper Classes & Graduate Students

Students with Dependents

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-5

Year 2015 Number of Students Per On-Campus Area of Housing

units of family student housing on the East Campus and adds 714 units of family student housing to the West Campus.

Even with this increase in university run housing, the housing stock within the City of Riverside will have to increase. The LRDP cites a City of Riverside study indicating that 950 new housing units will be required to accommodate student growth. Between 400-700 additional housing units will also be needed for increasing numbers of faculty and staff.

2.1.3 Implications for the MMTMS

- Travel demand at UCR will increase as the population grows; housing plans, however, will shift some of this travel from automobile trips to non-motorized travel or transit use.

- Although students compose the largest share of the campus population growth, the numbers of faculty and staff at UCR will also increase.

- UCR's student housing plans will increase the numbers of students making the short commute between the East Campus academic core and residences to the north and east.

- UCR's student housing plans will create new short commutes between the residences west of West Campus and may include the academic core.

2.2 Traffic

2.2.1 Existing Traffic

The LRDP breaks the roadway network into the following hierarchy:

- o Freeways
- o Arterial Roadways
- o Campus Loop Road
- o Local Access and Service Roads

Freeways: The six lane I-215/SR-60 bisects the East and West Campuses of UCR. To move from the West Campus to the East Campus travelers must pass through undercrossings on either University Avenue or Canyon Crest Drive.

The freeway provides access to UCR via intersections at Blaine Street, University Ave, and Martin Luther King Blvd. The interchanges at Blaine Street and University Avenue provide full access; the Martin Luther King Boulevard interchange only provides egress from southbound I-215/SR-60. At the current time, future Caltrans construction projects will include a full-diamond interchange at Martin Luther King Boulevard. Access to the East Campus will be via Martin Luther King Boulevard to the Canyon Crest underpass.

Arterial Roadways: A series of arterial roads and secondary streets provide access to the UCR campus (see Figure 2.6) Most of these roads consist of four lanes, with the exception of a section of Iowa Avenue south of University Avenue.

East/west Roads include:
- o Blaine Street/Watkins Drive
- o Linden Street
- o University Avenue
- o Big Springs Road
- o Martin Luther King Boulevard

North/south roads include:
- o Chicago Ave
- o Iowa Ave
- o Canyon Crest Drive
- o Valencia Hills Drive
- o Watkins Drive

Campus Loop Road: A separate road network provides access to areas within the East Campus academic core. A mostly two-lane loop (consisting of East, West, North and South Campus Drive) forms the main component of the campus loop road. These four segments of Campus Drive nearly encircle the academic core; North Campus Road ends at a parking lot, preventing the loop from making a full circle by connecting with the intersection of University Avenue and Canyon Crest Drive. As Figure 2.6 illustrates, the East Campus academic core is accessible from Canyon Crest Drive (south), Big Springs Road (east), Aberdeen Drive (north) and University Avenue (west). Access to facilities at the northeast end of campus is also provided via Linden Street, which reduces to two lanes as it becomes a campus street east of Canyon Crest Drive.

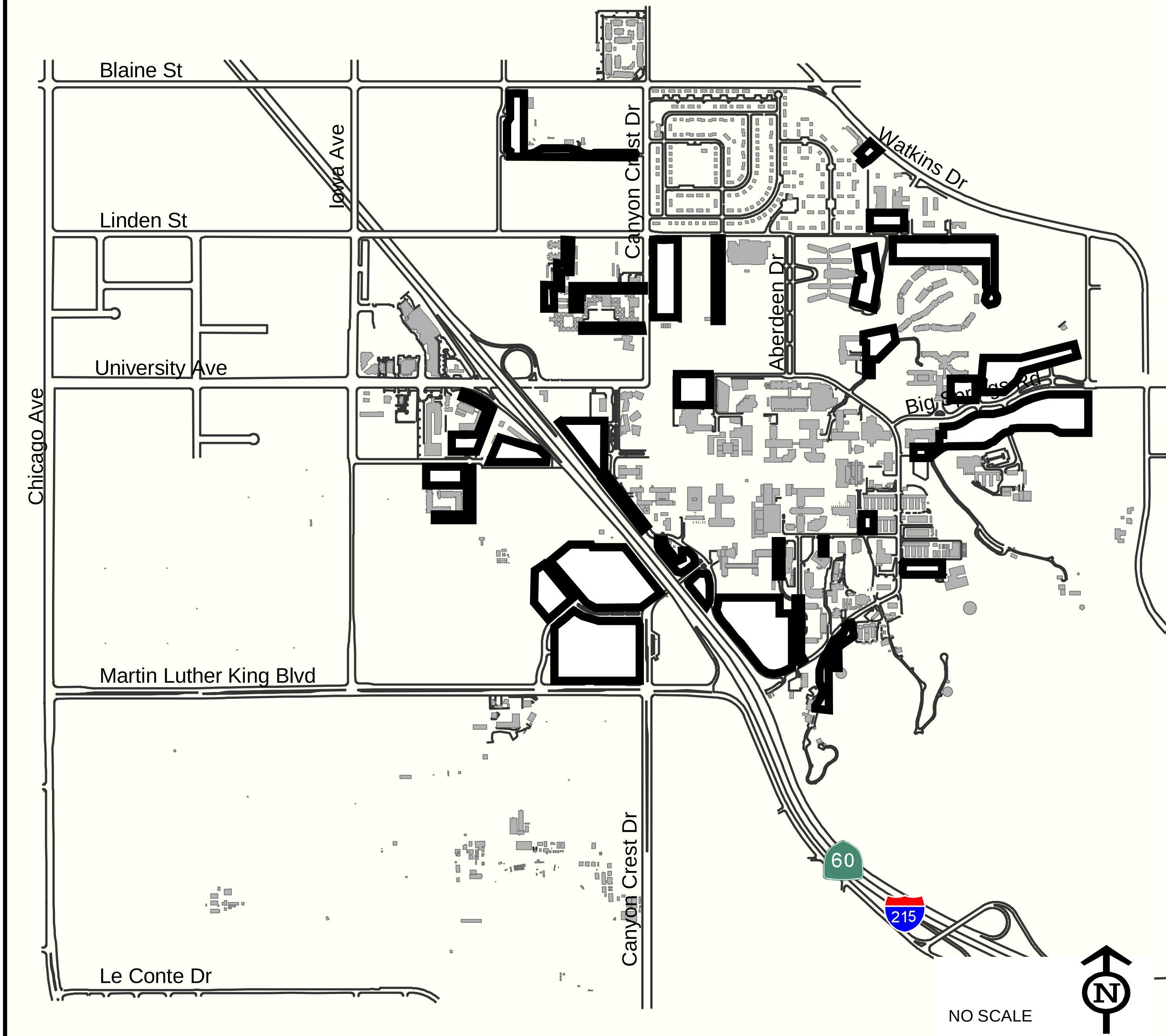
Local Access/Service Roadways: These segments provide access to interior parking lots and building service access. Used predominately by service, delivery and emergency vehicles, these roads are presently often accessible to private vehicles.

Traffic Patterns: In general, four routes provide external access to parking spaces and other major destinations within the campus. Average daily traffic counts (illustrated in Figure 2.7) and discussions with Transportation and Parking Services (TAPS) staff indicate that University Avenue is one of the most heavily traveled of these four routes[7].

University Avenue services both university-related traffic and non-university traffic. With a full diamond interchange to I-215/SR-60, University Avenue carries traffic between the freeway and locations west of the campus. In addition, University Avenue also provides regional access to non-university land uses to the east and north of the campus.

University Avenue is also used as a campus gateway. Visitors often use University Avenue, the campus' symbolic entrance, when traveling to UCR. Just past the freeway, University Avenue intersects with West Campus Drive, which provides access to an information kiosk, interior parking lots, and UCR's only official passenger drop-off

[7] Average daily traffic counts, taken in May of 2003, were supplied by Wilbur Smith Associates.



Source: CADD drawings provided by UCR Capital and Physical Planning, 2003.

LEGEND

BUILDINGS

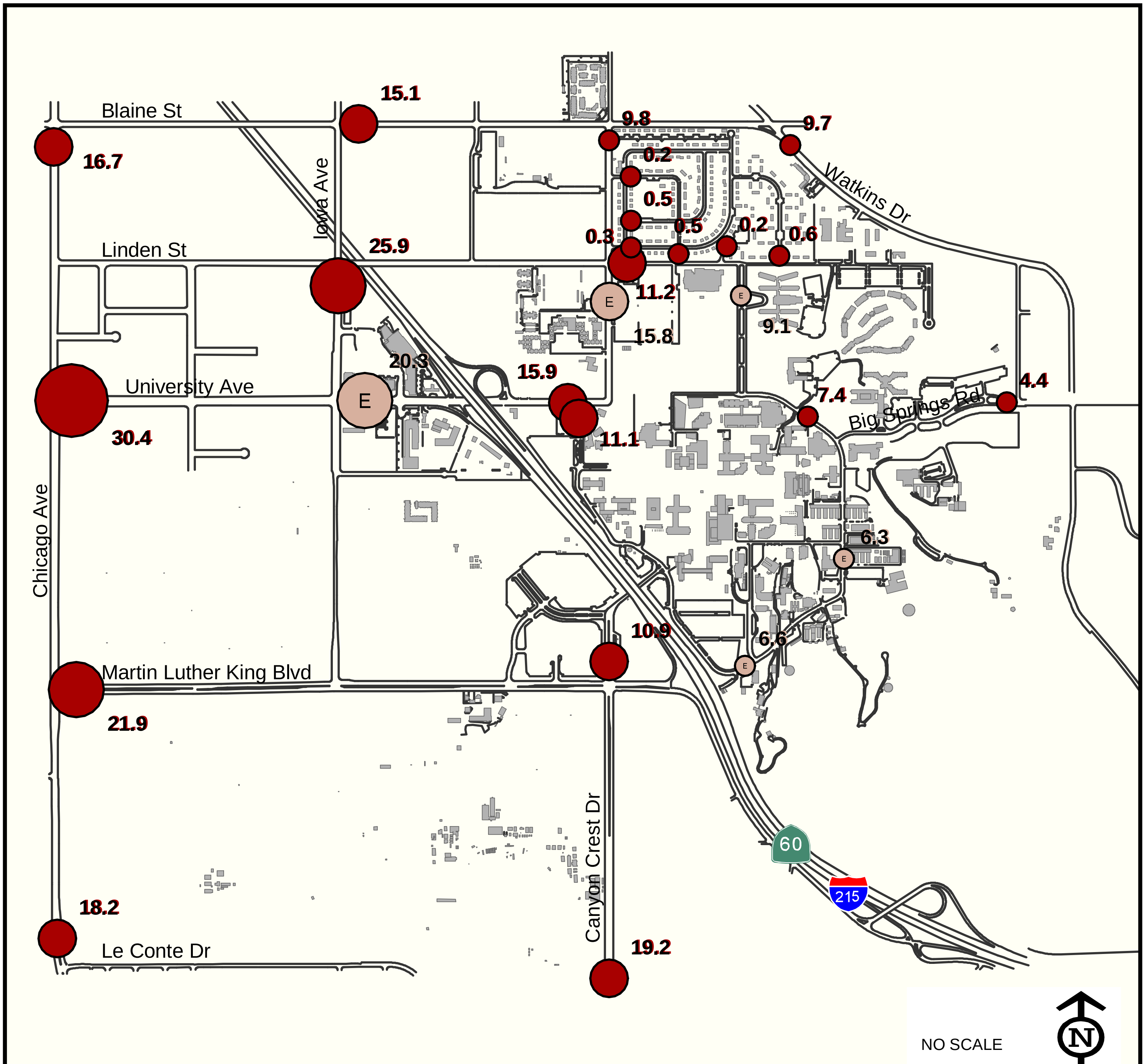
PARKING LOTS

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-6

Street and Parking Network Surrounding UCR



Source: Traffic Counts provided by Wilbur Smith Associates, 2001.

LEGEND

BUILDINGS

AVERAGE DAILY TRAFFIC IN THOUSANDS

AM		PM	
	0.2 - 10.0	E	0.2 - 10.0
	10.1 - 20.0	E	10.1 - 20.0
	20.1 - 30.0	E	20.1 - 30.0
	30.1 - 30.4	E	30.1 - 30.4

E : Estimated from PM Peak hour turning movments

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-7

Average Daily Traffic

point. At its terminus, University Avenue also connects with the northern section of Canyon Crest Drive, providing an alternate route to the parking lots and university facilities located along Canyon Crest Drive and Linden Street.

Martin Luther King Boulevard provides another major external access route. Like University Avenue, Martin Luther King Boulevard connects to the I-215/SR-60 and experiences both university and non-university related trips. Unlike University Avenue,

Martin Luther King Boulevard provides only partial freeway access via a southbound offramp. UCR traffic field staff stated that commuters traveling to and from the area south of the university use Martin Luther King Boulevard rather than the I-215/SR-60 to reach the SR-91, thereby bypassing the often congested I-215/SR-60/SR-91 interchange. Martin Luther King Boulevard also forms part of a major gateway to the campus; the street intersects with the south section of Canyon Crest Drive, which provides access to Lot 30 (a large commuter parking lot) and the interior West Campus Drive.

Linden Street and Big Springs Road provide the two other significant external access routes to UCR. Big Spring Road leads directly to Lot 13, another large commuter lot, and intersects with East Campus Road. Linden Street leads to UCR's residence halls and the University Recreation Center. Linden Street also intersects with Aberdeen Drive, another heavily used route into the campus loop road.

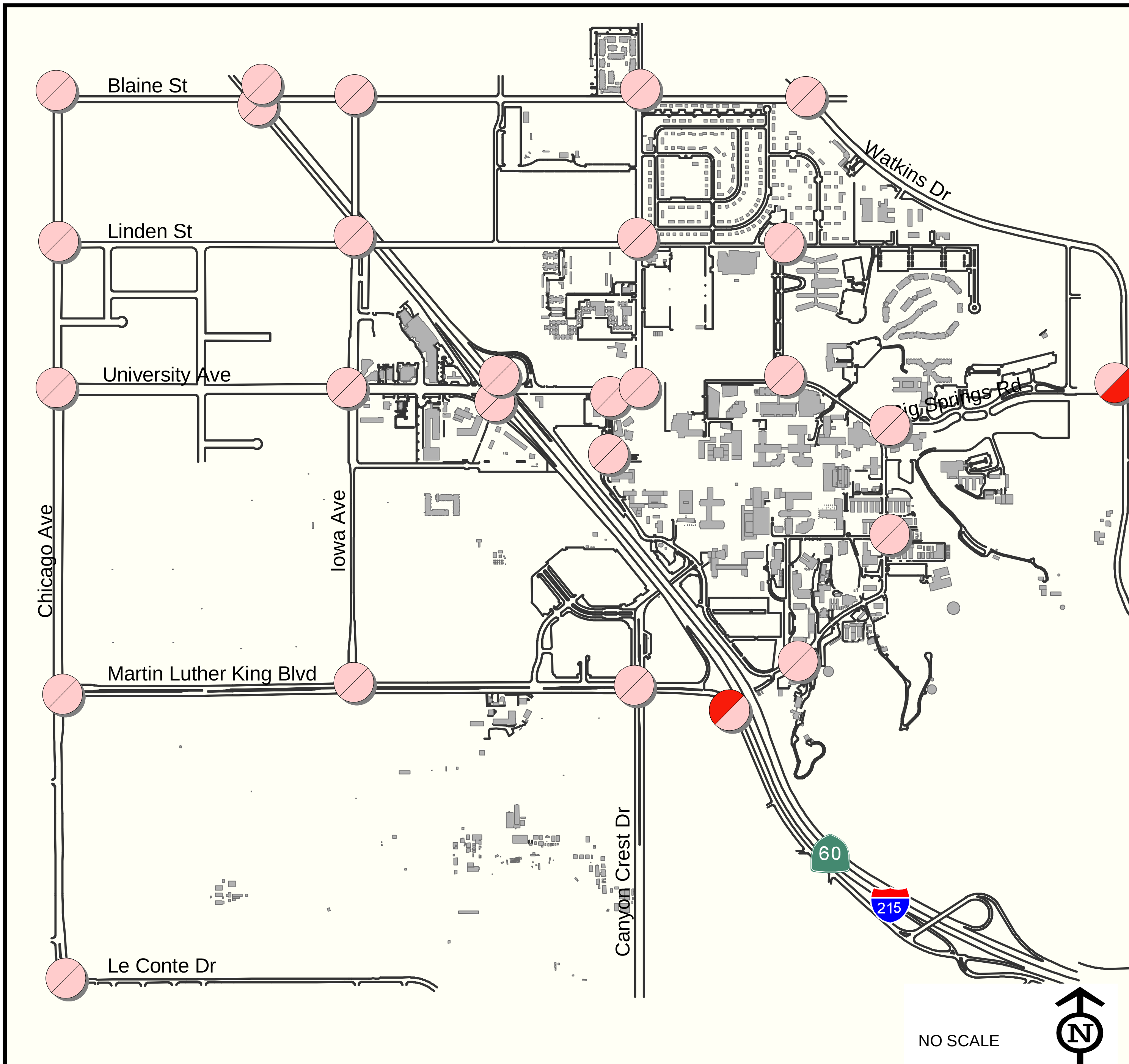
Figure 2.8 displays the AM/PM peak hour traffic Level of Service (LOS) for streets leading into the university. According to these measurements, developed for the draft 2003 LRDP Environmental Impact Report (EIR) Traffic Impact Study, only two intersections immediately along these campus entrances experience an LOS of E or lower: the southbound approach at I-215/SR-60 and Martin Luther King Boulevard (LOS F in the AM) and the Big Springs Road/Watkins Drive intersection (LOS F in the PM).

Although the remaining intersections experience a peak hour LOS of D or better, field observations and interviews with the UCR community indicate that many intersections experience recurring periods of congestion due to modal conflicts. These conflicts frequently occur between automobiles and pedestrians within the inner campus loops, or on segments of roads leading into the inner campus loop. Informal passenger drop-offs along the inner campus loop also create vehicle queues along Campus Drive.

Service and delivery vehicles use many of these same routes to access facilities interior to the campus. Once on campus, these vehicles rely upon the inner loop road in order to directly access building loading docks, or to reach service roads leading to these facilities. Figure 2.9 illustrates some of the common destinations for service vehicles, deliverers and vendors, as identified during discussions and interviews with TAPS staff and delivery personnel.

2.2.2 Future Traffic

Traffic around the university will increase as both the university and community populations grow. According to the *LRDP EIR*, only two existing intersections currently experience LOS peak period ratings of E or F. Forecasts from the same report, however, show several intersections with LOS ratings of E or lower in the year 2015. The study looked at two future scenarios, which are the same except for the number of lanes on the section of Iowa Avenue between University Avenue and Martin Luther King Boulevard.



Source: UCR Draft 2003 LRDP EIR Traffic Impact Study Draft Report, August 2003.

LEGEND

BUILDINGS

LEVEL OF SERVICE

AM

PM

Level of Service A, B, C or D

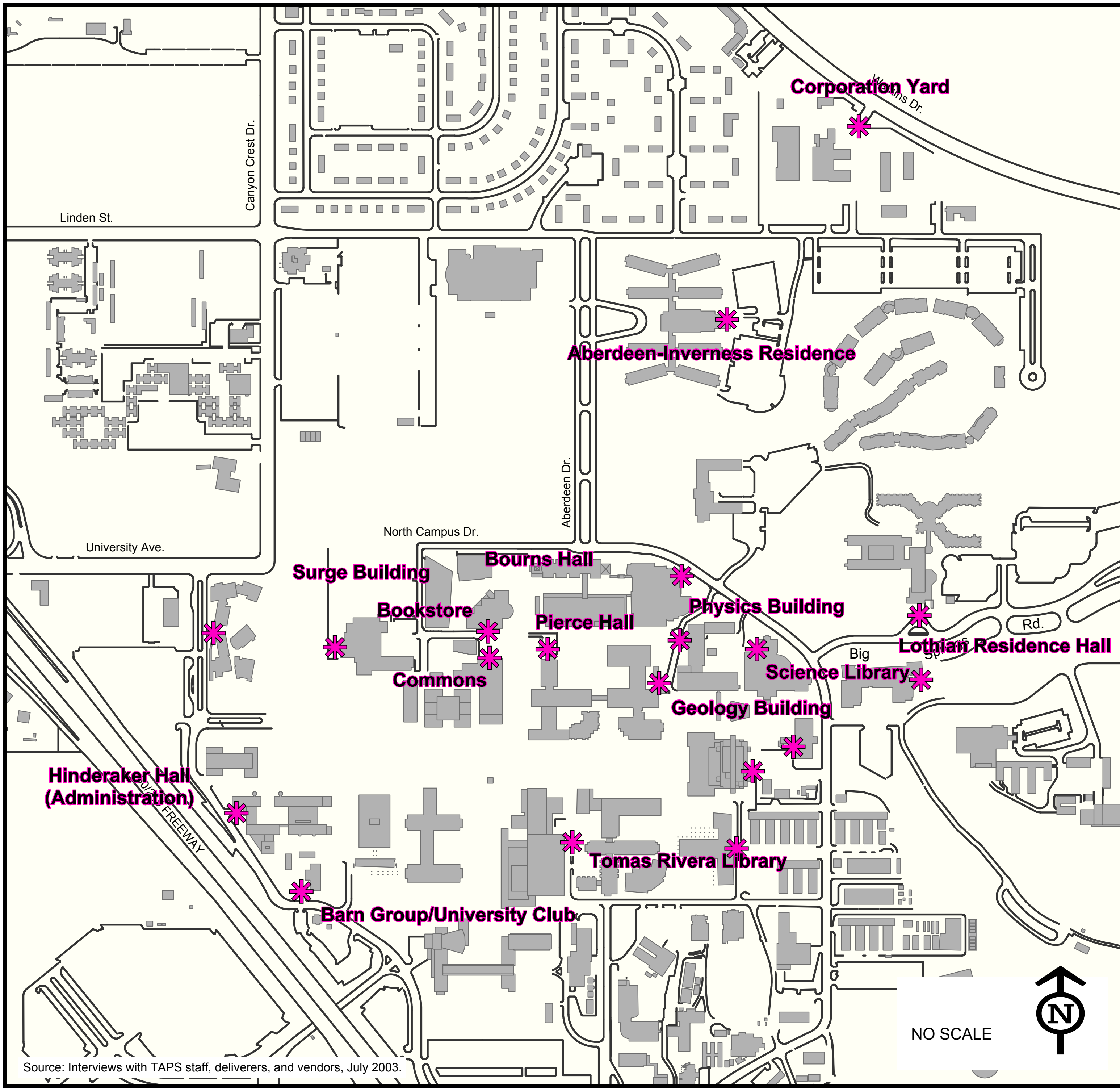
Level of Service E or F

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-8

Existing Level of Service



LEGEND

BUILDINGS

VENDORS DELIVERY LOCATIONS

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-9

Common Delivery Points on Campus

In one scenario, this segment of Iowa Avenue has 2 lanes; in the other scenario, this segment consists of 4 lanes.[8] In the 2-lane scenario, all the major arterials leading into the campus have at least one intersection on or near the campus entrance with an LOS rating of E or F. Table 2.3 summarizes these LOS ratings. Figure 2.10 shows the locations of these intersections. Most of these ratings occur in the PM peak hour, but 4 intersections experience LOS ratings of E or lower in both peak hours. In the 4-lane scenario, at least one intersection at each of the major arterials leading to campus has a LOS rating of E or F in at least one peak hour (Table 2.4). Figure 2.11 shows the location of these intersections with an LOS of E or lower for each scenario.

Table 2-3: LRDP (2015) Intersections with E or F LOS Ratings (Iowa 2-Lanes)

Intersection	LOS	Peak Hour
3rd Street/Chicago Avenue	E	PM
Blaine Street/Iowa Avenue	F	PM
Blaine Street/Watkins Drive	E	PM
University Avenue/Chicago Avenue	F	PM
University Avenue/Iowa Avenue	E	PM
University Avenue/I-215 Southbound Ramp	F	PM
Martin Luther King Boulevard/Chicago Avenue	E F	AM PM
Martin Luther King Boulevard/Canyon Crest Drive	E F	AM PM
Big Springs Road/Watkins Drive	E F	AM PM
Linden Street/Aberdeen Drive	E	PM
Le Conte/Chicago Avenue (westbound approach only)	F E	AM PM

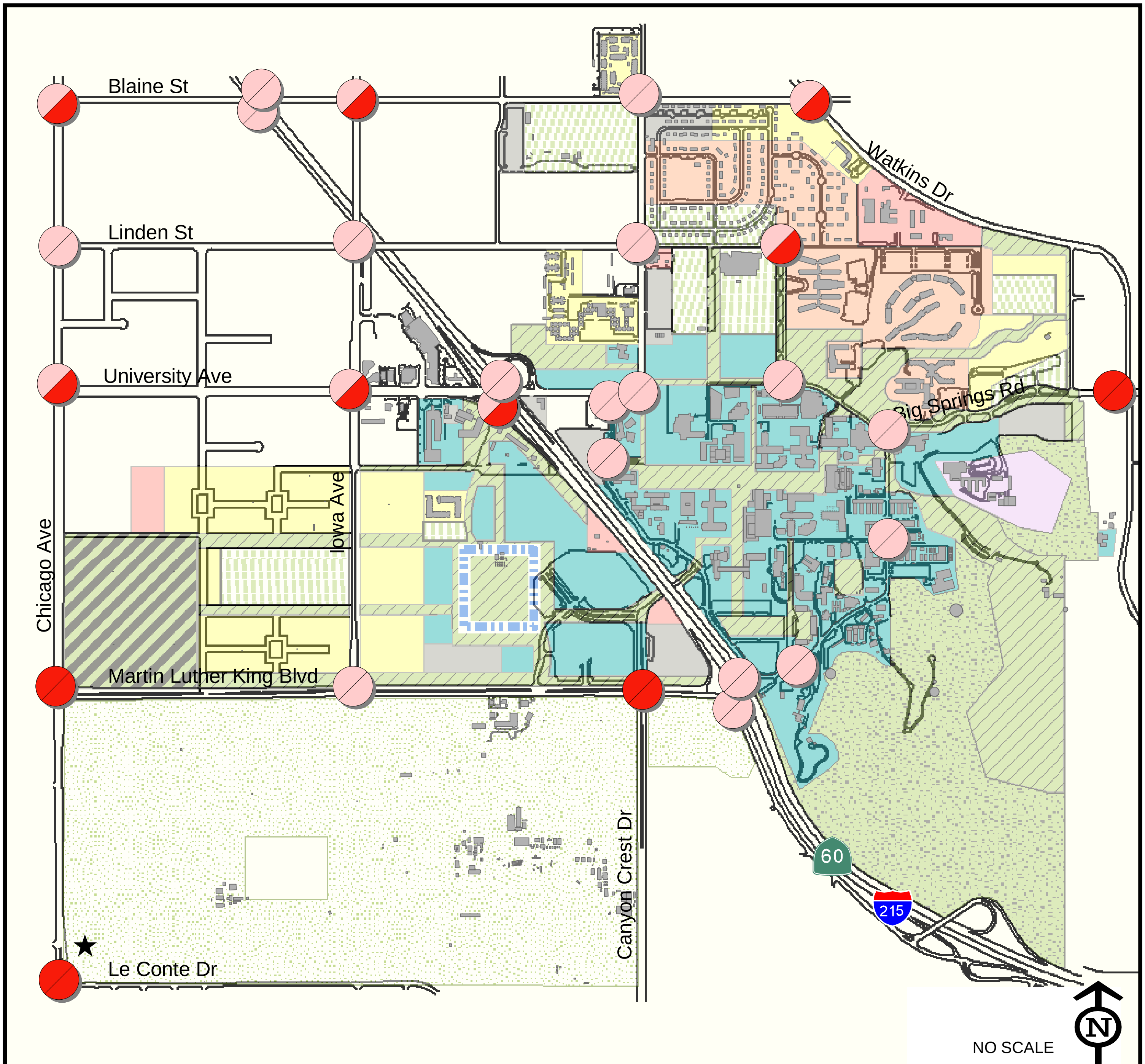
Source: UCR Draft 2003 LRDP Environmental Impact Report Traffic Impact Study Draft Report

Table 2-4: LRDP (2015) Intersections with E or F LOS Ratings (Iowa 4-Lanes)

Intersection	LOS	Peak Hour
Blaine Street/Iowa Avenue	F	PM
Blaine Street/Watkins Drive	E	PM
University Avenue/Chicago Avenue	F	PM
University Avenue/Iowa Avenue	F	PM
University Avenue/I-215 Southbound Ramp	F	PM
Martin Luther King Boulevard/Chicago Avenue	E	PM
Martin Luther King Boulevard/Canyon Crest Drive	E F	AM PM
Big Springs Road/Watkins Drive	E F	AM PM
Linden Street/Aberdeen Drive	E	PM
Le Conte/Chicago Avenue (westbound approach only)	F E	AM PM

Source: UCR Draft 2003 LRDP Environmental Impact Report Traffic Impact Study Draft Report

[8] In distributing traffic, the Draft Report of the Draft 2003 LRDP EIR Traffic Impact Study assumed the 2003 Draft LRDP parking plan, described in the section below. The report also assumed that the implementation of elements of the Multimodal Transportation Management Strategy would reduce student resident traffic by 10%.



Source: UCR Draft 2003 LRDP EIR Traffic Impact Study Draft Report, August 2003.

LEGEND

BUILDINGS

LEVEL OF SERVICE

AM

PM

Level of Service A, B, C or D

Level of Service E or F

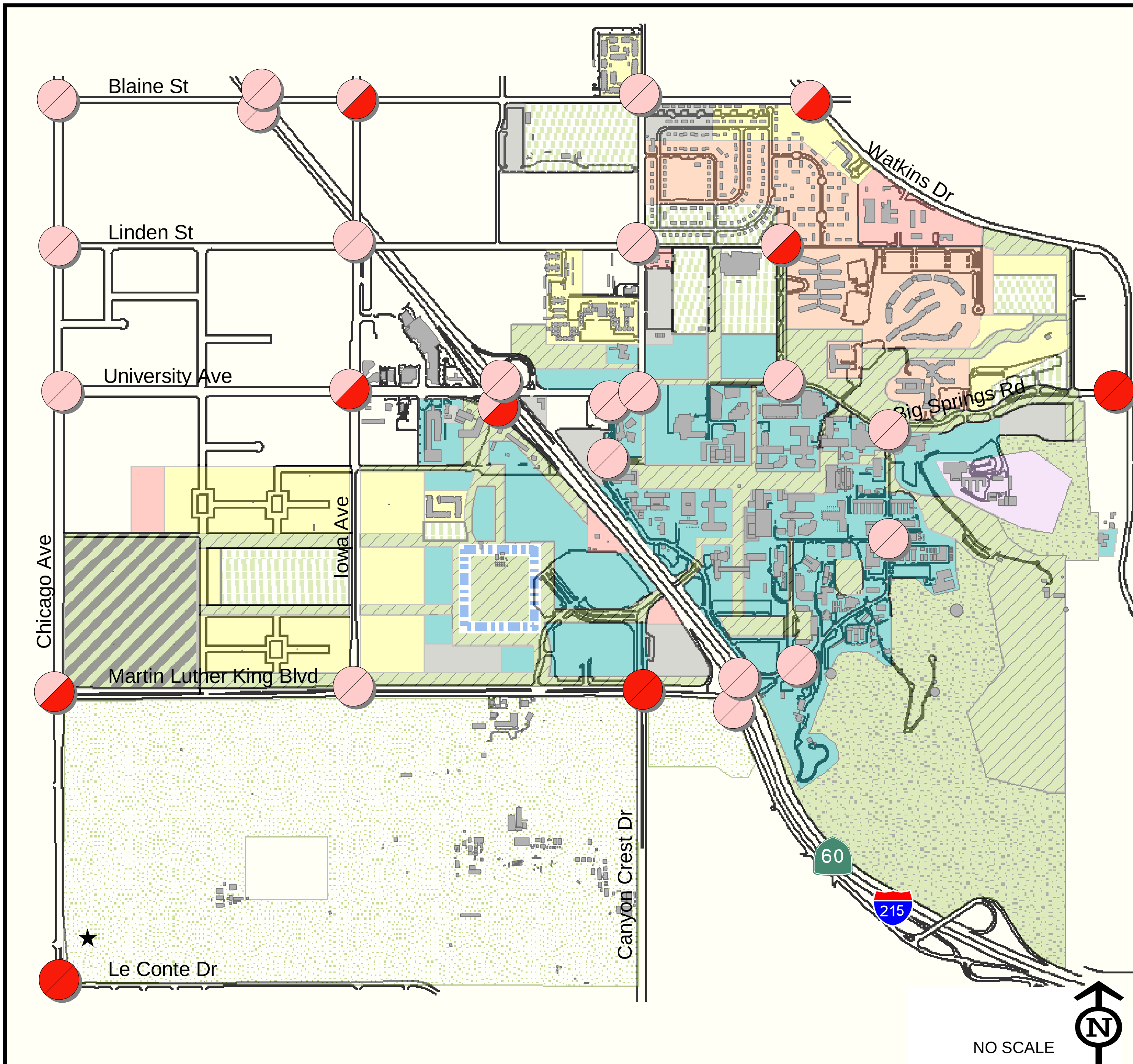
★ Westbound only

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-10

Future Level of Service (LRDP 2015, city and regional growth projection, Iowa with 2-Lanes)



Source: UCR Draft 2003 LRDP EIR Traffic Impact Study Draft Report, August 2003.

LEGEND

BUILDINGS

LEVEL OF SERVIVE

AM

PM

Level of Service A, B, C or D

Level of Service E or F

★ Westbound only

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-11

Future Level of Service (LRDP 2015, city and regional growth projection, Iowa with 4-Lanes)

Much of this traffic involves non-university related travel (city/regional travel). The Draft EIR Traffic Impact Study attempted to separate out traffic not to or from UCR (referred to as background traffic). Even after filtering out university traffic, many of the intersections would still have E or F LOS ratings. Tables 2.5 and 2.6 summarize intersections with background traffic causing an LOS of E or lower.

Table 2-5:Background (2015) Intersections with E or F LOS Ratings (Iowa 2-Lanes)

Intersection	LOS	Peak Period
Blaine Street/Iowa Avenue	E	PM
Martin Luther King Boulevard/Canyon Crest	F	PM
Big Springs Road/Watkins Drive	E F	AM PM
Le Conte Drive/Chicago Avenue	F	AM
University Avenue/Chicago Avenue	E	PM
Martin Luther King Boulevard/Chicago Avenue	E	PM

Source: UCR 2003 Draft LRDP Environmental Impact Report Traffic Impact Study Draft Report

Table 2-6: Background (2015) Intersections with E or F LOS Ratings (Iowa 4-Lanes)

Intersection	LOS	Peak Period
Blaine Street/Iowa Avenue	E	PM
Martin Luther King Boulevard/Canyon Crest	F	PM
Big Springs Road/Watkins Drive	E F	AM PM
Le Conte Drive/Chicago Avenue	F	AM
University Avenue/Iowa Avenue	E	PM

Source: UCR 2003 Draft LRDP Environmental Impact Report Traffic Impact Study Draft Report

In addition to rising traffic levels, UCR could also experience changes in traffic flow, as alterations in the regional network alters traffic patterns. Caltrans improvements to the SR-91and the SR-60/I-215 will involve adding HOV lanes, adding truck bypass ramps, and widening or reconfiguring a number of interchanges. As part of these improvements, Caltrans plans to permanently close the I-215/El Cerrito interchange and construct a new interchange at I-215/Martin Luther King Boulevard. This new interchange will provide on- and off-ramps for both northbound and southbound traffic. Traffic, however, will have to enter and exit the I-215 on the west side of the freeway; no access will be provided east of the freeway, which lies within the campus boundary[9]. This improvement will likely redirect both university and non-university related traffic to Martin Luther King Boulevard. At the same time, improvements could reduce the amount of regional through traffic that uses Martin Luther King Boulevard to bypass the SR-91/I-215/SR-60 interchange.

The LRDP circulation and parking plan seeks to maintain mobility for these increasing numbers of automobiles, while simultaneously creating an environment more conducive to campus transit and non-motorized travel within the inner campus loop. The expansion of the primary circulation system is one of the primary devices for accomplishing these goals.

[9] Description based on information provided by Caltrans.

The primary loop proposed in the Draft 2003 LRDP encircles the outer perimeter of both West and East Campuses. The loop consists of the following streets: Chicago Avenue on the west; Blaine Street on the north; Watkins Drive on the east; and Martin Luther King Boulevard on the south (see Figure 2.12). These will be the main route for frequent travelers to UCR – such as commuting students, employees, and vendors. The LRDP parking plan, discussed below, complements this proposed circulation by locating much of the future parking along this loop.

According to the Draft 2003 LRDP, expanding the primary traffic loop will help keep cars out of the inner campus, creating a more pedestrian and bicycle friendly environment. This will open up the inner campus loop for campus transit as well.

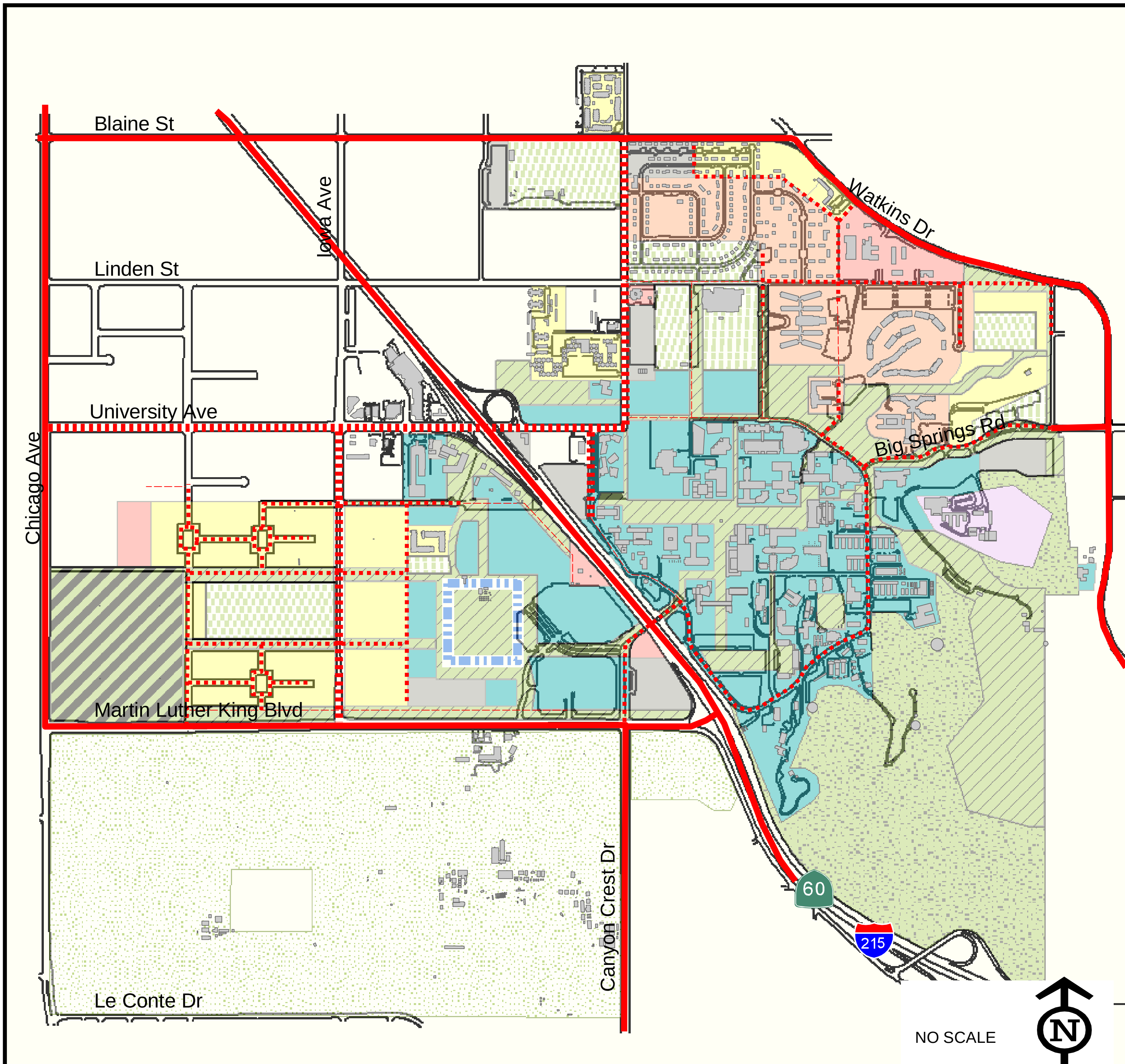
The LRDP secondary loop consists of University Avenue, the section of Canyon Crest Drive between Blaine Street and University Avenue, and Iowa Avenue. These roads will provide wayfinding and access for visitors, and entrance to some parking lots. Because many of these roads lie in between the campus core and future land uses – such as housing or potential academic facilities – the LRDP predicts the secondary loop will experience significant levels of bicycle, pedestrian, and transit movements. The LRDP, therefore, suggests designing the secondary loop to give pedestrians and bicyclists priority upon these roads whenever possible.

Much of the current inner campus loop will become a combination of restricted and unrestricted local access roads (shown on Figure 2.12). These roads will be used for intra-campus uses such as service, delivery, emergency and disabled vehicles. Local roads will also service student housing areas and, in some cases, provide access to parking lots. The Draft 2003 LRDP recommends designing these local roads to prevent the use of the inner campus loop for things like travel to and from the campus or parking structures. By minimizing traffic along this inner loop, the Draft 2003 LRDP hopes to open this road up for improved pedestrian and bicycle usage and for campus transit.

The Draft 2003 LRDP realizes that additional access controls may be required as the campus changes over time. Increasing travel demand could exceed the capacity of campus roads before land use changes effectively shift demand off-campus. Short-term access controls, for instance, may have to restrict traffic until UCR has time to build new peripheral parking. Changes in traffic circulation, therefore, will require a carefully phased implementation.

2.2.3 Implications for the MMTMS

- Campus gateway roads will experience heavier traffic volumes.
- Currently, peak hour congestion results from conflicts between travel modes. In the future, traffic volumes alone may congest intersections during peak travel periods.



Source: LRDP Draft, August 2003.

LEGEND

BUILDINGS

VEHICULAR CIRCULATION

- Primary Citywide Vehicular Circulation Route
- Secondary Campus Vehicular Circulation
- Local Campus Circulation
- Local Campus Circulation (access controlled)

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-12

Future Vehicle Circulation

- Improvements to the freeway could reduce some regional traffic, while shifting other travel onto arterials leading to the campus.

2.2.4 MMTMS Components

- Recommendations for street designs to give bicycles and pedestrians priority within the campus area.
- A phased implementation plan that coordinates shifting traffic to the appropriate circulation loop with gradual land use changes and modes of transit.
- A phased access control plan to limit traffic within the inner campus loop until land uses changes shift travel demand.
- A long-term plan to control more persistent uses of the inner campus loop road (e.g. passenger drop-offs, egress and ingress from parking lots).
- Signage and wayfinding elements that outline road hierarchies.

2.3 Parking

2.3.1 Existing Parking

UCR's existing parking system consists of about 27 surface lots located throughout the campus; surface lots are found within academic, housing and support zones. Figure 2.13 shows the location of UCR's existing parking lots, as well as the number of spaces in each lot. In the 2002-03 school year, these lots provided just over 8,200 spaces[10].

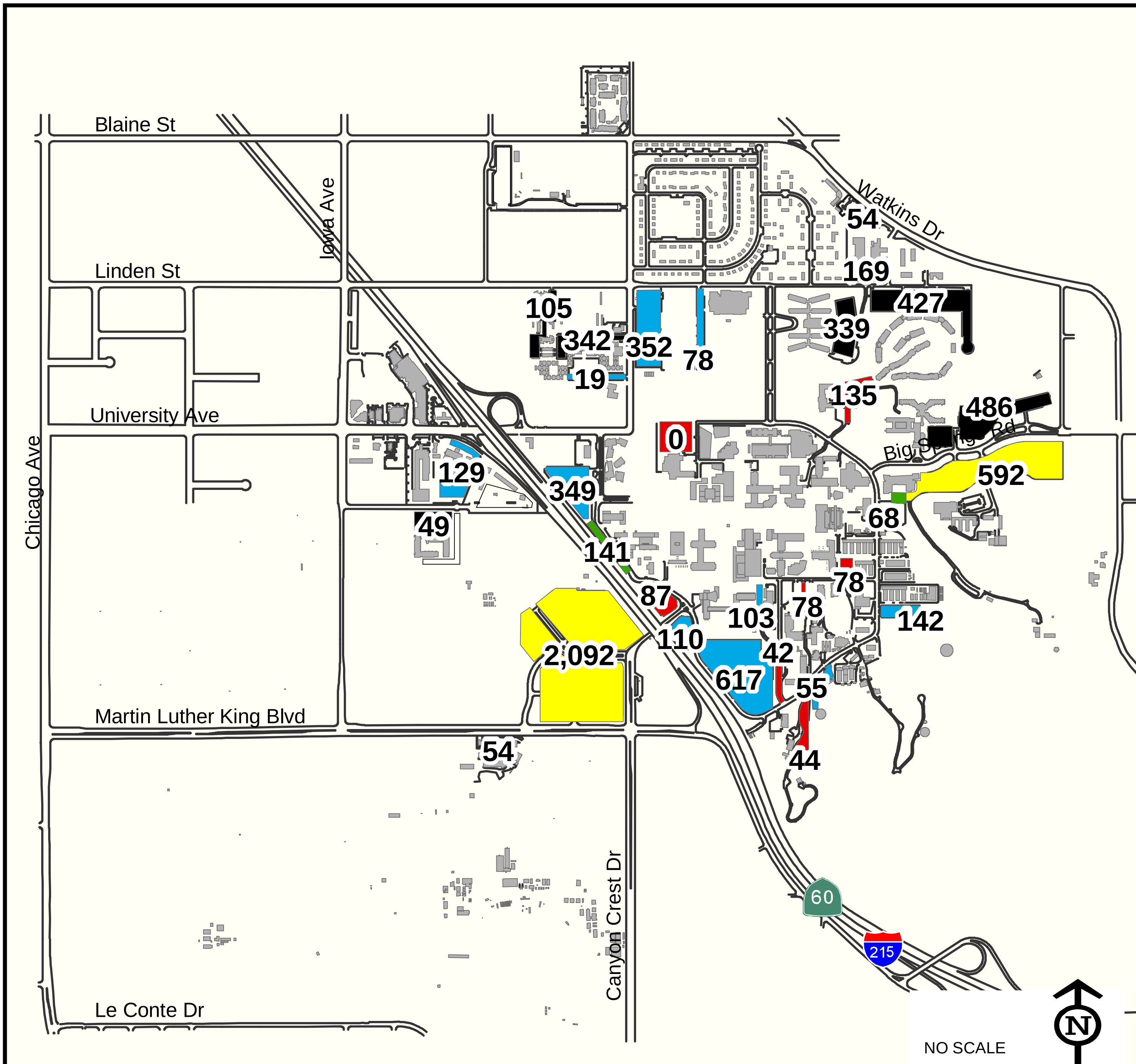
UCR currently uses a tiered parking system. Parking permits are broken down into several categories. The main three categories are Gold, Blue, and Red. Gold permits are valid only in Gold Spaces. Blue permits may be used in either Gold or Blue spaces. Holders of Red Permits may park in Gold, Blue or Red spaces.

Commuting students are eligible for Gold Permits. Gold Permit spaces are generally located in more peripheral parking lots. Students who live on campus may purchase, based upon availability, separate housing permits that allow them to park in lots adjacent to student housing.

Faculty and staff are also eligible to purchase Gold Permits. Based on availability, the university also offers faculty and staff Blue and Red Permits, which allow parking in more proximate, premium lots.

In addition, UCR offers lower parking rates for special circumstances. Special carpool permits, for example, offer discounted rates to commuters who carpool. Through night permits, the university also offers lower rates to students, faculty and staff who park after 4 p.m. After this time, the university also opens Blue and Red spaces, as well parking

[10] From parking lot inventory provided by TAPS.



Source: Data provided by TARS, July 2003.

LEGEND

BUILDINGS

PARKING LOTS PER TYPE OF PERMIT

Red Permit
Blue Permit
Gold Permit
Housing
Visitor

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-13

Existing Parking

spaces near loading docks, to all permit holders (with the exception of handicapped spaces and spots with a 24-hour special designation). Tables 2.7 and 2.8 summarize the various parking permits UCR offers students, faculty, staff, and visitors as well as their respective prices (for the 2003/04 school year).

Table: 2-7: Parking Permit Costs for Students (2003/04)

Type	Available To	Quarterly Cost
Gold	All Commuter students	$84.00
Housing	All Housing residents	$84.00
Motorcycle	All students	$42.00
Canyon Crest Housing	Canyon Crest Housing Residents	$3.00
Night	All students	$30.00
Disabled	Individuals with valid DMV placard	$84.00

Source: UCR TAPS website

Table 2-8: Parking Permit Costs for Faculty and Staff (2003/04)

Type	Available To	Quarterly Cost
Gold	All Faculty/Staff	$84.00
Blue	All Faculty/Staff/Grad Students, based on availability	$105.00
Red	All Faculty/Staff, based on availability	$147.00
Carpool Blue	Faculty/Staff/Grad Students, based on availability	$52.50
Carpool Red	Registered Faculty/Staff, based on Availability	$73.50
Disabled	Individuals with valid DMV placard	$84.00
Motorcycle	All Faculty/Staff	$42.00
Night	All Faculty/Staff/Students	$30.00

Source: UCR TAPS website

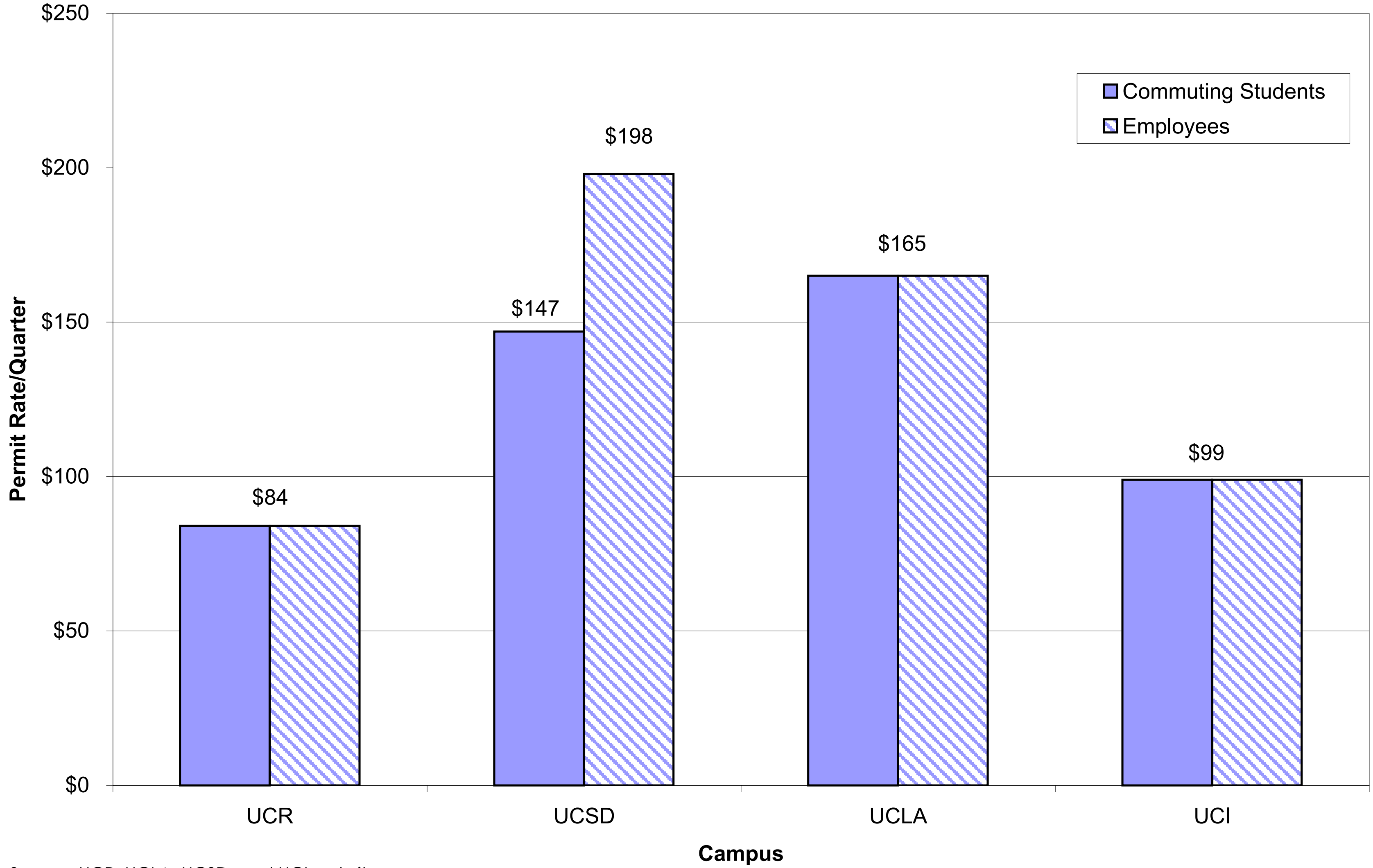
Table 2-9: Parking Permit Costs for Visitor Parking (2003/04)

Type (Duration)	Available To	Cost
Daily	Visitors	$6.00
Weekend/Evening (after 4 PM)	Visitors	$5.00
Daytime Hourly, Mon. – Fri.	Visitors	$1.00/per 30 minutes
Daytime Hourly, Weekends and after 4 PM Mon. – Fri.	Faculty/Staff/Grad Students, based on availability	$0.50/per 30 minutes
Vender Daily Permit	Venders	$10.00

Source: UCR TAPS website

UCR currently has the lowest permit prices of all eight UC campuses offering both undergraduate and graduate courses. The standard commuting permit (Gold) for both students and faculty runs $84 per quarter. As Figure 2.14 illustrates, 2003-04 parking prices (for the most inexpensive commuter prices permits) at other Southern California UC campuses range from $99 to $198 per quarter.

Figure 2-14: Parking Rates at Southern California UC Campuses (2003/04)



Source: UCR, UCLA, UCSD, and UCI websites.

2.3.2 Future Parking

The Draft 2003 LRDP parking strategy focuses on two main issues: providing parking for future demand and determining the location of parking lots. Since the university housing plan seeks to increase the number of students living in university-run housing, the demand for commuter/visitor parking is not expected to grow at the same rate as student enrollment. The DRAFT 2003 LRDP calls for increasing the number of commuter/visitor parking spaces from its 2001 supply of about 6,800 spaces to 9,800 spaces by 2015; LRDP projected student enrollment, by comparison, will nearly double[12].

The majority of this parking will be located on the campus periphery. Fitting projected parking demand within this footprint, the Draft 2003 LRDP states, will necessitate using multi-level structures to accommodate commuter parking (8,200 spaces). Figure 2.15 depicts the location of these new structures and the number of spaces in each. These structures will also provide visitor parking, the majority of which will be located near the campus entrances at University Avenue and at Martin Luther King/Canyon Crest.

Table 2-10: LRDP Parking Plan

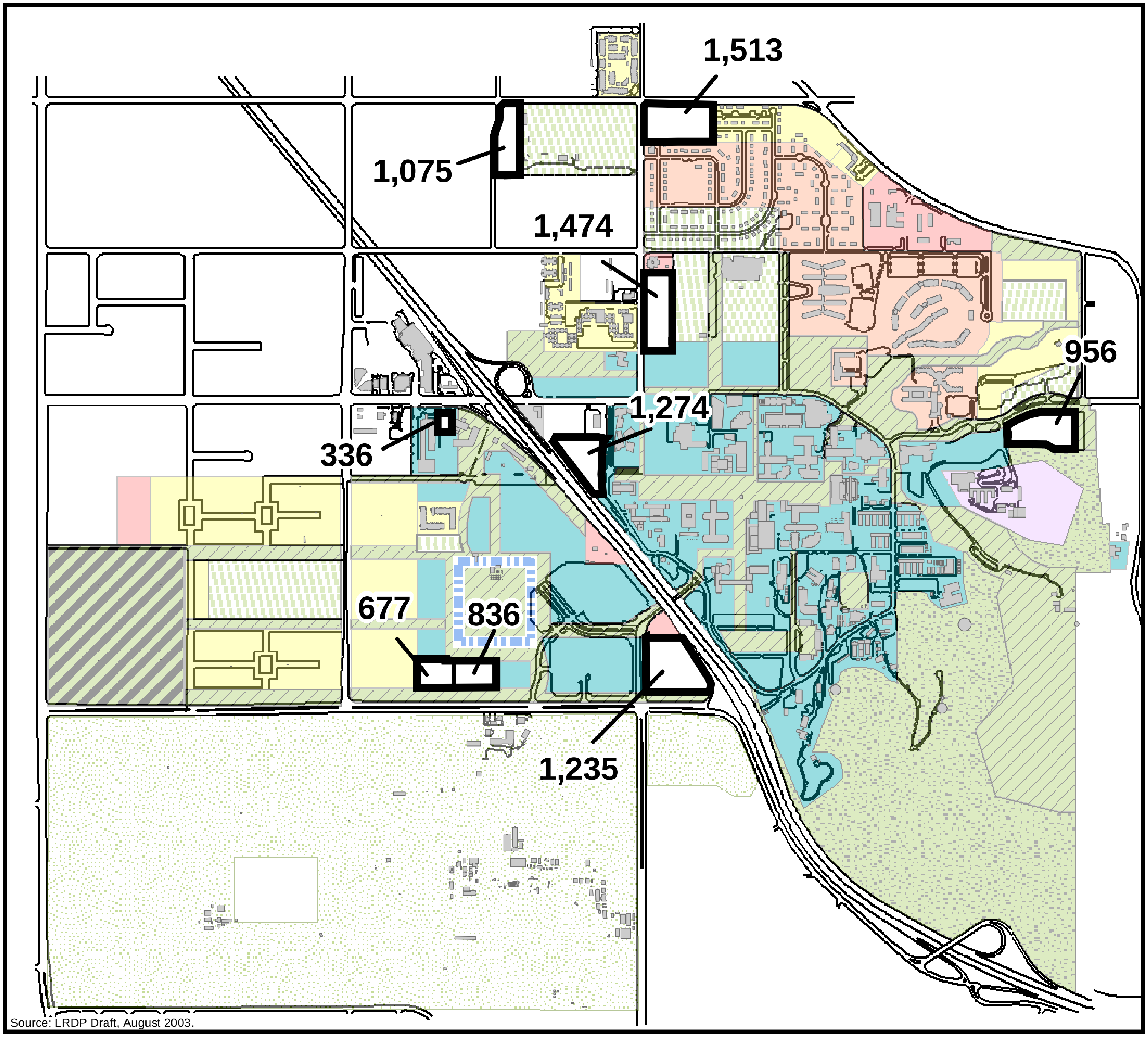
Type of Parking	Use	Number of Spaces
Structure	Commuter	8,820
Mix of Structure and Surface Lots	Visitor	980
	Special Permits, disabled, special needs	500
Surface Lots	Campus vehicles/service/delivery	80

Source: *Long Range Development Plan, August Draft 2003*

The university also plans to maintain about 500 spaces (5% of the total parking supply) within a mixture of surface lots and multi-level structures located inside the academic core. The university will reserve these proximate parking spaces for special permits, disabled drivers and other special needs. To provide parking for rising numbers of delivery and service vehicles, the LRDP calls for doubling the supply of parking spaces adjacent to buildings (for a total of about 80 spaces). Table 2.9 summarizes the numbers of parking spaces – broken down by type of structure and use – envisioned in the LRDP.

In addition, the LRDP estimates the need to provide a total of 5,130 parking spaces for residents of university-run housing. This parking will consist of a combination of surface lots and on-street parking near these housing facilities, as well as parking facilities within the building.

[12] Number of parking spaces taken from *UCR LRDP, Draft August 2003*.



LEGEND

BUILDINGS

Future Parking Location

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-15

Location of Future Parking Structures

The Draft 2003 LRDP also recommends changing or maintaining certain parking polices to help manage parking demand. This includes continuing the university policy that prohibits the sale of parking permits to students living within three miles of the campus. The LRDP also suggests replacing UCR's current tiered parking permit system with lot specific permits during peak hours. This latter policy change would be intended to discourage people from making cross-campus vehicle trips.

2.3.3 Implications for the MMTMS

- UCR's current parking system – e.g. prices, flexible parking – creates high demand for traffic inside the campus loop road.
- According to the Draft 2003 LRDP parking plan, many permit holders, especially those holding Blue or Red permits, will have to park further from the campus core.

2.3.4 MMTMS Components

- Strategies for raising funds for parking structures.
- Phasing implementation plan for construction new parking structures and lots.
- Clarification on location and number of surface lots to remain within the academic core.

2.4 Pedestrians

2.4.1 Existing Pedestrian Circulation

A network of pedestrian pathways and sidewalks provides pedestrians a means of accessing all facilities within the campus. Within the East Campus, pedestrian malls feature paths leading throughout the academic core. While the 2003Draft LRDP states that this current network is well used by pedestrians, the document also states that East and West Campus connections are poor. In traveling from East to West Campus, pedestrians must pass through one of two freeways undercrossings, one at University Avenue and one at Canyon Crest Boulevard (points 4 and 6 respectively on Figure 2.16). At these undercrossings, pedestrians experience narrow sidewalks, frequent high traffic volumes, and (in the case of Canyon Crest Drive) a grade change.

Figure 2.16 illustrates some of the major external pedestrian access routes to the campus. The figure also contains peak hour pedestrian counts taken during field observations[13]. Routes linking the campus to parking lots, housing and transit stops

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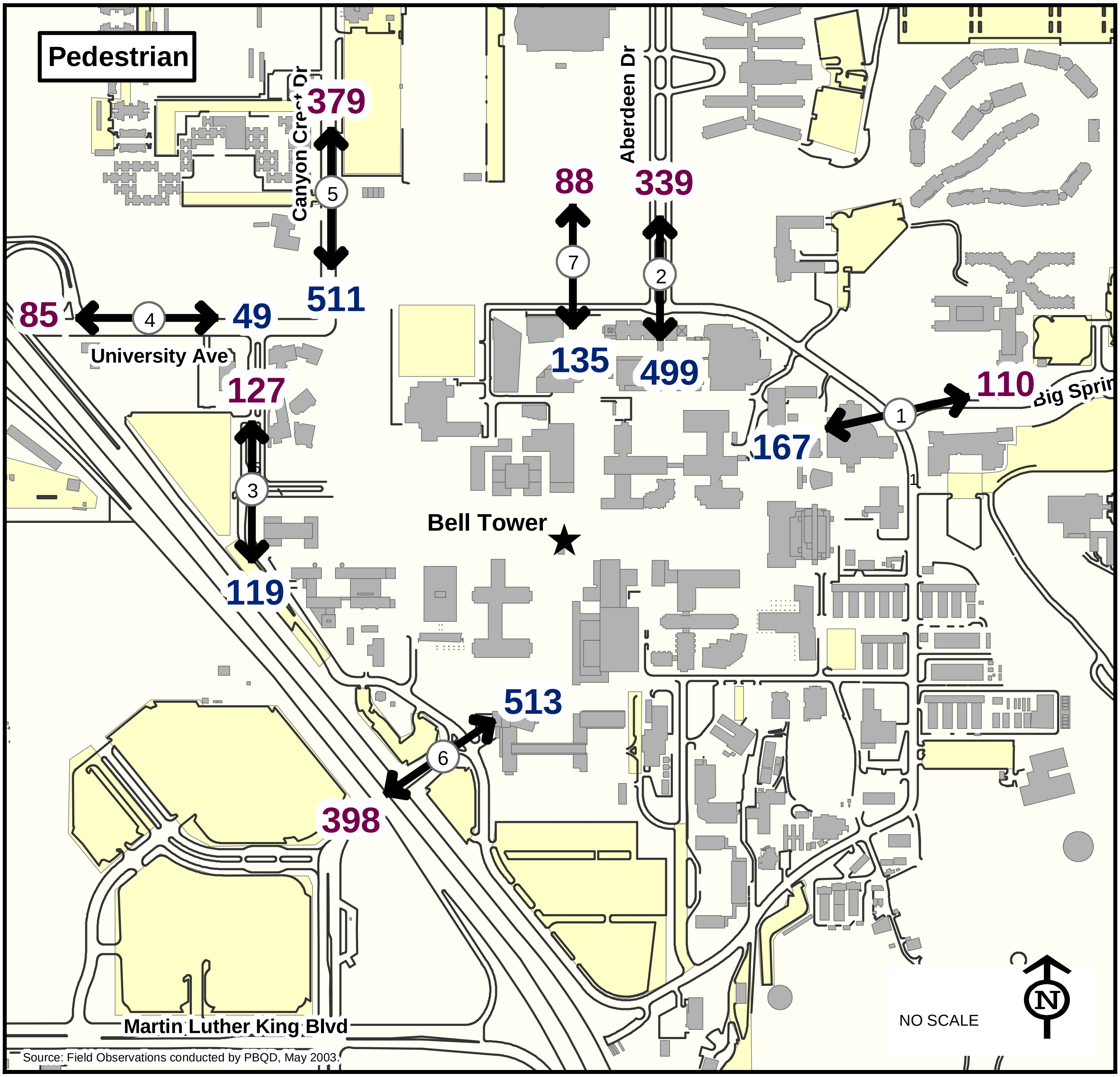
[13] The approaching AM peak hour was identified by determining the 60 minute period between 8:00 – 11:30 AM with highest number of pedestrians walking towards the Bell Tower. The departing AM peak hour was identified as the 60 minute period with the highest number of pedestrians walking away from the Bell Tower.



LEGEND

BUILDINGS

PARKING LOTS

NUMBER OF STUDENTS AT SELECTED LOCATION

Approching (Between 8:30 and 9:30 AM) — 1 — **Departing** (Between 10:30 and 11:30 AM)

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-16

Pedestrian Movements During AM Peak Hour

yielded the largest numbers of pedestrians. On the day field counts were taken, the Canyon Crest Boulevard undercrossing discussed above experienced the highest volume of pedestrians walking to and from the campus. The sidewalk along Canyon Crest Drive (Point 5) carried the second largest number of pedestrians.

Both routes connect the campus to large parking lots for commuter students. Both routes also connect RTA and Highlander Highlander bus stops to the campus. Canyon Crest Drive also links the campus to numerous private apartment complexes to the north and west of UCR.

The sidewalks along Aberdeen Drive (Point 2) carried a similarly high number of pedestrians. This walkway provides a path from UCR's residence halls to the campus. The sidewalk also leads to Bourns Hall and the Surge Building, the Learning Center and a large lecture hall. The sidewalk along the south side of the University Avenue freeway undercrossing does not link the university to large parking lots, and leads to few housing units; this sidewalk carried the lowest numbers of pedestrians. University Avenue does link the East Campus to the lecture facilities at University Village on the West Campus; campus transit, however, provides service between University Village and East Campus.

During the period the field counts were taken, both departing and approaching pedestrian travel experienced consistent hourly peaks. At the beginning of each hour, pedestrian movements peaked during the first fifteen minutes, a rise that corresponded with the beginning and end classes.[14]

2.4.2 Future Pedestrian Circulation

The Draft 2003 LRDP predicts that the proposed changes in traffic flow and parking discussed above will create a safer and more accessible campus for pedestrians. Minimizing the level of private vehicles within the inner campus loop, for instance, will reduce conflicts between pedestrians and automobiles.

At the same time, the Draft 2003 LRDP identifies the need to make walking an attractive alternative to automobile travel, especially as campus facilities expand outward from the academic core and walking distances increase. The Draft 2003 LRDP calls for extending the pedestrian malls within the academic core to the north and northeast sections of campus, where the university plans to build new housing and recreational facilities. It also suggests improving the pedestrian facilities at the north end of Canyon Crest Drive. This segment of Canyon Crest Drive provides a path between housing north of UCR and the academic core. Suggestions for Canyon Crest Drive include widening the sidewalk, narrowing crosswalks, and providing shade trees.

These new paths will likely experience high levels of pedestrian traffic. As discussed in Existing Conditions, pathways that run between private and residential housing and the academic core (such as Aberdeen Drive or Canyon Crest Drive north of University

[14] Field counts were taken on a Wednesday in May 2003. On Monday, Wednesday and Friday, classes begin and end on the hour. On Tuesday and Thursday, 90 minute classes begin and end alternately on the hour and the half-hour.

Avenue) carry some of the largest numbers of pedestrian trips. As new housing facilities develop north of the campus (for instance, in Areas 2, 3 and 4 in Figure 2.5), these high volumes of pedestrian travel will increase even further.

The LRDP also calls for improved pedestrian connections between East and West Campus. The planned development of new student residencies and academic facilities will increase the need for safe and convenient pedestrian links between East and West Campus. To create a more pedestrian friendly environment, the Draft 2003 LRDP proposes extending pedestrian malls to these West Campus residences (Area 5 in Figure 2.5). Inside these residential areas, the Draft 2003LRDP recommends widening sidewalks. To provide for easier pedestrian crossings, the Draft 2003 LRDP calls for designing a narrow cross-section for Iowa Avenue, a major road running between proposed West Campus housing.

One major component of pedestrian planning for UCR includes mending the disconnect between East and West Campuses, especially on pedestrian pathways bifurcated by the I-215/SR-60. Caltrans currently plans to improve the Canyon Crest undercrossing, one of these paths intersected by the freeway. This project includes widening the undercrossing and providing a raised, separated pedestrian and bicycle path. At University Avenue, the other major freeway undercrossing between East and West Campus, the LRDP recommends providing widened sidewalks, narrowing freeway on-ramps, and eliminating free right turns. Another project currently underway, the East Campus Entrance Area Study, is studying further options for improving the pedestrian environment along University Avenue and strengthening East and West Campus connections.

2.4.3 Implications for the MMTMS

- Pathways leading from parking, proximate housing, and transit stops experience some of the highest pedestrian volumes.

- Pedestrian traffic peaks on campus throughout the day as classes begin and end.

- Future plans for housing and parking will likely increase pedestrian trips along pathways currently experiencing the highest pedestrian travel volumes. These plans, however, could also increase pedestrian traffic along new pathways, such as from West Campus housing to the academic core.

2.4.4 MMTMS Components

- Strategies to help bridge the East and West Campus disconnect for pedestrians.

- Suggestions about the placement of new pedestrian paths north and west of the academic core.

2.5 Bicycles

2.5.1 Existing Bicycle Circulation

The bicycle network in and around UCR consists of a combination of bikes lanes, bike routes, and pathways shared with pedestrians. In general, most of the city streets surrounding the University provide bike lanes. The inner campus loop road is a bike route, but contains no striped bike lanes. Within the campus core, bicyclists are allowed to ride on pedestrian walkways.

Figure 2.17 illustrates the network of bike lanes. As the figure shows, most of the arterial and secondary roads leading into the campus contain bike lanes on both sides of the road, with the exception of some sections of Iowa Avenue and the Canyon Crest undercrossing. On the segment of Canyon Crest Drive between West Campus Drive and Martin Luther King Boulevard, bike lanes exist only along the southbound side. Northbound bicyclists must dismount their bikes and walk on the sidewalk across the street.

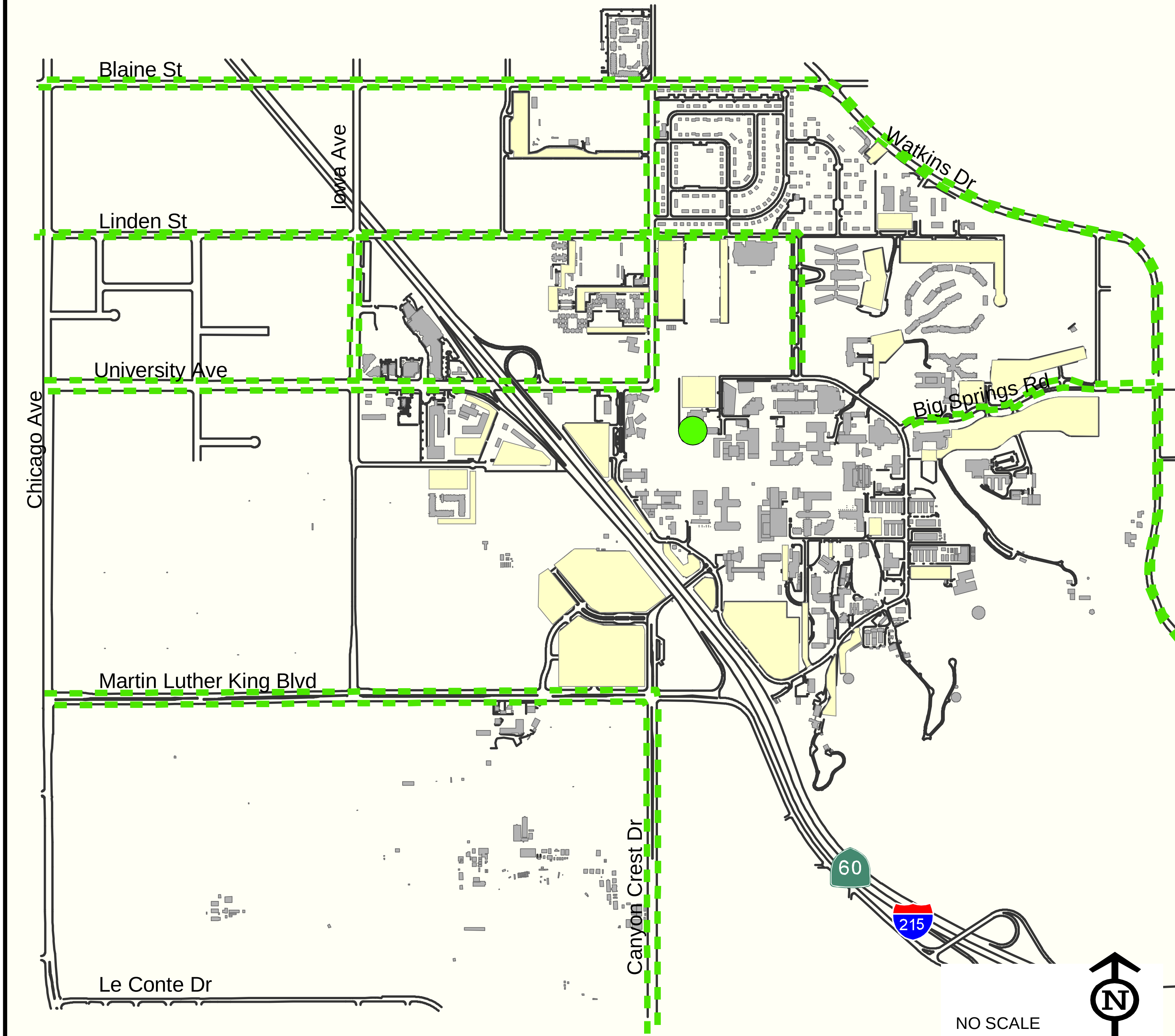
The Draft 2003 LRDP notes that the system of bicycles lanes on city streets disintegrates as one enters the campus. As with pedestrians, the LRDP also highlights the disconnection between East and West Campuses that the undercrossings create for bicyclists. In addition to the lack of bike lanes on Canyon Crest Drive, bicyclists must also contend with a grade change at the undercrossing. While the University Avenue undercrossing does contain bike lanes, these bike lanes are narrow and the street experiences high traffic volumes.

Bike racks are located throughout the campus. The campus uses a variety of bike racks, but currently does not offer any bike lockers. Showers are available for bicyclists at the Physical Education Building (noted on Figure 2.17); bicyclists who qualify for the Alternative Transportation (AT) program may use these showers for free.

During field observations conducted in the 2003 Spring Quarter, routes running between proximate housing and the East Campus experienced the highest number of peak hour trips.[15] As illustrated by Figure 2.18, the north/south route of Aberdeen Drive between North Campus Drive and Linden Street (Point 2 on Figure 2.18) carried approximately 80 bicycle trips approaching the campus core between 8:30 and 9:30 AM, and 30 trips departing the campus core between 10:30 to 11:30 AM. This segment of Aberdeen Drive links the residence halls at the north end of UCR with the East Campus core.

The north/south route on Canyon Crest Drive (Point 5) carried similarly high numbers of bicycle trips: 75 approaching trips between 8:30 and 9:30 AM and 38 departing trips between 10:30 to 11:30 AM. As with the Aberdeen Drive route, this segment of Canyon Crest Drive leads from the edge of the East Campus core to private apartments north and west of UCR.

[15] The identification of peak hours and whether a movement was approaching or departing was determined using the same methodology used for pedestrian movements.



Source: UCR LRDP EIR Traffic Impact Study Draft Report, August 2003.

LEGEND

BUILDINGS

BICYCLE LANES

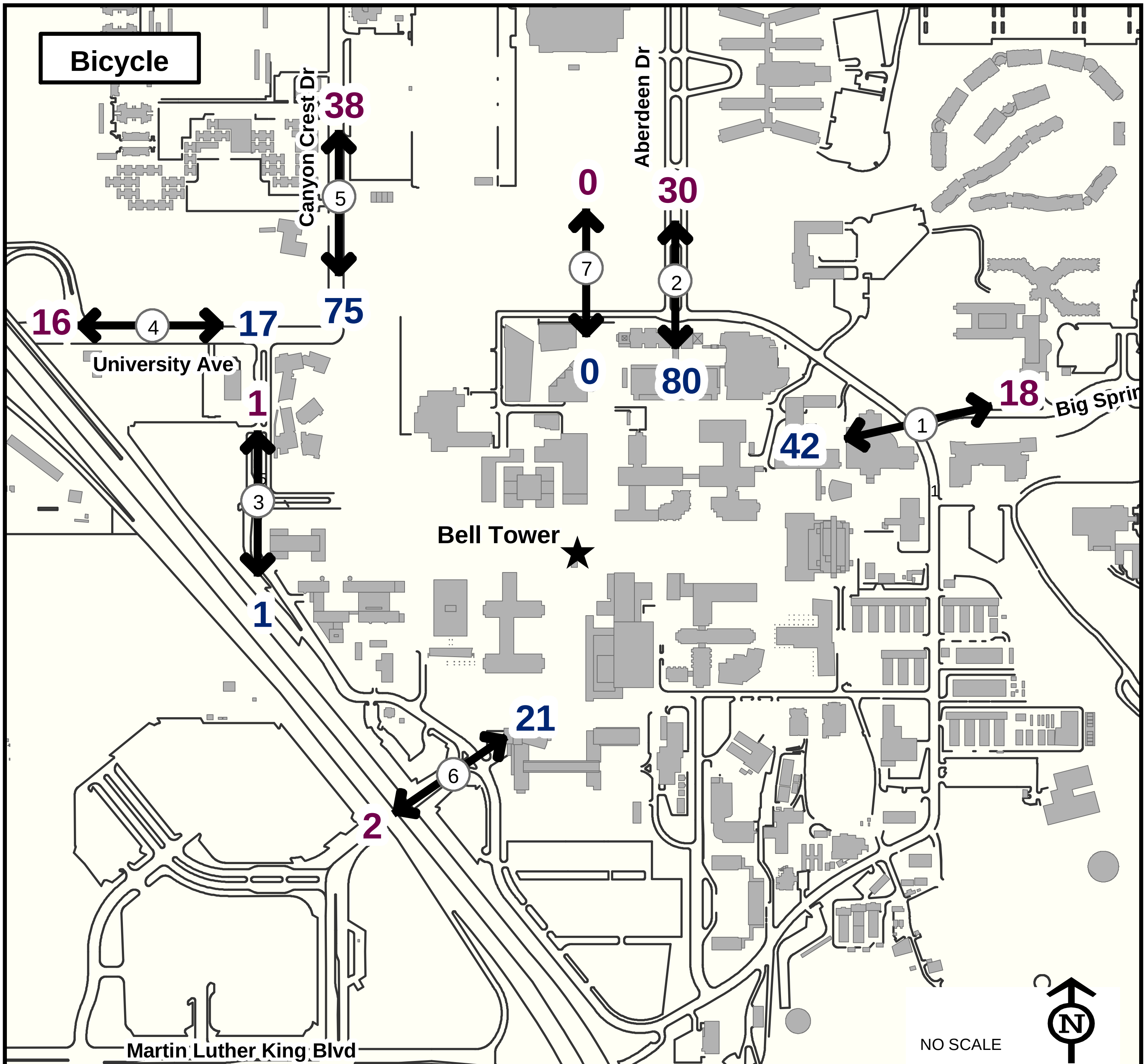
SHOWER FACILITIES

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-17

Existing Bicycle Paths



Source: Field Observations conducted by PBQD, May 2003.

LEGEND

BUILDINGS

NUMBER OF STUDENTS AT SELECTED LOCATION

Approching (Between 8:30 and 9:30 AM)

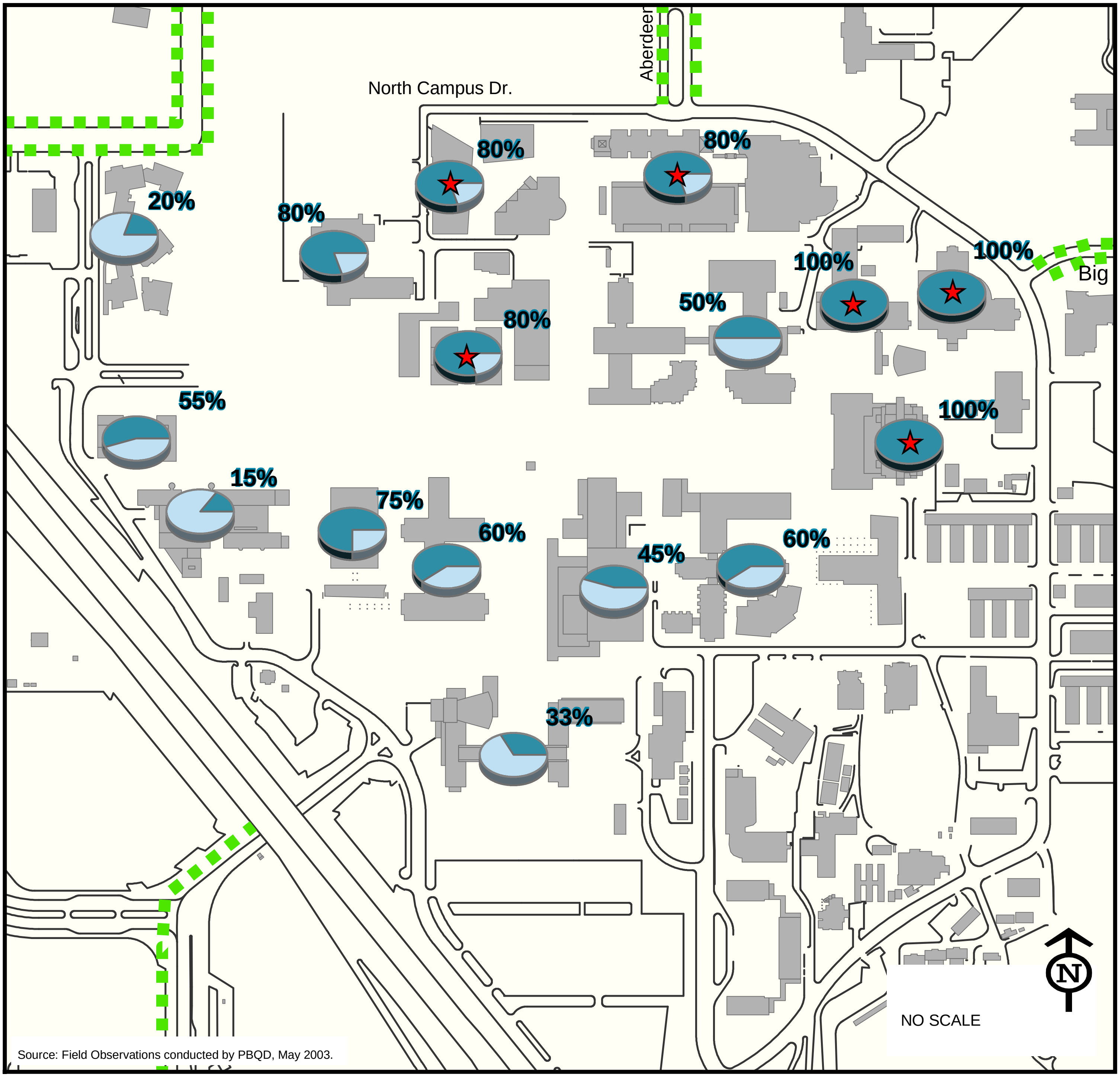
Departing (Between 10:30 and 11:30 AM)

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-18

Bicycle Movements During AM Peak Hour



LEGEND

BUILDINGS

BICYCLE LANES

OVERFILLED OR SIGN OF OVERFILLING

PERCENTAGE OF BICYCLE RACK USED VS AVAILABLE

% Used

% Available

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-19

Percentage of Usage at Selected Bike Racks

Surveys of bike rack usage – taken at various points within the campus during the same May 2003 field observations – provide some indication of where bicyclist travel once they reach the academic core. Figure 2.19 displays the percentage of rack spaces containing bikes at various points around the campus. Bike racks for facilities located at the northern perimeter of the academic core were the most highly used. Bike racks outside of the Science Library and the Physics Building were largely full.

Approximately 80% of bike rack spaces at Bourns Hall and the Surge Facility were in use. Both buildings also showed signs that adjacent bike racks had been full at some earlier point, such as bikes locked to the ends of racks or secured to drinking fountains. Further inside the East Campus academic core, the bike racks surrounding the Commons were 80% occupied; bike racks in this area also showed signs of previous overcrowding, such as bikes locked to automatic door railings.

These high bike rack usage rates may be an indication that students ride bicycles to the edge of the academic core, park their bikes, and then walk to various points on campus. The number of bikes locked within these racks could also be a result of the high numbers of students attending classes or labs within specific buildings in the area; facilities like the Surge Building, with the Learning Center and University Lecture Hall, or Bourns Hall are major destinations for students.

Ramps located outside the Surge Building and the Science Library might explain some of the high usage. In both cases, these ramps provide bicyclists with an opportunity to ride into the campus without having to dismount and carry bikes over stairs or curbs. The fact that the East Campus Road experiences a grade change just south of the Science Library might also cause many bicyclists to terminate their trips around the inner campus loop near the Science Library.

2.5.2 Future Bicycle Circulation

As with pedestrians, the Draft 2003 LRDP envisions that changes in the traffic circulation will create greater access for bicyclists. At the same time, however, these changes necessitate improvements to the current system. As the university expands and fewer vehicles are allowed inside the campus, the university must make bicycling a more attractive alternative. The LRDP also recognizes that as bicycling becomes a more popular mode of travel, increased facilities will be required.

The LRDP bicycle plan includes a number of measures designed to promote greater connectivity between East and West Campuses. Caltrans improvements to the Martin Luther King Boulevard interchange will take one step towards mending connections between these two areas on campus. As part of this project, Caltrans will create raised bicycle lanes on both sides of Canyon Crest Drive, decreasing the grade change bicyclists now experience crossing the underpass. The Draft 2003LRDP recommends further improving bicycle access by modifying the University Avenue undercrossing to include bicycle lanes on each side of the road. The Draft 2003 LRDP notes, however, that this improvement will require cooperation with Caltrans and the City of Riverside.

The Draft 2003 LRDP bicycle plan also advocates better connections between UCR's bicycle network and community bicycle facilities. One potential improvement would be to cover the Gage Canal and to use this facility to link UCR with a regional bicycle trail system. To better connect the campus bicycle network with the community, the Draft 2003 LRDP also calls for striping and signing bicycle lanes on all primary roads within the campus.

Larger numbers of bicycle riders will require improvements to the on-campus network as well. Local access roads, according to the Draft 2003 LRDP bicycle element, should be designed to allow for bicycle use; controlled access routes and service roads, therefore, should remain open to bicyclists. Increased numbers of pedestrians and bicyclists may also necessitate distinguishing between pedestrian and bicycle paths within the inner core of the campus. Although UCR currently allows pedestrians and bicyclists to share paths, rising usage could create conflicts. The Draft 2003 LRDP calls for evaluating interactions between pedestrians and bicyclists within the inner campus to determine if future growth will require separate systems. Striping part of the sidewalks for bicycle use is one alternative raised in the Draft 2003 LRDP. The Draft 2003 LRDP also discusses the possibility of creating a bicycle dismount zone in certain areas of the campus.

Increasing the number of bicycle facilities on campus also plays an important role in the Draft 2003 LRDP's vision of encouraging more bicycle usage. The Draft 2003 LRDP calls for providing ample bicycle facilities near the entrances of frequent campus destinations. In addition to adding more bike racks, the Draft 2003 LRDP encourages the use of bicycle lockers at these destinations. Bicycle facilities, including lockers, should also be provided at the major parking facilities, to allow commuters to ride bicycles from peripheral parking to the campus. These same bicycles could then be used to get to various points around campus.

In addition to changes in the bicycle network, the Draft 2003 LRDP suggests a series of policy changes designed to encourage and support increased bicycle usage. These programs include:

- bicycle clubs,
- bicycle promotion programs,
- bicycle rentals and sales,
- bicycle repair shops,
- safety seminars, and
- the distribution of information about bicycle retail facilities in the surrounding community.

2.5.3 Implications for the MMTMS

- Frequent bicycle paths to and from the campus core parallel those pedestrian paths that currently experience the heaviest usage. Many of the housing areas that generate pedestrian traffic also produce relatively large numbers of bicycle trips.

- Bicycle travel experiences the same peak travel periods as pedestrian traffic.

- Proposed land use changes will likely increase bicycle traffic along some of the most currently popular routes. These land uses could also create new demand for bicycle travel along streets and pathways running between the West Campus and the East Campus Academic Core.

2.5.4 MTMS Components

- Strategies for dealing with the disconnect bicyclists experience traveling between East and West Campuses.

- Suggestions for handling possible future conflicts between pedestrians and bicyclists (e.g. dismount zones, separated networks).

- Identification of necessary new bicycle facilities (e.g. bicycle lockers) and locations for these additions.

- Outline of new bicycle programs.

2.6 Transit

2.6.1 Existing Transit

Transit service to UCR consists of a combination of university-run programs and local transit routes. Through its Transportation and Parking Services (TAPS) department, UCR provides a number of transit services for students, faculty and staff. The Riverside Transit Agency (RTA) also runs routes linking UCR with surrounding communities.

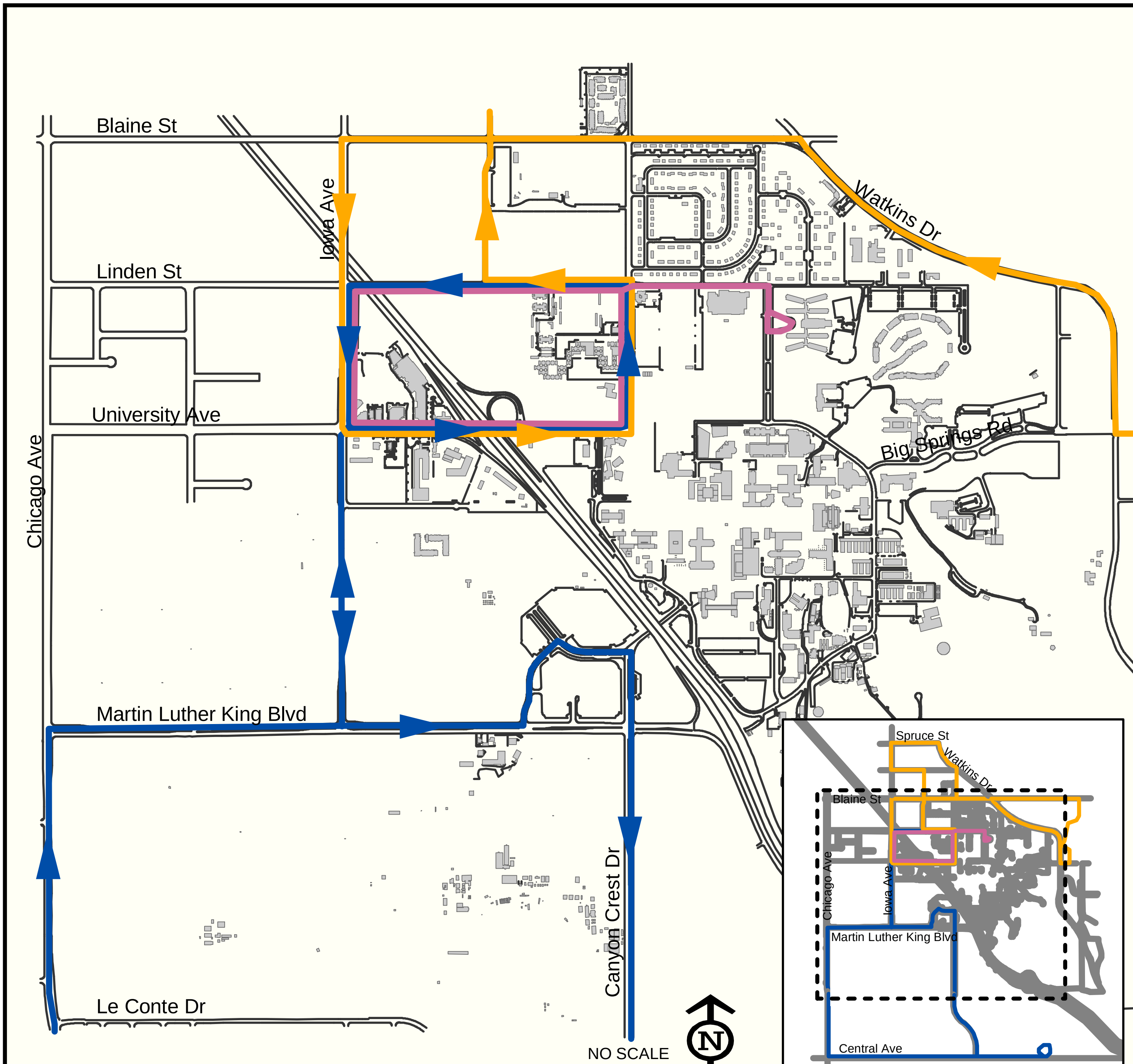
University-run transit: Three shuttle programs – the Highlander Hauler Blue Line, the Highlander Hauler Gold Line, and the Trolley Express – provide frequent service to and from the edge of the academic core and surrounding areas. These routes provide service for residents in private housing and university housing adjacent to the campus. The shuttles also carry students, faculty and staff from the East Academic Core to facilities on the West Campus, such as lecture halls located in University Village or the UCR Extension Center. Figure 2.20 illustrates these routes.

Other university-run transit provides more specialized services. The Metrolink Shuttle transports UCR Metrolink riders to and from the Downtown Riverside Station. The P2P (abbreviation for Point-to-Point) provides evening services from P2P stops to anywhere on campus.[16]

RTA Routes: Four RTA routes currently provide service to and from UCR. Route 1 runs between Corona and UCR. Route 14 provides service to and from UCR and the

[16] Information on campus transit obtained from UCR TAPS website (http://www.parking.ucr.edu).

[18] Information on RTA routes compiled using route schedules and maps obtained from website (http://www.riversidetransit.com/).



Source: University of California Riverside. Highlander Hauler Blue & Gold Line Map. www.parking.ucr.edu. August 1, 2003.

LEGEND

BUILDINGS

LOCAL TRANSITS

Gold Line

Blue Line

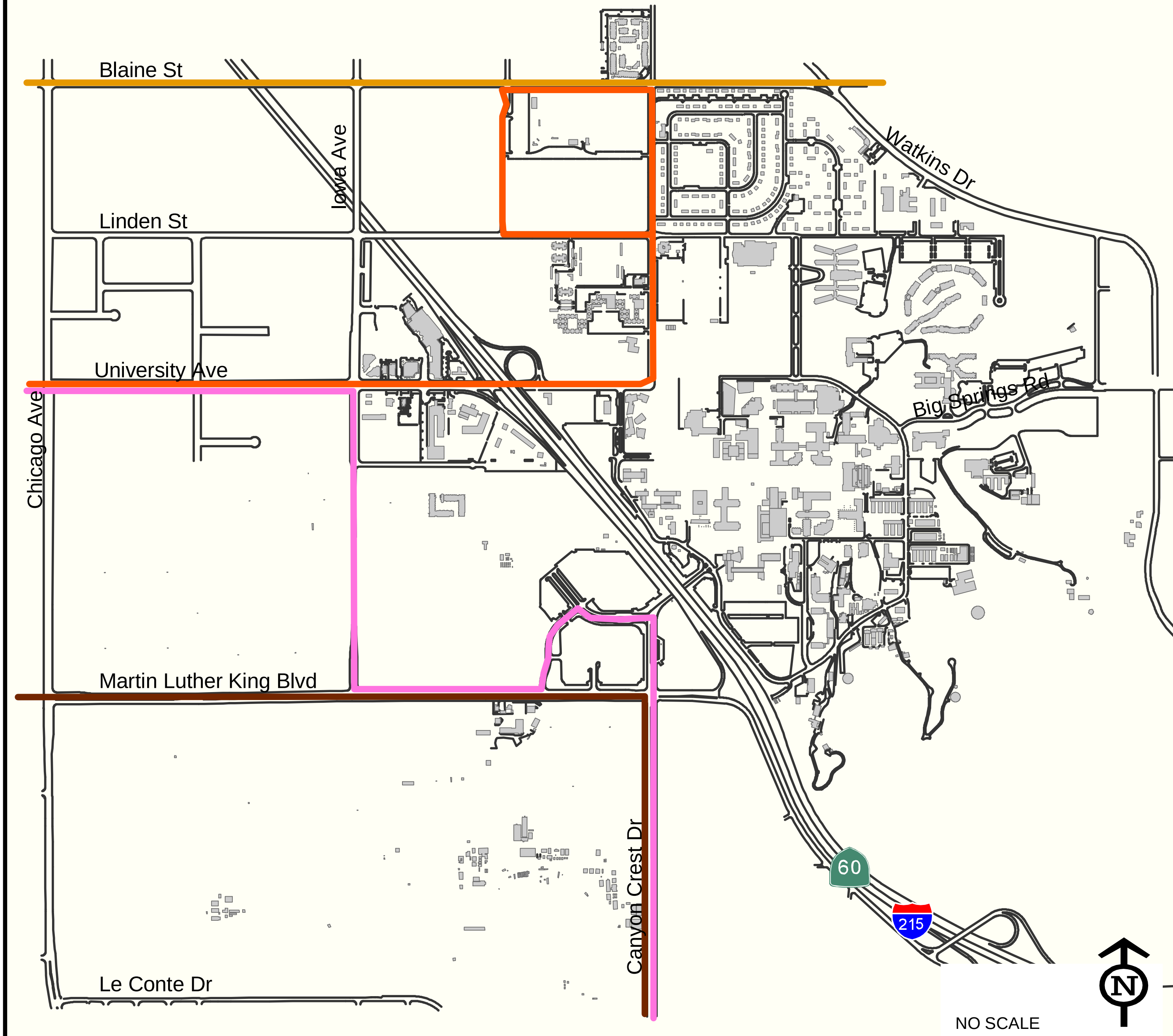
Trolley Express Line

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-20

Existing Campus Transit



Source: Riverside Transit Agency Ride Guide, May 2003

LEGEND

BUILDINGS

RTA ROUTE NUMBER

1 UCR/Downtown Terminal to W. Corona Metrolink

14 Blaine & Canyon Crest to Galleria at Tyler - Riverside

16 Main & Russell to March Air Reserve Base

99 Moreno Valley to Riverside Metrolink Station

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-21

Local Transit Routes

Table 2-11: Transit Routes Servicing UCR

Route		Fare/Trip	Monthly Pass	Weekday Headway (to and from points at UCR)
RTA	1	$1.00	$34.00*	Approx. 20 minutes
	14	$1.00	$34.00*	Approx. 65 minutes
	16	$1.00	$34.00*	Approx. 30 minutes
	99	$1.00	$34.00*	1 morning route (8:00) 1 evening route (6:04)
Campus Services	Highlander Hauler	Free (to faculty, students, staff)	N/A	Approx. 15 minutes
	Trolley Express	Free (to faculty, students, staff)	N/A	Approx. 15 minutes
	Metrolink Shuttle	Free (to faculty and staff)	N/A	1 morning shuttle (8:00) 6 afternoon shuttles (2-5:30)
	P2P Shuttle Service	Free (to faculty, students, staff)	N/A	Every 30 minutes from 6:20 PM to 11:50 PM

* - Monthly Pass is $17 after UCR ATS subsidy

Source: UCR TAPS and RTA websites

western end of the City of Riverside. Routes 16 and 99 carry passengers from Moreno Valley. These routes are illustrated in Figure 2.21. [18]

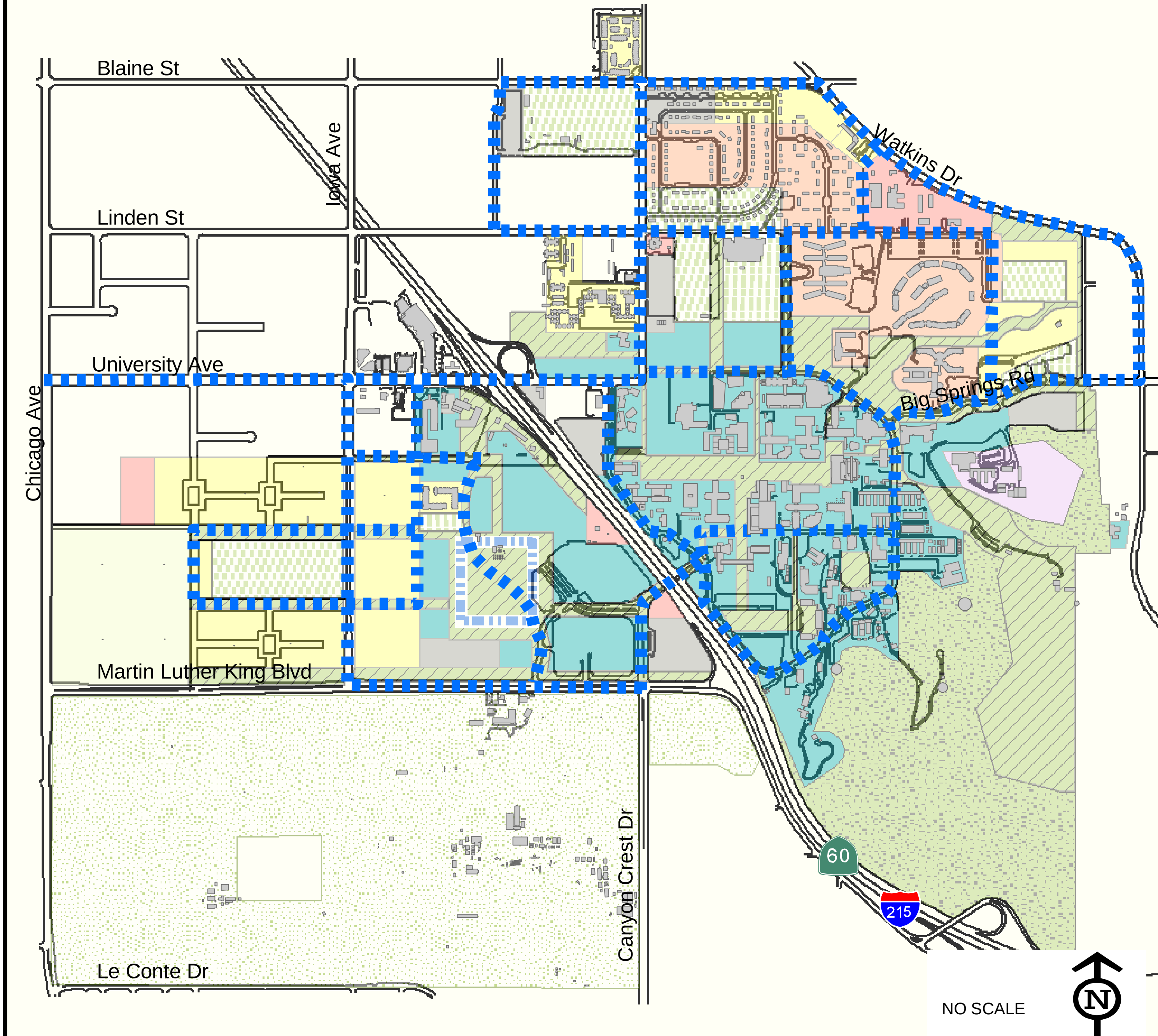
Table 2.10 summarizes fares and headway for both campus transit and RTA routes.

2.6.2 Future Transit

As the campus expands, the Draft 2003 LRDP envisions campus transit playing an important role in the future transportation system. The development of housing and new university facilities west of the freeway will necessitate frequent shuttle services between the East and West Campuses. Peripheral parking will also create a need for efficient shuttle service between structures and locations within the campus.

The Draft 2003 LRDP recommends the creation of a shuttle system that provides frequent service during peak hours (up to 5-minute headways) and drops passengers off within a 5-minute walk of all campus destinations. To do this, the Draft 2003 LRDP suggests transitioning from UCR's existing use of the buses (e.g. the Highlander Hauler) to more flexible shuttles that carry between 20-30 people.

The expansion of the primary loop and the placement of parking along the campus periphery could open up opportunities for campus transit to provide this level of service. Campus shuttles currently do not enter the campus inner loop. Peak period congestion levels would make it difficult for campus shuttles to travel through the inner campus



Source: LRDP Draft, August 2003.

LEGEND

BUILDINGS

CORRIDORS SUITABLE FOR SHUTTLE TRANSIT

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-22

Potential Future Campus Shuttle Route

loop and still provide efficient service. By redirecting traffic to the outer loop, the Draft 2003 LRDP traffic circulation will help to open up the inner loop for campus transit. Figure 2.22 illustrates potential transit corridors identified in the LRDP.

This vision for improved campus transit also includes linking shuttles with RTA routes at potential transportation hubs located at campus gateways. These links could promote transit use for trips between UCR and destinations within Riverside. Better links between campus transit and the RTA, the Draft 2003 LRDP suggests, could also minimize redundancies between the two systems.

Potential improvements to surrounding public transit could provide UCR with further opportunities to link into public transportation. RCTC is applying for federal funding to create a Metrolink line that will run from the City of Perris to downtown Riverside, extending the service that currently runs from Riverside to Los Angeles Union Station. Current thought is that this line would run three morning trains from Perris to Los Angeles and three evening trains in the opposite direction. Midday trains would run once in each direction.

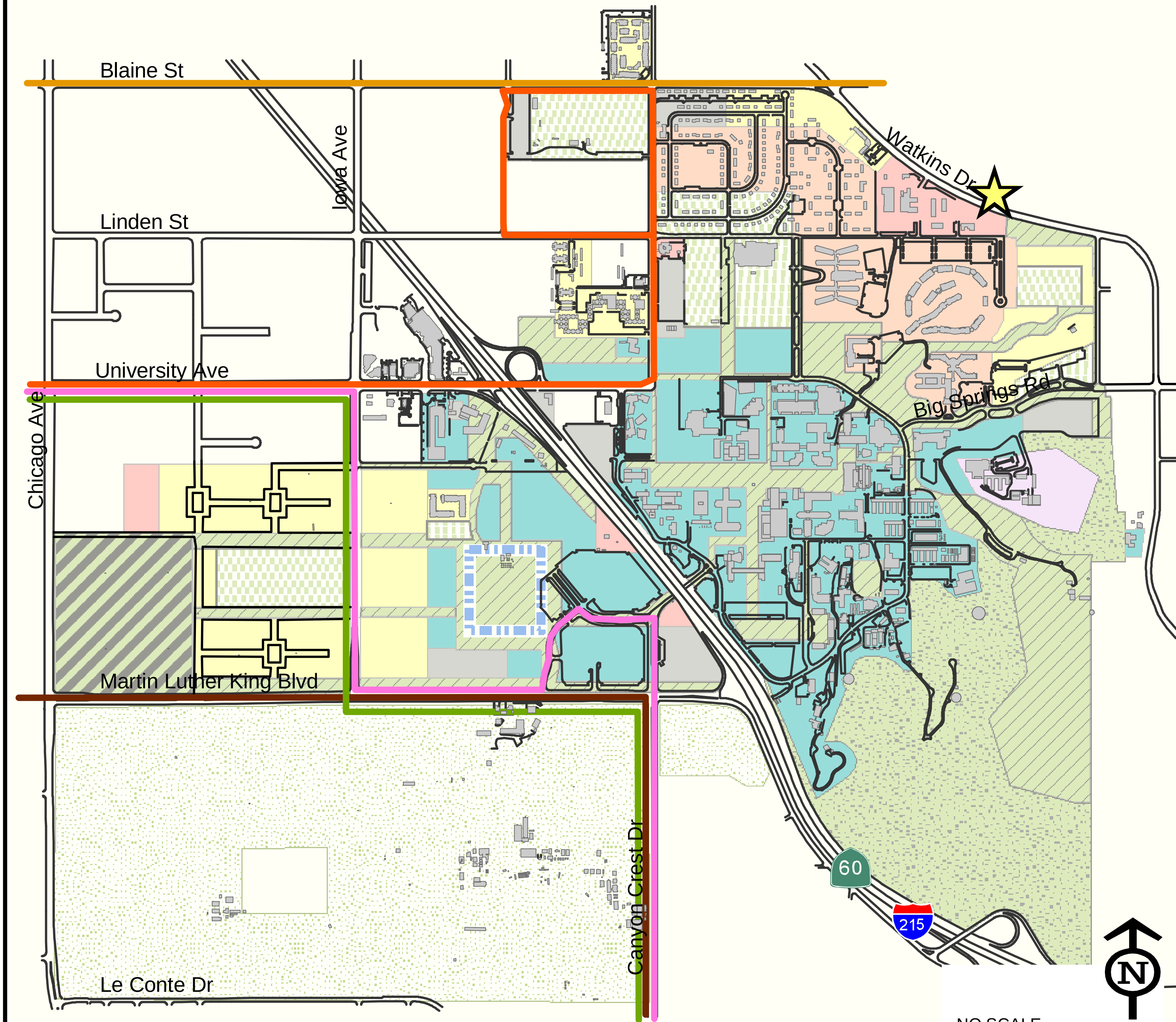
As part of this proposal, RCTC is considering building a Metrolink Station at Watkins Ave, adjacent to UCR's northeastern border. The station would have about 70 parking spaces. This new line could provide service for commuters traveling to UCR and from cities of Moreno Valley and Perris. This project could be completed as early as 2008.[19]

RTA is also in the process of developing two Bus Rapid Transit (BRT) lines. These lines would offer shorter travel times by stopping at a limited number of stops and by granting BRT buses priority at traffic signals. One proposed BRT line – Route 2 – would run from Moreno Valley to the Downtown Bus Terminal, stopping at UCR's Lot 30. Another BRT line – Route 1 – would run from Riverside to Corona. In the fall 2003, RTA is also starting a new commuter route – Line 208 – that will run from Temecula to Downtown Riverside. This line will also stop at UCR Parking Lot 30. Figure 2.23 depicts the existing RTA transit lines, as well as the proposed Metrolink Station and potential new RTA lines.[20]

2.6.3 Implications for the MMTMS

- Land use changes (e.g. parking, housing) will create the need for new routes and increased services.
- New public transportation routes present an opportunity to link campus and public transit.
- Changes in the primary traffic circulation loop may allow campus transit to run along inner campus roads.

[19] Information on possible San Jacinto Metrolink Line obtained from July 2003 meetings with consultant for RCTC and from "Inland Metrolink Project Ok'd," Press-Enterprise, June 12, 2003.
[20] Information obtained from July 2003 meeting with RTA representative.



Sources:
- Riverside Transit Agency Ride Guide, May 2003.
- Interviews with representatives from the RTA and the Riverside Couty Transportation Commission, July 2003.

LEGEND

BUILDINGS
BRT ROUTE
APPROXIMATE LOCATION FOR A NEW METROLINK STATION

RTA ROUTE NUMBER

1 UCR/Downtown Terminal to W. Corona Metrolink
14 Blaine & Canyon Crest to Galleria at Tyler - Riverside
16 Main & Russell to March Air Reserve Base
99 Moreno Valley to Riverside Metrolink Station

UC RIVERSIDE

MULTIMODAL TRANSPORTATION MANAGEMENT STRATEGY

Figure 2-23

Exisiting and Possible Future Local Transit Routes

2.6.4 MMTMS Components

- Strategies for funding new transit services.
- Components that link campus transit and public transit (including new potential transportation services).
- Further clarification of potential new transit routes.

2.7 Transportation Demand Management

2.7.1 Existing Transportation Demand Management

UCR's Alternative Transportation (AT) program contains a number of measures designed to minimize automobile traffic. The program offers both students and employees several alternatives to automobile travel. In addition to the Highlander Hauler and the Metrolink Shuttle (discussed in the previous section), the AT program offers carpool and vanpool programs.

AT provides participants with a number of incentives for using alternate modes of travel. The program, for example, provides a specified amount of free parking for eligible AT participants who surrender their parking permits, including, in some cases, those who walk or bike to campus. The program also offers also other incentives, such as `paying gym fees for access for some cyclists or offering Guaranteed Ride Homes to carpool and vanpool members. Table 2-11 summarizes AT program eligibility requirements and benefits.[21]

2.7.2 Future Transportation Demand Management

The Draft 2003 LRDP states that UCR's TDM program must seek to minimize traffic growth in the face of rising employment and student enrollment. Some of the suggestions include managing parking. The Draft 2003 LRDP suggests implementing a parking pricing system that captures the full cost of parking, and continuing the university policy of denying parking permits to those living within 3 miles of campus. Another Draft 2003 LRDP measure includes monitoring parking usage to prevent either an over- or undersupply of parking.

The LRDP lists a number of programs designed to provide commuters with increased alternatives to automobile travel. This includes linking campus transit with RTA routes at transportation hubs. Improving the campus bicycle system – through increased facilities, more comprehensive routes, and better links with the community – is mentioned as another possible measure for minimizing automobile usage.

[21] Complied from UCR TAPS website (http://www.parking.ucr.edu).

Table 2-12: UCR's Existing Alternative Transportation Program

Alternative Mode	Eligibility Requirements	Benefits
Bicycling and Walking	Participants Must: o Live More Than Two Miles Outside of Campus o Not hold a regular commuter parking permit (holding a night permit is allowed) o Be faculty, student, or staff member	o Alternative Transportation (AT) Smart Card good towards the purchase of up to 48 days of parking permits per fiscal year o Free night parking permits for those who waive the AT Smart Card o Payment of Physical Education Facility fees for two quarters o Payment of Physical Education Facility shower and locker usages fees
Carpooling	Participants Must: o Live More Than Two Miles Outside of Campus o Not hold a regular commuter parking permit (holding a night permit is allowed) o Ride together at least 3 days a week for 50% of the commute to campus o Be faculty, graduate student, or staff member	o For permit holders: reduced quarterly permit fees (graduate students/faculty/staff). o For non-permit holders: AT Smart Card good towards the purchase of up to 24 days of parking permits per fiscal year o For non-permit holders: Free night parking permits for those who waive the AT Smart Card o One free guaranteed ride home per quarter (graduate students/faculty/staff)
RTA/Metrolink	Participants Must: o Not have purchased a regular parking permit o For ATS Card: Live More Than Two Miles Outside of Campus o Be faculty or staff for 15% Metrolink ticket; be faculty, student, or staff for other benefits	o 50% discount on one 31-day RTA bus. o 15% off the face value of Metrolink ticket (for faculty and staff) o Alternative Transportation (AT) Smart Card good towards the purchase of up to 48 days of parking permits per fiscal year o Free night parking permits for those who waive the AT Smart Card
Vanpool	Participants Must: o Be faculty, staff or graduate student	o AT Smart Card good towards the purchase of up to 24 days of parking permits per fiscal year o One free guaranteed ride home per quarter (for full-time vanpoolers)
Drop-Off	Participants Must: o Be full-time faculty, staff or graduate student who are dropped off each day by someone who does not park their car on campus o Not have purchased a regular parking permit o Live More Than Two Miles Outside of Campus	o Alternative Transportation (AT) Smart Card good towards the purchase of up to 48 days of parking permits per fiscal year O Free night parking permits for those who waive the AT Smart Card

Source: UCR TAPS website

2.7.3 MMTMS Components

- Outline new AT program that corresponds to the new LRDP transportation system and goals.

Appendix C:

Full List of Proposed Solutions

UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

<table>
<tr><th colspan="2">Issues & Factors</th><th>Term</th><th>Potential Solutions</th><th>Positive Responses</th><th>Negative Responses</th></tr>
<tr><td rowspan="15">Automobiles</td><td rowspan="15">Conflict Points

Issues:

Travel by automobile drivers, pedestrians, and bicyclists peak at several times throughout the day, creating recurring conflict points.

Future land use patterns will likely intensify (or in some cases change) existing conflict points.

Factors:

Class and work schedules create common travel times and destinations.

Common pedestrian and bicycle routes cross roads traveled by automobiles.

Increased housing and parking north of campus will intensify conflicts.

New housing, parking and academic uses at West Campus will create new conflicts.</td><td rowspan="10">Short-Term</td><td>Implement flexible hours and other TDM strategies to spread out travel peaks and reduce conflicts (PC)</td><td>●■■</td><td></td></tr>
<tr><td>Close sections of the inner campus loop road that experience heavy pedestrian and bicycle crossings during peak hours (FG)</td><td>●●●●■■■■■</td><td>■■</td></tr>
<tr><td>Add traffic lights and controls
• Traffic lights in place of stop signs (PC,PO,FG)</td><td>●●●●●●■■</td><td>●■</td></tr>
<tr><td>• “Peak period” traffic signals that blink during non-peaks (PO,PC)</td><td>●●</td><td>●■</td></tr>
<tr><td>• Pedestrian walk lights on campus at places of high pedestrian flows (PO)</td><td>●●●■</td><td>●</td></tr>
<tr><td>• Separate traffic lights for bikes (FG,PC)</td><td></td><td>●●●●●</td></tr>
<tr><td>• Traffic actuated signals, in lieu of set timing/phasing (FG)</td><td>●</td><td>●</td></tr>
<tr><td>• Have transportation staff direct traffic along North Campus Drive (PO)</td><td></td><td>●●■■</td></tr>
<tr><td>On public streets, co-ordinate with the city on signal improvements or added traffic control measures such as left-hand turn arrows and pedestrian “scramble” zones (PO, FC)</td><td>●</td><td></td></tr>
<tr><td>Limit the use of personal automobiles on inner campus roadways through the use of gate controls or other means of controlled access (PC,PO,FG)</td><td>●●●●●</td><td></td></tr>
<tr><td rowspan="5">Long-Term</td><td>Move parking to the periphery of the campus to limit personal automobile use on the inner campus loop (PO, PC)</td><td>●●●●■</td><td>●■■</td></tr>
<tr><td>Permanently close sections of the inner campus loop road that experience heavy pedestrian and bicycle crossings (FG)</td><td>●●■■</td><td>■■</td></tr>
<tr><td>Provide grade-separated pedestrian walkways over major streets and arterials at major conflict areas (PC,PO,FG)</td><td>●●●●■■■■■</td><td></td></tr>
<tr><td>Consider a roundabout near the campus entrance (or entrances) to minimize conflict points and reduce speeds (FG)</td><td>●</td><td></td></tr>
<tr><td>Address sight-distance hazards around the campus road (PO)</td><td></td><td>●</td></tr>
</table>

● – Response from Planning Committee Member; ■ – Response from Campus Safety Committee/Traffic Sub-Committee Member
Source for Proposed Solution: (PC) Planning Committee; (FG) Focus Group; (PO) Public Outreach; (C) Consultant

UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

	Issues & Factors	Term	Potential Solutions	Positive Responses	Negative Responses
Automobiles	**Congestion** **Issues:** Regional and local traffic create congestion on many roads used for university- related travel. Forecasts indicate that traffic levels surrounding the university will rise, leading to increased travel delays. **Factors:** Surrounding arterial streets are used for travel between non-university destinations. Commuters use arterial streets to avoid congested freeways. Increased numbers of students, faculty, and staff will be traveling to UCR. Non-university travel will increase.	Short-Term	Widen the inner campus loop road to two-lanes in each direction (PO)	●■	●●●■■
			Use traffic calming devices in the inner campus loop to discourage residents from “cutting through” the campus (PC, PO)	●	
			Re-stripe arterials that have been down-graded to two lane roads back to four-lane roads (PO)		■
			Do not block off public roads for special events (PO)	●	●■
		Long-Term	Prevent queues outside of future parking structures by: • Using transponder access controls for quick ingress and egress (PC)	●	■
			• Locate parking for optimum access to freeway on/off-ramps (PC)	●	
			• Employ other “speed parking” techniques (PC)		
			Build access roads for the new residence halls that run south from Linden to Big Springs Road to redistribute traffic off of city streets north of campus (PO)	■	
			Reconnect the campus loop road to Canyon Crest Drive by extending North Campus Drive (PO)		●●●■
			Downplay the importance of the campus entrances on the side of campus facing residential neighborhoods and improve or increase entry points on the side of campus away from residential areas (PO)		
			Turn Valencia Hills Drive into a cul-de-sac (PO)		■■
Automobiles	**Drop-Offs/Pick-Ups** **Issues:** Frequent passenger drop-offs cause congestion along the inner campus loop. UCR only has one designated drop-off point -- flagpole. **Factors:** Docks and interior parking lots often provide the closest vehicle access to the campus core. The frequent vehicle stops and general disregard for traffic rules associated with passenger drop-offs halt traffic flow along campus roads.	Short-Term	Add drop-off and pick-up points in existing parking lots (PC, FG)	●●●●■	■
			Convert some existing parking lot spaces into drop-off and pick-up spots (PC)		●■
			Provide three major drop-off points, one at each main entrance to campus (PO)	●	●■■■
			Create more drop-off points and place them in: • Places outside of traffic streams (PC)	●●●■	
			• Place them in transit hubs (PC)	●■	
		Long-Term	Eliminate pick-up and drop-off areas on campus entirely and replace them with transit (PC)	●	●●■■■
			Place pick-up and drop-off points in new parking structures (PC, FG)		●■■
			Make the campus loop road a one-way road; use extra lane for drop-offs (FG)	●■■■	●●■■■

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UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

Issues & Factors		Term	Potential Solutions	Positive Responses	Negative Responses
Automobiles	**Access Controls** **Issue:** Moving traffic to the outer loop will require access control methods and a carefully phased implementation. **Factors:** Access controls to limit moving from parking lot to parking lot throughout the day. Access controls must be used until land use changes shift travel demand.	Short-Term	Use temporary measures such as sawhorses or roadway gates to close off certain streets (C)	■	
			Human controls at some points (PC)		●●●■
		Long-Term	Card access gates (PC)	●●●●	■
			Remote control gates (PC)	●●■■	
Automobiles	**Kiosks** **Issue:** The current use of the East Campus information kiosk as the primary source of information contributes to traffic congestion. **Factors:** The kiosk is too close to city streets, leading to traffic build up on University Avenue. The kiosk draws visitors into the campus loop at a point that is distant from their final destination.	Long-Term	Relocate existing kiosk to coincide with East Campus Entrance design (C)	●●■	
			Redesign the lanes at existing kiosks so that they can accommodate longer vehicle queues (C)	●●■■■	
			Provide information kiosks at multiple locations (PC)	●●●■	
			Find a source other than parking to pay for improvements to information kiosks (PC)	■	■■●

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UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

Issues & Factors		Term	Potential Solutions	Positive Responses	Negative Responses
Emergency, Service, and Delivery Vehicles	**Congestion/Conflict Points** **Issues:** The inner campus loop, upon which service and emergency vehicles rely, experiences frequent congestion. Service, delivery, and emergency vehicles will experience increasing levels of private vehicle traffic and conflict points. **Factors:** Congestion during peak travel time affects emergency response times or delays deliveries. Automobile shuttling generates traffic within the inner campus loop. Pedestrian streams often delay delivery vehicles. Forecasts predict increased travel on arterials surrounding the university. Higher volumes of pedestrian and bicycle travel along the inner campus loop could increase conflict points for service, emergency and delivery vehicles.	Short-Term	Encourage or shift timing of deliveries to the evening hours (FG).	●■■■	●●■■■■
			Improve access and service roads leading up to the docks (FG)		
		Long-Term	Limit inner loop access to service and emergency vehicles through the use of control access gates; provide these vehicles with transponders to open gates (PO)	●●●●●●●●■■■	■
			Create a centralized receiving area for all packages; then have university staff vehicles deliver materials to each department (PC, FG, C)	●●●●●●■■■■■■	●
			Alleviate congestion and conflicts on the inner loop road by adding an outer loop road around the campus (FG)		●●

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UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

Issues & Factors		Term	Potential Solutions	Positive Responses	Negative Responses
Emergency, Service, and Delivery Vehicles	**Loading Docks** **Issues:** The use of loading docks for multiple activities ties up docks. **Factors:** Unloading areas are often used for passenger drop-offs and pick-ups. Dock spaces are often used for the long-term parking of personal cars or department service vehicles, or to store equipment. Dock spaces are often used for handicapped parking. Peripheral parking could lead to increased use of loading docks for multiple activities.	Short-Term	Limit functions allowed within unloading docks; establish a priority of uses within the docks (FG)	●●●●●■■■■	
			Enhance enforcement of existing parking rules within dock areas (FG)	■	
			Eliminate private vehicle parking inside unloading docks entirely (FG)	●●●●●●●●●■■■■	●■
			Clean-up dock areas and remove inappropriate materials (FG)	●	●
			Create a comprehensive system for managing access to gates and emergency service facilities, such as a greater use of Knox Boxes (FG)	●■	
			Provide lifts at docks to accommodate different kinds of service vehicles (FG)		●■
		Long-Term	Place electronic access controls in unloading docks (PC)	●■■	●
			Replace handicapped parking in docks with demand response shuttles that take people from parking lots directly to their buildings (PO, PC)	●●■	■■
			Preserve proximate parking lots in the inner campus loop for handicapped parking (PC)	●■■	●
			Expand unloading docks so that they can accommodate multiple uses (PC)	●■	●●●●●●●■■■
			Design docks to meet the needs of each department and develop a set of minimum standards for docks, such as height, size, or provisions for unusual activities (PC)		●■
	New Vehicle Types **Issue:** Increased use of new types of service vehicles will create the need for new support facilities, such as charging stations in parking lots or docks areas.	Short-Term	Enact weight and size limits for sidewalks and pathways inside the campus to encourage the use of smaller utility vehicles in place of larger trucks (PC)	●	●●■■■
			Reduce the speed limit in some city streets to allow for use by electric vehicles (PC)	●●●●■	■
			Use better marketing to encourage greater use of existing on-campus alternative vehicle programs (PO)		●
		Long-Term	Replace current campus vehicles with more electric vehicles and alternative fuel vehicles (PC)	●■■	■

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UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

	Issues & Factors	Term	Potential Solutions	Positive Responses	Negative Responses
Parking	**Internal Congestion** **Issues:** The current parking system generates vehicle trips within the inner core. **Factors:** Interior lots draw traffic into the inner loop. Suspension of tiered parking permit system after 4:00 pm promotes car shuttling around the campus	Short-Term	Reduce the number of automobiles searching for parking in the inner loop by preventing freshmen from bringing cars to campus (PO)	●●■	
			Do not allow freshman to park within a ½ mile radius of the campus (PO)		●●●●●●■
			Use a lot specific permit parking system, rather than the color-coded system currently in use, to discourage car shuttling and searching for optimal parking (PC,PO,FG)	●●●●■	
			Extend the tiered parking system from 4 pm to 6 pm each day to prevent conflicts between service vehicles and people re-parking their cars (PC)	●●●●■■■■	
			Use transponder access systems at parking lot entrances; use this system to limit movements in and out of parking spaces (PC, C)	●●	■
			Improve parking lot access and reduce congestion at spot locations by segregating parking lot entrances and exits (PC)	●	
			Limit or stratify parking by vehicle size; restrict the number of parking spaces for larger vehicles (PC)	●	■■■■■
			Employ a tiered pricing system, with higher fees for proximate parking lots and lower fees for peripheral lots (PC, FG)	■	
			Raise the price of all parking permits to discourage the use of automobiles on campus and combine with improvements in alternative modes, such as transit, carpooling, bikes, and pedestrians (PO, C)	●■	■■■
			Enhance parking incentives – such as preferential location, differential prices – for registered employee carpools (C)	●■	
			Implement residential parking permit zones in neighborhoods surrounding the campus to discourage spillover parking in local communities. Timing needs to match parking cost hikes and limits on parking availability (C)		
		Long-Term	Employ speed parking strategies and design access ramps at future parking structures to prohibit queues from backing up on local streets (PC)	■	
			Encourage the use of alternative transportation by pushing parking lots out to the periphery of campus (PC,PO,FG)	●■■	
			Limit the number of parking spaces on campus to promote the use of alternative transportation (PO,PC)		
			Consolidate parking for the residence halls into one lot; place this lot in a location slightly removed from the dorms to discourage short vehicle trips (PO)	●■	●●
Parking	**Costs** **Issues:** New structures will require financing and impose new costs. **Factors:** Construction costs for structures are higher than for surface lots. Operating and maintenance costs for structures are higher than for surface lots. Structures, unlike surface lots, are considered permanent constructions.	Short-Term	Charge premium prices for event parking (PC)	■	●●■■■
			Create a temporary surface lot to defer parking structure construction costs (PC)		
		Long-Term	Fund parking structures through user fees (PO)	●	
			Use student referendums to fund new costs associated with parking (PC)		●●●■■■
			Create mixed uses in some parking structures, such as offices or retail spaces (PO)	●●■	
			Expanded surface lots rather than to build parking structures (C)	●●■	●●

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UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

Issues & Factors		Term	Potential Solutions	Positive Responses	Negative Responses
Parking	**Mobility** **Issues:** The LRDP parking plan will create new challenges for ensuring mobility and safety. **Factors:** Without improvement in the transportation system, peripheral parking will increase overall travel times. Peripheral structures will create new safety considerations. Negative perceptions about peripheral parking will need to be overcome. Constraining parking could increase the numbers of university travelers who park on neighboring streets.	Short-Term	Open up available blue-spaces to gold-permit holders after a certain time during the day (PO)	●●●■■	●
			Eliminate the color-coded system by setting aside parking for faculty and staff in each lot and allocating the remaining parking on a “first-come, first-served basis” (PO)		●●●●●■
			Do not “oversell” parking permits (PO)	●●■	
			Create a more realistic number of handicapped spaces in some areas of campus; in many areas there are too few (PO)	■	
			Create graduated parking prices, with lower paid employees paying less for parking (PO)	●■■	
			Use graduated parking prices in conjunction with tiered parking to reduce parking fees by offering inexpensive parking at remote lots (C)	●	
			Inform prospective hires about the cost of parking (PO)	●	●
			Provide free parking (PO)		●●●●●■■■
			Provide free parking on the weekends (PO)	●●	●●●●■■
			Provide more inexpensive evening parking (PO)	■	
			Offer a cart system – similar to the ones provided at airports – at parking lots for those who must carry materials to classes/worksites. (PO)	●●●■■	
			Provide adequate numbers of short-term parking (e.g. 15-120 minute parking) near campus buildings (PO)	●■	●●
			Price parking near neighboring residential areas at a lower rate to reduce the incentive to park on residential streets (PO)		
			Prohibit parking along Watkins Drive (PO)	●	●●■■
			Re-stripe Watkins back to 4-lanes to eliminate parking (PO)		■■
		Long-Term	Concentrate parking in a few areas to make it easier to provide security and transit services (FG).	●●	
			To provide proximate parking, build parking structures on-top of or below campus buildings (PO)	●■■	■■■
			Place security officers and cameras within parking structures (PC)	●●●●■	
			Provide adequate lighting in parking structures (PC, FG)	●●●■	
			Consolidate handicapped parking in one spot; run continuous shuttles from these lots to specific destinations (PC)		●■■

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<table>
<tr><th colspan="2">Issues & Factors</th><th>Term</th><th>Potential Solutions</th><th>Positive Responses</th><th>Negative Responses</th></tr>
<tr><td rowspan="5">Parking</td><td rowspan="5">Competition/Shared Facilities

Issues:

Visitors often use the same road network and parking spaces as daily commuters; this sharing of facilities can hinder the efficiency of visitor travel.

Visitors will encounter increasing traffic as they share facilities with both university and non-university commuters.

Factors:

There are two visitor parking lots; however, they are almost exclusively used by students.

Students often use visitor parking permits.

Future peripheral parking could motivate even greater use of visitor parking by frequent commuters.</td><td rowspan="3">Short-Term</td><td>Provide separate parking lots for visitors (PC)</td><td>●●</td><td>■</td></tr>
<tr><td>Enforce visitor-only parking by issuing all visitor permits at kiosks and tracking the frequency of visitor parking use through license plate numbers (C)</td><td>■■</td><td>●■</td></tr>
<tr><td>Eliminate visitor parking entirely (PO)</td><td></td><td>●●●●●●●■■■■</td></tr>
<tr><td rowspan="2">Long-term</td><td>Provide separate parking structures for visitors (PC)</td><td>●</td><td>●</td></tr>
<tr><td>To prevent the use of visitor spaces by frequent commuters, have visitor destinations validate parking as they leave the facilities. Note: This requires access controls at parking facilities (C)</td><td>●●</td><td></td></tr>
</table>

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Issues & Factors		Term	Potential Solutions	Positive Responses	Negative Responses
Transit	**No Inner Loop Service** **Issue:** Campus shuttles currently do not serve the inner campus. **Factors:** Lack of inner campus service inhibits transit's ability to minimize inner campus loop auto trips. Transit headways and service reliability are affected by automobile and pedestrian congestion.	Short-Term	Start running “park and ride” shuttles immediately from existing peripheral lots, such as Lot 30 (PC)	●●●●●■■■■	
			Design cut-outs in the inner campus loop road so that shuttles can pull in and out of traffic at transit stops (PC)	●●●●●●■■■	
			Provide queue jumps along the inner campus loop to give transit priority when pulling out of stops (C)	●	●●●■
			Clear the campus for transit service by making the campus loop road a one-way road; use the extra lane for transit (PC,FG)		●●●■■
			After personal vehicle traffic has been removed from inner campus core, remove speed bumps to prevent damage to transit vehicles (PC)	●	
			In conjunction with a one-way loop, run shuttles clockwise along the inner campus loop road to ensure riders exit directly facing the campus core (C)	●■	●●●■
		Long-Term	Eliminate personal vehicle traffic within the inner loop and provide an inner campus loop shuttle (PC, PO, C)	●●●●●●●■■■	■
			Use smaller, “easy on/off” vehicles –such as trams – to provide transit into the campus core, including pedestrian malls (PC,PO,FG)	●■	
			Create a hierarchy of transit vehicles, with larger buses servicing the streets around the university, smaller shuttles servicing the campus loop road, and trams or vans running through the campus core (PC)	●■■■	
			Create micro-transit hubs inside the campus core or in places such as dock spaces (PC)	●	●
Transit	**Cost** **Issue:** Transit services are dependent upon parking revenue. **Factors:** Increasing transit service may reduce demand for parking, its revenue source.	Short-Term	Increase the price of parking citations (PC)	●■■	●●■■■
			Add more sensible bus routes – eliminate underused routes (PO)		●●●
			Use transit facilities to generate advertising revenue (PO)	●●	
		Long-Term	Fund transit with student fees; then provide “fare free” transit (PC, PO)	●●●■■	●●■■
			Seek out and apply for transit service grants (PO, PC)	●●●■■	
			Find sources of funding other than parking revenue (PC)	●■■	

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Transit	**Need for Increased Service** **Issue:** Peripheral parking, new housing, and campus expansion will necessitate increased transit services. **Factors:** Transit will have to help lower travel times between peripheral parking structures and the campus. Transit will have to provide new services as campus housing and academic facilities expand. Transit will play a role in maintaining campus safety as trips across the campus become longer. Transit may provide wayfinding for first time visitors.	Short -Term	Run frequent “park and ride” shuttles or trams between peripheral parking spaces and the campus core (PC,PO,FG)	●●●●■■■■	
		Long-Term	Design the transit service to help create minimum walk times between any two points on campus (PC)	■	
			Create transit centers; use them as focal points between any two points on campus (PC, PO)	■■■	
			Create better integration between campus transit and regional/local transit, such as RTA buses, existing and proposed Metrolink stations, and Ontario Airport (PC, PO)	●●●	
			Provide students and/or employees with passes that subsidize the use of public transit, similar to Unlimited Access programs such as the University of Washington’s U-Pass program. Fund through a combination of grants, student fees, and higher parking fees (PO, FG)		
			Use color-coded routes and numbered stops in campus transit system; use this system to provide wayfinding to buildings (PO)		●●●●■■
			Provide shuttle service to houses surrounding the university, not just to neighboring apartment complexes (PO)	■	●●●
			Develop a monorail system (PC)	●●	●●●●●■■
			Implement marketing/education program for university and public transit services (FG, PC, C)	●■	
			Enhance “night” shuttle service for anyone walking to destinations on or near campus (PO)	●●●●●■■■■■■	
			Enhance shuttles for students to get to/from major regional transportation hubs or the beginning or end of quarters and vacations (C)		●■
			Promote the use of transit/alternative modes in developing a comprehensive package of incentives, disincentives, e.g. guaranteed ride home, emergency ride home, emergency use parking permits, higher parking charges. (PC, C)	●●■	
			Provide a specially equipped circulator geared towards employees and students with disabilities that operates around a designated route (C)		●

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UC Riverside Multi-Modal Transportation Management Strategy
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Pedestrians	**Conflict Points** **Issue:** Pedestrian crossings create points of conflict during peak travel times. Pedestrian and vehicle conflicts will likely increase. **Factors:** Pedestrian travel peaks at the same times as bicycle and automobile travel. Common pedestrian routes cross the inner campus loop. Some areas of existing conflicts will intensify. New development will create new conflicts.	Short-Term	Implement flexible hours and other TDM strategies to spread out travel peaks and reduce conflicts (PC)		
			Close sections of the inner campus loop road that experience heavy pedestrian and bicycle crossings during peak hours (FG)	●■■	●■
			Add traffic lights and controls • Traffic lights in place of stop signs (PC,PO,FG)	●●●●■■■■	■
			• "Peak period" traffic signals that blink during non-peaks (PO,PC)		●●
			• Pedestrian walk lights on campus at places of high pedestrian flows (PO)	●●●	
			• Separate traffic lights for bikes (FG,PC)		●●●■■■
			• Traffic actuated signals, in lieu of set timing/phasing (FG)	■	
			• Have transportation staff direct traffic along North Campus Drive (PO)	■■	●■■
			On public streets, co-ordinate with the city on signal improvements or added traffic control measures such as left-hand turn arrows and pedestrian "scramble" zones (PO, FC)	■■	
			Limit the use of personal automobiles on inner campus roadways through the use of gate controls or other means of controlled access (PC,PO,FG)	●●●●■■	■
		Long-Term	Move parking to the periphery of the campus to limit personal automobile use on the inner campus loop (PO, PC)	●●●■	●■■■
			Permanently close sections of the inner campus loop road that experience heavy pedestrian and bicycle crossings (FG)	●●●■■	■■
			Provide grade-separated pedestrian walkways over major streets and arterials at major conflict areas (PC,PO,FG)	●●●●	■■
			Consider a roundabout near the campus entrance (or entrances) to minimize conflict points and to reduce speeds (FG)		●●
			Address sight-distance hazards around the campus road (PO)		
Pedestrians	**Lack of Access Controls** **Issue:** Pedestrian non-compliance and a lack of traffic controls often create traffic congestion and safety hazards. **Factors:** Many intersections experience uninterrupted streams of pedestrian traffic. Pedestrian often cross at informal "crossing zones" between lights and crosswalks.	Short-Term	Put in fencing or landscaping that guides students to designated crossing locations (FG, PC)	●●●●●■■■	
			Enact lower speed limits on key streets to help increase pedestrian safety (PC)	●■	
		Long-Term	Use pathways to manage pedestrian flow and minimize pedestrian travel through buildings (PC)	●	
			Create elevated walkways or tunnels between buildings (PC)	●■■■	●●●●●

● – Response from Planning Committee Member; ■ – Response from Campus Safety Committee/Traffic Sub-Committee Member
Source for Proposed Solution: (PC) Planning Committee; (FG) Focus Group; (PO) Public Outreach; (C) Consultant

UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

	Issues & Factors	Term	Potential Solutions	Positive Responses	Negative Responses
Pedestrians	**East/West Connectivity** **Issue:** The connectivity between East and West Campuses is poor. **Factors:** The freeway inhibits pedestrian flow between the East and West Campuses. Expanding the campus will create a need to improve links between East and West Campuses.	Short-Term	Lower the speed limit on University Avenue under the freeway; add sound absorbent materials in the underpass (PO)	■	
			Provide east/west campus transit services so that pedestrians do not have to walk under freeway undercrossings (PC)		●●
			Widen existing sidewalks underneath freeway undercrossings (PO)	●●■	
		Long-Term	Create a pedestrian bridge that spans the freeway (PC,PO,FG)	●●●●●●■■■	
			Create pedestrian tunnel that runs underneath the freeway (PC,PO,FG)	●●	●●●■■■
Pedestrians	**Personal Safety/Special Services** **Issue:** The nature of pedestrian activity on college campuses creates a variety of personal safety and access needs. **Factors:** The freeway inhibits pedestrian flow between the East and West Campuses. Expanding the campus will create a need to improve links between East and West Campuses.	Short-Term	All transit buses should be wheel chair accessible, including special extended services such as shuttles added during finals week (PO, FG)	●■■■	
			Enhance the existing “Safe Path” program (FG)	●	
			Fund the campus safety Escort Service so the program consists of paid employees rather than volunteers (FG)		●●
			Provide safety campus escorts with small vehicles for longer trips (FG)		●
			Design benches that are more sensitive to the needs of the mobility or visually impaired, such as removing obstacles, providing hand holds, and the placement of benches away from main walkways so that they do not present an obstacle to the visually impaired (FG)	■	
			Add additional benches as rest places for handicapped students and for pedestrians in general; place these benches in logical locations, such as handicapped parking lots (PO)		
			As the campus grows, use manned, stationary guard posts or security in selected buildings along pedestrian paths; provide maps showing pedestrians the locations of these stations (C)	●●	●
		Long-Term	The campus should create a Master Mobility Plan (FG)	■	●
			Design pedestrian walkways to provide direct and aesthetically pleasing paths (PO)		
			As new buildings are designed, place sidewalks and pathways where pedestrians are most likely to travel (PO)	●●■	
			Add/use landscaping and structure design elements to provide shade, such as arcades or trees (PO)		
			Handicapped access to buildings should be more direct and well lit (FG)	●■	
			Replace UCR’s incremental lighting program with a more systematic plan that fills in gaps in lighting along pedestrian pathways (FG)	●	●

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UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

	Issues & Factors	Term	Potential Solutions	Positive Responses	Negative Responses
Bicycles	**Conflict Points** **Issue:** Points of conflict and congestion are created when bicycle travel, vehicular travel and pedestrian traffic come together during peak travel times. Areas of existing bicycle and vehicle conflicts are likely to intensify, or in some cases change. **Factors:** Bicycle travel occurs at many of the same times and along many of the same paths as automobile travel. Certain movements along the inner campus road pose safety hazards. New residence halls and other housing north of campus will intensify existing conditions. New housing and academic use are likely to create new conflicts near West Campus. Increasing numbers of pedestrians and bicyclists may create conflicts along shared pathways within the academic core.	Short-Term	Create bicycle lanes along the inner campus loop road (PC, PO, FG)	●●●●●●●●■■	
			Create bicycle stopping points and other bike traffic controls within and around the campus (PC, PO)		
			Centralize bicycle parking in four or five locations located to achieve a minimum walk time between bike parking and destinations on campus (FG)	●■	●●●■■
			To limit bicycle and pedestrian conflicts along campus core pathways, place bicycle racks on the sides of buildings facing the campus loop road near building entrances when possible (C)		
			Enforce bicycle rules on campus (FG, PC, PO)	■	●
			Fix blind corners where bicycle ramps lead into the campus loop road (PO)		■■■
			Move bicycle parking away from pedestrian paths, especially from handicapped accesses (FG)		●
		Long-Term	Provide bicycle actuated traffic lights (PO, PC, FG)		●●■■■■■■
			Segregate all bicycle and pedestrian movements within the campus though policy, operational, and physical improvements (PO, PC, FG)		
			Establish a comprehensive system hierarchy on campus and give priority to bicycles in the appropriate places (FG)	●	
			Create different surface patterns to distinguish bike paths from pedestrian paths (FG, PC, OH)		■
			Use bicycle turnarounds to help prevent conflicts where pedestrians and bicycles cross paths (PO)	■■	
			Create bicycle dismount zones in certain areas of campus and consolidate bicycle parking lots on the periphery of the campus core (PO, FG)		■■■■●●
			Widen sidewalks within the campus core to accommodate both pedestrians and bicyclists (PO, FG)	●●●●■	■

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UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

	Issues & Factors	Term	Potential Solutions	Positive Responses	Negative Responses
Bicycles	**Gaps in the System** **Issue:** The connectivity between the community bicycle network and the campus network is poor. **Factors:** Bicycle lanes on many streets stop at the campus. There is often a spatial mismatch between potential bike commuting areas and surrounding topography or land use.	Short-Term	Extend bike lanes on the city streets into the campus roads to provide continuous paths into UCR (PC, PO, FG)	●●■	
			Create bike paths that lead directly into the campus core (FG, OH)	●●●■	■
			Create a subsidy for electric bikes for commuters who face grade changes (FG)	■	
			Create a map that shows the best bicycle routes into campus from surrounding neighborhoods, including bike paths and most level routes (C)	●●●	
		Long-Term	Provide bike paths through selected areas of pedestrian malls on campus (FG, PO)	●■	
			Promote campus connections to regional bike paths; capitalize on the Gage Canal to make this connection (FG, PO)	●●	
Bicycles	**East/West Connectivity** **Issue:** The Connectivity between East and West Campuses is poor **Factors:** The freeway inhibits movements between East and West Campuses. Expanding the campus will create the need to improve links between the East and West Campuses.	Short-Term	Widen existing bike lanes underneath freeway undercrossings (PO)	●	■
		Long-Term	Create pedestrian bridges that span the freeway that can accommodate bicycles (PC,PO,FG)	●●●●●●■■■■■■■	
			Create a pedestrian tunnel that runs underneath the freeway that can accommodate bicycles (PC,PO,FG)	●■	●●●●■

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UC Riverside Multi-Modal Transportation Management Strategy
Planning Committee Responses to Full List of Proposed Solutions

	Issues & Factors	Term	Potential Solutions	Positive Responses	Negative Responses
Bicycles	**Support Facilities** **Issue:** Bicycle facilities, such as bike parking or places to shower, frequently do not meet the needs of many existing and potential bicycle commuters Peripheral parking and new housing will require additional bicycle network connections. **Factors:** UCR has no bicycle lockers for general use. Shower facilities are distant from many areas of campus. Bike racks fill up at some popular campus destinations. More peripheral parking may create a demand for facilities such as bike lockers in parking structures. New development will create a need for new bike paths and routes.	Short-Term	Determine areas of high bicycle usage, place ample parking in these areas (FG)	●●■■■	
			Provide better lighting at bicycle racks for security and to help cyclists operate locking devices (PO)		
			Use centralized bicycle parking or compounds as a way to enhance bicycle parking through the use of increased lighting and security (FG, PC)	●●■■`	■
			Upgrade campus bike racks to designs that work with u-shaped locks (PO)	■	
			Create a bicycle registration program to help manage bike thefts and to deal with abandoned bikes (FG)	■■■	■
			Create bicycle safety classes on campus; make this program part of the campus orientation (PO)	■	●■
			Post bicycle safety rules and regulations on UCR website (C)		●■
			Offer bicycle discounts to students, faculty, and staff (PO, PC)	●	
			Create maps of bicycle facilities on campus (PO)	●■	
		Long-Term	Create a bicycle system that supports multimodal transfers by providing bicycle racks on transit vehicles and bicycle facilities – such as bike racks or lockers – at transit stops (PO, FG, PC)	●●●●■■■	
			Place bicycle lockers in parking structures (PC)	●	●●■■■■
			Bicycle showers should be provided throughout the campus; at the very least, one more shower should be available at the hilly section at the southern end of the campus (PC)		●●■■■■■■■
			Provide a bicycle shop on campus; provide sales, repair facilities and maintenance classes at this facility (PO, PC)	●●●●●●■	

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Appendix D:

Data Used To Estimate Costs

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

MISCELLANEOUS

Assumptions:

25,000 future student population

Unit Cost Data:

$0.20	Annual cost per student for transit information in registration packets
$75,000	Capital cost per kiosk
$17,500	Parking Pricing program (assume 3 mo. FTE at level #2)
$10,000	Bicycle Registration Program
$5,000	Bicycle Safety Courses
$15,000	Campus Bike Map
$100	Labor hours
$100	Hourly rate
$10,000	Labor cost
$5,000	Printing
$100,000	Lighting System Plan

Applied Cost:

$5,000 Cost for transit info in regular packet

	Immediate	Short	Long
Locations	0	0	2
Kiosks (additional)	$0	$75,000	$225,000
Parking Pricing Program	$17,500	$0	$0
cycle Registration Program	$10,000	$0	$0
Bicycle Safety Courses	$5,000	$0	$0
Campus Bike Map	$0	$15,000	$0
Lighting System Plan	$0	$200,000	$0

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

MISCELLANEOUS OPERATIONS AND MAINTENANCE

Assumptions:

Labor level	Annual Labor	# of staff	% of a year	Immediate	Short	Long	Program
2	$70,000	1	0.25	0.5	1.0	1.0	Inner Campus Access Program
1	$40,000	2	100%	0.0	0.0	1.0	Information Kiosks
2	$70,000	1	50%	1.0	1.0	1.0	Parking Pricing Program
1	$40,000	1	25%	1.0	1.0	1.0	Bicycle Registration Program
2	$70,000	1	10%	1.0	1.0	1.0	Bicycle Safety Courses
1	$40,000	5	50%	0.1	0.5	1.0	Expand Campus Escort Service
3	$100,000	1	50%	1.0	1.0	1.0	Transportation Funding Plan
2	$70,000	1	25%	1.0	1.0	1.0	Information/Promotional Materials

0 = no program
1 = full program

Unit Cost Data:

FTE including fringe	
$40,000	Labor level #1
$70,000	Labor level #2
$100,000	Labor level #3

Applied Cost:

Immediate	Short	Long	Program
$8,750	$17,500	$17,500	Inner Campus Access Program
$0	$0	$80,000	Information Kiosks
$35,000	$35,000	$35,000	Parking Pricing Program
$10,000	$10,000	$10,000	Bicycle Registration Program
$7,000	$7,000	$7,000	Bicycle Safety Courses
$10,000	$50,000	$100,000	Expand Campus Escort Service
$50,000	$50,000	$50,000	Transportation Funding Plan
$17,500	$17,500	$17,500	Information/Promotional Materials

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

TRANSIT

Assumptions:

		Gold	Blue	Trolley	Red	Green	Overall System
Existing Service	Operating Speeds (mph)						18
	Operating Hours per day	12	11	10			
	Spare Ratio (spares/operating)						0.57
	Route length	6.88	7.36	2.13			16.37
	Round trip travel time (min)	22.9	24.5	7.1			
	Headway	10	30	15			
	Number of buses operating	3	1	1			
	Total bus fleet						8
Future Service	Operating Speeds (mph)						15
Immediate	Operating Hours per day	12	12	12			
	Spare Ratio (spares/operating)						0.57
	Route length	6.88	7.36	2.13			16.37
	Round trip travel time	27.5	29.4	8.5			
	Minimum layover (minutes)	4.0	4.0	4.0			
	Headway	10	10	15			
	Number of buses operating	4	4	1			
	Total bus fleet						14
Short-Term	Operating Hours per day	12	12		12	12	
	Spare Ratio (spares/operating)						0.50
	Route length	6.88	7.36		3.77	3.78	21.79
	Round trip travel time	27.5	29.4		15.1	15.1	
	Minimum layover (minutes)	4.0	4.0		4.0	4.0	
	Headway	10	10		20	20	
	Number of buses operating	4	4		1	1	
	Total bus fleet						15

Long-Term

Operating Hours per day	12	12		14	14	
Spare Ratio (spares/operating)						0.42
Route length	7	7.36		3.77	3.78	21.79
Round trip travel time	27.5	29.4		15.1	15.1	
Minimum layover (minutes)	4.0	4.0		4.0	4.0	
Headway	10	10		10	10	
Number of buses operating	4	4		2	2	
Total bus fleet						17

Operating days per year	185
Service life per bus (years)	7
Bus stops per mile	5

Unit Cost Data:

Capital cost per bus (dollars)	$230,000
Cost per operating hour (dollars)	$81.63
Capital cost per transit stop (signs, bench, etc.)	$2,500

Applied Cost:		Gold	Blue	Trolley	Red	Green	Total
Operating	Existing bus hours per year	6,660	2,035	1,850	0	0	10,545
	Existing annual operating cost	543,656	166,117	151,016	0	0	$860,788
Immediate	Future bus hours per year	8,880	8,880	2,220	0	0	19,980
	Future annual operating cost	724,874	724,874	181,219	0	0	$1,630,967
	Increase in annual operating cost						$770,179
Short-Term	Future bus hours per year	8,880	8,880	0	2,220	2,220	22,200
	Future annual operating cost	724,874	724,874	0	181,219	181,219	$1,812,186
	Increase in annual operating cost						$951,398

Long-Term

Future bus hours per year	8,880	8,880	0	5,180	5,180	28,120
Future annual operating cost	724,874	724,874	0	422,843	422,843	$2,295,436
Increase in annual operating cost						$1,434,647

Capital

Existing bus fleet cost	$1,840,000

Immediate

Future bus fleet cost	$3,220,000
Difference	$1,380,000
Bus stop capital cost	$0

Short-Term

Future bus fleet cost	$3,450,000
Difference	$1,610,000
Bus stop capital cost	$67,750

Long-Term

Future bus fleet cost	$3,910,000
Difference	$2,070,000
Bus stop capital cost	$0

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

Point-to-Point Shuttle Service

Assumptions:

185 Days of operation per year

Unit Cost Data:

$85,000	Annual operating cost for 1 vehicle (UCR)
$81.63	Hourly cost (1 vehicle)
$100,000	Capital cost per vehicle

Applied Cost:

	Existing	Immediate	Short	Long	
Daytime	0	0	12	12	hours of service - daytime
	0	0	1	2	number of vehicles - daytime
	$0	$0	$181,219	$362,437	Annual cost
Evening	6	6	6	8	hours of service - evening
	1	1	2	2	number of vehicles - evening
	$90,609	$90,609	$181,219	$241,625	Annual cost
	$90,609	$90,609	$362,437	$604,062	Total annual cost
		$0	$271,828	$513,453	increase from existing

Metrolink shuttle	0	0	0	6	Metrolink shuttle - hours of service
	0	0	0	1	Metrolink shuttle - number of vehicles
	$0	$0	$0	$90,609	Annual cost
	1	1	3	5	total vehicles
	$100,000	$100,000	$300,000	$500,000	capital cost
		$0	$200,000	$400,000	capital cost over existing

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

ACCESS CONTROLS

Assumptions:

Automated Bollards	4 bollards per location (two-lane road)
Barrier Openers	2 openers per location

Unit Cost Data:

Automated Bollards:	$25,000	per bollard		LEDA International LTD
	30%	installation cost		25-30%
Barrier Openers	$3,000	per opener		Chamberlain Sentex Systems
	60%	installation cost		
Control System	$10,000	per location (2 direc.)		Gary L. Barton Corporation
		$7-10K per location		

Applied Cost:

Automatic bollards	$100,000	**bollards**	$40,000	**installation/system control**
	$25,000	contingency (25%)	$10,000	contingency (25%)
	$125,000	total per location	**$50,000**	total per location

Signing/striping/minor	**$2,500**	total per location
Minor street improv	**$20,000**	(assume 1/2 of bus turnout cost)
Program Start-up	**$17,500**	(assume 3 months of Labor Level #2)

	Immediate	Short	Long
Locations	3	3	3
Gates/Equipment	$300,000	$300,000	$300,000
Installation/Control System	$120,000	$120,000	$120,000
Signing/Minor Street Improvements	$67,500	$67,500	$67,500
Program Start-up	$17,500	$0	$0
TOTAL	$505,000	$487,500	$487,500

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

TRAFFIC SIGNAL

Assumptions: auto and pedestrian-actuated
T-intersection of two-lane roads

Unit Cost Data: $85,000 per location PB design studies

Applied Cost:

$85,000	Signal
$12,750	contingency (20%)
$97,750	Total

	Immediate	Short	Long
Locations	0	1	0
Signal	$0	$97,750	$0

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

PEDESTRIAN ZONE

Assumptions:

Aberdeen	500 linear feet	30 width ft	15000 square ft
N. Campus	250 linear feet	30 width ft	7500 square ft
W. Campus	200 linear feet	30 width ft	6000 square ft

assume 4 bollards per location

Unit Cost Data: UC Davis Project 2002

Paving/Landscaping	$1.00 - $1.25	per square foot	15
Restriping	$1.00 - $2.00	per linear foot	2
Edging	$20	per linear foot	20
Bollards	$400-800	per bollard	800
Excavation	0.64	per sq ft	0.75
Contingency	25%		

Applied Cost:

	Immediate	Short	Long	Aberdeen	N. Campus	W. Campus
Street Removal	$0	$5,625	$21,094	$14,063	$7,031	$5,625
New Pavement/Landscaping	$0	$112,500	$421,875	$281,250	$140,625	$112,500
Signing/Striping/Miscellaneous	$0	$9,500	$28,625	$17,750	$10,875	$9,500
TOTAL	$0	$127,625	$471,594	$313,063	$158,531	$127,625

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

PARKING PICK-UP/DROP OFF CONSTRUCTION
TRANSIT STOP WITH TURNOUT

Assumptions:

12	width (feet)
150	length (feet)
1800	square feet

Transit stop with turnout

12	width (feet)
100	length (feet)
1200	square feet

Unit Cost Data:

$0.64	excavation (cost per sq ft) PB design study (bus turnouts for Centerline)
$20.00	construction (concrete) per square foot
1.22	inflation factor (1999 to 2004 at 4% annually)

Applied Cost: per dropoff location

$1,402	excavation
$43,800	construction
$2,500	benches/signs/trash cans, etc.
$11,925	contingency (25%)
$59,626	total per location

	Immediate	Short	Long
Locations	0	2	6
Drop-offs	$0	$119,253	$357,758

Applied Cost: per transit stop with turnout

$934	excavation
$29,200	construction
$2,500	benches/signs/trash cans, etc.
$8,159	contingency (25%)
$40,793	total per location

	Immediate	Short	Long
Locations	0	0	1
Transit Stop	$0	$0	$40,793

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

PEDESTRIAN-BICYCLE OVERPASSES

Assumptions:

Width	Length	Sq. ft.	
14	440	6160	I-215 overcrossing
10	500	5000	N. Campus Drive
10	150	1500	Iowa Avenue

Unit Cost Data:

ped/bike bridge over street 12' x 170' design study	$250,000	$123	per sq ft	City of Costa Mesa
ped bridge over highway (Glendale AZ) 290'x14' design study	$2,900,000	$714	per sq ft	URS (design engineer)
ped overcrossing of I-80 (Berkeley CA) 8' x 295' actual cost -- design and construction	$5,200,000	$2,200	per sq ft	City of Berkeley website
ped bridge over I-75 (Auburn Hills MI) 14' x 271' actual cost	$550,000	$145	per sq ft	
ped bridge over Hwy 99 (Seattle WA) actual cost	$2,500,000			WSDOT
bike/ped bridges over I-5 (Sacramento) 4000 sq ft design study 2001	$1.0 - $1.6M	$250-400	per sq ft	City of Sacramento

Applied Cost:

	Cost per sq ft	contingency	total cost per sq ft
I-215 overcrossing	800	25%	1000
N. Campus Drive	400	25%	500
Iowa Avenue	400	25%	500

I-215 overcrossing feasibility study $200,000

	Immediate	Short	Long
I-215 overcrossing	$0	$200,000	$6,160,000
N. Campus Drive	$0	$0	$2,500,000
Iowa Avenue	$0	$0	$750,000

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

BICYCLE LANE/PATH CONSTRUCTION

Assumptions:

1.75	Bike paths (linear miles)
0.11	Bike lanes to be striped - one side of street (linear miles)
2.65	Bike lanes to be striped - two sides of street (linear miles)
0.33	Existing ped paths to be striped for bikes (linear miles)
3.00	Bike routes to be signed (linear miles)
10	Width of bike path (feet)

Unit Cost Data:

$3	Bike path construction cost per sq ft.
$158,400	Bike path construction cost per linear mile (VA DOT = $92K/mi)
$3,000	Bike lane striping per linear mile (OR and VA DOT)
$2,000	Signage per linear mile (signs every 0.1 mile, $200 per location)

Applied Cost:

Bike Path	Lane	Route		
$158,400	$0	$0	construction cost/linear mile	
$3,000	$3,000	$0	striping cost/ linear mile	
$2,000	$2,000	$2,000	signing cost/ linear mile	
$40,850	$1,250	$500	contingency	25%
$204,250	$6,250	$2,500	Total Unit Cost per linear mile	
1.75	5.74	3	Linear miles	
$357,438	$35,875	$7,500	Total Cost	

% mileage by phase

	Immediate	Short	Long	Total
Bike Path	10%	50%	40%	100%
Lane	25%	50%	25%	100%
Route	80%	20%	0%	100%

	Immediate	Short	Long
Bike Path	$35,744	$178,719	$142,975
Lane	$8,969	$17,938	$8,969
Route	$6,000	$1,500	$0

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

BIKE RACKS AND LOCKERS

Assumptions:

34000	future campus population
250	spaces per 1000 pop
8500	total spaces
12	bike parking areas
708	spaces per parking area
200	spaces per locker
4	lockers per parking area
10	signs for dismount zone

Unit Cost Data:

Bike Racks	$150	per two spaces	www.bikinginfo.org
Bike Lockers	$1,000	per two spaces	www.bikinginfo.org
Bike spaces	330	spaces per 1000 pop	UC Davis
	405	spaces per 1000 pop	UC Santa Barbara
Bike lockers	1	locker per 416 spaces	UC Davis
Dismount zone	$500	per sign	

Applied Cost:

Racks	Lockers	Lighting/ Landscaping/ Paving		
$53,100	$2,000	$27,550	cost per parking area	
$13,275	$500	$6,888	contingency	25%
$66,375	$2,500	$34,438	total per parking area	
		$5,000	signing for dismount zone	

	Immediate	Short	Long
Locations	3	5	4
Bike Racks	$199,125	$331,875	$265,500
Fully Secured Bike Lockers	$7,500	$12,500	$10,000
Centralized Bike Parking Areas	$103,313	$172,188	$137,750
Bike Dismount Zone Signing	$0	$5,000	$0
TOTAL	$309,938	$521,563	$413,250

UC Riverside
Multi-Modal Transportation Management Study
Data Used to Develop Cost Estimates

Speed Bumps

Assumptions:

2	excavation area width (feet)
15	excavation area length (feet)
2	speed bumps per location
8	number of locations (est)
480	total excavation area (sq ft)

Unit Cost Data:

0.64	excavation cost per square foot
10	paving cost per square foot (est)

Applied Cost:

$307.20	excavation
$4,800.00	paving
$2,553.60	contingency (50%)
$7,660.80	total

Cost per Timeframe

$3,830.40	Immediate
$0.00	Short-Range
$3,830.40	Long-Range