Fourth Avenue/Fontana Bike Boulevard

Design Concept

Prepared for:
A Coalition of Amphi, Keeling, El Cortez Heights, Northwest and Feldman's Neighborhood Associations

The Drachman Institute
College of Architecture and Landscape Architecture
THE UNIVERSITY OF ARIZONA · TUCSON, ARIZONA

April, 2009

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Prepared By The Drachman Institute:
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April, 2009

The Drachman Institute is a research and public service unit of the College of Architecture and Landscape Architecture at the University of Arizona dedicated to the environmentally sensitive and resource-conscious development of neighborhoods and communities. The Drachman Institute, in particular, focuses its research and outreach activities on the proposition that housing is the building block of neighborhoods and neighborhoods are the building blocks of communities. The work of the Drachman Institute therefore facilitates the development of demographically diverse neighborhoods, rich in environmental amenities and built form good-quality, well-designed, regionally-appropriate housing that conserves land, energy and water.

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Amphi Neighborhood Association
El Cortez Heights Neighborhood Association
Keeling Neighborhood Association
Feldman's Neighborhood Association
Northwest Neighborhood Association
West University Neighborhood

The Downtown/University Bicycle Subcommittee of the Tucson/Pima County Bicycle Advisory Committee (BAC)

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Project History

The idea of Bicycle Boulevard along Fourth Avenue and Fontana Street from Speedway Boulevard to Prince Road emerged in early 2008 during a community design process with Northwest and El Cortez Heights Neighborhoods, facilitated by the Drachman Institute. Northwest Neighborhood then requested the Drachman Institute's assistance in visioning such a Boulevard, and bringing it to the other neighborhoods involved for their input.

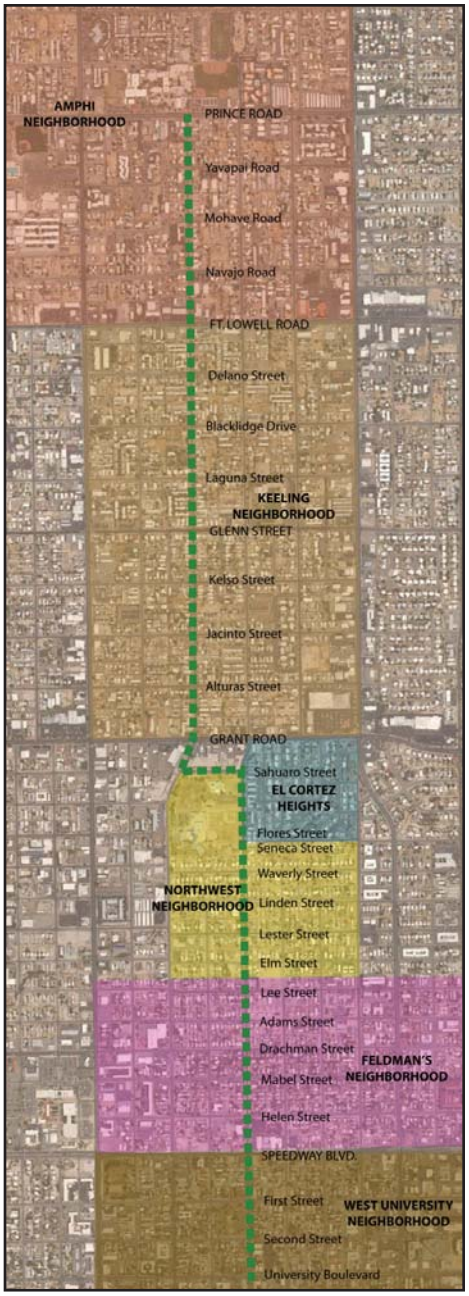
West University Neighborhood Association approached the Drachman Institute in mid October with interest in getting involved and extending the Boulevard concept south to University Avenue, and beyond.

Since September, 2008 the Drachman Institute has been leading a community design process with the five original neighborhoods: El Cortez Heights, Northwest, Feldman's, Keeling, and Amphi, with the ultimate goal of applying for RTA funds for the project during the current cycle.

At neighborhood meetings during September and October, all five of the original neighborhoods voted unanimously in support of the project as presented in this document. West University Neighborhood Association will be voting at their proximate Neighborhood Association meeting in early November.

It is important to note that although Keeling Neighborhood Association voted unanimously in support of the Fourth Avenue/ Fontana Bicycle Boulevard concept, Keeling Neighborhood expressed concerns for increased traffic volumes on other streets in their neighborhood as a result of greater traffic calming measures on Fontana Street.

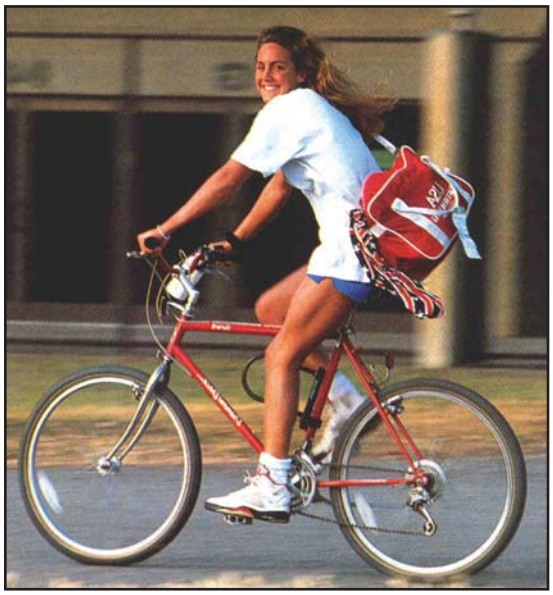
The other four neighborhoods supported the proposal without reservation.



The six neighborhoods that surround the proposed Fourth Avenue/Fontana Bicycle Boulevard are, from the north, Amphi. Keeling, El Cortez Heights, Northwest, Feldman's and West University.

Why Bike?

Bicycling is a great choice for both transportation and recreation because it is:



Inexpensive:

Bicycles can be very inexpensive to purchase, require no fuel or insurance to run, and monetary cost for maintenance and repairs are minimal.

Clean:

Bicycles do not emit fumes or green house gases, and require petroleum products only for lubrication.

Healthy:

Riding a bike is a great low-impact form of exercise.

Accessible:

Bikes are an affordable and legal mode of transport for young and old alike. Investments in bike facilities are therefore investments in transportation equity.

Quiet:

Bicycles create little to no noise pollution.

Fun:

Recreational riding is still the most popular reason for biking in the US.

Tucson has a great climate and topography for biking, and a growing network of bike paths and trails. Many bike routes are on arterial roads however, and deter riders who prefer not riding in traffic, particularly families, children and inexperienced riders. The city grid offers great opportunities for safe, pleasant and convenient biking in neighborhoods as an alternative to routes on major vehicular streets.

Bicycle Boulevards can help make biking an even safer, more attractive, and convenient form of transportation and recreation in Tucson for people of all ages and bicycling abilities.

A Bicycle Boulevard

A Bicycle Boulevard is a shared-use roadway optimized for bicycle traffic. A Bicycle Boulevard:

Gives priority to cyclists by allowing them to take the lane instead of riding along the curb.

Increases safety features for bicyclists and pedestrians.

Discourages cut-through motor vehicle traffic.

Slows vehicular traffic.

Provides way-finding signs and pavement markings.

Provides amenities such as rest nodes, drinking fountains and bike parking along the route.

Provides access to major destinations, transit system connections, and the network of other safe bicycle routes.

The design features associated with a Bicycle Boulevard can help:

Increase feelings of comfort and safety for pedestrians, bicyclists, and the community as a whole.

Increase bicycling and walking.

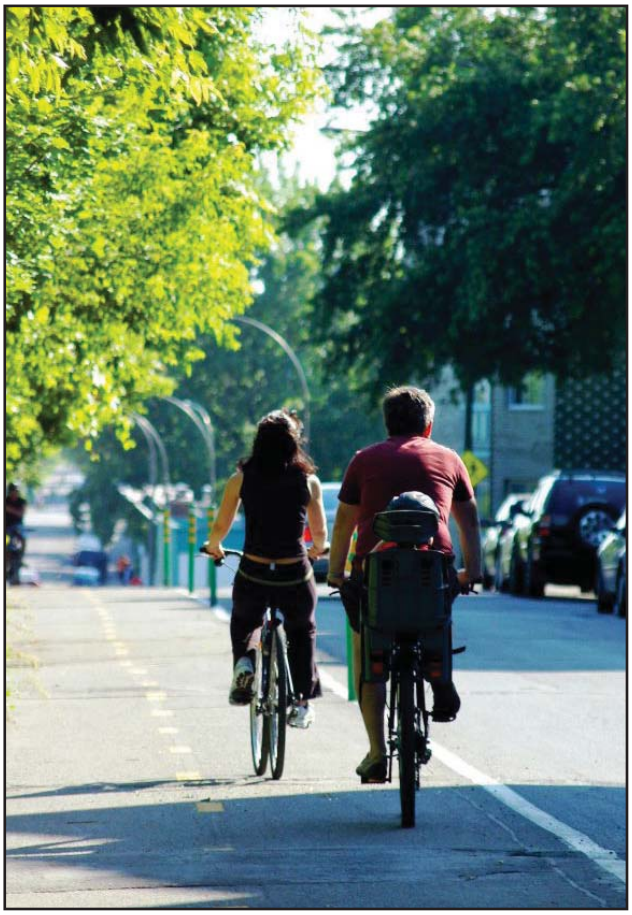
Improve way-finding.

Discourage neighborhood cut-through motor vehicle traffic.

Calm and reduce neighborhood traffic.

Provide water and shade for pedestrians and bicyclists.

Create a pleasant green corridor and micro climate through the urban desert.



Why Fourth Avenue/Fontana?

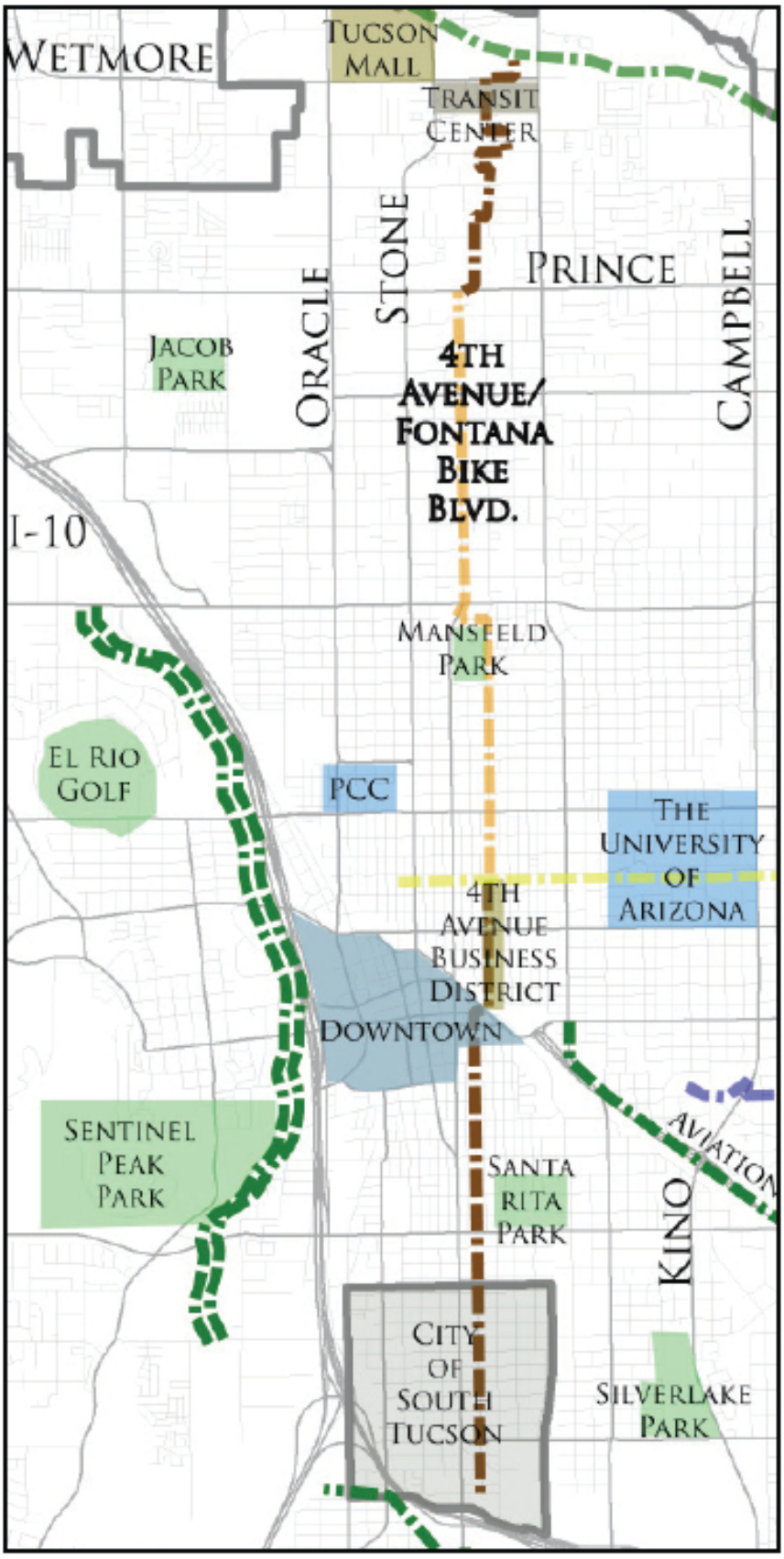
CONNECTIONS

The proposed Fourth Avenue/ Fontana Bike Boulevard would extend from Prince Road in the north, to University Avenue in the south, along Fourth Avenue, Sahuaro Street, Sixth Avenue and Fontana Street.

This proposed route fills a vital hole in the existing non-motor-vehicle-dominated "shared-use paths" in Tucson, moves through dense and underprivileged neighborhoods in the Tucson Empowerment Zone, and connects a myriad of schools, parks and commercial areas.

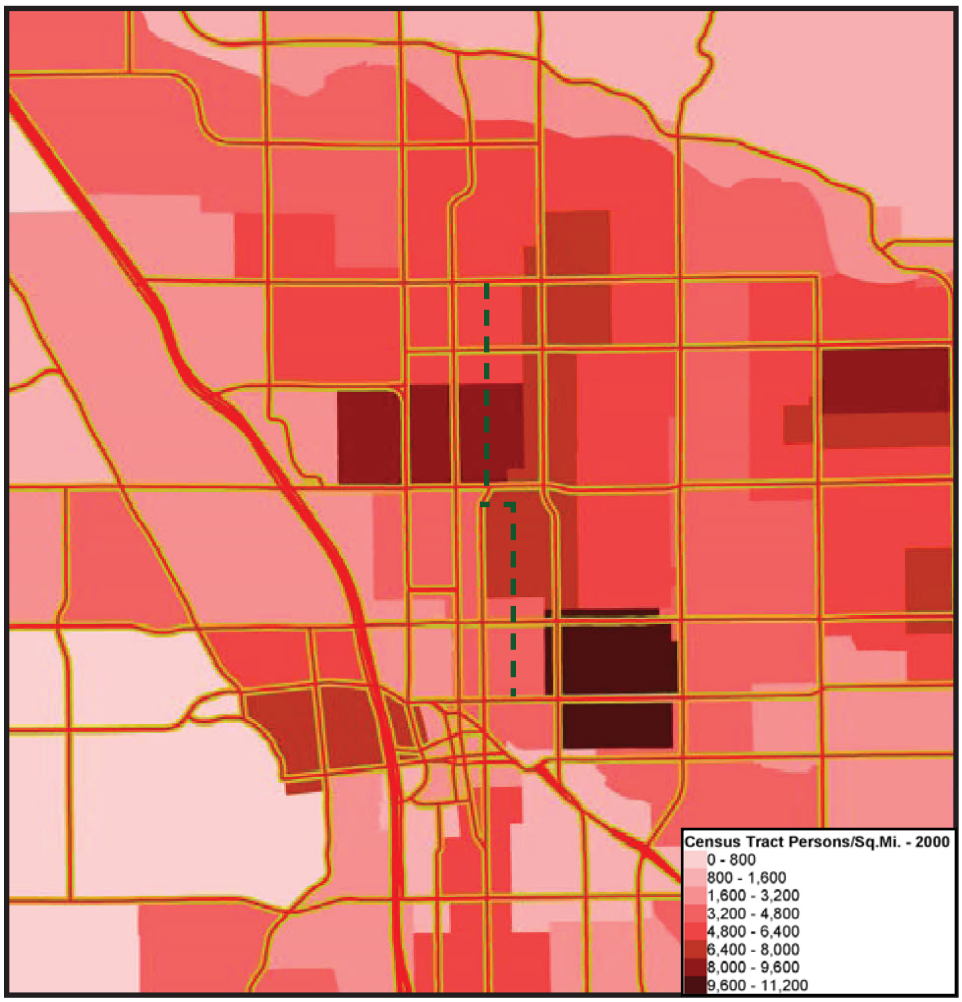
The Bike Boulevard would also connect major destinations such as the University of Arizona and Fourth Avenue's many shops, galleries, and restaurants.

If extended just a short distance north and south, the proposed Bike Boulevard would serve as a direct bicycle arterial connecting the Rillito River Path and Downtown Tucson.



Right: The Fourth Avenue/ Fontana Bike Boulevard (dashed orange line) would help connect major destinations such as the University of Arizona and the Fourth Avenue Business District. If extended a short distance north and south (brown dashed lines) it would also connect the Rillito River Path, Downtown Tucson, and the City of South Tucson.

Why Fourth Avenue/Fontana?



The Fourth Avenue/ Fontana Bike Boulevard is located almost entirely within the Tucson Empowerment Zone, and moves through some of the most densely populated areas of Tucson.

LOCATION

A good route to convert into a Bicycle Boulevard has the following characteristics:

- Local street or low-volume collector.
- Not a transit or truck route.
- Very little commercial frontage.
- Near major collectors and connects to other bike routes
- Spaced approximately 1 mile from other bicycle boulevards.
- Provides access to major destinations.
- Includes way-finding signs.

The proposed Fourth Avenue/ Fontana Bicycle Boulevard is:

- Exclusively on local or local-collector roads.
- Not a truck route.
- Residential in nature.
- Close to, and intersecting, a number of major arterial roads.
- Connects with University Avenue, which leads to the 3rd Street Bike Path.
- Approximately a 2.5 mile segment with only one jog at Sahuaro St. just south of Grant Road.
- Has traffic signals at all major intersections.
- Close to many schools and colleges, commercial areas, and parks.

Why Fourth Avenue/Fontana?

- Located within the Tucson Empowerment Zone, and moves through some of the most densely populated areas of the city.

Community and Neighborhood Parks

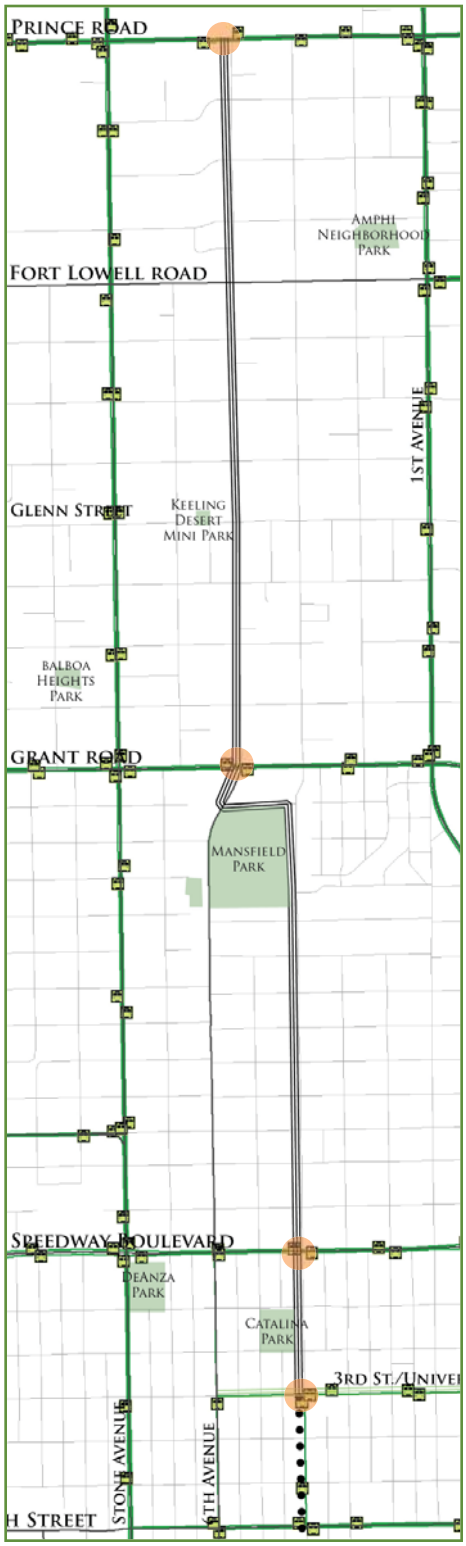
There are multiple linkage opportunities to public parks along the route, the most significant being Mansfield Park, where the Northwest Neighborhood Center, as well as ball fields and youth activities serve as a major draw for the surrounding neighborhoods.

Connections to Other Bike Facilities and Transit

Connections to the Sun Tran bus system can be found along the route at University Avenue, Speedway Boulevard, Grant, and Prince Roads.

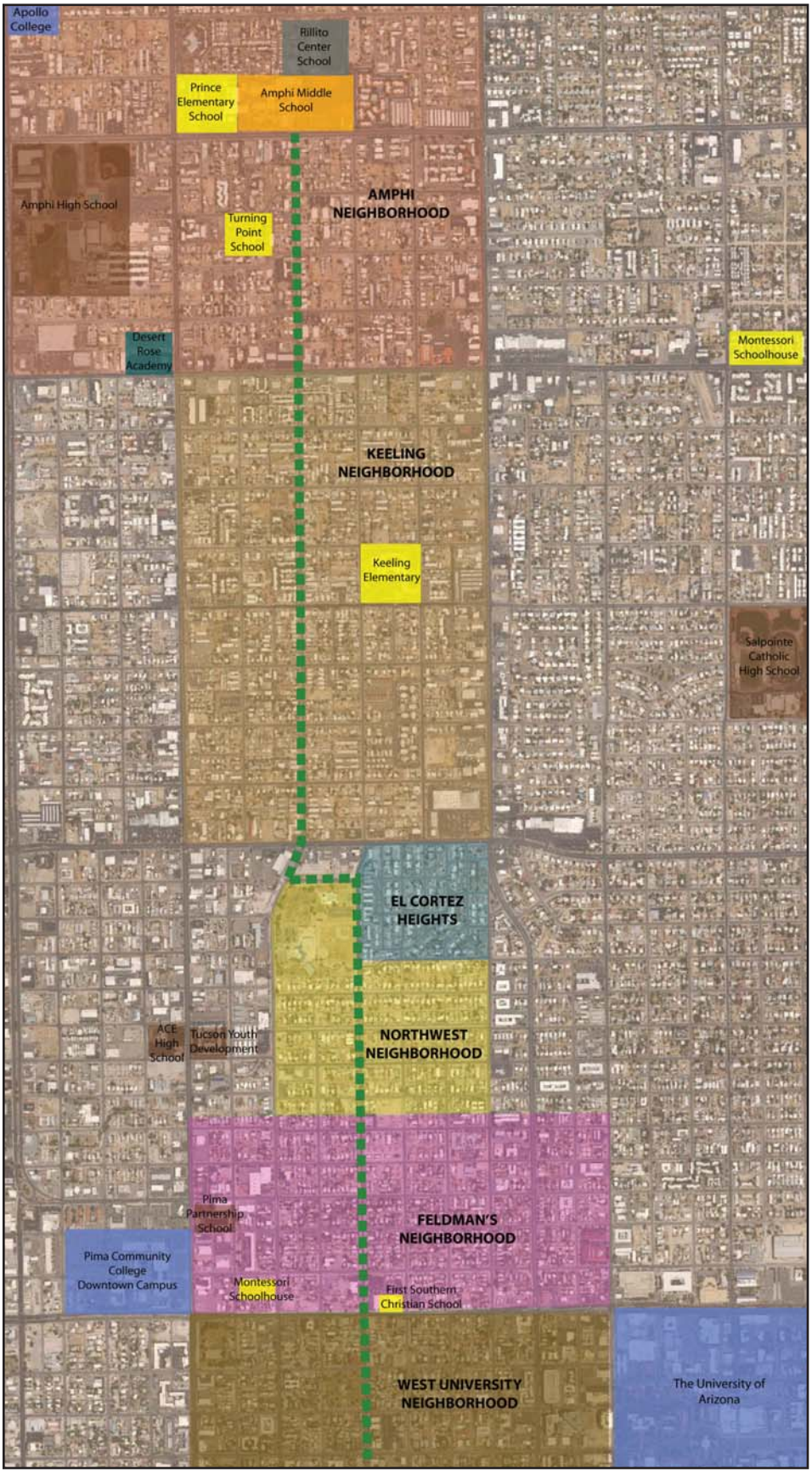
University Avenue will become an even more significant transit node once the modern streetcar begins operation to connect the University area with downtown and Rio Nuevo.

The 4th Avenue/Fontana route meets up with University Boulevard, which in turn leads to the University of Arizona where it turns in to the 3rd Street Bike Path. 3rd Street is a stretch of bikeway that already functions very much like a bicycle boulevard in Tucson.



Connections to the Sun Tran bus system can be found along the 4th Avenue/ Fontana route at University Avenue, Speedway Boulevard, Grant, and Prince Roads.

Why Fourth Avenue/Fontana?



Schools

The route is within 1/2 mile of 6 Elementary, 1 Middle and 5 High Schools, Pima Community College and The University of Arizona.

Existing Conditions

Streets and Surfaces

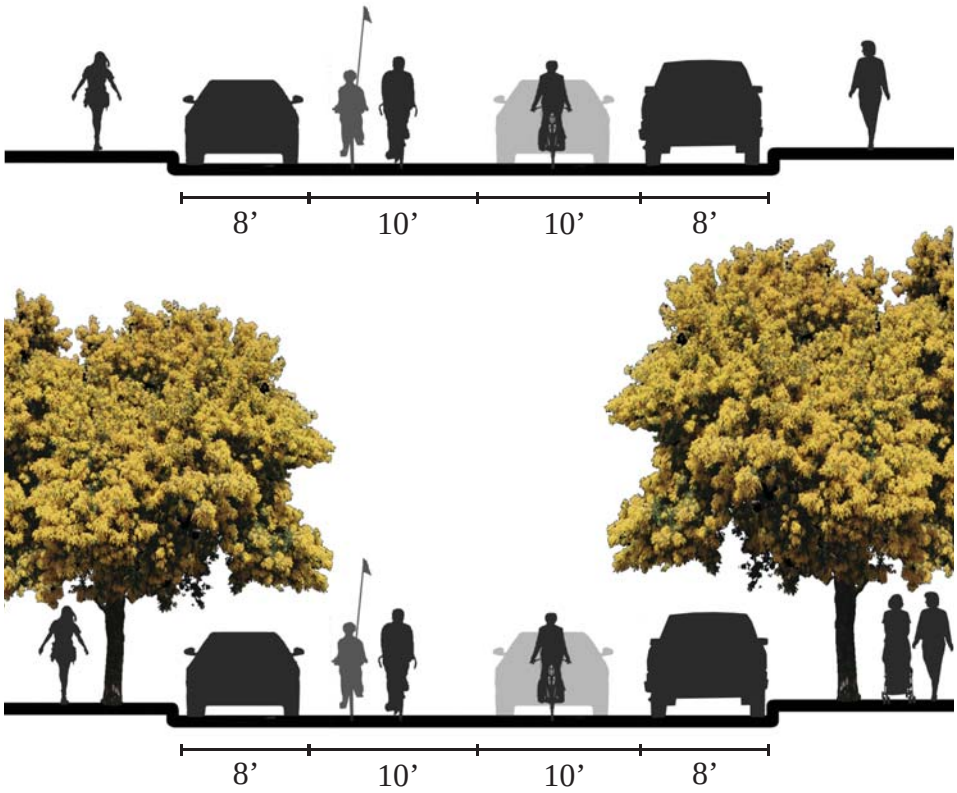
A bicycle boulevard along 4th Avenue and Fontana would primarily move along existing road widths of 36 feet. This width is ideal for the safe shared use by bicycles and vehicles, while maintaining existing on-street parking for the neighborhoods. Maintaining on-street parking is particularly important in Feldman's Neighborhood where driveways and off-street parking is very scarce.

Segments of the route are fairly wide, however. Sections where the roadway is 48 feet wide are particularly suitable for traffic calming and visual narrowing of the roadway through the use of chicanes, bulb-outs and street tree canopies.

The existing road surface condition along the route is classified as fair to poor, and segments are scheduled for repaving. The area with the most immediate need for resurfacing is that between Speedway and Seneca along 4th Avenue.

Traffic Speed and Volume

In 2007 Pima Association of Governments (PAG) counted 1,111 cars per day along Fontana Road between Grant and Prince Roads. 4th Avenue is currently being used as a neighborhood cut-through alternative to nearby 6th and Euclid/1st Avenues. This wide, open street also invites speeds well above the posted 30 mile per hour speed limit, and traffic volumes on this stretch can be very high.



36-foot street widths are suitable for shared-use bicycle boulevards. Street trees and on-street parallel parking can help calm traffic speeds.

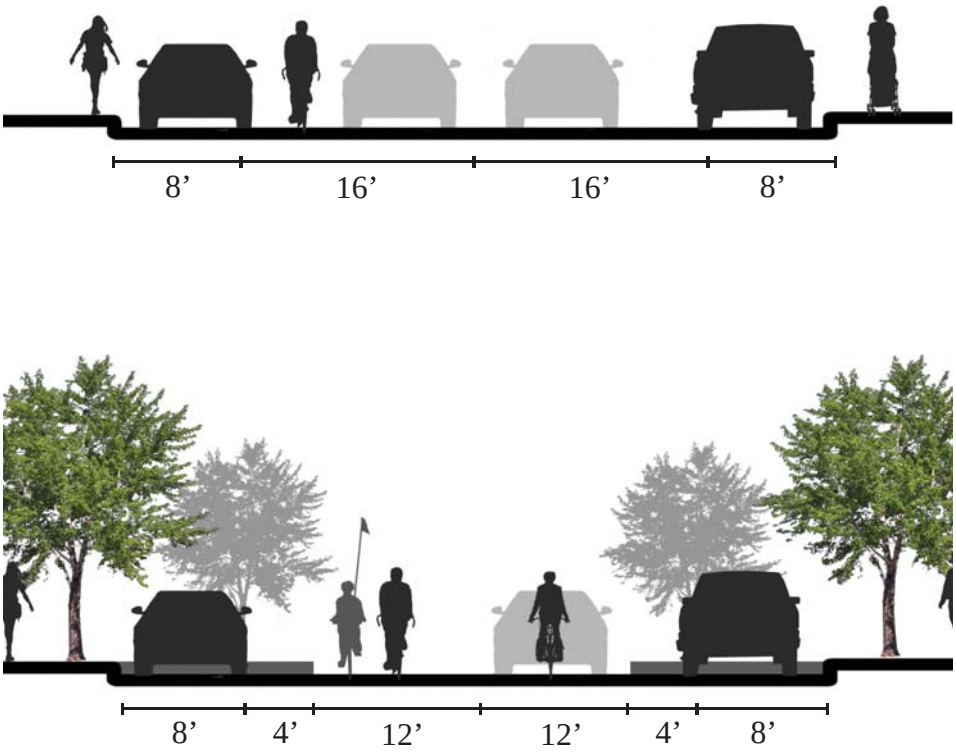
While some traffic calming elements already exist in the area, additional traffic calming measures, as well as limiting cut-through access onto the bicycle boulevard, could help both reduce and slow vehicular traffic in the neighborhoods.

Traffic calming, lowering the speed limit to 25 miles per hour along the entire stretch, and vehicular entry restrictions should be implemented to deter non-local or speeding motor vehicle traffic from using this stretch of 4th Avenue.

Crossings

Existing traffic lights control most of the larger street crossings along 4th Avenue/Fontana. The Grant Road crossing is also scheduled for improvement as part of the Grant Road widening project scheduled for construction over the next several years.

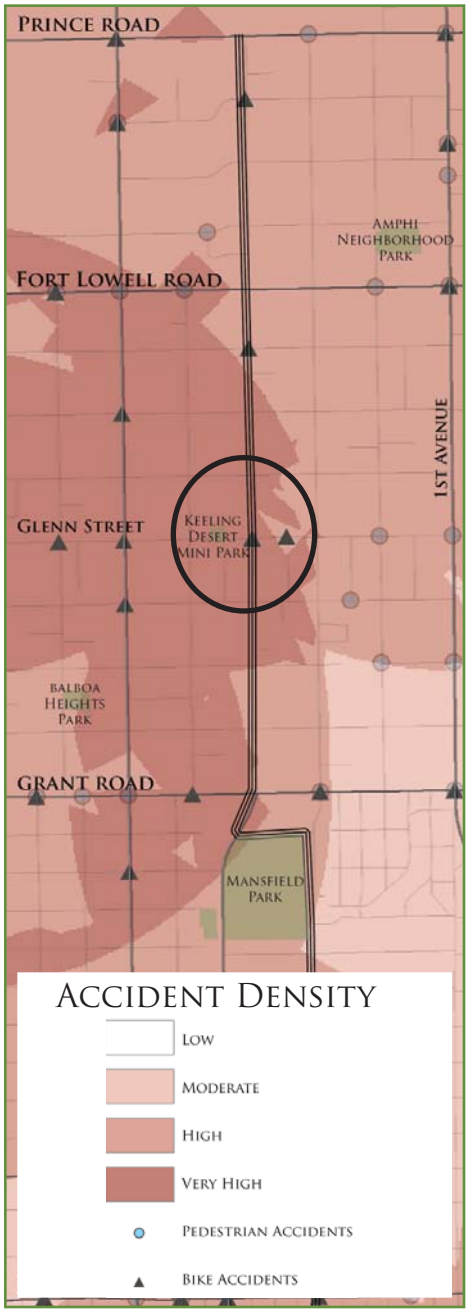
The main crossing barrier is found at Fontana and Glenn, where a lack of pedestrian and bicycle crossing facilities can cause long delays and unsafe maneuvering for



48-foot street widths are wide for bicycle boulevards, and may encourage speeding and cut-through traffic. These problems may be helped by traffic calming measures such as chicanes that help visually and physically narrow the roadway.

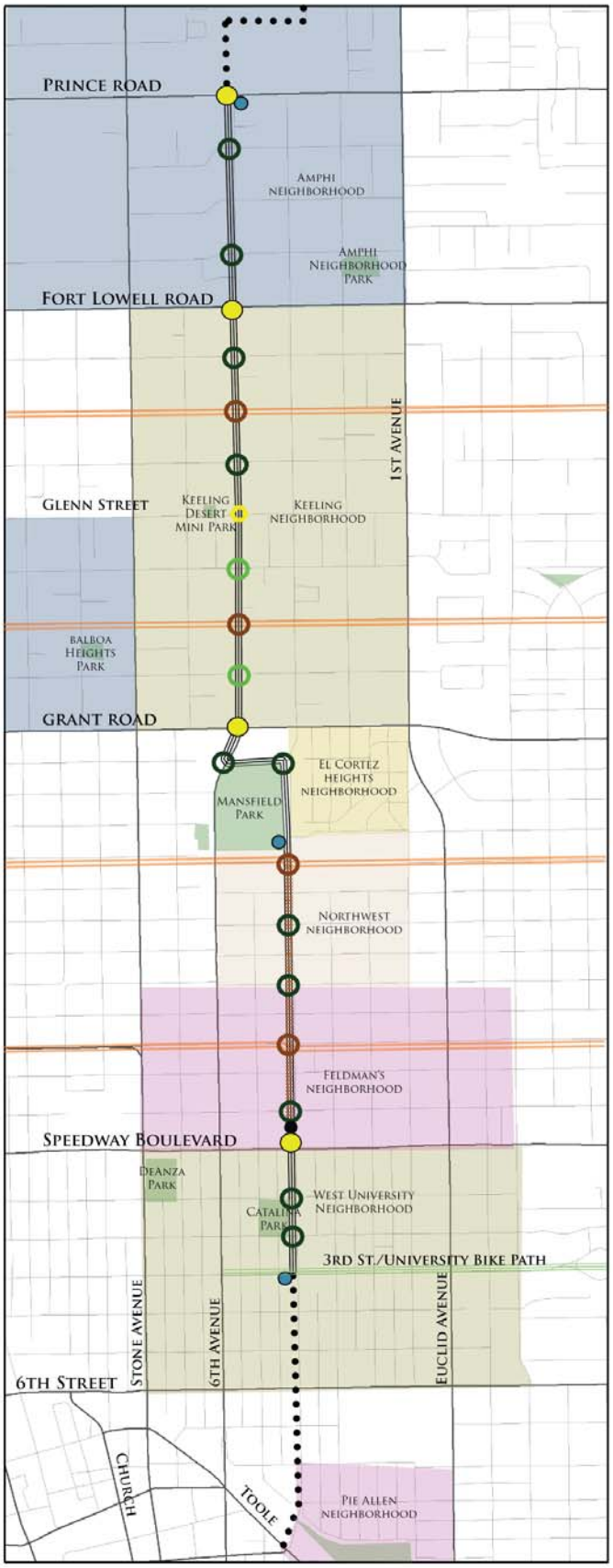
The rendering above shows the City-proposed configuration for the crossing at Grant and 6th Street included in the Grant Road Widening project. This crossing would be utilized by the 4th Avenue/Fontana Bicycle Boulevard.

crossing traffic. Glenn can also be expected to receive increasing traffic volumes particularly during the many years of planned construction associated with the Grant Road Widening project.



Accident density for both pedestrians and bicyclists is very high along Glenn Street, and several accidents have taken place at the intersection of Glenn and Fontana itself.

General Master Plan

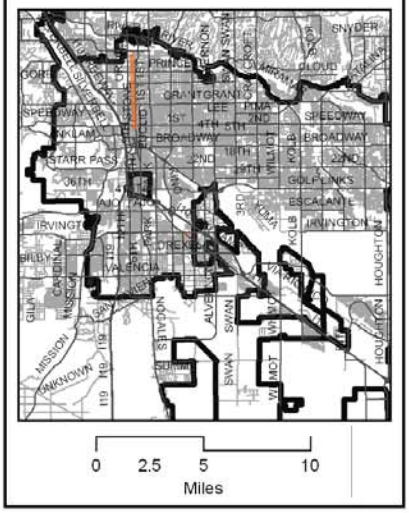


4th Ave/Fontana Bicycle Boulevard General Master Plan

- Proposed Hub
- Existing HAWK
- Proposed HAWK
- Proposed Toucan
- Existing Traffic Circle*
- Proposed Traffic Circle*
- Proposed Blvd. Junction*
- Proposed Blvd. Mark
- Proposed Diverter
- 4th Ave./Fontana Bicycle Blvd.
- Pavement Resurfacing
- Other Proposed Bicycle Blvds.
- Future Route Extension

0 .25 .5 Miles

*Note: all traffic circles are to be yield controlled.



General Design Elements

Distinctive Signs

Pavement Markings

Surface Conditions

Traffic Calming

Bicycle Amenities

Improved Crossings

Secure Bicycle Parking

Street Trees and Walking Paths

Drinking Fountains

Distinctive Signs

Distinguishing the Bicycle Boulevard

The signs and pavement markings found along a bicycle boulevard should communicate clearly to all users that they are on a particular type of shared-use roadway--one where bicyclists are prioritized. It is important that all signs communicate the special nature of the path to cyclists, pedestrians and motorists, and that it be both clear and legible, as well as uniform and recognizable throughout the city.

It is particularly important that vehicular drivers understand that on a bicycle boulevard cyclists share the main lane with cars. Highly visible and distinctive pavement markings help communicate this crucial attributes of a bicycle boulevard. Signs and markings also work together to brand and advertise the boulevard, and help create an identifiable symbol of bicycling in Tucson.

Figure 1: Proposed Tucson Bicycle Boulevard Identification Sign

Bicycle Boulevard Signs

All bicycle boulevard specific signs proposed here are to be made of a distinctive retroreflective blue with white lettering to distinguish them from other types of road signs. Signs may use text letters no smaller than 2 inches tall to ensure legibility.

Bicycle Boulevard Identification Sign (Figure 1)
Identification signs are the smallest of the bicycle boulevard signs proposed here, and can appear most frequently. These signs provide continuity, help with way-finding, help reveal the network to motorists and bicyclists, and lend identifiable character to the system. Signs are to be placed at every other block corner, except where another bicycle boulevard sign is present.

Destination and Distance Sign (Figure 2)
Destination and Distance Signs include major destinations along a boulevard route with distance and estimated bicycling times. These tools reveal the connectivity of the network, aid in way-finding, and help bicyclists plan their trip and budget time accordingly. Signs are to be placed every 1/4 mile, prior to signalized intersections, and in the block prior to the junction of two bicycle boulevards.

Intersection Sign (Figure 3)
Intersection signs inform bicyclists that they are approaching a node

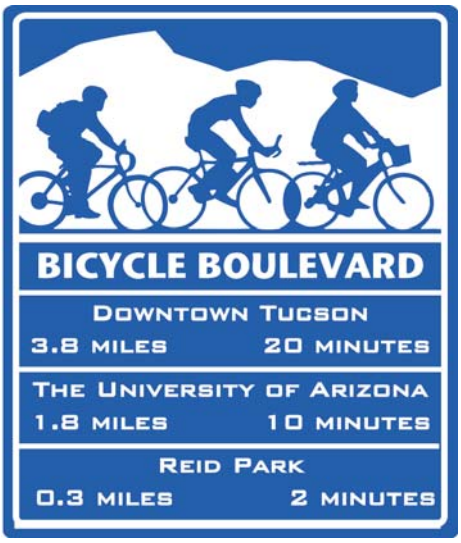


Figure 2: Proposed Tucson Bicycle Boulevard Destination and Distance Sign

where they may move on to another bicycle boulevard. Signs also indicate three main destinations along the three directional choices. Signs are to be placed mid-block in the block preceding the intersection of any two bicycle boulevards.

Directional Arrow Sign (Figure 4)
Although jogs and turns are to be generally avoided along bicycle boulevards, occasionally they are advisable or unavoidable for a variety of reasons. In such cases, recognizable bicycle boulevard signs with directional arrows help direct bicyclists and aid in way-finding. Signs are to be placed anywhere the bike boulevard path jogs or turns.

System Map (Figure 5)
System maps should be included at gathering areas along the route such as parks or bus stops, as well as on the Destination and Distance poles placed in the block leading

Figure 3: Proposed Tucson Bicycle Boulevard Intersection Sign

Figure 4: Proposed Tucson Bicycle Boulevard Directional Arrow Sign

Proposed General Guidelines for Tucson Bicycle Boulevard Signs:

1. Signs are a distinctive blue to distinguish them from other traffic and road signs.

2. Signs are made with retroreflective material for improved visibility.

3. Lettering on signs may be no less than two inches high.

4. Maps of the Tucson bicycle system are to be included at hubs and near the intersections of two bicycle boulevards.

5. Destination and Distance Signs will be placed every 1/4 mile, prior to signalized intersections, and in the block prior to the junction of two bicycle boulevards.

6. Bike Boulevard Identification Signs will be placed at every-other corner, except where another bicycle boulevard sign is present.

9. Bicycle Boulevard Intersection Signs will be placed in the block preceding the intersection of two bicycle boulevards.

8. Signs may not be obscured by vegetation or other visual impediments.

Figure 5: Proposed Tucson Bicycle Boulevard Destination and Distance Sign with a full scale bicycle system map.

up to the junction of two bicycle boulevards.

Whenever possible a six foot by seven foot box should be set aside in the parking lane directly in front of the system map. This set-aside is to accommodate bicyclists who pull over to consult the map.

Markings and Surfaces

Pavement Markings

Pavement markings supplement signs, serving to remind users that they are on a bicycle boulevard, that cyclists take the lane, and help aid cyclists in way-finding. The two main pavement treatments are lane stripes and bicycle boulevard-specific pavement markings.

Lane Stripes
Bicycle boulevard stretches with heavy use of on-street parallel parking shall include a 12-inch wide white Type 1 tape or thermoplastic parking lane stripe placed 8 feet from the edge of curb. This will help define where cars may park, help visually alert drivers and cyclist that a car is moving in to the lane, and provide a visual buffer between parking and drive lanes.

Bike Boulevard Pavement Marking (Figure 6)
Bicycle boulevard pavement markings are car-sized white pavement markings that depict a bicycle, the abbreviation of 'boulevard' and a directional arrow. These markings are to are to be applied directly to the road surface, in the center of the drive lane, with a 4 to 6 inch wide white thermoplastic paint. Markings should be placed in each direction of traffic just after every intersection, near high volume driveways or other potential conflict points, and at no more than 200 foot intervals. Where the bicycle boulevard turns or jogs the arrow should be turned 45 or 90 degrees in the appropriate direction to help aid in way-finding.

Figure 6: Proposed Tucson Bicycle Boulevard Pavement Marking

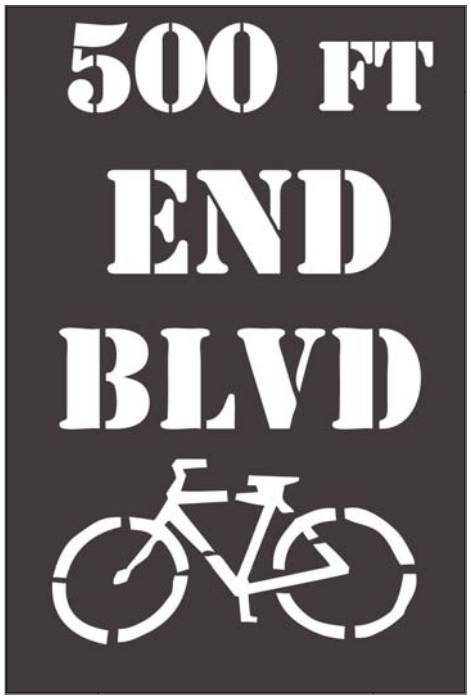


Figure 7: Proposed Tucson Bicycle Boulevard End Pavement Marking

Bicycle Boulevard End (Figure 7)
Bicycle boulevard pavement markings can also advertise an upcoming path end. When needed these should be located in the same place as standard pavement markings, and with sufficient advance warning to allow bicyclists to process the information and make appropriate decisions prior to the change. Advance warning of the end of a bicycle boulevard is indicated on the pavement surface with "END" replacing the arrow, and a count in feet until the end of the path as shown in Figure 7. These should be placed 500 and 200 feet prior to the end of a bicycle boulevard.

Surface Conditions

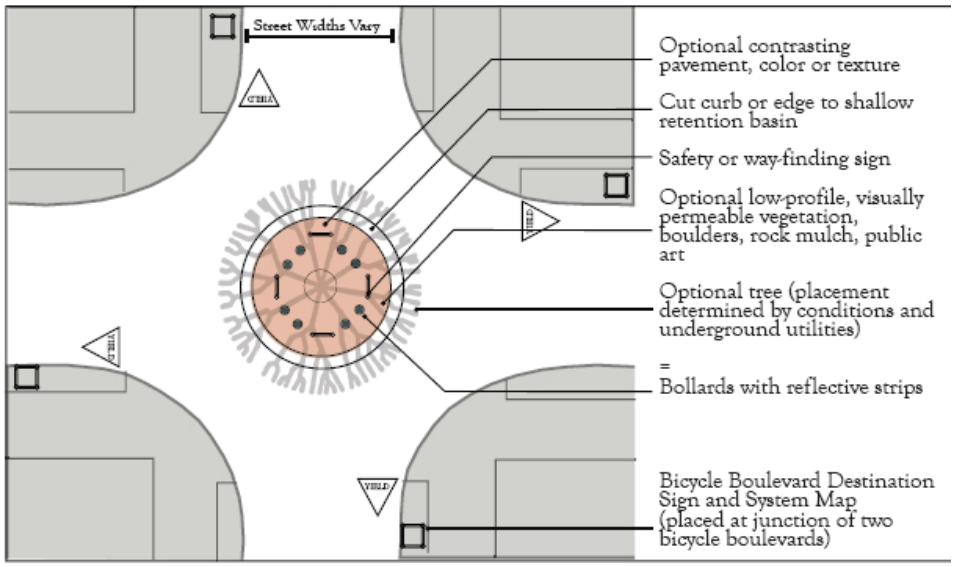
The paving and surface maintenance schedule of bicycle boulevards should be increased to levels of arterial roads to ensure a safe, comfortable surface for bicycling. Along 4th Avenue/ Fontana Bicycle Boulevard the area with the most immediate need for resurfacing is that between Speedway and Seneca.


Potholes, cracks, and other surface imperfections can significantly impact the comfort and safety of a bicycle rider.

Traffic Calming

Traffic Calming

Traffic calming measures can be separated into two groups based on the main impact intended: volume control and speed control. The distinction between the two types of measures is not always firm, as speed control measures frequently divert traffic to alternate routes, and volume control measures usually slow traffic as well. Both volume and speed control measures have been proposed for 4th Avenue/ Fontana Bicycle Boulevard.



Typical traffic circle design along 4th Avenue/Fontana Bicycle Boulevard.

Volume Control

Volume control measures are primarily used to address cut-through traffic problems by blocking certain movements and thereby discouraging and diverting traffic to streets that prioritize more efficient vehicular flow. Volume control measures include full and partial closures, diagonal diverters and medians. Closures and diverters direct cars to alternative routes, often main thoroughfares better suited for vehicular traffic, while allowing bicycles and pedestrians to safely continue along the route. Medians sit in the middle of the road and prevent left and "U" turns.

Speed Control

Speed control measures are primarily used to address speeding problems by changing vertical or horizontal alignment, or by narrowing the roadway. Proven speed control measures include speed humps and speed tables, street trees, high-visiblity crosswalks, chicanes and traffic circles.

To be effective along a section of roadway speed humps should be placed in series at 200-600 feet intervals in consideration of the geometries of the roadway, and spaced no further than 275 feet apart. The first speed hump in a series should be placed 50 to 200 feet from a small radius curve or stop sign.

Although effective at slowing traffic, humps also create some noise, and many drivers and bike riders find humps frustrating and uncomfortable to navigate. These devices also lack positive aesthetic value, providing no other benefits but pure speed reduction. For these reasons other speed control devices are preferred along bicycle boulevards.

Traffic circles are to be placed at regular intervals, preferably every other block, along bicycle boulevards, as supported by the surrounding neighborhood. Maintenance needs can be minimized with circles that feature sculpture, distinctive paving, bollards, or other nonliving, low-maintenance elements. When needed, circles can be modified in size to facilitate the passage of wide-chassis emergency vehicles such as fire trucks. All traffic circles are to be controlled by a four-way yield.

Chicanes help calm traffic by visually narrowing the roadway, and can also provide space for landscaping.

Bicycle-Specific Amenities

Crossings

The 4th Avenue/Fontana plan includes a proposed, and two existing HAWKS (High Intensity Activated Crosswalk.) These signals are on/off units activated by buttons. For all HAWK intersections along bike boulevards, bike buttons should be placed at either the right hand side of the roadway, or on a bicycle island placed just to the left of a vehicular right-turn-only lane, so that bicyclists need not dismount or cross travel lanes to reach the button. Medians can also be used at crossings to provide refuge for pedestrians and bicyclists, and allowing crosser's attention to be safely focused in just one direction at a time. These kinds of refuge islands are strongly recommended for large arterial crossings along bicycle boulevards.

Medians can provide refuge for pedestrians and bicyclists, allowing crosser's attention to be safely focused in just one direction at a time.

Parking

The security of personal belongings is a concern for bikers. As such providing bicycle parking facilities is an essential element in an overall effort to promote bicycling.

Bike buttons must be placed where bicyclists can reach them safely and easily.

The wide variety of bicycle parking devices are generally grouped into two classes, long-term and short-term. Long-term bicycle parking facilities provide a high degree of security and protection from the weather. These bicycle parking facilities are usually lockers, cages or rooms in buildings. Short-term facilities provide a means of locking the bicycle frame and both wheels, but do not necessarily provide accessory and component security or weather protection.

The bike parking need along 4th Avenue/Fontana is focused primarily on more parking spaces at more locations. Bike Corrals may be part of the solution at busy nodes along this route. Corrals utilize either sidewalk space or a automobile parking space to provide a large number of bicycle parking spaces. Twenty one bicycles will fit in a single traditional parking space. Corrals may be enclosed or covered. Covered bike parking areas are preferred, particularly in very hot and sunny, or very rainy, locations.

Providing secure bicycle parking at bus stops along the route also helps users combine these different modes of transport in a more flexible manner.

Secure bicycle parking in conjunction with transit stops can help users take advantage of multiple modes of transport.

Other Amenities

Pedestrian Paths

To take full advantage of the amenities of traffic calming, shade, landscaping, drinking fountains and improved crossings associated with a bicycle boulevard in Tucson, these paths should function simultaneously as pedestrian boulevards. By repairing and building continuous, safe sidewalks and walking paths for pedestrians along side the bicycle boulevard, neighbors and walkers can enjoy this improved walking environment more fully.

Lighting

Fixed-source lighting to improve visibility along paths and at intersections allows the bicyclist to see the path direction, surface conditions and obstacles. Lighting for bicycle boulevards is thus important and should be considered particularly where night usage is expected, such as on paths serving large populations of college students or commuters, and where nighttime security could be a particularly salient issue.

Depending on the location, average maintained horizontal illumination levels of 5 lux to 22 lux should be considered. Where special security problems exist, higher illumination levels may be considered. Light standards and poles should meet the City recommended horizontal and vertical clearances for pedestrians and evenly illuminate the boulevard lanes.

Public Art

Public art helps create the unique feel and look of a bicycle boulevard, and can bring increased interest and involvement from the community at-large. Public art should be incorporated into traffic calming devices and hubs at regular intervals. The specific form and type of art should be determined in conjunction with the surrounding neighborhoods, and must meet all relevant requirements of the City. Art should also be weather, theft and vandalism resistant. Art should be locally commissioned or produced as the result of a local competition, and address themes of bicycling, or relate to the local history or character of the location at which it is placed. Art may also be themed along a corridor to provide continuity and interest. Artistic or decorative bicycle racks and parking shelters may also be used, as long as all general parking standards are met.

Landscaping

Plant selections along bicycle boulevards should emphasize a sense of place in the Sonoran Desert, and be hardy, water conscious and desert appropriate. If properly planted and maintained, these plants should be easy care, water efficient, and attractive amenities for the neighborhood, bikers and pedestrians alike.

Street trees can significantly reduce surface temperatures and increase the appeal of a roadway. In addition to increasing the comfort and aesthetic qualities of a bicycle boulevard, street trees are known to have a traffic calming effect.

Street trees should be planted between sidewalks and roadways where possible to provide maximum shade for both bicyclists and pedestrians. A minimum of three feet of planting space is required for healthy tree growth. Medians should also include shade trees as long as there is a minimum of five feet of width, and mature tree canopies won't interfere with the movement of traffic.

The selection of a single species for distinguishing a bicycle boulevard, can be an effective design strategy, particularly if the species selected has a seasonal color or significant bloom to showcase. Mono-plantings may however be inadvisable if the species selected is at all susceptible to diseases or pests, as the entire corridor could suffer from one infestation or outbreak. It is also difficult to achieve the intended design effect, at least in the short to medium term, if already existing street trees are of another species.

In order to maintain clear sight lines and maintain safety and security on the roadway and in public areas, trees must be maintained with a lower canopy height of no less than 7 feet.

University and 4th Avenue

Bicycle Parking Corral at University Avenue

Ample bicycle parking allows bicyclists secure and convenient access to area stores, restaurants and other destinations, and serves the area during special event such as the 4th Avenue Street Fair. A bicycle corral the size of one parking space provides parking for 21 bicycles. A new mounted bicycle system map helps with way-finding and trip planning.

Speedway and 4th Avenue

Intersection with Major Arterial, Typical. 4th Avenue looking north. Including pavement markings, signs , limited vehicular access across major arterial, and vehicular route continuity along Boulevard.

Speedway and 4th Avenue

North side of 4th Avenue and Speedway looking north. Including pavement markings, signs , limited vehicular route continuity along Boulevard and Bicycle Boulevard Entry Feature with bicycle themed public art. .

A distinctive Bicycle Boulevard Entry Feature at Speedway and 4th Avenue would help increase the visibility of the bike boulevard, attract potential new riders, and make motorist aware that driving conditions along this road are now prioritizing bicyclists.

By restricting north-bound vehicular traffic and limiting south-bound traffic to right-turn-only, as well as providing a more visible crosswalk, the design improves both pedestrian and bicycle safety and connectivity. The bicycle boulevard entry feature helps calm traffic and simultaneously advertises the presence of a bicycle boulevard to all who traffic this popular stretch of busy Speedway Boulevard.

4th Avenue and Lester

Traffic Circle Treatment, Typical

Features pavement markings, way-finding and branding sign, yield signs for bike boulevard, two-way stop sign for cross traffic, and traffic circle (with or without bollards and vegetation.)

4th Avenue and Seneca

High-Visibility Pedestrian Cross Walk

Including colored cross walk to Mansfield Park, bollard lighting and way-finding pavement markings, this crossing will help calm traffic as it moves along the eastern edge of Mansfield Park, improving the safety of crossers to and from El Cortez Heights neighborhood.

Sahuaro Street

On-Street Parking Zone, Typical

Including parking stripe and way-finding pavement markings.

Fontana and Glenn

Intersection with Glenn Street

Including painted cross walks, safety and way-finding signs , limited vehicular entry access off arterial road, limited vehicular route continuity along Boulevard, and pedestrian beacon.

Fontana Mid-Block

Mid-Block Treatment, Typical

Including parking stripe, way-finding pavement markings, way-finding and safety signs, street trees, and back-of-curb path system

Phasing and Cost Estimate

PHASING

Once completed, the Fourth Avenue/Fontana Bicycle Boulevard will serve as an active model of Bicycle Boulevards in Tucson. As such, it's success and popularity may well be critical to realizing the future expansion of a Tucson Bicycle Boulevard network.

The plan presented here tries to present a complete Bicycle Boulevard that not only serves bicyclists, but also the neighborhoods it traverses with much needed amenities such as shade, safer crossings and drinking fountains. The wide-spread community and neighborhood support demonstrated for this project was based on this vision of a Bike Boulevard, and should not be compromised.

In order to meet the expectations and desires of users and neighbors, yet address the realities of limited budgets, the project has been conceived of as being completed in two phases.

Phase one would include the basic skeleton of a Bicycle Boulevard, as well as the trees that need time to grow to provide adequate shade. Phase two would include the artistic elements that combine to make this Bike Boulevard unique. Phase one would include traffic calming through the traffic circles, replacing stop signs with yield signs, installing way-finding signs, pavement markings, a drinking fountain at Glenn and Fontana, and the crosswalks at Seneca and Glenn. It also includes the street tree program and watering regime. The total cost of installation for phase one would be approximately $220,000.

Phase two would build on these elements by incorporating community art pieces that might also serve as entry signs for each of the neighborhoods along the route. This phase would add approximately $30,000 to the cost of the project.

ITEM DESCRIPTION	UNIT DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
Traffic Circles	Traffic Circle.	11	$10,000	$110,000
Yield Signs	4 at each traffic circle.	52	$200	$10,400
Way-Finding/ Branding Signage	To match standard for Tucson Bike Boulevards. One in each direction every block.	40	$500	$20,000
Pavement Safety Markings	Parking stripes- 4 inch wide.	Approx. 1 mi	$1.50/ linear foot	$7,620
Pavement Safety Markings	Crosswalks-18 inch stripes.	9	$4.50/ linear foot	$4,050
Pavement Legends	Two in each direction every block, at beginning and mid-block. Thermoplastic tape.	80	$150	$24,000
Drinking Fountain	Location as marked on plan.	1	$2,000	$2,000
Bike Racks	Placement to be determined.	10	$150	$1,500
Public Art	One per neighborhood. Placement and type to be determined.	6	$5,000	$30,000
Street Tree System with 18 month water contract	As needed to make continuous along Bicycle Boulevard corridor and Lester Street.			$40,000
TOTAL				$249,570

Note:
Drachman's cost estimates are based on similar TDOT projects, are approximate, and are not for final planning or construction purposes.