Kino Parkway Overpass at 22nd Street

# Environmental Design and Mitigation Report

Prepared for

**City of Tucson and**
**Regional Transportation Authority**

Prepared by

**AECOM**
**1860 East River Road, Suite 300**
**Tucson, Arizona 85718**

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# 1.0 INTRODUCTION

## A. Project Background

An overpass at the intersection of Kino Parkway and 22nd Street has been a vision of the community for many years, beginning with the planning of the Butterfield Route in the 1960s and continuing through the Regional Transportation Authority (RTA) plan that voters approved in May 2006. The Kino Parkway intersection is included in the RTA plan as part of the 22nd Street corridor from Interstate 10 (I-10) to Tucson Boulevard, RTA Project Number 19. In addition, funding for the intersection improvement project is also included in the Pima County Bond program, which voters approved in May 1997. This Environmental Design and Mitigation Report (ED&MR) has been prepared specifically for the Kino Parkway/22nd Street intersection improvements (see Figure 1).

**Figure 1: Project Vicinity Map**

Operations at the Kino Parkway/22nd Street intersection are problematical due to the close proximity of the traffic signal on 22nd Street at Cherry Avenue/Cherrrybell Stravenue, and the traffic signal on Kino Parkway at Barraza Aviation Parkway. Approximately 80,000 vehicles per day (vpd) pass through the intersection with an almost even distribution of 40,000 vpd each on 22nd Street and on Kino Parkway. During peak periods in the morning and evening, the intersection currently operates at level of service E (LOS E). The proposed improvements will create a grade separated interchange with Kino Parkway over 22nd Street. In addition, the capacity of 22nd Street will be improved by increasing the number of travel lanes from its current five-lane section with two lanes in each direction to three lanes in each direction with a

raised median. The improvements will also provide greater pedestrian and bicycle safety with new bike lanes and sidewalks, and improve existing transit service with new bus pullouts.

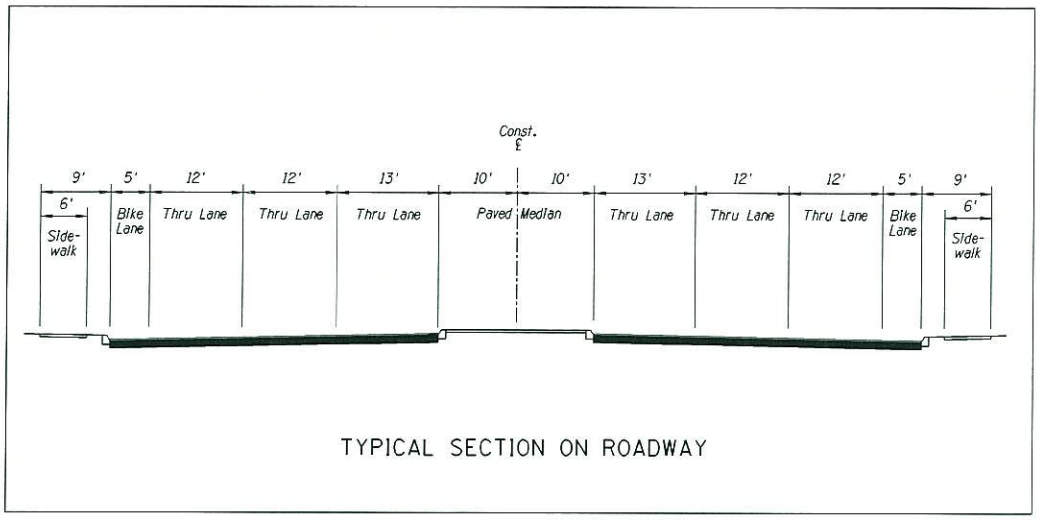
Planning for the improvements to the Kino Parkway/22nd Street intersection has followed the process detailed in the City of Tucson's *Roadway Development Policies*. In keeping with these policies, an Advance Planning Report (APR) and an Alternative Alignment Report (AAR) have been prepared. The APR, which was approved by the Citizens Transportation Advisory Committee in November 2007, documented the need for the project, provided a general overview of the existing conditions, and briefly described three alternatives to be taken forward into the AAR. The AAR was prepared to evaluate the alternatives from the APR and to document the process for selecting the preferred alternative. The AAR was endorsed by the Technical Advisory Committee and Citizens Advisory Committee before being approved by the Mayor and Council on November 18, 2008.

## B. Recommendation and Findings of the Alternative Alignment Report

Three alternative interchange configurations were developed for the Kino Parkway/22nd Street intersection. All three configurations are grade separated with Kino Parkway passing over 22nd Street, and they utilize a six-lane divided roadway with bike lanes and sidewalks with American with Disabilities Act (ADA) access ramps. The original typical section as depicted in the AAR is shown in figure 2. (Note that these typical roadway sections have since been refined as shown in section 3.0 D Additional Design Elements) The three alternatives were:

- A single point urban interchange (SPUI)
- A traditional tight diamond interchange
- A partial cloverleaf interchange with the cloverleaf portion to the south of 22nd Street

A comparative impact assessment of the alternatives was performed that considered several project elements. These elements included: traffic operations during and after construction, alternative modes (bus and bike routes and pedestrian facilities), drainage, utilities, right-of-way, bridge structures, zoning, and land use opportunities. A decision matrix was used to evaluate which alternative provided the best overall solution for the intersection. Through the matrix evaluation process, it was determined that the SPUI was the preferred interchange configuration. A copy of the matrix evaluation is contained in Appendix A. This interchange configuration was selected for the project and approved in November 2008 as described earlier.



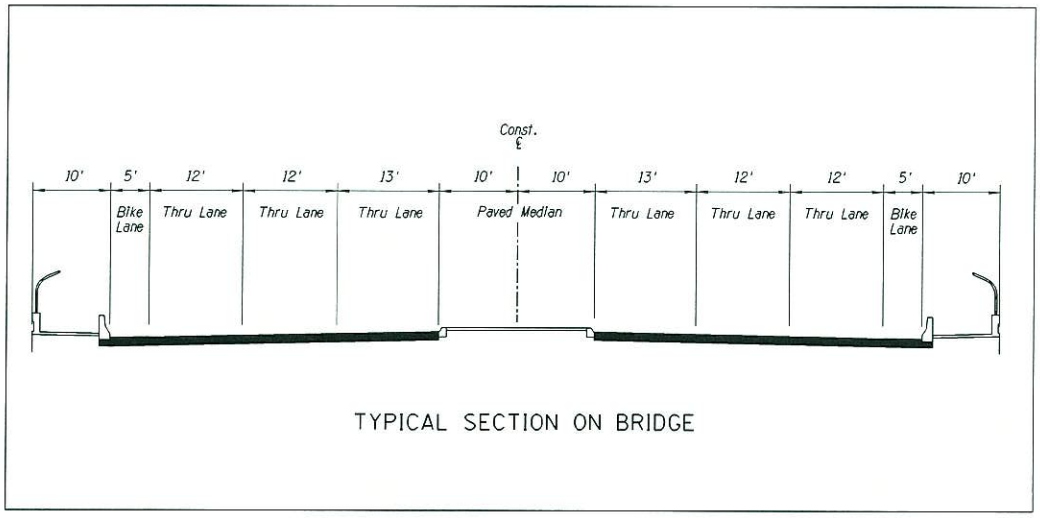




**Figure 2: Typical Section**

The selected interchange alternative, the SPUI, is shown in Figure 3. The SPUI configuration provides dual left turns in all directions, thru movements on 22nd Street, and dedicated right-turn lanes in all directions at the traffic signal for 22nd Street. No thru movements are allowed at the SPUI ramps across 22nd Street. In addition, a partial signal will be located at 22nd Street and Cherrybell Stravenue to provide westbound traffic left-turn access to local businesses southeast of the intersection, the main post office on Cherrybell Stravenue, and Pueblo Gardens south of Silverlake Road. Access at Cherrybell Stravenue on the south side of 22nd Street is limited to right-turn in, right-turn out.

After the AAR was made available, the public and the Citizens Advisory Committee provided comments. Two members of the Citizens Advisory Committee also prepared a minority report to accompany the committee's endorsement of the AAR. All of these comments were considered in preparing this ED&MR, and the 15% design plans. A representative summary of these comments included:

- A loop road running adjacent to the Union Pacific Railroad property will impact the existing active spur. Consider reconfiguring the loop road.
- The Campbell Avenue connection under the Union Pacific Railroad (UPRR) Bridge is an important link that needs to be maintained.
- The 23rd Street extension between Highland Avenue and Park Avenue is needed to provide access to businesses and residents on 23rd Street.
- Access into and out of the area northwest of the interchange will need to be improved. Per the minority report, consider the following:
  - Providing a connection to the southbound Kino off ramp via 21st Street.
  - Installing a traffic signal at Santa Rita and 22nd Street intersection
  - Installing a traffic signal at either Park Avenue and 18th Street or Park Avenue and 19th Street intersection.
- Bike lane access through the SPUI needs to be safe. Consider using the "green" lanes on Kino where bike lanes cross ramp exits and entrances.
- Will turning movements at Kino and Barraza-Aviation be eliminated as a result of this project, or will they be eliminated when a 22nd Street connection to Barraza-Aviation is made?
- Proper signage to direct traffic into the quadrants will be needed.
- Billboards are an eyesore for the area. Can they be removed as part of this project?

A listing of all comments received is contained in Appendix B.

## C. Mayor and Council Direction

In the public hearing that was held on November 18, 2008, the Mayor and Council gave direction to the team to continue to seek ways to mitigate the circulation issues that were mentioned in the minority report that accompanied the AAR. In addition, they requested that consideration be given to using 11-ft travel lanes on 22nd Street, a continuous bike lane on the Kino Parkway Bridge, and multi-purpose path for pedestrians and bicyclists adjacent to Kino Parkway for direct access to 22nd Street.

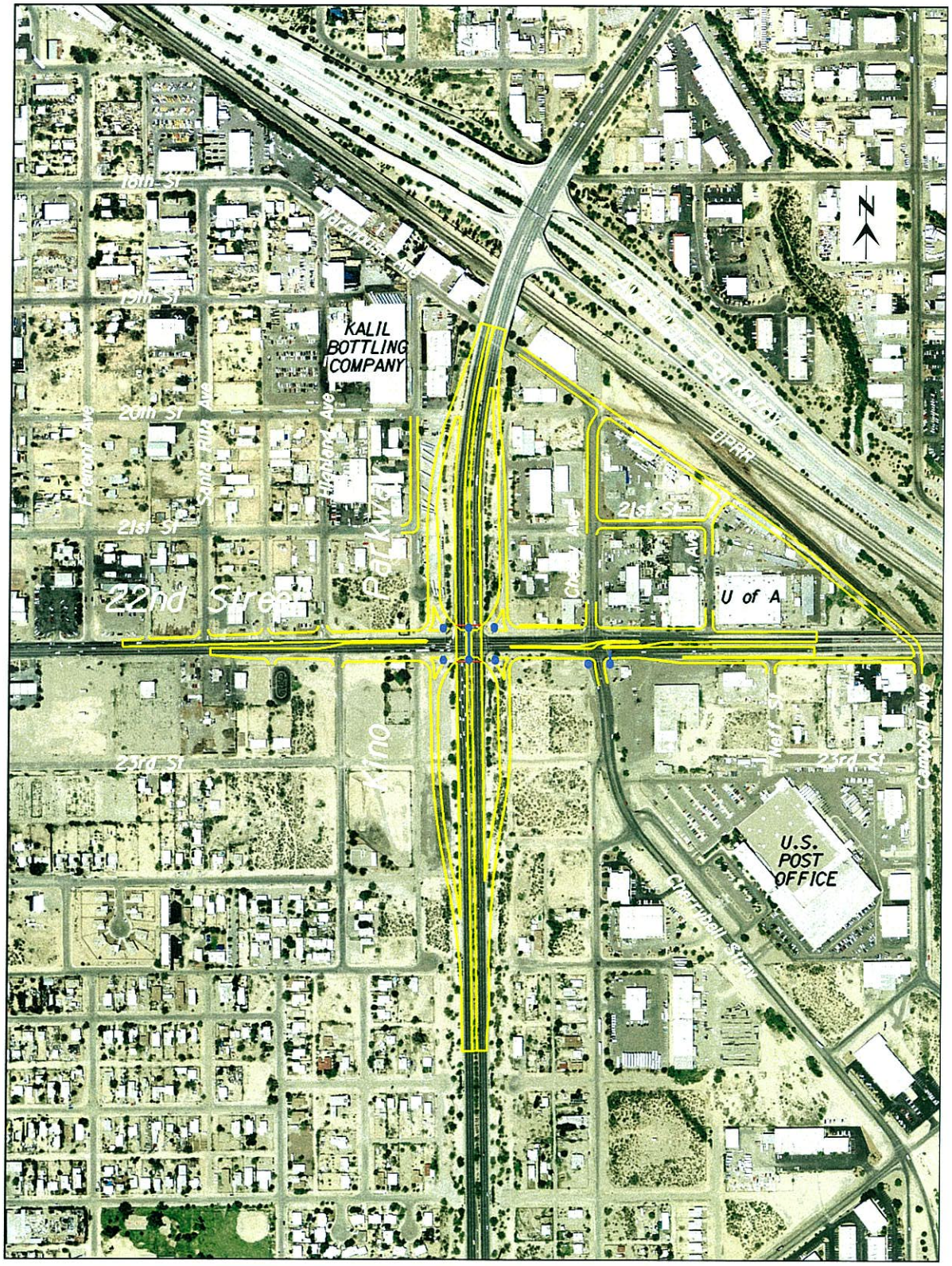



**Figure 3: Preferred Alternative**

# 2.0 Inventory Of Existing Conditions

The proposed improvements generally extend along Kino Parkway from 28th Street to Murphy's Overpass, and on 22nd Street from Fremont Avenue to Campbell Avenue. The project limits, however, have been expanded to include the collector road system and other peripheral improvements needed to enhance circulation between the four quadrants surrounding the intersection. The project area is shown in Figure 4.

## A. Environmental

### Topography

The topography of the area surrounding the project is generally flat with gentle slopes of less than 0.70%. A ridge runs southeast to northwest dividing the project area at about Cherrybell Stravenue. On the east side of the ridge, the land falls to the northwest, and on the west side of the ridge, the land falls to the west. The 22nd Street Bridge over the UPRR and Barraza-Aviation Parkway and the Kino Parkway Murphy's Overpass are the only significant topographic features that rise above the surrounding area. The 22nd Street Bridge is approximately 30 feet above grade, and Murphy's Overpass is approximately 33 feet above grade.

### Drainage

The City of Tucson has identified regional watersheds for the entire city. Each watershed has been classified as a balanced basin, a critical basin, or a non-designated basin. The project area is located in the Tucson Arroyo watershed and the 18th Street Wash watershed. Both of these watersheds are non-designated basins, meaning that detention/retention requirements may be waived for new development provided the new or existing stormwater conveyance facilities can safely convey the increased on-site runoff without increasing flood hazards to adjacent properties.

There is only one wash crossing in the project area. A tributary to the Railroad Wash is conveyed in an open channel that runs adjacent to Campbell Avenue, and crosses under the 22nd Street Bridge at the far east end of the project limits. The tributary is within a FEMA mapped floodplain (Appendix C) and has a 100-year flow of approximately 670 cubic feet per second.

Drainage facilities in the project area are limited (see Figure 5). Kino Parkway is raised and pipe culverts under Kino Parkway convey stormwater from the east into the residential area west of the parkway. The pipe culverts are in line with the east-west local streets, and the streets are the only conveyance system for more than one-half mile downstream of the parkway. A small storm drain system drains the Kino Parkway/22nd Street intersection. The system extends to a small outfall channel that runs adjacent to Kino Parkway and empties directly onto Warehouse Avenue at the north end of the project area.

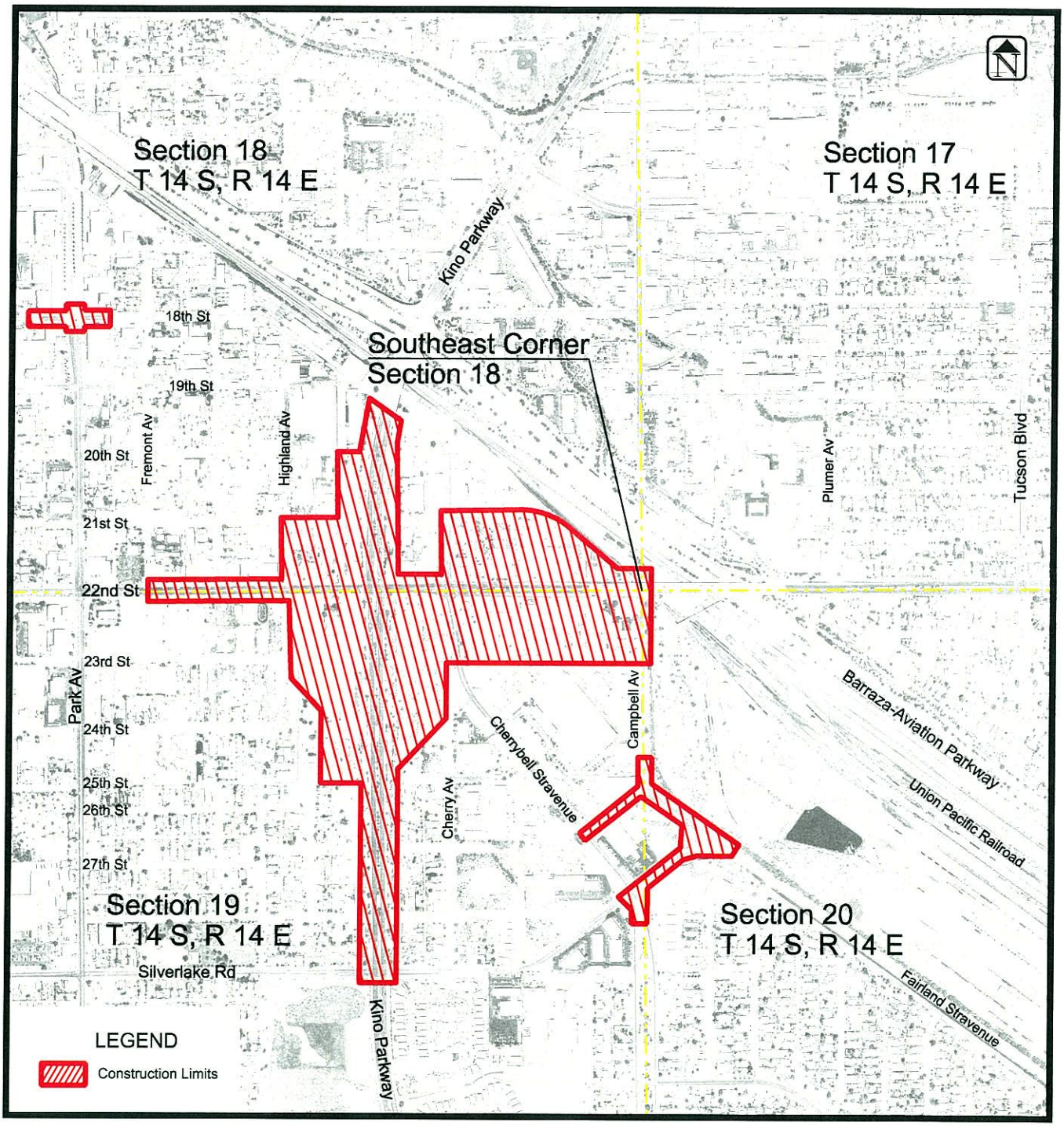



**Figure 4: Project Location**

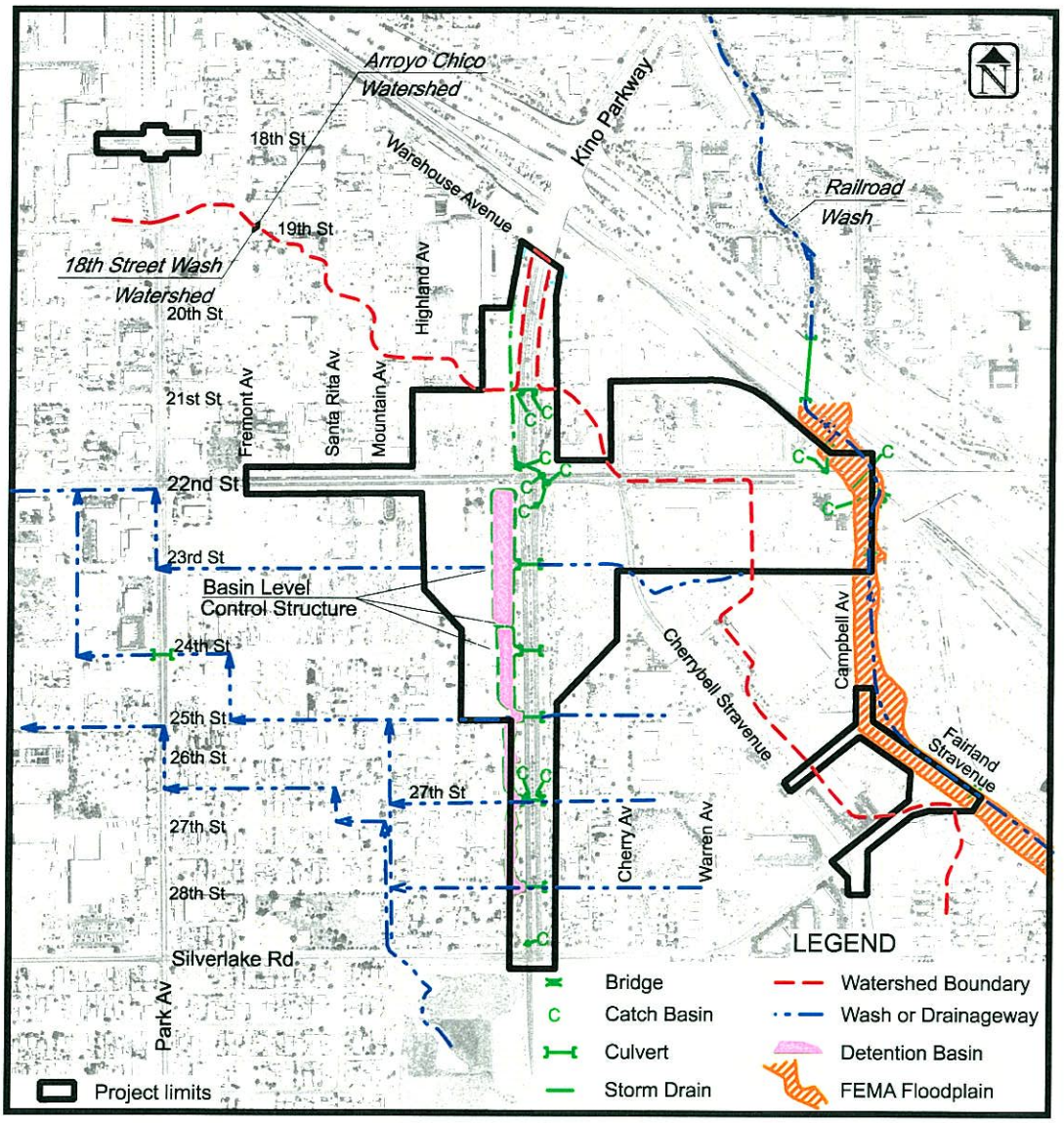



**Figure 5: Existing Drainage Facilities**

Floodplain Complaint and Field Investigation Reports were obtained from the City of Tucson. The records reviewed for this project covered the area bordered by Tucson Boulevard on the east, Park Avenue on the west, 18th Street on the north, and Silverlake Road on the south. A total of 25 complaints concerning flooding were received from residents and merchants in this area between March 1984 and April 2009. The nature of the complaints typically involved local flooding caused by clogged facilities or sheetflow breaking out of streets and impacting adjacent structures.

Conversations with area residents have brought to light additional drainage issues particularly west of Kino Parkway. The capacity of the street conveyance system is not sufficient to carry large flows, and in particular, 23rd Street and 24th Street have experienced flooding. To alleviate some of this flooding, the City has installed temporary detention facilities in the area immediately west of Kino Parkway.

### Water Quality

Only one water body exists within the project area, and is a tributary to Railroad Wash. The tributary is an ephemeral stream that runs adjacent to the east end of the project area. The project area drainage facilities currently do not provide water quality treatment of stormwater runoff entering this water body. However, UPRR has a stormwater collection pond southeast of the project area. Water from this pond is run through a water quality treatment system and is discharged into Railroad Wash downstream of the project area.

### Vegetation and Wildlife

The project is located within a previously disturbed urban environment. Vegetation on vacant parcels is sparse and comprised of a mix of upland and lowland Sonoran Desert scrub. Landscaped areas include the Kino Parkway median and sidewalk areas on either side of the roadway. There is sparse landscaping in the 22nd Street roadway median, but none in the area adjacent to the roadway. Most of the landscape vegetation within public right-of-way is comprised of irrigated, drought tolerant native, near-native, and non-native plants.

Native plants listed as protected native plants are present within the project limit. These plants are part of the existing streetscape landscape. No naturally occurring native plants are present within the project limits.

Wildlife within the area includes species such as songbirds, voles, and other small mammals that have adapted to human presence. The maintained urban landscape vegetation does not typically provide habitat for a large diversity of species. Use of these areas by small birds and mammals can attract predators to these areas.

A formal biological review has not been performed for the project. However, a search of the Heritage Data Management System (HDMS) database was conducted to determine if any Special Status Species are located in the vicinity of the project area. The search indicated that there are Special Status Species located within three miles of the project vicinity. The special status species include the Giant Spotted Whiptail, Western Burrowing Owl, Yellow-billed Cuckoo, Mexican Broomspurge, Great Plains Narrow-mouthed Toad, Sonoran Desert Tortoise, Cave Myotis, Stag-horn Cholla, and Tumamoc Globeberry. A copy of the HDMS project review is contained in Appendix D.

The Sonoran Desert Conservation Plan (SDCP) GIS map shows neither priority plant conservation areas nor priority wildlife conservation areas in or near the project. In addition, the project does not contain riparian habitat as defined in Pima County Ordinance 2005-FC2.

### View Sheds – Visual Analysis

The project is located in south central Tucson in the midst of an industrialized urban area. Local view sheds are typical for that type of land use. Because of the central location, most locations within the project area have views of the Tucson Mountains, Santa Catalina Mountains, and the Rincon Mountains. The Santa Rita Mountains to the south are less visible due to their proximity to the project. The existing bridges over the UPRR and Barraza Aviation Parkway are significant features that restrict views from the properties close to the bridges. The UPRR Bridge is a functional steel structure built in the 1960s, and has no amenities to enhance its appearance. Likewise, the Barraza Aviation Parkway Bridge is a concrete structure that also has no amenities to enhance its appearance.

This section of 22nd Street has nine billboards located adjacent to the roadway on private property. There are no billboards on Kino Parkway.

### Historical, Cultural and Archaeological

As of April 08, 2009 the National Register of Historic Places website listed no registered sites within the study area. All listings were reviewed for Pima County, Arizona.

The City of Tucson conducted a records search to determine if the proposed interchange would have any impact on a previously recorded significant archaeological or historical site. The search found that to date no previous recorded sites have been documented within the project area (Appendix E). Due to the highly urban and developed nature of the project area, the probability of encountering any previously unrecorded cultural or archaeological resources are low.

### Air Quality

The Tucson region is in attainment for all criteria pollutants. Additionally, the U.S. Environmental Protection Agency determined Pima County to be in attainment with the National Ambient Air Quality Standards for carbon monoxide in July 2000.

### Hazardous Waste

According to the Arizona Department of Environmental Quality (ADEQ) website, the UPRR yard south and east of the project area is a designated brownfield site with diesel fuel being the main contaminant in the soil. The site is participating in the ADEQ voluntary remediation program and is still considered active. The website indicates that the site is located within the UPRR yard. The UPRR yard is upslope and south of the 22nd Street alignment and outside of the limits of construction (see figure 6).

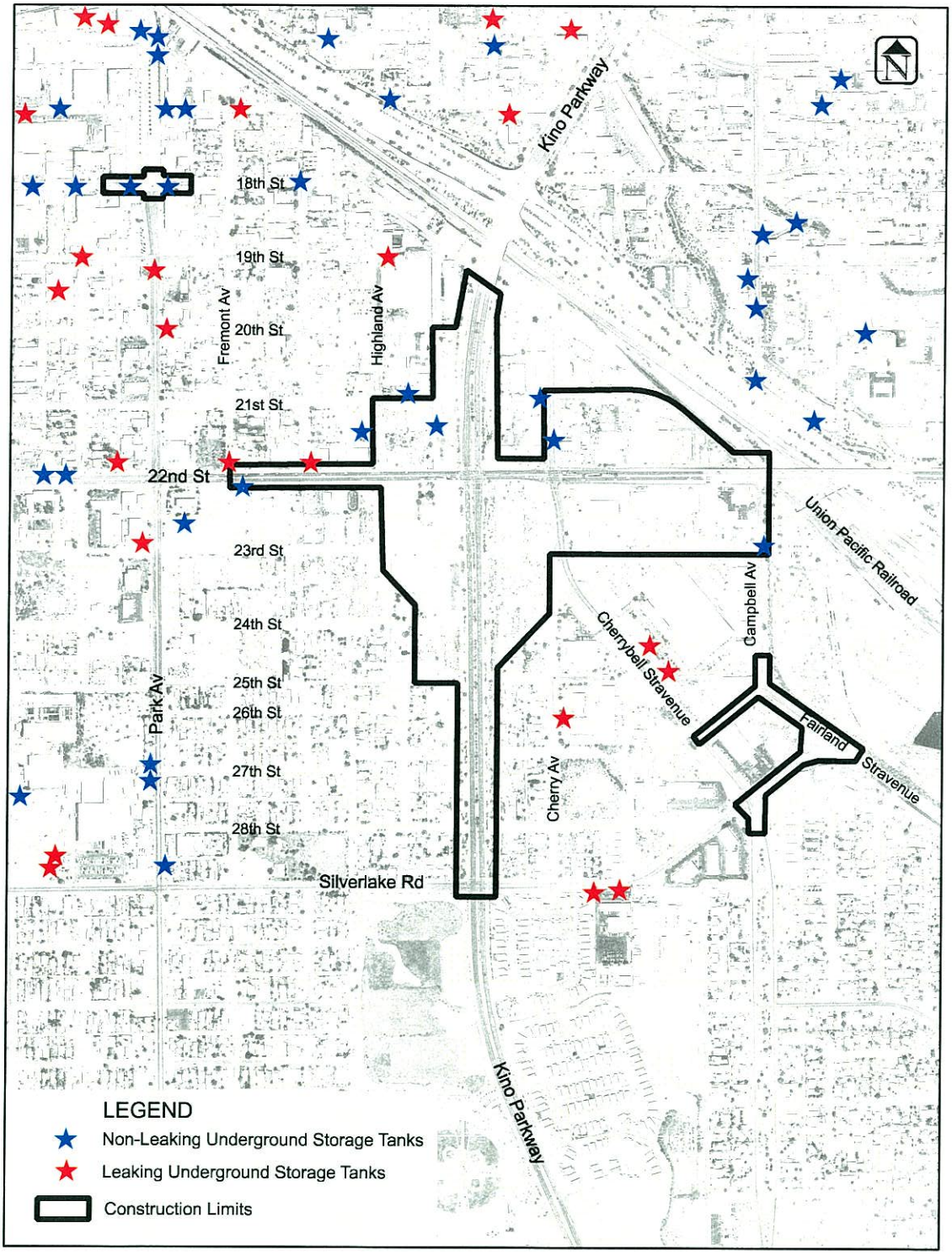



**Figure 6: Location of Identified Hazardous Waste Sites**

In addition to the UPRR brownfield site, 22 underground storage tanks were identified in and around the project area. Of the 22 storage tanks, 10 have been reported as leaking. Nine of the ten cases of reported leaking underground storage tanks have been closed, meaning corrective action has been taken, and allowable levels in the soil have been met. The remaining case is located on the United States Postal Service (USPS) site on Cherrybell Stravenue, and has a status listing of confirmed but has not yet been closed. The tanks identified by ADEQ are scattered throughout the area (see figure 6).

The proposed 23rd Street extension from Cherrybell Stravenue to Campbell Avenue crosses through an existing vacant building. The building contained a dry cleaning business in the past. The City of Tucson Environmental Services has performed a Phase 1 environmental study. The study did not find any indications of hazardous waste.

Additional potential for encountering hazardous waste exists in the buildings that will be demolished to provide right-of-way for roadway improvements. Given the age of the older buildings in the project vicinity, it is possible that lead based paints and asbestos could be found during the demolition process. The exact structures impacted and the extent of that impact on the structures has not been determined. Consequently, a survey of the structures has not been performed and the extent of asbestos and/or lead contamination, if present, is not known.

## B. Neighborhood

### Adjoining Land Uses and Property Values

The project area falls within three neighborhoods: Millville Neighborhood to the north, South Park Neighborhood to the south, and Pueblo Gardens at the east side of the project area (see figure 7). All neighborhoods have active neighborhood associations. Only one Neighborhood and Area Plan has been prepared that applies to the project area. The Greater South Park Plan covers the area north and south of 22nd Street and west of Barraza-Aviation Parkway.

Existing land use in the project area falls into four general groups: industrial/commercial, residential, private vacant land, and public vacant land (see figure 8). Two city parks, Mirasol Park and Quincie Douglas Park (also known as Silverlake Park) are located near the project, but are outside of the project limits. Generally, the land use is industrial/commercial in the northeast quadrant, a mixture of industrial, commercial, and residential in the northwest quadrant, residential with some commercial in the southwest quadrant, and a mixture of industrial, commercial, and residential in the southeast quadrant of the intersection. The major industrial facilities in the area include a bottling company, petroleum sales, construction goods manufacturing, and warehouse storage. The neighborhood has no grocery stores or health centers in the immediate vicinity of the project

The larger industrial parcels in the project vicinity include the USPS main post office in the southwest quadrant, and the Kalil Bottling plant in the northwest quadrant. Although it is outside of the project limits, the UPRR Gila sub-yard is located south of 22nd Street to the east of the project area. The maintenance yard is large, extending over one and a half miles to the southeast. The USPS facility is located just south of 22nd Street on Cherrybell Stravenue, and serves as the city's main post office, and is also a distribution center for southern Arizona.

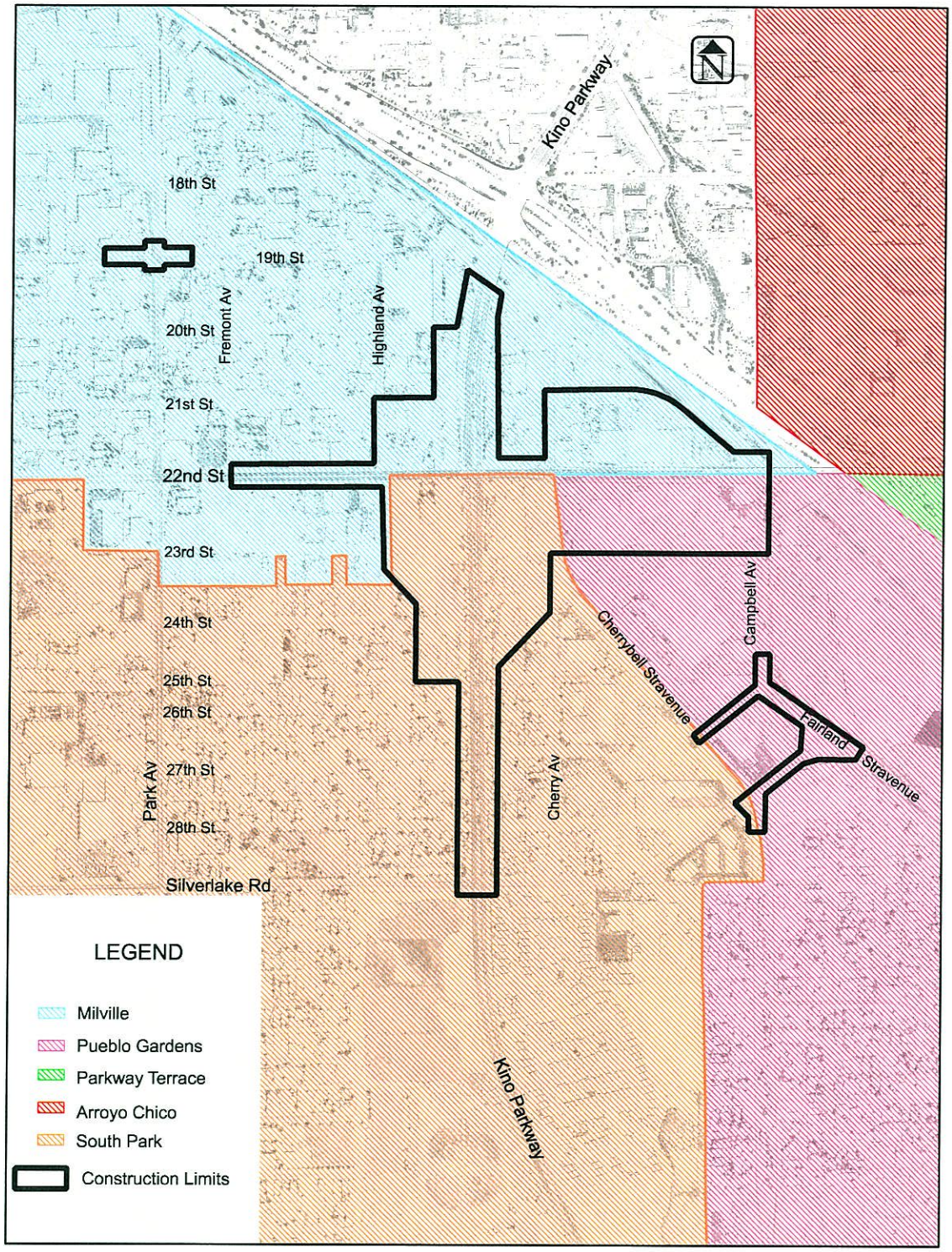



**Figure 7: Neighborhoods within the Project Area**

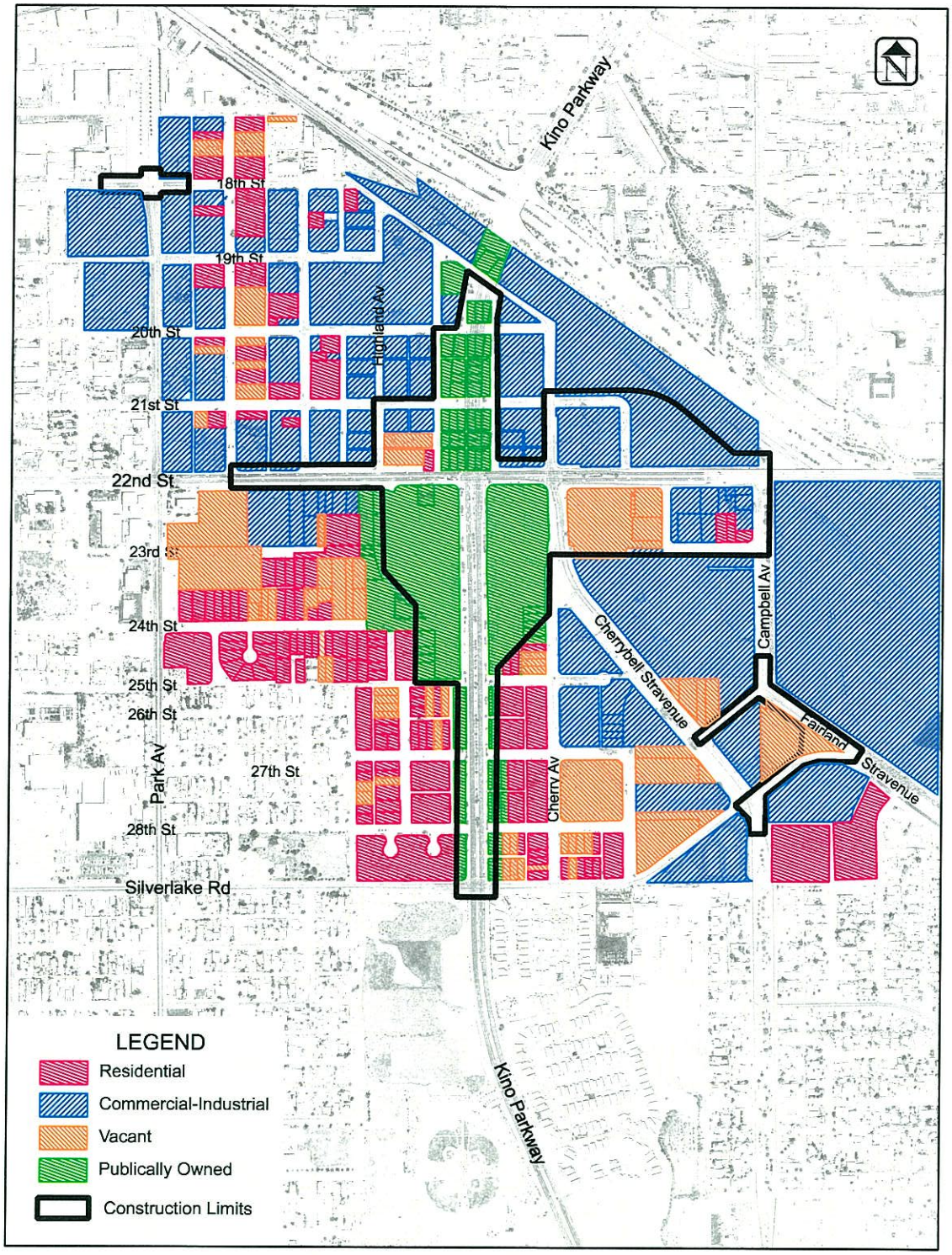



**Figure 8: Existing Land Use within the Project Area**

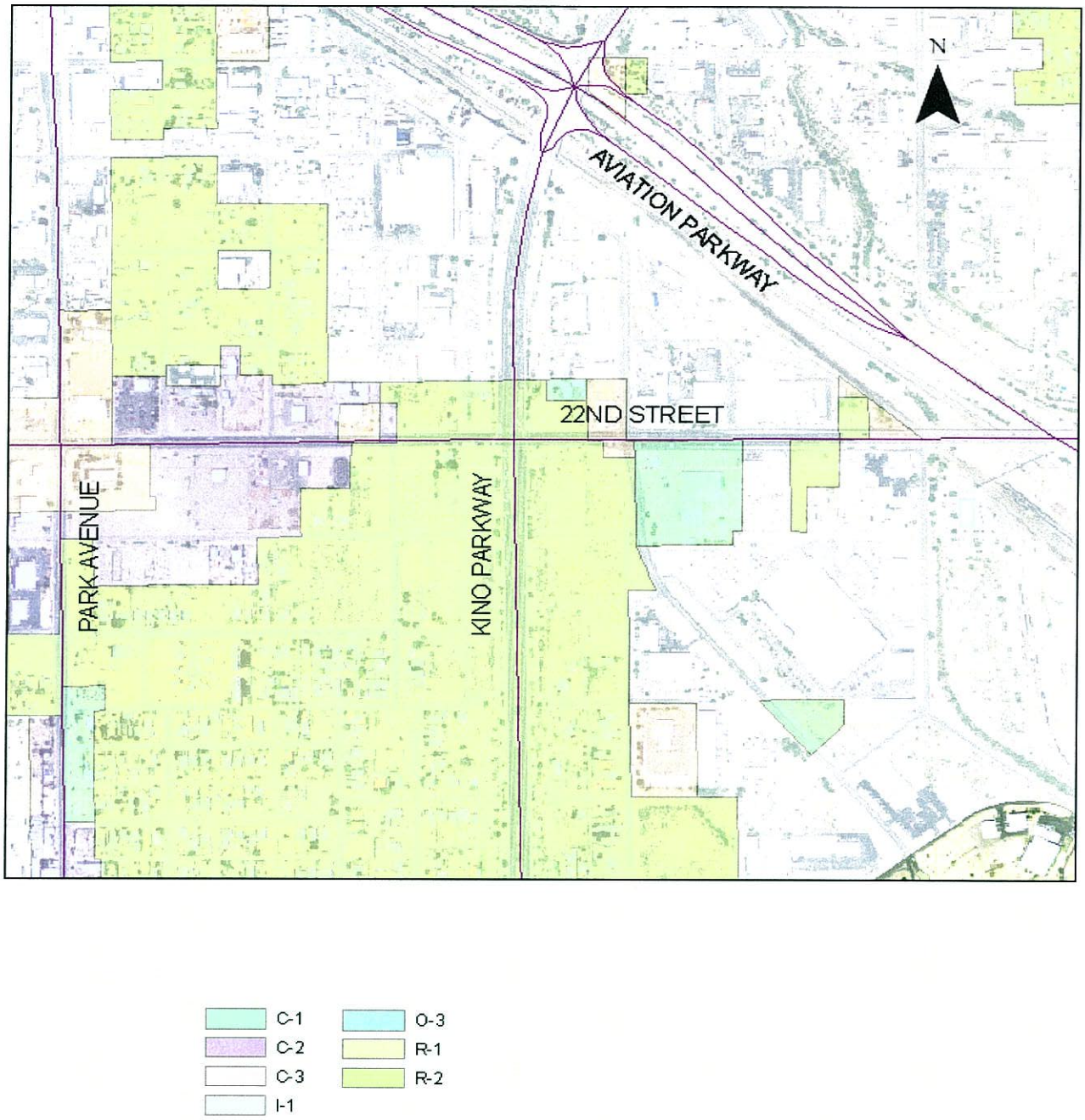



**Figure 9: Existing Zoning within the Project Area**

According to the *City of Tucson Land Use Code*, several different zoning types occur in the project area (see figure 9). The intersection itself is located in and surrounded by an R-2 zone. In addition to the R-2 zone, smaller areas of industrial (I-1) and commercial (C-1, C-2, and C-3) land use categories occur in the vicinity of the intersection. From 2010 Pima County assessor's data for the properties on 22nd Street between Santa Rita Avenue and Campbell Avenue, the average value of the vacant properties, residential properties and commercial properties in 2009 dollars is $42,300, $87,000, and $288,600, respectively

## Recreation

There are no recreational facilities in the project area. However, parks are located to the south and to the north of the project. Quincie Douglas Park, also know as Silverlake Park is at 36th Street and Kino Parkway; Mirasol Park is at Santa Rita Avenue and Silverlake Road; and a new detention drainage facility/park at the confluence of the Arroyo Chico and Railroad Washes north of the Murphy's Overpass has recently been completed.

## Access

Kino Parkway is a controlled-access facility between the traffic signals at Silverlake Road and 22nd Street, and between the traffic signals at 22nd Street and Murphy's Overpass. The access control restricts any turns off of or onto Kino Parkway except at the signalized intersections. Access on 22nd Street is controlled by a raised median in a short section of 22nd Street east of Kino Parkway. West of Kino Parkway, access is unrestricted in the five-lane section of roadway between Park Avenue and Kino Parkway. Currently, access between the northeast and southeast quadrants is provided via a traffic signal at 22nd Street and Cherrybell Stravenue, and via a short section of Campbell Avenue that crosses underneath the 22nd Street Bridge. Warehouse Avenue at the north end of the project area provides a connection between the northeast and northwest quadrants where it passes underneath Murphy's Overpass.

The 22nd Street Bridge provides the only connection between the areas east and west of the UPRR. One-way slip ramps located adjacent to 22nd Street at the west end of the bridge provide access to Neff Street and Warren Avenue. These one-way ramps together with the Campbell Avenue connection under the 22nd Street Bridge create a u-shaped circulation pattern around the west abutment of the existing bridge. The eastbound slip ramp ends at Campbell Avenue, and the westbound slip ramp ends at Warren Avenue, allowing traffic the option of either turning right onto Warren Avenue or entering the westbound 22nd Street travel lanes. Access to and from Neff Street and Warren Avenue is limited to right-turn-in and right-turn-out due to the rise in roadway elevation for the bridge over the UPRR.

## Traffic Operations

A separate traffic report detailing the existing traffic operations for the intersection of Kino Parkway and 22nd Street has been prepared for the project. According to that report, the average daily traffic (ADT) volume on 22nd Street is approximately 40,000 vehicles per day (vpd) between Park Avenue and Barraza-Aviation Parkway, and the ADT on Kino Parkway is approximately 38,000 vpd between Silverlake Road and Barraza Aviation Parkway. It is projected that volumes on 22nd Street and on Kino Parkway will increase to 73,000 vpd and 74,000 vpd, respectively, by 2030. The existing five-lane section of 22nd Street between Park Avenue and the bridge over the UPRR does not have sufficient capacity for the current ADT, and operates at LOS F. The six-lane section of Kino Parkway between Silverlake Road and Barraza Aviation Parkway better accommodates the ADT and operates at LOS D.

The surrounding signalized intersections have an impact on the traffic operations of the roadway segments between signals. The levels of service at the surrounding intersections are listed in Table 1. Typically a single lane at an intersection has a capacity of 1,100 vpd, while the roadway segment between the signals has a single lane capacity of 1,900 vpd. Consequently, the intersections are the operational elements that break down first and create restrictions in the system.

**Table 1: Level of Service at Intersections within the Study Area**

| Intersection | A.M. LOS | P.M. LOS |
|---|---|---|
| Broadway Blvd/Kino Parkway | F | F |
| Winsett Street/Kino Parkway | A | B |
| Barraza-Aviation Parkway/Kino Parkway | E | E |
| 22nd Street/Kino Parkway | E | E |
| Silverlake Road/Kino Parkway | A | B |
| 36th Street/Kino Parkway | B | B |
| Ajo Way Connection/Kino Parkway | B | B |
| 22nd Street/Park Avenue | E | E |
| 22nd Street/ Cherry Avenue | B | B |
| 22nd Street/Barraza-Aviation Parkway | A | A |
| 22nd Street/Tucson Blvd | B | C |

## Character

The character of Kino Parkway is that of a major thoroughfare with restricted access. The roadway is raised and there are no businesses or residential areas located with addresses on Kino Parkway. 22nd Street has the characteristics of an industrial/commercial arterial throughout the project area. Each of the quadrants has a unique character associated with it. The northwest and southeast quadrants are both a mixture of industrial/commercial and residential development while the northeast quadrant is almost wholly industrial. The southwest quadrant is almost entirely a residential area that was established in the mid 1900s. The area immediately east of the project area is home to the UPRR's Tucson Division Gila sub-yard. The railroad operates a very active switchyard and maintenance facility that is in service 24 hours a day. In addition, truck traffic is common where the industrial/commercial sites are located.

## Utilities

As-built roadway plans indicate that several utilities are located in 22nd Street. Kino Parkway, however, only has underground power for street lighting, and irrigation facilities in the median and the area adjacent to the roadway. Underground utilities in 22nd Street include sewer, gas, water, and power for street lighting. Overhead utilities include power, cable and telephone. Overhead facilities are located at the 22nd Street/Cherrybell Stravenue intersection, and the south side of 22nd Street between Park Avenue and Highland Avenue. The only large diameter utilities include a 30-inch-diameter water line that crosses Kino Parkway approximately 460 feet south of 22nd Street and a 78-inch-diameter water line approximately 900 feet south of 22nd Street. The 78-inch-diameter waterline feeds into a pressure adjusting station located outside of the project limits at the northeast corner of Highland Avenue and 24th Street. Light pole spacing for street lights on 22nd Street is sporadic, and appears to be limited to approach lighting for traffic signals at Park Avenue, Kino Parkway, and Cherry Avenue. Light pole spacing for street lights on Kino Parkway is approximately 200 feet apart on either side of the roadway.

### Noise

A qualitative analysis found noise levels from 22nd Street and from Kino Parkway within the project area to be typical of those on major arterial roadways throughout the Tucson area. The existing roadway section of Kino Parkway has three lanes in each direction throughout the project area. 22nd Street has two lanes in each direction with a center two-way left-turn lane west of the intersection with Kino Parkway, and a raised median east of the intersection. Noise from the UPRR maintenance yard also adds to the noise levels experienced by the adjacent areas. No quantitative analyses are being performed for this report.

## C. Alternative Modes

### Bikeway Facilities

According to the Tucson Metro Bike Map (updated September 2006), the area has several bike routes of various classifications. The map identifies 22nd Street west of Cherry Avenue and all of Kino Parkway as a designated bike route with striped shoulders (see Figure 10). The south Campbell Avenue connection to the 18th Street and Park Avenue intersection is designated as a bike route. Cherrybell Stravenue, Cherry Avenue, and Warehouse Avenue provide the connection between south Campbell Avenue and the intersection of 18th Street and Park Avenue. Both Fairland Stravenue and Silverlake Road between Campbell Avenue and Fairland Stravenue are designated as residential street bike routes.

In addition to bike routes, a shared-use path is located on the east side of the Barraza-Aviation Parkway. Although the path is outside of the project limits, its close proximity makes it worth mentioning. The path extends from Escalante Road and Kolb Road to downtown Tucson, and serves a significant role in providing a connection between these two points. The width of the path varies between 10 feet and 16 feet as it passes near project vicinity.

### Pedestrian Facilities

Within the project limits, pedestrian facilities in the form of concrete sidewalks are located on each side of Kino Parkway with curb access ramps at the intersection of Kino Parkway and 22nd Street. Pedestrian facilities on 22nd Street are currently limited to sidewalks on the existing 22nd Street Bridge over the UPRR facilities, just outside of the project limits. The adjacent shared-use path on Barraza-Aviation Parkway is a separate facility and is not connected to the pedestrian facilities on the 22nd Street Bridge.

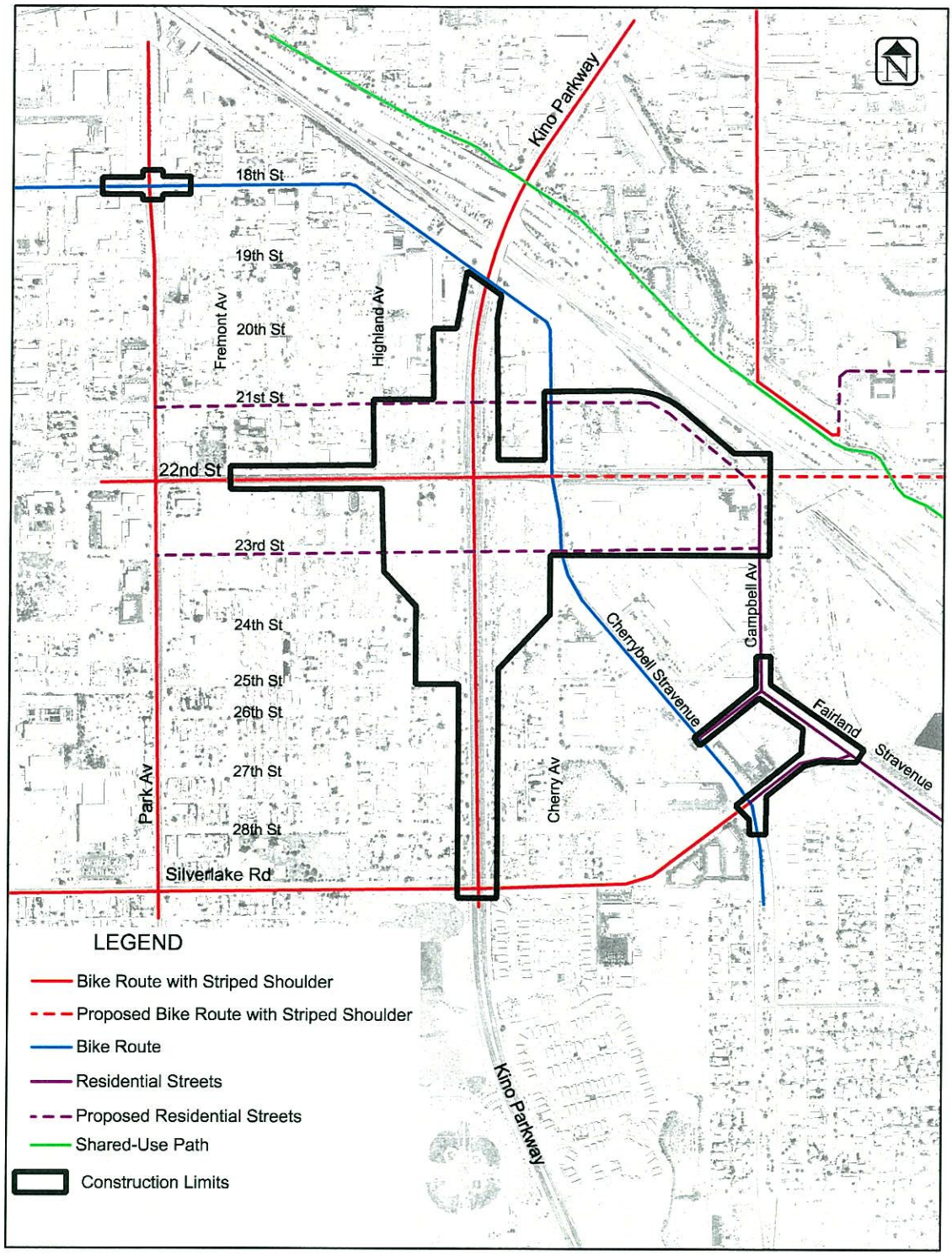



**Figure 10: Alternate Modes**

## Public Transit Facilities

Transit service along the 22nd Street corridor between Park Avenue and the 22nd Street Bridge is provided by SunTran. Currently, SunTran Routes 2 and 7 serve the Kino Parkway/22nd Street intersection (see Figure 11). A third SunTran route, Route 6, serves the intersection of 22nd Street and Park Avenue. The intersection of 22nd Street and Park Avenue is the transfer point between all three routes. Table 2 summarizes the main attributes of each route.

**Table 2: SunTran Weekday Service within Study Area**

| Route | Direction | Start | End | Trips per weekday | Peak hour headway | Hours of Operation | |
|---|---|---|---|---|---|---|---|
| | | | | | | Begin | End |
| 2 | Northbound | Laos Transit Center | Ronstadt Transit Center | 31 | 30 min | 5:15 AM | 7:45 PM |
| | Southbound | Ronstadt Transit Center | Laos Transit Center | 31 | 30 min | 6:00 AM | 7:30 PM |
| 6 | Northbound | Laos Transit Center | Tohono Tadai Transit Center | 47 | 15 min | 4:22 AM | 10:50 PM |
| | Southbound | Tohono Tadai Transit Center | Laos Transit Center | 44 | 15 min | 5:31 AM | 10:31 PM |
| | Northbound | Tucson International Airport | Tohono Tadai Transit Center | 35 | 30 min | 4:35 AM | 5:05 PM |
| | Southbound | Tohono Tadai Transit Center | Tucson International Airport | 33 | 30 min | 6:44 AM | 5:26 PM |
| 7 | Westbound | Harrison at Golf Links | Ronstadt Transit Center | 31 | 30 min | 6:06 AM | 10:39 PM |
| | Eastbound | Ronstadt Transit Center | Harrison at Golf Links | 33 | 30 min | 6:05 AM | 10:30 PM |

Note: The Laos Transit Center is located at 6th Avenue and Irvington Road (South Tucson).
The Ronstadt Transit Center is located at 6th Avenue and Congress Street (Downtown Tucson).
The Tohono Tadai Transit Center is located at 6th Avenue and Congress Street (Downtown Tucson).

Route 2, named "Cherrybell/Country Club," connects the Laos Transit Center in South Tucson with the Downtown Ronstadt Transit Center (see Figure 11). This route uses 22nd Street between Park Avenue and Cherrybell Stravenue, and has a scheduled stop located at the 22nd Street/Cherry Avenue/Cherrybell Stravenue intersection.

Route 7, named "22nd Street," begins at the Golf Links Road/Harrison Road intersection and ends at the Downtown Ronstadt Transit Center. This route runs on 22nd Street from Harrison Road to 10th Avenue, except for a detour to avoid the 22nd Street Bridge over Barraza-Aviation Parkway and UPRR due to weight restrictions placed on the bridge. Once the new bridge is completed, the detour will no longer be needed. Route 7 does not have a scheduled stop along 22nd Street between Kino Parkway and Tucson Boulevard. The closest stop to the study area is on 22nd Street at Park Avenue (approximately three-tenths of a mile west of Kino Parkway).

Route 6, named "South Park Avenue/North 1st Avenue" connects the Tucson International Airport with the Laos Transit Center, the Downtown Ronstadt Transit Center, and the Tohono Tadai Transit Center. Route 6 has a scheduled stop on Park Avenue at 22nd Street for both northbound and southbound riders.

Within the project limits, SunTran does not have any bus pullouts, but bus shelters are located on the northwest and southwest corners of 22nd Street at its intersection with Cherry Avenue. Figure 11 shows the bus shelter at the northwest corner of the 22nd Street/Cherry Avenue intersection.

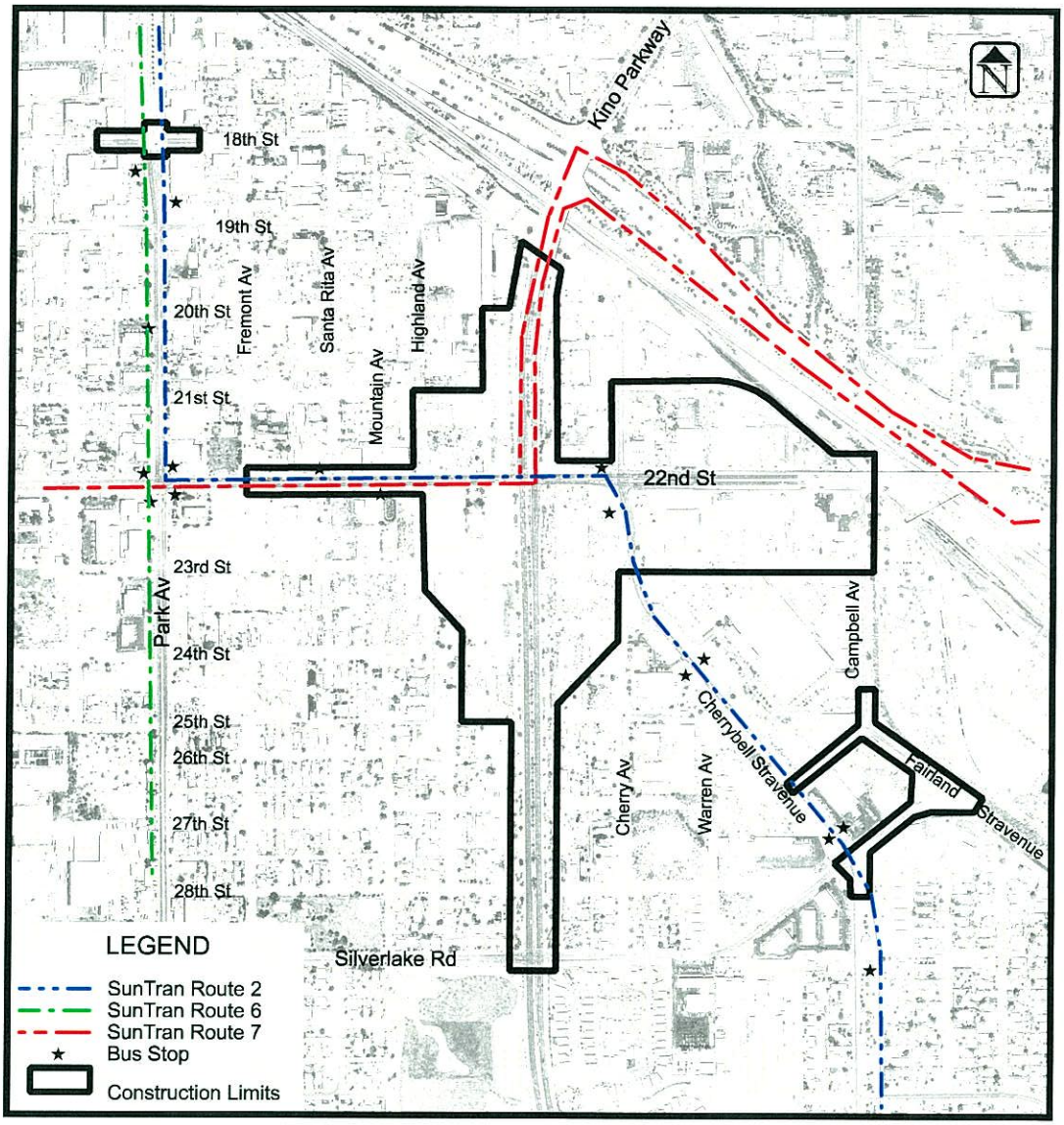



**Figure 11: Transit Routes Map**

# 3.0 Proposed Design Features

## A. Design Standards and Criteria

The following lists the design criteria to be used on Kino Parkway and 22nd Street and the associated ramps to and from Kino Parkway. Any deviation from the criteria must be approved by the City project manager.

### Roadway Design Criteria

| | |
|---|---|
| ▪ Geometrics | AASHTO *A Policy on Geometric Design of Highways and Streets*, 2004 Edition |
| | Arizona Department of Transportation Roadway Design Guidelines, 2007 |
| ▪ Standards | Pima County & City of Tucson Standard Specifications and Details for Public Improvements, 2004 |
| | Arizona Department of Transportation Standard Construction Drawings, May 2007 |
| ▪ Pavement Design | To be determined by geotechnical analyses |
| ▪ Design Speed | 45 mph – 22nd Street and Kino Parkway |
| | 35 mph – body of SPUI ramp |
| | 25 mph – SPUI ramp at intersection with 22nd Street |
| ▪ Travel Lanes | Three through lanes in each direction, dual left-turn lanes and dedicated right-turn lanes all directions at Kino Parkway/22nd Street SPUI |
| ▪ Bike Lanes | One bike lane in each direction on both Kino Parkway and 22nd Street |
| ▪ Through Lane Width | Varies 11 feet to12 feet on Kino Parkway; 11 feet on 22nd Street |
| ▪ Turn Lane Width | 12 foot right-turn lanes; 15 foot left-turn lanes on SPUI ramps, 12 foot left-turn lanes on 22nd Street |
| ▪ Median Width | 20 feet |
| ▪ Bike Lane Width | 6 feet |
| ▪ Sidewalk Width | 6 feet adjacent to roadway; 8 feet on bridge |
| ▪ Bus Pullouts | New farside pullouts on 22nd Street at Kino Parkway. |
| ▪ Structures | Combination cast-in-place/drop-in-girder bridge (Kino over 22nd Street) |
| ▪ Handicap Ramps | ADA Compliant |

**Drainage Criteria**

| | |
|---|---|
| ▪ Cross drainage | 100-year event |
| ▪ Pavement drainage | 10-year event contained in the roadway (no higher than top of curb) |
| | 10-year event, one lane in each direction clear of flow. |

## B. Roadway Improvements

The improvements at the intersection of Kino Parkway and 22nd Street will increase the capacity, safety, and mobility of the roadway system in the vicinity of the intersection. The increase will be achieved by widening 22nd Street to three lanes in each direction, and by grade separating Kino Parkway and 22nd Street. The grade separation created by the SPUI will increase efficiency of 22nd Street through the intersection due to better signal phasing, and will increase the efficiency of Kino Parkway by bridging 22nd Street and eliminating the stop condition created for through traffic at a traffic signal.

In addition to the intersection improvements, a partial signal at the intersection of Cherrybell Stravenue and 22nd Street will allow westbound to southbound left turns to access the USPS main office. A raised median in 22nd Street will control turning movements along 22nd Street and will further promote safety.

This project will construct sidewalks and bike lanes on each side of the roadway and construct far side bus pull-outs on 22nd Street at the SPUI. These improvements will increase the access to alternate modes of transportation at and in the vicinity of the Kino Parkway/22nd Street intersection. The 15% plans showing the roadway improvements are contained in Appendix F.

## C. Land Planning

The land planning component of the project has analyzed the existing land uses and the trends within the residential and industrial/commercial areas to develop a framework for future land use planning. The existing land uses along 22nd Street between Park Avenue and the bridge over the UPRR are varied. The west end between Park Avenue and Kino Parkway is spotted with commercial, residential, and vacant lots. The east end between Kino Parkway and the UPRR Bridge is generally industrial and commercial with a few vacant parcels near the Kino Parkway/22nd Street intersection. Within the quadrants surrounding the intersection, the uses are varied. Land uses are listed below with the order based on the extent of use from largest to smallest.

| ▪ **Quadrant** | **Existing Land Use** |
|---|---|
| ▪ Northwest | Industrial, residential, and commercial |
| ▪ Northeast | Industrial and commercial |
| ▪ Southwest | Residential and commercial |
| ▪ Southeast | Commercial and residential |

The framework plan for the area between Park Avenue and Kino Parkway is to preserve the existing character and integrity of the residential neighborhoods in the area south of 22nd Street and to maintain the mixed use of industrial, residential, and commercial in the area north of 22nd Street. This mixed use is unique in that it provides support for living and working opportunities in the same neighborhood. In addition, the vacant or underused parcels can be used for residential redevelopment and business renovation.

The framework plan for the area between Kino Parkway and UPRR Bridge designates the land uses as employment areas on both the north and south sides of 22nd Street. The intent for the employment areas is to maintain the existing industrial/commercial uses and to introduce future new employment opportunities as new businesses move into the area. Tucson Water is currently performing a site assessment for relocating their Plant 1 to the vacant parcels immediately adjacent to the SPUI ramps in the southeast and southwest quadrants of the intersection. As an alternative to the proposed Tucson Water plant, these parcels could be sold per existing city guidelines and developed for commercial use. The commercial use could serve as a gateway to the proposed mixed-use/commercial area on the west, and provide for greater commercial opportunities in terms of size and access on the east. These uses are consistent with the uses designated in the framework plan.

A separate Land Planning document is being prepared for the section of 22nd Street between Park Avenue and Tucson Boulevard. More detailed information on the plan and the recommendations will be available in that document.

## D. Additional Design Elements

As mentioned previously, Mayor and Council gave direction to seek ways to alleviate the circulation issues identified in the minority report that accompanied the AAR. The minority report requested that the design team determine the feasibility of connecting 21st Street to the southbound Kino Parkway off-ramp, placing a traffic signal at Park Avenue and either 18th Street or 19th Street, and placing a traffic signal at Santa Rita and 22nd Street. The minority report also requested that special attention be paid to pedestrian and bicycle circulation both through and over the intersection. These items along with some additional design elements are discussed below.

### Park Avenue Traffic Signal

Traffic counts for the intersections of Park Avenue/18th Street and Park Avenue/19th Street were obtained to determine if warrants were sufficient to consider placing a traffic signal on Park Avenue. The traffic counts indicated the volumes were sufficient at 18th Street to place a traffic signal, but 19th Street alone does not generate sufficient volumes to warrant a traffic signal. Therefore, it was determined that a traffic signal could be placed at 18th Street, or if the volumes are combined, a signal could be placed at 19th Street. Combining volumes can only be achieved by placing median controls in Park Avenue to ensure all left-turn movements are made at the signal.

A task force consisting of representatives from the Santa Rita Neighborhood, Armory Park Neighborhood, and Millville Neighborhood was created to discuss installing a traffic signal at either the Park Avenue/18th Street or Park Avenue/19th Street intersection. Initially, the task force agreed that a traffic signal at Park Avenue/19th Street would best meet the requirements of all parties without placing undo hardship on the adjacent residential community. However, a

signal at 19th Street requires an extension of the existing median in Park Avenue from the north side of 18th Street to the north side of 19th Street. The extension is required to ensure southbound left-turn movements occur at the signalized intersection. Residents of the Millville Neighborhood were strongly opposed to the median closure, so the task force has reconvened to evaluate a signal at 18th Street. Evaluation of the improvements is ongoing, and to date, the City of Tucson has not approved any recommendation.

### Santa Rita Avenue/22nd Street Traffic Signal

Traffic counts were also obtained for the intersections of Highland, Santa Rita, and Fremont Avenues with 22nd Street. The traffic volumes at each of these locations are very low, and even in combination, do not warrant placement of a traffic signal. Moreover, Santa Rita Avenue is less than 1,000 feet from both Park Avenue and Kino Parkway, which is less than the city requirement of ¼ mile spacing between signals. Due to its proximity to the Park Avenue/22nd Street and Kino Parkway/22nd Street intersections, placement of a signal at Santa Rita Avenue would negate any benefits the new interchange at Kino Parkway and 22nd Street would have for 22nd Street. Consequently, it was determined that a traffic signal at Santa Rita Avenue and 22nd Street is not feasible.

### 21st Street Ramp Connection

A connection to the Kino Parkway southbound off-ramp at 21st Street would provide the Millville area eastbound access onto 22nd Street via the traffic signal at the SPUI. To make the connection feasible, the grades of 21st Street and the southbound off-ramp need to be reasonably close at the connection. If 21st Street is significantly elevated to meet the connection, the existing business access on 21st Street west of Curtis Avenue could be negatively impacted. Modifications to the initial vertical profile for the southbound off-ramp were made, and it was determined that a connection could be made while maintaining existing business access and adequate sight visibility. However, the ramp connection will only allow a right-turn out for 21st Street traffic. No right turns will be allowed onto 21st Street from the ramp.

### Kino Parkway Lane Configuration

Providing sufficient weaving and merging distance for on-ramps is an important safety component for any interchange. In addition, lane balance between the through plus exit lanes and the through plus entrance lanes assists in safer, more efficient operations.

The lane configuration for Kino Parkway initially included three lanes in each direction for the length of the project. At the south end, the project has sufficient right-of-way to construct auxiliary lanes at both the exit and entrance ramps. However, at the north end where the improvements tie into the existing bridge for Murphy's Overpass, there is not sufficient room for auxiliary lanes and associated tapers, and the weaving distance for merging is inadequate. In lieu of auxiliary lanes, the northbound lanes must be striped for an outside lane drop to provide a dedicated entrance lane onto northbound Kino Parkway and eliminate the need for weaving.

Another approach for addressing the inadequate weaving distance is to apply the concept of lane balancing to Kino Parkway. Lane balancing at an interchange is based on removing the outside lane at the exit ramp, and adding the lane back into the road system at the associated entrance ramp. Applying this approach to Kino Parkway results in the outside lanes being

dedicated to exit and entrance ramp connections, and leaves only two through lanes between the ramp connections to Kino Parkway.

This approach will only work if the traffic volumes exiting the mainline are sufficient to reduce the need for the outside through lane, which is the case for Kino Parkway. Approximately 1/3 of the volume on Kino Parkway turns either left or right at the intersection with 22nd Street. This is true for both northbound and southbound directions of travel. The traffic model for the interchange was modified to determine if applying the lane balance concept to Kino Parkway is feasible, and it was determined that the concept can be applied and not impact traffic operations on Kino Parkway. The new typical section for the bridge and roadway is shown in figure 12. Note that the typical section for 22nd Street reflecting Mayor and Council direction to use 11-ft travel lanes is also shown in figure 12.

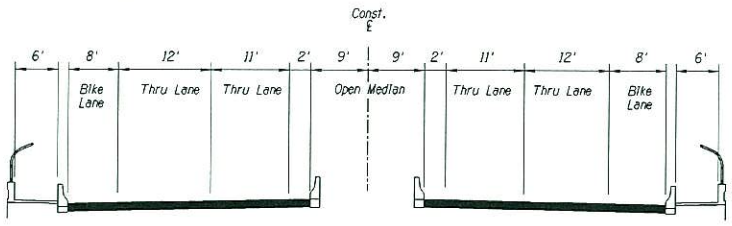
## Bicycle and Pedestrian Circulation

As mentioned previously, the area has several bike routes, but connectivity to Kino Parkway is currently limited to the intersection of Kino Parkway and 22nd Street. As part of the bicycle improvements, enhanced connectivity can be provided to Kino Parkway bike lanes at 23rd Street and at 21st Street. These proposed routes are shown in Figure 10. 22nd Street will still be available for a Kino Parkway connection as well as an east-west bike route, but designating the parallel residential streets as bike routes could provide the less experienced rider with a higher level of comfort.

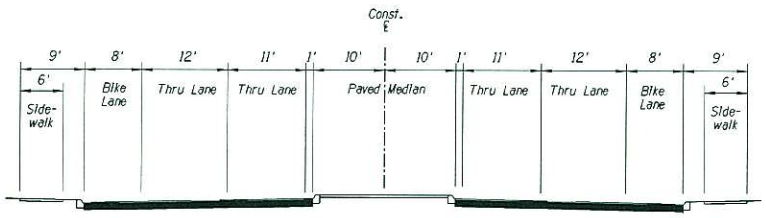
Crossing entrance and exit ramps on an urban interchange is difficult for bicyclists. At the Kino Parkway/22nd Street interchange, the rider will have the option of exiting or entering on the off and on-ramps, or they can remain on the mainline and cross the entrance and exit ramps. The less experienced rider will likely exit and enter with the ramp traffic. These riders will cross 22nd Street at the traffic signal for the SPUI. The more experienced rider would likely remain on the mainline, and continue across the overpass bridge. A safe means to cross the entrance and exit ramps will need to be developed for these riders. Currently, the options being researched include "green" lanes, and strategies for creating a more perpendicular crossing of the ramp. However, the perpendicular crossings could force bicyclists to dismount before crossing, which is not desirable.

Pedestrians will have the option of remaining on the sidewalk adjacent to the entrance and exit ramps to access 22nd Street, or crossing the ramps at designated crosswalks and walking across 22nd Street via the Kino Parkway Bridge. The traffic signal for the SPUI can be phased to allow an at-grade crossing of 22nd Street for pedestrians and bicycles. Pedestrian and bicycle counts performed for the existing intersection indicate these numbers are low, and impact on intersection efficiency will be minimal.

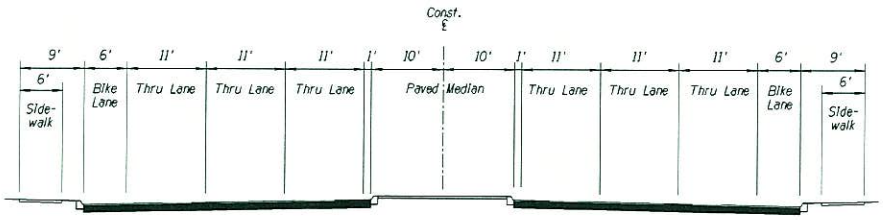
The Technical Advisory Committee for the project has met several times to assist the design team in refining the more detailed aspects of the traffic, bicycle, and pedestrian circulation. The 21st Street ramp connection, Kino Parkway lane configuration, and the bicycle and pedestrian circulation issues have been brought forward for discussion with the Technical Advisory Committee. The committee is in agreement with providing a connection at 21st Street and the southbound Kino Parkway off-ramp, and applying lane balance to Kino Parkway over 22nd Street. The design team will continue to work with the committee to determine safer crossings for bicycles at entrance and exit ramps.




TYPICAL SECTION ON KINO PARKWAY BRIDGE
WITH OPEN MEDIAN




TYPICAL SECTION ON KINO PARKWAY




TYPICAL SECTION ON 22nd STREET

**Figure 12: New Typical Roadway Sections**

## Design Charette Summary

The Citizens Advisory Committee worked through the principle project elements in a design charette held April 30, 2009. The elements included traffic and roadway, landscape architecture and urban design/land planning, bridge engineering/architecture, and art. The format of the charette was generally as a discussion venue for the principle, and allowed for concerns to be voiced, and questions and review comments to be discussed. The intent of the discussions was to obtain direction from the Citizens Advisory Committee on the project elements. The summary of the discussions are included in Appendix G.

# 4.0 Detailed Environmental Impact Assessment

## A. Environmental

### Topography

The proposed roadway improvements will not significantly impact the topography of the area surrounding the intersection. However, Kino Parkway will be raised to span 22nd Street. Retaining walls will be needed where right-of-way is limited. In areas where right-of-way is available, the ground will be sloped to compensate for grade differences between existing grade and the new roadway or ramp. The Kino Parkway Bridge over 22nd Street will be approximately 25 feet above existing grade, and will provide a minimum clearance of 16'-6" over 22nd Street. In addition, the new structure type will be a combination of cast-in-place structure and drop-in girder, which allows a thinner structure than strictly cast-in-place bridge construction.

Some minor changes in topography will occur at the intersections of 22nd Street and its intersecting minor streets. The vertical profiles of the minor streets will need to be adjusted to match into the existing grade as quickly as possible to provide required sight distance without compromising traffic safety.

### Drainage

The proposed roadway improvements will not significantly impact the existing drainage features, and will not change the existing drainage patterns. The existing cross drainage culverts under Kino Parkway may be extended to avoid impacts with new roadway elements (see Figure 12), but the capacity of the culvert crossings will not be reduced as a result of any extension. If needed, the culverts will be augmented to ensure any extension does not reduce capacity. Because the culverts are not within washes or roadside ditches and are only conveying surface flow from the adjacent streets, it is anticipated that an Army Corp of Engineers 401/404 permit will not be required for this project.

### Water Quality

The potential to impact groundwater resources is expected to be minimal. Consequently, the project will not change long-term water quality. During construction, however, water quality may be impacted as the ground is exposed by construction activities and the potential for runoff to carry sediment off of the project site is increased.

There are no washes in the project limits. The cross culverts under Kino Parkway convey the surface flow in streets from east to west, and would not be considered jurisdictional waters. Consequently, it is anticipated that an Army Corp of Engineers 401/404 permit will not be required for this project.

## Vegetation and Wildlife

The landscape vegetation located adjacent to Kino Parkway and within the roadway median will be removed by construction activities associated with the project. Vegetation will need to be cleared to build the new ramps and to raise Kino Parkway for the bridge over 22nd Street. Existing vegetation outside the construction footprint of these improvements will not be affected.

The vegetation in the 22nd Street median east of Kino Parkway will be removed to reconstruct 22nd Street. The city's Native Plant Preservation Ordinance (NPPO) provides guidance on the size and species of plants that require mitigation. The NPPO takes precedence over the SDCP, and the guidelines presented in the ordinance will be followed for this project.

The project will not affect any priority Sonoran desert vegetation or wildlife.

## View Sheds – Visual Analysis

As mentioned earlier, the new bridge on Kino Parkway over 22nd Street will be a new topographic feature in the area. This feature will change the view sheds to the east and west depending on where a viewer is located. The further away viewers are from the new bridge, the less the new bridge will affect the view shed.

The new bridge will have pedestrian access and will include sidewalks on either side of the roadway and bridge. Pedestrians, bicyclists, and motorists traveling across the bridge will have a vantage point from which to view the surrounding mountains.

One billboard near Kino Parkway will be directly impacted by the proposed improvements. The billboard is located on the north side of 22nd Street between Kino Parkway and Cherry Avenue.

## Historical, Cultural and Archaeological

Given the highly urbanized and developed nature of the area, the project is not expected to impact historical, cultural, or archaeological sites in the area (see Appendix E).

## Air Quality

Although an additional lane in each direction is being added to 22nd Street, it is anticipated that air quality will improve. The increased efficiency of the intersection and additional capacity of the roadway will decrease the wait time for idling automobiles. Short-term impacts such as increased dust and odors could be experienced during construction.

It is anticipated that the limits of ground disturbance will exceed one acre, and an Air Quality Activity Permit will be required. In addition, adherence with the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) will be required for the demolition of existing structures (see discussion in the following Hazardous Waste section).

## Hazardous Waste

The estimated area of impact for construction and construction-related activities is outside of the known areas of contamination from the brownfield area on UPRR property and the leaking underground storage tanks scattered throughout the project area. Although the brownfield is

upslope of 22nd Street, the construction area for the roadway is west of the UPRR site, and it is anticipated that no contaminated soil will be encountered. However, as mentioned previously, the case for the leaking underground storage tank at the USPS site on Cherrybell Stravenue has not been closed. A hazardous waste monitoring plan is recommended to monitor construction activities near the site. It is also recommended that the special provisions include specific direction to the contractor to comply with state and federal standards for monitoring requirements during construction.

The National Emissions Standards for Hazardous Air Pollutants (NESHAPS) has specific requirements for removal of asbestos and lead from structures being demolished. A survey of the structures to be demolished must be performed prior to beginning demolition so that an inventory of hazardous materials present can be logged. The results of the survey will be made know to the demolition contractor, and necessary steps will be taken to ensure compliance with NESHAPS.

## B. Neighborhood

### Adjoining Land Uses and Property Values

The properties adjacent to 22nd Street will be impacted to some extent by the widening. The extent of the impact will be determined during the design phase. In addition, the new Campbell Avenue and 23rd Street extension circulation roads will require additional right-of-way where they cross over private property. These properties are mostly commercial and industrial. Demolition of the structures will need to comply with the condition of the NESHAPS as discussed previously. Although these properties are impacted, the adjoining land uses will not be changed as a result of the project. The land use of the two parks near the project, Mirasol Park and Quincie Douglas Park, will not change as a result of the project.

The values of the adjacent properties are expected to be maintained or increase as a result of the project. The proposed improvements at the intersection will enhance exposure to the traveling public, and consequently increase commercial business opportunities on the adjacent properties.

The City of Tucson follows the Uniform Relocation Assistance and Real Property Acquisition Policies Act for property acquisition. These guidelines not only ensure a fair market value for the property, but they also provide relocation assistance to property owners and tenants who are displaced by the roadway improvements. The relocation assistance program helps residential owners find a new residence of comparable value in a comparable neighborhood, and provides moving expenses as well. Similar benefits are also available to residential tenants. Businesses are also covered by the Act, and receive moving expense benefits.

The improvements benefit the adjacent community in that new sidewalks will be provided along the entire project length with better access to improved transit service. The new bike lanes and connection to the Kino Parkway ramps will also support connectivity to the adjacent neighborhoods, offering better access to other services in Tucson and the surrounding area. In addition, improvements to the Kino Parkway/22nd Street intersection combined with those for the corridor to the west will provide improved access to I-10.

### Recreation

No recreational areas are located within the project limits, therefore no impacts are anticipated. Access to the parks and recreation facilities mentioned previously will not be changed during construction or as a result of proposed improvements.

### Access

Access to and from portions of the project area will change as a result of the interchange. On the east side of Kino Parkway, the existing traffic signal at 22nd Street and Cherry Avenue/Cherrybell Stravenue will be removed and a raised median will be installed to eliminate through movements at this intersection. The only movements that will be allowed at the intersection include a right-turn-in and right-turn-out on Cherry Avenue and on Cherrybell Stravenue, and a westbound left turn off 22nd Street onto Cherrybell Stravenue southbound for access to the main post office. The existing right-turn-in and right-turn-out condition at Neff Street and Warren Avenue will not be changed.

On the west side of Kino Parkway, a raised median will be installed between Kino Parkway and Santa Rita Avenue. Although access from Santa Rita Avenue to the west will remain the same, access at Highland Avenue and at Curtis Avenue on the south will be restricted to right-turn-in and right-turn-out.

Improvements will be made to improve the circulation between quadrants. On the east side, Campbell Avenue will be extended under 22nd Street at its current location to intersect with Warren Avenue at 21st Street. In addition, 23rd Street will be extended between Campbell Avenue and Cherrybell Stravenue immediately north of the post office to provide additional circulation within the southeast quadrant and access to eastbound 22nd Street.

Access to adjacent parks and recreational areas will not change as a result of the project, and access will not be impacted by construction of the proposed improvements.

### Traffic Operations

Traffic operations for the Kino Parkway/22nd Street intersection will improve with the new traffic interchange and new six-lane roadway section on 22nd Street. During construction, temporary impacts will occur as detours and/or lane-width reductions occur. However, two lanes of traffic in each direction will be maintained during construction.

### Character

The overall character of the surrounding area will not change as a result of the project. However, new pedestrian and bicycle amenities together with future land uses may change the local character of the area. As mentioned previously, a land use plan is being prepared for the project and is discussed in more detail in Section 3.0, Proposed Design Features.

### Utilities

Impacts on utilities will be typical of those in roadway reconstruction projects. It is anticipated that the existing small diameter water mains are at substandard depth and will need to be replaced, and sewer manhole covers will require adjustment to new finish vertical grades. No impacts are anticipated on the larger diameter water mains in the area. Power poles on the

south side of 22nd Street and at the intersection of Cherry Avenue and 22nd Street will also be impacted. Six poles on 22nd Street and two poles at Cherry Avenue will need to be relocated to allow for the roadway widening. The utilities located on the power poles that will be impacted include Tucson Electric Power, Expedius, Comcast, and Qwest. Although the vertical profile of the roadway is not changing significantly, it is also possible that the gas facilities are not deep enough to avoid impact by construction of the new pavement section.

### Noise

The sensitive land uses potentially affected by changes in noise are the residential neighborhoods in the southern portion of the project area. The residential pockets within the Millville neighborhood in the northwest quadrant are currently experiencing noise from the industrial and commercial operations in the area. As mentioned previously, Kino Parkway will remain a six-lane facility, however, 22nd Street will be widened to include an additional lane in each direction. Because the City uses rubberized asphaltic concrete for new roadway surfaces, it is anticipated that noise levels will not be significantly increased as a result of the new interchange and widening on 22nd Street.

## C. Alternative Modes

### Bikeway Facilities

The project will improve existing bikeway facilities by adding bike lanes on 22nd Street in each direction within the project limits. These new facilities will extend the bike routes in this corridor. In addition, bicyclists will have a new connection from these facilities to the shared-use path that runs adjacent to Barraza-Aviation Parkway.

### Pedestrian Facilities

The project will improve existing pedestrian facilities by constructing sidewalks along both sides of 22nd Street and Kino Parkway. The new sidewalks will provide continuous access from one end of the project to the other.

### Public Transit Facilities

The project will improve existing public transit route facilities. It is anticipated that bus pullouts will be located on 22nd Street on the far side of the intersection with Kino Parkway. The exact locations will be coordinated with SunTran.

Building a grade separated interchange at Kino Parkway and 22nd Street will alter Sun Tran's route 2. An initial concept has been developed with input from Sun Tran. The concept essentially eliminates the segment on 22nd Street between Kino Parkway and Cherry Avenue, and uses Kino Parkway and Silverlake Road as a connection between the Kino Parkway/22nd Street intersection and the Campbell Avenue/Silverlake Road intersection. A stop in front of the main post office will be maintained to provide the service to the 22nd Street/Cherrybell Stravenue area. The concept is shown in figure 13. The existing transfer point for routes 2, 6, and 7 at Park Avenue and 22nd Street will remain.

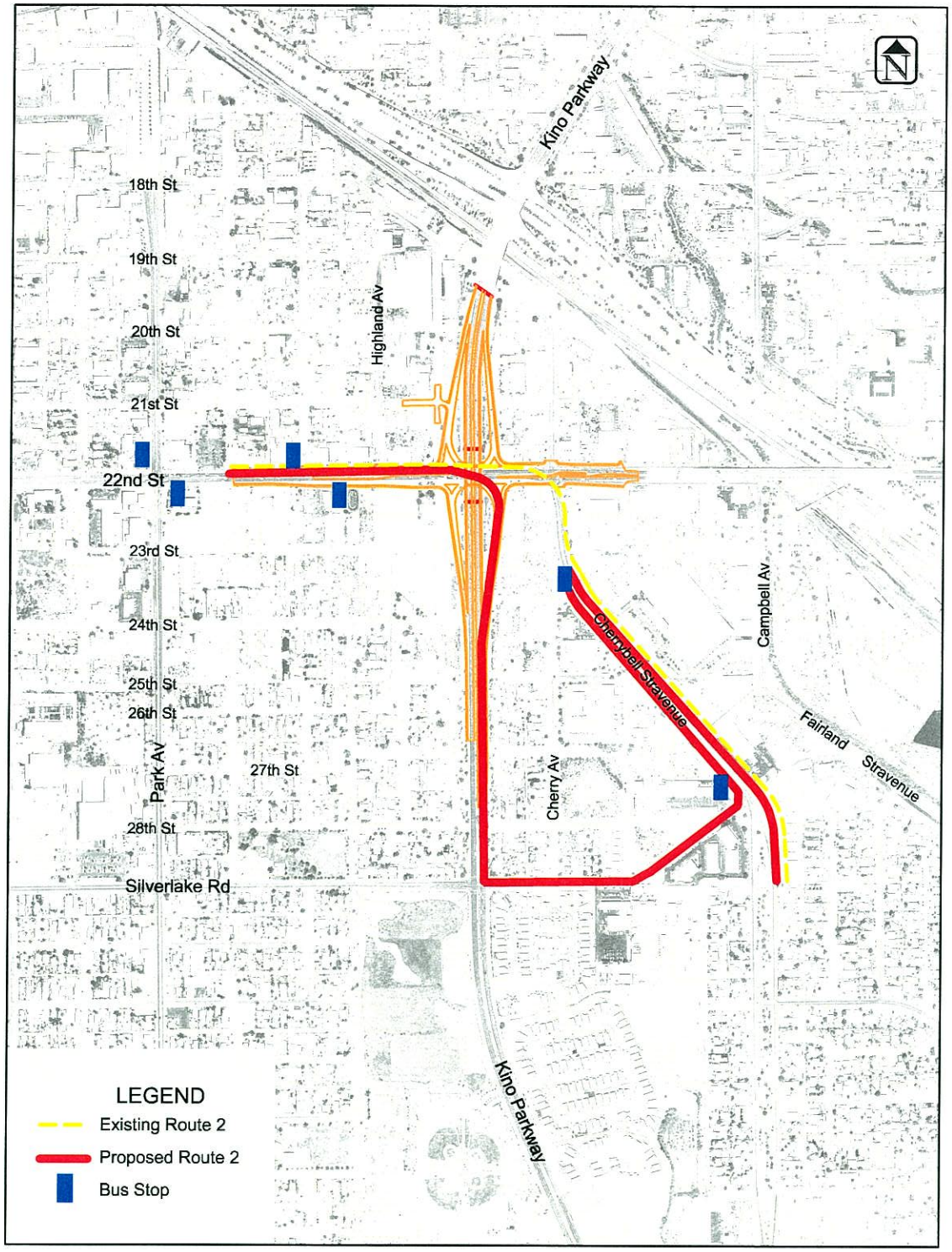



**Figure 13: SunTran Route 2**

Currently, there are no Sun Tran routes on Kino Parkway. However, the potential exists for future service on Kino Parkway to provide a connection between the University of Arizona and the new Science and Technology Park at 36th Street and Park Avenue. Bus pullouts could be provided on Kino Parkway past the gore area of the off ramps to pick up and drop off 22nd Street passengers. Passengers from 22nd Street would need to use the sidewalk adjacent to the ramp for access to and from the bus stop.

## D. Public Art

Public art is in integral element of this project. The Tucson Pima Arts Council issued a call to artists at the project onset, and the selected public artist has worked with the Citizens Advisory Committee to develop an art theme for the project. The foundation of the theme is 'structure in native plants'. A secondary theme, also endorsed by the CAC, is the concept of the intersection of 22nd Street and Kino Blvd. as a compass. Both themes are applied to the design development of the bridge structure and the landscape plan and are used to develop the public art sculptural forms as they are integrated into the bridge structure. These themes are being used to develop any stand alone art as well as the treatment to bridge piers and hardscape/landscape elements.

A rendering of the bridge with the art elements incorporated was developed to illustrate how the theme will blend in with the other components of the project. The rendering shows how vertical structure from native plants can be displayed through art elements, and how horizontal structure can be incorporated into the bridge architecture as well as a tiered wall system that provides opportunity for landscaping (see figure 14).

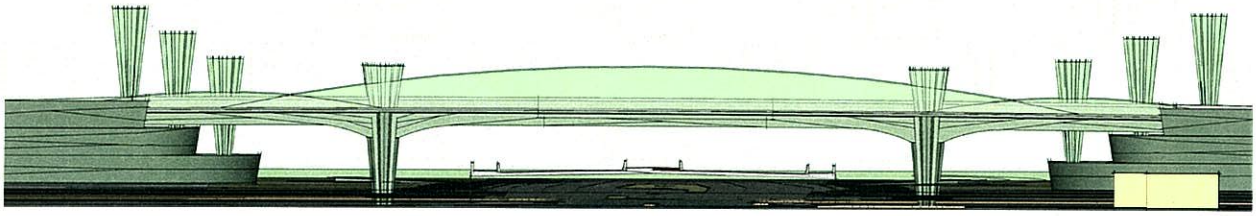


**Figure 14: Rendering of Bridge with Art Elements**

*Vertical Art Elements © Barbara Grygutis 2009*
*Bridge Architecture © Structural Grace2009*
*Artwork Digital Imaging: Nora Kuehl*

# 5.0 MITIGATION MEASURES

Although the improvements do impact some areas, this project provides the opportunity to improve conditions for motorists, bicyclists, and pedestrians. Reconstruction of the roadway allows the City to provide sidewalks connecting into other pedestrian facilities, provide pullouts for SunTran buses, provide a connection between existing bike routes, and bring the road up to current City standards with ADA ramps and street lighting. The project also provides the extra benefit of enhancing the area through the use of well-designed landscaping and art elements.

Table 3 describes the identified project impacts and the mitigation measures incorporated into the project design.

**Table 3: Project Impacts and Associated Mitigation Measures**

| Description | Impacts | Mitigation Measures |
|---|---|---|
| ***Environmental*** | | |
| Topography | None. | None required. |
| Drainage | Identified culverts will be extended. | 100-year flood levels will be maintained within 0.1 foot of existing levels. |
| Vegetation | Existing median landscaping will be removed, but no priority habitats will be affected. | Mitigation plant quantities, determined after the limit of disturbance is established, will be incorporated into the urban streetscape landscape. |
| Wildlife | Yellow-billed Cuckoo is within 3 miles of project area. The Yellow-billed Cuckoo requires dense riparian habitats; there are none within the project area | None required. |
| View Sheds | Increased height of bridge will impact east-west views. | Integrated art with bridge design to improve aesthetics of bridge and special landscape treatment around the bridge to enhance local view shed at a pedestrian level |
| Historical, Cultural and Archaeological | None. | In the event that archaeological artifacts are found during construction, all construction work in that area shall be halted until an archaeological assessment can be conducted. |
| Air Quality | Short-term impacts due to dust and odors during construction.<br>Disturbance caused by construction will cover more than one acre.<br>Demolition of structures could potentially involve asbestos and lead removal. | Best management practices will be followed during construction to minimize dust and odors.<br>Requirements of Air Quality Activity Permit will be followed by contractor.<br>Demolition contractor will need to apply for NESHAPS permit and comply with association requirements. |
| Water Quality | Short term impact during construction. | Contractor will adhere to a Stormwater Pollution Prevention Plan during construction to control erosion and keep sediment laden runoff from leaving the project area. |

## Table 3: Project Impacts and Associated Mitigation Measures (continued)

| Description | Impacts | Mitigation Measures |
|---|---|---|
| ***Environmental (continued)*** | | |
| Hazardous Waste | Demolition of structures could potentially involve asbestos and lead removal.<br>Possible leaking underground storage tank at USPS site. | Demolition contractor will need to apply for NESHAPS permit and comply with association requirements. Use city monitoring for USPS. In the event other unknown contaminated sites are discovered, they will be managed so that construction activities comply with state and federal environmental regulations. |
| ***Neighborhood*** | | |
| Adjoining Land Uses | Where new circulation roadways extend over properties, the properties will be in direct conflict with proposed improvements. These properties will be acquired, and the structures demolished.<br>Demolition of structures could potentially involve asbestos and lead removal. | Streetscape enhancement will be provided in remnant areas on the acquired properties. Streetscape items will include landscaped areas and buffer walls.<br>Displaced tenants and property owners will receive compensation and assistance per the Uniform Relocation Assistance and Real Property Acquisition Policies Act.<br>Demolition contractor will need to apply for NESHAPS permit and comply with associated requirements. |
| Recreation | None. | None required. |
| Access | Access to and from the northwest quadrant, northeast quadrant, and the southeast quadrant will be most impacted. Access to and from the southwest quadrant will have no significant change. | A new road circulation system connecting the quadrants will be built using a 23rd Street extension between Campbell Avenue and Cherrybell Stravenue and an extension of Campbell Avenue under the 22nd Street Bridge on the east side of the project.<br>A traffic signal will be provided at Park Avenue and 19th Street for access to and from the northwest quadrant.<br>21st Street will be extended to connect to the southbound Kino Parkway off-ramp for access out of the northwest quadrant. |
| Traffic | Short term impact during construction. | Contractor will maintain two lanes of traffic in each direction at all times. |
| Character | The improvements will not change the current character. | Landscape area with pedestrian amenities will be built to provide enhanced aesthetics. |
| Utilities | Roadway reconstruction will impact small diameter mains and overhead facilities on power poles. | Modification plans for affected utilities will be prepared. |
| Noise | The project is not anticipated to increase current noise levels, which are typical of arterials in commercial and industrial areas. | Roadway will be paved with asphaltic rubber to lessen the noise levels from tires. |

## Table 3: Project Impacts and Associated Mitigation Measures (continued)

| Description | Impacts | Mitigation Measures |
|---|---|---|
| ***Alternate Modes*** | | |
| Bikeway Facilities | Short-term impacts during construction. | Contractor will provide appropriate signage to direct users safely through or around the construction zone. |
| Pedestrian Facilities | Short-term impacts during construction. | Contractor will provide appropriate signage to direct users safely through or around the construction zone. |
| Public Transit Facilities | Short-term impacts during construction. | Contractor will work with SunTran to provide users safe access to bus stops. |

# 6.0 Conclusions and Recommendations

## A. Proposed Action

A 30 day review period was provided for the public to review and comment on the contents, conclusions, and recommendations of this report. Seven comments from the public were received on this document. Six of these pertained to the location of the traffic signal on Park Avenue at 18th Street or 19th Street, and one was regarding decreasing the bridge width to two lanes in each direction. A copy of the comments is contained in Appendix H.

The comments regarding the traffic signal on Park Avenue were opposed to a median closure at 18th Street, and consequently placing the traffic signal at 19th Street. Currently, the task force has acknowledged the comments received from the public, and is working toward a solution for a traffic signal on Park Avenue.

The recommendation of this report is to carry forward the selected alternative as modified herein and continue design of the improvements to the Kino Parkway/22nd Street intersection. Because design considerations for bicycles and pedestrians, in particular, still need to be refined, it is recommended that coordination with the Technical Advisory Committee continue. It is also recommended that the Citizens Advisory Committee for the project be maintained, if possible, for input at the 30% and 75% design stages, and for updates and input on other design elements such as access and circulation, transit facilities, bike and pedestrian circulation, landscape and hardscape treatments, and art. Input from both committees will be required to assist in refining the transit elements along with bicycle and pedestrian circulation.

## B. Cost

A preliminary estimate of the construction costs has been prepared and is shown in Table 4 on the following page.

## Table 4: Preliminary Construction Cost Estimate

| Item | Quantity | Unit | Cost/Unit | Cost |
|---|---|---|---|---|
| Removals | 1 | LS | $200,000 | $200,000 |
| Curb | 36,600 | LF | $20 | $732,000 |
| Sidewalk | 107,200 | SF | $6 | $643,200 |
| AC (6") | 28,300 | TON | $95 | $2,688,500 |
| AB (9") | 21,700 | CY | $40 | $868,000 |
| Kino Bridge | 1 | EACH | $4,309,000 | $4,309,000 |
| Signals | 3 | EACH | $275,000 | $825,000 |
| Walls | 35,000 | SF | $55 | $1,925,000 |
| Lighting | 1.13 | MILE | $235,000 | $395,500 |
| Drainage | 1.13 | MILE | $500,000 | $565,000 |
| Utility Relocation | 1.13 | MILE | $600,000 | $678,000 |
| Landscape & Streetscape | 1.13 | MILE | $650,000 | $734,500 |
| Maintain and Protect of Traffic | 8% | TOTAL | | $1,165,096 |
| Mobilization | 7% | TOTAL | | $1,019,459 |
| Contingencies | 25% | TOTAL | | $4,187,064 |
| | | | **Construction Total:** | **$20,935,319** |
| | | | Public Art/Aesthetics 1% | $209,000 |
| | | | Construction Admin 15% | $3,140,298 |
| | | | Engineering 8% | $1,674,826 |
| | | | Right-Of-Way* | $3,400,000 |
| | | | **Total** | **$29,359,443** |

* Does not include demolition