

# Crosstown Boulevard Bicycle and Pedestrian Technical Memorandum



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## Table of Contents

Summary of Findings.....	1
1.0 Introduction.....	3
2.0 Background .....	4
2.1 Plans.....	4
2.2 Existing Conditions.....	5
2.3 Safety.....	6
2.4 Other Initiatives.....	8
2.4.1 Spokies Bike Share.....	8
2.4.2 OpenStreets OKC .....	9
2.5 Future Plans.....	9
3.0 Impacts of Alternatives.....	10
3.1 Methodology .....	10
3.2 West Section: Pennsylvania Avenue to Western Avenue .....	12
3.3 Central Section: Western Avenue to E.K. Gaylord Boulevard.....	12
3.3.1 Alternative A .....	12
3.3.2 Alternative B.....	13
3.3.3 Alternative C.....	13
3.3.4 Alternative D .....	18
3.4 East Section: E.K. Gaylord Boulevard to Byers Avenue.....	20
3.5 Summary.....	20
4.0 References.....	22

## List of Tables

Table 1. Design Elements and Pedestrian/Bike Accessibility between Western Avenue and E.K. Gaylord Boulevard.....	21
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## List of Figures

Figure 1. Existing and Proposed Bicycle, Pedestrian, and Shared-Use Facilities .....	7
Figure 2. Alternative A Bicycle and Pedestrian Access .....	14
Figure 3. Alternative B Bicycle and Pedestrian Access.....	15
Figure 4. Alternative C Bicycle and Pedestrian Access .....	17
Figure 5. Alternative D Bicycle and Pedestrian Access .....	19

## Summary of Findings

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This technical report assesses the alternatives of the Crosstown Boulevard and the impact these would have on pedestrian and bicycle travel in the area. Alternative A is a six-lane boulevard design and is the baseline condition; the other three alternatives—B, C, and D—are compared to this baseline..

Streets are public spaces that facilitate travel for a variety of users. How people use the street depends on a number of factors. Streets that are safe and comfortable, provide direct access to destinations, are visually and otherwise appealing, and are easy to navigate are generally considered to be pedestrian and bicyclist friendly. These features translate into measurable factors such as road design, operations, and amenities adjacent to the roadway. Numerous resources define standards, guidelines, and best practices for designing streets to accommodate all users. A listing of those consulted is included at the end of this report.

In the West Connection, between Pennsylvania Avenue and Western Avenue, the alternatives for the Crosstown Boulevard would be limited-access four-to-six lanes. This road section would not include any bicycling and pedestrian facilities as options for travel because it transitions from an access controlled interstate system. In the area adjacent to the Crosstown Boulevard, the existing east-west and north-south sidewalks are limited, disconnected, and inadequate in this primarily industrial area. Without sidewalks, pedestrians must walk in the roadway or on the dirt and grass. Bicyclists can use the existing roads, but have no dedicated lane to facilitate travel. Oklahoma City has proposed that a shared-use path parallel the south side of the Crosstown Boulevard, which would offer an east-west connection.

From Western Avenue to E.K. Gaylord Boulevard, Alternative A is proposed as a six-lane facility. The section from Western Avenue to Lee Avenue would consist of a bridge structure transitioning to at-grade east of Lee Avenue. Intersections with the north-south streets would be configured with a combination of through and turn lanes that result in eight- and nine-lane crossings of 120 feet or more. Medians, as designed, may offer some space for waiting pedestrians. No bicycle facilities are proposed between Walker Avenue and E.K. Gaylord Boulevard. Sidewalks would be located along this section, but they would abut the 35 mile-per-hour (mph) traffic without the benefit of a buffer of parked vehicles or a parkway. North-south connections would be maintained.

Comparing the other alternatives to Alternative A as the baseline, Alternative B would also keep the six-lane bridge between Western Avenue and Lee Avenue, transitioning to at-grade between Lee Avenue and Walker Avenue. No pedestrian or bicycle facilities are proposed for the bridge. From Walker Avenue to E.K. Gaylord Boulevard, the alignment narrows to a four-lane, 35-mph street with dedicated bicycle lanes, on-street parking, and sidewalks. Intersection-crossing distances would be between 80 and 105 feet; medians are proposed and could provide a waiting area for pedestrians. As the bridge section is similar to Alternative A, north-south connections would be maintained.

Alternative C would narrow the bridge to four lanes, transitioning to at-grade at Reno Avenue. The bridge would not have bicycle or pedestrian facilities, but new shared-use paths on both sides of the Crosstown Boulevard would provide east-west access between Reno Avenue and E.K. Gaylord Boulevard. The recommended width for a two-way shared-use path is 10 feet to 14 feet per the (AASHTO 2012). The wider width is appropriate for facilities that will experience high use or a wide variation of users. Shared-use paths should have a five-foot separation from the edge-of-curb. Where the separation is less than five feet, a physical barrier or railing is needed. The intersection with Reno Avenue would be more than 170 feet wide and medians could provide a waiting area for pedestrians caught between signals. From Reno Avenue to Walker Avenue, north-south access would be maintained as Shartel Avenue and Lee Avenue would remain open. Between Walker Avenue and E.K. Gaylord Boulevard, the road would narrow by eliminating the median, reducing the crossing distance. A new pedestrian and bicyclist mid-block crossing (located at Harvey Avenue, which is closed due to new development and the proposed park) would provide pedestrian and bicyclist access. The slower vehicle speed (25 mph) and shorter intersection crossing distances (55 to 80 feet) would create a more pleasant and safer environment for road users.

Alternative D would transition the Crosstown Boulevard to city streets—California Avenue and Third Avenue—that would be redesigned to four lanes with sidewalks but without dedicated bicycle lanes or a buffer between the road and sidewalks. Existing north-south and east-west connectivity would be maintained. With the designated speed limit of 25 mph and shorter intersection crossing distances (42 to 50 feet), this alternative would provide better options for bicyclists and pedestrians compared to Alternatives with higher speed limits and more travel lanes.

The East Connection of the Crosstown Boulevard between E.K. Gaylord Boulevard and Byers Avenue was identified and approved during the interchange study for the Final Environmental Impact Statement and Record of Decision for the *Interstate 40 – Crosstown Expressway from I-235 to Meridian Avenue Oklahoma City, Oklahoma* (FHWA 2002). The East Connection is a four-lane, limited-access, median-separated alignment, with a designated speed limit of 45 mph. No separate or on-road bicycle facilities are incorporated in this section. A proposed pedestrian walkway on the north side of the Crosstown Boulevard would create a new east-west connection for pedestrians. It is recommended that the proposed sidewalk have a landscape buffer of five to six feet, or if immediately adjacent to the roadway, be a minimum of eight feet, to allow for some separation from traffic. The addition of a parkway will increase the attractiveness as a way for pedestrians to travel between the Bricktown entertainment district and the many activity centers in the west of E.K. Gaylord Boulevard.

Overall, all of the alternatives would have both beneficial and detrimental impacts for pedestrians and bicyclists when compared to Alternative A. Alternative C, with the inclusion of the shared-use paths, would provide the most east-west connectivity for bicyclists and pedestrians, maintain connections to the existing north-south street network, and improve travel conditions for all users.

## 1.0 Introduction

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The purpose of this technical report is to assess the potential impacts for bicyclists and pedestrians of Alternatives B, C, and D when compared to Alternative A. This report also considers the City of Oklahoma City's current efforts to improve the bicycling and walking environment in the city. Bicyclists and pedestrians vary in ability, from children who often require assistance in assessing traffic conditions, to persons such as seniors or those with different physical abilities who may walk or move more slowly. This assessment accounts for users, especially the most vulnerable, when considering the potential impacts on bicyclists and pedestrians.

This *Bicycle and Pedestrian Technical Memorandum* was developed to support the analysis completed for the Environmental Assessment for the Crosstown Boulevard. The Environmental Assessment includes a summary of this technical report and is included as an attachment to the Environmental Assessment.

## 2.0 Background

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This section reviews the plans and initiatives that are in effect throughout Oklahoma City for enhancing and improving conditions for bicyclists and pedestrians. A number of sources were consulted, including the Oklahoma City Planning Department, the Oklahoma City Geographic Information System (GIS), the Association of Central Oklahoma Governments (ACOG) GIS, and planning documents pertaining to bicycling, walking, and development in Downtown Oklahoma City. This information provides the setting for considering how the Crosstown Boulevard alternatives would complement and enhance the existing and planned bicycle and pedestrian environment.

### 2.1 Plans

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Oklahoma City has a number of studies, plans, and funding initiatives that address walking, bicycling, and development in and near the Crosstown Boulevard study area. These plans include the *Downtown Strategic Action Plan 2010* (Oklahoma City Planning Department 2003), the *Downtown Streetscape Master Plan* (Oklahoma City 2008), the *Core to Shore Plan* (Oklahoma City 2008), and the ongoing *planOKC*, which is the city's comprehensive plan (Oklahoma City Planning Department, 2013). Funding programs include Project 180 and the Metropolitan Area Projects (MAPS 3). In conjunction with the MAPS 3 program, *planOKC* generated the *Sidewalk Master Plan* (Oklahoma City 2012).

The *Sidewalk Master Plan* identified and prioritized 120 miles of needed pedestrian infrastructure and committed to building 25 to 36 miles with the \$6.8 million available from the MAPS 3 program. The MAPS 3 tax initiative, funded by a temporary one-cent sales tax, is providing monetary support for eight projects, including \$10 million for new sidewalks, \$40 million for new trails, and \$130 million for the new 70-acre Downtown Public Park, a portion of which is located in the study area.

The *Downtown Streetscape Master Plan* provided recommendations for enhancing the pedestrian network, including the area of the Crosstown Boulevard between Western Avenue and Byers Avenue. The *Downtown Strategic Action Plan 2010* (written in 2003) established the desire and vision for a vibrant, active downtown, and recognized that an enhanced pedestrian environment would assist with implementing this vision.

Oklahoma City published its first bicycle plan in 2008, which focused on creating a network of safe travel routes supported by public education, encouragement, and enforcement actions. The *Bicycle Strategic Action Plan 2008 to 2015* (Oklahoma City Planning Department 2008) identified nearly 200 miles of facilities for Phase 1, mainly on-road bicycle routes and shared roadways, with a smaller portion as designated bicycle lanes. An additional 300 miles of routes and lanes were proposed for Phase 2, to be developed after 2015. These facilities, both urban and suburban, would complement and connect with the existing shared-use trails and those proposed in the *Oklahoma City Trails Master Plan* (Oklahoma City 1997).

The *Oklahoma City Trails Master Plan* identified 28 corridors for development by the year 2020 for off-road, shared-use paths that would provide access for community residents and recreation, education and economic activities, and transportation. The plan identified 207 miles of trails, with the Bricktown Canal Trail and the North Canadian Central Greenway (now the Oklahoma River Trail) two of the first four that were funded and constructed. The plan also identified the I-40 Corridor as a long-term trail opportunity. Use of this corridor for a potential shared-use facility was reinforced with the 2008 *Bicycle Strategic Action Plan 2008 to 2015*, which showed the Crosstown Boulevard corridor as a proposed but unfunded shared-use facility.

The *Core to Shore Plan* (developed in 2008) is a redevelopment plan for the area extending from downtown to the Oklahoma River, including an area now connected to downtown as a result of the I-40 relocation. This plan noted that transportation alternatives on the former I-40 right-of-way should be comfortable for pedestrians, meet “complete street” policies identified in the *planOKC*, provide land use connections between downtown and the Oklahoma River, and support mixed-use development. The mixed-use development concept would add residential, commercial, and recreational uses to the area between Shartel Avenue and Byers Avenue, south of the Crosstown Boulevard study area. This new development, including the portion between I-40 and the Oklahoma River, is expected to attract between 6,000 and 7,500 new residents to the area, creating demand and opportunities for walking and bicycling.

Project 180 funding comes from a number of sources, including the downtown Tax Increment Financing district money, general obligation bonds, and the Oklahoma City Water Utilities Trust. This funding is dedicated to improving and revitalizing 180 acres of downtown, including downtown streets, sidewalks, parks, and plazas, with the goal of making the area more accessible for pedestrians. Construction began in 2010 and is transforming streets by converting them to two-way traffic (rather than one-way), and adding landscaping, decorative lighting, bicycle lanes, on-street parking, and public art. Improved streets in the Crosstown Boulevard study area include Reno, California, and Sheridan Avenues, while E.K. Gaylord Boulevard (between Reno and Sheridan Avenues) is slated for improvement in 2014.

The ongoing *planOKC* established a set of goals in 2012 known as *planOKC Goal Summary* (City of Oklahoma City 2012). The transportation component of *planOKC* is called *connectOKC*. The purpose of *connectOKC* is to address comprehensively the transportation system with a focus on moving people rather than cars. This component lays out the vision for the bicycle and pedestrian environment in the city (along with other modes). Both the bicycle and pedestrian goals stress the desire for complete, quality facilities for all users.

## 2.2 Existing Conditions

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Oklahoma City offers 81 miles of shared-use trails, 96 miles of bicycle routes, and five miles of bicycle lanes. The study area has approximately three miles of shared paths (including paths in Myriad Botanical Gardens and along the Bricktown Canal), 0.8 mile of bicycle routes, and 0.4 mile of bicycle lanes.



Shared-use paths (also known as multi-use paths or trails) are off-road facilities available to non-motorized users for activities such as bicycling, walking, skating/skate boarding, and running. In addition, motorized wheelchairs and other motorized assistive devices for the mobility impaired are allowed. Bicycle lanes are on-road facilities identified by signage or pavement striping that designates a lane for use by bicycles only. Shared lanes differ from separated bicycle lanes in that bicyclists and motor vehicles share the same lane. These shared facilities are usually indicated with “Share the Road” signage or with painted bicycle symbols on the pavement but without the striped lane. The term “bicycle route” is applied to both shared and designated lanes, but most often refers to shared-lane facilities.

In the Crosstown Boulevard study area, striped bicycle lanes are provided on Sheridan Avenue, between Shartel Avenue and Hudson Avenue, and between Robinson Avenue and E.K. Gaylord Boulevard. These two segments are connected by a bicycle route (unstriped, shared lane) between Hudson Avenue and Robinson Avenue on the north side of Myriad Botanical Gardens. A bicycle lane is provided on California Avenue between Dewey Avenue and Walker Avenue and connects to the plaza between Walker Avenue and Hudson Avenue. Walker Avenue, from Reno Avenue to NW 6<sup>th</sup> Street, also has a bicycle lane. Robinson Avenue is identified as an existing bicycle route and connects to the downtown bicycle route network and the Oklahoma River Trail (Figure 1).

The sidewalk network in Oklahoma City is not as well quantified as the bicycle network. Streets in residential or active business areas may have sidewalks on one or both sides of the road network. However, in other areas, whether as a function of past or existing land use, pedestrian walkways are missing altogether. As an example, a number of streets in the western portion of the Crosstown Boulevard study area do not have contiguous sidewalks, such as Sheridan Avenue from Pennsylvania Avenue to Douglas Avenue.

As a result of Project 180, portions of Reno Avenue, California Avenue, Sheridan Avenue, and soon, E.K. Gaylord Boulevard, have improved pedestrian infrastructure. Used by pedestrians and bicyclists, the Bricktown District has the River Walk which parallels the canal. Myriad Botanical Gardens has a network of pedestrian paths. In addition, the park adjacent to the east side of the Amtrak/BNSF railway between Reno Avenue and Sheridan Avenue provides a one-block, north-south connection.

Although the SkyDance Bridge is just south of the Crosstown Boulevard study area, this new link, opened in 2012 over the relocated I-40 Expressway, is an important crossing for pedestrians and bicyclists between downtown and the Oklahoma River. As part of the *Core to Shore Plan*, the bridge connects two sections of the proposed 70-acre downtown park.

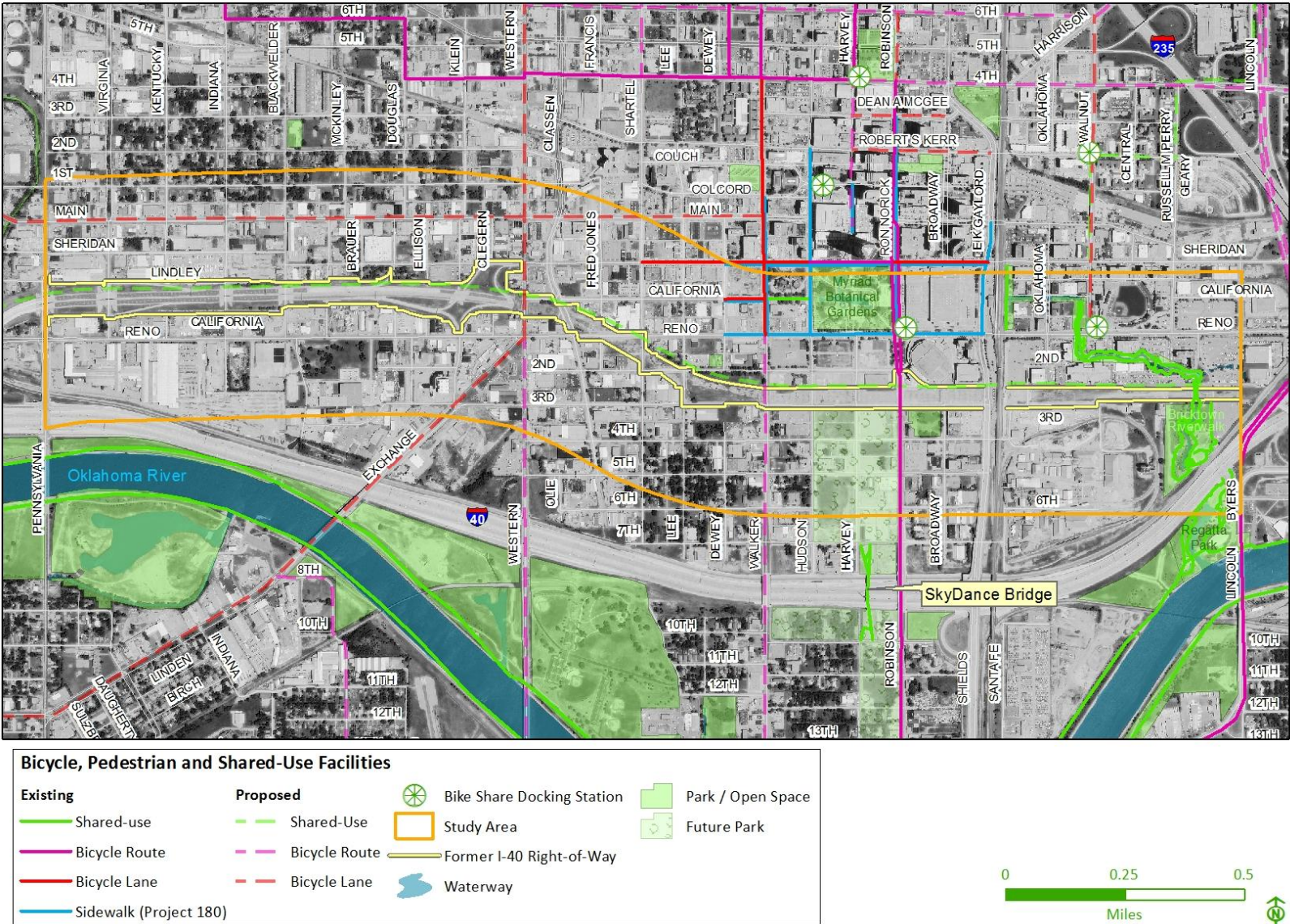
### 2.3 Safety

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Pedestrians and bicyclists are the most vulnerable users of roads and are often over-represented in fatal and injury crashes. Generally, pedestrians are safer if they are on sidewalks out of the flow of vehicle traffic. A safety study from the FHWA (2010) found that having sidewalks



Figure 1. Existing and Proposed Bicycle, Pedestrian, and Shared-Use Facilities



reduces pedestrian crashes by half. Bicyclists also benefit from infrastructure designated for their use: on-road bicycle lanes reduced crash rates by about 50 percent, according to one study from 2010 (FHWA 2010).

Vehicle speed contributes to the severity of injury in crashes involving bicyclists and pedestrians (Smart Growth America/National Complete Streets Coalition 2010). Generally, higher speeds mean a greater likelihood for fatalities and severe injuries. At 30 mph, a pedestrian has a 60 percent chance of surviving a crash, while at 40 mph; the likelihood of survival is reduced to about 20 percent. If a crash occurs between a motor vehicle and a pedestrian or bicyclist, the pedestrian or bicyclist is the most at risk (Smart Growth America/National Complete Streets Coalition 2010).

Using statewide incident data from 2007 to 2011, ACOG produced an overview of crashes in the Oklahoma City metropolitan region, noting that 10.4 percent of fatal crashes were pedestrian related. These data indicate that 68.4 percent of pedestrian fatalities and 100 percent of bicycle fatalities were not at intersections. The region analyzed includes urban, suburban, and rural areas in Cleveland and Oklahoma Counties and parts of Canadian, Grady, Logan, and McClain Counties.

Additional analysis by ACOG for bicycle and pedestrian crashes in Oklahoma City showed that between 2007 and 2011, there were 715 pedestrian-related crashes, which resulted in 40 fatalities and 688 injuries. During the same period, there were 302 bicycle-related crashes, resulting in three fatalities and 269 injuries. In both cases, failure to yield was the primary cause of the crash, although the report does not indicate which party failed to yield. Most crashes occurred during the day in clear weather. Most crashes for bicyclists occurred at intersections (54.3 percent) (Association of Central Oklahoma Governments 2013).

## 2.4 Other Initiatives

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### 2.4.1 Spokies Bike Share

Oklahoma City's bicycle share program, Spokies, was launched by the City's Office of Sustainability in May 2012 and is operated by Downtown OKC. The program currently has 97 bikes and seven docking stations between NW 10<sup>th</sup> Street to the north, Reno Avenue to the south, Walker Avenue to the west, and Mickey Mantle Drive to the east. Two stations are in the study area: one near Myriad Botanical Gardens at the corner of Robinson Avenue and Reno Avenue and the other at the corner of Walnut Avenue and Reno Avenue near the Bricktown River Walk (Figure 1).

Under the Spokies program, riders sign up for an annual, monthly, or daily membership pass and can ride for 30 minutes free for an unlimited number of times. To avoid paying the extra fee for rides longer than 30 minutes, bicyclists need to check in their bike at a docking station but can then immediately check the bike out again. This fee structure encourages short trips for a wide number of users.

## 2.4.2 OpenStreets OKC

Oklahoma City's first OpenStreets event occurred on March 30, 2014, in the Uptown 23<sup>rd</sup> District between Western and Robinson Avenues on 23<sup>rd</sup> Street. OpenStreets events are periods where a street is closed to motorized vehicle traffic and opened to other types of uses, such as bicycling, walking, running, exercising, pop-up vendors, picnics, and other types of neighborhood activity. The street becomes a public space for the community to enjoy for a set period of time. A reported 20,000 people came out for this event (*The Oklahoman* 2014).

## 2.5 Future Plans

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Oklahoma City has proposed and funded an additional 48 miles of shared-use trails, 140 miles of bicycle routes, and 14.5 miles of bicycle lanes and has proposed a shared-use facility along the entire length of the Crosstown Boulevard. As described in Section 3, some of the Crosstown Boulevard alternatives provide for bicycle lanes in the segments between Walker Avenue and E.K. Gaylord Boulevard, and sidewalks in all segments where the alternatives are at-grade.

Other proposed bicycle routes are on Western and Walker Avenues, south of Reno Avenue. Planned projects in the study area include bicycle lanes on Exchange, Main, Walnut, and Western Avenues north of the intersection with Exchange Avenue, and bicycle route facilities (shared lane) on Walker and Western Avenues, south of the Exchange Avenue intersection. Figure 1 shows the proposed shared-use and bicycle facilities, as well as the potential connected network of bicycle and pedestrian facilities throughout the study area.

As stated previously, Oklahoma City's MAPS 3 program committed to building between 25 and 36 miles of facilities based on the *Sidewalk Master Plan* prioritization analysis. This is in addition to Oklahoma City's Project 180 initiative, which is redesigning the downtown street network and adding pedestrian and bicycling facilities to downtown. None of the sidewalks in the MAPS 3 program are in the Crosstown Boulevard study area.



## 3.0 Impacts of Alternatives

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The analysis of alternatives for the Crosstown Boulevard addresses three sections within the study area:

- West Connection from Pennsylvania Avenue to Western Avenue
- Central Section from Western Avenue to E.K. Gaylord Boulevard
- East Connection from E.K. Gaylord Boulevard to Byers Avenue

### 3.1 Methodology

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Many factors influence the choice of bicycling and walking as a mode of transportation. Primary factors used for this assessment of the Crosstown Boulevard alternatives fall into two categories: facility design and operation. Design factors include road and intersection widths that affect crossing distances; the density of spacing of side-street intersections, and driveways (curb cuts) along the road; corner curb radii at intersections; the inclusion of medians or pedestrian refuge areas; the availability of signalized or protected crosswalks, sidewalk widths and separation distances to the nearest traffic lane or presence of a buffer; Americans with Disabilities Act (ADA) compliant features; and what pedestrian and bicycling facilities are available along the road.

Operational factors include the speed at which vehicles travel, how many cars and trucks use the road, signal timing for turning vehicles, pedestrians, and bicyclists; and connectivity to other parts of the transportation network. Numerous guidelines, standards, and best practices address these issues. Sources used are from the FHWA, the U.S. Access Board, transportation industry associations and organizations, and Oklahoma City's transportation plans.

Other factors that influence the decision to walk or bicycle for transportation include personal health and ability, cultural attitudes, weather, land use (i.e., are there desired destinations in the area), and the aesthetics and street-side amenities, such as pedestrian-scale lighting, landscaping, public transportation service and shelters, wayfinding signage, and secure and available bicycle parking. Although these factors are important in the decision to bicycle or walk, the focus of this analysis is on the design and operational features of the Crosstown Boulevard.

This report makes several assumptions about design and operational conditions for the Crosstown Boulevard. One assumption is that all alternatives will include pedestrian walkways along the at-grade section, unless other provisions are noted. For Alternatives A and B, this section is between Walker Avenue and E.K. Gaylord Boulevard. For Alternative C, shared-use paths are proposed for the entire distance, and for both sides of the road. For Alternative D, sidewalks would be included as the Crosstown Boulevard segments connect at California Avenue and Third Avenue.

To clarify, a shared-use path is defined as a facility for use by bicyclists, pedestrians, skaters, wheelchair users (both motorized and non-motorized) and other non-motorized modes. This type of facility, sometimes called a trail, is separated from motorized vehicular traffic and other land uses with a planted buffer (parkway) or other barrier (AASHTO, 1999).

A second assumption is that the proposed road, the proposed shared-use path, and any other bicycling and walking facilities will meet minimum standards as established by law or requirement. For example, current ADA sidewalk standards (enforceable by the U.S. Department of Justice) are for a minimum clear width of three feet (U.S. Department of Justice 2010); proposed guidelines currently under review call for a minimum clear width of four feet (U.S. Access Board 2011). Clear width means that no obstructions (utility poles, sign posts, and hydrants) can be located in that zone. Proposed guidelines are also under review for shared-use paths. Oklahoma City guidelines call for sidewalks in commercial areas to be a minimum of five feet wide (with at least a three-foot clear zone) or six feet wide if adjacent to the curb (City of Oklahoma City Public Works Department 2013).

Traffic volume, travel speed, and the mix of cars and trucks can negatively influence bicyclists or pedestrians from walking or bicycling on any proposed sidewalk, bicycle lane or shared use path. Heavy traffic volumes, speeding motorists or the presence of a large number of trucks can act as deterrents for bicyclists and pedestrians. This analysis assumes that there would only be minimal differences in volume, speed and vehicle mix when comparing each Alternate, and therefore, would not significantly alter the level of pedestrian or bicycle use for each proposed Alternate..

Lastly, accounting for walk speed is an important factor in signal timing and pedestrian safety. Current federal standards require signals to be timed based on a maximum walking speed of 3.5 feet per second (2.38 mph) for pedestrian crossings (FHWA 2009); signal timing at intersections is assumed to account for adequate pedestrian crossing times in a single signal cycle.

The impact analysis of the alternatives will consider the following road design and operational factors:

- The number of lanes/intersection distance—This factor affects the width of the road, which affects how much time and distance pedestrians and bicyclists need to cross before safely reaching the other side of the street.
- Speed limits—This serves as a proxy for travel speed and design speed. Travel (actual) speed is how fast or slow drivers go; design speed is the maximum speed that drivers can safely travel based on the engineering design of the road.
- The provision of bicycle lanes, on-street parking, and sidewalks—Bicycle lanes provide a separate space for bicyclists on the road. On-street parking provides a buffer between moving vehicles and pedestrians, and in some cases, bicyclists.
- Connectivity to the existing network—This factor affects direct access to destinations. For example, roads that dead-end without trails or sidewalk connections require all

users to find an alternate route to reach their destination, which is usually less difficult for motorized vehicles than for pedestrians. Connectivity to existing and proposed pedestrian and bicycle networks improves accessibility.

### 3.2 West Section: Pennsylvania Avenue to Western Avenue

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For the alternatives, the segment between Pennsylvania Avenue and Western Avenue is designed as four to six lanes of traffic at a posted speed limit of 45 mph; no bicycling or pedestrian facilities exist along this section of the Crosstown Boulevard. In this area, there are no designated accommodations for bicyclists on any adjacent roads. Pedestrian infrastructure is also lacking.

Oklahoma City has proposed that a shared-used path be located adjacent to the facility to accommodate pedestrians and bicyclists, thereby creating an east-west connection to the proposed bicycle lane on Western Avenue. The addition of a shared-use facility will improve safety for all users in this section, by providing bicyclists and walkers a designated route, with physical separation from the traffic lanes.

### 3.3 Central Section: Western Avenue to E.K. Gaylord Boulevard

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#### 3.3.1 Alternative A

Between Western Avenue and E.K. Gaylord Boulevard, Alternative A would be a 45 mph, six-lane thoroughfare. No bicycle facilities are proposed for this section. Sidewalks will be provided immediately adjacent to the road, and will meet City of Oklahoma design standards. The current design includes a six-lane bridge between Western Avenue and Lee Avenue, transitioning to an at-grade alignment between Lee Avenue and Walker Avenue. Bicyclists and pedestrians would not have access to this bridge, but would transition from the proposed shared-use path (from Pennsylvania Avenue to Western Avenue, location to be determined) to existing sidewalks and streets. Existing north-south connections would be maintained under the bridge, although Western Avenue would be realigned to merge with Classen Boulevard. Western Avenue on the north side of the Crosstown Boulevard would dead end and Lee Avenue and SW 2<sup>nd</sup> Street also would be dead end to accommodate the transition to at-grade. Accommodations for bicycle and pedestrian access at these closures have not been determined.

Between Walker Avenue and E.K. Gaylord Boulevard, the facility would remain at-grade with a posted speed limit of 35 mph. Intersections in this section would have one or two dedicated left-turn lanes, a minimum of three through lanes, and a dedicated right-only lane at three out of four intersections, resulting in eight and nine lane cross-sections. These intersections would be a potentially intimidating barrier for pedestrians and bicyclists, as all crossings would be 120 feet wide or more, except at E.K. Gaylord Boulevard, which would be 110 feet. At a walking speed of 3.5 feet per second (2.38 mph), intersections would take an average pedestrian at least 30 seconds to cross. Medians would separate the eastbound and westbound lanes, potentially

providing pedestrians with a waiting area for those unable to completely cross the intersection during one signal cycle.

Alternative A does not provide for a dedicated bicycle lane. North-south connectivity would be maintained at Walker, Hudson, and Robinson Avenues. Harvey Avenue would be closed. Figure 2 reflects pedestrian and bicyclist conditions under Alternative A.

### 3.3.2 Alternative B

For Alternative B, the proposed 45 mph, six-lane bridge would continue from Western Avenue to Shartel Avenue but then narrow to four lanes at Lee Avenue when the transition to at-grade would begin. No bicycle or pedestrian facilities are proposed for the bridge, but pedestrian and bicyclists would transition from the proposed shared-use path to existing sidewalks and streets, until Walker Avenue. As with Alternative A, Western Avenue would dead end on the north side of the Crosstown Boulevard and be realigned to merge with Classen Boulevard. Lee Avenue and SW 2<sup>nd</sup> Street also would dead end to accommodate the transition to at-grade, thereby reducing direct through access in this location. Accommodations for bicycle and pedestrian access at these closures have not been determined. Other north-south connections would be maintained under the bridge.

From Walker Avenue to E.K. Gaylord Boulevard, posted speed limits would be 35 mph. In addition to the four-lane configuration, Alternative B would include a dedicated bicycle lane and parking (on the south side) between Walker Avenue and E.K. Gaylord Boulevard.

Intersection crossing distance in Alternative B would be between 80 to 105 feet, shorter than Alternative A and thereby reducing the time needed for pedestrians to cross. Proposed medians would separate the lanes of traffic and potentially provide waiting areas for pedestrians caught between signal cycles. However, there would be no medians at the intersection of the Crosstown Boulevard and Hudson Avenue (west side) and the Crosstown Boulevard and E.K. Gaylord Boulevard, resulting in crossing distances of at least 84 feet. Parking lanes would serve as a buffer between the sidewalk and the street and could slow travel speeds in the area, as drivers park or merge back into the travel lane. On-street parking provides a visual narrowing of the roadway, acting as a traffic calming feature that encourages drivers to travel at slower speeds.

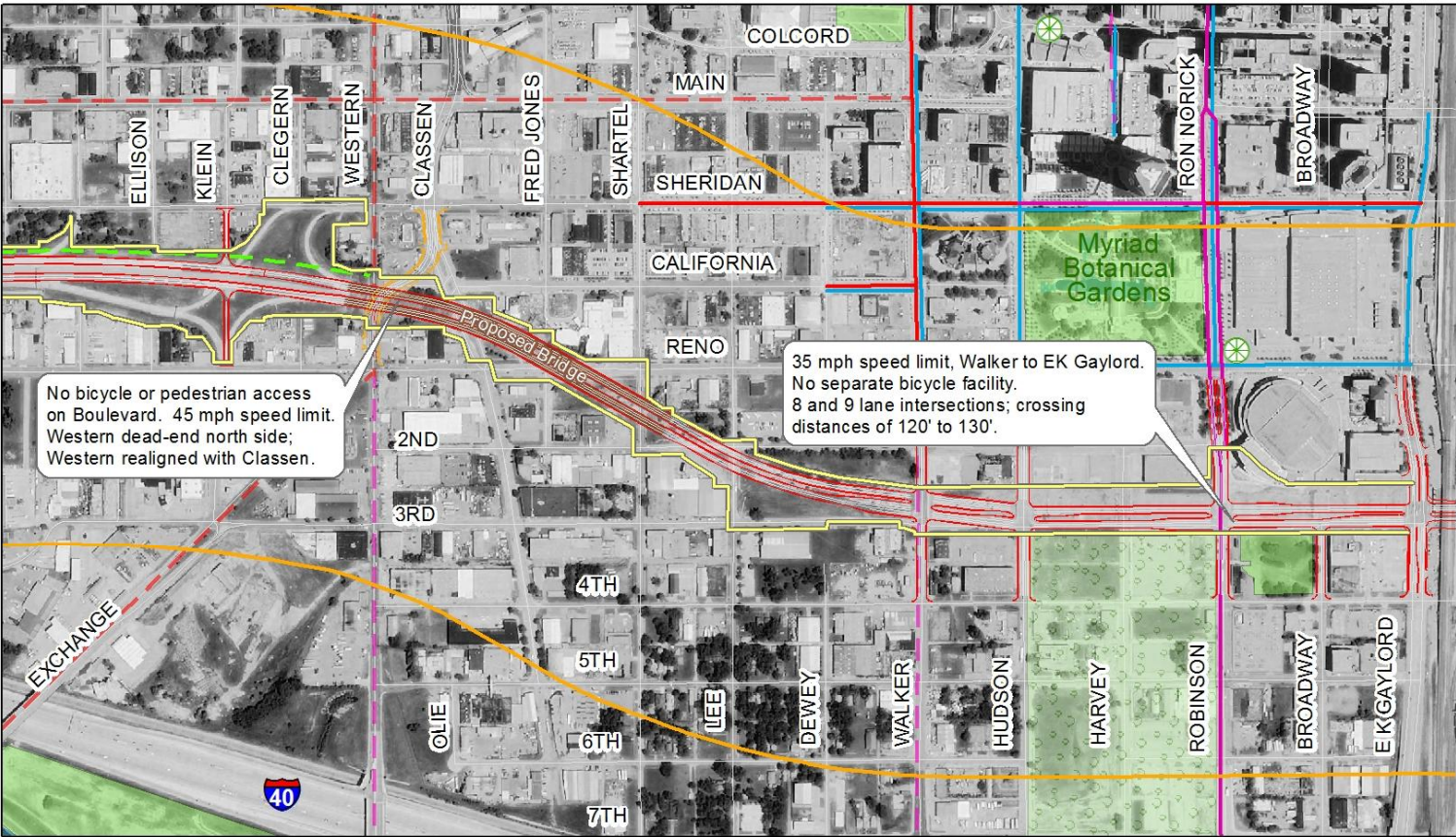
With the addition of the dedicated bicycle lane, Alternative B would be more amenable to bicyclists as it facilitates travel outside of the motorized traffic lanes. The dedicated lane would connect to the existing Robinson Avenue bicycle route and the proposed Walker Avenue and Western Avenue bicycle routes. Figure 3 reflects pedestrian and bicyclist conditions under Alternative B.

### 3.3.3 Alternative C

Alternative C provides the greatest number of enhancements for bicycle and pedestrian travel in the project corridor. Most significantly, Alternative C will include – on both sides of the



Figure 2. Alternative A Bicycle and Pedestrian Access



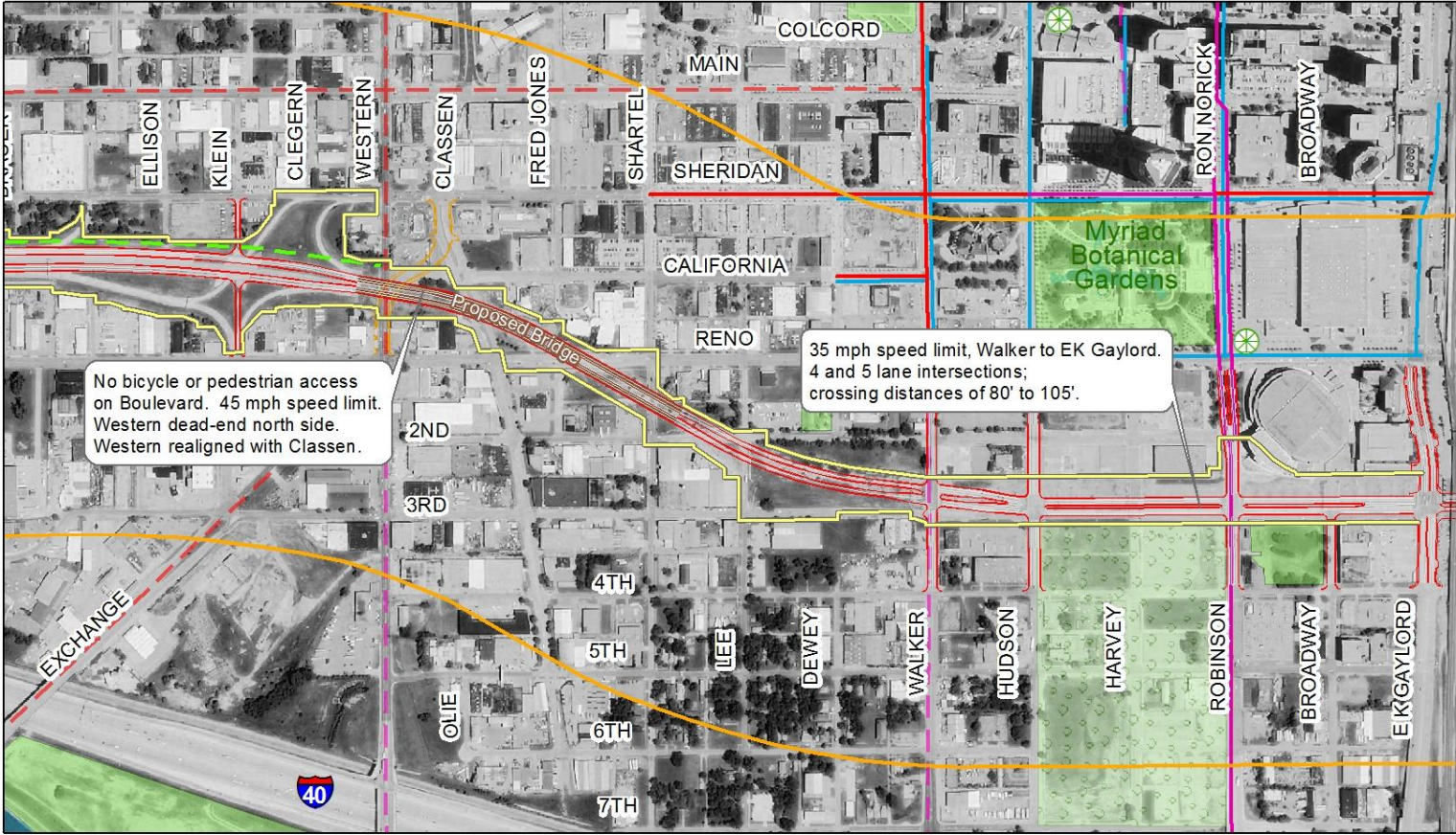
**Alternate A**

Proposed Pavement	Study Area	Park / Open Space	Existing Bicycle Route
Proposed Striping	Former I-40 Right-of-Way	Future Park	Existing Bicycle Lane
Proposed Western Avenue Realignment	Waterway	Project 180 Sidewalk	Proposed Bicycle Route
Proposed Bridge		Bike Share Docking Station	Proposed Bicycle Lane
			Proposed Shared-Use Path (Location To Be Determined)





Figure 3. Alternative B Bicycle and Pedestrian Access



**Alternate B**

Proposed Pavement	Study Area	Park / Open Space	Existing Bicycle Route
Proposed Striping	Former I-40 Right-of-Way	Future Park	Existing Bicycle Lane
Proposed Western Avenue Realignment	Waterway	Project 180 Sidewalk	Proposed Bicycle Route
Proposed Bridge		Bike Share Docking Station	Proposed Bicycle Lane
			Proposed Shared-Use Path (Location To Be Determined)



Crosstown Boulevard – an eight to 12 foot shared-use path between Western Avenue and the Bricktown Canal. These facilities, in addition to proposed on-road bicycle lanes from Walker Avenue to E.K. Gaylord Boulevard, and a proposed mid-block crossing at the existing Harvey Avenue, ensure that pedestrians and the greatest population of bicyclists (of varying experience levels) will be fully accommodated in this section of the project corridor. It should be noted that shared-use paths, as an off-road bicycle facility, may require dedicated signing, pavement marking and signals where the shared-use path intersects with side streets.

From the west, Alternative C will narrow to four lanes and shorten the bridge over Western Avenue, transitioning to at-grade at Reno Avenue. The speed limit in this section would be 45 mph. As with Alternatives A and B, Western Avenue would be realigned to merge with Classen Boulevard under the Crosstown Boulevard bridge. The north side of Western Avenue, the south side of Classen Boulevard, Francis Avenue, and SW 2<sup>nd</sup> Street would all dead end at the Crosstown Boulevard. North-south access would be maintained at Shartel Avenue and Lee Avenue, while the new shared-use path would provide east-west connectivity for pedestrians and bicyclists.

The Crosstown Boulevard intersection at Reno Avenue would be between 170 and 180 feet wide. A median (60 to 64 feet) would separate the four lanes of the Crosstown Boulevard, providing potential waiting areas for pedestrians walking along Reno Avenue. However, the proposed eastbound turn lane from the Crosstown Boulevard to westbound Reno Avenue may require pedestrians to cross along the south side of Reno Avenue for safety reasons.

Between Walker Avenue and E.K. Gaylord Boulevard, the Crosstown Boulevard would be four lanes, with dedicated turn lanes at all four cross streets, bringing the intersections to five lanes (six lanes at E. K. Gaylord Boulevard). North-south intersection crossing distances from Walker Avenue to E.K. Gaylord Boulevard would be between 60 and 90 feet. The addition of corner bump outs at some intersections would assist pedestrians with crossing the Crosstown Boulevard, by making them more visible to motorists and narrowing the intersection.

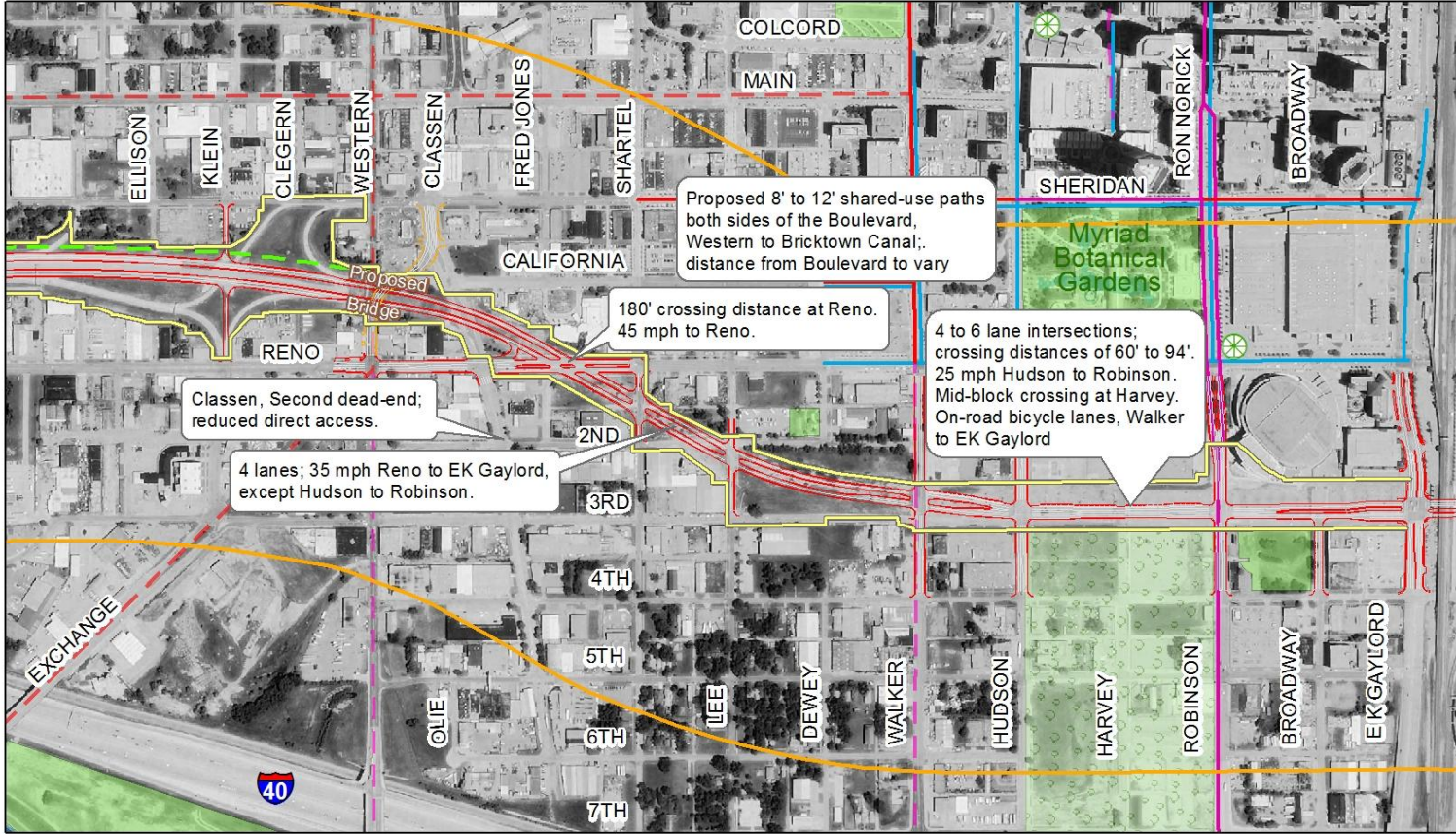
The narrowest section of the roadway (52 feet) would be the mid-block crossing at Harvey Avenue. This crossing will facilitate pedestrian and bicyclist travel between new development to the north and the proposed park to the south. Harvey Avenue will be closed, and the right-of-way (ROW) will be dedicated for use as part of the park. Parking is included on the north side of the street between Walker Avenue and Robinson Avenue.

The speed limit would be 35 mph between Reno Avenue and Hudson Avenue, 25 mph between Hudson Avenue and Robinson Avenue, and 35 mph between Robinson Avenue and E.K. Gaylord Boulevard. The 25-mph speed limit, mid-block crossing, on-street bicycle lanes, shared-use path and shorter crossing distances provide an environment that encourages walking and bicycling. Figure 4 reflects pedestrian and bicyclist conditions under Alternative C.

To note: the shared-use paths are not shown on Figure 4, as the location and design have yet to be determined. The separation distance between the shared-use path and the Crosstown



Figure 4. Alternative C Bicycle and Pedestrian Access



**Alternate C**

Proposed Pavement	Study Area	Park / Open Space	Existing Bicycle Route
Proposed Striping	Former I-40 Right-of-Way	Future Park	Existing Bicycle Lane
Proposed Western Avenue Realignment	Waterway	Project 180 Sidewalk	Bicycle Route
Proposed Bridge		Bike Share Docking Station	Bicycle Lane
			Proposed Shared-Use Path (Location To Be Determined)



Boulevard will vary, depending upon conditions, although best practice recommendations are for two to four feet on local or collector streets and for five to six feet on arterial or major streets. Best practice for two-way shared-use path design is a minimum of ten feet and eight feet should be used in rare circumstances (AASHTO, 2004, 2012).

### 3.3.4 Alternative D

Alternative D consists of two separate east-west alignments. In Alternative D, Crosstown Boulevard would transition into the existing Oklahoma City street network rather than building a new road between Western Avenue and E.K. Gaylord Boulevard. On the west end of the Crosstown Boulevard, Alternative D would merge into California Avenue with two through lanes in each direction. The four lanes would end at Dewey Avenue. East of Dewey Avenue, California Avenue would become one lane in each direction with an existing dedicated bicycle lane. North-south connectivity would be maintained.

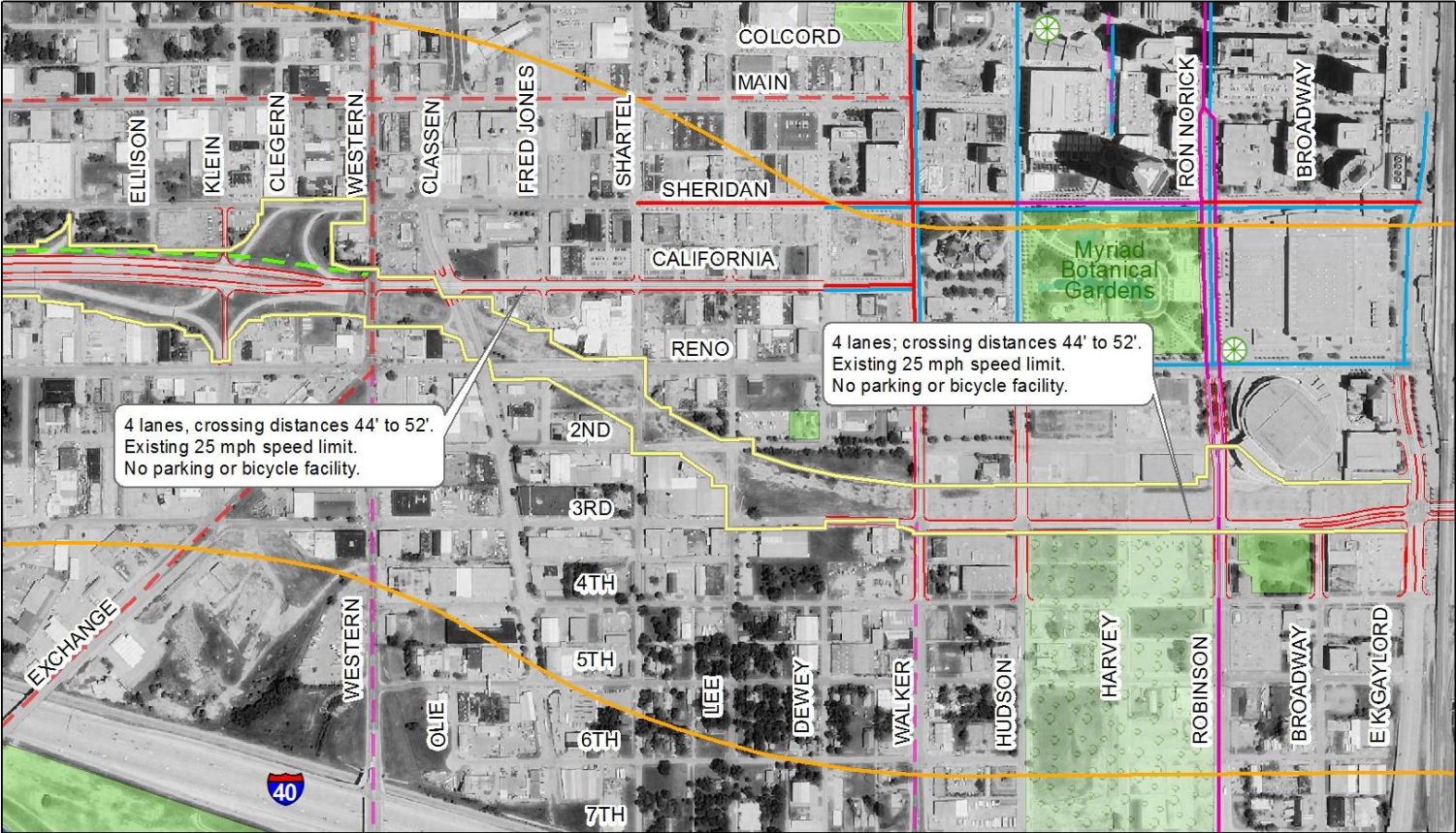
On the east end, the Crosstown Boulevard would tie into SW 3<sup>rd</sup> Street at E.K. Gaylord Boulevard. West of Walker Avenue, SW 3<sup>rd</sup> Street would become a two-lane, bi-directional street rather than a one-way street. East of Walker Avenue, SW 3<sup>rd</sup> Street would be reconstructed to four lanes, two in each direction. Just west of Broadway Avenue, the four lanes would split and incorporate a median as the road intersects with E.K. Gaylord Boulevard.

Pedestrians would use new sidewalks along California Avenue and SW 3<sup>rd</sup> Street. The posted speed limit (25 mph or 30 mph on designated streets) would remain as is, and north-south cross streets would remain open. Intersection crossing distances would be 52 feet along California Avenue and 44 feet along SW 3<sup>rd</sup> Street, resulting in shorter road crossings for pedestrians.

The 25-mph speed limit would create conditions comfortable for pedestrians and bicyclists, as vehicle traffic would be slowed. No new bicycle facilities are proposed; bicyclists would be able to ride on these streets or other low-volume or bicycle-friendly streets immediately adjacent. The Oklahoma City street grid network would be intact and north-south access would be maintained. Figure 5 reflects pedestrian and bicyclist conditions under Alternative D.



Figure 5. Alternative D Bicycle and Pedestrian Access



**Alternate D**

Proposed Pavement	Park / Open Space	Existing Bicycle Route
Proposed Striping	Future Park	Existing Bicycle Lane
Study Area	Project 180 Sidewalk	Proposed Bicycle Route
Former I-40 Right-of-Way	Bike Share Docking Station	Proposed Bicycle Lane
Waterway	Proposed Shared-Use Path (Location To Be Determined)	



### 3.4 East Section: E.K. Gaylord Boulevard to Byers Avenue

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The approximately half-mile-long segment from E.K. Gaylord Boulevard to Byers Avenue would be a four-lane, median-separated road with a 45 mph speed limit. The Crosstown Boulevard would proceed east underneath the railroad tracks that carry Amtrak's Heartland Flyer and BNSF freight services.

As currently planned, the proposed shared-use paths would continue to the Bricktown Canal. The shared-use path on the boulevard's north side would connect to the Bricktown District, which contains numerous entertainment and recreational attractions. The shared-use path on the south side would provide access to Regatta Park, via the Bricktown River Walk. With the convention center and the Chesapeake Energy Arena on the west and the Bricktown District and Regatta Park on the east, it will be important to provide capacity and to create an inviting pedestrian environment, so that walkers and bicyclists will use the new connection between these activity centers.

### 3.5 Summary

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The current design of the Crosstown Boulevard from Pennsylvania Avenue to Western Avenue does not provide for a shared-use path or any other pedestrian and bicycle facilities and is therefore incompatible for bicycling and walking. Table 1 summarizes how the alternatives would affect the bicycle and pedestrian environments for the section from Western Avenue to E.K. Gaylord Boulevard. Alternative C, with proposed shared-use paths on both sides of the Crosstown Boulevard, is anticipated to provide the best conditions for bicyclists and pedestrians, as well as other users. From E.K. Gaylord Boulevard to Byers Avenue, the shared-use paths will provide connections to the Bricktown District and Regatta Park.



Table 1. Design Elements and Pedestrian/Bicycle Accessibility between Western Avenue and E.K. Gaylord Boulevard

FACTOR	Alternative A	Alternative B	Alternative C	Alternative D
Travel lanes	6 to 9	4 to 6	4 to 6	4
Crossing distance (feet) at intersections	100 to 120	80 to 100	55 to 170. Crossing at Reno includes 48 crossing distance between 60-63 median	44 to 52
Speed limit	45 mph; 35 mph, Walker to E.K. Gaylord	45 mph; 35 mph, Walker to E.K. Gaylord	45 mph; 35 mph Reno to Hudson; 25 mph Hudson to Robinson; 35 mph Robinson to E.K. Gaylord	25 to 30 mph
Bicycle facility	No	Yes, Walker to E.K. Gaylord	Shared-use paths, 8 to 12feet, from Western to E.K. Gaylord; midblock crossing at Harvey; corner bump-outs at some intersections	No
Pedestrian facility	Walker to E.K. Gaylord	Walker to E.K. Gaylord		Throughout
Parking lane	No	Yes, Walker to E.K. Gaylord	Yes, north side only, Walker to Robinson	No
Continuity/connections	Western Avenue realignment; limited east-west and north-south	Western Avenue realignment; limited east-west and north-south	Western Avenue realignment, shared-use paths, north-south access at Shartel and Lee	No changes to existing
Summary	Least pedestrian and bicyclist friendly due to vehicle speed limit and generally longer crossing distances	Pedestrian and bicyclist friendly between Walker and E.K. Gaylord due to speed limit and bicycle and pedestrian facilities	Pedestrian and bicyclist friendly between Western and E.K. Gaylord due to speed limit, intersection crossing distances, mid-block crossing, and shared use paths	Pedestrian friendly throughout due to lower speed limit and shortest intersection crossing distances for pedestrians

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