Congress Avenue Urban Design Initiative

Mobility Report

March 4, 2019

Attribution

Planning and Zoning Department

Public Works Department

Austin Transportation Department

Report Prepared by:

Alliance Transportation Group, Inc.

ATG ALLIANCE TRANSPORTATION GROUP

In collaboration with the Austin Transportation Department and Sasaki Associates, Inc.

March 4, 2019

Table of Contents

Introduction

Congress Avenue, one of Austin's most iconic and lively streets, is being re-envisioned through an effort called the Congress Avenue Urban Design Initiative, with study limits between Riverside Drive to 11th Street. As the central spine of downtown Austin and the connection between Texas State Capitol, Lady Bird Lake, and the South Congress Historic District, Congress Avenue is arguably Austin's most prominent street. Despite this, the avenue lacks the vitality and identity of a great people-centric place. The goal of this effort is to develop an urban design and implementation strategy that results in a human-centric, multi-functional complete street with a clear and attractive identity.

Improving Congress Avenue as the 'Main Street of Texas' is called for in the City Council adopted Downtown Austin Plan, and the project is made possible with funding from the City's 2012 bond program. In partnership with the Downtown Austin Alliance (DAA) and community stakeholders, the City contracted with an Urban Design consultant team to help refine and realize the vision for Congress Avenue from the Capitol to Riverside Drive.

The intent of this mobility report, a supporting document that is part of this Congress Avenue Urban Design Initiative, is to examine the effect of proposed Congress Avenue alternatives on mobility for all modes of transportation. The alternatives seek to optimize and rebalance existing space on the avenue to improve the safety, comfort, capacity of other transportation modes, and to support vibrancy of Congress Avenue. Throughout the public involvement process for this project, there has been strong support to increase the space along the avenue for people to walk, bicycle, and sit at cafes with an openness to reducing space currently allocated for use by motor vehicles.

Congress Avenue is a walking street for 12,000 Downtown residents, a major destination for 24 million annual visitors, as well as an important civic place and regional mobility corridor for 86,000 employees. Mobility is a key function of Congress Avenue and any change has implications on how people traveling by vehicle, walking, bicycle, scooter, and transit move along the corridor. The corridor has significant constraints, including the Ann Richards Bridge, home to the world's largest urban bat colony, and historic buildings in the downtown. From a motor vehicle perspective, north of Cesar Chavez Street, Congress Avenue serves primarily as a feeder road to Austin's commercial core and the downtown street grid, which helps to disperse peak period traffic. South of Cesar Chavez Street, Congress Avenue serves as a regional gateway to downtown and connects to Riverside Drive. In peak periods, Congress Avenue experiences significant motor vehicle congestion. Trip generation from the large potential development site south of downtown in the South Central Waterfront planning area has the potential to significantly worsen the current congested vehicle conditions if people are not able to shift to other modes of transportation.

Within this context, this report aims to articulate the status of current mobility on this avenue and analyze the mobility impacts of alternatives developed to inform the decisions of possible infrastructure changes to the avenue. A universe of mobility alternatives was discussed and refined to three main concepts that apply to Congress Avenue, north of Cesar Chavez Street:

- 5-Lane with Parking
- 5-Lane with Flex Parking
- 4-Lane with Parking

Each alternative has unique challenges and impacts on mobility, which are discussed in the later sections of this report. Common transportation improvements are included in each alternative, including a single preferred configuration south of Cesar Chavez Street, to adequately address mobility at major intersections along the Congress Avenue corridor.

Existing Conditions

Congress Avenue is an important mobility connection for all modes and is also an important place for Austin. People travel to and along Congress Avenue by foot, bicycle, transit, motor vehicle, and now even scooter[1]. **Figure 1** shows the existing cross section along Congress Avenue north of Cesar Chavez Street. In order to make future mobility recommendations, this study analyzed the current conditions for walking, biking, transit, and vehicular traffic along Congress Avenue to lay the ground work for addressing future challenges and needs.

Figure 1: Congress Avenue Existing Cross Section

Network Function

Congress Avenue was originally conceived as the grand avenue of the capital city but its role in the overall vehicular network of the city is slowly changing over time. Per Texas Department of Transportation (TxDOT) count data, Congress Avenue vehicle volumes have trended down in recent years, as traffic has shifted to larger north-south corridors such as Lamar, Guadalupe/Lavaca, I-35, and Mopac (Loop 1) that provide access to increasingly dispersed employment centers and are better connected to the north. Beyond local trips, Congress Avenue serves travel demand as a critical connection over Lady Bird Lake to downtown, largely from South Austin.

South of Lady Bird Lake, Congress Avenue not only connects to South Austin, but also collects traffic from Riverside Drive and Barton Springs Road. Congress provides access to the Downtown area and the

[1] Dockless scooters were introduced to Austin as a pilot program in April, 2018, and have resulted in over one million vehicle miles travelled in the first 6 months of implementation. Over 11,000 scooters operate in the City of Austin and they are expected to continue to play a major role in future mobility.

Austin American-Statesman site. Despite its car-oriented design, Congress connects many popular local and tourist destinations and serves pedestrians and cyclists. **Figure 2** illustrates these important connectors passing through Congress Avenue.

Figure 2: Congress Avenue Major Connections

Pedestrian Conditions

With ample destinations and attractors in close proximity along Congress Avenue, walking to and along the Avenue is how many residents and visitors experience Congress Avenue. Survey results show that over 75% percent of respondents sometimes walk to get to and around Congress. **Figure 3** is a heat map of where people walk around and along the Avenue. The darker red along Congress Avenue from the Capitol to the south side of the Congress bridge shows Congress Avenue as a heavily walked thoroughfare in the Downtown area. Additionally, the dark red lines of the Hike and Bike trail show the trail as heavily walked and connects to Congress Avenue on both the north and south side of the bridge.

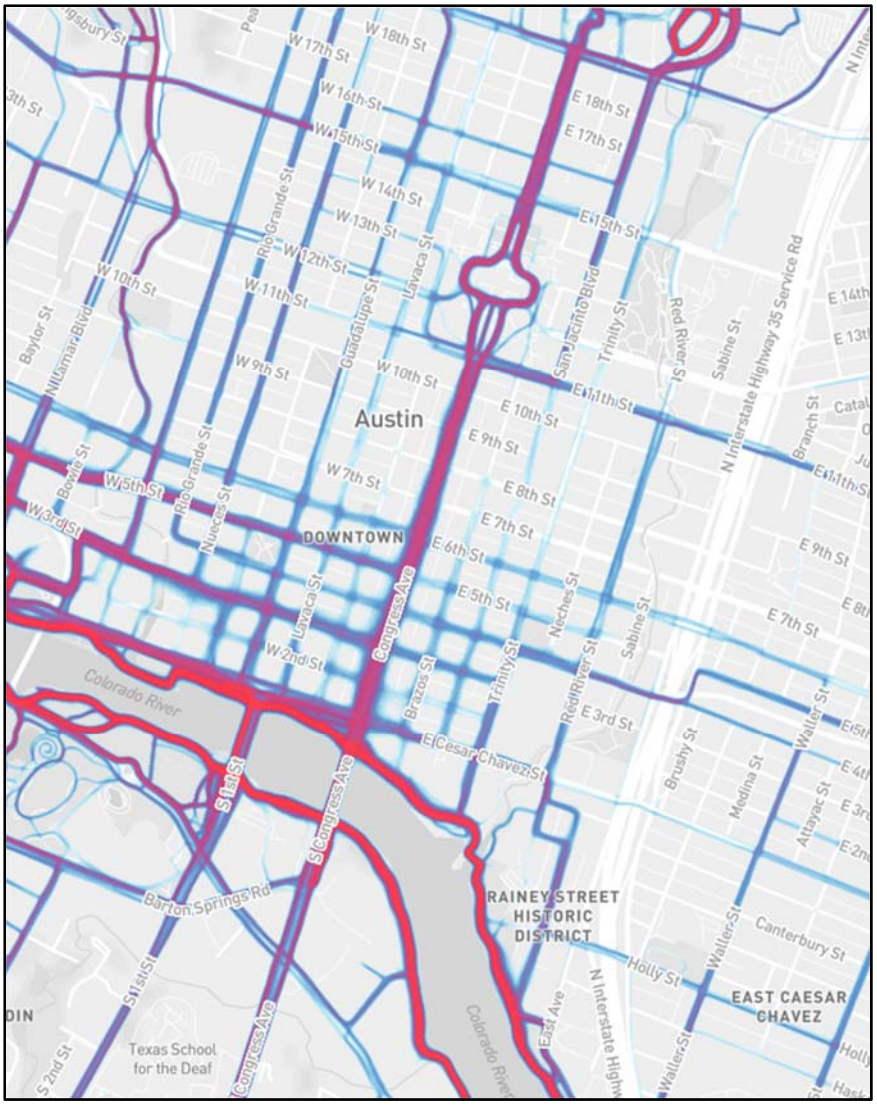
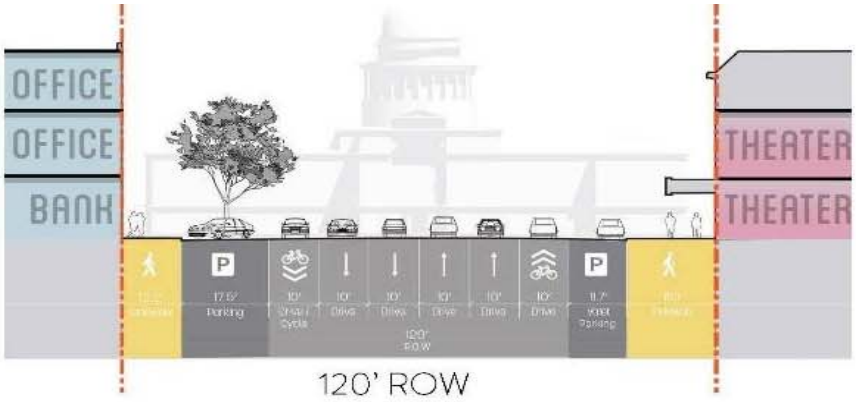


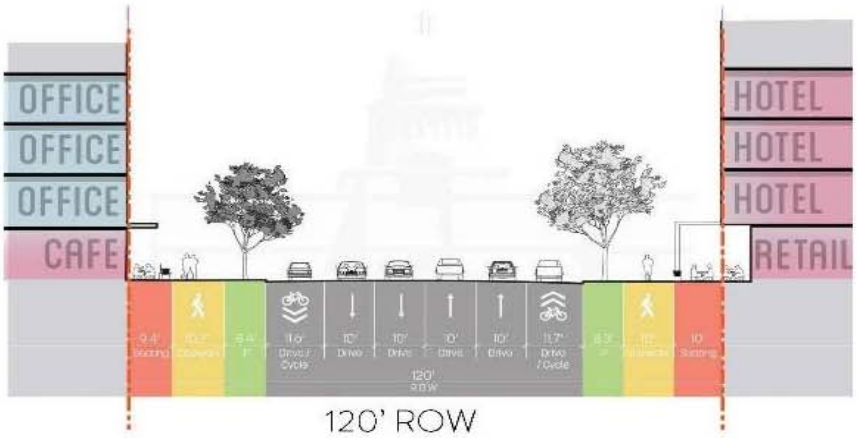
Figure 3: Heat Map of Pedestrian Use in Downtown Austin (Source: Strava)

Pedestrian zones vary along Congress Avenue. **Figure 4** illustrates three different pedestrian zones currently present at specific locations along Congress Avenue. As shown in the cross sections, pedestrian clear zones, the unobstructed space that is clear to walk, range from 5-20 feet and are adjacent to the various features in different parts of the corridor, such as café and restaurant seating, landscaping, parking, and travel lanes. To address high pedestrian volumes and conflicts with turning vehicles, many crossings along the corridor implement Leading Pedestrian Intervals (LPI). Studies have indicated that this approach can reduce vehicle-pedestrian collisions by as much as 60%[2]. This mechanism gives pedestrians a few seconds advance to cross an intersection before the corresponding green traffic light phase. Implementing an LPI encourages pedestrian safety by reducing the potential for pedestrian-vehicle collisions. As shown in **Figure 5**, much of the Right of Way along the corridor is dedicated to travel lanes and angle parking, leaving minimal sidewalk and public space.

[2] Source: A.C. Fayish and Frank Gross, "Safety effectiveness of leading pedestrian intervals evaluated by a before–after study with comparison groups," Transportation Research Record No. 2198 (2010): 15–22.



Section 1: @ Tenth Street



Section 2: @ Second Street

Section 3: @ Barton Springs

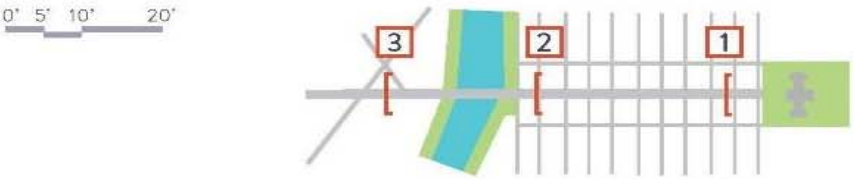


Figure 4: Pedestrian Right-of-Way Along Congress Avenue

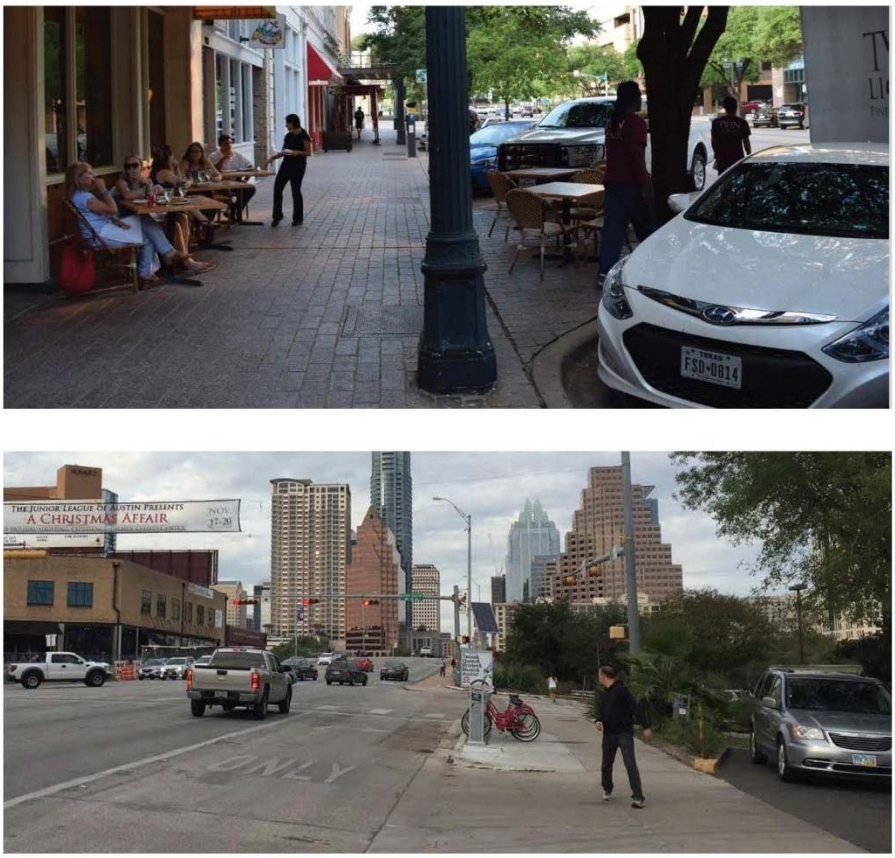


Figure 5: Existing Pedestrian Conditions along Congress Avenue

Ann W. Richards Congress Avenue Bridge

Another important problem area for pedestrian comfort and safety is the Ann Richards Bridge over Lady Bird Lake. The crossing of the lake is very long and, in the summer, unshaded and hot. The sidewalk is 8 feet wide, but immediately at the back of curb adjacent to 30 mile per hour traffic (posted speed limit) and shared with people bicycling, scootering, and even getting pedicab rides. Another condition that occurs nightly between March and October is bat-watching from the bridge. The Ann Richards Congress Avenue Bridge is home to North America's largest urban bat colony, where roughly 1.5 million Mexican free-tailed bats depart each evening for feeding[3]. Bat-watching attracts very large crowds that often entirely block the eastern sidewalk forcing people walking by or bicycling on the sidewalk to step into the outside travel lane. **Figure 6** shows the bridge during bat watching time.

[3] Source: City of Austin, http://www.austintexas.gov/blog/seasons-funcoupon-idea-5

Figure 6: Bat-Watching Crowds on the Congress Bridge

Bicycle Conditions

The City of Austin categorizes the city's bicycle routes based off of comfort levels. Perceived rider comfort level often reflects the level of safety a rider feels while riding along a bicycle facility. In general, the greater the separation from vehicular traffic, the higher level of perceived comfort and real safety along a bike facility. For example, a bike lane separated from vehicular traffic by a physical barrier is considered a high comfort facility whereas a street with no designated bike lane and high traffic volume is considered a low comfort facility. Routes with a higher level of comfort are often the most traveled and are integral to Austin's "all ages and abilities" bicycle network. **Table 1** includes the descriptions for the City of Austin's bicycle routes by level of comfort.

Table 1: Bicycle Route Level of Comfort Descriptions

Level of Comfort	Bicycle Route Description
High-Comfort	Off-road, or on-road with physical separation from motor vehicle traffic, or quiet streets with very low motor vehicle speeds and volumes.
Medium-Comfort	Includes bicycle accommodations on low- to high-speed roads, or shared lanes on roads with low to moderate speeds and volumes. On Medium- and Low-comfort sections, be ready to interact with motor vehicle traffic at intersections and throughout each block.
Low-Comfort	Important connections with high traffic volumes and speeds, and little or no bicycle accommodations.
Extremely Low-Comfort	Not recommended for bicycle travel, but have no particular alternatives for some trips.
Helpful Sidewalks	Sidewalk is present next to a less-comfortable road.
Restricted Sidewalk	Sidewalk is prohibited for bicycle use. Travel on the road surface.

Congress Avenue is categorized by the City of Austin in the medium and low comfort categories for cycling. There are no dedicated lanes or protection present for cyclists – only shared lane markings. Similarly, there are no intersection bicycle accommodations such as bike-actuated signals or protected intersections. Despite the lack of bicycle infrastructure, there is a large cyclist presence along the corridor as shown in the heat map (**Figure 7**) due to the connectivity to the south of the study area, the crossing of Lady Bird Lake, the modest grade compared to adjacent streets, and the connectivity to the north through the Texas State Capitol. As shown in **Figure 6**, high-comfort bike routes pass through Congress Avenue including the 3rd Street protected bike lanes and the Ann Butler Hike and Bike Trail.

While on-street bicycle infrastructure is lacking, other bicycle-friendly features along Congress Avenue are present. This includes the presence of many B-cycle locations on or just off Congress Avenue. Connections to the Ann Butler Hike and Bike Trail are located on the north and south side of the Ann W. Richards Congress Avenue Bridge.

Biking conditions may be separated into three distinguishable sections along the corridor: Cesar Chavez Street to 11th Street, the Congress Avenue Bridge, and Barton Springs Road to Riverside Drive. Descriptions of these sections are listed below.

- **Cesar Chavez Street to 11th Street**

  Six lanes of two-way traffic run from Cesar Chavez to 11th Street. Sharrows, shared bicycle and vehicle lanes, are present in the right lanes designating that cyclists may use the full lane. Cyclists use Congress Avenue as a thoroughfare connecting to the Capitol, South Congress, the Hike and Bike Trail, and major east-west bicycle routes intersecting the Avenue. These travel behaviors are present in the heat map (**Figure 7**). The absence of bike lanes and separation from vehicular traffic poses a safety concern and lack of comfort, given the often high-volumes of motor vehicles traveling in the shared lanes. The angled parking present on Congress Avenue results in drivers pulling out with limited view of oncoming bicycle and motor vehicle traffic.

- **Ann W. Richards Congress Avenue Bridge**

  The Ann W. Richards Congress Avenue Bridge crossing is intimidating for cyclists – its six-lane cross-section and uninterrupted length encourage high vehicular speeds. There was a notable bicycle fatality that happened on the bridge in 2012 caused by an intoxicated driver and a lack of dedicated bicycle facilities may have been a contributing factor. Due to the higher speed vehicles and lack of lane width comfort, cyclists, scooters, and pedicabs can often be found riding along the sidewalk and forced to navigate through pedestrian traffic. Given the relatively narrow width of the sidewalk immediately adjacent to the travel lane, this is a risk for people walking and bicycling/scootering, particularly when there is higher use. During the summer months, when the bat-watching crowds are at their peak, it is not uncommon to see pedestrians step off into travel lanes to avoid the pedestrian, scooter, and bicycle traffic on the sidewalk. While the Hike and Bike trail may be accessed via Congress Avenue, a lack of visible signage, on-coming turning traffic, and no provision of bicycle-friendly access points make it difficult for cyclists to access the trail.

- **Barton Springs Road and Riverside Drive**

This section of Congress Avenue includes six lanes of two-way traffic with the addition of turning bays at each intersection. Similar to the sections described above, the section along Congress Avenue between Barton Springs Road and Riverside Drive does not provide any additional bicycle facilities other than shared lane markings. Due to high speeds, high traffic volumes, and the northbound grade up to the abutment to the bridge, comfort and safety in this section is low. Key bicycle route network connections pass through this section of Congress Avenue including Barton Springs Road, the future Barton Springs extension, and the Butler Trail.

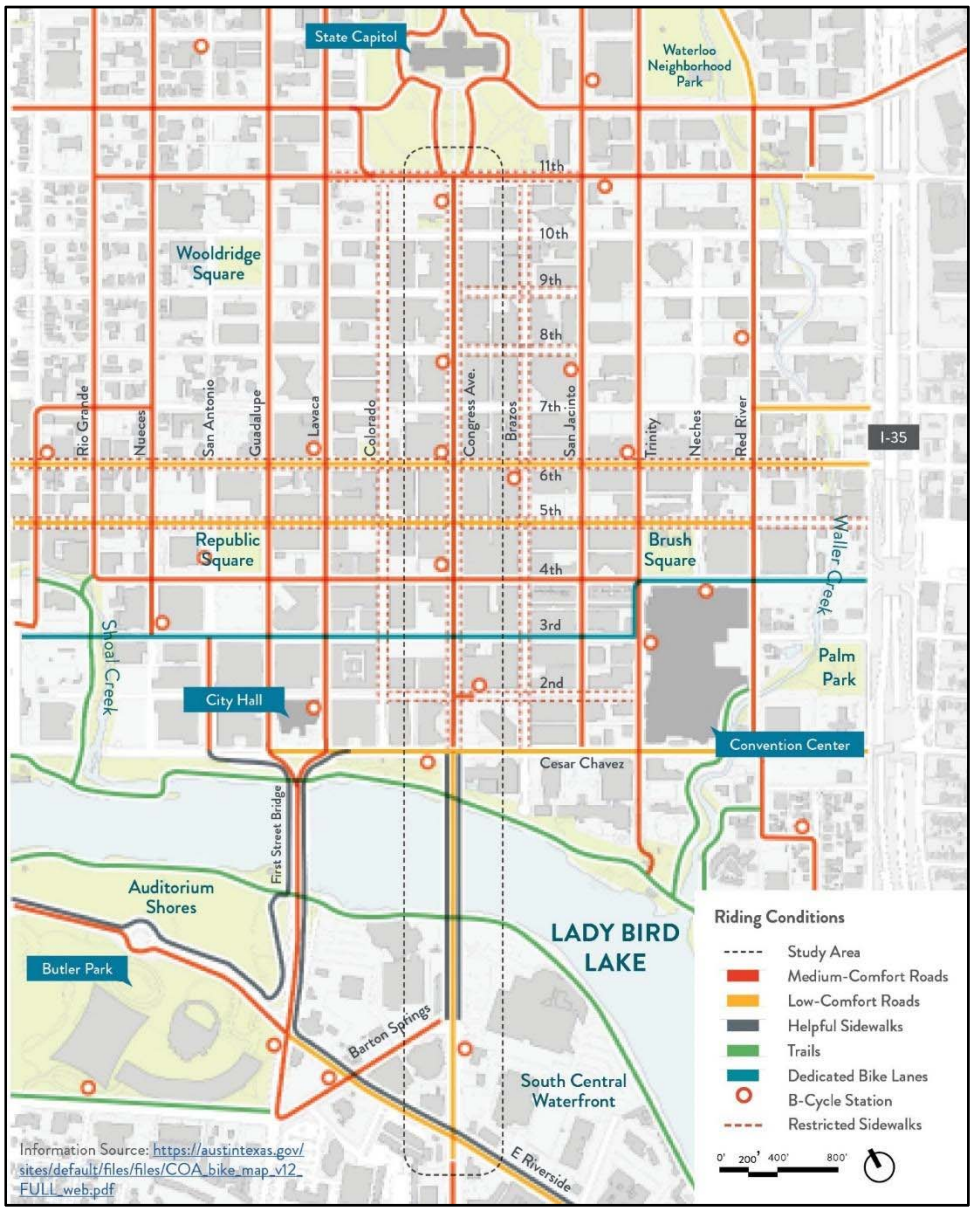


Figure 6: Bicycle Facilities Along Congress Avenue

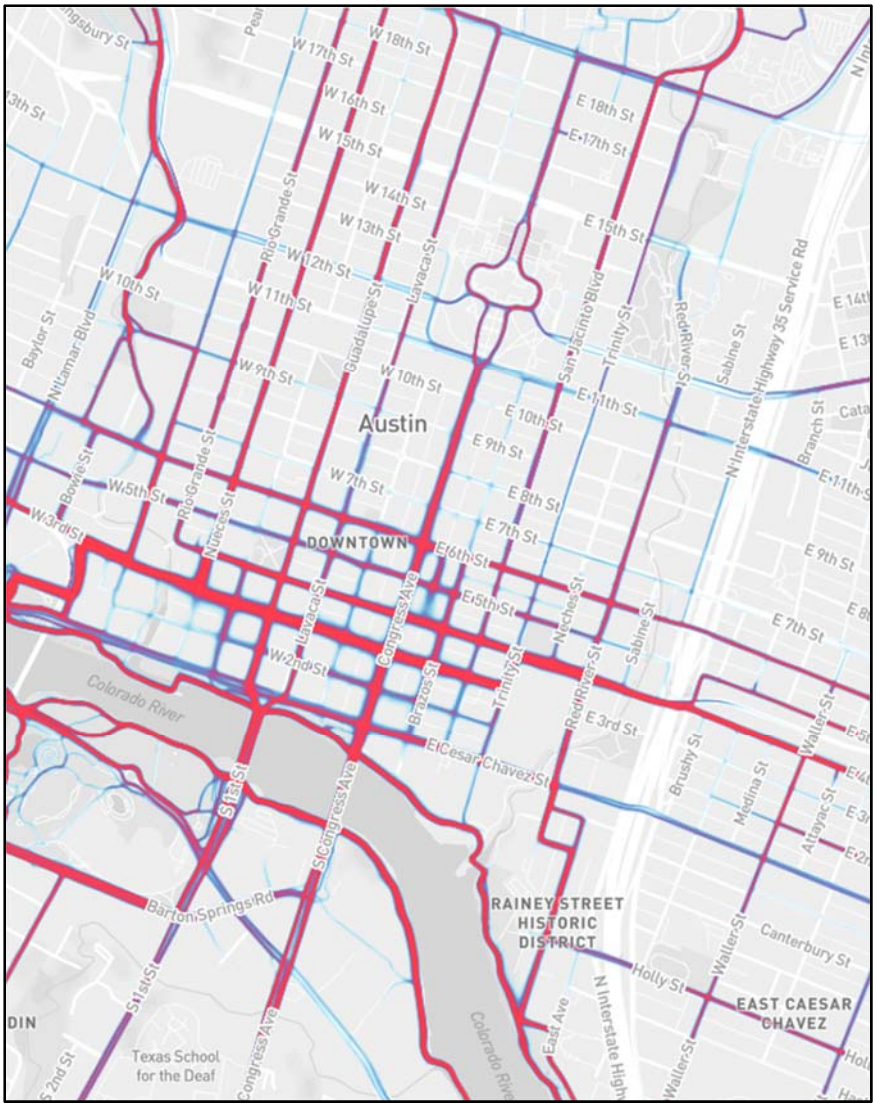


Figure 7: Heat Map for Bicycle Use in Downtown Austin

As shown in the existing heat map for bicycle use in **Figure 7**, Congress Avenue has a high concentration of bicycle use, along with 3rd Street, which recently implemented protected bicycle lanes. There have been three public meetings held for this Congress Avenue project and there was a large presence of people at the public meetings interested in safe bicycle facilities on Congress Avenue. It is a key item that was considered in alternatives in this study.

Transit Conditions

At present, Congress Avenue does not carry any CapMetro high-frequency or local routes. The MetroAirport (100) route uses Congress south of 4th Street, as shown in **Figure 8**. While transit does not operate along Congress Avenue, important transit lines operate in close proximity to Congress Avenue. Austin's primary north-south transit corridor utilizes the Lavaca-Guadalupe pair and the First Street Bridge which include high-frequency routes. Regular bus service intersects with Congress at Riverside, Cesar Chavez, 4th, 5th, 8th and 11th Streets. The Downtown Station for the Metro Rail is located three blocks east of Congress Avenue on 4th Street.

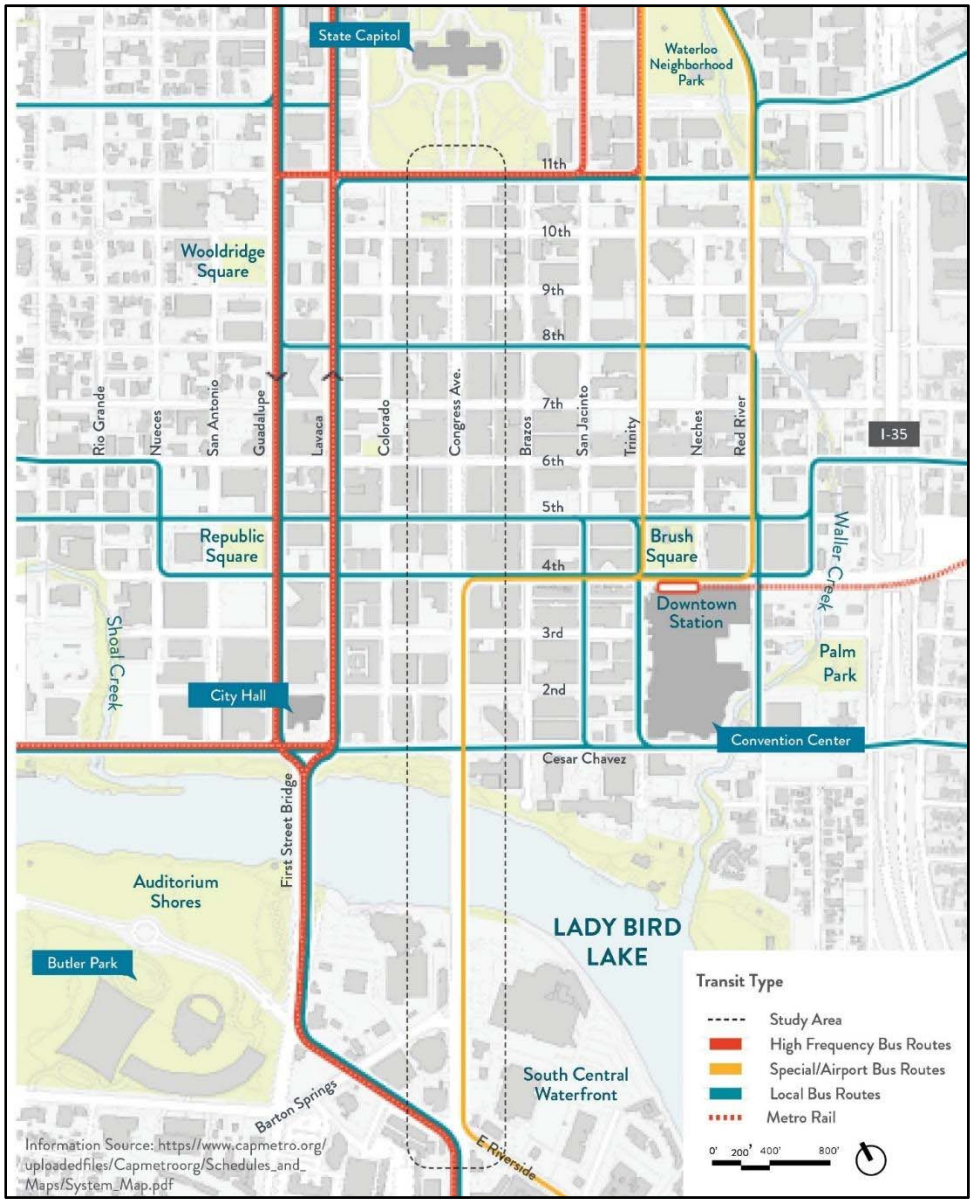


Figure 8: Transit Routes in Downtown Austin

Figure 9: Existing Transit on South Congress Avenue

Because it is interrupted at the Texas State Capitol, Congress Avenue in the Downtown Austin area does not currently play a more major role in the city's bus system. Many bus routes operate on Congress Avenue south of the study area, starting at Riverside Drive.

High-capacity transit in Austin is recommended as part of Project Connect, which includes long-term recommendations for transit. South Congress Avenue is recommended as a part of the current proposed high-capacity transit plans, but Congress Avenue through the study area is not recommended for high-capacity transit. The Lavaca-Guadalupe corridor is used as the recommended north-south high-capacity transit line through Downtown Austin.

Project Connect does recommend a downtown circulator route, which operates along Congress Avenue from south of Riverside Drive to 4th Street. Future bus accommodations are being considered in accommodating the Project Connect proposed circulator route, along with supporting local transit with a continuous and safe pedestrian network.

Patterns of Vehicular Traffic

Congress Avenue is a two-way street intersected at regular intervals north of Lady Bird Lake by the numbered, mostly one-way streets from 5th to 10th Streets. The northern blocks along Congress Avenue are shorter and carry relatively less north-south traffic than blocks in the southern half of Congress Avenue. The east-west streets often have higher speeds because they are one-way. This contributes to an auto-oriented environment that is at odds with the large pedestrian presence along the corridor. Many of the east-west cross streets in the northern section of Congress Avenue have recently implemented two-way operations or been recommended for conversion to two-way traffic through the Downtown Plan. Pedestrian/vehicular conflicts occur at intersections, as right-turning traffic commonly encroaches upon crosswalks. Not all signals have leading pedestrian intervals. **Figure 10** illustrates the traffic patterns along Congress Avenue.

Figure 10: Patterns of Vehicular Traffic in Downtown Austin

Together with South 1st Street and Lamar Boulevard to the west, Congress Avenue is one of only three arterial streets that provide access to downtown from South Austin. Interstate 35 and Loop 1 are freeways that provide additional access and greater mobility to commuters from the south. Although typical morning and evening weekday peak periods see the highest traffic volumes, Downtown and Congress Avenue is an all-hours destination. It has high traffic demand during weekends, nighttime, and special events due to the high concentration of attractions. However, off-peak traffic volumes are similar to or lower than those of typical daily peaks. The typical day peak analysis in this report is representative of all high demand time periods along Congress Avenue.

The epicenter of peak hour congestion along the Congress corridor is the intersection with Cesar Chavez

Street. Congestion is progressively lighter towards 11th Street as traffic volumes drop. Signal progression along the Avenue generally favors north-south movement, but also balances significant east-west travel demand at Riverside Drive, Barton Springs Road, Cesar Chavez Street, 5th Street, and 6th Street. Signal timing is updated throughout the day and is operated by the City of Austin's Transportation Management Center (TMC). The TMC monitors City of Austin signals 7 days a week and manages signal timings continuously.

The existing six lane cross section is not optimal for safety, flexibility in operations, turning movements / conflicts, or traffic volumes. From Cesar Chavez Street to 11th Street, left-turning vehicles routinely block the inside lanes which creates unpredictable traffic patterns (vehicles changing lanes to avoid blockages) that are known to cause crashes. Because the numbered streets crossing the northernmost segment of Congress are one-way, its lanes are not efficiently utilized. At every other intersection, where there are no left turns, there are three effective through lanes; at the others there are two, as vehicles turning left off of Congress block through traffic. This leads to an underutilization of existing roadway capacity and offers opportunities to strategically reduce the number of lanes without compromising vehicular levels of service. For example, the lack of left-turn lanes at Cesar Chavez Street limits the ability to flexibly manage traffic operations.

North of Lady Bird Lake, the street pattern is characterized by a rectilinear street grid. On the south side, Riverside Drive approaches Congress Avenue at a skewed angle, creating an intersection with sharp angles and long crosswalks. The long pedestrian crossing distances and heavy pedestrian crossings of Congress Avenue require significant east-west signal time, which limits the allowable signal timings for north-south movements.

Existing Condition Analysis

The most significant cross streets that intersect Congress Avenue were analyzed, which include 11th Street, 6th Street, 5th Street, Cesar Chavez Street, Barton Springs Road, and Riverside Drive. The intersections at these cross streets vary in terms of Level of Service due to differing traffic volumes and geometry (such as the three-leg intersection at 11th Street).

Traffic on Congress Avenue is highly directional: northbound in the AM, southbound in the PM. The closer to the river, the greater the delay during peak hours. The majority of delay along the corridor occurs at the at Cesar Chavez/Congress intersection, due to high volumes, lack of left-turn bays and heavy east-west traffic.

Many people visiting Downtown at various times of day do so by driving a vehicle on Congress Avenue; therefore, driving conditions for those moving to and from Congress Avenue by motor vehicle are important to understand and address. Evaluating motor vehicle delay, level of service, and travel times are ways to analyze how well the roadway and intersections perform along Congress Avenue.

Motor vehicle delay is the additional time that a person experiences traveling through a signalized intersection compared to a free-flowing movement at the speed of the street. In this report, delay is shown in terms of average intersection delay, which averages the per person average delay from every approach for a given intersection and every turning movement. To help give people context of the severity of delay a quality level (letter grade A-F) is often given, called Level of Service (LOS). An intersection receiving a grade "A" has very low levels of delay meaning vehicles rarely stop at all

whereas an intersection receiving a grade "F" experiences high-levels of delays and congestion that most drivers view as unacceptable. The City of Austin defines unacceptable LOS as that which is LOS E or F. **Figure 11** provides the average delay in seconds per vehicle for each Level of Service grade.

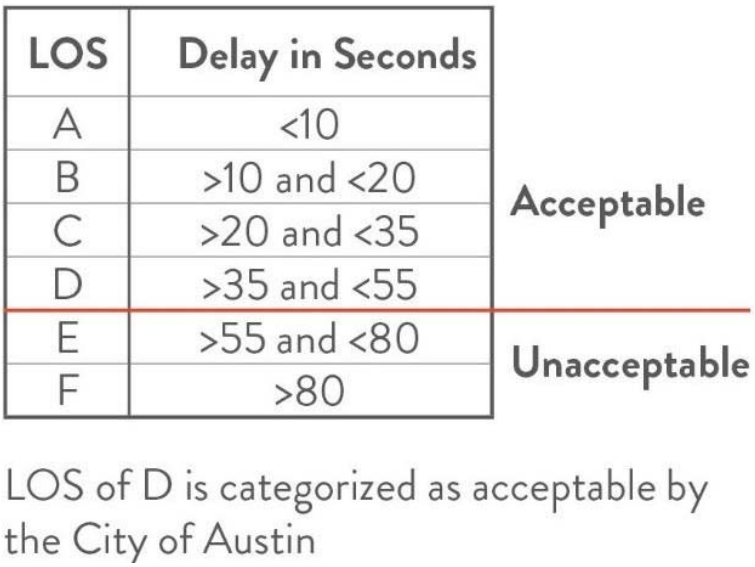


Figure 11: Level of Service (LOS) Criteria for Signalized Intersections

Six intersections along Congress Avenue, shown in **Figure 12**, were evaluated including the following: 11th Street, 5th Street, Cesar Chavez Street, Barton Springs Road, and Riverside Drive. Motor vehicle delay and LOS was calculated for each intersection in the AM and PM peaks, as shown in **Table 2**. The intersection with the highest delay is Congress Avenue and Cesar Chavez Street, followed by Riverside Drive. The Synchro reports are included in **Appendix A**.

Table 2: Congress Avenue Existing Delay and LOS (2017)

Intersection Locations	AM Peak Hour		PM Peak Hour	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Congress Ave at 11th St	19.2	B	19.3	B
Congress Ave at 6th St	20.3	C	46.7	D
Congress Ave at 5th St	16.2	B	20.7	C
Congress Ave at Cesar Chavez St	134.4	F	229.9	F
Congress Ave at Barton Springs Rd	12.8	B	26.8	C
Congress Ave at Riverside Dr	58.8	E	51.2	D

11th Street

Northbound traffic splits evenly east and west. Pedestrian crossings from the Capitol impact vehicle delay. Generally, vehicular traffic is light and congestion is minimal.

5th and 6th Streets

Both intersections operate well. North of 6th Street toward the Capitol, traffic demand becomes lighter. Pedestrian traffic at both intersections is heaviest in the PM peak period between 4th and 7th Streets and at night, generated by nearby office buildings and nightlife. Conflicts arise between pedestrians and vehicles, particularly right-turning ones. No leading pedestrian intervals are provided.

Cesar Chavez Street

Significant congestion in both peak hours. Traffic is highly directional here as elsewhere, heaviest northbound in the AM and southbound in the PM. The PM (3:30 – 7:00) prohibition on northbound left turns is necessary to prevent more significant congestion.

Figure 12: Congress Avenue Study Area

Barton Springs Road

A much different urban environment south of Lady Bird Lake generates less pedestrian traffic, though this will likely change with expected redevelopment. Even today's pedestrian levels at Barton Springs Road result in limiting green time available to Congress Avenue. Barton Springs Road provides connectivity to development along Lady Bird Lake and continues west of the project limits to event centers, park area, residential development, and Mopac Expressway. Turning movements from Congress Avenue are relatively low in the peak periods but are expected to change with the South Central Waterfront redevelopment.

Riverside Drive

Riverside Drive has high east-west traffic demand, which combines with commuter demand into and out of the downtown area in the north-south directions. In the AM, the northbound and westbound directions experience significant queueing and delays as traffic converges to cross into Downtown.

Existing Allocation of Space

The overall existing allocation of right-of way space north or Cesar Chavez is shown in **Figure 13**. As illustrated, most of the right-of-way is dedicated to vehicle traffic, and there is no dedicated space for bicycles. Bicycles must share the roadway with vehicles. In addition, parking makes up a large percentage of the right-of-way space since it is angled parking. The parking space is also a tree and amenity zone with trees interspersed between angled parking. The allocation of space was a key component in the development of alternatives that address all transportation users along Congress Avenue.

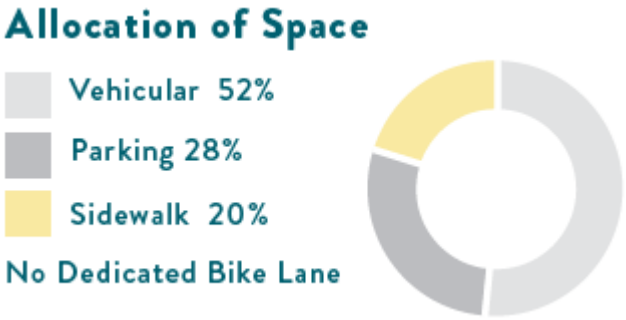


Figure 13: Existing Allocation of Space

Future Conditions

Concurrent Plans, Policies, and Reports Impacting Mobility

Many plans and reports have been developed for areas ranging in scale from the region, to the county, to the city, and to downtown-specific reports. A previous Congress Avenue strategic report led to the current project. These plans, reports, and data informed the work of the Congress Avenue Design Initiative. A literature review of relevant plans and best practices is included in **Appendix B**. The list below includes the relevant plans.

- Imagine Austin Comprehensive Plan
- Austin's Complete Streets Policy
- Downtown Austin Plan
- Downtown Austin Alliance Downtown Parking Strategy
- Austin Strategic Mobility Plan
- Austin Metropolitan Area Transportation Plan
- Austin Bicycle Plan 2014
- Pedestrian Safety Action Plan
- Connections 2025
- Project Connect
- Briefing Book 2040
- Regional Transportation Plan 2045
- Regional Active Transportation Plan

Development and Expected Growth

Future growth along Congress Avenue, contributed to by a variety of factors, will greatly impact mobility along it. A method for understanding the impacts of future growth on mobility is forecasting expected vehicular demand. This analysis method was used and incorporated historical count data (TxDOT) and forecast models (CAMPO) to provide a basis for projecting future vehicular demand along Congress Avenue. Additionally, the proposed South Central Waterfront (SCWF) development is expected to be constructed by 2040 within the project limits and is included in the analysis.

The Texas Department of Transportation (TxDOT) historical traffic count information, summarized in **Table 3**, shows the highest growth along the Avenue has been located south of Lady Bird Lake. Whereas, traffic volumes north of Lady Bird Lake have historically experienced a slight decline, likely due to saturation of motor vehicle traffic.

The Capital Area Metropolitan Planning Organization (CAMPO) travel demand models (TDM) for 2010 and 2040 project moderate growth throughout the corridor, shown in **Table 4**. The highest growth is near the Capitol, likely due to available vehicle capacity.

Table 3: TxDOT Historical Average Annual Daily Traffic on/near Congress Avenue

Location	Station Number	2005	2010	2015	2005-2015 Growth Rate
South of Riverside	227U749	18,440	N/A	25,016	3.57%
Between 2nd and 3rd St	227U731	25,380	23,260	20,307	-2.00%
Between 4th and 5th St	227U728	22,460	20,270	18,300	-1.85%
Between 10th and 11th St	227U710	8,540	7,340	6,909	-1.91%

Obtained from TxDOT Traffic Count Database System (TCDS)

Table 4: CAMPO 2010 and 2040 Traffic Projections

Location	2010	2040	2005-2015 Growth Rate
South of Riverside	31,378	37,264	0.63%
Between 2nd and 3rd St	27,893	35,955	0.96%
Between 4th and 5th St	25,019	32,785	1.03%
Between 9th and 10th St	12,265	20,222	2.16%

Obtained from TxDOT Traffic Count Database System (TCDS)

In addition to the historical growth considerations, the proposed South Central Waterfront Vision Framework Plan was included in the traffic analysis. A detailed analysis to incorporate the expected SCWF development was implemented to accurately compare design alternatives along the Congress Avenue corridor.

The SCWF Framework Plan provides a roadmap for waterfront planning and establishes a cohesive set of recommendations to guide public and private investment in the SCWF. The plan also provides a physical framework of internal streets and expected land uses in the area. In a series of scenarios, planners outlined the various paths development could take and the steps needed to accomplish the recommended development. **Figure 14** illustrates the internal street network and parcels with a comparison of scenarios. The consultant team worked with City of Austin to establish an agreed upon approach for incorporating the SCWF development. The methodology and additional discussion can be found in **Appendix C**, Traffic Analysis Memo.

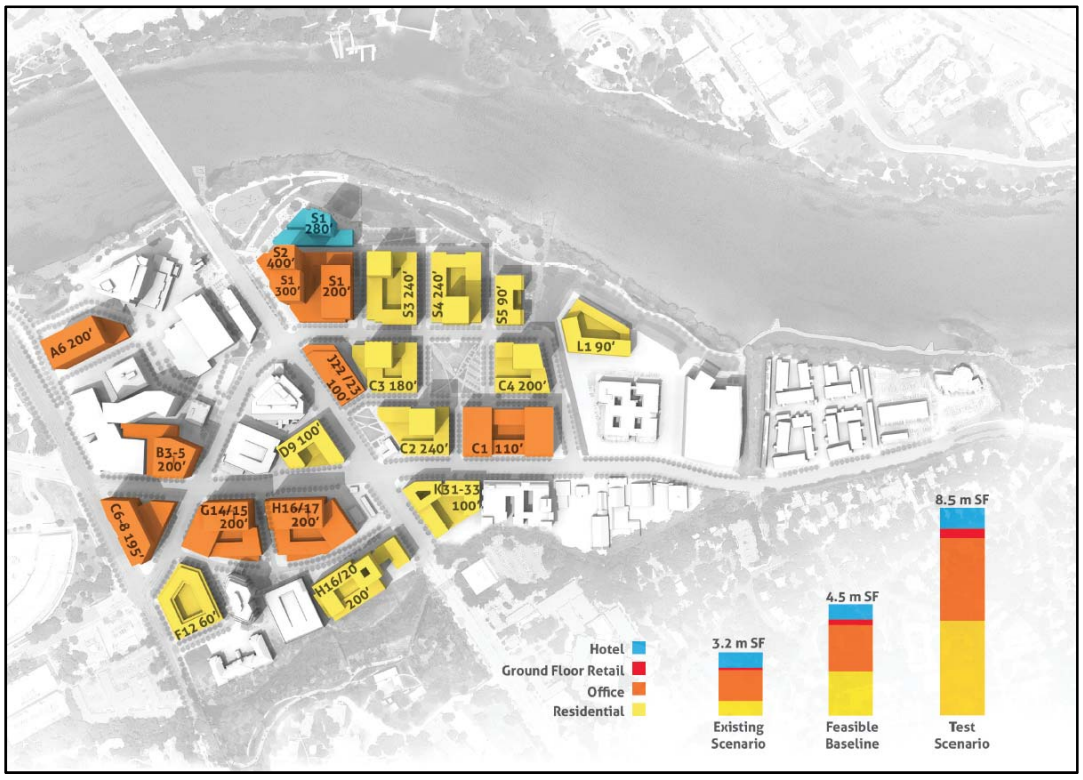


Figure 14: South Central Waterfront Parcels and Land Use

Multimodal Use

A key component to being able to accommodate future vehicular traffic is the ability to offer alternatives to vehicular trips. Concerted efforts to incentivize bicycle, pedestrian, and public transportation trips to and from Congress Avenue and the SCWF development are anticipated and imperative to accommodating future growth. Cities that do not allow for choice in transportation tend to rely solely on vehicle trips, often single-occupant vehicle trips. At a certain point, the demand cannot be met by supply in terms of space. In the case of Congress Avenue, there is little that can be done to accommodate an ever-growing increase in vehicular demand, currently at saturation during peak hours, other than replacing some of those trips with other modes like transit, walking, or biking/scootering that offset the demand for vehicular space. Vehicle volumes are constrained by limited ROW, competing uses, and most importantly, the Congress Avenue Bridge, which is unable to be widened (due to structural limitations) and is habitat to a bat colony.

The feedback garnered throughout the public engagement process, summarized in **Figure 15**, shows strong support for improved pedestrian, bicycling, and transit features along and around Congress Avenue. While driving remains an important travel mode, many already choose to walk, bike, scoot, and take transit along and around Congress Avenue even with less than optimal existing conditions for these modes (See **Figure 15**). There is a strong consensus that better multimodal infrastructure will increase non-vehicular trips and improve both social and economic features along the corridor. When asked what would make Congress Avenue more accessible, over half of respondents identified improved sidewalks. The public also agreed that better mobility and connectivity would help keep a diversity of jobs along the Avenue and best support the planned South Central Waterfront development. Transit connectivity was identified as the leading answer for how to broaden economic opportunities to different levels of income and education. The public also identified specific ideas for improvements along the Avenue including improving bike lanes and pedestrian areas and re-allocating more space for sidewalk cafés, vegetation, pedestrians, and bicyclists.

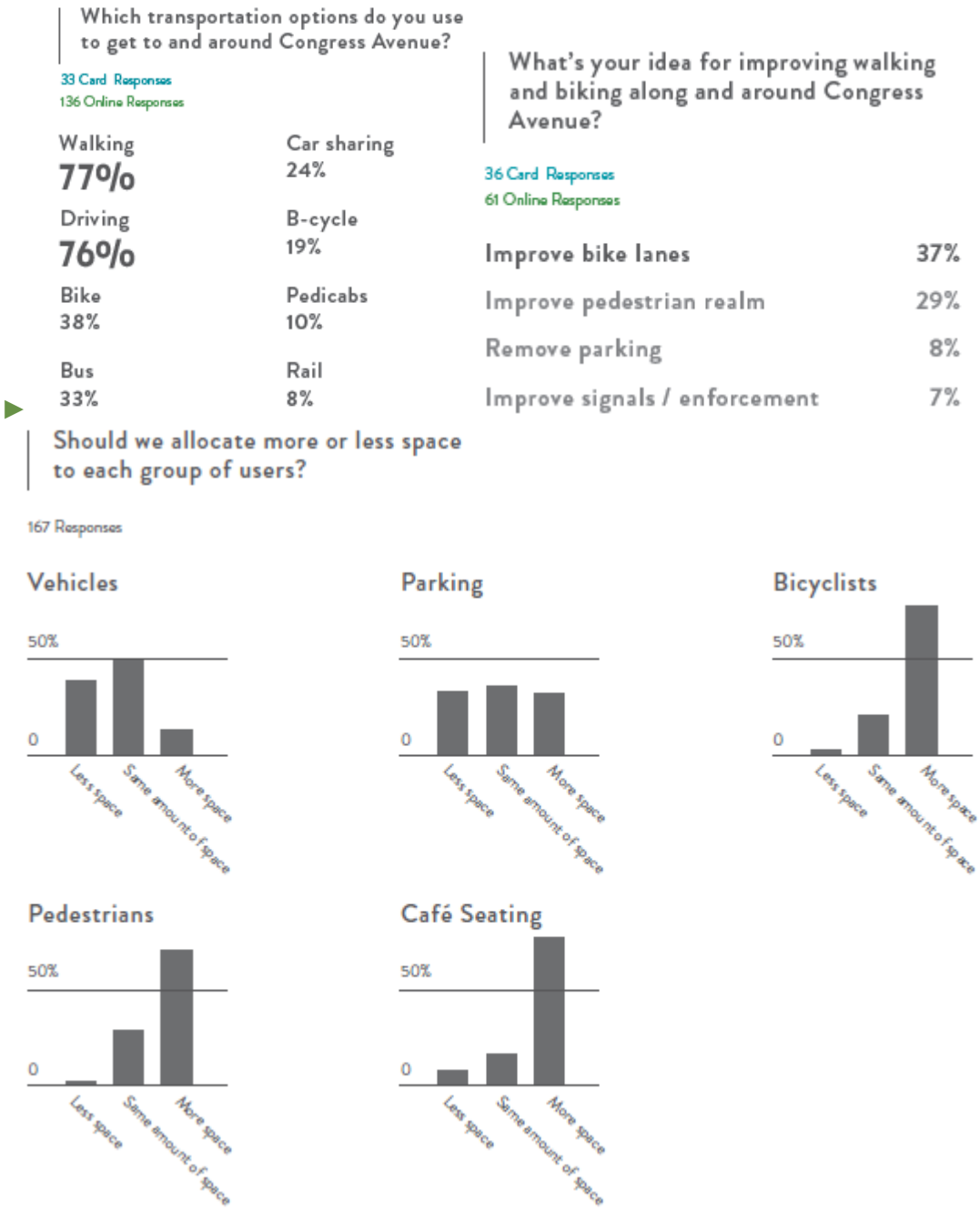


Figure 15: Public Comments Garnered from Engagement Process

Each of these modes of transportation require careful consideration concerning local area infrastructure and the connections needed to surrounding areas. The following sections detail best practices for encouraging walking, biking, and transit trips along Congress Avenue and potential improvements.

Propensity for Mode Change

The future of mobility along Congress Avenue relies on supporting transportation choices. As mentioned above, growing demand for vehicular space along Congress Avenue cannot be met by more supply of vehicular space. However, an unmet opportunity exists to encourage biking, scootering, walking, and

transit trips along the corridor through improving active transportation facilities along Congress Avenue. These facilities move more people with less space than those dedicated solely to vehicular traffic. Research has shown that providing connected walking, biking, and transit networks with safe and comfortable facilities lead to more people choosing those modes of transportation[4,5]. Streets that have been reconfigured to accommodate moving people walking, cycling, and taking transit over vehicular only travel have seen dramatic increases in mode share while also seeing safety and economic vitality increase along the street[1, 6].

Adding protected bicycle lanes and crosswalks has proven a successful aid in encouraging mode shifts along a corridor. Telegraph Avenue, a high-injury corridor in Oakland, California, repurposed a travel lane to create nine block of parking-protected bike lanes and implemented eight high-visibility pedestrian crosswalks. After the re-design, there was a 78 percent increase in cycling and 100 percent increase in walking along the street. More 30 percent of all trips along the street are now made by walking, biking, and transit. Speeding along the street decreased by 45 percent and collisions reduced by 40 percent. Additionally, there was a nine percent increase in retail sales and five new businesses along the street[7]

Transit-oriented developments (TOD) have been well-documented to dramatically increase transit ridership. TOD's prioritize transit access for residents by ensuring transit stops are easily accessible via walking and biking and often integrate a high-capacity transit service. In a study of TOD residents in California, it was found that residents who moved from housing that was not near transit reduced their daily vehicle miles traveled (VMT) by an average of 9.8 miles[8].

If the design guidance and best practices listed below that best support walking, biking, and taking transit are considered and implemented along Congress Avenue, it is very likely an increase in these modes will occur along the avenue.

Design Guidance

Several widely-accepted manuals provide design guidance for accommodating pedestrian, bicycles, and transit, in addition to the manuals the City of Austin has developed. These manuals discuss treatments for intersections, sidewalks, transit stops, bicycle infrastructure and capacity analyses for these streets. These manuals should be referenced for design guidance in the future development of alternatives for Congress Avenue. **Table 5** lists the design manuals and associated authors.

[4] Xinyu Cao, Susan L. Handy and Patricia L. Mokhtarian (2006), "The Influences Of The Built Environment And Residential Self-Selection On Pedestrian Behavior," Transportation (www.springerlink.com), Vol. 33, No. 1, pp. 1 – 20.
[5] Dill, J., Carr, T., 2003. Bicycle commuting and facilities in major U.S. cities: If you build them, commuters will use them. Transp. Res. Rec. 1828, 116–123.
[6] Kitamura R, Mokhtarian PL, Laidet L:Amicro-analysis of land use and travel in five neighborhoods in the San Francisco Bay area. Transportation. 1997, 24:125–158.
[7] City of Oakland, 2017. Telegraph Avenue Progress Report. Oakland Department of Transportation.
[8] Alliance for Community Transit- Los Angeles, 2015. Transit For All Achieving Equity in Transit-Oriented Development

Table 5: Design Manuals

Design Guide	Author
Urban Street Design Guide Transit Street Design Guide Urban Bikeway Design Guide	National Association of City Transportation Officials (NACTO)
Austin Street Design Guide	City of Austin
Designing Walkable Urban Thoroughfares: A Context Sensitive Approach	Institute of Transportation Engineers and Congress for the New Urbanism
Highway Capacity Manual: A Guide for Multimodal Mobility Analysis, 6th edition	Transportation Research Board

Case Studies

In addition to design guidance, there are similar arterials that have undergone transformations to serve more than just motor vehicle throughput. These streets serve as precedent streets for designing Congress Avenue alternatives. **Table 6** lists applicable street improvement case studies.

Table 6: Street Redesign Case Studies

Street and Location	Mode Best Practice	Treatment
Pennsylvania Avenue Washington, DC	Vehicle and Bike	Protected bikes lanes in center median
Broadway from 23rd to 59th New York, NY	Pedestrian and Bike	Protected bike lanes, public plazas
The Porch/Market St Philadelphia, PA	Pedestrian	Parking lane /sidewalk converted to pedestrian area; directly adjacent to bridge across Schuykill River
Broadway Street Seattle, WA	Vehicle, Transit, and Bike	Bike signalization, protected lanes, transit connectivity to street
200 South Salt Lake City, UT	Vehicle and Bike	Similar to green lanes but sharrow symbol used; encourage motor vehicles to pass and bikes to stay safely positioned in the lane; used when there is not enough room for a dedicated bike facility
Michigan Avenue Chicago, IL	Vehicle and Pedestrian	Advanced pedestrian signal phase (LPIs), variety of uses, premier avenue in Chicago
Passeig de St Joan Barcelona, Spain	Transit and Pedestrian	Center bike lanes, wide sidewalks, transit lane

Pennsylvania Avenue – Washington DC

Pennsylvania Avenue is a premier avenue in Washington DC that utilizes median bike lanes. The bike lanes are now fully protected by barriers to improve safety to bicyclists and vehicles along the facility. The District Department of Transportation (DDOT) is in the process of installing Park-Its, curbed median with discontinuous spacing, to provide the protected bicycle lanes and allow access to and from the facilities. Bike lanes in the median eliminate right-hook opportunities and eliminate the danger for cyclists trying to turn left from the lanes.

Broadway Blvd – New York City, NY

The Broadway Boulevard redesign is one of the most famous street redesigns in the country. Broadway Boulevard from 23rd to 59th was redesigned to add protected bike lanes, pedestrian plazas, and some car-free zones. Painted curbs added space for pedestrians wishing to sit and those needing to walk to their destination. Protected bike lanes made biking safer and more accessible to cyclists of various experience levels. The most well-known part of this project was the conversion of Times Square to a pedestrian plaza with seating, shade, planters, and activities. In addition to aesthetic and experience improvements, traffic operations improved. Traffic volumes remained the same, but throughput increased, crashes and injuries declined, the number of cyclists increased, and pedestrian encroachment into travel lanes decreased.

The Porch at Market Street – Philadelphia, PA

The Porch at 30th Street replaced a parking lane and sidewalk with an activated pedestrian plaza. The Porch is located near the bridge across the Schuylkill River and in front of the 30th Street Station, which sees 27,000 daily commuters. The original iteration of the Porch included seating and planters, which later evolved into a space with food trucks, shade, and swings.

Broadway Street – Seattle, WA

Broadway Street's redesign shows what an arterial can be when all modes are considered. Broadway Street has a cycle track, bus routes, a streetcar line, wide sidewalks, and one lane of traffic each way. The two-way cycle track is on the east side of street and protected with a concrete buffer. The bus stops are "floating" which means the protected bicycle lane continues between the sidewalk and the stop so that buses and bikes do not conflict. The protected bicycle lane comes up to grade with the transit stops to indicate they are shared space for pedestrians and cyclists. Conflict points at intersections are marked with green paint and each one has dedicated bike signals with detection.

200 South – Salt Lake City

Salt Lake City used an enhanced "sharrow" (shared vehicle-bicycle lane) treatment to connect two dedicated bike lanes in a constrained segment of 200 South between Main Street and State Street. The green lane encourages drivers to change lanes when a cyclist is present but does not prevent drivers from using the lane when there are no cyclists. This treatment has also been used in Long Beach, CA and Oakland, CA.

Michigan Avenue – Chicago, IL

Michigan Avenue is one of the most famous streets in America. There are a wide variety of shops, restaurants, and businesses that attract tourist and residents. Michigan Avenue has wide sidewalks, seating, and shade trees. Some intersections have leading pedestrian intervals to allow pedestrians to enter the crosswalk and be more visible to right turning drivers. There are also signalized mid-block crossings for pedestrians.

Passeig de St Joan- Barcelona, Spain

This Boulevard includes wide verge with landscaping, permeable pavement, and seating. In addition to the pedestrian seating area, there is a wide sidewalk. The travel lanes include a transit lane and a travel lane on each side divided by a median with two-way protected bicycle lane with bike signals.

Traffic Modeling and Mode Shift Assumptions

The existing turning movement count volumes were used to develop future year traffic forecasts and implemented into 2040 traffic models. As shown in **Table 3**, the motor vehicle traffic on Congress has been declining except for the southern section. **Table 4** shows CAMPO growth rates for Congress around 1-2%. The traffic growth rate used for the existing counts was 0.5%, despite peak hour saturation, to indicate an increase in demand along the roadway. Synchro software was used for the traffic analysis to compare expected delay based on demand and capacity. Synchro is an accepted tool to predict delay, however, it is limited in its ability to accurately predict over-saturated conditions and impacts between adjacent intersections. Further analysis to capture microscopic-level impact and network impacts is recommended prior to implementation of alternatives.

A range of potential motor vehicle trip reductions based on the quality of multi-modal transportation infrastructure proposed by this plan was developed with City of Austin coordination and agreed upon for use in the 2040 Synchro analysis for alternative scenarios. By improving the quality, comfort, and safety of pedestrian, bicycle/scooter, and transit facilities on Congress Avenue, mode shift to these modes would occur. The exact amount of shift is unknown, but a series of mode shifts were analyzed to provide a range of possible scenarios. It should be noted that individuals who choose to shift modes due to the proposed alternatives are likely making short trips (less than three miles) rather than long trips. Regardless of which travelers choose to shift, the motor vehicle delay at intersections analyzed in this report are improved the same.

The percentages were established based on case studies (included in previous section) and coordination with the City of Austin Transportation Department. **Table 7** summarizes the mode split scenarios analyzed.

Table 7: 2040 Mode Split Adjustment for No Build and Build Scenarios

Traffic Adjustment	2040 No Build	Alternative Scenarios		
		Mode Shift Low	Mode Shift Moderate	Mode Shift Aggressive
Traffic Growth From Existing Counts (per year)	0.5%	0.5%	0.5%	0.5%
Vehicle Trip Reduction for Existing Trips	0	4%	8%	12%
Vehicle Trip Reduction for new South Central Waterfront Site Trips	30%	40%	50%	60%

The subsequent 2040 traffic volumes for each scenario were analyzed using Synchro 10.0 software. **Figure 16** shows the lane assignments along Congress Avenue for the Existing, No-Build, and Build scenarios.

Build Alternatives

The build alternatives consist of changes to the motor vehicle lane configurations along Congress Avenue in order to improve the comfort and safety for walking and bicycling. Each alternative consists of a series of common elements that are recommended to be included in each option. There are three alternatives that explore different cross section approaches at select locations north of Cesar Chavez and balance parking and turning needs. The alternatives include:

- 5-Lane with Parking
- 5-Lane with Flex Parking
- 4-Lane with Parking

These alternatives provide the same capacity and lane assignments at study intersections, but have varying impacts on operations. The traffic analysis addresses each cross section alternative. The nuances in operations, maintenance, and flexibility are discussed for each alternative in later sections of this report and an implemented alternative would consider the aspects discussed.

Common Elements in Build Alternatives

The following are common elements for all build scenarios:

- Modifications to lane configurations are proposed at Riverside Drive, Barton Springs Road, Cesar Chavez Street, 5th Street, 6th Street, and 11th Street that are the same across the three build alternatives that explore different cross sections north of Cesar Chavez Street.
- Improved quality and consistency of pedestrian facilities throughout the corridor. Clear width north of Cesar Chavez Street of 10 feet or greater and south of Cesar Chavez Street at least 8 feet. This includes addressing existing ADA cross slope issues.
- One-way protected bicycle lanes in each direction located behind curb that make bicycling and scootering along the corridor safe and comfortable for people of all ages and abilities.
- Space for transit stops is reserved at the far side of select intersections along the avenue to support a future circulator or other future transit service that would provide local circulation and connections to more significant transit lines.
- Shortened pedestrian crossings across Congress Avenue along the corridor for improved pedestrian safety and more flexible signal operations.

For each of the three build alternatives, the quality improvements for walking, bicycling, and scootering have the potential to shift a significant amount existing and new short trips along the corridor.

No Build vs Build Motor Vehicle Lane Configuration

The following diagrams show the No-Build and Build lane configurations at major intersections used in the Synchro traffic model to determine motor vehicle delay and travel times for all the Build alternatives. The three alternative cross sections north of Cesar Chavez Street do not affect the lane configurations of the simulate intersections. Turn bays at various study intersections were included in the Build design to mitigate or improve vehicle delay. In addition, signal timings were updated with slight adjustments to timing with the added turn bays and changes in lane configuration.

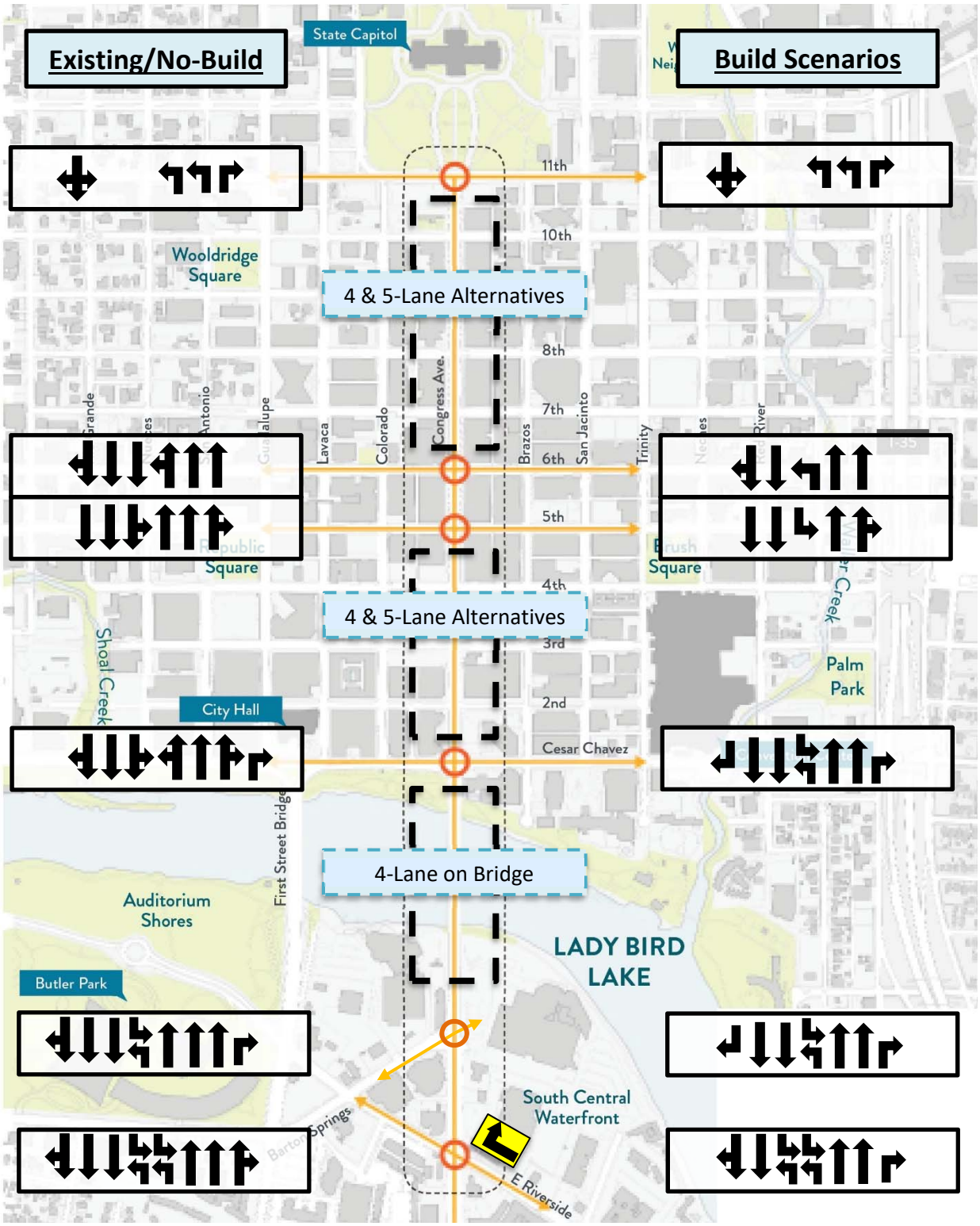


Figure 16: Congress Avenue Lane Assignments at Major Intersections

Traffic Model Results

Synchro analysis was performed for the following scenarios to assess motor vehicle delay and travel time outcomes in both the AM and PM peak periods. The five scenarios modeled were 2017 No-Build (existing traffic demand), 2040 No-Build accounting for traffic growth, and three Build alternative traffic models that account for different levels of mode shift from motor vehicle to walking, bicycling / scootering, and transit trips along the corridor.

The impact to vehicular delay, travel time, and total person carrying capacity are important in determining the feasibility of implementing protected bike lanes and adjusted sidewalk widths in this section of Congress Avenue. Cesar Chavez Street and Riverside Drive currently have the highest delay of the intersections along Congress Avenue, which is expected to become even more congested with the growth in travel demand and development proposed south of Lady Bird Lake. Despite these facts, the current configuration is auto-centric, and does not provide adequate infrastructure for other modes of transportation. **Figure 17** shows the expected delay changes for motor vehicle traffic with varying degrees of mode shifts, which are impacted by the investment in bicycle, pedestrian, and transit infrastructure.

The scenarios made minor changes to the total green time allotted to Congress Avenue at Riverside Drive, 5th Street, and 6th Street to address the updated lane configurations. Signal phasing was maintained and timing adjustments did not exceed 10 second adjustments for various intersections.

Delay Analysis

The motor vehicle delays reported in **Figure 17** are average intersection delays of all approaches and turning movements. It is important to note that, in the following figures, both the peak and non-peak directions are averaged so the results shown do not necessarily reflect the experience traveling in the peak direction. The peak direction travel time analysis shown in the next section better illustrates the experience of traveling along the corridor in the peak direction. As noted above, minor east-west street green time was adjusted based on added turn bay capacity. Synchro reports are included in **Appendix C.**

It is also important to note that the analysis, as performed in Synchro software, does not fully capture the effect of pedestrian, bicycle, and scooter traffic on motor vehicle operations. Existing pedestrian volumes were assumed to be 90 per peak hour per crosswalk. After analysis was completed, 300-400 pedestrians were observed and counted at the crosswalks in the peak hour at the Cesar Chavez Street intersection and 200 per hour at Barton Springs Road. By using lower pedestrian volumes, the performance benefit of the proposed right turn lanes at Cesar Chavez Street, Barton Springs Road, and Riverside Drive are likely underestimated. This would slightly affect travel times presented in the following section, particularly for the Existing and No-Build traffic model results. In addition to underestimating the existing levels of pedestrian, bicycle, and scooter crossings in the traffic analysis, no additional growth in crossings was assumed over time and with the additional development of the South Central Waterfront. An increase in crossings would likely improve the performance of the Build alternatives compared to the No-Build. Lastly, Synchro, the software tool used to simulate motor vehicle operations, is not equipped to simulate high levels of mixed pedestrian, bicycle, and scooter crossings that are not uniform or predictable in nature.

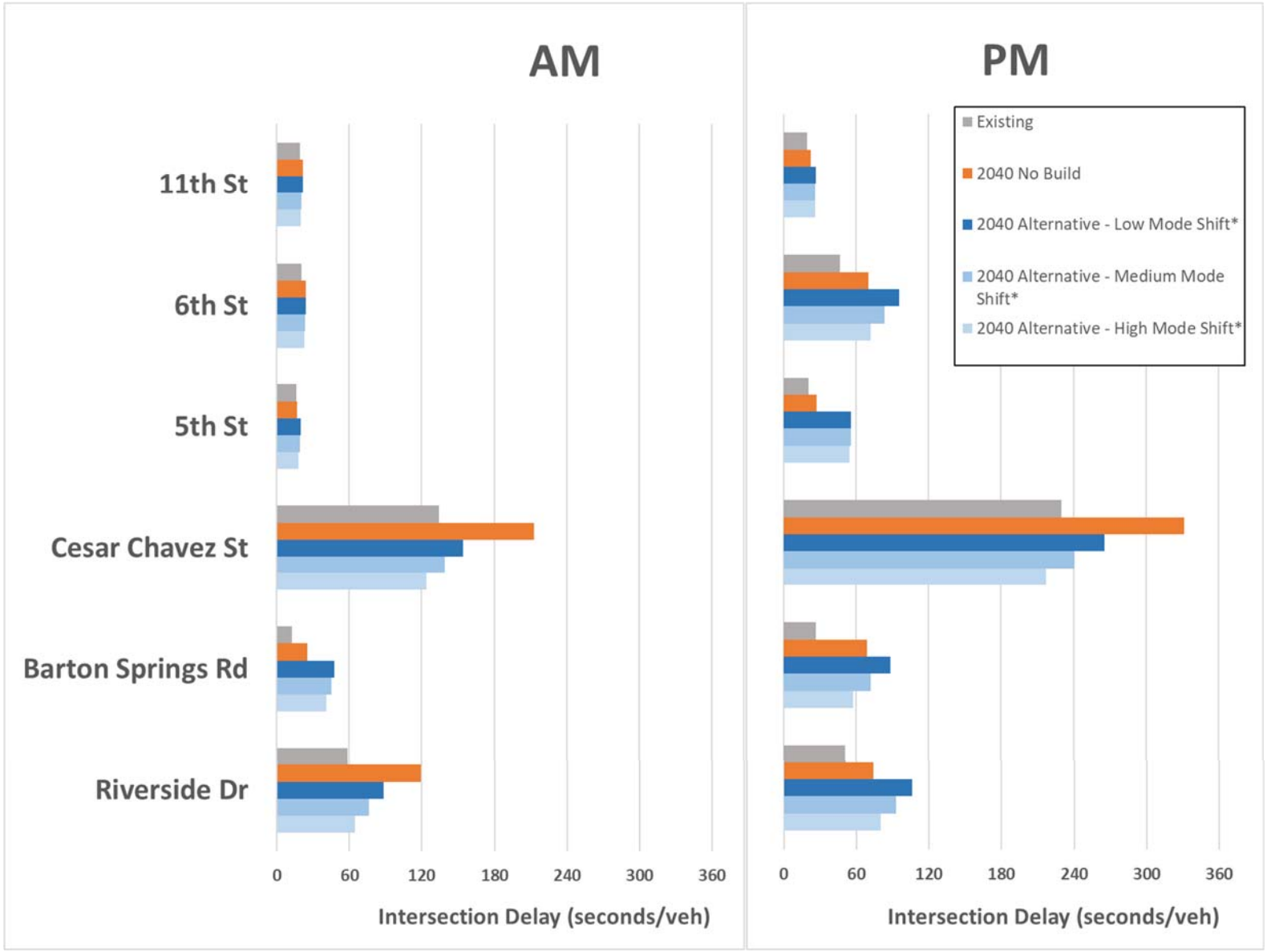


Figure 17: Congress Avenue Build Alternatives Intersection Delay

***Mode shift scenarios discussed on Page 25**

The following key items summarize the motor vehicle delay results and conclusions that can be garnered from these results.

- Peak period delays are expected to increase from current conditions for all scenarios, including the no-build scenario, due to traffic growth.
- Walking, bicycling, and scootering along this portion of Congress will likely be the most reliable travel modes during peak times and will likely have travel times that compete with motor vehicle travel times.
- In both the existing and proposed conditions, the highest motor vehicle delay is expected to take place at the Cesar Chavez Street intersection in all peaks followed by Riverside Drive.
- In the AM, delay along the corridor with the proposed lane changes is expected to perform equal to or better than 2040 No-Build scenario even in the low mode shift scenario. Significant improvement to delay at Cesar Chavez Street is expected due to the addition of left and right turn bays.
- In the PM, vehicle delay at all intersections, except Cesar Chavez Street, is expected to increase with the proposed intersections compared to the 2040 No-Build scenario at low mode shift. At Cesar Chavez Street, the constraining intersection, delay is expected to reduce related to the addition of left and right turn bays. At 6th Street, 5th Street, Barton Springs Road, and Riverside Drive, delay is expected to moderately increase or remain constant depending on mode shift scenarios.

Motor Vehicle Travel Time Analysis

Motor vehicle travel time was evaluated for peak direction traveled for the AM and PM periods. This evaluation analyzed the highest demand traffic direction at peak times with conservative estimates. The travel times shown were used to estimate the time it would take to travel along the entire corridor in the peak direction. While the delay analysis looked at the average delay for each intersection for all approaches and all turning movements, this travel time analysis looks only at the delay for peak direction through movements at each intersection from the Synchro results which were added to baseline travel times along the corridor. **Figure 18** shows the overall impact to northbound and southbound vehicle travel time.

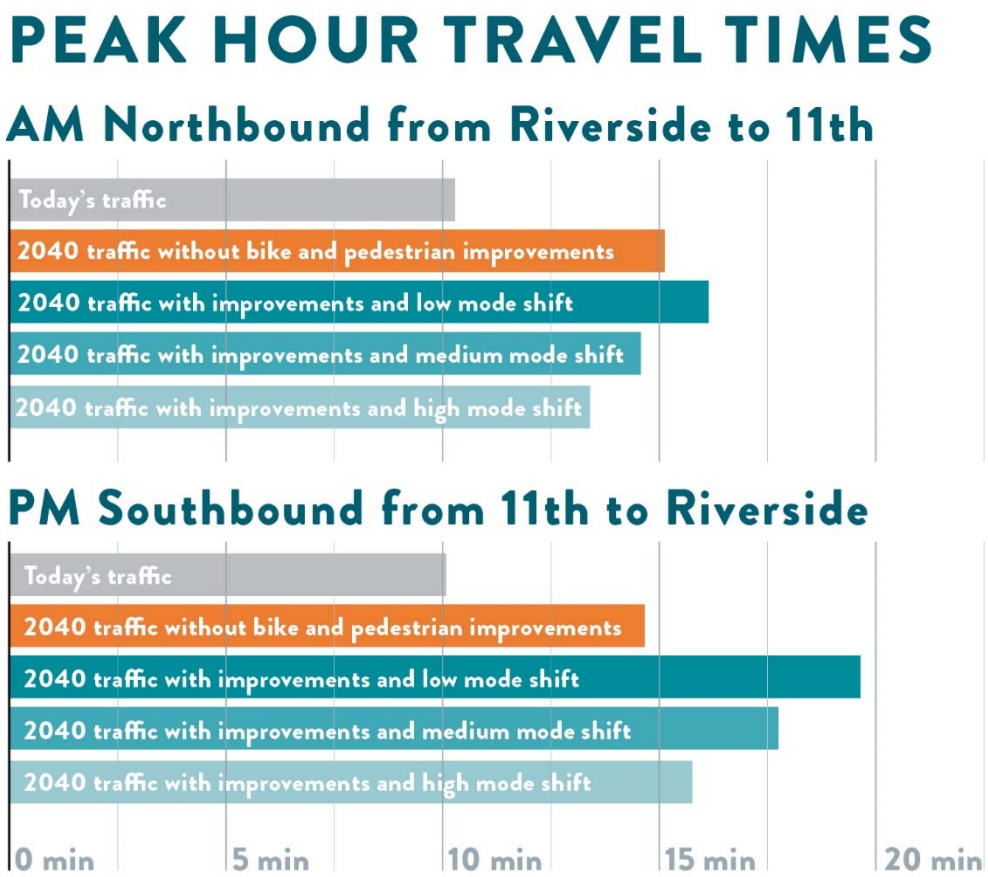


Figure 18: Congress Avenue Inbound and Outbound Peak Travel Times

***Mode shift scenarios discussed on Page 25**

The following key items summarize the motor vehicle travel time results and conclusions that can be garnered from the results.

- AM peak direction (northbound) travel times are comparable to the No-Build scenario depending on the degree of mode shift affected by the alternatives.
- PM peak direction (southbound) travel time impacts vary depending on the degree of mode shift achieved. All mode shift scenarios result in an increase in expected vehicle travel time along the corridor.
- The travel times shown are conservative estimates for the 2040 model scenarios since there are multiple pathways in the downtown area that distribute travel demand. This study assumes all demand will remain on Congress Avenue and experience growth. For example, if the proposed lane changes are anticipated to increase the travel time by 5 minutes, a certain portion of the demand that could be served by IH 35, South 1st Street, or South Lamar Boulevard. This would distribute travel time increases along these alternate route corridors.

People Carrying Capacity

People moving capacity was considered to understand the capacity of Congress Avenue at its most constrained section, over the Congress Bridge and through the Cesar Chavez Intersection. As discussed previously, significant additional development is expected along Congress Avenue just south of Downtown in the South Central Waterfront. Approximately half of the development square footage is expected to be residential and is located within walking, bicycling, and scooter trip distances from employment Downtown, which drives peak direction travel demand. It is reasonable to expect that significant improvements to comfort and safety along Congress Avenue have the potential to significantly shift these and other short trips to these other modes that are highly reliable and time competitive.

The following key items summarize the people carrying capacity and conclusions that can be garnered from them.

- The Cesar Chavez Street intersection remains the controlling constraint for motor vehicle volumes along the entire corridor as it is today. Additional vehicle capacity in peak periods cannot be provided through this intersection due to heavy east-west demand.
- Walking, bicycling, scootering, and transit are the modes that have potential to absorb future trip growth along the corridor.

The alternative configurations significantly increase person carrying capacity across the bridge and through the intersection of Cesar Chavez in a peak hour and peak direction due to expanding the space for people traveling by foot, bicycle, and scooter. They also improve the efficiency of these spaces by removing bicycle conflicts from the sidewalk.

Safety

A vital component to the function of Congress Avenue is the level of comfort and safety that it offers to its users. Whether people are driving, walking, biking, scootering, or taking transit, it is essential to provide a safe means of accessing places along the avenue. The City of Austin adopted the Vision Zero Action Plan in 2016, with the goal of eliminating transportation-related deaths and serious injuries by 2025. The study area along Congress Avenue includes five intersections that have been designated with very high pedestrian crash scores in the City of Austin Pedestrian Safety Action Plan. They include Congress Avenue at; Riverside Drive, Cesar Chavez Street, 4th Street, 6th Street, and 8th Street.

The Build alternatives aim at reducing the risk of crashes by improving the overall predictability of vehicle, bicycle/scooter, and pedestrian movements. This predictability is accomplished with shortened pedestrian crossings, turn bays to provide predictable vehicle movements, protected signal phasing, designation of areas for various modes (bike lanes, transit stops, sidewalk, green-painted conflict areas), and removal of shared spaces. Reducing the number of vehicle through lanes with the addition of turn bays has generally shown a reduction in crashes. A study of lane reductions conducted by researchers at the National Cooperative Highway Research Program (NCHRP) showed a Crash Reduction Factor (CRF) of 29% to be expected with lane conversions[9].

The addition of turn bays prevents vehicles from stopping in the left-most shared left-through lanes. This reduces the likelihood of an accident, especially rear end collisions. The American Association of

[9] https://www.fhwa.dot.gov/publications/research/safety/10053/

State Highway and Transportation Officials (AASHTO) 2010 Highway Safety Manual includes a CRF of 42% for providing a left turn lane at both major signalized intersection approaches in an urban area.

Vehicle merge points are removed with the Build alternatives, to provide, a consistent, two vehicle through lanes in each direction. Vehicles traveling into and out of the Downtown area could remain in the designated lanes for the length of their route, until using proposed turn bays. Currently, there are multiple merge points throughout the corridor that require vehicles to change lanes, either for capacity through intersections or due to stopped turning vehicles. The consistency and removal of vehicle lane change maneuvers is expected to reduce crashes.

Overall, the separation of transportation modes and improved predictability in lane change maneuvers proposed in the Build alternatives is expected to reduce crashes and improve safety in the project area. Congress Avenue has been subject to high numbers of vehicle and pedestrian crashes and would have safety benefit from the proposed Build alternative geometry.

Cross Section Alternatives North of Cesar Chavez

The project team met with the public and stakeholders to develop cross section alternatives north of Cesar Chavez Street that seek to improve the sense of place, safety and access for all modes of transportation while balancing on-street parking, turning access off Congress Avenue, operational flexibility and reliability, and safety.

These alternatives have various pros and cons that will be discussed in the subsequent sections. Common elements and benefits that apply to each alternative are discussed above and the sections below focus on the differences between each alternative. It is important to note that these alternatives are applicable to different sections of Congress Avenue, since the motor vehicle mobility operational needs vary along the corridor. **Table 8** summarizes the potential areas of implementation for each alternative.

Table 8: Congress Avenue Alternatives by Location

Alternative	Potential Areas for Implementation
5-Lane with Parking	2nd Street to 11th Street
5-Lane with Flex Parking	2nd Street to 11th Street
4-Lane with Parking	2nd Street to 5th Street and 6th Street to 11th Street

As noted previously, these alternatives do not affect lane configurations at major intersections along Congress Avenue or the traffic analysis results presented previously.

5-Lane with Parking

The 5-lane with parking alternative has two motor vehicle lanes in each direction, left-turn bays, parallel parking insets, protected bicycle lanes in each direction, and a, generally, 18-foot sidewalk. **Figure 19** illustrates the potential cross section.

Figure 19: Five-Lane with Parking

Space Allocation

This alternative redistributes space from the existing cross section by removing one of the travel lanes and converting the space used by angle parking to parallel parking to increase space for a consistent pedestrian zone and protected bicycle lanes. **Figure 20** illustrates the allocation of space in the available right-of-way by mode. This option has potential application between Cesar Chavez Street and 11th Street.

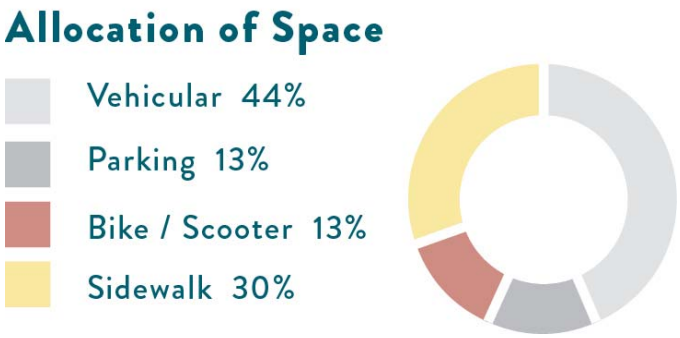


Figure 20: 5-Lane with Parking Space Allocation

The pedestrian zone leaves only 8 feet for outdoor café seating, gathering, or amenities, equaling the pedestrian space of a standard downtown street and significantly less space than where parklets have been created in parking spaces on Congress Avenue.

The allocation of space by mode is updated to reflect a shift from vehicle and parking to bicycle and sidewalk. With those changes, left-turn bays are provided to prevent vehicle queues from impeding vehicles traveling straight along the avenue.

Operations and Safety

The left turn bays along the avenue allow for flexible traffic signal operations by time of day and ensure that left turn access off Congress Avenue will be retained in the future design, unlike the 4-lane option.

Safety for all modes will increase due to the left turn bays. Shared travel lanes that are used for left turn movements generate crashes and unpredictable behavior. Left turn pockets allow through traffic to move smoothly and predictably. Left turning traffic can be provided protected turning phases to better manage the safe interactions with bicycle and pedestrian crossing movements.

Parking

This configuration reduces the number of parking spaces available from the Existing/No-Build condition from approximately 20 spaces per block to 10 spaces per block. There are various options for the use of curb space and interaction with bicycles, pickup/dropoff points, and parking layouts, including American Disability Act (ADA) accommodations.

5-Lane with Flex Parking

The 5-lane with flex parking alternative is similar to the 5-lane with parking but provides the parking within the vehicle travel lanes by time of day. **Figure 21** illustrates the additional width available for sidewalk and café space with the adjustment to parking.

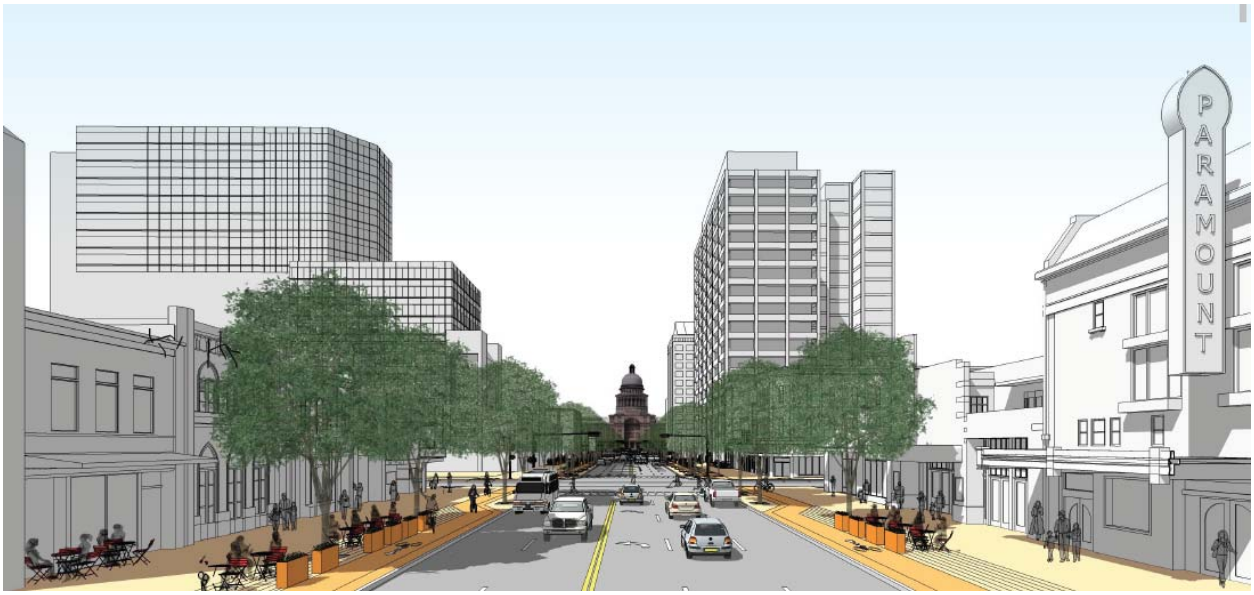


Figure 21: Congress Avenue 5-Lane with Flex Parking Cross Section

Space Allocation

This alternative redistributes space used for parking pull-outs in the previous alternative toward additional sidewalk space, as shown in **Figure 22**.

The pedestrian zone leaves 16 feet for outdoor café seating, gathering, or amenities, which would be among the higher quality pedestrian spaces downtown with significant activation potential.

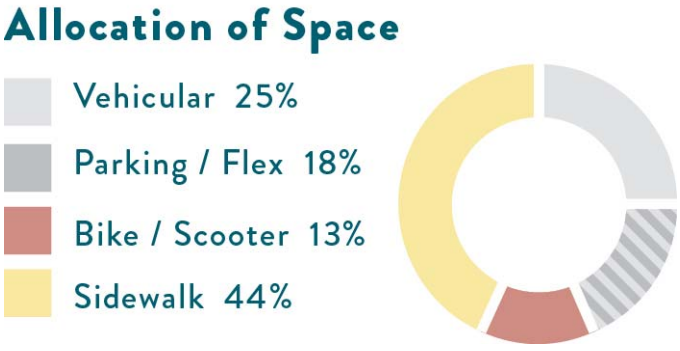


Figure 22: 5-Lane with Flex Parking Space Allocation

Operations and Safety

There are substantial vehicle operational impacts with the 5-Lane with Flex Parking alternative. Theoretically, the vehicle LOS would operate as the same as the 5-Lane with Parking alternative during peak hours, since, during AM and PM peak hours, parking would not be permitted. This would require active maintenance to ensure no vehicles are parked in the right-most lane during peak hours or they are towed prior to peak periods. This level of active parking management has historically been very difficult to successfully enforce. City of Austin has not implemented flex parking and would need active maintenance to maintain operations during peak periods.

Another operational impact of the flex parking concept is the potential stopped traffic in off-peak periods. The concept provides a single travel lane north and south in off-peaks, which would come to a stop if rideshare drop-offs or pickups occur or a transit stop occurs. It would also stop as vehicles parallel park along Congress Avenue.

Similar to the prior alternative, the left turn lanes along Congress Avenue allow for flexible traffic signal operations by time of day and ensure that left turn access off of Congress will be retained in the future design unlike the 4-lane option.

Safety for all modes will increase due to the left turn lanes as previously discussed. Left turning traffic can be provided protected turning phases to better manage the safe interactions with bicycle and pedestrian crossing movements.

Parking

The 5-Lane with flex parking cross section reduces the number of parking spaces from a maximum of 20 spaces per block to 16. As shown in **Figure 22**, the vehicle space is reduced in off-peak hours with the flex parking concept. This allows significant increase in sidewalk space.

4-Lane with Parking

The 4-lane with parking alternative has two motor vehicle lane in each direction, no left turn bays, parallel parking insets, protected bicycle lanes in each direction, and a generally, 23' sidewalk. **Figure 23** shows the potential 4-lane cross section.

Figure 23: Congress Avenue 4-Lane with Parking Cross Section

Space Allocation

This alternative redistributes space used for the left turn bays in the first alternative towards additional sidewalk space. **Figure 24** shows the reallocation of space with this alternative.

The pedestrian zone leaves 13 feet for outdoor café seating, gathering, or amenities, which would be greater than standard downtown pedestrian spaces.

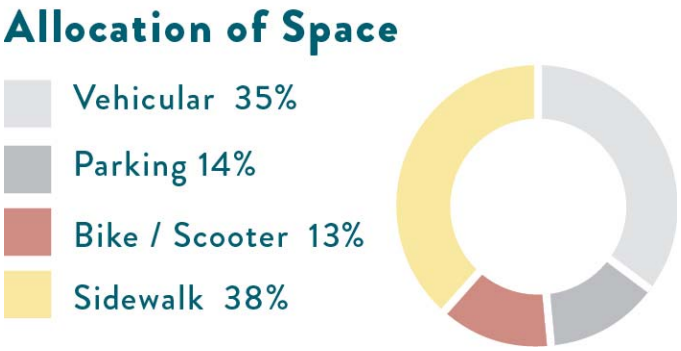


Figure 24: 4-Lane with Parking Space Allocation

This configuration would not be considered at major intersections, rather, it would be considered at cross streets where traffic volume turning movements are low. The potential areas of implementation are from 2nd street to 5th street and 7th street to 10th street. This would allow left turn movements to be potentially rerouted in the downtown area.

Operations and Safety

As mentioned previously, major intersections north of Cesar Chavez Street would require a 5-lane section, meaning the vehicle delay at each intersection would be the same as the 5-lane with parking alternative. At minor streets where this alternative was applied, left-turn movements off Congress Avenue would have to be restricted. **Table 9** shows the existing number of left-turns during peak hours that would be rerouted with left turn prohibition. Rerouted left turns would put additional motor

vehicle demand at the major intersections where full movement is allowed, resulting in an increase in delay. In discussions with the City of Austin, it was agreed that a 4-Lane alternative would require left turn prohibition to maintain safe and efficient north-south movement along the corridor. **Figure 25** shows the rerouting options that would be utilized with the left-turn prohibitions.

Table 9: Rerouted Traffic Demand with Left-Turn Prohibition of 4-Lane Alternative

Cross Street	Rerouted Traffic			
	AM Peak Hour		PM Peak Hour	
	Northbound Lefts	Southbound Lefts	Northbound Lefts	Southbound Lefts
2nd to 5th 4-Lane	185	37	151	25
8th to 10th 4-Lane	131	33	131	24

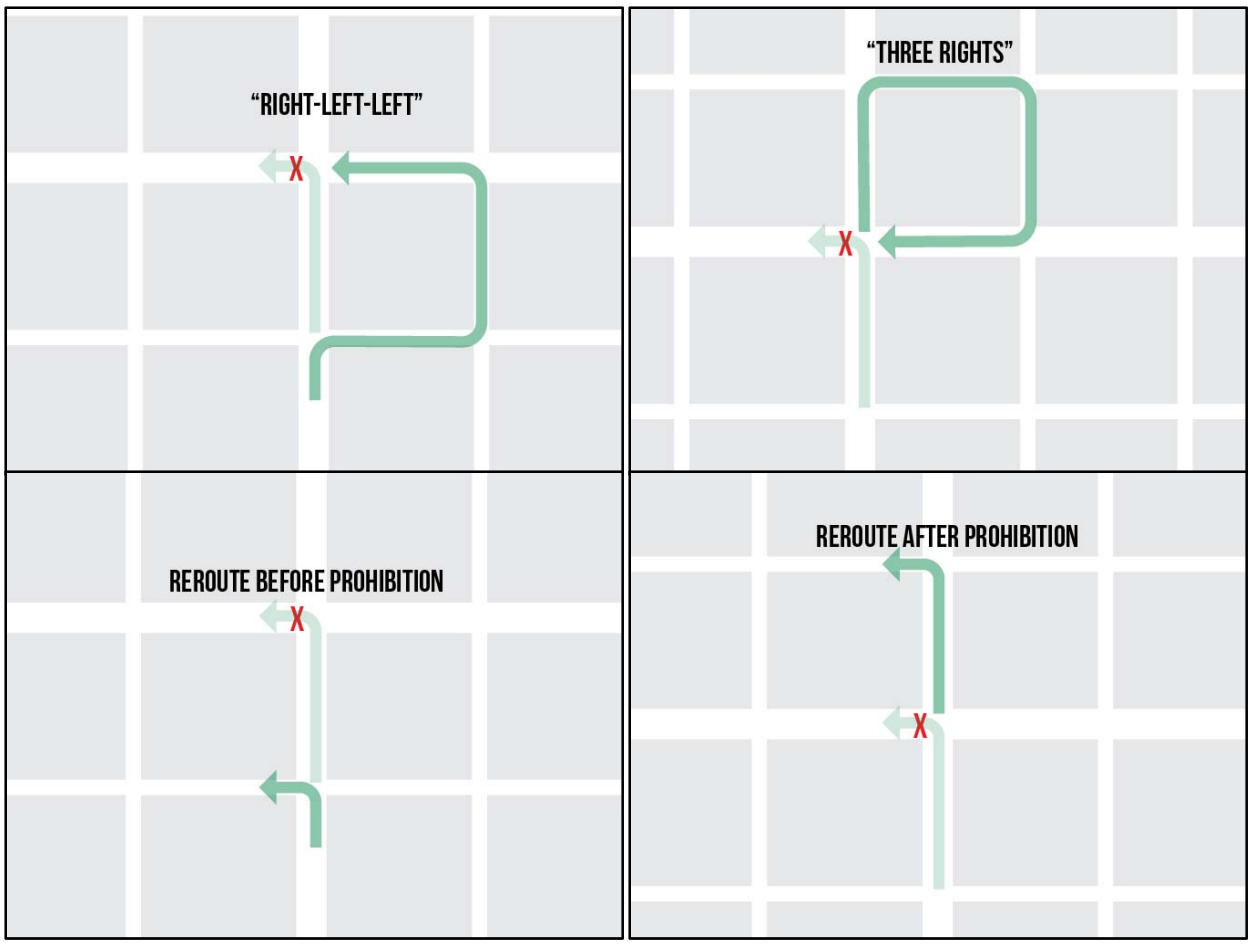


Figure 25: 4-Lane Alternative Left-Turn Prohibition Rerouted Traffic Options (Source: NACTO)

It would likely be difficult to enforce left turn prohibitions at intersections with 4 lanes, which could result in unreliable traffic flow and unpredictable driver behavior that reduces safety along the street. The turn prohibitions would likely need active enforcement to be effective.

Parking

The 4-Lane cross section also reduces the number of parking spaces from 20 to 10 spaces per block.

Cesar Chavez Street to Riverside Drive

In this section of Congress Avenue, while motor vehicle demand is high, there are critical gaps in the quality of pedestrian and bicycle/scooter accommodations. To redistribute space for safer walking, bicycling, and scootering facilities it is proposed to continue two travel lanes in each direction. This provides space for improved sidewalks and protected bicycle lanes similar to the rest of the corridor and adds a continuous protected bicycle lane over Lady Bird Lake to connect the Downtown area and the proposed South Central Waterfront development. In addition, there are currently bike lanes south of Riverside Drive that would be able to connect to the project limits.

At Riverside Drive, Barton Springs Road, and Cesar Chavez Street intersections, additional turn lanes are recommended where there are heavy turning movements. The lane assignments were discussed and established with the City of Austin based on preliminary traffic model results and included in **Figure 16**.

Cesar Chavez Street

Cesar Chavez Street, as mentioned, is the constraining intersection along the corridor. North and southbound left turn lanes keep the through lanes moving. The following improvements are proposed:

- A northbound dedicated right turn bay is proposed to keep the through lanes moving.
- A southbound dedicated right turn bay is proposed to keep the through lanes moving.

Congress Bridge

The Congress Avenue Bridge has the lowest bicycle and pedestrian level of comfort on the corridor, is structurally constrained, and home to a bat colony. There are no turning movements on the bridge, and thus, there is an opportunity to redistribute the space to improve comfort and safety of other modes. **Figure 26** shows the potential reallocation of space to other modes along the Congress Avenue Bridge.

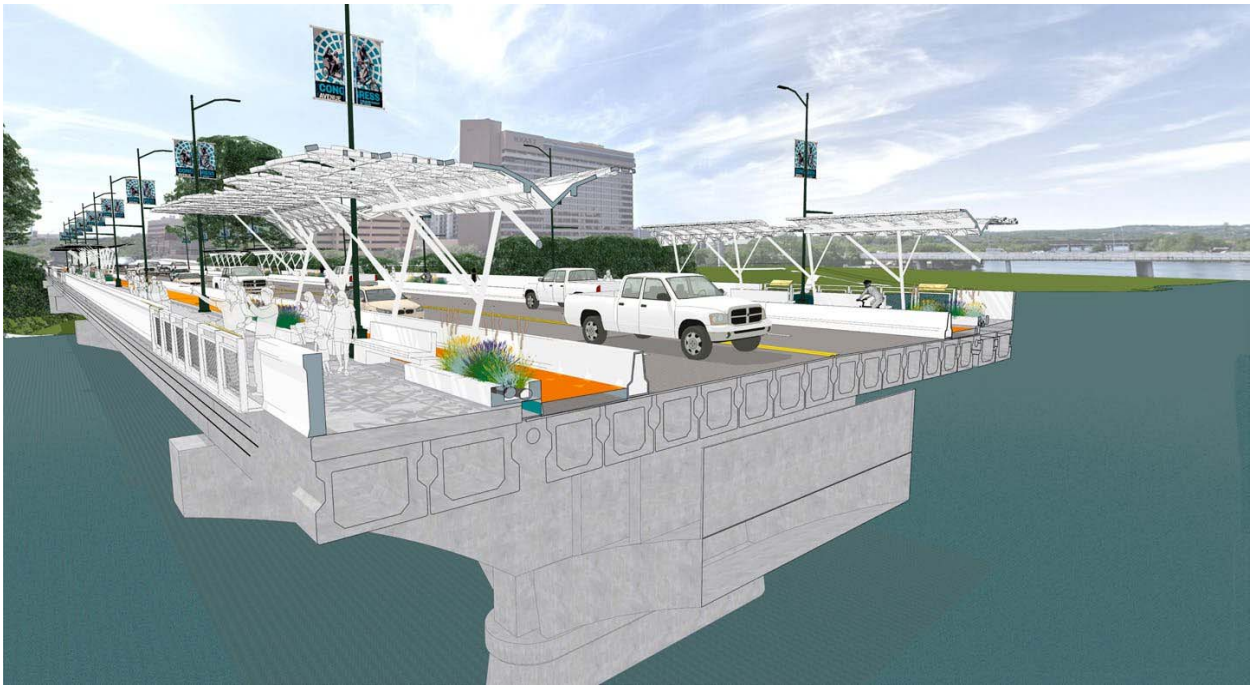


Figure 26: Conceptual Layout of Congress Avenue Bridge

The lane assignments allow a 4-Lane cross section over the Congress Avenue Bridge, which provide physical protected bicycle and pedestrian connection over Lady Bird Lake. The addition of the protected bicycle lanes prevents substantial additions to sidewalk width. However, the sidewalk on the Congress Avenue bridge could be slightly expanded with fewer conflicts expected between transportation modes.

A crash barrier between the travel lanes and bicycle and pedestrian spaces would serve to protect crowds of bat watchers that currently, at times, spill off the sidewalk into the outside traffic lane and block travel for people walking, bicycling, scootering or in wheelchairs.

Barton Springs

Dedicated left and right turn bays were provided for both north and southbound Congress Avenue to serve existing travel demand, future South Central Waterfront Development travel demand, and manage conflict points between motor vehicle and pedestrians.

Riverside Drive

The following improvements are proposed to mitigate impacts to motor vehicle delay and travel time with the reduction in through capacity at the Riverside Drive intersection.

- In addition to two through lanes in each direction, maintaining the existing dual lefts are proposed.
- A northbound right turn bay should be provided to separate right turning vehicles from through traffic due to reduced northbound vehicle capacity
- A westbound right turn bay to provide improved operations through the intersection and reduce vehicle and pedestrian conflict.

Conclusion

The intent of this report is to examine the effect of proposed Congress Avenue alternatives on mobility for all modes of transportation. The alternatives reconfigure existing motor vehicle lanes to increase available space for safety, comfort, capacity of other transportation modes, and sense of place. Throughout the public involvement process for this project, there has been strong support for improvements in walking, bicycling, transit, and the quality of the public space. Outside the scope of this mobility report, perhaps the most important effect of the redistribution of space is in service to the quality and vibrancy of the public space on this iconic civic avenue.

From a mobility perspective, the proposed alternative achieves high-quality places for people to walk and bicycle/scooter, with the potential to significantly shift existing and future trips from motor vehicle to other transportation modes. A thorough literature review was conducted and confirms this. This highly viable potential for mode shift is driven by a confluence of factors including; the inability to increase the number of motor vehicles that can travel along the corridor (the intersection with Cesar Chavez Street and the constrained Congress Avenue Bridge are at saturation), the high levels of development and additional travel demand planned in South Central Waterfront, and the high levels of very short trips (both existing and new trips), which are perfect candidates for walking, bicycling, and scootering.

We know that mobility demand will continue to increase. The analysis shows that the already saturated peak direction travel time conditions in the AM and PM are expected to worsen by 50% by 2040 in the No-Build ("Do Nothing") scenario. One of the most viable means of meeting that additional demand, apart from costly capacity-increasing infrastructure investments such as new bridges across Lady Bird Lake or management of travel demand, is through the space efficient modes of walking, bicycling, scootering, and transit. It should be noted that the City of Austin would be expected to collaborate with Capital Metro to plan and implement transit service to help achieve higher levels of mode shifts analyzed in this report.

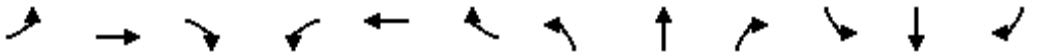
The analysis of the impact of proposed motor vehicle operations was conducted by looking at a reasonable range of shifts to other modes (low, medium, and high). It should be noted that individuals who choose to shift modes due to the proposed alternatives are likely making short trips (less than 3 miles) rather than long trips. Regardless of who chooses to shift, the benefit motor vehicle delay at intersections analyzed in this report are improved the same. Every person who can reasonably travel through this constrained gateway into downtown and decides to do so not in a single-occupied vehicle improves driving conditions for others. The analysis used Synchro models to evaluate the AM and PM peak periods. This traffic analysis tool is based on capacity and demand. It is limited in its ability to model the interaction of adjacent intersections with oversaturated conditions. The network impacts at a microscopic level should be analyzed prior to implementation.

The findings were that in the AM the proposed changes do not degrade motor vehicle operations and actually have the potential to improve motor vehicle operations at the intersection of Cesar Chavez Street, the bottleneck on the corridor. In the PM the analysis anticipates that depending on the degree of mode shift, there could be significant increases in peak travel times. The travel time increase can be largely mitigated by achieving higher levels of mode shift. Outside of the peak periods, it is anticipated that the operations and safety of the corridor will improve, largely with the addition of left turn bays at

major intersections (and potentially minor intersections depending on the alternative) from Cesar Chavez Street to the north. South of Cesar Chavez Street, the proposed changes provide improved multimodal connectivity from the expected South Central Waterfront to Downtown Austin.

Overall, the Congress Avenue corridor will experience a negative effect for vehicular operations in the PM peak unless a high degree of mode shift occurs. The quality of the potential improvements for walking and bicycling and the nature of the travel demand suggests that high levels of mode shift are achievable and that the alternatives are worth serious consideration. Lastly, while this report focuses on mobility, Congress Avenue in not a place only for mobility but is one of Austin's most important civic and public spaces. The proposed changes will enhance the character and vibrancy of this important space – the Main Street of Texas.

Appendix A: Existing Synchro Reports



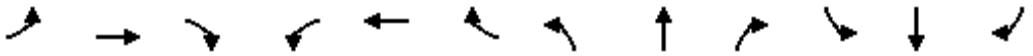
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	205	31	54	332	0	200	0	200	0	0	0
Future Volume (vph)	0	205	31	54	332	0	200	0	200	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	2		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	3433	0	1583	0	1863	0
Flt Permitted					0.874		0.950					
Satd. Flow (perm)	0	3539	1472	0	3076	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						206			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	211	32	0	398	0	206	0	206	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.12	0.04		0.22		0.72		0.58			
Control Delay		15.7	0.1		12.4		44.5		13.5			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.7	0.1		12.4		44.5		13.5			
LOS		B	A		B		D		B			
Approach Delay		13.7			12.4			29.0				
Approach LOS		B			B			C				
Queue Length 50th (ft)		43	0		73		66		70			
Queue Length 95th (ft)		65	0		99		#126		107			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50									
Base Capacity (vph)		1796	800		1792		286		496			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.12	0.04		0.22		0.72		0.42			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 19.2		Intersection LOS: B	
Intersection Capacity Utilization 55.7%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: 11th Street

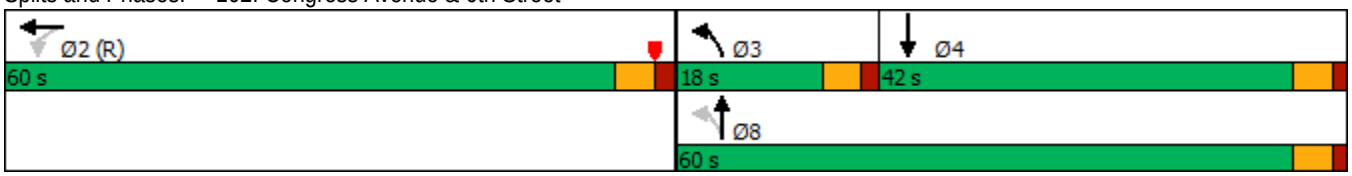


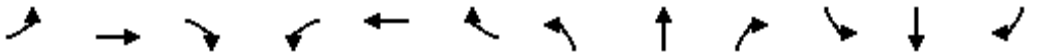
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	185	1097	55	261	800	0	0	229	77
Future Volume (vph)	0	0	0	185	1097	55	261	800	0	0	229	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5677	0	0	4522	0	0	4311	0
Flt Permitted					0.993			0.740				
Satd. Flow (perm)	0	0	0	0	5634	0	0	3354	0	0	4311	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9						73	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1408	0	0	1117	0	0	322	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				60.0	60.0		18.0	60.0			42.0	
Total Split (%)				50.0%	50.0%		15.0%	50.0%			35.0%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.5			5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					54.5			55.0			37.0	
Actuated g/C Ratio					0.45			0.46			0.31	
v/c Ratio					0.55			0.67			0.23	
Control Delay					24.7			13.5			22.1	
Queue Delay					0.0			0.8			0.0	
Total Delay					24.7			14.2			22.1	
LOS					C			B			C	
Approach Delay					24.7			14.2			22.1	
Approach LOS					C			B			C	
Queue Length 50th (ft)					223			184			51	
Queue Length 95th (ft)					259			250			77	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)												
Base Capacity (vph)					2563			1663			1379	
Starvation Cap Reductn					0			250			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio					0.55			0.79			0.23	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 20.3		Intersection LOS: C	
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			
Description: 6th Street			

Splits and Phases: 102: Congress Avenue & 6th Street



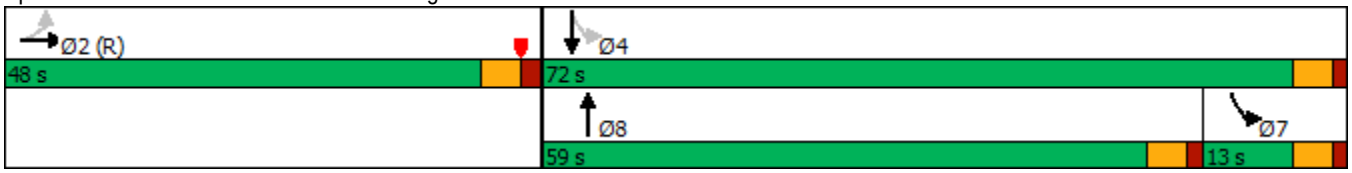


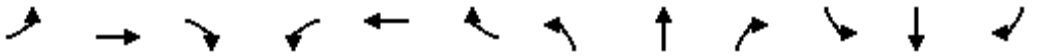
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	703	67	0	0	0	0	900	179	106	285	0
Future Volume (vph)	75	703	67	0	0	0	0	900	179	106	285	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1593	4492	0	0	0	0	0	4404	0	0	4517	0
Flt Permitted	0.950										0.645	
Satd. Flow (perm)	1505	4492	0	0	0	0	0	4404	0	0	2945	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14						45				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	819	0	0	0	0	0	1147	0	0	416	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						59.0		13.0	72.0	
Total Split (%)	40.0%	40.0%						49.2%		10.8%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0			0.0	
Total Lost Time (s)	5.5	5.5						5.0			5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						54.0			67.0	
Actuated g/C Ratio	0.35	0.35						0.45			0.56	
v/c Ratio	0.15	0.51						0.57			0.24	
Control Delay	27.5	31.4						5.3			14.0	
Queue Delay	0.0	0.0						0.1			0.0	
Total Delay	27.5	31.4						5.4			14.0	
LOS	C	C						A			B	
Approach Delay		31.0						5.4			14.0	
Approach LOS		C						A			B	
Queue Length 50th (ft)	42	178						33			60	
Queue Length 95th (ft)	80	221						m22			77	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)												
Base Capacity (vph)	533	1599						2006			1749	
Starvation Cap Reductn	0	0						0			0	
Spillback Cap Reductn	0	0						83			0	
Storage Cap Reductn	0	0						0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.15	0.51						0.60			0.24	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 16.2		Intersection LOS: B	
Intersection Capacity Utilization 74.7%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	873	191	136	441	103	162	1800	475	22	400	60
Future Volume (vph)	191	873	191	136	441	103	162	1800	475	22	400	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	0		175	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	1593	2991	0	0	4274	1225	0	4390	0
Flt Permitted	0.225			0.319				0.809			0.728	
Satd. Flow (perm)	359	3185	1170	508	2991	0	0	3451	1025	0	3202	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182		26			3	227		25	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	90		90	90		90	90		90	90		90
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)									10%			
Lane Group Flow (vph)	195	891	195	139	555	0	0	2051	436	0	491	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0		27.0	27.0	27.0	27.0	27.0	
Total Split (s)	21.0	52.0	52.0	16.0	47.0		52.0	52.0	52.0	52.0	52.0	
Total Split (%)	17.5%	43.3%	43.3%	13.3%	39.2%		43.3%	43.3%	43.3%	43.3%	43.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	Max	Max	Max	Max	Max		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)	46.0	46.0	46.0	41.0	41.0			46.0	46.0		46.0	
Actuated g/C Ratio	0.38	0.38	0.38	0.34	0.34			0.38	0.38		0.38	
v/c Ratio	0.67	0.73	0.35	0.53	0.53			1.55	0.82		0.40	
Control Delay	38.4	36.0	6.2	45.0	32.5			280.0	29.6		27.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay	38.4	36.0	6.2	45.0	32.5			280.0	29.6		27.1	
LOS	D	D	A	D	C			F	C		C	
Approach Delay		31.8			35.0			236.1			27.1	
Approach LOS		C			D			F			C	
Queue Length 50th (ft)	105	307	6	77	172			~874	180		110	
Queue Length 95th (ft)	167	385	57	130	229			#977	#419		147	
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175					175			
Base Capacity (vph)	291	1220	560	263	1039			1324	532		1242	

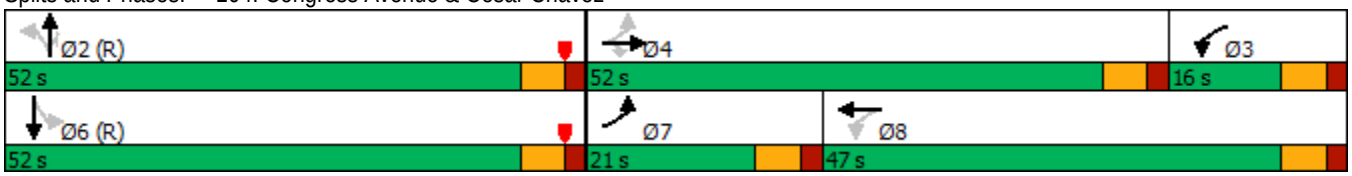
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0			0	0		0	
Spillback Cap Reductn	0	0	0	0	0			0	0		0	
Storage Cap Reductn	0	0	0	0	0			0	0		0	
Reduced v/c Ratio	0.67	0.73	0.35	0.53	0.53			1.55	0.82		0.40	

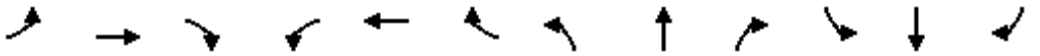
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 54 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Red			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.55			
Intersection Signal Delay: 134.4		Intersection LOS: F	
Intersection Capacity Utilization 119.3%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 104: Congress Avenue & Cesar Chavez



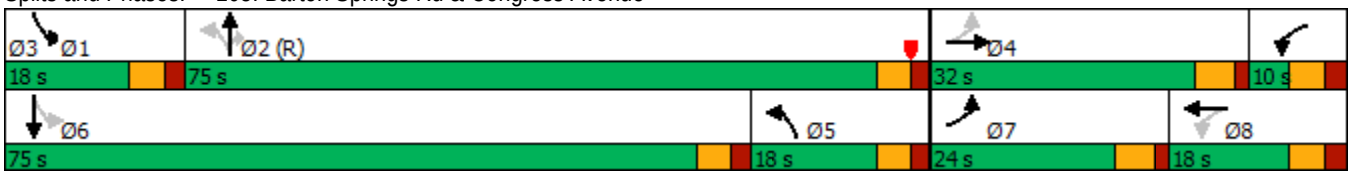


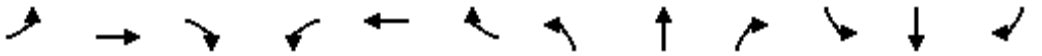
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	15	44	7	9	10	73	1800	41	31	386	221
Future Volume (vph)	400	15	44	7	9	10	73	1800	41	31	386	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		0
Storage Lanes	2		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1610	0	1770	1680	0	1770	5085	1583	1770	4626	0
Flt Permitted	0.556			0.716			0.392			0.057		
Satd. Flow (perm)	1960	1610	0	1304	1680	0	705	5085	1497	106	4626	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		47			11				158		158	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	430	63	0	8	21	0	78	1935	44	33	653	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0		3.0	25.0	25.0	3.0	25.0	
Minimum Split (s)	20.0	38.5		10.0	35.0		15.0	45.0	45.0	15.0	45.0	
Total Split (s)	24.0	32.0		10.0	18.0		18.0	75.0	75.0	18.0	75.0	
Total Split (%)	17.8%	23.7%		7.4%	13.3%		13.3%	55.6%	55.6%	13.3%	55.6%	
Yellow Time (s)	4.0	4.0		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5		2.5	2.5		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	Max	
Act Effct Green (s)	29.7	27.5		13.6	10.8		85.5	85.5	85.5	80.2	80.2	
Actuated g/C Ratio	0.22	0.20		0.10	0.08		0.63	0.63	0.63	0.59	0.59	
v/c Ratio	0.67	0.17		0.05	0.15		0.16	0.60	0.04	0.26	0.23	
Control Delay	52.1	16.5		54.1	37.4		4.5	4.5	0.0	20.3	11.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1	0.0	0.0	0.0	
Total Delay	52.1	16.5		54.1	37.4		4.5	4.6	0.0	20.3	11.2	
LOS	D	B		D	D		A	A	A	C	B	
Approach Delay		47.6			42.0			4.5			11.7	
Approach LOS		D			D			A			B	
Queue Length 50th (ft)	147	9		5	8		13	140	0	14	84	
Queue Length 95th (ft)	237	52		24	36		m13	m130	m0	32	110	
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		
Base Capacity (vph)	654	431		152	178		575	3228	1008	217	2813	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	288	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.66	0.15		0.05	0.12		0.14	0.66	0.04	0.15	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 72 (53%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 12.8		Intersection LOS: B	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			
Description: Barton Springs			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	467	109	144	935	334	269	1500	118	110	231	20
Future Volume (vph)	87	467	109	144	935	334	269	1500	118	110	231	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	225		0	180		0
Storage Lanes	1		1	1		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1583	1770	3369	0	3433	5009	0	3433	5001	0
Flt Permitted	0.094			0.323			0.950			0.950		
Satd. Flow (perm)	175	3539	1526	596	3369	0	3253	5009	0	3408	5001	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112		44			10			11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	481	112	148	1308	0	277	1668	0	113	259	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4								
Detector Phase	3	8	5	7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	10.0	3.0	3.0	10.0		3.0	5.0		3.0	4.0	
Minimum Split (s)	13.0	38.0	8.0	8.0	38.0		8.0	32.0		8.0	32.0	
Total Split (s)	13.0	50.0	17.0	22.0	59.0		17.0	48.0		15.0	46.0	
Total Split (%)	9.6%	37.0%	12.6%	16.3%	43.7%		12.6%	35.6%		11.1%	34.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min	None	None	Min		None	Min		None	C-Max	
Act Effct Green (s)	50.6	50.6	62.5	53.6	53.6		11.9	43.4		10.0	41.5	
Actuated g/C Ratio	0.37	0.37	0.46	0.40	0.40		0.09	0.32		0.07	0.31	
v/c Ratio	0.56	0.36	0.15	0.45	0.96		0.92	1.03		0.44	0.17	
Control Delay	62.5	32.0	3.8	31.3	54.8		95.2	75.2		56.6	24.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	62.5	32.0	3.8	31.3	54.8		95.2	75.2		56.6	24.1	
LOS	E	C	A	C	D		F	E		E	C	
Approach Delay		31.4			52.4			78.1			34.0	
Approach LOS		C			D			E			C	
Queue Length 50th (ft)	51	158	0	84	564		126	~576		50	60	
Queue Length 95th (ft)	97	217	33	135	#723		#209	#675		82	86	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150			225			180		
Base Capacity (vph)	160	1326	772	384	1374		305	1618		254	1546	

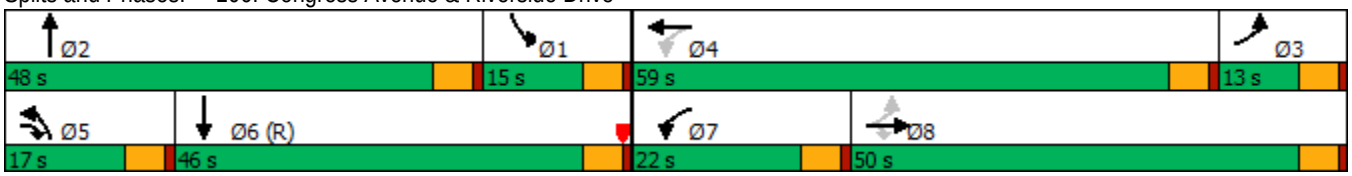
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.56	0.36	0.15	0.39	0.95		0.91	1.03		0.44	0.17	

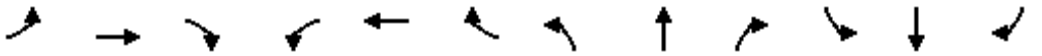
Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 60 (44%), Referenced to phase 6:SBT, Start of Red			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 58.8		Intersection LOS: E	
Intersection Capacity Utilization 95.5%		ICU Level of Service F	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Congress Avenue & Riverside Drive



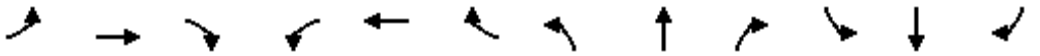


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	375	119	145	298	0	148	0	192	0	0	0
Future Volume (vph)	0	375	119	145	298	0	148	0	192	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	2		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3185	1425	0	3134	0	3090	0	1425	0	1676	0
Flt Permitted					0.664		0.950					
Satd. Flow (perm)	0	3185	1325	0	2096	0	2783	0	1334	0	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						204			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	399	127	0	471	0	157	0	204	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.25	0.17		0.38		0.61		0.61			
Control Delay		17.2	4.6		14.1		62.2		11.7			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		17.2	4.6		14.1		62.2		11.7			
LOS		B	A		B		E		B			
Approach Delay		14.1			14.1			33.7				
Approach LOS		B			B			C				
Queue Length 50th (ft)		88	7		90		46		0			
Queue Length 95th (ft)		121	39		120		84		45			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50									
Base Capacity (vph)		1616	726		1240		257		460			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.25	0.17		0.38		0.61		0.44			

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 19.3		Intersection LOS: B	
Intersection Capacity Utilization 58.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: 11th Street

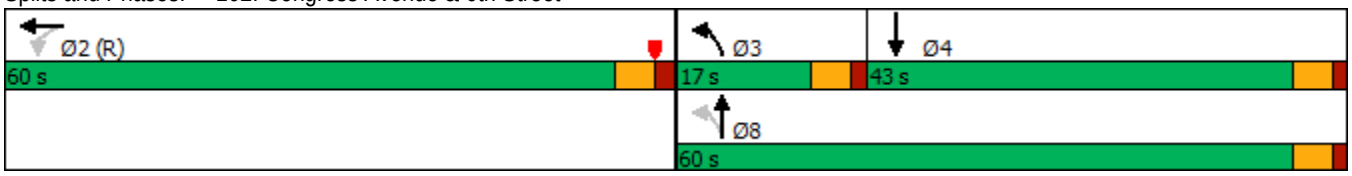


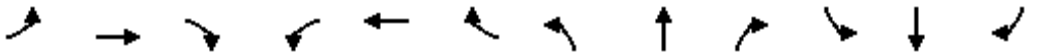
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	248	790	71	195	544	0	0	1300	113
Future Volume (vph)	0	0	0	248	790	71	195	544	0	0	1300	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5623	0	0	4517	0	0	4492	0
Flt Permitted					0.989			0.696				
Satd. Flow (perm)	0	0	0	0	5554	0	0	3185	0	0	4492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					15						12	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			48.7	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1206	0	0	803	0	0	1536	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				60.0	60.0		17.0	60.0			43.0	
Total Split (%)				50.0%	50.0%		14.2%	50.0%			35.8%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.5			5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					54.5			55.0			38.0	
Actuated g/C Ratio					0.45			0.46			0.32	
v/c Ratio					0.48			0.99dl			1.07	
Control Delay					23.3			9.9			84.3	
Queue Delay					0.0			0.0			0.0	
Total Delay					23.3			9.9			84.3	
LOS					C			A			F	
Approach Delay					23.3			9.9			84.3	
Approach LOS					C			A			F	
Queue Length 50th (ft)					182			54			~483	
Queue Length 95th (ft)					215			63			#582	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)												
Base Capacity (vph)					2530			1592			1430	
Starvation Cap Reductn					0			54			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio					0.48			0.52			1.07	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 21 (18%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 46.7		Intersection LOS: D	
Intersection Capacity Utilization 80.8%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			

Splits and Phases: 102: Congress Avenue & 6th Street



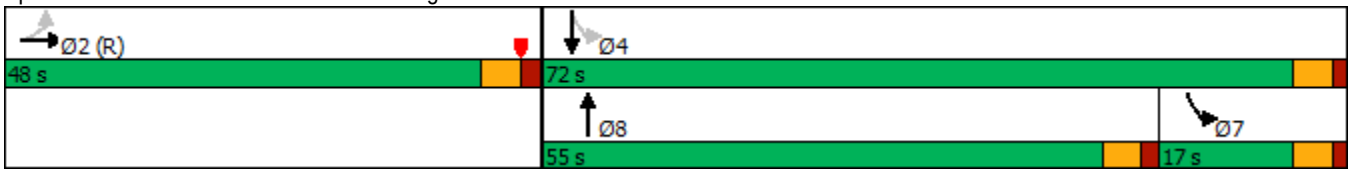


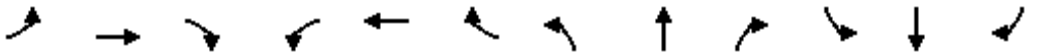
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	845	300	0	0	0	0	588	131	67	1500	0
Future Volume (vph)	107	845	300	0	0	0	0	588	131	67	1500	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1593	4323	0	0	0	0	0	4389	0	0	4568	0
Flt Permitted	0.950										0.850	
Satd. Flow (perm)	1505	4323	0	0	0	0	0	4389	0	0	3887	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20						51				
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			9.7	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	1193	0	0	0	0	0	749	0	0	1633	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						55.0		17.0	72.0	
Total Split (%)	40.0%	40.0%						45.8%		14.2%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0			0.0	
Total Lost Time (s)	5.5	5.5						5.0			5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						50.0			67.0	
Actuated g/C Ratio	0.35	0.35						0.42			0.56	
v/c Ratio	0.21	0.77						0.40			0.73	
Control Delay	28.4	38.0						10.7			12.0	
Queue Delay	0.0	0.0						0.0			0.2	
Total Delay	28.4	38.0						10.7			12.2	
LOS	C	D						B			B	
Approach Delay		37.2						10.7			12.2	
Approach LOS		D						B			B	
Queue Length 50th (ft)	60	294						128			95	
Queue Length 95th (ft)	105	353						m49			m73	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)												
Base Capacity (vph)	533	1543						1858			2238	
Starvation Cap Reductn	0	0						0			94	
Spillback Cap Reductn	0	0						0			0	
Storage Cap Reductn	0	0						0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.21	0.77						0.40			0.76	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 19 (16%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 89.7%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	1200	406	416	1000	53	200	681	317	150	1700	200
Future Volume (vph)	83	1200	406	416	1000	53	200	681	317	150	1700	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	150		0	0		175	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	3090	1648	0	0	4232	1225	0	4371	0
Flt Permitted	0.174			0.950				0.700			0.646	
Satd. Flow (perm)	286	3185	1170	2993	1648	0	0	2990	1025	0	2835	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136		2			4	275		19	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		1084			1831			1735			1425	
Travel Time (s)		24.6			41.6			39.4			38.9	
Confl. Peds. (#/hr)	90		90	90		90	90		90	90		90
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)									10%			
Lane Group Flow (vph)	85	1224	414	424	1074	0	0	931	291	0	2092	0
Turn Type	pm+pt	NA	Perm	Prot	NA		Perm	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8			2	3	1	6	
Permitted Phases	4		4				2		2	6		
Detector Phase	7	4	4	3	8		2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	5.0	5.0	10.0	
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0		27.0	27.0	11.0	11.0	27.0	
Total Split (s)	15.0	38.0	38.0	24.0	47.0		31.0	31.0	24.0	27.0	58.0	
Total Split (%)	12.5%	31.7%	31.7%	20.0%	39.2%		25.8%	25.8%	20.0%	22.5%	48.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	Max	Max	Max	Max	Max		Max	Max	Max	Max	C-Max	
Act Effct Green (s)	32.0	32.0	32.0	18.0	41.0			25.0	43.0		52.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.15	0.34			0.21	0.36		0.43	
v/c Ratio	0.49	1.44	1.01	0.92	1.90			3.71dl	0.51		1.39	
Control Delay	55.1	239.4	76.4	75.9	439.3			262.2	6.9		202.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay	55.1	239.4	76.4	75.9	439.3			262.2	6.9		202.2	
LOS	E	F	E	E	F			F	A		F	
Approach Delay		191.1			336.5			201.4			202.2	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	51	~677	~240	169	~1289			~388	8		~770	
Queue Length 95th (ft)	95	#814	#454	#263	#1548			#486	79		#874	
Internal Link Dist (ft)		1004			1751			1655			1345	
Turn Bay Length (ft)	200		200	150					175			
Base Capacity (vph)	174	849	411	463	564			626	573		1508	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0			0	0		0	
Spillback Cap Reductn	0	0	0	0	0			0	0		0	
Storage Cap Reductn	0	0	0	0	0			0	0		0	
Reduced v/c Ratio	0.49	1.44	1.01	0.92	1.90			1.49	0.51		1.39	

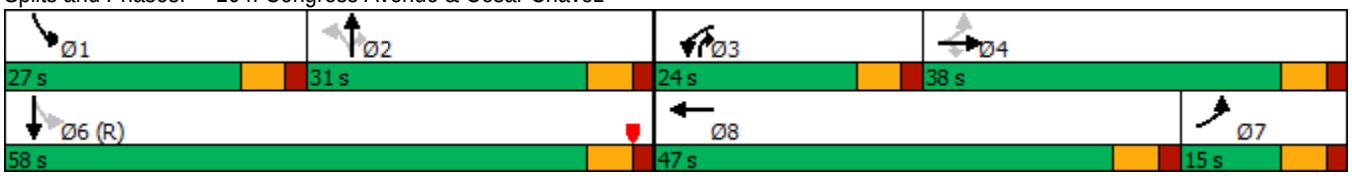
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 2 (2%), Referenced to phase 6:SBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.90			
Intersection Signal Delay: 229.9		Intersection LOS: F	
Intersection Capacity Utilization 155.2%		ICU Level of Service H	
Analysis Period (min) 15			

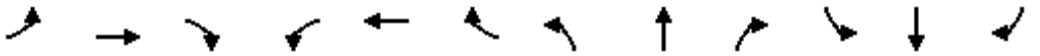
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 104: Congress Avenue & Cesar Chavez





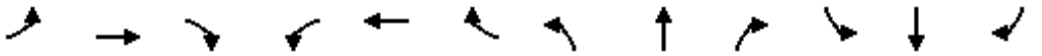
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	10	97	30	29	18	81	722	12	19	2100	404
Future Volume (vph)	222	10	97	30	29	18	81	722	12	19	2100	404
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	100		100	70		0
Storage Lanes	2		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1558	0	1770	1730	0	1770	5085	1583	1770	4879	0
Flt Permitted	0.421			0.684			0.050			0.311		
Satd. Flow (perm)	1484	1558	0	1246	1730	0	93	5085	1495	572	4879	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		102			17				152		47	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		792			262			650			1735	
Travel Time (s)		18.0			6.0			14.8			39.4	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	234	113	0	32	50	0	85	760	13	20	2636	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0		3.0	25.0	25.0	3.0	25.0	
Minimum Split (s)	20.0	38.5		10.0	35.0		8.5	45.0	45.0	8.5	45.0	
Total Split (s)	26.0	32.0		10.0	16.0		13.0	87.0	87.0	11.0	85.0	
Total Split (%)	18.6%	22.9%		7.1%	11.4%		9.3%	62.1%	62.1%	7.9%	60.7%	
Yellow Time (s)	4.0	4.0		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5		2.5	2.5		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	Max	
Act Effct Green (s)	22.7	22.7		12.5	11.7		94.0	94.0	94.0	87.9	87.9	
Actuated g/C Ratio	0.16	0.16		0.09	0.08		0.67	0.67	0.67	0.63	0.63	
v/c Ratio	0.55	0.34		0.25	0.31		0.59	0.22	0.01	0.05	0.86	
Control Delay	56.9	13.7		62.7	46.4		59.5	10.9	0.0	13.2	26.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	1.3	
Total Delay	56.9	13.7		62.7	46.4		59.5	10.9	0.0	13.2	27.6	
LOS	E	B		E	D		E	B	A	B	C	
Approach Delay		42.9			52.8			15.6			27.5	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	96	8		26	27		53	197	0	8	779	
Queue Length 95th (ft)	138	63		62	71		m96	254	m0	20	863	
Internal Link Dist (ft)		712			182			570			1655	
Turn Bay Length (ft)							100		100	70		
Base Capacity (vph)	548	377		127	183		152	3414	1053	406	3081	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	4		0	0		0	0	0	0	246	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.43	0.30		0.25	0.27		0.56	0.22	0.01	0.05	0.93	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 26.8		Intersection LOS: C	
Intersection Capacity Utilization 88.3%		ICU Level of Service E	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	846	248	134	700	189	226	593	153	410	1700	30
Future Volume (vph)	36	846	248	134	700	189	226	593	153	410	1700	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	250		0	180		0
Storage Lanes	1		1	1		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1583	1770	3399	0	3433	4869	0	3433	5065	0
Flt Permitted	0.216			0.090			0.157			0.340		
Satd. Flow (perm)	400	3539	1525	167	3399	0	565	4869	0	1197	5065	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94		28			44			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			650	
Travel Time (s)		12.8			30.0			13.0			14.8	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	900	264	143	946	0	240	794	0	436	1841	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4			2			6		
Detector Phase	3	8	5	7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	3.0	3.0	10.0		3.0	15.0		3.0	15.0	
Minimum Split (s)	10.0	38.0	8.0	8.0	38.0		8.0	32.0		8.0	32.0	
Total Split (s)	12.0	53.0	17.0	16.0	57.0		17.0	41.0		30.0	54.0	
Total Split (%)	8.6%	37.9%	12.1%	11.4%	40.7%		12.1%	29.3%		21.4%	38.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max	None	None	Max		None	Max		C-Max	Max	
Act Effct Green (s)	48.9	48.9	59.5	54.4	54.4		36.0	36.0		50.4	50.4	
Actuated g/C Ratio	0.35	0.35	0.42	0.39	0.39		0.26	0.26		0.36	0.36	
v/c Ratio	0.19	0.73	0.37	0.80	0.71		0.66	0.62		0.53	1.01	
Control Delay	37.2	44.1	16.8	62.1	39.1		51.0	45.7		46.7	63.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	5.5	
Total Delay	37.2	44.1	16.8	62.1	39.1		51.0	45.7		46.7	68.7	
LOS	D	D	B	E	D		D	D		D	E	
Approach Delay		37.9			42.1			46.9			64.5	
Approach LOS		D			D			D			E	
Queue Length 50th (ft)	23	379	94	89	380		90	222		135	~586	
Queue Length 95th (ft)	50	460	160	#190	463		128	270		m165	#744	
Internal Link Dist (ft)		485			1241			491			570	
Turn Bay Length (ft)	150			150			250			180		
Base Capacity (vph)	208	1237	722	190	1338		391	1284		830	1825	

Appendix B: Literature Review Memo

MEMORANDUM

DATE: August 23, 2017
TO: Susannah Ross
CC: Martin Zogran
FROM: Clint Jumper, PE
RE: Congress Avenue Streetscape Improvement – Literature Review

AUSTIN OFFICE
11500 Metric Blvd.
Bldg. M-1, Ste. 150
Austin, TX 78758
Phone: 512.821.2081
Fax: 512.821.2085
Toll Free: 866.576.0597
TBPE Firm Registration No. 812

As part of the Congress Avenue Streetscape Improvement project, Alliance Transportation Group is tasked with evaluating the existing transportation network and relevant plans. This memo will summarize relevant plans and how they will be incorporated into Congress Avenue Streetscape Improvement Urban Design Initiative.

There are many plans and reports that have been developed for areas ranging in scale from the region, to the county, to the city, and to downtown-specific reports. There is a previous Congress Avenue strategic report that lead to the current project. These plans, reports, and the data included in them should inform the work of the Congress Avenue Design Initiative. This memo summarizes the plans and identifies the most pertinent information that will be included in the ultimate Mobility Report.

Many of the relevant plans underwent extensive public outreach and stakeholder input to develop a plan that addresses a wide variety of needs. **Table 1** lists the reports that are summarized in this memo.

Table 1: List of Plans and Reports Relevant to Congress Avenue

Document	Author	Date
Austin Strategic Mobility Plan	City of Austin	In Development
2025 Austin Metropolitan Area Transportation Plan	City of Austin	Adopted 2004
Bicycle and Sidewalk Master Plans	City of Austin	2014, 2016
Connections 2025	Capital Metropolitan Transportation Authority	Adopted 2016
Project Connect	Capital Metropolitan Transportation Authority	In Development
Downtown Austin Plan	Downtown Austin Alliance	Adopted 2011
Downtown Austin Alliance Downtown Parking Strategy Briefing Book	Downtown Austin Alliance	November 2016
2040 Regional Transportation Plan	Capital Area MPO	Adopted October 2016
2045 Regional Active Transportation Plan	Capital Area MPO	In Development

City of Austin

Austin Strategic Mobility Plan

The Austin Strategic Mobility Plan (ASMP) is borne from the outcomes of the Imagine Austin comprehensive plan, mobility talks, past mode planning documents, and bond programs. The ASMP will ultimately be adopted by Austin City Council to amend the Imagine Austin comprehensive plan. It will include policies, programs, and projects. Strategies, recommendations, and draft networks will be released through the Spring and Summer of 2017. The final draft will be ready for adoption in January 2018. The ASMP will serve as the updated transportation plan replacing the 2025 Austin Metropolitan Area Transportation Plan.

2025 Austin Metropolitan Area Transportation Plan

The Austin Metropolitan Area Transportation Plan (AMATP) was adopted in 1994 and last amended in 2004. Due to the large gap from the last amendment, it is not as useful to the Congress Avenue project as more recent plans. The 2025 Austin Metropolitan Area Transportation Plan refers to this segment of Congress Avenue as an undivided major arterial with 6 lanes. Congress Avenue is listed as part of Capital Area Metropolitan Planning Organization's Bike System and denotes the recommendation from the Austin Bike Plan for Congress Avenue to be a wide curb (15') facility. Wide curb facility is the precursor to the "sharrow" term that is now common.

Bicycle and Sidewalk Master Plans

The City of Austin developed master plans for bicycles and sidewalks, completed in 2014 and 2016, respectively. The Bicycle Master Plan includes maps of bicycle coverage in the City of Austin and the types of facilities provided. It includes the improvements made since the previous bike master plan (2009) and the goals for improvement before the next installment. The Sidewalk Master Plan includes recommendations for new sidewalks, recommendations for improvement to existing sidewalks, with an emphasis on ADA compliance, and goals for future improvements. Maps are included as a visual display of sidewalk coverage and type.

Relevance to Congress Avenue Streetscape Improvement

Given Downtown's high concentration of jobs and Congress Avenue's role as major route especially for transportation across Lady Bird Lake, the impacts from the ASMP will need to be considered in the Congress Avenue Mobility Plan. Of the mobility considerations listed in the ASMP two are especially relevant for Congress Avenue Design Initiative: travel choice and placemaking. Ongoing coordination will need to take place with the ASMP project stakeholders to ensure consistency between reports and adjacent street plans. Downtown area planned projects will impact Congress Avenue mobility and effect the alternative analyses. The bicycle and sidewalk master plans show the current state of bicycle routes and sidewalks along Congress Avenue and connecting to adjacent streets. Congress Avenue has the highest pedestrian score, but does not have dedicated bike facilities within the project limits.

Capital Metro

Connections 2025

Capital Metro Transportation Authority's new service plan, Connections 2025, was adopted in February 2017 and includes both short-term and long-term proposals. Based on ridership and route data, in addition to the public input, several principles were selected to guide development. They included an easy-to-understand network, a more robust frequent network, matching service to markets, enhancing

customer experience, complementing emerging mobility initiatives, growing ridership, laying the groundwork for future service plans, and coordinating land use and infrastructure.

Plan development began in October 2015 with data collection. Next, the existing system and service lines were evaluated. The five-year service plan and long range plan were developed and combined into the final transit plan. There were three components of the study process: market assessment, service evaluation, and mobility. Market assessment included information about land use, demographics, travel patterns, and population. Service evaluation sought to understand ridership trends and route performance. Finally, mobility services were differentiated between lifestyle (all-day, all-week use) and targeted (commuter, seniors, youth).

The plan includes several modifications and additions. The fare system was simplified by eliminating the premium fare for rapid buses. The plan also expanded the frequent network by adding two MetroRapid routes, including more local routes in the frequent network, and reducing headways on MetroRail. To improve regional connectivity, east-west routes are proposed and new IH-35 BRT routes are proposed in addition to the new realigned Express routes along MoPac Express Lanes. The Plan also introduces Mobility Innovation Zones to replace underperforming routes with mobility options through various pilot programs (shared-rides, TNCs, bike and car sharing, etc.) The plan proposes capital improvements, including new buses, additional park and ride lots, improved and additional MetroRapid stations, and more effective transit priority lanes and signalization.

Project Connect

Capital Metro is currently developing its Project Connect plan. The plan is designed to create a system of high-capacity transit options that will connect people, places, and opportunities in an affordable, efficient, and sustainable way. The planning level project will work with local agencies, stakeholders, and the public to identify high-capacity transit solutions for further development. The project has completed the preliminary evaluation and developed the purpose and need. There have also been multiple public involvement events to hear community ideas and gauge existing public issues. The report is under development and expected to be completed Spring 2018.

Relevance to Congress Avenue Streetscape Improvement

Since Downtown serves as the hub of Capital Metro's network and most routes operate through Downtown, this plan will have an impact on Downtown traffic patterns as well as street design. There are several alignment changes and route additions that will impact Congress Avenue. Most bus routes that impact Congress Avenue operate along Congress Avenue cross streets. The updated plan does not specify bus route locations. Our team will coordinate with Cap Metro to determine the expected stops along Congress Avenue. **Figure 1** shows the route locations, which are also listed below.

Route Additions

- The addition of Route 450 – Congress Shuttle will bring bus service back to Congress Avenue. The shuttle will run from the Capitol to just north of Oltorf Street. The shuttle will operate 7 days a week from 7AM-2PM.
- The addition of Route 804 will bring rapid bus service for crosstown commuters. This route will cross Congress Avenue at 7th Street and assumes 7th Street will be bi-directional.
- Route 820 – Riverside/Manor is a new rapid route that will cross Congress Avenue at Riverside Drive.
- The addition Route 451 – Downtown circulator will provide bus service between Trinity and Lamar and cross Congress Avenue at 4th Street.

- Route 2 – Rosewood, Route 6 – East 12th, Route 7 – Duval, and Route 10 - Red River below will undergo alignment changes. Currently, these routes only cross Congress Avenue at 11th Street. The Connections 2025 plan calls for these routes to use the Trinity/ San Jacinto couplet instead of the Guadalupe/Lavaca couplet. This results in the alignments for all four of these routes crossing Congress at 4th and 5th streets. Route 7 – Duval also crosses Congress Avenue at the south limit of this project, Riverside Drive.
- Route 111 - South MoPac Express and Route 171 – Oak Hill Express proposed alignment will cross Congress at Cesar Chavez to use the San Jacinto/Trinity couplet. Route 111 – South MoPac Express is also being upgraded to Express service.

Potential impacts to Congress Avenue include new bus stops and associated no parking zones and changes to pedestrian, bike, and vehicle traffic patterns since the downtown area is a small grid system. A more robust frequent network, better commuter rail service, more east-west routes, and the shifting of certain routes to the San Jacinto/Trinity couplet will likely impact Congress Avenue both in terms of street design and traffic patterns. Street design changes can include additional and relocated bus stops, associated no parking zones, and transit priority signalization. In terms of traffic patterns, the probability that more commuters and visitors to downtown will find transit a viable option will mean fewer cars and more pedestrians and bikes.

Project Connect identifies projects that are likely long-term improvements that should be recognized in the Congress Avenue Mobility Plan. The planned improvements that impact Congress Avenue and adjacent facilities will be considered in the analysis.

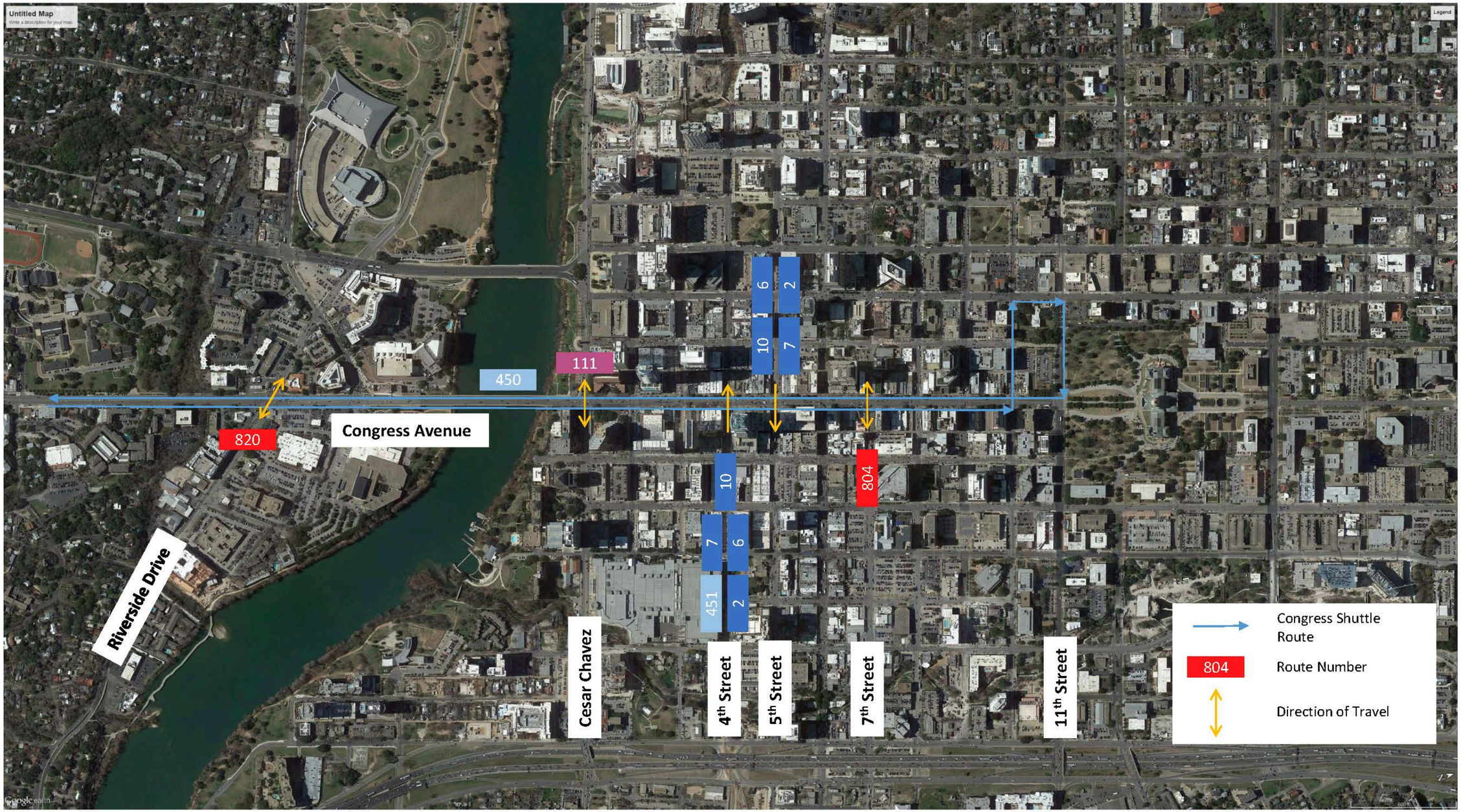


Figure 1: Connections 2025 Routes along Congress Avenue

Downtown Austin Alliance

Downtown Austin Plan

The Downtown Austin Plan (DAP) was commissioned by the Downtown Austin Alliance and adopted by Austin City Council in 2011. The scope of the plan includes the area between Martin Luther King Boulevard and Lady Bird Lake and between Lamar Boulevard and I-35. The Downtown Austin Plan came out of a three-year dialogue with the public and Downtown community through six town halls and many smaller meetings and workshops. The planning process began with a diagnostic phase and culminated with the release of the "Downtown Austin Plan Issues and Opportunities" in February 2008. From 2008-2009, City Council acted to advance several of the elements of the Downtown Austin Plan. Relevant to the Congress Avenue Design Imitative are the Downtown Transportation Framework Plan and the Downtown Parks and Open Space Master Plan.

The DAP lists seven transformative steps to be taken in the next ten years, an explanation of why Downtown is important, the history and current status of Downtown, and risks facing Downtown. The Downtown Austin Plan organizes their goals and recommendations into seven elements: historical preservation, activities and uses, density and design, public realm, transportation and parking, utilities and infrastructure, and leadership and implementation.

Relevance to Congress Avenue Streetscape Improvement

Most of these elements will influence the Congress Avenue Urban Design Initiative. Historic Preservation will require the balance of modern and historic design. The Activities and Uses element encourages a diverse mix of uses and services that are pedestrian-friendly and not just oriented to nighttime activity. This element specifically calls out Congress Avenue and recommends improving Congress Avenue in "keeping with its role as the Main Street of Texas".

In regards to transportation-related items, Transportation and Parking calls for a multi-modal transportation system to improve access to and in Downtown and manage parking demand and strategies. These aspects include improving pedestrian facilities, converting certain streets to two-way operation, establishing a comprehensive way finding system, and maintaining alleys as the means of loading, servicing, and parking access. The transit section of the report encourages concentrating major bus routes along the Downtown corridors and creating high-quality state of the art transit stops. For bicyclists, the plan recommends providing facilities for all levels of bicycles along key north-south corridors and increasing bicycle parking downtown. The parking section emphasizes the need to better manage Downtown parking, providing incentives for on-site car sharing spaces and managing on-street parking and loading in a more efficient manner. There is also a strong push for complete streets to be incorporated into transportation infrastructure.

Downtown Parking Strategy

The Downtown Austin Alliance initiated this study to approach parking in downtown in a comprehensive manner. The Briefing Book is the first major deliverable to come out of the Parking Study. The Briefing Book includes stakeholder interviews, community feedback, data analytics, and documentation of issues and challenges. The report summarizes the existing parking data and condition. The Briefing Book also includes information of what currently works and what does not for parking downtown. This portion of the parking study does not include proposed adjustments to downtown parking. The next stage of the study is currently being completed by the DAA and will include unveiling the proposed downtown parking. Our project will need to incorporate the DAA parking plan with emphasis on parking along Congress Avenue and adjacent facilities. The study area is bounded by Lamar Boulevard, Lady Bird Lake,

I-35, and MLK Boulevard. And the South Central Waterfront is also included. The project goals and objectives were selected to ensure the downtown parking system is supportive, multimodal, available, cost-effective, user-friendly, and adaptable.

Relevance to Congress Avenue Streetscape Improvement

The Briefing Book will serve as important document to the Congress Avenue project. Ongoing coordination will be required to ensure consistency between the DAA parking recommendations and the Congress Avenue alternatives.

The Initial findings from the Downtown Parking Strategy team indicates there are over 70,000 parking spaces downtown. Only 9 percent of these are on-street spaces. The on-street spaces that do exist are underpriced which leads to low turnover. Additionally, many drivers violate the posted time limits. Most employees downtown have free or discounted parking and benefits for those who choose other modes are rare. The ease of parking varies across areas in downtown but typically there are underutilized parking spaces with a short distance from the areas which parking is scarce. Most important, many people indicated that they may leave downtown if they cannot find parking.

The DAA's review of relevant plans and existing regulations found that there have been many planning efforts for downtown and these plans call for an ongoing vitality, multimodal access, and reducing reliance on single-occupancy car trips. The research also found that the approach to parking has been "siloed" in its approach so that each development builds parking for specific user group instead of considering parking as shared commodity. The Briefing Book also suggested that the land development code could improve its regulation concerning parking requirements. The DAA is currently working on proposed parking downtown and the CodeNext draft was released last month and will ultimately incorporate parking standards.

Capital Area Metropolitan Planning Organization

2040 Regional Transportation Plan

The Capital Area Metropolitan Planning Organization's long range transportation plan, CAMPO 2040, was initially adopted in May 2015. The plan serves as the long-range transportation plan for all modes of transpiration in the six-county region. The 2040 Plan is divided into six chapters including an introduction and appendix. The second chapter details with regional mobility needs. This chapter catalogs the current transportation network, forecasts future travel demand, and evaluates alternative scenarios. Next, mobility strategies are introduced, which include increasing capacity, managing demand, and more efficient land use. Chapter 4 details considerations for transportation planning. The planning considerations include financial forecasts, maintenance costs, corridor preservation, safety and security, freight movement, environmental protection and justice, and emerging technologies. Lastly, the action plan and projects are presented in Chapter 5. The roadway and transit projects are presented in table format and include project sponsors, limits and description, let year, and cost and funding source. Also available are the public involvement plan and county-level appendices that include over thirty thematic maps.

Relevance to Congress Avenue Streetscape Improvement

The 2040 Plan does not include any projects that fall in the project limits of the Congress Avenue Streetscape Improvement. However, South Congress is listed in the roadway table for bus rapid transit improvements with a let year of 2020 which may impact the southern limits of the project, specifically, the intersection of Riverside Dr. at Congress Ave.

The Travis County Appendix denotes Congress Avenue as a principal arterial in 2040. The Appendix also includes maps illustrating bicycle and pedestrian crashes by crash severity from 2011 to 2013. These maps do not provide crash counts but per TxDOT CRIS data, Congress Avenue has had one pedestrian fatality and one bicyclist fatality. Of the 114 crashes involving a bicyclist or pedestrian, twelve involved an incapacitating injury.

2045 Regional Active Transportation Plan

The 2045 RATP will be the first active transportation plan for Central Texas. Currently, the draft vision, goals, and objectives have been released to the public. The vision for the 2045 ATP is to provide "safe, direct, convenient, and comfortable" access for those walking and biking to "important destinations for all residents and visitors". The stated goals of the plan are safety, accessibility, functionality, equity everyday use, and quality of life. A series of open house meetings recently concluded, which will inform the next steps of plan development. Since specifics are not yet available, it is assumed that the portions previous Regional Transportation Plans dealing with active transportation will be used as basis for the 2045 Regional Active Transportation Plan. The 2045 RTAP is expected to be submitted for adoption by CAMPO's Transportation Policy Board in May 2017.

Relevance to Design Initiative

In the 2035 Regional Active Transportation Plan, Congress Avenue is shown as high priority bicycle corridor with a planned separated lane. The 2035 plan also shows separated bike lanes for 5th Street and 6th Street and shared lane markings for 9th and 10th Streets. Our team will need to coordinate with the 2045 plan updates to ensure consistency between planned improvements.

Additional Plans and Reports

Beyond the above plans, there are many other plans that were researched and will be considered during progress on the Congress Avenue project.

Texas Capitol Complex Master Plan shows the segment of Congress Avenue to Martin Luther King Boulevard as a pedestrian plaza. To accomplish this the conceptual plan shows the conversion of Congress Avenue from 15th to MLK Boulevard from asphalt to a grass open space. Congress Avenue and cross streets are shown with the addition of street trees. In addition to increasing the landscaping, surface lots are proposed to removed and replaced with development. This plan in addition to the outcomes of the Urban Design Initiative could create people-oriented link between the University of Texas, the Capitol, and Lady Bird Lake along Congress Avenue.

The City of Austin's Pedestrian Safety Action Plan will address five areas: engineering, education, enforcement, encouragement, and policy. A draft of this plan will be released in April 2017. The City's Bicycle Master Plan also includes several planned improvements for Congress Avenue and some cross streets.

The Downtown Austin Alliance commissioned a report specifically for Congress Avenue to determine what experiences on Congress Avenue people want to have and what changes Congress Avenue needs. The report, Envisioning the Avenue, lists the most common experiences people wished to have. They included food and drinks, the arts, shopping, and transportation modes other than driving. The changes they recommend include streetscape and pedestrian experience improvements, more retail uses, and better transportation options.

Pedestrian, Bicycle and Transit Best Practices

There are several widely-accepted manuals that provide design guidance for accommodating pedestrian, bicycles, and transit as well as a manual the City of Austin has developed. These manuals discuss treatments for intersections, sidewalks, transit stops, bicycle infrastructure and capacity analyses for these streets. These manuals should be referenced for design guidance in the future development of alternatives for Congress Avenue.

Design Guide	Author
Urban Street Design Guide Transit Street Design Guide Urban Bikeway Design Guide	NACTO
Austin Complete Streets: A Guide to City of Austin Resources	City of Austin
Designing Walkable Urban Thoroughfares: A Context Sensitive Approach	Institute of Transportation Engineers and Congress for the New Urbanism
Highway Capacity Manual: A Guide for Multimodal Mobility Analysis, 6th edition	Transportation Research Board

In addition to design guidance, there are similar arterials have undergone transformations to serve more than just cars and streets that can serve as precedent streets for designing Congress Avenue alternatives.

Street and Location	Mode Best Practice	Treatment	Congress Ave Specific
Pennsylvania Avenue Washington, DC	Vehicle and Bike	Protected bikes lanes in center median	Length of corridor
Broadway from 23rd to 59th New York, NY	Pedestrian and Bike	Protected bike lanes, public plazas	Length of corridor
The Porch/Market St Philadelphia, PA	Pedestrian	Parking lane /sidewalk converted to pedestrian area; directly adjacent to bridge across Schuykill River	Surface lot land use at intersections
Broadway Street Seattle, WA	Vehicle, Transit, and Bike	Bike signalization, protected lanes, transit connectivity to street	Congress Ave shuttle Intersection design
200 South Salt Lake City, UT	Vehicle and Bike	Similar to green lanes but sharrow symbol used; encourage cars to pass and bikes to stay safely positioned in the lane; used when there is not enough room for a dedicated bike facility	Bridge potential use or using existing lane widths throughout the corridor

Street and Location	Mode Best Practice	Treatment	Congress Ave Specific
Michigan Avenue Chicago, IL	Vehicle and Pedestrian	Advanced pedestrian signal phase (LPIs), variety of uses, premier avenue in Chicago	Length of corridor
Passeig de St Joan Barcelona, Spain	Transit and Pedestrian	Center bike lanes, wide sidewalks, transit lane	Length of corridor

Pennsylvania Avenue – Washington DC

Pennsylvania Avenue is a premier avenue in Washington DC that utilizes median bike lanes. The bike lanes are now fully protected by barriers to improve safety to bicyclists and vehicles along the facility. The District Department of Transportation (DDOT) is in the process of installing Park-Its, curbed median with discontinuous spacing, to provide the protected bicycle lanes and allow access to and from the facilities. Bike lanes in the median eliminate right-hook opportunities and eliminate the danger for cyclists trying to turn left from the lanes.

Broadway Blvd – New York City, NY

The Broadway Boulevard redesign is one of the most famous street redesigns in the country. Broadway Boulevard from 23rd to 59th was redesigned to add protected bike lanes, pedestrian plazas, and some car-free zones. Painted curbs added space for pedestrians wishing to sit and people watch and those needing to walk to their destination. Protected bike lanes made biking safer and more accessible to cyclists of various experience levels. The most well known part of this project was the conversion of Times Square to a pedestrian plaza with seating, shade, planers, and activities. In addition to aesthetic and experience improvements, traffic operations improved. Traffic volumes remained the same but throughput increased even though crashes and injuries declined, the number of cyclists increased, and pedestrian encroachment into travel lanes decreased.

The Porch at Market Street – Philadelphia, PA

The Porch at 30th Street replaced a parking lane and sidewalk with a activated pedestrian plaza. The Porch is located near the bridge across the Schuylkill River and in front of the 30th Street Station which sees 27,000 daily commuters. The original iteration of the Porch included seating and planters and later evolved into a space with food trucks, shade, and swings.

Broadway Street – Seattle, WA

Broadway Street's redesign shows what an arterial can be when all modes are considered. Broadway Street has a cycle track, bus routes and a streetcar line, wide sidewalks, and one lane of traffic each way. The two-way cycle track is on the east side of street and protected with a concrete buffer. The bus tops are "floating" which means the cycletrack continues between the sidewalk and the stop so that buses and bikes do not have to interact. The cycletrack come up to grade with the transit stops to indicate they are shared space for pedestrians and cyclists. Conflict points at intersections are marked with green paint and each one has dedicated bike signals with detection.

200 South – Salt Lake City

Salt Lake City used this enhanced "sharrow" (shared vehicle-bicycle lane) treatment to connect two dedicated bike lanes in a constrained segment of 200 South between Main Street and State Street. The green lane encourages drivers to change lanes when a cyclist is present but does not prevent drivers from using the lane when there are no cyclists. This treatment has also been used in Long Beach, CA and Oakland, CA.

Michigan Avenue – Chicago, IL

Michigan Avenue is one of the most famous streets in America. There are a wide variety of shops, restaurants, and businesses that attract tourist and residents. Michigan Avenue has wide sidewalks, seating, and shade trees. Some intersections have leading pedestrian intervals to allow pedestrians to enter the crosswalk and be more visible to right turning drivers. There are also signalized mid-block crossings for pedestrians.

Passeig de St Joan- Barcelona, Spain

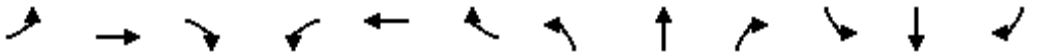
This Boulevard includes wide verge with landscaping, permeable pavement, and seating. In addition to the pedestrian seating area there is wide sidewalk for those walking through. The travel lanes include a transit lane and a travel lane on each side divided by a median with two-way cycletrack with bike signals.

Conclusion

There are a multitude of plans that should be considered in the design process for the Urban Design Initiative. These plans indicate a consensus opinion that downtown, and specifically Congress Avenue, should be a people-oriented space with a variety of uses.

Document	Author	Applicable Elements	Action Item
Austin Strategic Mobility Plan 2025 Austin Metropolitan Area Transportation Plan	City of Austin	• Planned Projects Impacting Congress Ave • Congress Ave Facility Type	ATG will consider relevant planned projects and project area facility types used in the ASMP.
Connections 2025	Capital Metropolitan Transportation Authority	• Cap Metro Planned Bus Routes • Bus Stop Locations	ATG will account for bus route traffic, stop locations, and pedestrian connections in comparing alternatives.
Downtown Austin Plan	Downtown Austin Alliance	• Congress Avenue Plan and Role within the City • Multi-modal Planned Projects on and adjacent to Congress Avenue	ATG will consider how a more diverse mix of businesses Downtown will affect transportation mode choice and incorporate background projects.
Downtown Austin Alliance Downtown Parking Strategy Briefing Book	Downtown Austin Alliance	• Existing Parking along Congress Ave and Adjacent Facilities • DAA to provide proposed parking plan in 2017	ATG will monitor results and recommendations of Parking Study as they impact Congress Avenue.
2040 Regional Transportation Plan	Capital Area MPO	• Planned Projects Impacting Congress Ave	ATG will identify transportation impacts due to roadway improvements in the project area.
2045 Regional Active Transportation Plan	Capital Area MPO	• Pedestrian and Bicycle Plans along Congress Ave	ATG will account for increased volumes of cyclists and pedestrians due to improved infrastructure in the project area.

Appendix C: 2040 Build Alternative Synchro Reports



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	219	36	63	355	0	224	0	224	0	0	0
Future Volume (vph)	0	219	36	63	355	0	224	0	224	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	3433	0	1583	0	1863	0
Flt Permitted					0.861		0.950					
Satd. Flow (perm)	0	3539	1472	0	3029	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						231			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	226	37	0	431	0	231	0	231	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.13	0.05		0.24		0.81		0.62			
Control Delay		15.8	0.1		12.6		55.0		13.9			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.8	0.1		12.6		55.0		13.9			
LOS		B	A		B		D		B			
Approach Delay		13.6			12.6			34.5				
Approach LOS		B			B			C				
Queue Length 50th (ft)		46	0		80		80		68			
Queue Length 95th (ft)		70	0		107		m#148		m103			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1766		286		515			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.13	0.05		0.24		0.81		0.45			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 21.6		Intersection LOS: C	
Intersection Capacity Utilization 56.6%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

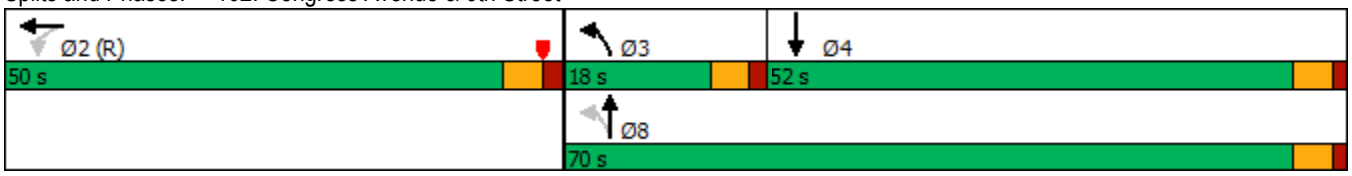
Splits and Phases: 101: 11th Street

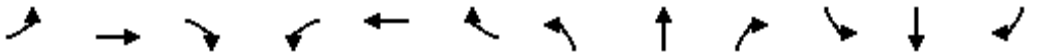
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	221	1174	59	293	899	0	0	273	82
Future Volume (vph)	0	0	0	221	1174	59	293	899	0	0	273	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5671	0	1593	3185	0	0	3015	0
Flt Permitted					0.992		0.439					
Satd. Flow (perm)	0	0	0	0	5624	0	712	3185	0	0	3015	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8						39	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1531	0	308	946	0	0	373	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		18.0	70.0			52.0	
Total Split (%)				41.7%	41.7%		15.0%	58.3%			43.3%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			47.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.39	
v/c Ratio					0.73		0.64	0.55			0.31	
Control Delay					35.0		10.6	8.4			21.2	
Queue Delay					0.0		3.0	2.9			0.0	
Total Delay					35.0		13.6	11.3			21.2	
LOS					C		B	B			C	
Approach Delay					35.0			11.9			21.2	
Approach LOS					C			B			C	
Queue Length 50th (ft)					293		62	158			92	
Queue Length 95th (ft)					338		m72	175			131	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2090		481	1725			1204	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		91	644			0	
Spillback Cap Reductn					0		0	0			0	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.73		0.79	0.88			0.31	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 24.2		Intersection LOS: C	
Intersection Capacity Utilization 79.8%		ICU Level of Service D	
Analysis Period (min) 15			
Description: 6th Street			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 102: Congress Avenue & 6th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	752	84	0	0	0	0	1020	203	113	356	0
Future Volume (vph)	80	752	84	0	0	0	0	1020	203	113	356	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4478	0	0	0	0	0	3065	0	1593	3185	0
Flt Permitted	0.950									0.105		
Satd. Flow (perm)	1505	4478	0	0	0	0	0	3065	0	176	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	85	889	0	0	0	0	0	1301	0	120	379	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	43.0	43.0						64.0		13.0	77.0	
Total Split (%)	35.8%	35.8%						53.3%		10.8%	64.2%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	37.5	37.5						59.0		72.0	72.0	
Actuated g/C Ratio	0.31	0.31						0.49		0.60	0.60	
v/c Ratio	0.18	0.63						0.86		0.60	0.20	
Control Delay	31.4	37.0						9.0		37.6	9.3	
Queue Delay	0.0	0.0						0.4		0.0	0.0	
Total Delay	31.4	37.0						9.4		37.6	9.3	
LOS	C	D						A		D	A	
Approach Delay		36.5						9.4			16.1	
Approach LOS		D						A			B	
Queue Length 50th (ft)	48	211						41		44	72	
Queue Length 95th (ft)	89	260						m30		m71	86	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	470	1410						1520		200	1911	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	0	
Spillback Cap Reductn	0	0						36		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.18	0.63						0.88		0.60	0.20	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 20.1		Intersection LOS: C	
Intersection Capacity Utilization 79.8%		ICU Level of Service D	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	934	324	175	472	110	185	2058	543	24	514	64
Future Volume (vph)	204	934	324	175	472	110	185	2058	543	24	514	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	1593	3050	0	1593	3185	1425	1593	3185	1425
Flt Permitted	0.199			0.285			0.292			0.111		
Satd. Flow (perm)	328	3185	1325	470	3050	0	480	3185	1317	186	3185	1317
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			192		25				195			191
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	953	331	179	594	0	189	2100	554	24	524	65
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	3	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	29.0	31.0	31.0	31.0
Total Split (s)	21.0	52.0	52.0	16.0	47.0		10.0	52.0	52.0	42.0	42.0	42.0
Total Split (%)	17.5%	43.3%	43.3%	13.3%	39.2%		8.3%	43.3%	43.3%	35.0%	35.0%	35.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	46.0	46.0	46.0	41.0	41.0		46.0	46.0	46.0	36.0	36.0	36.0
Actuated g/C Ratio	0.38	0.38	0.38	0.34	0.34		0.38	0.38	0.38	0.30	0.30	0.30
v/c Ratio	0.73	0.78	0.53	0.70	0.56		0.86	1.72	0.89	0.44	0.55	0.12
Control Delay	43.1	38.0	14.8	56.6	33.2		65.1	355.2	39.9	64.6	40.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	38.0	14.8	56.6	33.2		65.1	355.2	39.9	64.6	40.0	2.8
LOS	D	D	B	E	C		E	F	D	E	D	A
Approach Delay		33.6			38.6			274.4			37.0	
Approach LOS		C			D			F			D	
Queue Length 50th (ft)	113	337	77	102	187		101	~1263	279	17	193	2
Queue Length 95th (ft)	#191	422	169	#180	247		#219	#1401	#508	m#49	254	m10
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		150
Base Capacity (vph)	283	1220	626	254	1058		221	1220	625	55	955	528

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.78	0.53	0.70	0.56		0.86	1.72	0.89	0.44	0.55	0.12

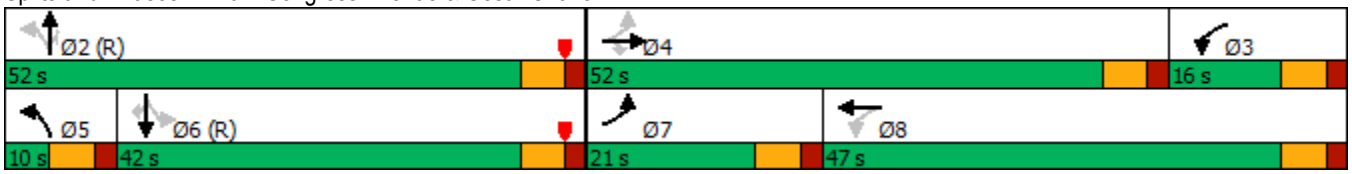
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 54 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.72			
Intersection Signal Delay: 154.3		Intersection LOS: F	
Intersection Capacity Utilization 131.0%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

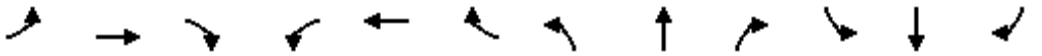
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	439	92	48	23	110	111	87	1993	115	90	450	298
Future Volume (vph)	439	92	48	23	110	111	87	1993	115	90	450	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1744	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.360			0.661			0.476			0.066		
Satd. Flow (perm)	1257	1744	0	1207	1863	1521	861	3539	1519	123	3539	1464
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				154			158			262
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	472	151	0	25	118	119	94	2143	124	97	484	320
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	15.0	45.0	45.0	15.0	45.0	45.0
Total Split (s)	24.0	32.0		10.0	18.0	18.0	18.0	75.0	75.0	18.0	75.0	75.0
Total Split (%)	17.8%	23.7%		7.4%	13.3%	13.3%	13.3%	55.6%	55.6%	13.3%	55.6%	55.6%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	29.4	29.4		12.8	11.1	11.1	75.1	75.1	75.1	70.6	70.6	70.6
Actuated g/C Ratio	0.22	0.22		0.09	0.08	0.08	0.56	0.56	0.56	0.52	0.52	0.52
v/c Ratio	0.83	0.38		0.19	0.77	0.45	0.17	1.09	0.14	0.60	0.26	0.36
Control Delay	62.0	44.1		60.7	91.5	8.9	6.8	58.0	0.0	35.9	18.5	5.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0
Total Delay	62.0	44.1		60.7	91.5	8.9	6.8	63.0	0.0	35.9	18.5	5.0
LOS	E	D		E	F	A	A	E	A	D	B	A
Approach Delay		57.7			51.1			57.4			15.6	
Approach LOS		E			D			E			B	
Queue Length 50th (ft)	201	104		21	102	0	16	~1152	0	42	122	25
Queue Length 95th (ft)	#263	174		51	#193	31	m16	m#906	m0	92	158	80
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	572	393		131	165	275	562	1967	914	216	1849	890

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	291	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.38		0.19	0.72	0.43	0.17	1.28	0.14	0.45	0.26	0.36

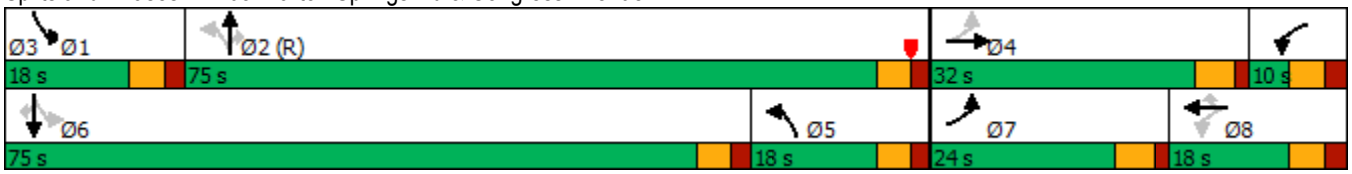
Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 72 (53%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 48.0		Intersection LOS: D	
Intersection Capacity Utilization 98.1%		ICU Level of Service F	
Analysis Period (min) 15			
Description: Barton Springs			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	519	120	194	1151	458	309	1637	144	137	262	40
Future Volume (vph)	131	519	120	194	1151	458	309	1637	144	137	262	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		150	225		200	180		0
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3539	1636	3433	3539	1583	3433	3450	0
Flt Permitted	0.121			0.214			0.950			0.950		
Satd. Flow (perm)	225	3539	1577	395	3539	1577	3322	3539	1518	3417	3450	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124			192			137		13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	135	535	124	200	1187	472	319	1688	148	141	311	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			
Detector Phase	3	8	5	7	4	4	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	8.0	10.0	3.0	3.0	10.0	10.0	3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	13.0	40.0	8.0	8.0	40.0	40.0	8.0	42.0	42.0	8.0	37.0	
Total Split (s)	13.0	43.0	22.0	22.0	52.0	52.0	22.0	55.0	55.0	15.0	48.0	
Total Split (%)	9.6%	31.9%	16.3%	16.3%	38.5%	38.5%	16.3%	40.7%	40.7%	11.1%	35.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min	Min	None	Min	Min	None	C-Max	
Act Effct Green (s)	41.0	41.0	56.1	47.0	47.0	47.0	15.1	50.0	50.0	10.0	44.9	
Actuated g/C Ratio	0.30	0.30	0.42	0.35	0.35	0.35	0.11	0.37	0.37	0.07	0.33	
v/c Ratio	0.85	0.50	0.17	0.71	0.96	0.70	0.83	1.29	0.23	0.56	0.27	
Control Delay	94.4	41.1	4.2	47.3	61.5	28.1	77.2	171.7	6.4	56.1	19.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	1.5	0.0	0.0	0.0	
Total Delay	94.4	41.1	4.2	47.3	61.5	28.4	77.2	173.3	6.4	56.1	19.3	
LOS	F	D	A	D	E	C	E	F	A	E	B	
Approach Delay		44.4			51.6			147.6			30.8	
Approach LOS		D			D			F			C	
Queue Length 50th (ft)	90	204	0	128	535	216	142	~989	6	63	107	
Queue Length 95th (ft)	#207	268	37	196	#685	351	193	#1127	52	100	151	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150		150	225		200	180		

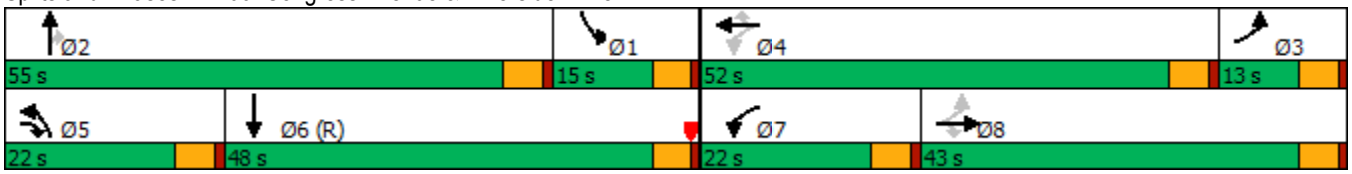
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	159	1074	755	310	1232	674	432	1310	648	254	1156	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	20	0	384	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.85	0.50	0.16	0.65	0.96	0.72	0.74	1.82	0.23	0.56	0.27	

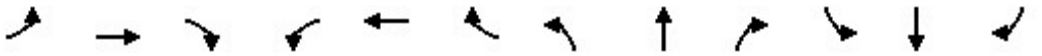
Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 60 (44%), Referenced to phase 6:SBT, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 88.0		Intersection LOS: F	
Intersection Capacity Utilization 104.9%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Congress Avenue & Riverside Drive



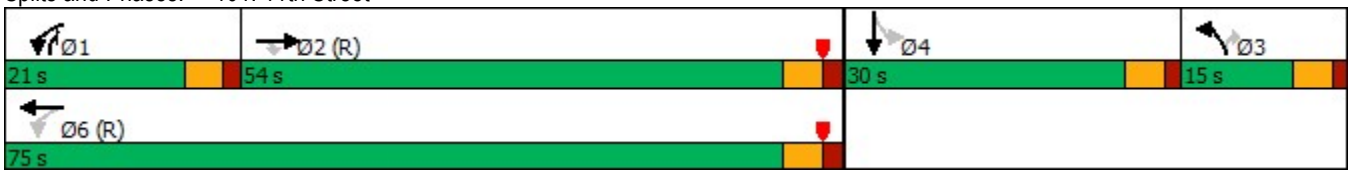


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	401	130	158	319	0	182	0	236	0	0	0
Future Volume (vph)	0	401	130	158	319	0	182	0	236	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3483	0	3433	0	1583	0	1863	0
Flt Permitted					0.657		0.950					
Satd. Flow (perm)	0	3539	1472	0	2305	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						243			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	413	134	0	492	0	188	0	243	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.23	0.17		0.36		0.66		0.63			
Control Delay		16.9	4.8		13.8		78.8		41.8			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		16.9	4.8		13.8		78.8		41.8			
LOS		B	A		B		E		D			
Approach Delay		14.0			13.8			57.9				
Approach LOS		B			B			E				
Queue Length 50th (ft)		90	9		93		78		124			
Queue Length 95th (ft)		123	42		123		118		191			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1365		286		525			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.23	0.17		0.36		0.66		0.46			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 26.8		Intersection LOS: C	
Intersection Capacity Utilization 58.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	271	846	76	244	681	0	0	1422	121
Future Volume (vph)	0	0	0	271	846	76	244	681	0	0	1422	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5623	0	1593	3185	0	0	3127	0
Flt Permitted					0.989		0.075					
Satd. Flow (perm)	0	0	0	0	5553	0	126	3185	0	0	3127	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13						9	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1256	0	257	717	0	0	1624	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		17.0	70.0			53.0	
Total Split (%)				41.7%	41.7%		14.2%	58.3%			44.2%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			48.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.40	
v/c Ratio					0.61		1.20	0.42			1.29	
Control Delay					31.8		147.5	9.9			172.1	
Queue Delay					1.0		0.0	1.9			0.7	
Total Delay					32.9		147.5	11.8			172.8	
LOS					C		F	B			F	
Approach Delay					32.9			47.6			172.8	
Approach LOS					C			D			F	
Queue Length 50th (ft)					225		~184	139			~851	
Queue Length 95th (ft)					264		m#316	161			#994	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2067		214	1725			1256	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		0	810			0	
Spillback Cap Reductn					515		0	0			186	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.81		1.20	0.78			1.52	

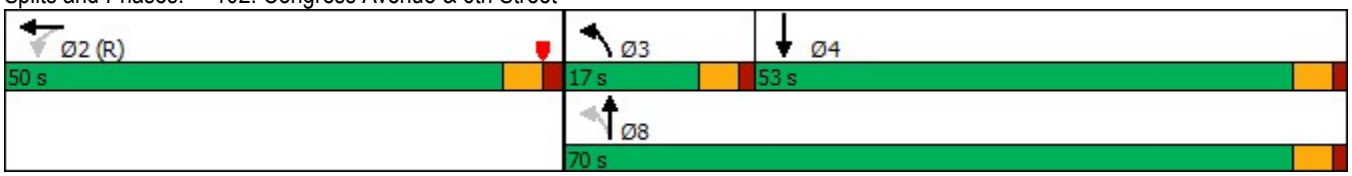
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 95.6		Intersection LOS: F	
Intersection Capacity Utilization 97.0%		ICU Level of Service F	
Analysis Period (min) 15			
Description: 6th Street			

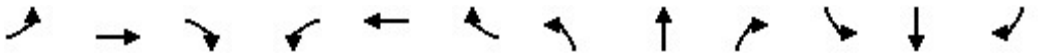
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Congress Avenue & 6th Street





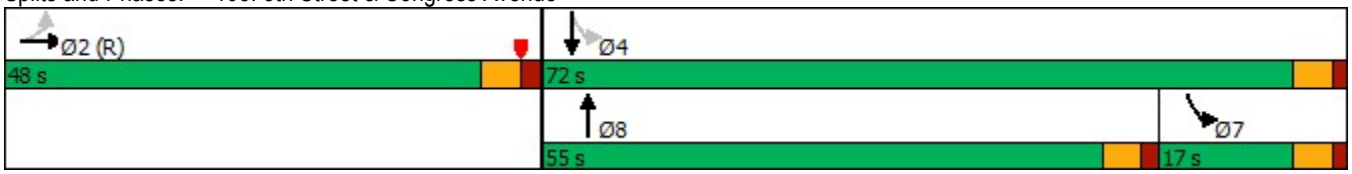
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	904	328	0	0	0	0	764	170	72	1642	0
Future Volume (vph)	115	904	328	0	0	0	0	764	170	72	1642	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4317	0	0	0	0	0	3055	0	1593	3185	0
Flt Permitted	0.950									0.164		
Satd. Flow (perm)	1505	4317	0	0	0	0	0	3055	0	275	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	1311	0	0	0	0	0	994	0	77	1747	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						55.0		17.0	72.0	
Total Split (%)	40.0%	40.0%						45.8%		14.2%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						50.0		67.0	67.0	
Actuated g/C Ratio	0.35	0.35						0.42		0.56	0.56	
v/c Ratio	0.23	0.85						0.77		0.27	0.98	
Control Delay	28.7	42.1						39.1		26.1	37.8	
Queue Delay	0.0	0.0						0.1		0.0	41.3	
Total Delay	28.7	42.1						39.2		26.1	79.1	
LOS	C	D						D		C	E	
Approach Delay		41.0						39.2			76.8	
Approach LOS		D						D			E	
Queue Length 50th (ft)	66	338						385		35	485	
Queue Length 95th (ft)	115	403						m379		m31	m370	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	533	1536						1288		285	1778	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	609	
Spillback Cap Reductn	0	0						12		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.23	0.85						0.78		0.27	1.49	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 55.9		Intersection LOS: E	
Intersection Capacity Utilization 97.0%		ICU Level of Service F	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	1284	446	457	1070	57	269	916	426	161	1869	214
Future Volume (vph)	89	1284	446	457	1070	57	269	916	426	161	1869	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	3090	1656	0	1593	3185	1425	1593	3185	1425
Flt Permitted	0.174			0.950			0.115			0.103		
Satd. Flow (perm)	289	3185	1325	3040	1656	0	193	3185	1317	173	3185	1245
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173		2				173			191
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	1310	455	466	1150	0	274	935	435	164	1907	218
Turn Type	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4		4				2		2	6		6
Detector Phase	7	4	4	3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	5.0	4.0	10.0	10.0
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	11.0	8.0	31.0	31.0
Total Split (s)	15.0	38.0	38.0	24.0	47.0		10.0	31.0	24.0	27.0	48.0	48.0
Total Split (%)	12.5%	31.7%	31.7%	20.0%	39.2%		8.3%	25.8%	20.0%	22.5%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	0.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max		None	Max	Max	None	C-Max	C-Max
Act Effct Green (s)	32.0	32.0	32.0	18.0	41.0		38.7	34.7	52.7	53.7	42.0	42.0
Actuated g/C Ratio	0.27	0.27	0.27	0.15	0.34		0.32	0.29	0.44	0.45	0.35	0.35
v/c Ratio	0.52	1.54	0.95	1.01	2.03		2.51	1.02	0.63	0.70	1.71	0.39
Control Delay	56.8	282.4	57.4	94.4	493.4		730.3	76.4	18.3	42.9	349.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	282.4	57.4	94.4	493.4		730.3	76.4	18.3	42.9	349.2	6.8
LOS	E	F	E	F	F		F	E	B	D	F	A
Approach Delay		216.2			378.4			170.0			294.6	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	55	~751	234	~189	~1411		~294	~386	134	83	~1144	18
Queue Length 95th (ft)	101	#888	#448	#301	#1674		#502	#593	258	m89	m#1200	m24
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		150
Base Capacity (vph)	174	849	480	463	567		109	920	691	350	1114	559

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.52	1.54	0.95	1.01	2.03		2.51	1.02	0.63	0.47	1.71	0.39

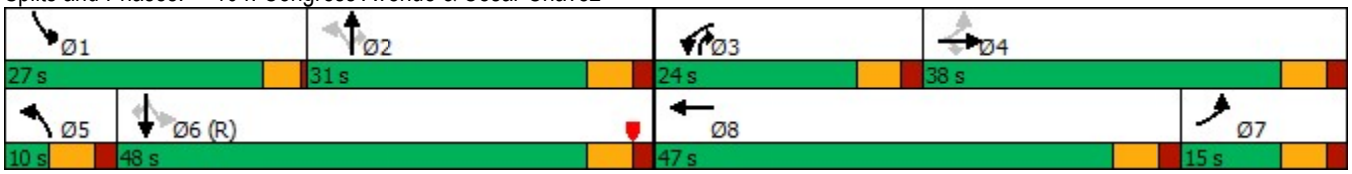
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 2 (2%), Referenced to phase 6:SBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 2.51			
Intersection Signal Delay: 265.6		Intersection LOS: F	
Intersection Capacity Utilization 166.0%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

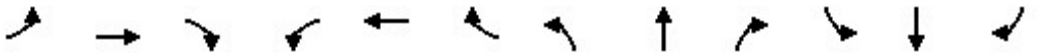
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	314	62	108	67	183	179	90	865	52	57	2269	448
Future Volume (vph)	314	62	108	67	183	179	90	865	52	57	2269	448
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1646	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted							0.054			0.218		
Satd. Flow (perm)	3495	1646	0	1826	1863	1519	101	3539	1518	404	3539	1461
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55				169			152			152
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	338	183	0	72	197	192	97	930	56	61	2440	482
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	8.5	45.0	45.0	8.5	45.0	45.0
Total Split (s)	26.0	32.0		10.0	16.0	16.0	13.0	87.0	87.0	11.0	85.0	85.0
Total Split (%)	18.6%	22.9%		7.1%	11.4%	11.4%	9.3%	62.1%	62.1%	7.9%	60.7%	60.7%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	21.8	20.0		15.6	13.8	13.8	83.3	83.3	83.3	79.5	79.5	79.5
Actuated g/C Ratio	0.16	0.14		0.11	0.10	0.10	0.60	0.60	0.60	0.57	0.57	0.57
v/c Ratio	0.62	0.65		0.36	1.08	0.64	0.67	0.44	0.06	0.22	1.21	0.54
Control Delay	59.8	48.8		65.7	145.6	22.7	72.4	21.8	2.1	15.5	130.6	14.8
Queue Delay	0.0	89.8		105.8	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Total Delay	59.8	138.6		171.5	145.6	22.7	72.4	21.8	2.1	15.5	131.7	14.8
LOS	E	F		F	F	C	E	C	A	B	F	B
Approach Delay		87.5			98.5			25.3			110.4	
Approach LOS		F			F			C			F	
Queue Length 50th (ft)	143	105		63	~200	20	67	383	5	24	~1427	177
Queue Length 95th (ft)	194	185		120	#409	#120	m#108	440	m13	46	#1553	276
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	599	356		202	183	301	150	2106	965	283	2009	895

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	293		162	0	0	0	0	0	0	601	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	2.90		1.80	1.08	0.64	0.65	0.44	0.06	0.22	1.73	0.54

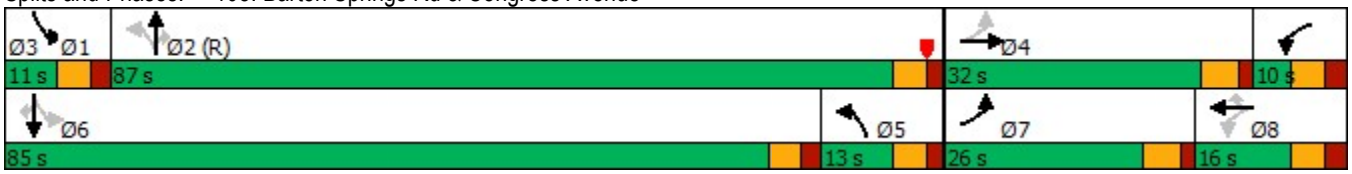
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.21			
Intersection Signal Delay: 88.7		Intersection LOS: F	
Intersection Capacity Utilization 112.1%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Barton Springs			

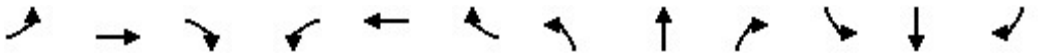
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	972	271	164	803	259	250	672	183	483	1827	57
Future Volume (vph)	81	972	271	164	803	259	250	672	183	483	1827	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		150	225		200	180		0
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3539	1636	3433	3539	1583	3433	3517	0
Flt Permitted	0.216			0.136			0.950			0.950		
Satd. Flow (perm)	400	3539	1576	253	3539	1576	3421	3539	1516	3365	3517	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			166			169		3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	1002	279	169	828	267	258	693	189	498	1943	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			
Detector Phase	3	8	5	7	4	4	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	3.0	3.0	10.0	10.0	3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	10.0	40.0	8.0	8.0	40.0	40.0	8.0	32.0	32.0	8.0	37.0	
Total Split (s)	12.0	48.0	17.0	16.0	52.0	52.0	17.0	46.0	46.0	30.0	59.0	
Total Split (%)	8.6%	34.3%	12.1%	11.4%	37.1%	37.1%	12.1%	32.9%	32.9%	21.4%	42.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min	Min	None	Min	Min	C-Max	None	
Act Effct Green (s)	42.3	42.3	54.0	40.5	40.5	40.5	11.7	33.5	33.5	33.2	55.0	
Actuated g/C Ratio	0.30	0.30	0.39	0.29	0.29	0.29	0.08	0.24	0.24	0.24	0.39	
v/c Ratio	0.34	0.94	0.42	0.88	0.81	0.47	0.90	0.82	0.38	0.61	1.40	
Control Delay	49.3	63.8	19.9	80.0	52.7	16.8	95.3	58.5	9.9	57.2	219.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
Total Delay	49.3	63.8	19.9	80.0	52.7	16.8	95.3	58.5	9.9	57.2	220.0	
LOS	D	E	B	E	D	B	F	E	A	E	F	
Approach Delay		53.9			48.8			58.8			186.8	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	56	465	110	121	368	70	121	316	14	180	~1247	
Queue Length 95th (ft)	99	#592	183	#214	419	146	#200	364	74	m170	m#939	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150		150	225		200	180		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	246	1086	673	192	1188	639	294	1036	563	814	1383	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	42	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	0.92	0.41	0.88	0.70	0.42	0.88	0.67	0.34	0.61	1.45	

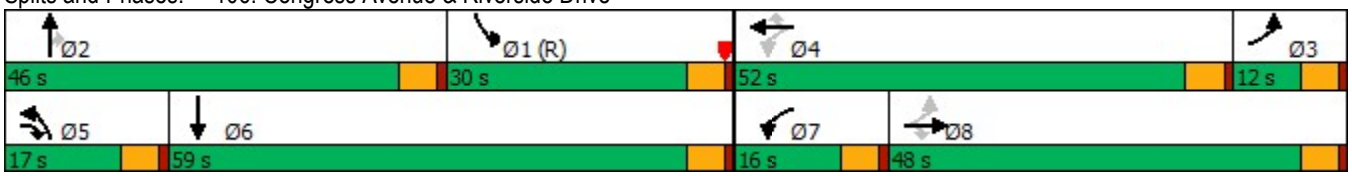
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 1:SBL, Start of Red			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.40			
Intersection Signal Delay: 106.0		Intersection LOS: F	
Intersection Capacity Utilization 112.4%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Congress Avenue & Riverside Drive



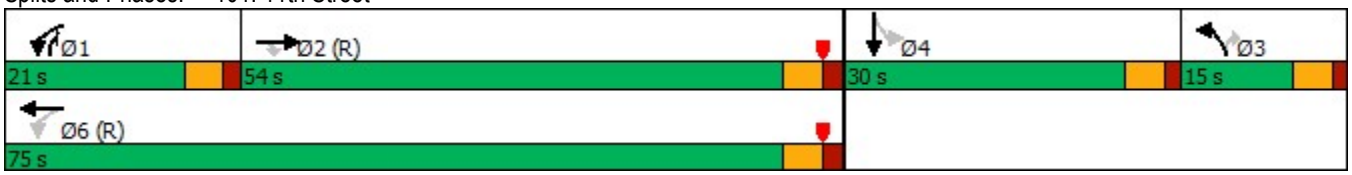
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	210	34	60	341	0	213	0	213	0	0	0
Future Volume (vph)	0	210	34	60	341	0	213	0	213	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	3433	0	1583	0	1863	0
Flt Permitted					0.865		0.950					
Satd. Flow (perm)	0	3539	1472	0	3043	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						220			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	216	35	0	414	0	220	0	220	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.12	0.04		0.23		0.77		0.60			
Control Delay		15.8	0.1		12.5		50.7		13.9			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.8	0.1		12.5		50.7		13.9			
LOS		B	A		B		D		B			
Approach Delay		13.6			12.5			32.3				
Approach LOS		B			B			C				
Queue Length 50th (ft)		44	0		76		74		71			
Queue Length 95th (ft)		66	0		103		m#140		m109			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1774		286		506			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.12	0.04		0.23		0.77		0.43			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 56.2%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: 11th Street



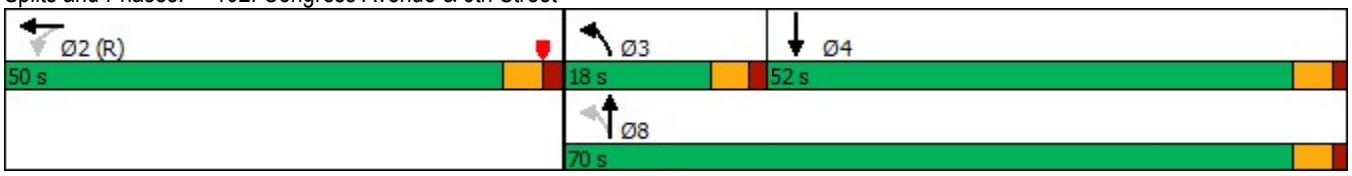
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	209	1125	56	279	856	0	0	258	79
Future Volume (vph)	0	0	0	209	1125	56	279	856	0	0	258	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5677	0	1593	3185	0	0	3014	0
Flt Permitted					0.993		0.452					
Satd. Flow (perm)	0	0	0	0	5631	0	732	3185	0	0	3014	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8						39	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1463	0	294	901	0	0	355	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		18.0	70.0			52.0	
Total Split (%)				41.7%	41.7%		15.0%	58.3%			43.3%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			47.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.39	
v/c Ratio					0.70		0.60	0.52			0.29	
Control Delay					34.1		10.0	8.4			20.9	
Queue Delay					0.0		2.3	2.1			0.0	
Total Delay					34.1		12.3	10.5			20.9	
LOS					C		B	B			C	
Approach Delay					34.1			10.9			20.9	
Approach LOS					C			B			C	
Queue Length 50th (ft)					275		60	153			86	
Queue Length 95th (ft)					319		m73	164			125	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2093		489	1725			1204	

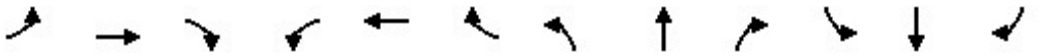
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		96	644			0	
Spillback Cap Reductn					0		0	0			0	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.70		0.75	0.83			0.29	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 23.3		Intersection LOS: C	
Intersection Capacity Utilization 77.6%		ICU Level of Service D	
Analysis Period (min) 15			
Description: 6th Street			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Congress Avenue & 6th Street





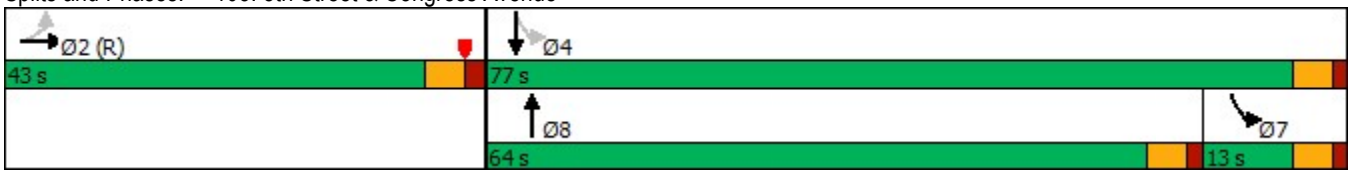
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	721	79	0	0	0	0	970	193	109	334	0
Future Volume (vph)	77	721	79	0	0	0	0	970	193	109	334	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4479	0	0	0	0	0	3065	0	1593	3185	0
Flt Permitted	0.950									0.122		
Satd. Flow (perm)	1505	4479	0	0	0	0	0	3065	0	205	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	851	0	0	0	0	0	1237	0	116	355	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	43.0	43.0						64.0		13.0	77.0	
Total Split (%)	35.8%	35.8%						53.3%		10.8%	64.2%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	37.5	37.5						59.0		72.0	72.0	
Actuated g/C Ratio	0.31	0.31						0.49		0.60	0.60	
v/c Ratio	0.17	0.60						0.81		0.54	0.19	
Control Delay	31.3	36.4						7.7		31.8	9.4	
Queue Delay	0.0	0.0						0.2		0.0	0.0	
Total Delay	31.3	36.4						7.9		31.8	9.4	
LOS	C	D						A		C	A	
Approach Delay		36.0						7.9			14.9	
Approach LOS		D						A			B	
Queue Length 50th (ft)	46	200						37		43	70	
Queue Length 95th (ft)	87	247						m30		m63	84	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	470	1410						1520		215	1911	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	0	
Spillback Cap Reductn	0	0						25		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.17	0.60						0.83		0.54	0.19	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 77.6%		ICU Level of Service D	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	896	296	164	452	106	176	1956	516	23	482	62
Future Volume (vph)	196	896	296	164	452	106	176	1956	516	23	482	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	1593	3050	0	1593	3185	1425	1593	3185	1425
Flt Permitted	0.215			0.312			0.314			0.111		
Satd. Flow (perm)	354	3185	1325	514	3050	0	515	3185	1317	186	3185	1317
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			210		26				195			191
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	914	302	167	569	0	180	1996	527	23	492	63
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	3	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	29.0	31.0	31.0	31.0
Total Split (s)	21.0	52.0	52.0	16.0	47.0		10.0	52.0	52.0	42.0	42.0	42.0
Total Split (%)	17.5%	43.3%	43.3%	13.3%	39.2%		8.3%	43.3%	43.3%	35.0%	35.0%	35.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	46.0	46.0	46.0	41.0	41.0		46.0	46.0	46.0	36.0	36.0	36.0
Actuated g/C Ratio	0.38	0.38	0.38	0.34	0.34		0.38	0.38	0.38	0.30	0.30	0.30
v/c Ratio	0.69	0.75	0.47	0.63	0.54		0.77	1.64	0.84	0.42	0.52	0.12
Control Delay	39.7	36.7	11.1	50.4	32.5		53.1	318.0	34.7	62.7	39.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	36.7	11.1	50.4	32.5		53.1	318.0	34.7	62.7	39.1	2.7
LOS	D	D	B	D	C		D	F	C	E	D	A
Approach Delay		31.7			36.6			245.2			36.0	
Approach LOS		C			D			F			D	
Queue Length 50th (ft)	108	318	47	95	177		96	~1175	248	16	178	1
Queue Length 95th (ft)	#174	398	127	154	235		#189	#1313	#462	m44	239	m9
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		150
Base Capacity (vph)	290	1220	637	265	1059		233	1220	625	55	955	528

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.75	0.47	0.63	0.54		0.77	1.64	0.84	0.42	0.52	0.12

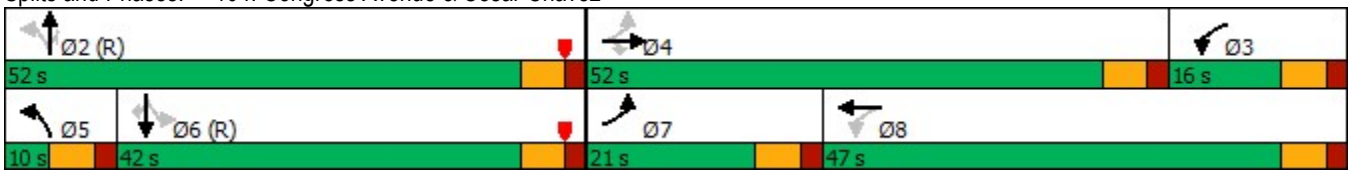
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 54 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Red			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.64			
Intersection Signal Delay: 139.0		Intersection LOS: F	
Intersection Capacity Utilization 126.0%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	419	78	46	20	93	94	82	1902	102	79	427	278
Future Volume (vph)	419	78	46	20	93	94	82	1902	102	79	427	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1737	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.381			0.672			0.488			0.065		
Satd. Flow (perm)	1328	1737	0	1226	1863	1521	882	3539	1519	121	3539	1464
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19				154			158			258
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	451	133	0	22	100	101	88	2045	110	85	459	299
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	15.0	45.0	45.0	15.0	45.0	45.0
Total Split (s)	24.0	32.0		10.0	18.0	18.0	18.0	75.0	75.0	18.0	75.0	75.0
Total Split (%)	17.8%	23.7%		7.4%	13.3%	13.3%	13.3%	55.6%	55.6%	13.3%	55.6%	55.6%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	28.7	28.7		12.2	10.5	10.5	76.4	76.4	76.4	71.3	71.3	71.3
Actuated g/C Ratio	0.21	0.21		0.09	0.08	0.08	0.57	0.57	0.57	0.53	0.53	0.53
v/c Ratio	0.80	0.35		0.17	0.69	0.39	0.15	1.02	0.12	0.55	0.25	0.33
Control Delay	60.3	42.2		60.4	84.4	5.9	6.4	27.5	0.0	32.7	18.0	4.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	31.4	0.0	0.0	0.0	0.0
Total Delay	60.3	42.2		60.4	84.4	5.9	6.4	58.9	0.0	32.7	18.0	4.4
LOS	E	D		E	F	A	A	E	A	C	B	A
Approach Delay		56.1			46.5			54.0			14.6	
Approach LOS		E			D			D			B	
Queue Length 50th (ft)	190	87		18	86	0	15	~1050	0	37	114	17
Queue Length 95th (ft)	#259	152		47	#151	11	m16	m895	m0	78	150	67
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	570	384		127	165	275	581	2003	928	216	1869	894

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	290	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.35		0.17	0.61	0.37	0.15	1.19	0.12	0.39	0.25	0.33

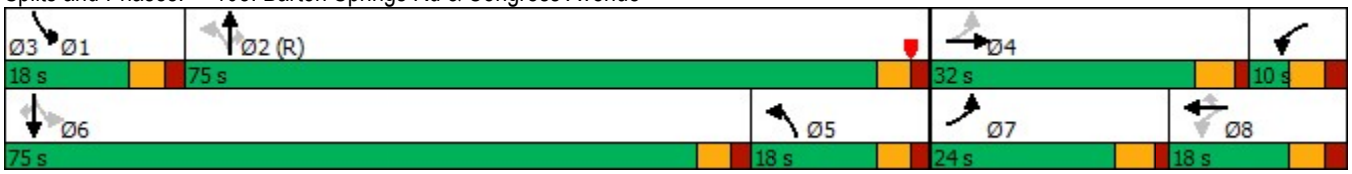
Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 72 (53%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 45.3		Intersection LOS: D	
Intersection Capacity Utilization 94.4%		ICU Level of Service F	
Analysis Period (min) 15			
Description: Barton Springs			

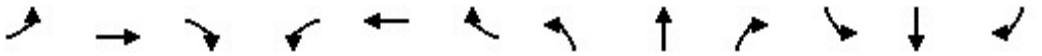
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





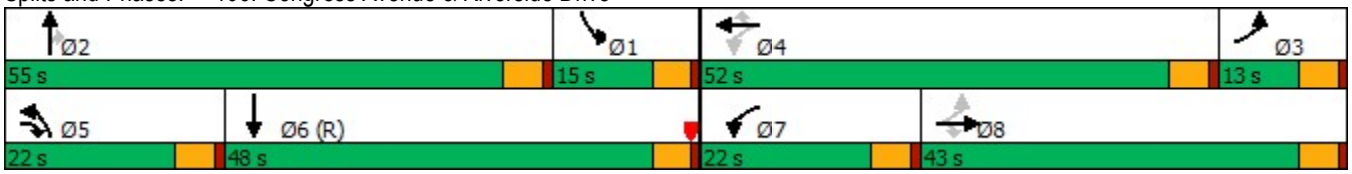
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	495	115	181	1085	427	293	1565	136	129	249	36
Future Volume (vph)	121	495	115	181	1085	427	293	1565	136	129	249	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		150	225		200	180		0
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3539	1636	3433	3539	1583	3433	3454	0
Flt Permitted	0.122			0.231			0.950			0.950		
Satd. Flow (perm)	226	3539	1577	426	3539	1577	3319	3539	1518	3415	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			119			196			137		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	125	510	119	187	1119	440	302	1613	140	133	294	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			
Detector Phase	3	8	5	7	4	4	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	8.0	10.0	3.0	3.0	10.0	10.0	3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	13.0	40.0	8.0	8.0	40.0	40.0	8.0	42.0	42.0	8.0	37.0	
Total Split (s)	13.0	43.0	22.0	22.0	52.0	52.0	22.0	55.0	55.0	15.0	48.0	
Total Split (%)	9.6%	31.9%	16.3%	16.3%	38.5%	38.5%	16.3%	40.7%	40.7%	11.1%	35.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min	Min	None	Min	Min	None	C-Max	
Act Effct Green (s)	40.9	40.9	55.6	46.4	46.4	46.4	14.7	50.6	50.6	10.0	45.9	
Actuated g/C Ratio	0.30	0.30	0.41	0.34	0.34	0.34	0.11	0.37	0.37	0.07	0.34	
v/c Ratio	0.78	0.48	0.16	0.67	0.92	0.66	0.81	1.22	0.21	0.52	0.25	
Control Delay	85.0	40.5	4.2	44.8	55.4	25.2	75.6	141.4	5.5	55.2	18.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.1	0.0	0.0	0.0	
Total Delay	85.0	40.5	4.2	44.8	55.4	25.3	75.6	142.6	5.5	55.2	18.9	
LOS	F	D	A	D	E	C	E	F	A	E	B	
Approach Delay		42.2			46.7			123.4			30.2	
Approach LOS		D			D			F			C	
Queue Length 50th (ft)	82	191	0	119	490	181	134	~917	2	59	101	
Queue Length 95th (ft)	#183	255	36	184	#620	304	184	#1057	46	95	143	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150		150	225		200	180		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	160	1072	751	315	1232	676	432	1327	655	254	1183	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	17	0	313	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.78	0.48	0.16	0.59	0.91	0.67	0.70	1.59	0.21	0.52	0.25	

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 60 (44%), Referenced to phase 6:SBT, Start of Red			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 76.2		Intersection LOS: E	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Congress Avenue & Riverside Drive

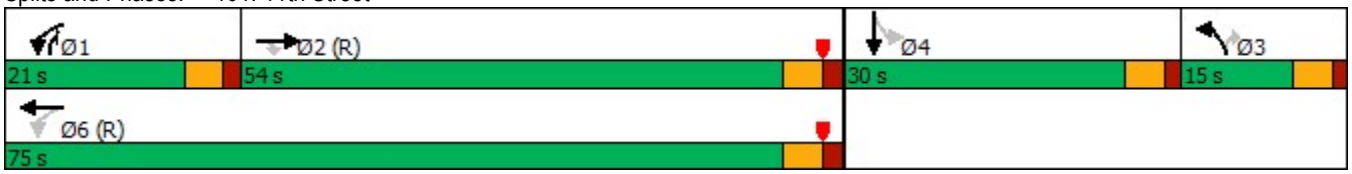


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	385	124	151	306	0	172	0	223	0	0	0
Future Volume (vph)	0	385	124	151	306	0	172	0	223	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3483	0	3433	0	1583	0	1863	0
Flt Permitted					0.663		0.950					
Satd. Flow (perm)	0	3539	1472	0	2325	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						230			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	397	128	0	471	0	177	0	230	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.22	0.16		0.34		0.62		0.61			
Control Delay		16.8	4.5		13.5		77.7		42.2			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		16.8	4.5		13.5		77.7		42.2			
LOS		B	A		B		E		D			
Approach Delay		13.8			13.5			57.6				
Approach LOS		B			B			E				
Queue Length 50th (ft)		86	7		88		74		120			
Queue Length 95th (ft)		118	39		117		111		187			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1376		286		514			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.22	0.16		0.34		0.62		0.45			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 26.4		Intersection LOS: C	
Intersection Capacity Utilization 57.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	259	810	73	230	641	0	0	1359	116
Future Volume (vph)	0	0	0	259	810	73	230	641	0	0	1359	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5623	0	1593	3185	0	0	3127	0
Flt Permitted					0.989		0.075					
Satd. Flow (perm)	0	0	0	0	5553	0	126	3185	0	0	3127	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13						9	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1203	0	242	675	0	0	1553	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		17.0	70.0			53.0	
Total Split (%)				41.7%	41.7%		14.2%	58.3%			44.2%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			48.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.40	
v/c Ratio					0.58		1.13	0.39			1.24	
Control Delay					31.3		122.4	10.1			148.6	
Queue Delay					0.8		0.0	1.4			0.5	
Total Delay					32.1		122.4	11.6			149.1	
LOS					C		F	B			F	
Approach Delay					32.1			40.8			149.1	
Approach LOS					C			D			F	
Queue Length 50th (ft)					212		~160	135			~789	
Queue Length 95th (ft)					251		m#316	159			#932	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2067		214	1725			1256	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		0	810			0	
Spillback Cap Reductn					515		0	0			144	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.78		1.13	0.74			1.40	

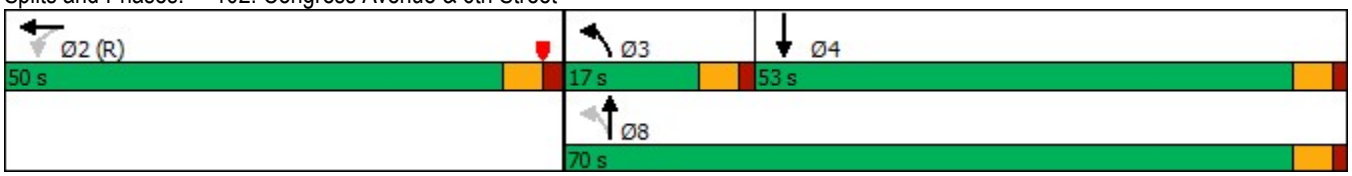
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.24			
Intersection Signal Delay: 83.8		Intersection LOS: F	
Intersection Capacity Utilization 94.0%		ICU Level of Service F	
Analysis Period (min) 15			
Description: 6th Street			

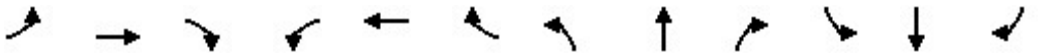
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Congress Avenue & 6th Street





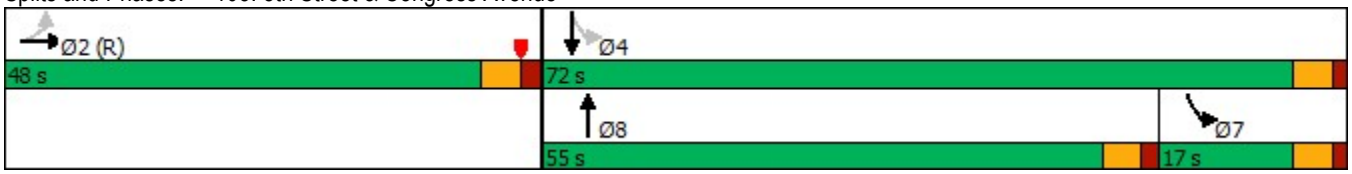
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	867	314	0	0	0	0	715	159	69	1569	0
Future Volume (vph)	110	867	314	0	0	0	0	715	159	69	1569	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4317	0	0	0	0	0	3055	0	1593	3185	0
Flt Permitted	0.950									0.189		
Satd. Flow (perm)	1505	4317	0	0	0	0	0	3055	0	317	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	1256	0	0	0	0	0	930	0	73	1669	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						55.0		17.0	72.0	
Total Split (%)	40.0%	40.0%						45.8%		14.2%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						50.0		67.0	67.0	
Actuated g/C Ratio	0.35	0.35						0.42		0.56	0.56	
v/c Ratio	0.22	0.82						0.72		0.24	0.94	
Control Delay	28.6	40.0						39.1		24.9	34.2	
Queue Delay	0.0	0.0						0.0		0.0	45.6	
Total Delay	28.6	40.0						39.2		24.9	79.7	
LOS	C	D						D		C	E	
Approach Delay		39.1						39.2			77.4	
Approach LOS		D						D			E	
Queue Length 50th (ft)	63	317						358		33	451	
Queue Length 95th (ft)	110	379						m381		m31	m366	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	533	1538						1288		304	1778	

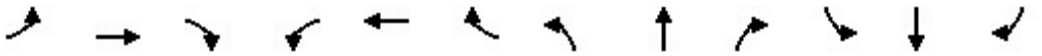
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	611	
Spillback Cap Reductn	0	0						10		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.22	0.82						0.73		0.24	1.43	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 55.6		Intersection LOS: E	
Intersection Capacity Utilization 94.0%		ICU Level of Service F	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	1231	426	437	1026	54	251	854	398	154	1785	205
Future Volume (vph)	85	1231	426	437	1026	54	251	854	398	154	1785	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	3090	1658	0	1593	3185	1425	1593	3185	1425
Flt Permitted	0.174			0.950			0.114			0.102		
Satd. Flow (perm)	289	3185	1325	3036	1658	0	191	3185	1317	171	3185	1245
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173		2				173			191
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	1256	435	446	1102	0	256	871	406	157	1821	209
Turn Type	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4		4				2		2	6		6
Detector Phase	7	4	4	3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	5.0	4.0	10.0	10.0
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	11.0	8.0	31.0	31.0
Total Split (s)	15.0	38.0	38.0	24.0	47.0		10.0	31.0	24.0	27.0	48.0	48.0
Total Split (%)	12.5%	31.7%	31.7%	20.0%	39.2%		8.3%	25.8%	20.0%	22.5%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	0.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max		None	Max	Max	None	C-Max	C-Max
Act Effct Green (s)	32.0	32.0	32.0	18.0	41.0		39.1	35.1	53.1	53.7	42.0	42.0
Actuated g/C Ratio	0.27	0.27	0.27	0.15	0.34		0.33	0.29	0.44	0.45	0.35	0.35
v/c Ratio	0.50	1.48	0.91	0.96	1.94		2.35	0.93	0.58	0.69	1.63	0.37
Control Delay	55.5	255.3	49.5	84.6	456.4		655.8	59.4	16.1	43.4	315.9	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	255.3	49.5	84.6	456.4		655.8	59.4	16.1	43.4	315.9	6.6
LOS	E	F	D	F	F		F	E	B	D	F	A
Approach Delay		195.2			349.3			147.5			266.8	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	52	~705	212	179	~1332		~264	344	114	78	~1085	18
Queue Length 95th (ft)	97	#842	#414	#282	#1593		#466	#527	224	m91	m#1181	m24
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		150
Base Capacity (vph)	174	849	480	463	567		109	932	695	349	1114	559

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.50	1.48	0.91	0.96	1.94		2.35	0.93	0.58	0.45	1.63	0.37

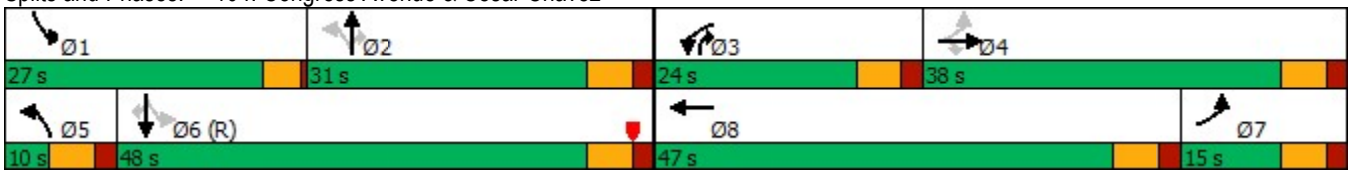
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 2 (2%), Referenced to phase 6:SBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 2.35			
Intersection Signal Delay: 240.9		Intersection LOS: F	
Intersection Capacity Utilization 159.3%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	53	103	60	157	152	86	817	45	50	2172	427
Future Volume (vph)	292	53	103	60	157	152	86	817	45	50	2172	427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1637	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.426			0.651			0.055			0.233		
Satd. Flow (perm)	1487	1637	0	1188	1863	1519	102	3539	1518	432	3539	1461
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		62				163			152			152
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	314	168	0	65	169	163	92	878	48	54	2335	459
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	8.5	45.0	45.0	8.5	45.0	45.0
Total Split (s)	26.0	32.0		10.0	16.0	16.0	13.0	87.0	87.0	11.0	85.0	85.0
Total Split (%)	18.6%	22.9%		7.1%	11.4%	11.4%	9.3%	62.1%	62.1%	7.9%	60.7%	60.7%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	26.8	25.8		16.5	14.6	14.6	83.3	83.3	83.3	79.5	79.5	79.5
Actuated g/C Ratio	0.19	0.18		0.12	0.10	0.10	0.60	0.60	0.60	0.57	0.57	0.57
v/c Ratio	0.61	0.48		0.38	0.87	0.54	0.64	0.42	0.05	0.18	1.16	0.51
Control Delay	56.9	37.3		67.0	99.1	15.7	69.8	21.5	1.9	15.0	108.5	14.0
Queue Delay	0.0	3.7		92.7	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Total Delay	56.9	41.0		159.7	99.1	15.7	69.8	21.5	1.9	15.0	109.6	14.0
LOS	E	D		F	F	B	E	C	A	B	F	B
Approach Delay		51.3			74.8			25.0			92.4	
Approach LOS		D			E			C			F	
Queue Length 50th (ft)	132	85		56	154	0	63	357	3	21	~1323	160
Queue Length 95th (ft)	182	161		#129	#345	73	m103	417	m11	42	#1451	253
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	580	388		171	194	304	150	2105	964	297	2009	895

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	144		114	0	0	0	0	0	0	583	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.69		1.14	0.87	0.54	0.61	0.42	0.05	0.18	1.64	0.51

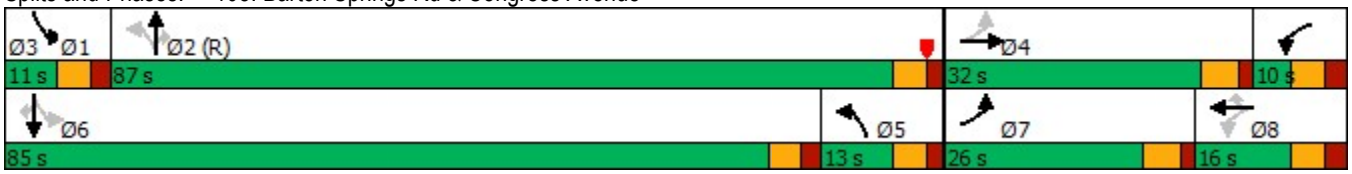
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 72.3		Intersection LOS: E	
Intersection Capacity Utilization 107.9%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Barton Springs			

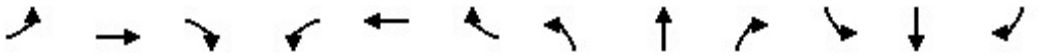
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





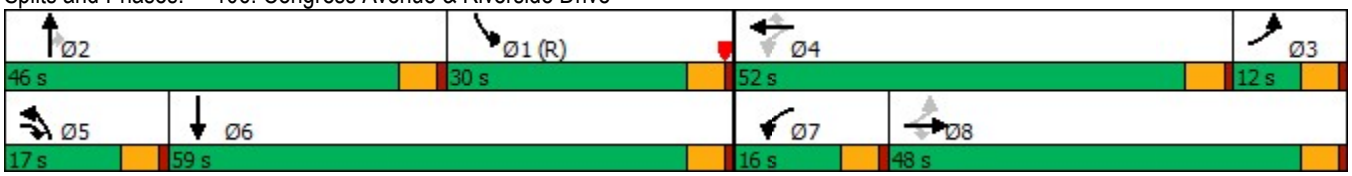
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	923	259	155	763	241	239	639	173	457	1750	51
Future Volume (vph)	73	923	259	155	763	241	239	639	173	457	1750	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		150	225		200	180		0
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3539	1636	3433	3539	1583	3433	3521	0
Flt Permitted	0.266			0.123			0.950			0.950		
Satd. Flow (perm)	492	3539	1576	229	3539	1576	3420	3539	1516	3362	3521	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			162			168		2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	952	267	160	787	248	246	659	178	471	1857	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			
Detector Phase	3	8	5	7	4	4	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	3.0	3.0	10.0	10.0	3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	10.0	40.0	8.0	8.0	40.0	40.0	8.0	32.0	32.0	8.0	37.0	
Total Split (s)	12.0	48.0	17.0	16.0	52.0	52.0	17.0	46.0	46.0	30.0	59.0	
Total Split (%)	8.6%	34.3%	12.1%	11.4%	37.1%	37.1%	12.1%	32.9%	32.9%	21.4%	42.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min	Min	None	Min	Min	C-Max	None	
Act Effct Green (s)	41.5	41.5	53.2	43.3	43.3	43.3	11.7	32.0	32.0	35.7	56.0	
Actuated g/C Ratio	0.30	0.30	0.38	0.31	0.31	0.31	0.08	0.23	0.23	0.26	0.40	
v/c Ratio	0.30	0.91	0.40	0.85	0.72	0.41	0.86	0.82	0.37	0.54	1.32	
Control Delay	45.4	60.2	19.4	73.9	47.6	15.4	90.4	59.6	9.1	55.2	182.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
Total Delay	45.4	60.2	19.4	73.9	47.6	15.4	90.4	59.6	9.1	55.2	182.4	
LOS	D	E	B	E	D	B	F	E	A	E	F	
Approach Delay		50.9			44.4			58.3			156.7	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	50	433	102	116	350	60	115	301	7	162	~1160	
Queue Length 95th (ft)	90	#523	173	#208	394	129	#187	350	65	m160	m#931	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150		150	225		200	180		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	250	1086	666	191	1212	646	296	1036	562	875	1410	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	43	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.30	0.88	0.40	0.84	0.65	0.38	0.83	0.64	0.32	0.54	1.36	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 1:SBL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.32			
Intersection Signal Delay: 92.7		Intersection LOS: F	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Congress Avenue & Riverside Drive



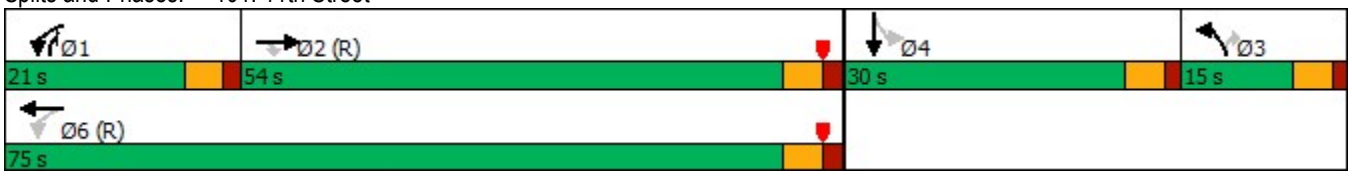
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	201	32	56	326	0	203	0	203	0	0	0
Future Volume (vph)	0	201	32	56	326	0	203	0	203	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	3433	0	1583	0	1863	0
Flt Permitted					0.870		0.950					
Satd. Flow (perm)	0	3539	1472	0	3061	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						209			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	33	0	394	0	209	0	209	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.12	0.04		0.22		0.73		0.59			
Control Delay		15.7	0.1		12.4		46.6		14.0			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.7	0.1		12.4		46.6		14.0			
LOS		B	A		B		D		B			
Approach Delay		13.6			12.4			30.3				
Approach LOS		B			B			C				
Queue Length 50th (ft)		42	0		72		70		73			
Queue Length 95th (ft)		64	0		98		#129		112			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1784		286		498			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.12	0.04		0.22		0.73		0.42			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 55.6%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: 11th Street

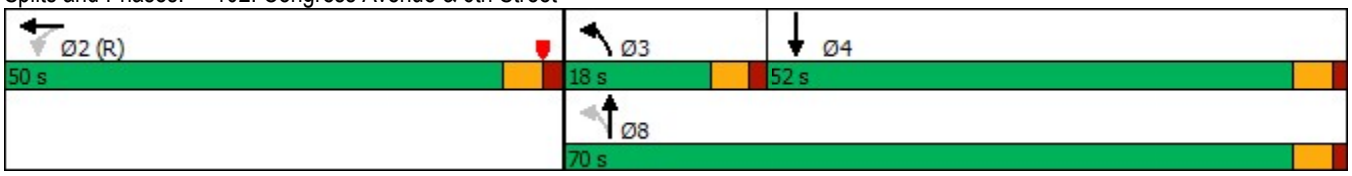


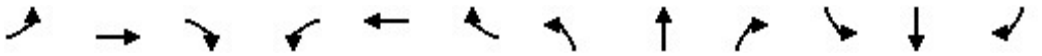
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	197	1076	54	265	813	0	0	243	76
Future Volume (vph)	0	0	0	197	1076	54	265	813	0	0	243	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5677	0	1593	3185	0	0	3010	0
Flt Permitted					0.993		0.465					
Satd. Flow (perm)	0	0	0	0	5631	0	752	3185	0	0	3010	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8						41	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1397	0	279	856	0	0	336	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		18.0	70.0			52.0	
Total Split (%)				41.7%	41.7%		15.0%	58.3%			43.3%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			47.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.39	
v/c Ratio					0.67		0.56	0.50			0.28	
Control Delay					33.3		9.5	8.4			20.4	
Queue Delay					0.0		1.8	1.6			0.0	
Total Delay					33.3		11.3	10.0			20.4	
LOS					C		B	B			C	
Approach Delay					33.3			10.3			20.4	
Approach LOS					C			B			C	
Queue Length 50th (ft)					259		59	147			80	
Queue Length 95th (ft)					301		m76	161			116	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2093		498	1725			1203	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		102	646			0	
Spillback Cap Reductn					0		0	0			0	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.67		0.70	0.79			0.28	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 22.7		Intersection LOS: C	
Intersection Capacity Utilization 75.5%		ICU Level of Service D	
Analysis Period (min) 15			
Description: 6th Street			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 102: Congress Avenue & 6th Street





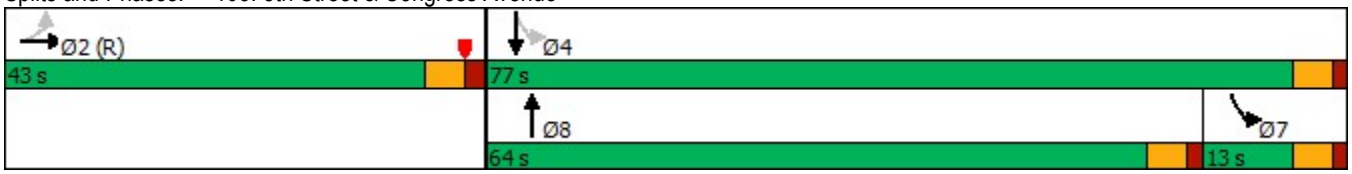
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	690	74	0	0	0	0	921	183	104	313	0
Future Volume (vph)	74	690	74	0	0	0	0	921	183	104	313	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4479	0	0	0	0	0	3065	0	1593	3185	0
Flt Permitted	0.950									0.139		
Satd. Flow (perm)	1505	4479	0	0	0	0	0	3065	0	233	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	813	0	0	0	0	0	1175	0	111	333	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	43.0	43.0						64.0		13.0	77.0	
Total Split (%)	35.8%	35.8%						53.3%		10.8%	64.2%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	37.5	37.5						59.0		72.0	72.0	
Actuated g/C Ratio	0.31	0.31						0.49		0.60	0.60	
v/c Ratio	0.17	0.58						0.77		0.48	0.17	
Control Delay	31.2	35.8						6.7		27.2	9.6	
Queue Delay	0.0	0.0						0.1		0.0	0.0	
Total Delay	31.2	35.8						6.8		27.2	9.6	
LOS	C	D						A		C	A	
Approach Delay		35.4						6.8			14.0	
Approach LOS		D						A			B	
Queue Length 50th (ft)	44	189						34		40	67	
Queue Length 95th (ft)	84	234						m30		m62	82	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	470	1410						1520		230	1911	

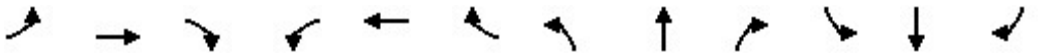
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	0	
Spillback Cap Reductn	0	0						18		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.17	0.58						0.78		0.48	0.17	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 75.5%		ICU Level of Service D	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	857	267	153	433	101	167	1854	489	22	449	59
Future Volume (vph)	187	857	267	153	433	101	167	1854	489	22	449	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	1593	3050	0	1593	3185	1425	1593	3185	1425
Flt Permitted	0.232			0.325			0.337			0.111		
Satd. Flow (perm)	381	3185	1325	535	3050	0	552	3185	1317	186	3185	1317
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			228		26				195			191
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	874	272	156	545	0	170	1892	499	22	458	60
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	3	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	29.0	31.0	31.0	31.0
Total Split (s)	21.0	52.0	52.0	16.0	47.0		10.0	52.0	52.0	42.0	42.0	42.0
Total Split (%)	17.5%	43.3%	43.3%	13.3%	39.2%		8.3%	43.3%	43.3%	35.0%	35.0%	35.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	46.0	46.0	46.0	41.0	41.0		46.0	46.0	46.0	36.0	36.0	36.0
Actuated g/C Ratio	0.38	0.38	0.38	0.34	0.34		0.38	0.38	0.38	0.30	0.30	0.30
v/c Ratio	0.64	0.72	0.42	0.58	0.51		0.69	1.55	0.80	0.40	0.48	0.11
Control Delay	36.8	35.5	7.6	47.0	32.0		44.9	281.1	30.5	60.8	38.2	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.8	35.5	7.6	47.0	32.0		44.9	281.1	30.5	60.8	38.2	2.7
LOS	D	D	A	D	C		D	F	C	E	D	A
Approach Delay		30.0			35.3			216.6			35.2	
Approach LOS		C			D			F			D	
Queue Length 50th (ft)	103	298	22	88	167		90	~1087	218	15	164	0
Queue Length 95th (ft)	163	376	87	145	224		#156	#1226	#387	m44	222	m8
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		150
Base Capacity (vph)	297	1220	648	270	1059		246	1220	625	55	955	528

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.72	0.42	0.58	0.51		0.69	1.55	0.80	0.40	0.48	0.11

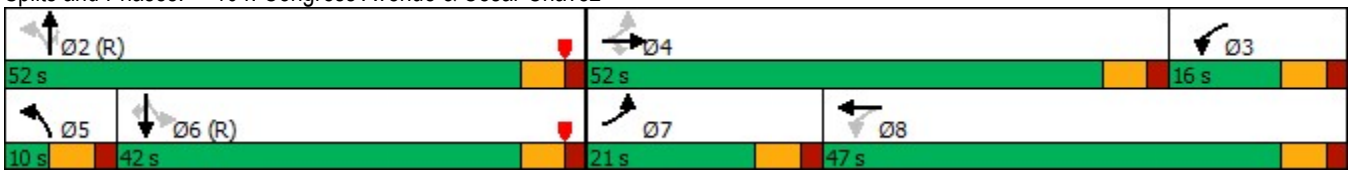
Intersection Summary	
Area Type:	CBD
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 54 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Red	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.55	
Intersection Signal Delay: 124.2	Intersection LOS: F
Intersection Capacity Utilization 121.0%	ICU Level of Service H
Analysis Period (min) 15	
Description: Cesar Chavez	

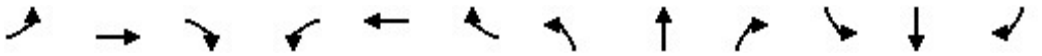
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez



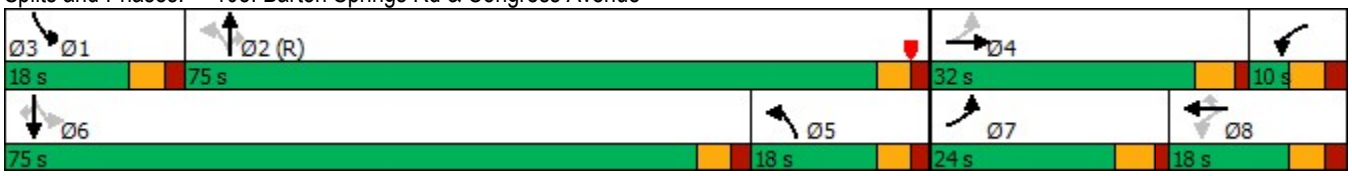


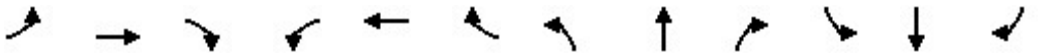
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	65	44	17	76	77	78	1811	88	68	404	258
Future Volume (vph)	400	65	44	17	76	77	78	1811	88	68	404	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1726	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.384			0.682			0.500			0.065		
Satd. Flow (perm)	1335	1726	0	1244	1863	1521	903	3539	1519	121	3539	1464
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				154			158			254
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	430	117	0	18	82	83	84	1947	95	73	434	277
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	15.0	45.0	45.0	15.0	45.0	45.0
Total Split (s)	24.0	32.0		10.0	18.0	18.0	18.0	75.0	75.0	18.0	75.0	75.0
Total Split (%)	17.8%	23.7%		7.4%	13.3%	13.3%	13.3%	55.6%	55.6%	13.3%	55.6%	55.6%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	30.1	30.1		12.8	10.1	10.1	79.6	79.6	79.6	71.9	71.9	71.9
Actuated g/C Ratio	0.22	0.22		0.09	0.07	0.07	0.59	0.59	0.59	0.53	0.53	0.53
v/c Ratio	0.75	0.29		0.13	0.59	0.32	0.14	0.93	0.10	0.50	0.23	0.31
Control Delay	55.9	38.0		57.9	77.2	3.3	6.1	15.6	0.1	29.0	17.6	3.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	37.1	0.0	0.0	0.0	0.0
Total Delay	55.9	38.0		57.9	77.2	3.3	6.1	52.7	0.1	29.0	17.6	3.7
LOS	E	D		E	E	A	A	D	A	C	B	A
Approach Delay		52.1			41.8			48.5			13.8	
Approach LOS		D			D			D			B	
Queue Length 50th (ft)	162	65		14	70	0	14	954	0	31	107	10
Queue Length 95th (ft)	237	132		41	126	0	m16	m887	m0	63	141	55
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	584	401		134	165	275	613	2087	960	216	1885	898

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	287	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.29		0.13	0.50	0.30	0.14	1.08	0.10	0.34	0.23	0.31

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 72 (53%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 41.2		Intersection LOS: D	
Intersection Capacity Utilization 90.8%		ICU Level of Service E	
Analysis Period (min) 15			
Description: Barton Springs			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





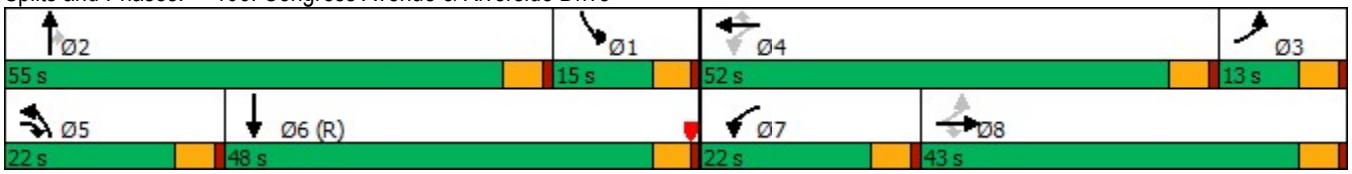
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	471	109	168	1018	395	278	1493	127	121	237	32
Future Volume (vph)	111	471	109	168	1018	395	278	1493	127	121	237	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		150	225		200	180		0
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3539	1636	3433	3539	1583	3433	3458	0
Flt Permitted	0.133			0.247			0.950			0.950		
Satd. Flow (perm)	247	3539	1577	456	3539	1577	3316	3539	1518	3413	3458	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112			202			137		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	486	112	173	1049	407	287	1539	131	125	277	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			
Detector Phase	3	8	5	7	4	4	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	8.0	10.0	3.0	3.0	10.0	10.0	3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	13.0	40.0	8.0	8.0	40.0	40.0	8.0	42.0	42.0	8.0	37.0	
Total Split (s)	13.0	43.0	22.0	22.0	52.0	52.0	22.0	55.0	55.0	15.0	48.0	
Total Split (%)	9.6%	31.9%	16.3%	16.3%	38.5%	38.5%	16.3%	40.7%	40.7%	11.1%	35.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min	Min	None	Min	Min	None	C-Max	
Act Effct Green (s)	40.7	40.7	54.9	45.5	45.5	45.5	14.3	51.5	51.5	10.0	47.2	
Actuated g/C Ratio	0.30	0.30	0.41	0.34	0.34	0.34	0.11	0.38	0.38	0.07	0.35	
v/c Ratio	0.70	0.46	0.16	0.62	0.88	0.61	0.79	1.14	0.20	0.49	0.23	
Control Delay	74.1	40.1	4.3	42.8	51.6	22.0	74.7	111.5	4.7	54.3	18.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.0	0.0	0.0	
Total Delay	74.1	40.1	4.3	42.8	51.6	22.1	74.7	112.2	4.7	54.3	18.3	
LOS	E	D	A	D	D	C	E	F	A	D	B	
Approach Delay		39.9			43.3			99.5			29.5	
Approach LOS		D			D			F			C	
Queue Length 50th (ft)	74	179	0	109	446	146	128	~846	0	56	93	
Queue Length 95th (ft)	#155	243	35	171	538	258	175	#986	39	90	135	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150		150	225		200	180		

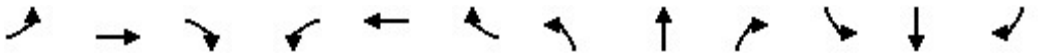
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	164	1066	744	319	1232	680	432	1348	663	254	1215	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	13	0	235	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.70	0.46	0.15	0.54	0.85	0.61	0.66	1.38	0.20	0.49	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 60 (44%), Referenced to phase 6:SBT, Start of Red			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 65.0		Intersection LOS: E	
Intersection Capacity Utilization 96.2%		ICU Level of Service F	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Congress Avenue & Riverside Drive



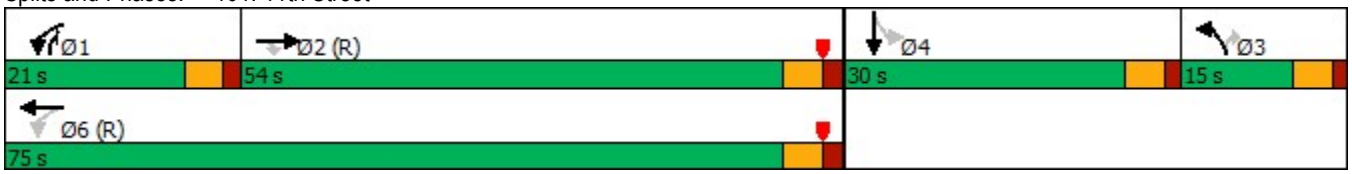


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	368	118	144	292	0	161	0	209	0	0	0
Future Volume (vph)	0	368	118	144	292	0	161	0	209	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3483	0	3433	0	1583	0	1863	0
Flt Permitted					0.671		0.950					
Satd. Flow (perm)	0	3539	1472	0	2352	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						215			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	379	122	0	449	0	166	0	215	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.21	0.15		0.32		0.58		0.60			
Control Delay		16.7	4.2		13.3		76.9		42.5			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		16.7	4.2		13.3		76.9		42.5			
LOS		B	A		B		E		D			
Approach Delay		13.7			13.3			57.5				
Approach LOS		B			B			E				
Queue Length 50th (ft)		82	5		83		69		113			
Queue Length 95th (ft)		113	36		112		106		181			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1391		286		503			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.21	0.15		0.32		0.58		0.43			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 26.1		Intersection LOS: C	
Intersection Capacity Utilization 57.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	247	775	70	215	600	0	0	1296	111
Future Volume (vph)	0	0	0	247	775	70	215	600	0	0	1296	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5623	0	1593	3185	0	0	3127	0
Flt Permitted					0.989		0.075					
Satd. Flow (perm)	0	0	0	0	5553	0	126	3185	0	0	3127	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					14						9	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1150	0	226	632	0	0	1481	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		17.0	70.0			53.0	
Total Split (%)				41.7%	41.7%		14.2%	58.3%			44.2%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			48.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.40	
v/c Ratio					0.56		1.06	0.37			1.18	
Control Delay					30.8		98.2	10.3			125.3	
Queue Delay					0.7		0.0	1.1			0.5	
Total Delay					31.4		98.2	11.4			125.8	
LOS					C		F	B			F	
Approach Delay					31.4			34.3			125.8	
Approach LOS					C			C			F	
Queue Length 50th (ft)					200		~117	130			~726	
Queue Length 95th (ft)					237		#296	153			#869	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2068		214	1725			1256	

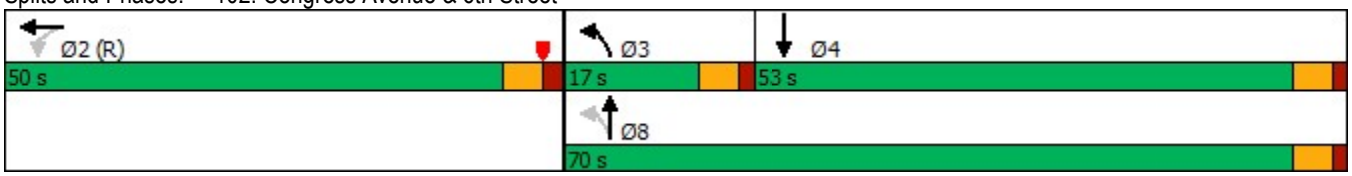
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		0	811			0	
Spillback Cap Reductn					515		0	0			140	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.74		1.06	0.69			1.33	

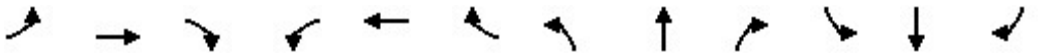
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 72.2		Intersection LOS: E	
Intersection Capacity Utilization 91.0%		ICU Level of Service E	
Analysis Period (min) 15			
Description: 6th Street			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Congress Avenue & 6th Street





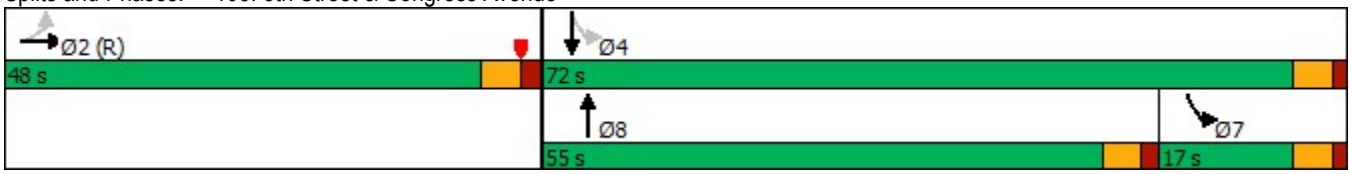
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	829	299	0	0	0	0	667	149	66	1496	0
Future Volume (vph)	105	829	299	0	0	0	0	667	149	66	1496	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4317	0	0	0	0	0	3054	0	1593	3185	0
Flt Permitted	0.950									0.215		
Satd. Flow (perm)	1505	4317	0	0	0	0	0	3054	0	357	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	112	1200	0	0	0	0	0	869	0	70	1591	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						55.0		17.0	72.0	
Total Split (%)	40.0%	40.0%						45.8%		14.2%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						50.0		67.0	67.0	
Actuated g/C Ratio	0.35	0.35						0.42		0.56	0.56	
v/c Ratio	0.21	0.78						0.67		0.22	0.89	
Control Delay	28.4	38.3						38.6		24.0	32.1	
Queue Delay	0.0	0.0						0.0		0.0	47.2	
Total Delay	28.4	38.3						38.7		24.0	79.3	
LOS	C	D						D		C	E	
Approach Delay		37.4						38.7			76.9	
Approach LOS		D						D			E	
Queue Length 50th (ft)	60	297						332		32	416	
Queue Length 95th (ft)	105	356						m382		m32	m362	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	533	1541						1288		322	1778	

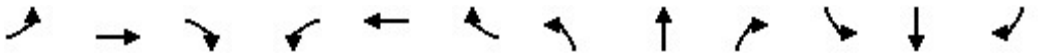
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	611	
Spillback Cap Reductn	0	0						7		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.21	0.78						0.68		0.22	1.36	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 54.8		Intersection LOS: D	
Intersection Capacity Utilization 91.0%		ICU Level of Service E	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	1177	406	416	981	52	233	793	369	147	1701	196
Future Volume (vph)	81	1177	406	416	981	52	233	793	369	147	1701	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	3090	1656	0	1593	3185	1425	1593	3185	1425
Flt Permitted	0.174			0.950			0.113			0.134		
Satd. Flow (perm)	289	3185	1325	3032	1656	0	189	3185	1317	225	3185	1245
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173		2				186			191
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	1201	414	424	1054	0	238	809	377	150	1736	200
Turn Type	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4		4				2		2	6		6
Detector Phase	7	4	4	3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	5.0	4.0	10.0	10.0
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	11.0	8.0	31.0	31.0
Total Split (s)	15.0	38.0	38.0	24.0	47.0		10.0	31.0	24.0	27.0	48.0	48.0
Total Split (%)	12.5%	31.7%	31.7%	20.0%	39.2%		8.3%	25.8%	20.0%	22.5%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	0.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max		None	Max	Max	None	C-Max	C-Max
Act Effct Green (s)	32.0	32.0	32.0	18.0	41.0		39.5	35.5	53.5	53.6	42.0	42.0
Actuated g/C Ratio	0.27	0.27	0.27	0.15	0.34		0.33	0.30	0.45	0.45	0.35	0.35
v/c Ratio	0.48	1.41	0.86	0.92	1.86		2.18	0.86	0.53	0.62	1.56	0.36
Control Delay	54.4	227.9	43.0	75.9	419.6		585.5	50.8	13.4	35.0	283.2	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	227.9	43.0	75.9	419.6		585.5	50.8	13.4	35.0	283.2	6.3
LOS	D	F	D	E	F		F	D	B	C	F	A
Approach Delay		174.4			321.0			130.3			238.8	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	50	~658	189	169	~1254		~236	310	87	62	~1030	18
Queue Length 95th (ft)	94	#795	#374	#263	#1513		#430	#465	184	m77	#1137	m23
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		150
Base Capacity (vph)	174	849	480	463	567		109	943	706	363	1114	559

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.48	1.41	0.86	0.92	1.86		2.18	0.86	0.53	0.41	1.56	0.36

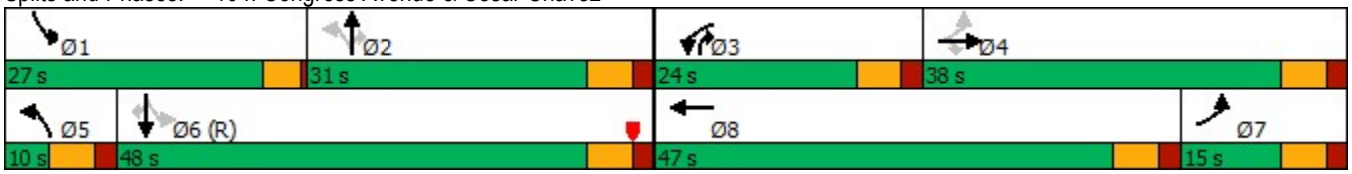
Intersection Summary	
Area Type:	CBD
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 2 (2%), Referenced to phase 6:SBTL, Start of Red	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.18	
Intersection Signal Delay: 217.5	Intersection LOS: F
Intersection Capacity Utilization 152.6%	ICU Level of Service H
Analysis Period (min) 15	
Description: Cesar Chavez	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	269	44	98	53	130	124	81	770	38	43	2075	407
Future Volume (vph)	269	44	98	53	130	124	81	770	38	43	2075	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1626	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.435			0.660			0.054			0.254		
Satd. Flow (perm)	1516	1626	0	1204	1863	1519	101	3539	1518	470	3539	1461
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71				148			152			152
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	289	152	0	57	140	133	87	828	41	46	2231	438
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	8.5	45.0	45.0	8.5	45.0	45.0
Total Split (s)	26.0	32.0		10.0	16.0	16.0	13.0	87.0	87.0	11.0	85.0	85.0
Total Split (%)	18.6%	22.9%		7.1%	11.4%	11.4%	9.3%	62.1%	62.1%	7.9%	60.7%	60.7%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	25.7	24.6		16.8	14.7	14.7	84.2	84.2	84.2	80.4	80.4	80.4
Actuated g/C Ratio	0.18	0.18		0.12	0.10	0.10	0.60	0.60	0.60	0.57	0.57	0.57
v/c Ratio	0.59	0.44		0.33	0.72	0.46	0.61	0.39	0.04	0.15	1.10	0.48
Control Delay	56.8	31.6		65.0	81.0	12.0	68.1	21.3	1.7	14.5	81.9	13.0
Queue Delay	0.0	1.8		1.2	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0
Total Delay	56.8	33.4		66.2	81.0	12.0	68.1	21.3	1.7	14.5	83.7	13.0
LOS	E	C		E	F	B	E	C	A	B	F	B
Approach Delay		48.7			50.6			24.7			71.2	
Approach LOS		D			D			C			E	
Queue Length 50th (ft)	121	64		48	125	0	59	335	1	18	~1219	146
Queue Length 95th (ft)	168	135		98	#267	52	m101	394	m9	37	#1350	233
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	572	383		175	195	292	150	2128	973	320	2032	904

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	118		37	0	0	0	0	0	0	552	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.57		0.41	0.72	0.46	0.58	0.39	0.04	0.14	1.51	0.48

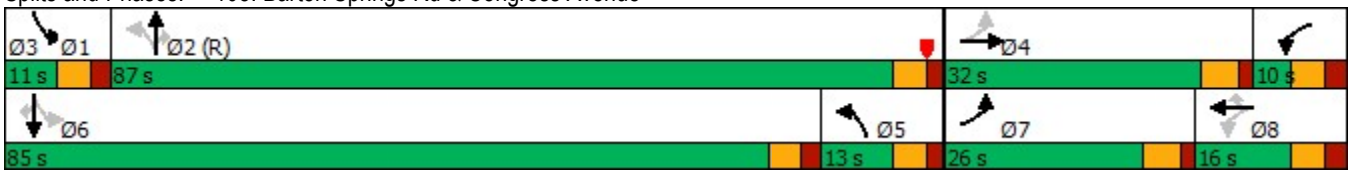
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 57.4		Intersection LOS: E	
Intersection Capacity Utilization 103.5%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Barton Springs			

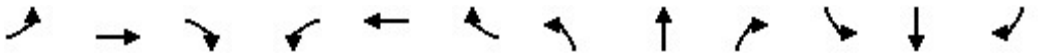
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	875	247	145	723	223	227	606	163	432	1673	46
Future Volume (vph)	64	875	247	145	723	223	227	606	163	432	1673	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		150	225		200	180		0
Storage Lanes	1		1	1		1	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3373	1489	3433	3539	1583	3433	3521	0
Flt Permitted	0.249			0.124			0.950			0.950		
Satd. Flow (perm)	460	3539	1576	231	3373	1434	3418	3539	1516	3358	3521	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94		2	141			167		2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	66	902	255	149	768	207	234	625	168	445	1772	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4		4			2			
Detector Phase	3	8	5	7	4	4	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	3.0	3.0	10.0	10.0	3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	10.0	40.0	8.0	8.0	40.0	40.0	8.0	32.0	32.0	8.0	37.0	
Total Split (s)	12.0	48.0	17.0	16.0	52.0	52.0	17.0	46.0	46.0	30.0	59.0	
Total Split (%)	8.6%	34.3%	12.1%	11.4%	37.1%	37.1%	12.1%	32.9%	32.9%	21.4%	42.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min	Min	None	Min	Min	C-Max	None	
Act Effct Green (s)	40.4	40.4	51.9	42.8	42.8	42.8	11.5	30.6	30.6	38.5	57.5	
Actuated g/C Ratio	0.29	0.29	0.37	0.31	0.31	0.31	0.08	0.22	0.22	0.28	0.41	
v/c Ratio	0.29	0.88	0.39	0.80	0.74	0.39	0.83	0.81	0.36	0.47	1.22	
Control Delay	45.5	58.5	19.0	67.3	48.8	14.7	86.8	60.4	8.1	52.7	142.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
Total Delay	45.5	58.5	19.0	67.3	48.8	14.7	86.8	60.4	8.1	52.7	142.2	
LOS	D	E	B	E	D	B	F	E	A	D	F	
Approach Delay		49.6			45.0			57.9			124.2	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	44	405	93	107	358	50	109	285	1	146	~1076	
Queue Length 95th (ft)	82	488	162	#182	406	119	#174	335	57	m155	m#938	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150		150	225		200	180		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	231	1086	655	191	1141	578	297	1036	562	942	1447	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	43	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.29	0.83	0.39	0.78	0.67	0.36	0.79	0.60	0.30	0.47	1.26	

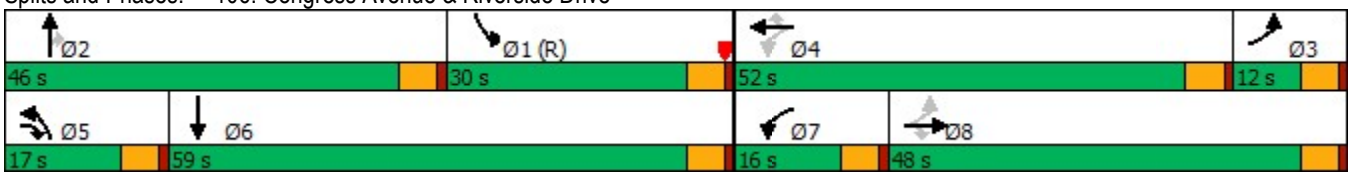
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 1:SBL, Start of Red			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 79.8		Intersection LOS: E	
Intersection Capacity Utilization 104.7%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Congress Avenue & Riverside Drive



Appendix D: Congress Avenue Traffic Analysis Memo

MEMORANDUM

DATE: May 14, 2018
TO: Susannah Ross
CC: Martin Zogran
FROM: Cody Stone, P.E.
RE: Congress Avenue Urban Design Initiative – Traffic Analysis

AUSTIN OFFICE
11500 Metric Blvd.
Bldg. M-1, Ste. 150
Austin, TX 78758
Phone: 512.821.2081
Fax: 512.821.2085
Toll Free: 866.576.0597
TBPE Firm Registration No. 812

As part of the Congress Avenue Urban Design Initiative, Alliance Transportation Group Inc. (Alliance) completed a preliminary analysis of future traffic conditions for multiple alternatives. The traffic analysis includes six (6) intersections within the project corridor, which extends from Riverside Drive to 11th Street. Alliance performed a detailed analysis of the expected future traffic to analyze the feasibility of design concepts that change the current traffic operations along the corridor. This analysis will be used to garner Stakeholder input and incorporate feedback into the ultimate Mobility Report. The South Central Waterfront (SCWF) proposed development is expected to be constructed by 2040 within the project limits and is included in the analysis.

The traffic analysis focused on vehicle delay with alternatives that reduced roadway capacity and helped identify several transportation system management improvements that can mitigate vehicle delay impact. The traffic analysis also illustrated that any mode choice change towards bicycle and pedestrian transportation improves the corridor mobility by reducing the vehicle demand in the project area. The shift in mode choice is expected to be higher with accommodation of bicycle, pedestrian, and transit facilities in the available right-of-way. As part of the alternative analysis, a range of mode shifts were analyzed to provide potential traffic delay results for various scenarios.

Traffic Forecasts

Alliance developed a step-by-step methodology to incorporate the South Central Waterfront (SCWF) development into the Congress Avenue traffic analysis. Prior to developing the methodology, our team performed a review of expected growth and the SCWF expected land use.

Expected Area Growth

There are a variety of factors that contribute to area growth. For traffic analysis, the main focus of the forecast is expected vehicular demand. Alliance performed a thorough review of historical counts and the existing CAMPO model to determine the expected change in vehicle demand by 2040. The Texas Department of Transportation (TxDOT) historical traffic count information is summarized in **Table 1**.

Table 1. TxDOT Historical Average Annual Daily Traffic on/near Congress Avenue

Location	Station Number	2005	2010	2015	2005-2015 Growth Rate
South of Riverside	227U749	18,440	N/A	25,016	3.57%
Between 2nd and 3rd St	227U731	25,380	23,260	20,307	-2.00%
Between 4th and 5th St	227U728	22,460	20,270	18,300	-1.85%
Between 10th and 11th St	227U710	8,540	7,340	6,909	-1.91%

Obtained from TxDOT Traffic Count Database System (TCDS)

As illustrated in **Table 1**, the highest growth has been experienced south of the project area. North of Lady Bird Lake, traffic volumes have historically seen a slight decline.

The 2010 Capitol Area Metropolitan Planning Organization (CAMPO) travel demand model (TDM) and 2040 CAMPO TDM were compared to identify the vehicular growth between models. **Table 2** summarizes the growth between CAMPO models. The base year does not reflect actual traffic counts, but the comparison is direct and illustrates the expected corridor growth.

Table 2. CAMPO 2010 and 2040 Traffic Projections

Location	2010	2040	2005-2015 Growth Rate
South of Riverside	31,378	37,264	0.63%
Between 2nd and 3rd St	27,893	35,955	0.96%
Between 4th and 5th St	25,019	32,785	1.03%
Between 9th and 10th St	12,265	20,222	2.16%

Obtained from TxDOT Traffic Count Database System (TCDS)

The CAMPO TDM traffic projections show moderate growth throughout the corridor. The highest growth is near the Capitol, likely due to available vehicle capacity. The next area of growth to consider is local development.

South Central Waterfront Development

In June 2016, the City of Austin completed the South Central Waterfront Vision Framework Plan. This plan provided a roadmap for waterfront planning and established a cohesive set of recommendations to guide public and private investment in the SCWF.

Most relevant to the Congress Avenue Urban Design Initiative, the SCWF provided a physical framework of internal streets and expected land uses in the area. In a series of scenarios, planners outlined the various paths development could take and the steps needed to accomplish the recommended development. **Figure 1** illustrates the internal street network and parcels with a comparison of scenarios. The test scenario was the recommended option and incorporated into this Congress Avenue traffic analysis.

Figure 1: South Central Waterfront Parcels and Land Use

As shown in Figure 1, the SCWF recommended test scenario adds approximately 5.3 million square feet of mixed use development to the Congress Avenue, Riverside Drive, and Barton Springs Road area. A summary of the parcel land uses from the SCWF Framework Plan is provided in **Appendix A**.

Methodology

After discussion with the City of Austin Transportation Department (ATD) and the project team, it was agreed that a detailed analysis would be required for the Congress Avenue project to incorporate the expected SCWF development to accurately compare design alternatives along the Congress Avenue corridor. Alliance developed a step-by-step methodology to analyze future traffic conditions and capture the impact of potential mode split changes.

The future mode split is a key consideration in developing options due to the overlapping Capital Metropolitan Transit Organization's (CapMetro) Project Connect initiative and the inclusion of bicycle and pedestrian accommodations as part of the design alternatives. Project Connect serves as CapMetro's 2040 transit plan, and was released March 28th, 2018. The mode split comparison is a tool to evaluate all modes of travel and the tradeoffs associated with design options.

Step-by-Step Methodology

Alliance and Sasaki met with City of Austin on November 16, 2017 to discuss an approach to the 2040 traffic analysis along Congress Avenue. The following approach was developed with City of Austin comments incorporated.

1. Apply a 0.5% linear growth rate from 2017 existing turning movement count (TMC) data to 2040
2. Obtain land uses expected from SCWF
3. Perform trip generation with expected land uses

4. Perform trip distribution of development trips based on site plan and existing TMC data
5. Consider driveway locations and percentage expected to use each access point
6. Perform trip assignment by adding site traffic to study intersections (Riverside, Barton Springs, Cesar Chavez, 5th, 6th, and 11th)
7. Perform analysis of 2040 No-Build scenario conditions with forecasted traffic
8. Update lane assignments with Congress Avenue options and perform Build alternative analysis
9. Include sensitivity analysis of the range of mode splits from the development site trips
10. Directly compare alternatives with No-Build by maintaining signal phasing and general timing
11. Present preliminary findings to ATD in a workshop meeting
12. Discuss the expected mode split of No-Build scenario vs. Build scenario, agree upon expected percentages with and without proposed improvements to present in Mobility Report
13. Incorporate 2040 traffic operation results and sensitivity analysis into Mobility Report deliverable
14. Create a traffic operation executive summary

Steps 1 through 12 have been completed as part of this technical memorandum. This memo has been updated from initial ATD review and will be incorporated in the final Mobility Report.

Traffic Analysis Alternatives

The first public meeting set the stage for the aspirations of the Congress Avenue streetscape. Our team heard a resounding interest in dedicated bicycle facilities, pedestrian improvements, and vehicle mobility enhancements. In the urban environment, there are trade-offs with each focus area as there is limited City of Austin right-of-way (ROW), historical buildings, and environmental constraints. The steering committee held a series of meetings to determine concepts to move forward. These alternatives each have major bicycle, pedestrian, transit, and vehicle mobility implications.

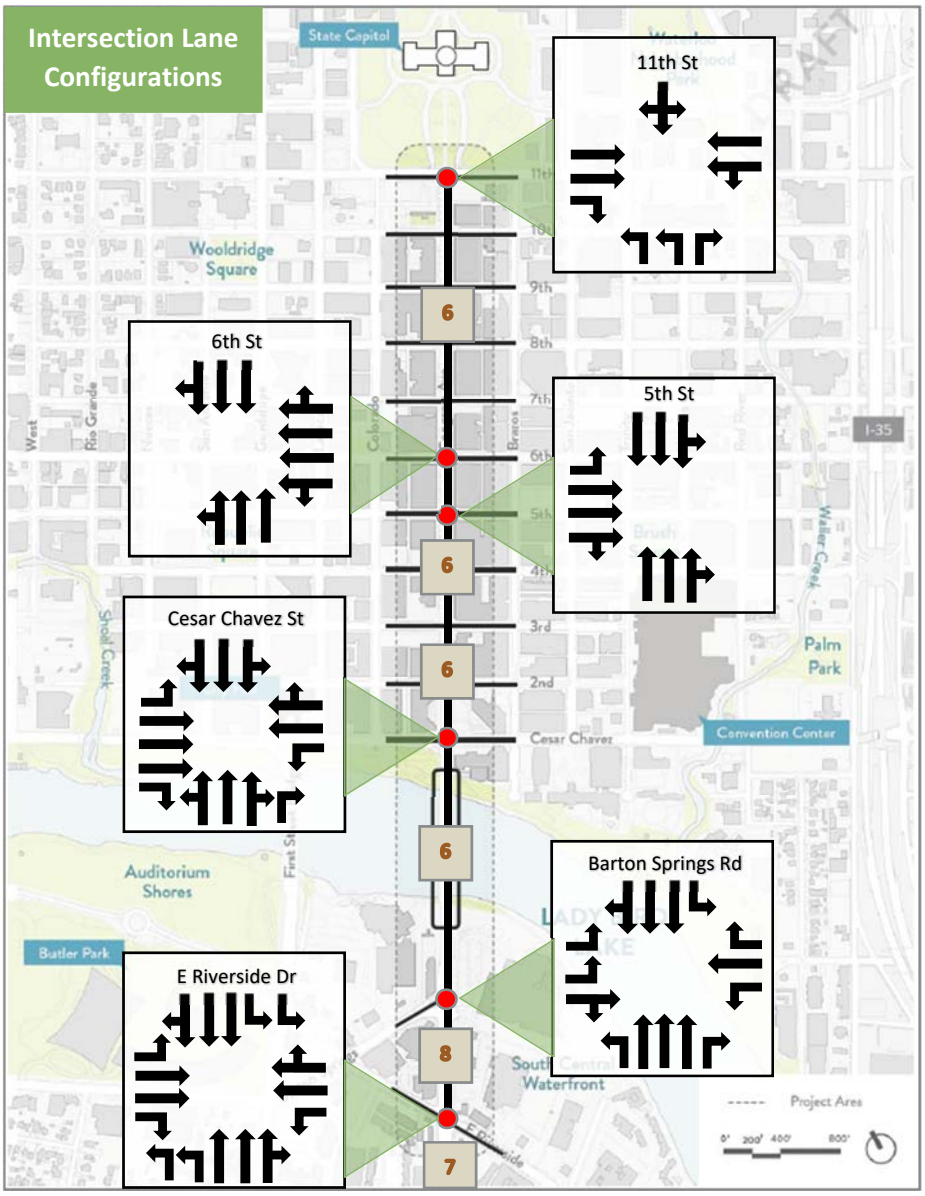
Existing

Available existing traffic count data and signal timings were obtained from the City of Austin. The traffic volumes were adjusted by City of Austin staff to capture typical peak hour traffic operations, including vehicle queues and intersection level of service (LOS). Existing volumes were collected before the opening of the Mopac managed lanes. Traffic volumes during the AM and PM peak hours on Cesar Chavez have increased by 10-20%. Cycle lengths were updated as a result with each alternative updated accordingly.

No-Build

The No-Build alternative, shown in **Figure 2**, maintains the existing vehicle lane configurations and intersection operations with 2040 traffic forecasts. The No-Build also maintains the existing pedestrian width and existing lack of dedicated bicycle facilities. The No-Build considers the impact of SCWF plans within the current roadway geometry.

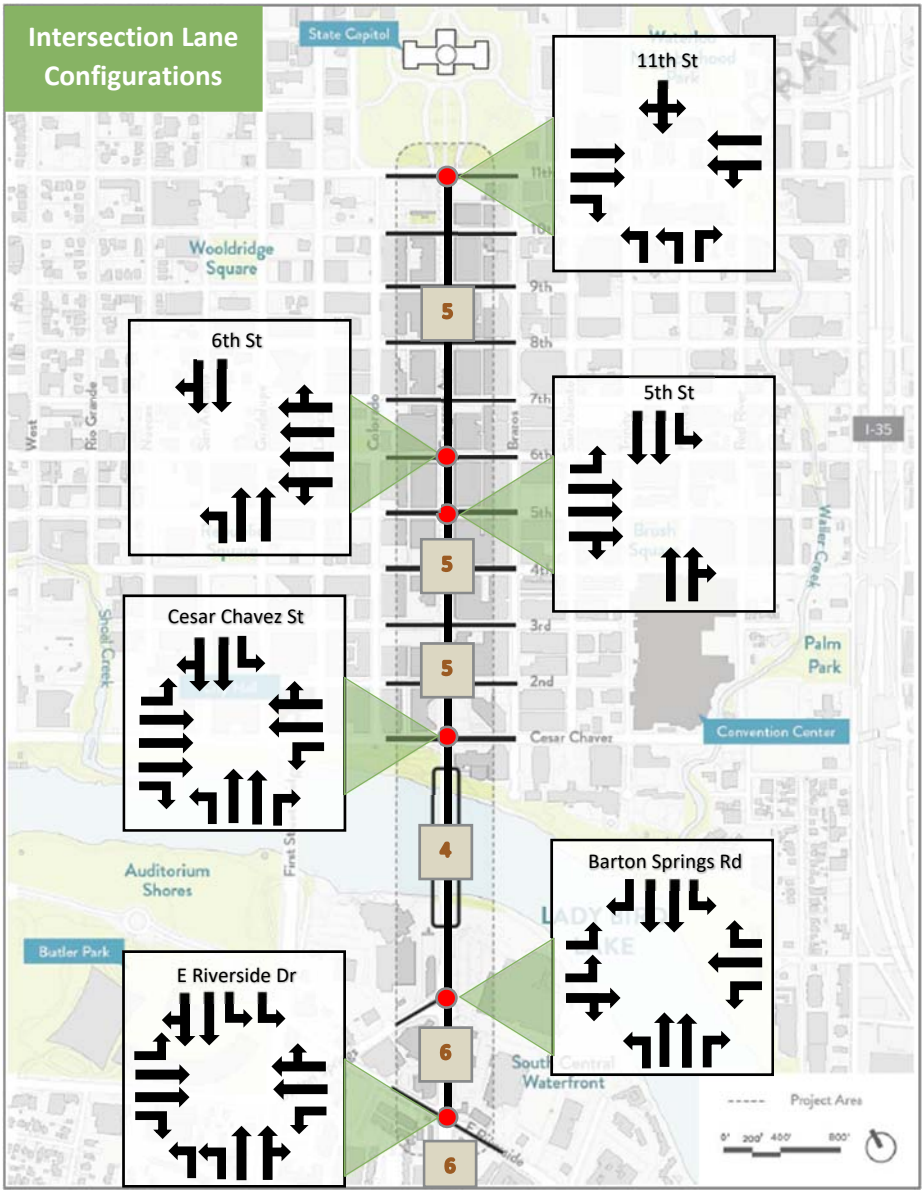
Figure 2: No-Build Intersection Lane Configurations



Alternative 1

Alternative 1 converts Congress Avenue's existing 6-lane configuration through most of the project area to 5-lanes. This reduces the through lanes from 3 to 2 in each direction, with a center lane provided for left-turn movements. The 5-lane alternative provides dedicated bicycle facilities in each direction and additional pedestrian space. It also considers potential additional transit stop locations. **Figure 3** below shows the general cross section of Alternative 1.

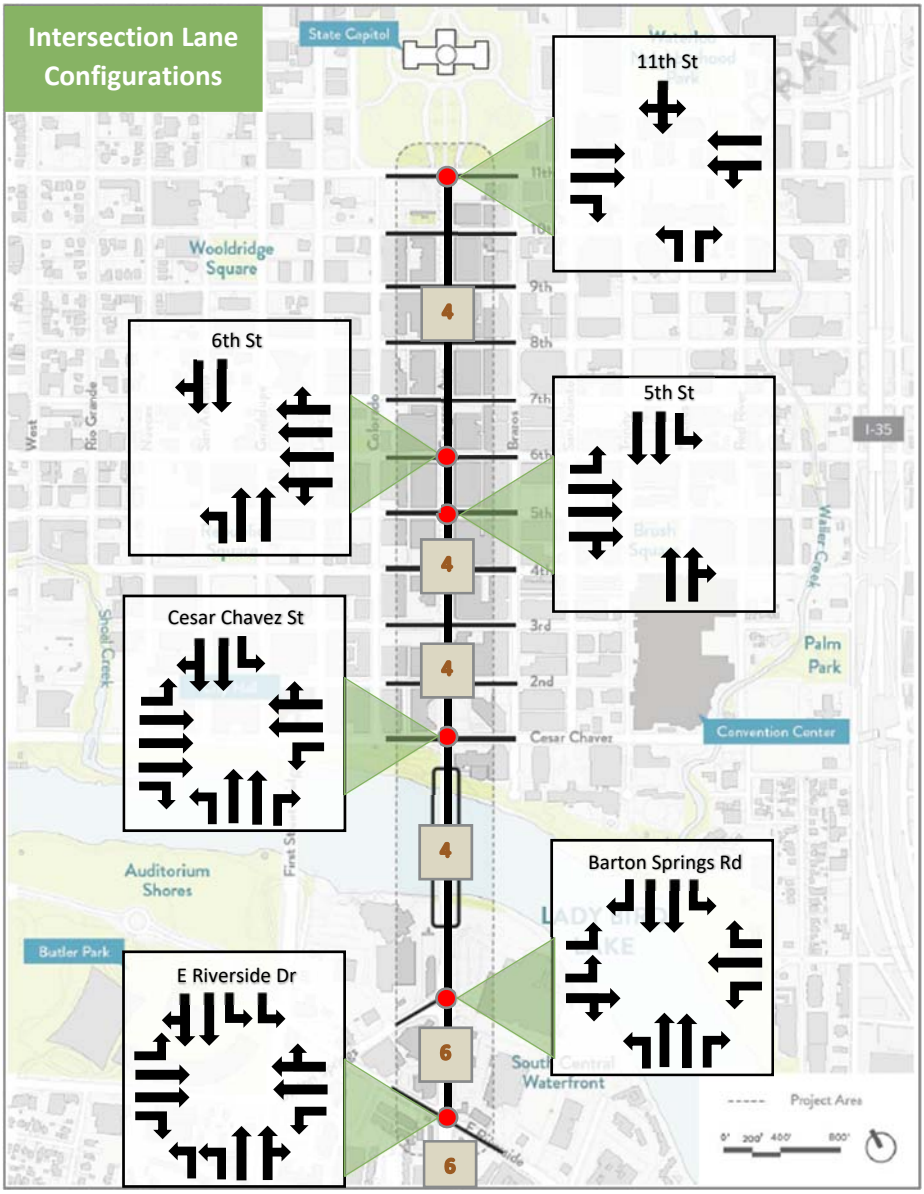
Figure 3: Alternative 1 Intersection Lane Configurations



Alternative 2

Alternative 2 is very similar Alternative 1, but reduces the number of lanes at various sections along Congress Avenue to 4-lanes. This alternative would consider prohibited left turns in certain street sections. The reduction in vehicle lanes provides more space for pedestrians and dedicated bicycle facilities in each direction. Alternative 2 is illustrated in **Figure 4**.

Figure 4: Alternative 2 Intersection Lane Configurations



2040 Vehicle Traffic Volumes

Vehicle traffic volumes were developed with the step by step methodology outlined in the 2040 traffic forecast section. The additional development land uses from the SCWF are provided in **Appendix A** and are included in the South Central Waterfront Vision Framework Plan, adopted in 2016 by the City of Austin.

Trip generation was performed with a combination of Institute of Transportation Engineers (ITE) 9th and 10th Edition Trip Generation Manual. The 9th edition contained a land use included in the SCWF land use summary that was removed in the 10th edition. The trip generation table is included in **Appendix B**.

Trip distribution was developed based on existing turning movement counts. Percentages were assigned to relevant directions and routes that coincided with existing data.

The trip assignment for the SCWF development utilized PTV Vistro 5.0 to distribute trips on routes and through assumed development access points. The access points are based on the South Central Waterfront Vision Framework Plan. The vehicle traffic volumes were then distributed along the Congress Avenue corridor at subsequent study intersections.

2040 No-Build Traffic Volumes are included in **Appendix B**.

Bicycle, Pedestrian, Transit, and Vehicle Mode Split Summary

A key component to being able to accommodate future traffic projections is the ability to offer alternatives to vehicle trips. This requires a concerted effort to incentivize bicycle, pedestrian, and public transportation trips to and from the proposed SCWF development. Each of these modes of transportation require careful consideration for the local area infrastructure and the connections needed to surrounding areas.

Cities that do not allow for choice in transportation tend to rely on vehicle trips, often single-occupant vehicle trips. At a certain point, the demand cannot be met by supply in terms of space. In this case, there is little that can be done to accommodate an ever-growing increase in vehicle trips except replacing some vehicle trips with other modes like transit, walking, or biking.

Pedestrian

The typical distance a person can be expected to choose walking over driving in a downtown area has traditionally been assumed to 0.25 - 0.5 miles. This can vary between person and is dependent on the environment in which the walking trip occurs. The SCWF development is approximately 0.5 miles by 0.3 miles, which is a small enough area that many trips would be expected to be walking trips. The development also is situated next to the Ann and Roy Butler Hike-and-Bike Trail, which has a high volume of pedestrians and bicyclists throughout the day.

Figure 5 shows a heat map concentration of pedestrians using Strava in the project area. Strava is a widely used mobile application used to track physical activity and is a recognized source of bicycle and pedestrian usage data for decision making. Red indicates the highest use, while purple and blue show relatively lower levels of usage, respectively.

Figure 5: Strava Heat Map for Pedestrian Use in Downtown Austin

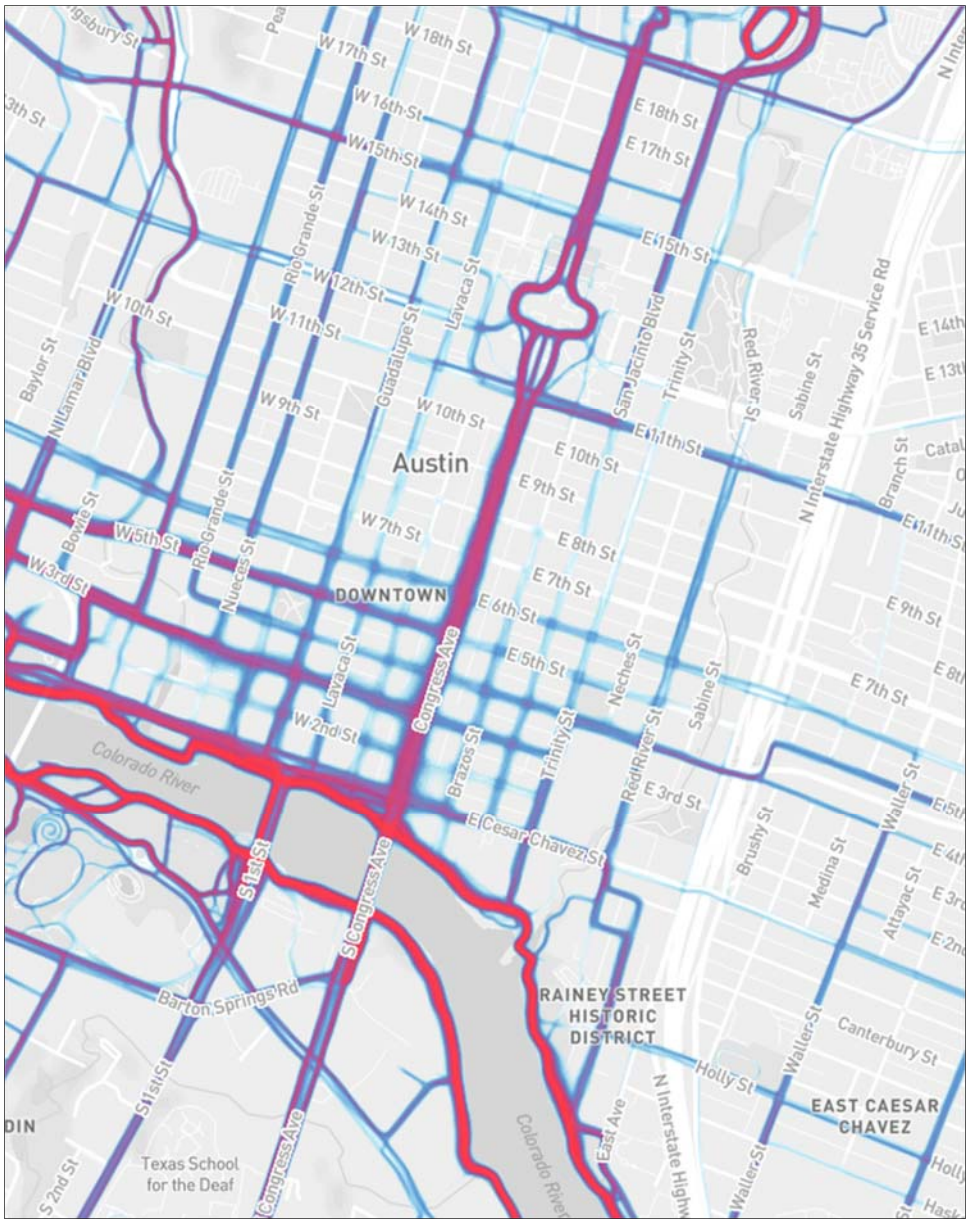


Figure 5 illustrates the high pedestrian demand along Congress Avenue and the key connection to the Hike-and-Bike trail.

Based on the mix of office, retail, and residential land use, the vehicle trip reduction as a result of pedestrian trips and pedestrian infrastructure accommodation likely ranges from 5-20%.

Bicycle

For trips too far to walk, a bike can serve as middle ground between walking and taking transit. The distance itself is not the only consideration when people to choose to bike however. The actual and perceived safety of the bike facility is the largest factor affecting use.

In 2014, Portland State University completed a study evaluating U.S. protected bicycle lanes in terms of their use, perception, benefits, and impacts. The study, Lessons From The Green Lanes: Evaluating

Protected Bike Lanes in the U.S, sampled various areas of the U.S. where protected bike lanes have been implemented, including Austin, Texas. The study found an increase in ridership ranging from 21-171% and, based on survey results, 10% of current riders switched from other modes. Rio Grande Street and Barton Springs Road showed a 126% and 58% increase in bicycle ridership, respectively. Survey of the two Austin, Texas routes showed that 6-7% of riders would have made their trip by other modes.

Figure 6 shows the heat map concentration of bicyclists using Strava in the project area. Red indicates the highest use, while purple and blue show relatively lower levels of usage, respectively.

Figure 6: Strava Heat Map for Bicycle Use in Downtown Austin

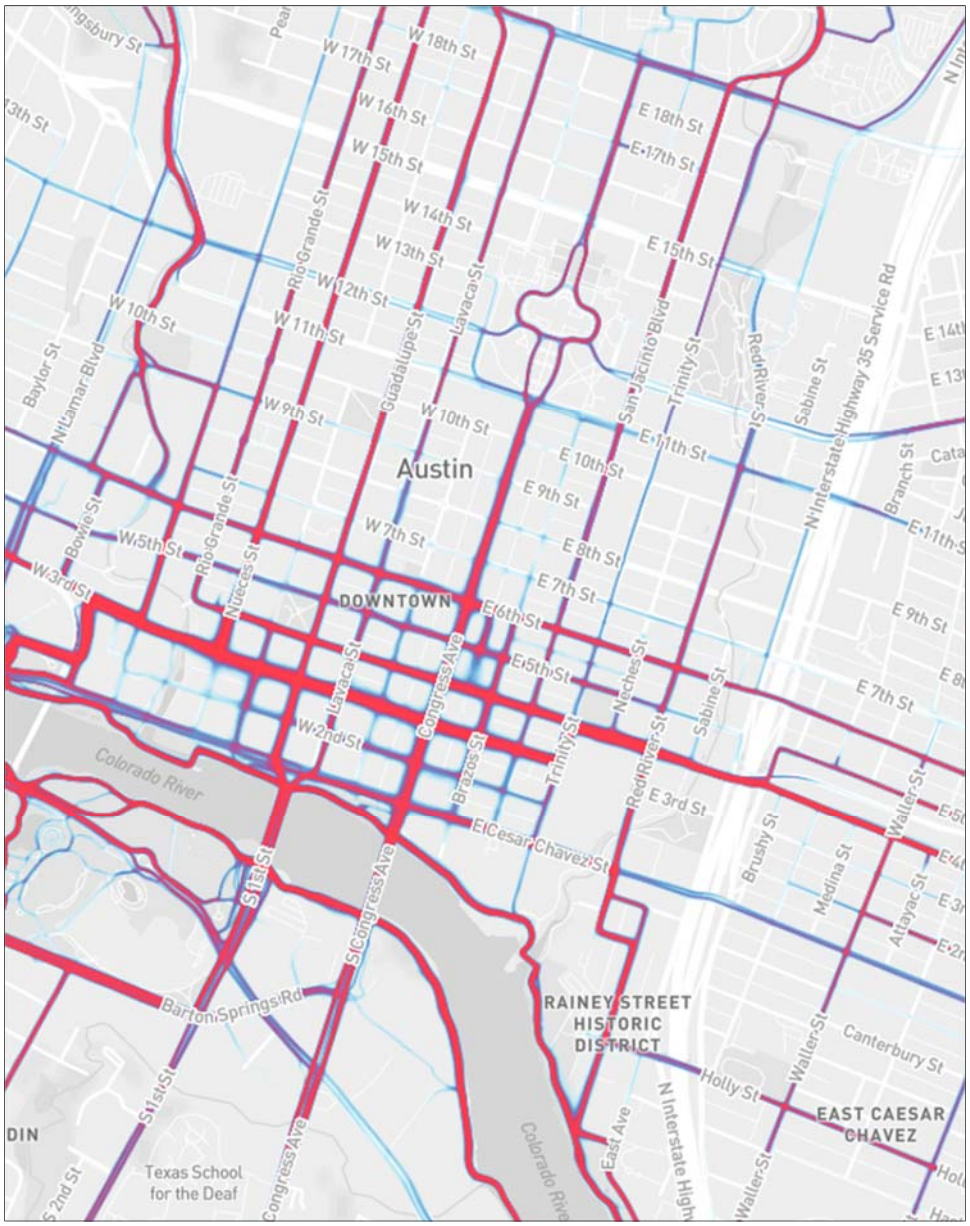


Figure 6 shows that bicycle use is high on Congress Ave and many other adjacent routes. It is important to notice the concentration of bicycle demand on 3rd Avenue, which recently implemented protected bicycle lanes.

Based on the case studies and interest in protected bicycle lanes, it is safe to assume a change of mode choice of 5 to 15% with the implementation of protected bicycle lanes.

Transit

The greatest obstacle to the use of available transit systems is often the distance between the transit station and the traveler's origin or destination, termed the last-mile problem. The advantage of the SCWF development layout is the close proximity between commercial, retail, residential, and office incentivizes trips to occur in the same general vicinity. The proposed development is contained within a half-mile radius.

Currently numerous transit routes run south of Riverside Drive to access South Congress Avenue, but only one route, Route 100 Airport Flyer, operates along Congress Avenue within the project limits.

Transit along Congress Ave is proposed in the Connections 2025 plan and is a corridor of interest in the Project Connect plan. Project Connect, Capital Metropolitan Transportation Authority's (CapMetro) long term plan, released Phase 2 results March 28th, 2018. The Phase 2 documents identified South Congress Avenue and Riverside Drive as key corridors for implementation of high capacity transit (HCT) lines. Both lines terminate at the end of this project's limits into the proposed SCWF location. The amount of capacity and expected use of the high capacity transit line depends on the type. The types still being considered include:

- Lower Investment
  - Bus Rapid Transit (BRT)
  - Street Level Guideway
- Higher Investment
  - Light Rail Transit (LRT)
  - Elevated Guideway

The proposed HCT lines intersect at Riverside Drive and Congress Avenue, adjacent to the proposed SCWF development.

There are multiple articles that illustrate that improved walking and bicycle facilities lead to increased transit ridership, such as "Examining the Link Between Public Transit Use and Active Commuting" (Bopp M, 2015). These studies generally agree that a mixture of high quality bicycle and pedestrian infrastructure, paired with transit supportive land uses lead to increased transit ridership.

Potential transit stop locations have been incorporated into each alternative and provide the necessary infrastructure to operate dedicated transit routes in the future. A station on either side of the bridge would provide transit connection between downtown area development.

A dedicated transit line could see a mode change from vehicles to transit from 10-30%, based on the carrying capacity.

Summary

Since Alternative 1 and 2 offer distinct multi-modal advantages, a sensitivity analysis of SCWF mode split was conducted. The sensitivity analysis is meant to capture the potential mitigation of vehicle delay with the mode split change towards safer, more environmentally friendly, options.

2040 Traffic Analysis Results

Synchro(TM) Version 10.0 uses level of service (LOS) as the method by which the quality of traffic flow is described. LOS describes operational conditions in six levels based upon speed and travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. These six levels are given the letters 'A' through 'F' and are given different descriptions and defining criteria depending on the roadway element analyzed.

LOS criteria for traffic signals are based on the average control delay per vehicle. Control delay includes deceleration and acceleration delay, time spent moving up in queue, and stopped delay. These criteria are shown in **Table 3**. For signalized intersections, LOS 'A' represents very low delay; most vehicles do not stop at all. With LOS 'B' intersections, more vehicles stop which increases the average delay. Under LOS 'C', the number of vehicles stopping is significant. However, many vehicles still pass through the intersection without stopping. LOS 'D' describes conditions where congestion is readily visible with many vehicles stopping and individual cycle failures are noticeable. LOS 'E' generally describes operations with poor vehicle progression, long cycle lengths and frequent cycle failures. LOS 'F' describes unacceptable operations which include many cycle failures caused by arrival flow rates exceeding intersection capacity.

Table 3: LOS Criteria for Signalized Intersections

LOS	Average Control Delay – Signalized Intersections (sec/veh)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Notes: LOS – level of service, sec/veh – seconds per vehicle

For this study, the criterion for minimum acceptable LOS for future conditions is a LOS 'D' or better.

Synchro(TM) Version 10.0 was used to evaluate existing and 2040 intersection conditions.

Alternative 1 and Alternative 2 Synchro Adjustments

Various updates were made to the alternative Synchro models to accommodate the added site traffic and changes in configuration. The bullet list below summarizes the changes to signal timing, signal phasing, and additional roadway geometry changes.

- During the AM peak, 5 seconds of north-south green time was shifted to east-west traffic at the 5th Street intersection.
- During the AM and PM peaks, 10 seconds of westbound green time was shifted to north-south at the 6th Street intersection.
- Protected left turn phases at Cesar Chavez Street and Congress Avenue were added with the addition of proposed northbound and southbound left-turn bays.
- Pedestrian volumes were added based off field observations as conflicting pedestrians per hour for left and right turning vehicles.

- A 70-foot southbound right turn bay was added at Barton Springs Road and Congress Avenue.

A range of potential trip reductions based on available transportation infrastructure was developed with City of Austin coordination and agreed upon for use in the 2040 Synchro traffic analysis. It was generally agreed that providing pedestrian and bicycle accommodations, as in Alternative 1 and 2, would create a mode choice shift towards the proposed infrastructure. The exact amount of shift is unknown, but a series of mode shifts were analyzed to provide a range of possible scenarios. The percentages were established based on case studies (included in previous section) and coordination with the City of Austin Transportation Department. **Table 4** summarizes the mode split scenarios analyzed.

Table 4: 2040 Mode Split Adjustment for No Build and Build Scenarios

Traffic Adjustment	2040 No Build	Alternative 1 and 2		
		Mode Shift Low	Mode Shift Moderate	Mode Shift Aggressive
Vehicle Trip Reduction for Existing Trips	0	4%	8%	12%
Vehicle Trip Reduction for South Central Waterfront Site Trips	30%	40%	50%	60%

The subsequent 2040 traffic volumes for each scenario were analyzed using Synchro 10.0 software. **Appendix C** through **E** include the Synchro results from the sensitivity analyses. **Figure 7** and **8** are a graphical display of intersection delay for AM and PM peaks, respectively. **Table 5** and **6** summarize the intersection LOS and delay.

As shown in the tables and graphs, the intersections with the highest overall delay in all alternatives are Cesar Chavez Street and Riverside Drive at Congress Avenue. An aggressive mode shift with Alternative 1 and 2 results in intersection delay below or only slightly higher than the No-Build scenario. The increase in mode shift to pedestrian, bicycle, or transit illustrate the associated improvement in vehicle delay.

Figure 7: 2040 AM Peak Intersection Delays

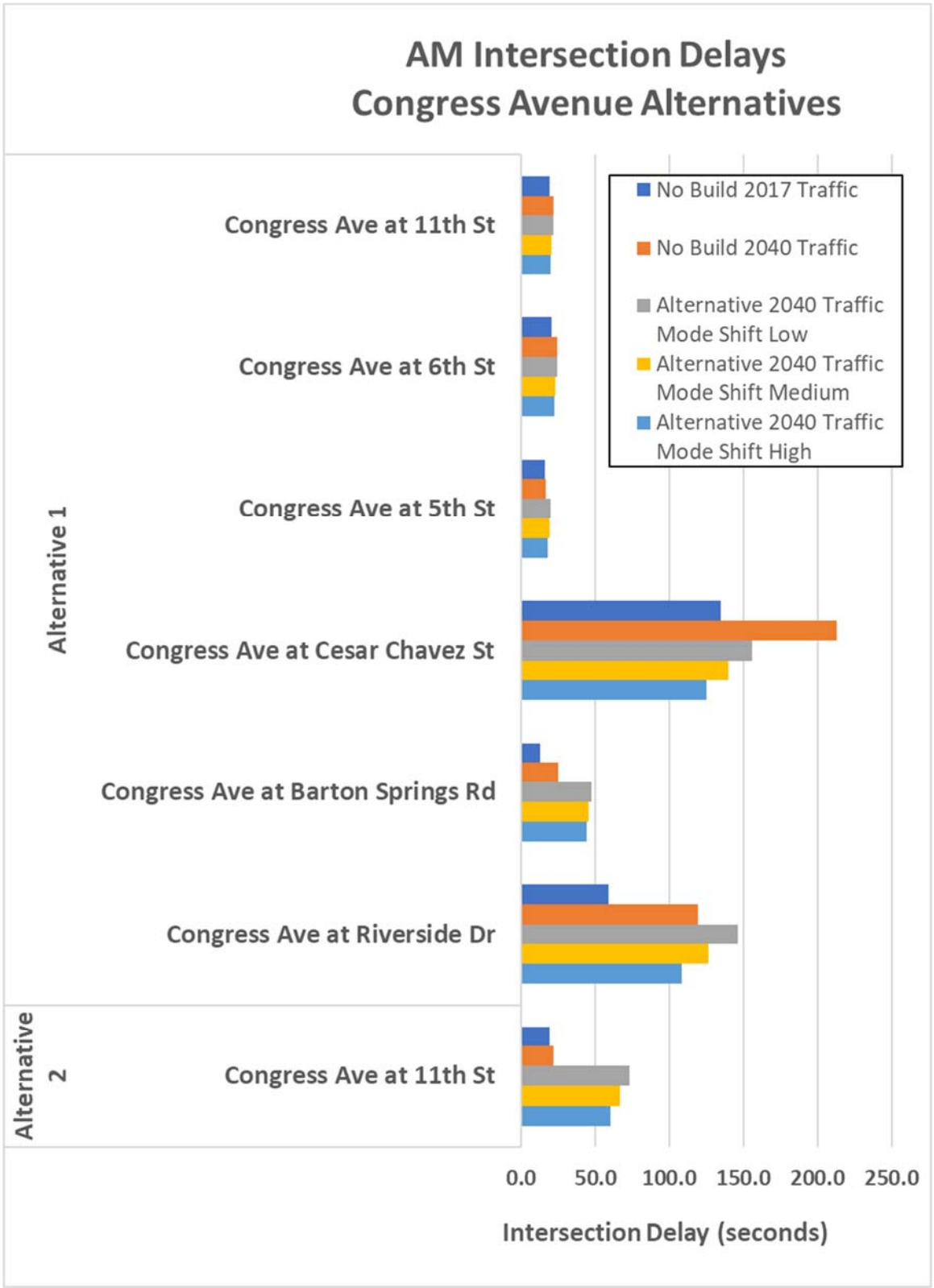


Figure 8: 2040 PM Peak Intersection Delays

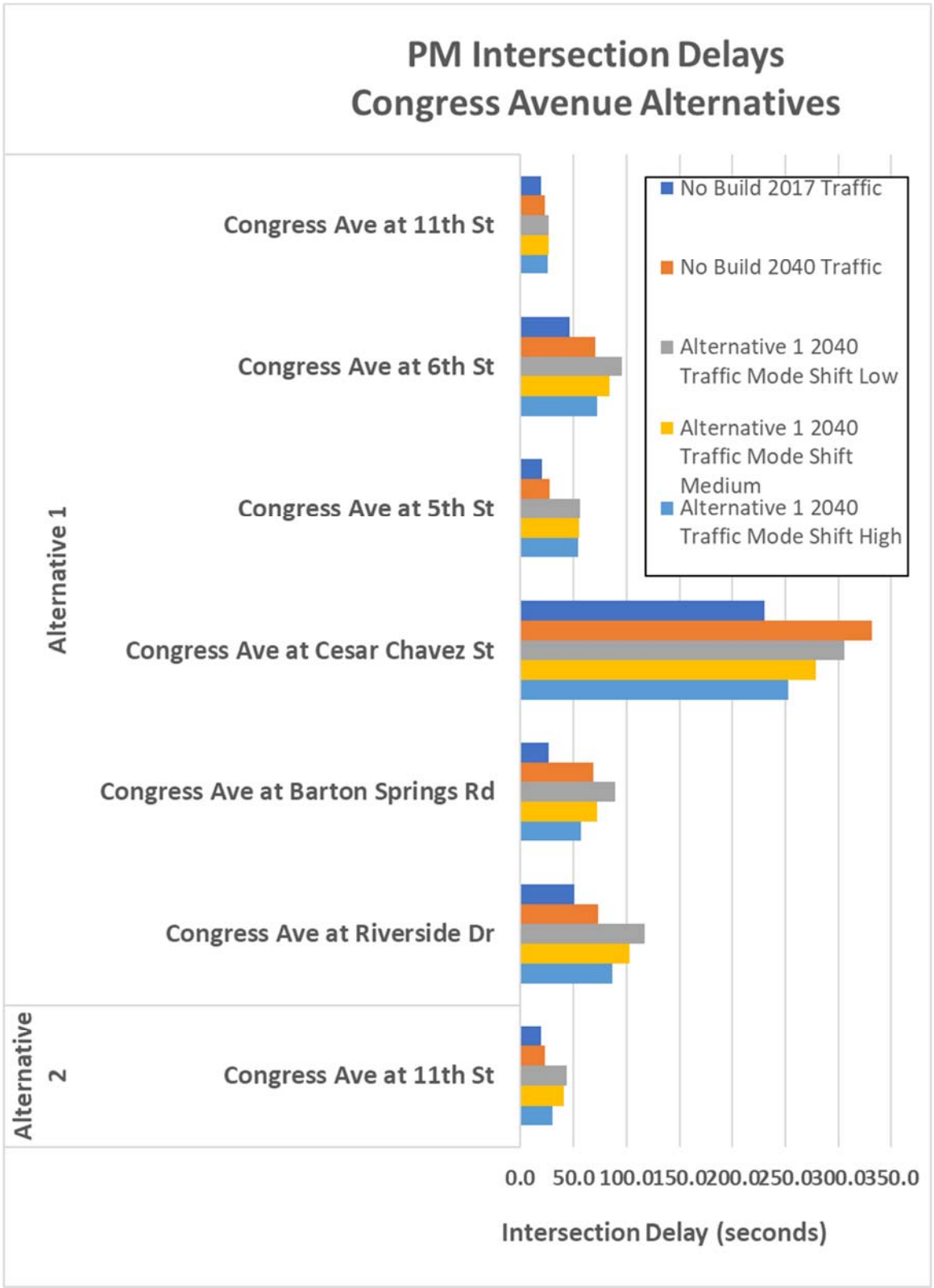


Table 5: Synchro Level of Service Results – Existing/No Build vs. Alternative 1

Node #	Intersection	MOE	2017		2040							
			Existing		No Build		Alternative 1					
							Low Shift 1 - 40%		Medium Shift 2 - 50%		High Shift 3 - 60%	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
101	Congress Ave at 11th St	LOS	B	B	C	C	C	C	C	C	B	C
		Delay (s)	19.2	19.3	21.9	22.8	21.6	26.8	20.6	26.4	19.8	26.1
102	Congress Ave at 6th St	LOS	C	D	C	E	C	F	C	F	C	E
		Delay (s)	20.3	46.7	24.1	70.2	24.2	95.6	23.3	83.8	22.7	72.2
103	Congress Ave at 5th St	LOS	B	C	B	C	C	E	B	E	B	D
		Delay (s)	16.2	20.7	16.8	27.2	20.1	55.9	19.1	55.6	18.2	54.8
104	Congress Ave at Cesar Chavez St	LOS	F	F	F	F	F	F	F	F	F	F
		Delay (s)	134.4	229.9	213.0	331.7	155.6	305.4	140.0	278.4	125.0	252.9
105	Congress Ave at Barton Springs Rd	LOS	B	C	C	E	D	F	D	E	D	E
		Delay (s)	12.8	26.8	25.1	68.9	47.7	89.0	45.3	72.5	44.4	57.5
106	Congress Ave at Riverside Dr	LOS	E	D	F	E	F	F	F	F	F	F
		Delay (s)	58.8	51.2	119.4	73.7	145.9	117.5	126.5	102.7	108.4	87.0

Table 6: Synchro Level of Service Results – Existing/No Build vs. Alternative 2

Node #	Intersection	MOE	2017		2040							
			Existing		No Build		Alternative 2					
							Low Shift 1 - 40%		Medium Shift 2 - 50%		High Shift 3 - 60%	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
101	Congress Ave at 11th St	LOS	B	B	C	C	E	D	E	D	E	C
		Delay (s)	19.2	19.3	21.9	22.8	72.9	44.0	66.4	41.0	60.2	29.8

The Alternative 1 results show the Cesar Chavez Street and Riverside Drive intersections are projected to perform at an unacceptable LOS with the highest delay per vehicle. The delay per vehicle decreases in the AM peak due to the addition of the northbound left-turn bay that provides a protected movement and removes left-turning vehicles from the path of vehicles traveling north of Cesar Chavez Street. During the PM peak, the intersections of Congress Avenue at 6th Street, 5th Street, and Barton Springs Road are also projected to perform at unacceptable LOS, but improve with the increasing mode shifts.

Alternative 2 directly impacts one study intersection, Congress Avenue at 11th Street. With this alternative, one northbound left-turn lane is removed. The resulting LOS is acceptable and the delay at the intersection increases. There is an impact to 2nd through 5th street, in which each would either have permitted left turns that slow vehicle progression or require prohibiting left turn movements with vehicles routed through other routes.

Alternatives 1 and 2 have slightly increased vehicle LOS, but they offer improved mode choice options with dedicated width to pedestrians and bicycles. The proposed alternatives create a safer environment for these modes. The alternatives also designate space for potential future transit stop locations.

Travel time for the peak commuter movements were calculated along the corridor by adding the total delay for northbound and southbound movements at intersections to the free flow travel time between blocks. The results are summarized in **Figure 9**.

Figure 9: Congress Avenue Travel Times

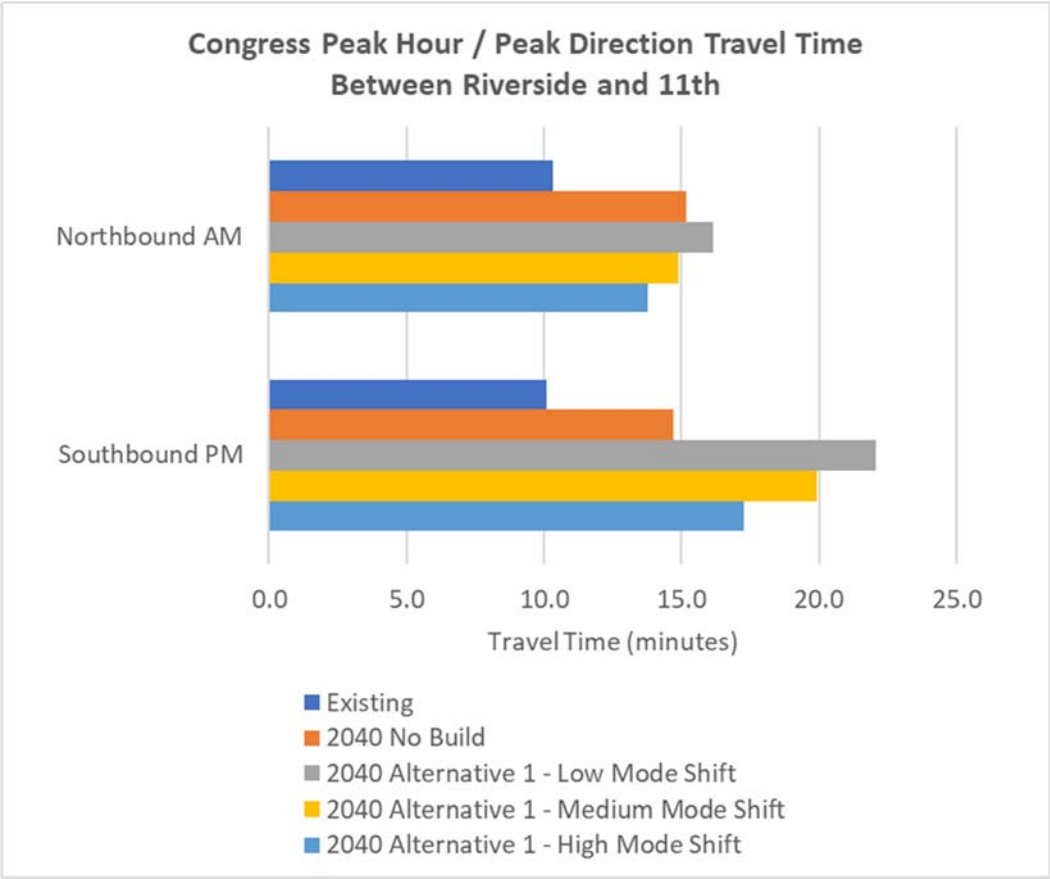


Figure 9 shows that for the AM peak, the medium and high mode shift scenarios have a lower travel time in comparison to the No Build. For the PM peak, all three shifts have longer travel times in comparison to the No Build.

Summary

This technical memorandum includes the analysis of expected future traffic along the Congress Avenue downtown corridor. Several alternatives were analyzed including:

- No-Build – In this scenario, the Congress Avenue corridor would remain a six-lane cross section with slanted parking. The pedestrian width and lack of a dedicated bicycle facility would stay as it currently functions.
- Alternative 1 – This scenario included a five-lane scenario for most of the corridor. It includes dedicated bicycle lanes in both directions for the entire length of the corridor and options to address parking between blocks.
- Alternative 2 – The final scenario considers four-lane sections at certain points on the corridor to provide greater sidewalk width. This scenario also includes dedicated bicycle facilities for the length of the corridor.

A key point in this analysis was that an investment in pedestrian, bicycle, and transit infrastructure could potentially decrease vehicle trips from existing trips and future development by encouraging locals to utilize the multi-modal facilities instead of vehicles.

The traffic analysis showed mixed results with some intersections having higher delay even with mode shifts to pedestrian, bicycle, and transit modes, while other intersections showed lower delay. Overall, the traffic analysis did not preclude the alternatives from moving forward for consideration and should be considered to achieve multi-modal mobility and a safer infrastructure.

Appendix A: South Central Waterfront Vision Framework Plan (Relevant Pages)


S1 280'
S2 400'
S1 300'
S1 200'
S3 240'
S4 240'
S5 90'
L1 90'
A6 200'
J22 /23 100'
C3 180'
C4 200'
B3-5 200'
D9 100'
C2 240'
C1 110'
K31-33 100'
C6-8 195'
G14/15 200'
H16/17 200'
H16/20 200'
F12 60'
Hotel
Ground Floor Retail
Office
Residential
3.2 m SF
Existing Scenario
4.5 m SF
Feasible Baseline
8.5 m SF
Test Scenario

Attachment 4: Test Scenario Results

Parcel	A6	B3, B4, B5	C6,C7,C8	D9	F12	G14,G15	H16, H17, H20	S1 Sub-Parcel:	S2 Sub-Parcel:	S3 Sub-Parcel:
Use	Office	Office	Office/MF	MF	MF/Office	Office	Office/MF	Office	Hotel	MF
Acres	3.71	1.71	1.50	0.92	1.24	1.56	6.09	2.30	0.73	1.49
PUD?	Y			Y			Y		Y	
Entitlement Assumptions										
FAR	2.4	3.5	4.7	3.7	3.2	5.3	3.0	8.5	8.4	7.0
Height (Stories)	13	13	14	9	5 to 6	15	15 to 18	17 to 26	24	7 to 21
Use Mix										
Office SF	360,000	250,000	270,525	0	10,000	347,600	371,000	812,900	0	0
Hotel SF	0	0	0	0	0	0	0	0	254,500	0
Retail SF	20,000	10,000	21,045	9,000	7,000	10,000	32,000	38,000	12,000	25,000
Residential SF	0	0	13,800	152,000	155,975	0	387,000	0	0	430,750
Total SF	**380,000**	**260,000**	**305,370**	**161,000**	**172,975**	**357,600**	**790,000**	**850,900**	**266,500**	**455,750**
Residential Units										
Market Residential Units	0	0	9	152	0	0	344	0	0	430
Affordable Residential Units	0	0	0	52	150	0	86	0	0	0
Total Units	0	0	9	204	150	0	430	0	0	430
Affordable Housing Subsidy	$ -	$ -	$ -	$ 5,460,000	$ 4,050,000	$ -	$ 4,300,000	$ -	$ -	$ -
Per Unit Subsidy	$ -	$ -	$ -	$ 105,000	$ 27,000	$ -	$ 50,000	$ -	$ -	$ -
Parking										
Surface	0	0	0	0	0	0	0	0	0	0
Structure	170	520	772	222	128	476	824	919	340	287
Underground	0	0	96	0	0	238	412	459	170	143
Total Spaces	**170**	**520**	**868**	**222**	**128**	**714**	**1,236**	**1,378**	**510**	**430**
Development Cost										
Building Cost	$109 M	$86 M	$109 M	$55 M	$31 M	$123 M	$258 M	$281 M	$108 M	$143 M
Parcel Infastructure Cost	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$2.6 M	$1.3 M	$4.8 M	$1.7 M	$0.5 M	$3.3 M
DistrictMaster Planning Fee	$3.8 M	$2.6 M	$3.1 M	$1.6 M	$1.7 M	$3.6 M	$7.9 M	$8.5 M	$2.7 M	$4.6 M
Financial Results										
Return on Cost	8.1%	8.1%	8.2%	7.0%	7.0%	8.1%	7.6%	8.1%	#N/A	7.0%
Building Value	$141 M	$109 M	$137 M	$71 M	$39 M	$155 M	$327 M	$354 M	$145 M	$177 M
Total Land Value	$32 M	$16 M	$12 M	$5 M	$0 M	$18 M	$33 M	$50 M	$13 M	$8 M
Total Value (Land + Building)	$173 M	$125 M	$148 M	$76 M	$39 M	$173 M	$361 M	$404 M	$158 M	$185 M
Residual Land Value / SF	**$200**	**$220**	**$180**	**$125**	**$0**	**$260**	**$125**	**$500**	**$400**	**$125**

Test Scenario Results, Continued

Parcel Use	S4 Sub-Parcel: MF	S5 Sub-Parcel: MF	J22, J23 Office	C1 Sub-Parcel: MF	C2 Sub-Parcel: Office	C3 Sub-Parcel MF	C4 Sub-Parcel MF	K31, K32, K33 MF	L1 MF	Total
Acres	1.49	0.58	0.81	1.25	2.00	1.19	1.08	1.87	2.99	48.7
PUD?										
Entitlement Assumptions										
FAR	7.0	4.5	4.6	7.1	4.1	5.7	5.1	3.3	1.3	
Height (Stories)	7 to 21	8	8	21	22 to 23	16	17	7 to 9	9	
Use Mix										
Office SF	0	0	153,000	0	325,900	0	0	0	0	2,900,925
Hotel SF	0	0	0	0	0	0	0	0	0	254,500
Retail SF	25,000	12,000	10,000	19,318	35,000	14,861	30,000	14,300	0	344,524
Residential SF	430,750	102,000	0	293,626	0	225,891	211,000	202,348	163,000	2,768,140
Total SF	455,750	114,000	163,000	312,944	360,900	240,752	241,000	216,648	163,000	6,268,088
Residential Units										
Market Residential Units	430	102	0	289	0	210	186	238	163	2,553
Affordable Residential Units	0	40	0	73	0	52	0	74	0	527
Total Units	430	142	0	362	0	262	186	312	163	3,080
Affordable Housing Subsidy	$ -	$ 1,400,000	$ -	$ 20,440,000	$ -	$ 15,600,000	$ -	$ 8,510,000	$ -	$60 M
Per Unit Subsidy	$ -	$ 35,000	$ -	$ 280,000	$ -	$ 300,000	$ -	$ 115,000	$ -	
Parking										
Surface	0	0	0	0	0	0	0	0	0	0
Structure	287	140	163	247	839	210	186	342	240	7,310
Underground	143	0	163	123	413	52	0	0	0	2,412
Total Spaces	430	140	326	370	1,252	262	186	342	240	9,722
Development Cost										
Building Cost	$143 M	$30 M	$56 M	$105 M	$142 M	$79 M	$72 M	$71 M	$52 M	$2,053 M
Parcel Infastructure Cost	$2.9 M	$0.9 M	$0.0 M	$3.4 M	$3.4 M	$1.8 M	$1.9 M	$0.0 M	$0.0 M	$28 M
DistrictMaster Planning Fee	$4.6 M	$1.1 M	$1.6 M	$3.1 M	$3.6 M	$2.4 M	$2.4 M	$2.2 M	$1.6 M	$63 M
Financial Results										
Return on Cost	7.0%	7.0%	8.0%	7.0%	8.0%	7.0%	7.0%	7.0%	7.0%	-
Building Value	$177 M	$39 M	$69 M	$135 M	$170 M	$102 M	$85 M	$93 M	$66 M	$2,593 M
Total Land Value	$8 M	$3 M	$8 M	$7 M	$8 M	$6 M	$6 M	$10 M	$0 M	$245 M
Total Value (Land + Building)	$185 M	$43 M	$78 M	$142 M	$178 M	$109 M	$91 M	$103 M	$67 M	$2,838 M
Residual Land Value / SF	**$125**	**$125**	**$240**	**$125**	**$80**	**$125**	**$130**	**$125**	**$2**	

Appendix B: SCWF Trip Generation Summary

Project Name:
ITE Standard Method by Individual Uses - 9th Edition

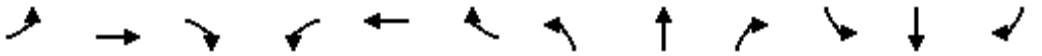
BLOCK	TRACT	ITE CODE	UNITS		ITE DESCRIPTION	ADJUSTED TRIPS								
						ADT			AM PEAK VOLS			PM PEAK VOLS		
						TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
a-6	1	710b	360.000	KSF	General Office Building (10th - center city core)	0	0	0	180	158	22	151	25	126
a-6	2	826	20.000	KSF	Specialty Retail Center	518	261	257	0	0	0	48	21	27
b-3,4,5	3	710	250.000	KSF	General Office Building	2,355	1,209	1,146	398	350	48	353	59	294
b-3,4,5,	4	826	10.000	KSF	Specialty Retail Center	260	131	129	0	0	0	31	14	17
c-6,7,8	5	710b	270.525	KSF	General Office Building (10th - center city core)	0	0	0	135	119	16	115	19	96
c-6,7,8	6	826	21.045	KSF	Specialty Retail Center	547	276	271	0	0	0	50	22	28
c-6,7,8	7	220b	9.000	OCC.DU	Low-RISE APARTMENT (10TH ED - dense multi-use urban)	33	16	17	3	1	2	3	2	1
d-9	9	231	195.840	DU	mid-rise residential with 1st floor commercial	0	0	0	61	25	36	86	36	50
f-12	10	710b	10.000	KSF	General Office Building (10th - center city core)	0	0	0	5	4	1	5	1	4
g-14,15	13	710b	347.600	KSF	General Office Building (10th - center city core)	0	0	0	174	153	21	146	24	122
g-14,15	14	826	10.000	KSF	Specialty Retail Center	260	131	129	0	0	0	31	14	17
h-16,17,20	15	710b	371.000	KSF	General Office Building (10th - center city core)	0	0	0	185	163	22	156	26	130
h-16,17,20	17	232	412.800	DU	HIGH-rise residential with 1st floor commercial	0	0	0	128	27	101	81	47	34
s-1	18	710b	812.900	KSF	General Office Building (10th - center city core)	0	0	0	407	358	49	343	57	286
s-1	19	826	38.000	KSF	Specialty Retail Center	985	497	488	0	0	0	77	34	43
s-2	20	310b	425.000	ROOMS	HOTEL	2,876	1,401	1,475	225	133	92	238	119	119
s-2	21	826	12.000	KSF	Specialty Retail Center	311	157	154	0	0	0	34	15	19
s-3	23	232	413.520	DU	HIGH-rise residential with 1st floor commercial	0	0	0	128	27	101	81	47	34
s-4	25	232	412.800	DU	HIGH-rise residential with 1st floor commercial	0	0	0	128	27	101	81	47	34
s-5	27	231	136.320	DU	mid-rise residential with 1st floor commercial	0	0	0	42	17	25	60	26	34
j-22,23	28	710b	153.000	KSF	General Office Building (10th - center city core)	0	0	0	76	67	9	65	11	54
j-22,23	29	826	10.000	KSF	Specialty Retail Center	260	131	129	0	0	0	31	14	17
c-1	31	232	347.520	DU	HIGH-rise residential with 1st floor commercial	0	0	0	108	23	85	68	39	29
c-2	32	710b	325.900	KSF	General Office Building (10th - center city core)	0	0	0	163	143	20	138	23	115
c-2	33	826	35.000	KSF	Specialty Retail Center	908	458	450	0	0	0	73	32	41
c-3	35	231	251.520	DU	mid-rise residential with 1st floor commercial	0	0	0	78	32	46	110	47	63
c-4	37	231	178.560	DU	mid-rise residential with 1st floor commercial	0	0	0	56	23	33	79	34	45
k -31,32,33	39	232	299.520	DU	HIGH-rise residential with 1st floor commercial	0	0	0	92	19	73	59	34	25
l-1	40	221c	156.480	OCC.DU	Mid Rise Apartment (10th ed dense multi-use urban)	503	245	258	45	12	33	37	23	14
					Total	9,816	4,913	4,903	2,817	1,881	936	2,830	912	1,918

2040 NO-BUILD TRAFFIC VOLUMES

Intersection	INTID	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Congress and 11th	101	240	0	240	0	0	0	0	229	39	68	370	0
Congress and 6th	102	314	963	0	0	302	86	0	0	0	244	1223	61
Congress and 5th	103	0	1097	218	118	402	0	84	784	95	0	0	0
Congress and Cesar Chavez	104	200	2226	587	25	589	67	213	973	413	200	492	115
Congress and Barton Springs	105	96	2118	165	130	492	348	464	143	50	34	178	178
Congress and Riverside	106	334	1726	161	155	283	53	161	552	128	227	1293	541

Intersection	INTID	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Congress and 11th	101	205	0	266	0	0	0	0	418	137	167	332	0
Congress and 6th	102	277	772	0	0	1500	126	0	0	0	286	881	79
Congress and 5th	103	0	880	196	75	1733	0	119	942	347	0	0	0
Congress and Cesar Chavez	104	314	1071	498	167	1978	223	93	1338	472	484	1115	59
Congress and Barton Springs	105	95	958	78	82	2377	476	376	97	115	91	286	287
Congress and Riverside	106	266	723	203	530	1908	75	112	1055	286	184	870	305

Appendix C: 2017 Existing & 2040 No-Build Results



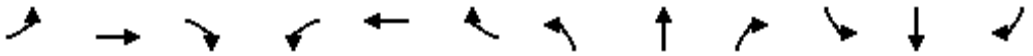
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	205	31	54	332	0	200	0	200	0	0	0
Future Volume (vph)	0	205	31	54	332	0	200	0	200	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	2		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	3433	0	1583	0	1863	0
Flt Permitted					0.874		0.950					
Satd. Flow (perm)	0	3539	1472	0	3076	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						206			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	211	32	0	398	0	206	0	206	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.12	0.04		0.22		0.72		0.58			
Control Delay		15.7	0.1		12.4		44.5		13.5			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.7	0.1		12.4		44.5		13.5			
LOS		B	A		B		D		B			
Approach Delay		13.7			12.4			29.0				
Approach LOS		B			B			C				
Queue Length 50th (ft)		43	0		73		66		70			
Queue Length 95th (ft)		65	0		99		#126		107			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50									
Base Capacity (vph)		1796	800		1792		286		496			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.12	0.04		0.22		0.72		0.42			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 19.2		Intersection LOS: B	
Intersection Capacity Utilization 55.7%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: 11th Street

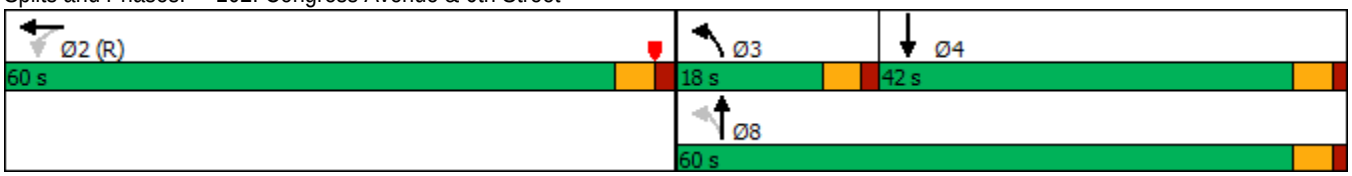


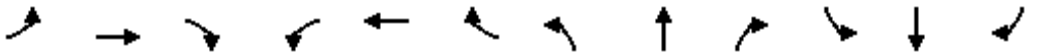
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	185	1097	55	261	800	0	0	229	77
Future Volume (vph)	0	0	0	185	1097	55	261	800	0	0	229	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5677	0	0	4522	0	0	4311	0
Flt Permitted					0.993			0.740				
Satd. Flow (perm)	0	0	0	0	5634	0	0	3354	0	0	4311	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9						73	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1408	0	0	1117	0	0	322	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				60.0	60.0		18.0	60.0			42.0	
Total Split (%)				50.0%	50.0%		15.0%	50.0%			35.0%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.5			5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					54.5			55.0			37.0	
Actuated g/C Ratio					0.45			0.46			0.31	
v/c Ratio					0.55			0.67			0.23	
Control Delay					24.7			13.5			22.1	
Queue Delay					0.0			0.8			0.0	
Total Delay					24.7			14.2			22.1	
LOS					C			B			C	
Approach Delay					24.7			14.2			22.1	
Approach LOS					C			B			C	
Queue Length 50th (ft)					223			184			51	
Queue Length 95th (ft)					259			250			77	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)												
Base Capacity (vph)					2563			1663			1379	
Starvation Cap Reductn					0			250			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio					0.55			0.79			0.23	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 20.3		Intersection LOS: C	
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			
Description: 6th Street			

Splits and Phases: 102: Congress Avenue & 6th Street



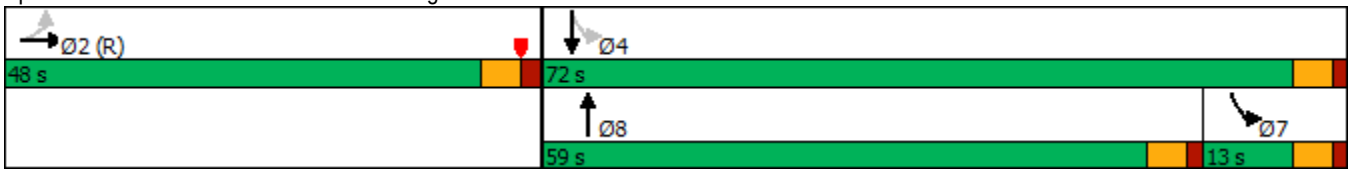


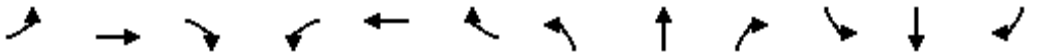
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	703	67	0	0	0	0	900	179	106	285	0
Future Volume (vph)	75	703	67	0	0	0	0	900	179	106	285	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1593	4492	0	0	0	0	0	4404	0	0	4517	0
Flt Permitted	0.950										0.645	
Satd. Flow (perm)	1505	4492	0	0	0	0	0	4404	0	0	2945	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14						45				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	819	0	0	0	0	0	1147	0	0	416	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						59.0		13.0	72.0	
Total Split (%)	40.0%	40.0%						49.2%		10.8%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0			0.0	
Total Lost Time (s)	5.5	5.5						5.0			5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						54.0			67.0	
Actuated g/C Ratio	0.35	0.35						0.45			0.56	
v/c Ratio	0.15	0.51						0.57			0.24	
Control Delay	27.5	31.4						5.3			14.0	
Queue Delay	0.0	0.0						0.1			0.0	
Total Delay	27.5	31.4						5.4			14.0	
LOS	C	C						A			B	
Approach Delay		31.0						5.4			14.0	
Approach LOS		C						A			B	
Queue Length 50th (ft)	42	178						33			60	
Queue Length 95th (ft)	80	221						m22			77	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)												
Base Capacity (vph)	533	1599						2006			1749	
Starvation Cap Reductn	0	0						0			0	
Spillback Cap Reductn	0	0						83			0	
Storage Cap Reductn	0	0						0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.15	0.51						0.60			0.24	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 16.2		Intersection LOS: B	
Intersection Capacity Utilization 74.7%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	873	191	136	441	103	162	1800	475	22	400	60
Future Volume (vph)	191	873	191	136	441	103	162	1800	475	22	400	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	0		175	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	1593	2991	0	0	4274	1225	0	4390	0
Flt Permitted	0.225			0.319				0.809			0.728	
Satd. Flow (perm)	359	3185	1170	508	2991	0	0	3451	1025	0	3202	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182		26			3	227		25	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	90		90	90		90	90		90	90		90
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)									10%			
Lane Group Flow (vph)	195	891	195	139	555	0	0	2051	436	0	491	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0		27.0	27.0	27.0	27.0	27.0	
Total Split (s)	21.0	52.0	52.0	16.0	47.0		52.0	52.0	52.0	52.0	52.0	
Total Split (%)	17.5%	43.3%	43.3%	13.3%	39.2%		43.3%	43.3%	43.3%	43.3%	43.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	Max	Max	Max	Max	Max		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)	46.0	46.0	46.0	41.0	41.0			46.0	46.0		46.0	
Actuated g/C Ratio	0.38	0.38	0.38	0.34	0.34			0.38	0.38		0.38	
v/c Ratio	0.67	0.73	0.35	0.53	0.53			1.55	0.82		0.40	
Control Delay	38.4	36.0	6.2	45.0	32.5			280.0	29.6		27.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay	38.4	36.0	6.2	45.0	32.5			280.0	29.6		27.1	
LOS	D	D	A	D	C			F	C		C	
Approach Delay		31.8			35.0			236.1			27.1	
Approach LOS		C			D			F			C	
Queue Length 50th (ft)	105	307	6	77	172			~874	180		110	
Queue Length 95th (ft)	167	385	57	130	229			#977	#419		147	
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175					175			
Base Capacity (vph)	291	1220	560	263	1039			1324	532		1242	

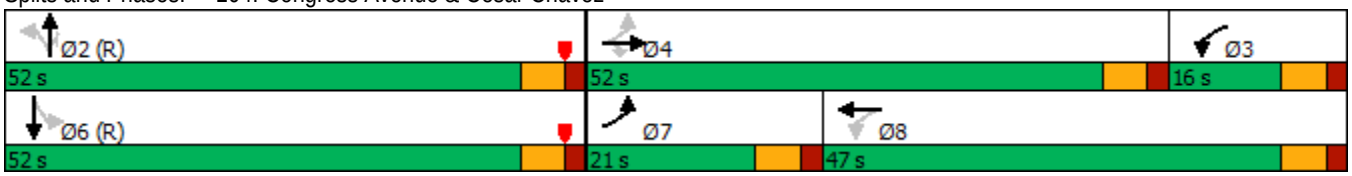
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0			0	0		0	
Spillback Cap Reductn	0	0	0	0	0			0	0		0	
Storage Cap Reductn	0	0	0	0	0			0	0		0	
Reduced v/c Ratio	0.67	0.73	0.35	0.53	0.53			1.55	0.82		0.40	

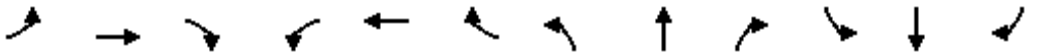
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 54 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Red			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.55			
Intersection Signal Delay: 134.4		Intersection LOS: F	
Intersection Capacity Utilization 119.3%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 104: Congress Avenue & Cesar Chavez



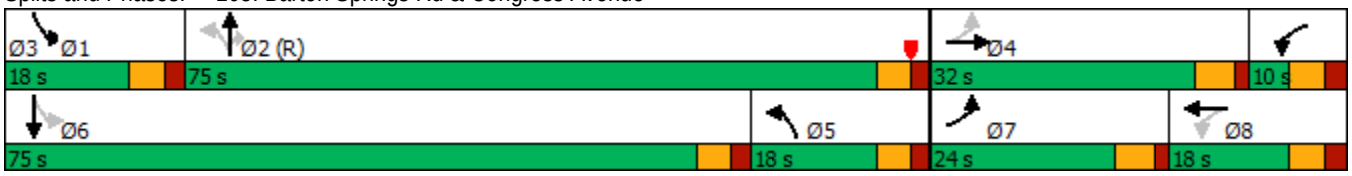


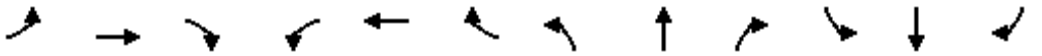
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	15	44	7	9	10	73	1800	41	31	386	221
Future Volume (vph)	400	15	44	7	9	10	73	1800	41	31	386	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		0
Storage Lanes	2		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1610	0	1770	1680	0	1770	5085	1583	1770	4626	0
Flt Permitted	0.556			0.716			0.392			0.057		
Satd. Flow (perm)	1960	1610	0	1304	1680	0	705	5085	1497	106	4626	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		47			11				158		158	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	430	63	0	8	21	0	78	1935	44	33	653	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0		3.0	25.0	25.0	3.0	25.0	
Minimum Split (s)	20.0	38.5		10.0	35.0		15.0	45.0	45.0	15.0	45.0	
Total Split (s)	24.0	32.0		10.0	18.0		18.0	75.0	75.0	18.0	75.0	
Total Split (%)	17.8%	23.7%		7.4%	13.3%		13.3%	55.6%	55.6%	13.3%	55.6%	
Yellow Time (s)	4.0	4.0		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5		2.5	2.5		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	Max	
Act Effct Green (s)	29.7	27.5		13.6	10.8		85.5	85.5	85.5	80.2	80.2	
Actuated g/C Ratio	0.22	0.20		0.10	0.08		0.63	0.63	0.63	0.59	0.59	
v/c Ratio	0.67	0.17		0.05	0.15		0.16	0.60	0.04	0.26	0.23	
Control Delay	52.1	16.5		54.1	37.4		4.5	4.5	0.0	20.3	11.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.1	0.0	0.0	0.0	
Total Delay	52.1	16.5		54.1	37.4		4.5	4.6	0.0	20.3	11.2	
LOS	D	B		D	D		A	A	A	C	B	
Approach Delay		47.6			42.0			4.5			11.7	
Approach LOS		D			D			A			B	
Queue Length 50th (ft)	147	9		5	8		13	140	0	14	84	
Queue Length 95th (ft)	237	52		24	36		m13	m130	m0	32	110	
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		
Base Capacity (vph)	654	431		152	178		575	3228	1008	217	2813	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	288	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.66	0.15		0.05	0.12		0.14	0.66	0.04	0.15	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 72 (53%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 12.8		Intersection LOS: B	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			
Description: Barton Springs			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	467	109	144	935	334	269	1500	118	110	231	20
Future Volume (vph)	87	467	109	144	935	334	269	1500	118	110	231	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	225		0	180		0
Storage Lanes	1		1	1		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1583	1770	3369	0	3433	5009	0	3433	5001	0
Flt Permitted	0.094			0.323			0.950			0.950		
Satd. Flow (perm)	175	3539	1526	596	3369	0	3253	5009	0	3408	5001	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112		44			10			11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	481	112	148	1308	0	277	1668	0	113	259	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4								
Detector Phase	3	8	5	7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	10.0	3.0	3.0	10.0		3.0	5.0		3.0	4.0	
Minimum Split (s)	13.0	38.0	8.0	8.0	38.0		8.0	32.0		8.0	32.0	
Total Split (s)	13.0	50.0	17.0	22.0	59.0		17.0	48.0		15.0	46.0	
Total Split (%)	9.6%	37.0%	12.6%	16.3%	43.7%		12.6%	35.6%		11.1%	34.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min	None	None	Min		None	Min		None	C-Max	
Act Effct Green (s)	50.6	50.6	62.5	53.6	53.6		11.9	43.4		10.0	41.5	
Actuated g/C Ratio	0.37	0.37	0.46	0.40	0.40		0.09	0.32		0.07	0.31	
v/c Ratio	0.56	0.36	0.15	0.45	0.96		0.92	1.03		0.44	0.17	
Control Delay	62.5	32.0	3.8	31.3	54.8		95.2	75.2		56.6	24.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	62.5	32.0	3.8	31.3	54.8		95.2	75.2		56.6	24.1	
LOS	E	C	A	C	D		F	E		E	C	
Approach Delay		31.4			52.4			78.1			34.0	
Approach LOS		C			D			E			C	
Queue Length 50th (ft)	51	158	0	84	564		126	~576		50	60	
Queue Length 95th (ft)	97	217	33	135	#723		#209	#675		82	86	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150			225			180		
Base Capacity (vph)	160	1326	772	384	1374		305	1618		254	1546	

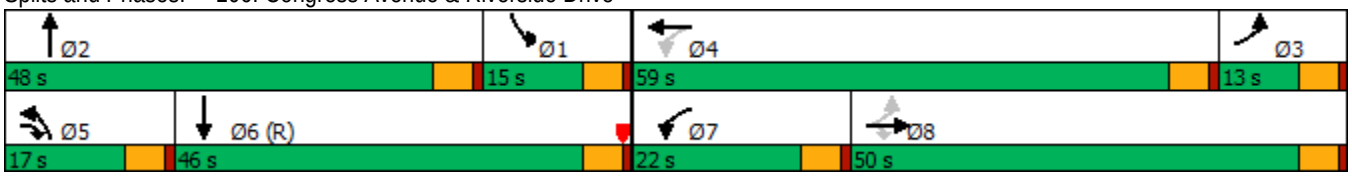
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.56	0.36	0.15	0.39	0.95		0.91	1.03		0.44	0.17	

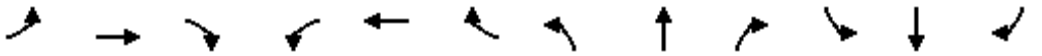
Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 60 (44%), Referenced to phase 6:SBT, Start of Red			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 58.8		Intersection LOS: E	
Intersection Capacity Utilization 95.5%		ICU Level of Service F	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Congress Avenue & Riverside Drive



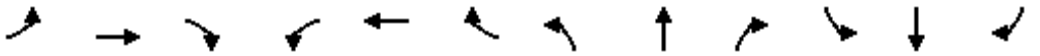


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	375	119	145	298	0	148	0	192	0	0	0
Future Volume (vph)	0	375	119	145	298	0	148	0	192	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	2		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3185	1425	0	3134	0	3090	0	1425	0	1676	0
Flt Permitted					0.664		0.950					
Satd. Flow (perm)	0	3185	1325	0	2096	0	2783	0	1334	0	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						204			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	399	127	0	471	0	157	0	204	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.25	0.17		0.38		0.61		0.61			
Control Delay		17.2	4.6		14.1		62.2		11.7			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		17.2	4.6		14.1		62.2		11.7			
LOS		B	A		B		E		B			
Approach Delay		14.1			14.1			33.7				
Approach LOS		B			B			C				
Queue Length 50th (ft)		88	7		90		46		0			
Queue Length 95th (ft)		121	39		120		84		45			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50									
Base Capacity (vph)		1616	726		1240		257		460			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.25	0.17		0.38		0.61		0.44			

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 19.3		Intersection LOS: B	
Intersection Capacity Utilization 58.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: 11th Street

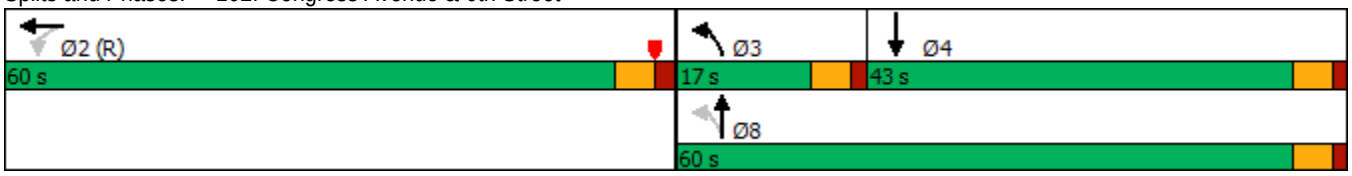


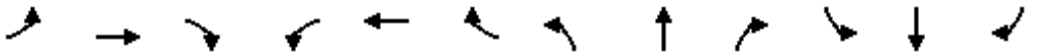
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	248	790	71	195	544	0	0	1300	113
Future Volume (vph)	0	0	0	248	790	71	195	544	0	0	1300	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5623	0	0	4517	0	0	4492	0
Flt Permitted					0.989			0.696				
Satd. Flow (perm)	0	0	0	0	5554	0	0	3185	0	0	4492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					15						12	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			48.7	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1206	0	0	803	0	0	1536	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				60.0	60.0		17.0	60.0			43.0	
Total Split (%)				50.0%	50.0%		14.2%	50.0%			35.8%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.5			5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					54.5			55.0			38.0	
Actuated g/C Ratio					0.45			0.46			0.32	
v/c Ratio					0.48			0.99dl			1.07	
Control Delay					23.3			9.9			84.3	
Queue Delay					0.0			0.0			0.0	
Total Delay					23.3			9.9			84.3	
LOS					C			A			F	
Approach Delay					23.3			9.9			84.3	
Approach LOS					C			A			F	
Queue Length 50th (ft)					182			54			~483	
Queue Length 95th (ft)					215			63			#582	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)												
Base Capacity (vph)					2530			1592			1430	
Starvation Cap Reductn					0			54			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio					0.48			0.52			1.07	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 21 (18%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 46.7		Intersection LOS: D	
Intersection Capacity Utilization 80.8%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			

Splits and Phases: 102: Congress Avenue & 6th Street



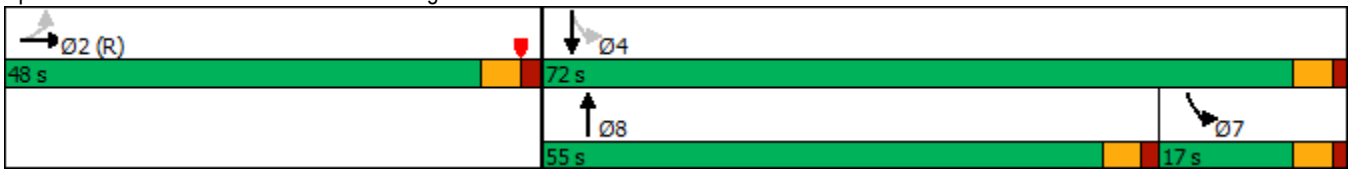


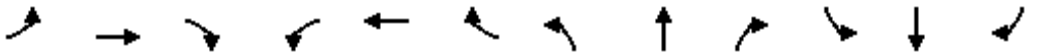
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	845	300	0	0	0	0	588	131	67	1500	0
Future Volume (vph)	107	845	300	0	0	0	0	588	131	67	1500	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1593	4323	0	0	0	0	0	4389	0	0	4568	0
Flt Permitted	0.950										0.850	
Satd. Flow (perm)	1505	4323	0	0	0	0	0	4389	0	0	3887	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20						51				
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			9.7	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	1193	0	0	0	0	0	749	0	0	1633	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						55.0		17.0	72.0	
Total Split (%)	40.0%	40.0%						45.8%		14.2%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0			0.0	
Total Lost Time (s)	5.5	5.5						5.0			5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						50.0			67.0	
Actuated g/C Ratio	0.35	0.35						0.42			0.56	
v/c Ratio	0.21	0.77						0.40			0.73	
Control Delay	28.4	38.0						10.7			12.0	
Queue Delay	0.0	0.0						0.0			0.2	
Total Delay	28.4	38.0						10.7			12.2	
LOS	C	D						B			B	
Approach Delay		37.2						10.7			12.2	
Approach LOS		D						B			B	
Queue Length 50th (ft)	60	294						128			95	
Queue Length 95th (ft)	105	353						m49			m73	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)												
Base Capacity (vph)	533	1543						1858			2238	
Starvation Cap Reductn	0	0						0			94	
Spillback Cap Reductn	0	0						0			0	
Storage Cap Reductn	0	0						0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.21	0.77						0.40			0.76	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 19 (16%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 89.7%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	1200	406	416	1000	53	200	681	317	150	1700	200
Future Volume (vph)	83	1200	406	416	1000	53	200	681	317	150	1700	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	150		0	0		175	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	3090	1648	0	0	4232	1225	0	4371	0
Flt Permitted	0.174			0.950				0.700			0.646	
Satd. Flow (perm)	286	3185	1170	2993	1648	0	0	2990	1025	0	2835	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136		2			4	275		19	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		1084			1831			1735			1425	
Travel Time (s)		24.6			41.6			39.4			38.9	
Confl. Peds. (#/hr)	90		90	90		90	90		90	90		90
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)									10%			
Lane Group Flow (vph)	85	1224	414	424	1074	0	0	931	291	0	2092	0
Turn Type	pm+pt	NA	Perm	Prot	NA		Perm	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8			2	3	1	6	
Permitted Phases	4		4				2		2	6		
Detector Phase	7	4	4	3	8		2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	5.0	5.0	10.0	
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0		27.0	27.0	11.0	11.0	27.0	
Total Split (s)	15.0	38.0	38.0	24.0	47.0		31.0	31.0	24.0	27.0	58.0	
Total Split (%)	12.5%	31.7%	31.7%	20.0%	39.2%		25.8%	25.8%	20.0%	22.5%	48.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	Max	Max	Max	Max	Max		Max	Max	Max	Max	C-Max	
Act Effct Green (s)	32.0	32.0	32.0	18.0	41.0			25.0	43.0		52.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.15	0.34			0.21	0.36		0.43	
v/c Ratio	0.49	1.44	1.01	0.92	1.90			3.71dl	0.51		1.39	
Control Delay	55.1	239.4	76.4	75.9	439.3			262.2	6.9		202.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay	55.1	239.4	76.4	75.9	439.3			262.2	6.9		202.2	
LOS	E	F	E	E	F			F	A		F	
Approach Delay		191.1			336.5			201.4			202.2	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	51	~677	~240	169	~1289			~388	8		~770	
Queue Length 95th (ft)	95	#814	#454	#263	#1548			#486	79		#874	
Internal Link Dist (ft)		1004			1751			1655			1345	
Turn Bay Length (ft)	200		200	150					175			
Base Capacity (vph)	174	849	411	463	564			626	573		1508	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0			0	0		0	
Spillback Cap Reductn	0	0	0	0	0			0	0		0	
Storage Cap Reductn	0	0	0	0	0			0	0		0	
Reduced v/c Ratio	0.49	1.44	1.01	0.92	1.90			1.49	0.51		1.39	

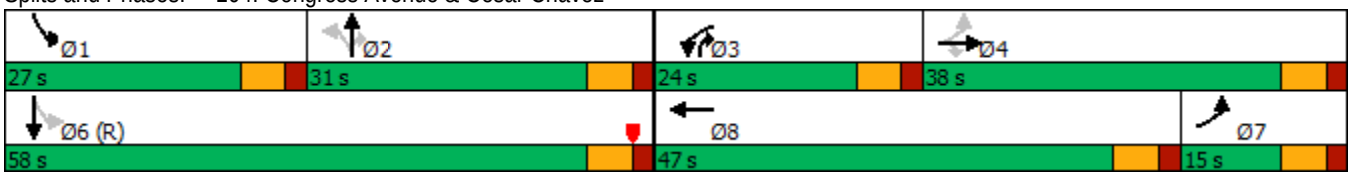
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 2 (2%), Referenced to phase 6:SBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.90			
Intersection Signal Delay: 229.9		Intersection LOS: F	
Intersection Capacity Utilization 155.2%		ICU Level of Service H	
Analysis Period (min) 15			

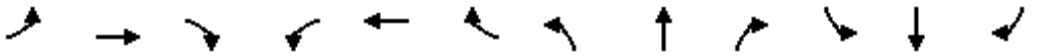
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 104: Congress Avenue & Cesar Chavez





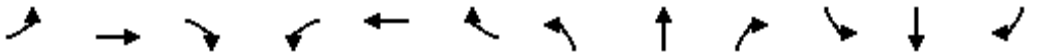
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	10	97	30	29	18	81	722	12	19	2100	404
Future Volume (vph)	222	10	97	30	29	18	81	722	12	19	2100	404
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	100		100	70		0
Storage Lanes	2		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1558	0	1770	1730	0	1770	5085	1583	1770	4879	0
Flt Permitted	0.421			0.684			0.050			0.311		
Satd. Flow (perm)	1484	1558	0	1246	1730	0	93	5085	1495	572	4879	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		102			17				152		47	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		792			262			650			1735	
Travel Time (s)		18.0			6.0			14.8			39.4	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	234	113	0	32	50	0	85	760	13	20	2636	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	7	4		3	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0		3.0	25.0	25.0	3.0	25.0	
Minimum Split (s)	20.0	38.5		10.0	35.0		8.5	45.0	45.0	8.5	45.0	
Total Split (s)	26.0	32.0		10.0	16.0		13.0	87.0	87.0	11.0	85.0	
Total Split (%)	18.6%	22.9%		7.1%	11.4%		9.3%	62.1%	62.1%	7.9%	60.7%	
Yellow Time (s)	4.0	4.0		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5		2.5	2.5		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0		5.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	Max	
Act Effct Green (s)	22.7	22.7		12.5	11.7		94.0	94.0	94.0	87.9	87.9	
Actuated g/C Ratio	0.16	0.16		0.09	0.08		0.67	0.67	0.67	0.63	0.63	
v/c Ratio	0.55	0.34		0.25	0.31		0.59	0.22	0.01	0.05	0.86	
Control Delay	56.9	13.7		62.7	46.4		59.5	10.9	0.0	13.2	26.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	1.3	
Total Delay	56.9	13.7		62.7	46.4		59.5	10.9	0.0	13.2	27.6	
LOS	E	B		E	D		E	B	A	B	C	
Approach Delay		42.9			52.8			15.6			27.5	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	96	8		26	27		53	197	0	8	779	
Queue Length 95th (ft)	138	63		62	71		m96	254	m0	20	863	
Internal Link Dist (ft)		712			182			570			1655	
Turn Bay Length (ft)							100		100	70		
Base Capacity (vph)	548	377		127	183		152	3414	1053	406	3081	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	4		0	0		0	0	0	0	246	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.43	0.30		0.25	0.27		0.56	0.22	0.01	0.05	0.93	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 26.8		Intersection LOS: C	
Intersection Capacity Utilization 88.3%		ICU Level of Service E	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue



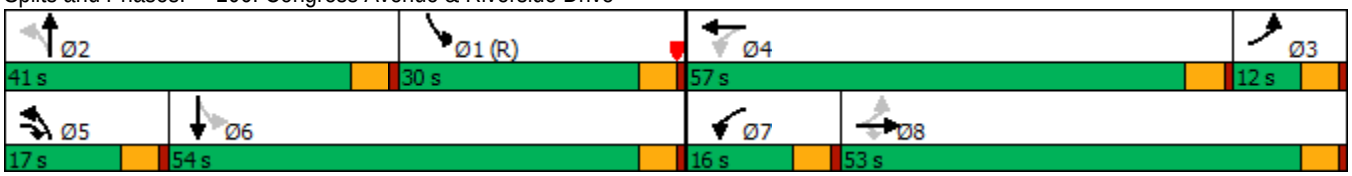
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	846	248	134	700	189	226	593	153	410	1700	30
Future Volume (vph)	36	846	248	134	700	189	226	593	153	410	1700	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	250		0	180		0
Storage Lanes	1		1	1		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1583	1770	3399	0	3433	4869	0	3433	5065	0
Flt Permitted	0.216			0.090			0.157			0.340		
Satd. Flow (perm)	400	3539	1525	167	3399	0	565	4869	0	1197	5065	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94		28			44			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			650	
Travel Time (s)		12.8			30.0			13.0			14.8	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	900	264	143	946	0	240	794	0	436	1841	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4			2			6		
Detector Phase	3	8	5	7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	3.0	3.0	10.0		3.0	15.0		3.0	15.0	
Minimum Split (s)	10.0	38.0	8.0	8.0	38.0		8.0	32.0		8.0	32.0	
Total Split (s)	12.0	53.0	17.0	16.0	57.0		17.0	41.0		30.0	54.0	
Total Split (%)	8.6%	37.9%	12.1%	11.4%	40.7%		12.1%	29.3%		21.4%	38.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max	None	None	Max		None	Max		C-Max	Max	
Act Effct Green (s)	48.9	48.9	59.5	54.4	54.4		36.0	36.0		50.4	50.4	
Actuated g/C Ratio	0.35	0.35	0.42	0.39	0.39		0.26	0.26		0.36	0.36	
v/c Ratio	0.19	0.73	0.37	0.80	0.71		0.66	0.62		0.53	1.01	
Control Delay	37.2	44.1	16.8	62.1	39.1		51.0	45.7		46.7	63.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	5.5	
Total Delay	37.2	44.1	16.8	62.1	39.1		51.0	45.7		46.7	68.7	
LOS	D	D	B	E	D		D	D		D	E	
Approach Delay		37.9			42.1			46.9			64.5	
Approach LOS		D			D			D			E	
Queue Length 50th (ft)	23	379	94	89	380		90	222		135	~586	
Queue Length 95th (ft)	50	460	160	#190	463		128	270		m165	#744	
Internal Link Dist (ft)		485			1241			491			570	
Turn Bay Length (ft)	150			150			250			180		
Base Capacity (vph)	208	1237	722	190	1338		391	1284		830	1825	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0		0	32	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.18	0.73	0.37	0.75	0.71		0.61	0.62		0.53	1.03	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 1:SBL, Start of Red			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 51.2		Intersection LOS: D	
Intersection Capacity Utilization 91.6%		ICU Level of Service F	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Congress Avenue & Riverside Drive



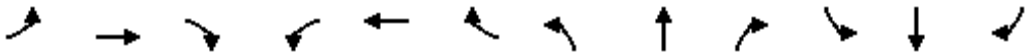
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	229	38	66	370	0	235	0	235	0	0	0
Future Volume (vph)	0	229	38	66	370	0	235	0	235	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	2		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3511	0	3433	0	1583	0	1863	0
Flt Permitted					0.857		0.950					
Satd. Flow (perm)	0	3539	1472	0	3016	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						242			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	236	39	0	449	0	242	0	242	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.13	0.05		0.26		0.85		0.63			
Control Delay		15.9	0.1		12.8		58.1		12.2			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.9	0.1		12.8		58.1		12.2			
LOS		B	A		B		E		B			
Approach Delay		13.6			12.8			35.2				
Approach LOS		B			B			D				
Queue Length 50th (ft)		48	0		83		85		62			
Queue Length 95th (ft)		72	0		112		m#128		m69			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50									
Base Capacity (vph)		1795	800		1759		286		524			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.13	0.05		0.26		0.85		0.46			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 21.9		Intersection LOS: C	
Intersection Capacity Utilization 57.1%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: 11th Street

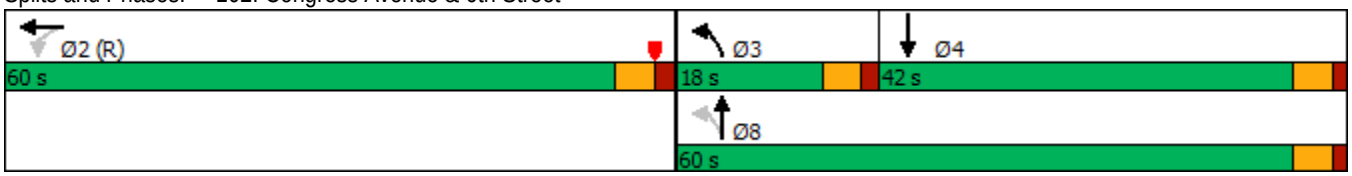


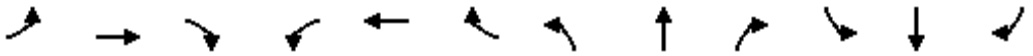
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	233	1223	61	307	942	0	0	288	86
Future Volume (vph)	0	0	0	233	1223	61	307	942	0	0	288	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5672	0	0	4522	0	0	4332	0
Flt Permitted					0.992			0.719				
Satd. Flow (perm)	0	0	0	0	5624	0	0	3263	0	0	4332	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9						66	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1596	0	0	1315	0	0	394	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				60.0	60.0		18.0	60.0			42.0	
Total Split (%)				50.0%	50.0%		15.0%	50.0%			35.0%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.5			5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					54.5			55.0			37.0	
Actuated g/C Ratio					0.45			0.46			0.31	
v/c Ratio					0.62			0.81			0.29	
Control Delay					26.1			17.3			24.5	
Queue Delay					0.0			4.2			0.0	
Total Delay					26.1			21.5			24.5	
LOS					C			C			C	
Approach Delay					26.1			21.5			24.5	
Approach LOS					C			C			C	
Queue Length 50th (ft)					266			261			69	
Queue Length 95th (ft)					306			338			98	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)												
Base Capacity (vph)					2559			1631			1381	
Starvation Cap Reductn					0			242			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio					0.62			0.95			0.29	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 24.1		Intersection LOS: C	
Intersection Capacity Utilization 80.8%		ICU Level of Service D	
Analysis Period (min) 15			
Description: 6th Street			

Splits and Phases: 102: Congress Avenue & 6th Street



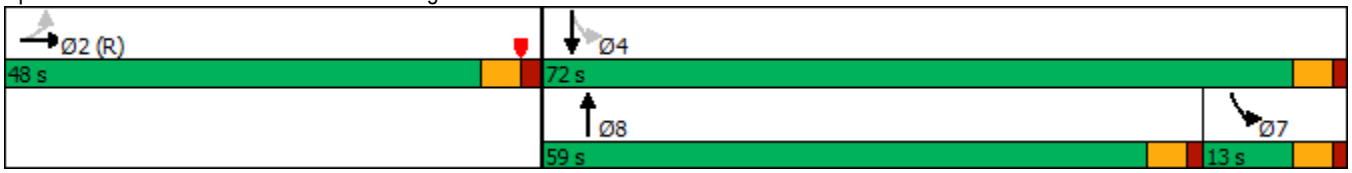


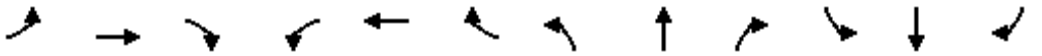
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	784	89	0	0	0	0	1069	213	118	377	0
Future Volume (vph)	84	784	89	0	0	0	0	1069	213	118	377	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1593	4478	0	0	0	0	0	4404	0	0	4522	0
Flt Permitted	0.950										0.649	
Satd. Flow (perm)	1505	4478	0	0	0	0	0	4404	0	0	2970	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18						45				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	929	0	0	0	0	0	1364	0	0	527	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						59.0		13.0	72.0	
Total Split (%)	40.0%	40.0%						49.2%		10.8%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0			0.0	
Total Lost Time (s)	5.5	5.5						5.0			5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						54.0			67.0	
Actuated g/C Ratio	0.35	0.35						0.45			0.56	
v/c Ratio	0.17	0.58						0.68			0.30	
Control Delay	27.7	32.6						5.9			13.9	
Queue Delay	0.0	0.0						0.4			0.0	
Total Delay	27.7	32.6						6.4			13.9	
LOS	C	C						A			B	
Approach Delay		32.2						6.4			13.9	
Approach LOS		C						A			B	
Queue Length 50th (ft)	47	208						39			75	
Queue Length 95th (ft)	87	255						m20			94	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)												
Base Capacity (vph)	533	1597						2006			1761	
Starvation Cap Reductn	0	0						0			0	
Spillback Cap Reductn	0	0						237			0	
Storage Cap Reductn	0	0						0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.17	0.58						0.77			0.30	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 79.2%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	973	353	186	492	115	194	2160	570	25	546	67
Future Volume (vph)	213	973	353	186	492	115	194	2160	570	25	546	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	0		175	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	1593	2991	0	0	4274	1225	0	4418	0
Flt Permitted	0.182			0.258				0.763			0.714	
Satd. Flow (perm)	293	3185	1170	416	2991	0	0	3260	1025	0	3161	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			107		26			3	228		19	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	90		90	90		90	90		90	90		90
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)									10%			
Lane Group Flow (vph)	217	993	360	190	619	0	0	2460	524	0	651	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0		27.0	27.0	27.0	27.0	27.0	
Total Split (s)	21.0	52.0	52.0	16.0	47.0		52.0	52.0	52.0	52.0	52.0	
Total Split (%)	17.5%	43.3%	43.3%	13.3%	39.2%		43.3%	43.3%	43.3%	43.3%	43.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	Max	Max	Max	Max	Max		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)	46.0	46.0	46.0	41.0	41.0			46.0	46.0		46.0	
Actuated g/C Ratio	0.38	0.38	0.38	0.34	0.34			0.38	0.38		0.38	
v/c Ratio	0.79	0.81	0.70	0.79	0.60			1.97	0.98		0.53	
Control Delay	48.6	39.7	29.9	66.4	34.0			462.3	56.8		30.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay	48.6	39.7	29.9	66.4	34.0			462.3	56.8		30.0	
LOS	D	D	C	E	C			F	E		C	
Approach Delay		38.7			41.7			391.1			30.0	
Approach LOS		D			D			F			C	
Queue Length 50th (ft)	119	358	166	109	198			~1158	310		154	
Queue Length 95th (ft)	#224	446	289	#214	261			#1257	#598		201	
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175					175			
Base Capacity (vph)	274	1220	514	240	1039			1251	533		1223	

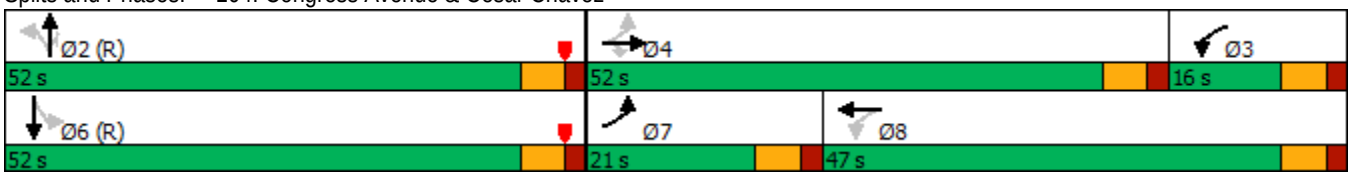
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0			0	0		0	
Spillback Cap Reductn	0	0	0	0	0			0	0		0	
Storage Cap Reductn	0	0	0	0	0			0	0		0	
Reduced v/c Ratio	0.79	0.81	0.70	0.79	0.60			1.97	0.98		0.53	

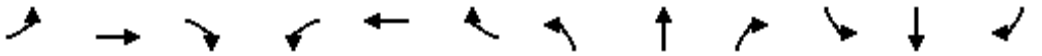
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 54 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.97			
Intersection Signal Delay: 213.0		Intersection LOS: F	
Intersection Capacity Utilization 134.7%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 104: Congress Avenue & Cesar Chavez



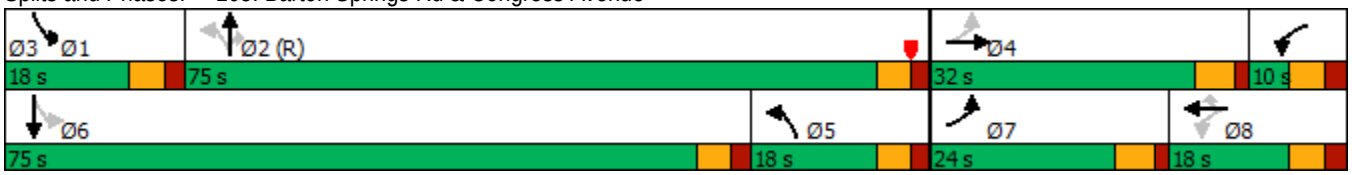


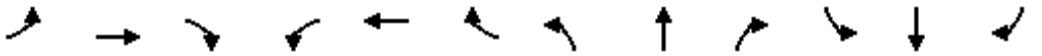
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	459	105	50	26	128	128	92	2085	129	101	474	318
Future Volume (vph)	459	105	50	26	128	128	92	2085	129	101	474	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		0
Storage Lanes	2		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1751	0	1770	1863	1583	1770	5085	1583	1770	4583	0
Flt Permitted	0.345			0.651			0.320			0.066		
Satd. Flow (perm)	1226	1751	0	1189	1863	1521	581	5085	1497	123	4583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				154			158		184	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	494	167	0	28	138	138	99	2242	139	109	852	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	15.0	45.0	45.0	15.0	45.0	
Total Split (s)	24.0	32.0		10.0	18.0	18.0	18.0	75.0	75.0	18.0	75.0	
Total Split (%)	17.8%	23.7%		7.4%	13.3%	13.3%	13.3%	55.6%	55.6%	13.3%	55.6%	
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	
Act Effct Green (s)	30.5	30.5		13.4	11.6	11.6	73.5	73.5	73.5	71.5	71.5	
Actuated g/C Ratio	0.23	0.23		0.10	0.09	0.09	0.54	0.54	0.54	0.53	0.53	
v/c Ratio	0.84	0.41		0.21	0.86	0.51	0.24	0.81	0.16	0.64	0.34	
Control Delay	62.4	45.1		61.0	102.9	13.3	7.1	9.2	0.0	39.9	14.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	7.3	0.0	0.0	0.0	
Total Delay	62.4	45.1		61.0	102.9	13.3	7.1	16.5	0.0	39.9	14.6	
LOS	E	D		E	F	B	A	B	A	D	B	
Approach Delay		58.0			58.4			15.2			17.5	
Approach LOS		E			E			B			B	
Queue Length 50th (ft)	211	118		23	121	0	19	194	0	48	120	
Queue Length 95th (ft)	#287	193		56	#239	51	m17	m169	m0	106	152	
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		
Base Capacity (vph)	585	407		135	165	275	435	2767	886	217	2514	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	500	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.84	0.41		0.21	0.84	0.50	0.23	0.99	0.16	0.50	0.34	

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 72 (53%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 125			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 25.1		Intersection LOS: C	
Intersection Capacity Utilization 92.9%		ICU Level of Service F	
Analysis Period (min) 15			
Description: Barton Springs			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	543	126	207	1218	490	324	1710	152	145	275	44
Future Volume (vph)	141	543	126	207	1218	490	324	1710	152	145	275	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	225		0	180		0
Storage Lanes	1		1	1		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1583	1770	3352	0	3433	5001	0	3433	4940	0
Flt Permitted	0.100			0.254			0.950			0.950		
Satd. Flow (perm)	186	3539	1526	469	3352	0	3270	5001	0	3415	4940	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130		53			11			23	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	145	560	130	213	1761	0	334	1920	0	149	329	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4								
Detector Phase	3	8	5	7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	10.0	3.0	3.0	10.0		3.0	5.0		3.0	4.0	
Minimum Split (s)	13.0	38.0	8.0	8.0	38.0		8.0	32.0		8.0	32.0	
Total Split (s)	13.0	50.0	17.0	22.0	59.0		17.0	48.0		15.0	46.0	
Total Split (%)	9.6%	37.0%	12.6%	16.3%	43.7%		12.6%	35.6%		11.1%	34.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min	None	None	Min		None	Min		None	C-Max	
Act Effct Green (s)	48.0	48.0	60.0	54.0	54.0		12.0	43.0		10.0	41.0	
Actuated g/C Ratio	0.36	0.36	0.44	0.40	0.40		0.09	0.32		0.07	0.30	
v/c Ratio	0.91	0.44	0.17	0.66	1.28		1.10	1.20		0.59	0.22	
Control Delay	104.3	35.2	3.9	38.3	167.2		135.1	136.3		60.3	22.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.2		0.0	0.0	
Total Delay	104.3	35.2	3.9	38.3	167.2		135.1	136.5		60.3	22.8	
LOS	F	D	A	D	F		F	F		E	C	
Approach Delay		42.3			153.3			136.3			34.5	
Approach LOS		D			F			F			C	
Queue Length 50th (ft)	90	198	0	126	~1019		~170	~747		67	77	
Queue Length 95th (ft)	#216	261	36	191	#1159		#269	#843		105	107	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150			225			180		
Base Capacity (vph)	159	1259	756	351	1372		305	1600		254	1516	

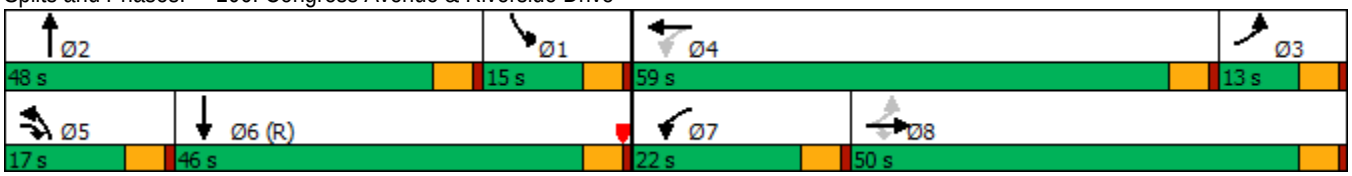
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	90		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.91	0.44	0.17	0.61	1.28		1.10	1.27		0.59	0.22	

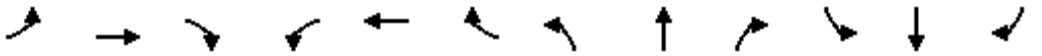
Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 60 (44%), Referenced to phase 6:SBT, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.28			
Intersection Signal Delay: 119.4		Intersection LOS: F	
Intersection Capacity Utilization 115.1%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Congress Avenue & Riverside Drive





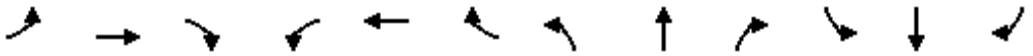
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	418	136	165	332	0	193	0	250	0	0	0
Future Volume (vph)	0	418	136	165	332	0	193	0	250	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	2		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3185	1425	0	3134	0	3090	0	1425	0	1676	0
Flt Permitted					0.644		0.950					
Satd. Flow (perm)	0	3185	1325	0	2034	0	2783	0	1334	0	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						266			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	445	145	0	529	0	205	0	266	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.4	60.4		69.5		10.0		14.1			
Actuated g/C Ratio		0.50	0.50		0.58		0.08		0.12			
v/c Ratio		0.28	0.20		0.44		0.80		0.68			
Control Delay		17.9	5.8		14.8		78.0		13.6			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		17.9	5.8		14.8		78.0		13.6			
LOS		B	A		B		E		B			
Approach Delay		14.9			14.8			41.6				
Approach LOS		B			B			D				
Queue Length 50th (ft)		100	14		103		71		36			
Queue Length 95th (ft)		142	51		136		#138		73			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50									
Base Capacity (vph)		1603	721		1210		257		509			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.28	0.20		0.44		0.80		0.52			

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 22.8		Intersection LOS: C	
Intersection Capacity Utilization 60.5%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: 11th Street

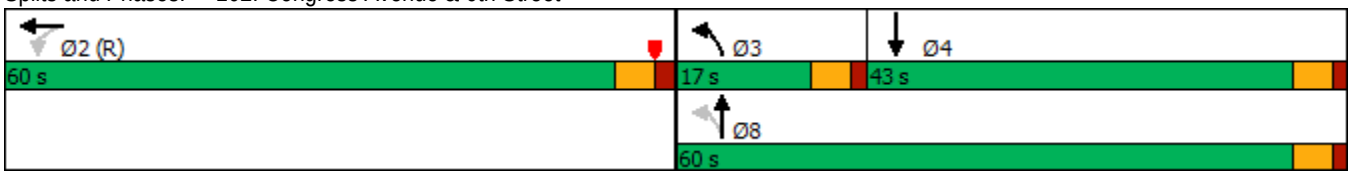


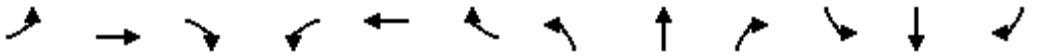
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	283	881	79	259	722	0	0	1485	126
Future Volume (vph)	0	0	0	283	881	79	259	722	0	0	1485	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5623	0	0	4517	0	0	4493	0
Flt Permitted					0.989			0.709				
Satd. Flow (perm)	0	0	0	0	5553	0	0	3245	0	0	4493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					15						12	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			48.7	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1352	0	0	1067	0	0	1751	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				60.0	60.0		17.0	60.0			43.0	
Total Split (%)				50.0%	50.0%		14.2%	50.0%			35.8%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.5			5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					54.5			55.0			38.0	
Actuated g/C Ratio					0.45			0.46			0.32	
v/c Ratio					0.53			1.31dl			1.22	
Control Delay					24.3			9.8			142.4	
Queue Delay					0.0			0.0			0.1	
Total Delay					24.3			9.8			142.5	
LOS					C			A			F	
Approach Delay					24.3			9.8			142.5	
Approach LOS					C			A			F	
Queue Length 50th (ft)					212			61			~612	
Queue Length 95th (ft)					247			69			#710	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)												
Base Capacity (vph)					2530			1614			1430	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					58			0			34	
Storage Cap Reductn					0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio					0.55			0.66			1.25	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 21 (18%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 70.2		Intersection LOS: E	
Intersection Capacity Utilization 90.3%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			

Splits and Phases: 102: Congress Avenue & 6th Street



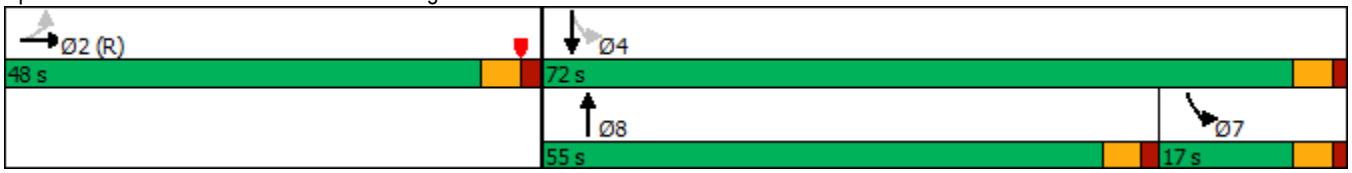


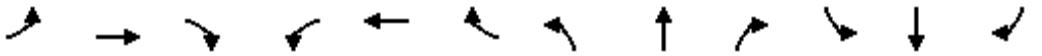
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	942	343	0	0	0	0	813	181	75	1715	0
Future Volume (vph)	119	942	343	0	0	0	0	813	181	75	1715	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1593	4317	0	0	0	0	0	4389	0	0	4568	0
Flt Permitted	0.950										0.781	
Satd. Flow (perm)	1505	4317	0	0	0	0	0	4389	0	0	3573	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12						51				
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			9.7	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	1338	0	0	0	0	0	1036	0	0	1864	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						55.0		17.0	72.0	
Total Split (%)	40.0%	40.0%						45.8%		14.2%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0			0.0	
Total Lost Time (s)	5.5	5.5						5.0			5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						50.0			67.0	
Actuated g/C Ratio	0.35	0.35						0.42			0.56	
v/c Ratio	0.23	0.87						0.56			0.89	
Control Delay	28.8	43.3						13.7			22.2	
Queue Delay	0.0	0.0						0.0			0.8	
Total Delay	28.8	43.3						13.7			23.0	
LOS	C	D						B			C	
Approach Delay		42.0						13.7			23.0	
Approach LOS		D						B			C	
Queue Length 50th (ft)	67	349						293			236	
Queue Length 95th (ft)	116	415						m50			m108	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)												
Base Capacity (vph)	533	1536						1858			2094	
Starvation Cap Reductn	0	0						0			65	
Spillback Cap Reductn	0	0						0			0	
Storage Cap Reductn	0	0						0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.23	0.87						0.56			0.92	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 19 (16%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 27.2		Intersection LOS: C	
Intersection Capacity Utilization 103.6%		ICU Level of Service G	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	1338	466	478	1115	59	287	977	455	167	1953	223
Future Volume (vph)	93	1338	466	478	1115	59	287	977	455	167	1953	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	150		0	0		175	0		0
Storage Lanes	1		1	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	3090	1648	0	0	4232	1225	0	4378	0
Flt Permitted	0.174			0.950				0.708			0.652	
Satd. Flow (perm)	286	3185	1170	3011	1648	0	0	3030	1025	0	2866	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136		2			4	259		19	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		1084			1831			1735			1425	
Travel Time (s)		24.6			41.6			39.4			38.9	
Confl. Peds. (#/hr)	90		90	90		90	90		90	90		90
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)									10%			
Lane Group Flow (vph)	95	1365	476	488	1198	0	0	1336	418	0	2391	0
Turn Type	pm+pt	NA	Perm	Prot	NA		Perm	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8			2	3	1	6	
Permitted Phases	4		4				2		2	6		
Detector Phase	7	4	4	3	8		2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		10.0	10.0	5.0	5.0	10.0	
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0		27.0	27.0	11.0	11.0	27.0	
Total Split (s)	15.0	38.0	38.0	24.0	47.0		31.0	31.0	24.0	27.0	58.0	
Total Split (%)	12.5%	31.7%	31.7%	20.0%	39.2%		25.8%	25.8%	20.0%	22.5%	48.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0		6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	Max	Max	Max	Max	Max		Max	Max	Max	Max	C-Max	
Act Effct Green (s)	32.0	32.0	32.0	18.0	41.0			25.0	43.0		52.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.15	0.34			0.21	0.36		0.43	
v/c Ratio	0.55	1.61	1.16	1.05	2.12			5.33dl	0.74		1.58	
Control Delay	58.1	310.1	124.3	105.7	535.5			529.2	20.3		284.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay	58.1	310.1	124.3	105.7	535.5			529.2	20.3		284.4	
LOS	E	F	F	F	F			F	C		F	
Approach Delay		252.1			411.1			407.9			284.4	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	58	~797	~354	~212	~1492			~643	108		~948	
Queue Length 95th (ft)	105	#935	#567	#321	#1756			#746	244		#1047	
Internal Link Dist (ft)		1004			1751			1655			1345	
Turn Bay Length (ft)	200		200	150					175			
Base Capacity (vph)	174	849	411	463	564			634	563		1517	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0			0	0		0	
Spillback Cap Reductn	0	0	0	0	0			0	0		0	
Storage Cap Reductn	0	0	0	0	0			0	0		0	
Reduced v/c Ratio	0.55	1.61	1.16	1.05	2.12			2.11	0.74		1.58	

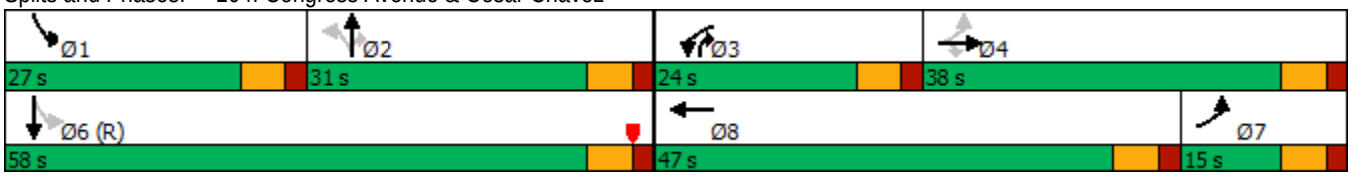
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 2 (2%), Referenced to phase 6:SBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 2.12			
Intersection Signal Delay: 331.7		Intersection LOS: F	
Intersection Capacity Utilization 178.7%		ICU Level of Service H	
Analysis Period (min) 15			

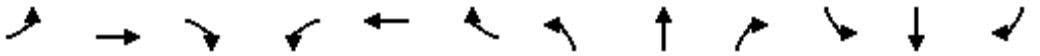
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 104: Congress Avenue & Cesar Chavez





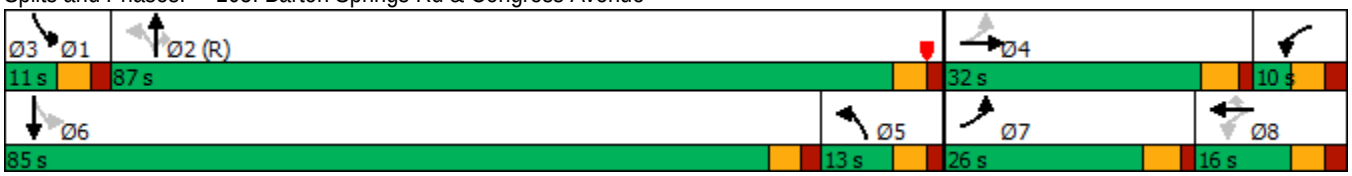
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	337	71	113	74	210	207	94	912	59	64	2366	469
Future Volume (vph)	337	71	113	74	210	207	94	912	59	64	2366	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	100		100	70		0
Storage Lanes	2		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1653	0	1770	1863	1583	1770	5085	1583	1770	4871	0
Flt Permitted							0.054			0.232		
Satd. Flow (perm)	3545	1653	0	1827	1863	1519	101	5085	1495	428	4871	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50				157			152		49	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		792			262			650			1735	
Travel Time (s)		18.0			6.0			14.8			39.4	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	355	194	0	78	221	218	99	960	62	67	2985	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	8.5	45.0	45.0	8.5	45.0	
Total Split (s)	26.0	32.0		10.0	16.0	16.0	13.0	87.0	87.0	11.0	85.0	
Total Split (%)	18.6%	22.9%		7.1%	11.4%	11.4%	9.3%	62.1%	62.1%	7.9%	60.7%	
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	
Act Effct Green (s)	22.0	20.4		14.8	13.2	13.2	83.3	83.3	83.3	79.5	79.5	
Actuated g/C Ratio	0.16	0.15		0.11	0.09	0.09	0.60	0.60	0.60	0.57	0.57	
v/c Ratio	0.64	0.68		0.41	1.26	0.76	0.69	0.32	0.07	0.23	1.07	
Control Delay	60.0	53.0		67.5	202.6	37.0	68.8	18.4	1.5	15.6	69.3	
Queue Delay	0.0	0.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	
Total Delay	60.0	53.1		67.5	202.6	37.0	68.8	18.4	1.5	15.6	82.2	
LOS	E	D		E	F	D	E	B	A	B	F	
Approach Delay		57.6			112.4			21.9			80.8	
Approach LOS		E			F			C			F	
Queue Length 50th (ft)	151	120		68	~254	53	69	275	5	26	~1095	
Queue Length 95th (ft)	204	203		#136	#462	#200	m92	m321	m6	50	#1174	
Internal Link Dist (ft)		712			182			570			1655	
Turn Bay Length (ft)							100		100	70		
Base Capacity (vph)	607	353		192	176	285	150	3025	950	295	2787	

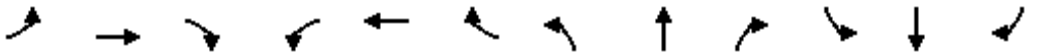
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	6		0	0	0	0	0	0	0	591	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.58	0.56		0.41	1.26	0.76	0.66	0.32	0.07	0.23	1.36	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.26			
Intersection Signal Delay: 68.9		Intersection LOS: E	
Intersection Capacity Utilization 107.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





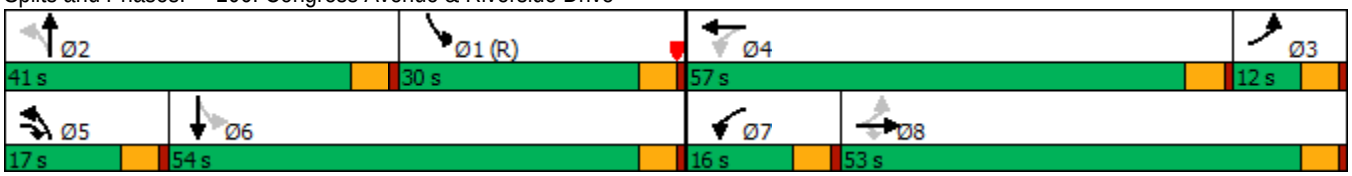
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	1021	283	174	843	277	262	704	193	508	1904	62
Future Volume (vph)	90	1021	283	174	843	277	262	704	193	508	1904	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	250		0	180		0
Storage Lanes	1		1	1		0	2		0	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1583	1770	3377	0	3433	4861	0	3433	5051	0
Flt Permitted	0.098			0.098			0.161			0.243		
Satd. Flow (perm)	182	3539	1525	183	3377	0	580	4861	0	861	5051	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94		36			48			4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			650	
Travel Time (s)		12.8			30.0			13.0			14.8	
Confl. Peds. (#/hr)	20		20	20		20	30		30	30		30
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	1086	301	185	1192	0	279	954	0	540	2092	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4			2			6		
Detector Phase	3	8	5	7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	3.0	3.0	10.0		3.0	15.0		3.0	15.0	
Minimum Split (s)	10.0	38.0	8.0	8.0	38.0		8.0	32.0		8.0	32.0	
Total Split (s)	12.0	53.0	17.0	16.0	57.0		17.0	41.0		30.0	54.0	
Total Split (%)	8.6%	37.9%	12.1%	11.4%	40.7%		12.1%	29.3%		21.4%	38.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Max	None	None	Max		None	Max		C-Max	Max	
Act Effct Green (s)	48.0	48.0	59.2	52.0	52.0		36.0	36.0		49.8	49.8	
Actuated g/C Ratio	0.34	0.34	0.42	0.37	0.37		0.26	0.26		0.36	0.36	
v/c Ratio	0.68	0.90	0.43	0.96	0.93		0.74	0.74		0.71	1.16	
Control Delay	76.7	54.3	18.7	90.9	54.9		54.8	49.4		55.1	119.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	76.7	54.3	18.7	90.9	54.9		54.8	49.4		55.1	119.1	
LOS	E	D	B	F	D		D	D		E	F	
Approach Delay		48.5			59.8			50.6			105.9	
Approach LOS		D			E			D			F	
Queue Length 50th (ft)	61	492	118	118	534		106	280		177	~825	
Queue Length 95th (ft)	#123	#597	192	#274	#678		147	334		m165	m#742	
Internal Link Dist (ft)		485			1241			491			570	
Turn Bay Length (ft)	150			150			250			180		
Base Capacity (vph)	141	1213	712	192	1276		393	1285		765	1799	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0		0	25	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.68	0.90	0.42	0.96	0.93		0.71	0.74		0.71	1.18	

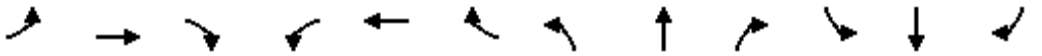
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 1:SBL, Start of Red			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 73.7		Intersection LOS: E	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Congress Avenue & Riverside Drive



Appendix D: 2040 No-Build Alternative 1 Results



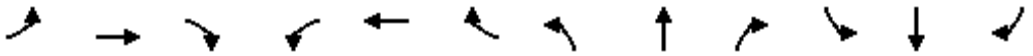
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	219	36	63	355	0	224	0	224	0	0	0
Future Volume (vph)	0	219	36	63	355	0	224	0	224	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	3433	0	1583	0	1863	0
Flt Permitted					0.861		0.950					
Satd. Flow (perm)	0	3539	1472	0	3029	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						231			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	226	37	0	431	0	231	0	231	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.13	0.05		0.24		0.81		0.62			
Control Delay		15.8	0.1		12.6		55.0		13.9			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.8	0.1		12.6		55.0		13.9			
LOS		B	A		B		D		B			
Approach Delay		13.6			12.6			34.5				
Approach LOS		B			B			C				
Queue Length 50th (ft)		46	0		80		80		68			
Queue Length 95th (ft)		70	0		107		m#148		m103			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1766		286		515			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.13	0.05		0.24		0.81		0.45			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 21.6		Intersection LOS: C	
Intersection Capacity Utilization 56.6%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: 11th Street

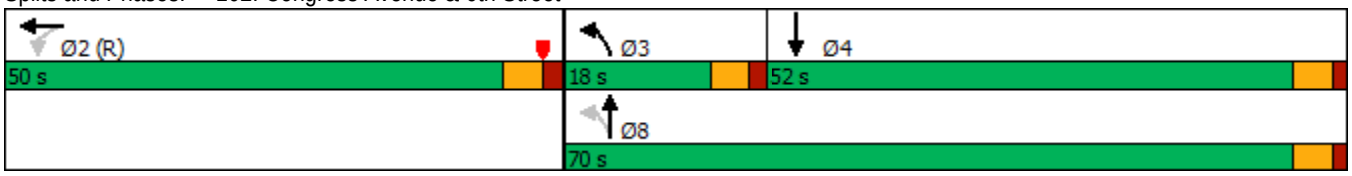


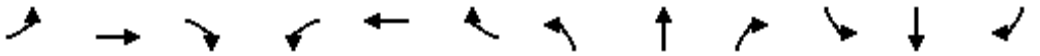
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	221	1174	59	293	899	0	0	273	82
Future Volume (vph)	0	0	0	221	1174	59	293	899	0	0	273	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5671	0	1593	3185	0	0	3015	0
Flt Permitted					0.992		0.439					
Satd. Flow (perm)	0	0	0	0	5624	0	712	3185	0	0	3015	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8						39	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1531	0	308	946	0	0	373	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		18.0	70.0			52.0	
Total Split (%)				41.7%	41.7%		15.0%	58.3%			43.3%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			47.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.39	
v/c Ratio					0.73		0.64	0.55			0.31	
Control Delay					35.0		10.6	8.4			21.2	
Queue Delay					0.0		3.0	2.9			0.0	
Total Delay					35.0		13.6	11.3			21.2	
LOS					C		B	B			C	
Approach Delay					35.0			11.9			21.2	
Approach LOS					C			B			C	
Queue Length 50th (ft)					293		62	158			92	
Queue Length 95th (ft)					338		m72	175			131	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2090		481	1725			1204	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		91	644			0	
Spillback Cap Reductn					0		0	0			0	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.73		0.79	0.88			0.31	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 24.2		Intersection LOS: C	
Intersection Capacity Utilization 79.8%		ICU Level of Service D	
Analysis Period (min) 15			
Description: 6th Street			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 102: Congress Avenue & 6th Street





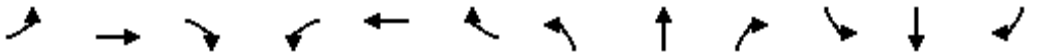
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	752	84	0	0	0	0	1020	203	113	356	0
Future Volume (vph)	80	752	84	0	0	0	0	1020	203	113	356	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4478	0	0	0	0	0	3065	0	1593	3185	0
Flt Permitted	0.950									0.105		
Satd. Flow (perm)	1505	4478	0	0	0	0	0	3065	0	176	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	85	889	0	0	0	0	0	1301	0	120	379	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	43.0	43.0						64.0		13.0	77.0	
Total Split (%)	35.8%	35.8%						53.3%		10.8%	64.2%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	37.5	37.5						59.0		72.0	72.0	
Actuated g/C Ratio	0.31	0.31						0.49		0.60	0.60	
v/c Ratio	0.18	0.63						0.86		0.60	0.20	
Control Delay	31.4	37.0						9.0		37.6	9.3	
Queue Delay	0.0	0.0						0.4		0.0	0.0	
Total Delay	31.4	37.0						9.4		37.6	9.3	
LOS	C	D						A		D	A	
Approach Delay		36.5						9.4			16.1	
Approach LOS		D						A			B	
Queue Length 50th (ft)	48	211						41		44	72	
Queue Length 95th (ft)	89	260						m30		m71	86	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	470	1410						1520		200	1911	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	0	
Spillback Cap Reductn	0	0						36		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.18	0.63						0.88		0.60	0.20	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 20.1		Intersection LOS: C	
Intersection Capacity Utilization 79.8%		ICU Level of Service D	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	934	324	175	472	110	185	2058	543	24	514	64
Future Volume (vph)	204	934	324	175	472	110	185	2058	543	24	514	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	1593	3050	0	1593	3185	1425	1593	3105	0
Flt Permitted	0.199			0.285			0.251			0.111		
Satd. Flow (perm)	328	3185	1325	470	3050	0	414	3185	1317	186	3105	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			192		25				195		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	953	331	179	594	0	189	2100	554	24	589	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	29.0	31.0	31.0	
Total Split (s)	21.0	52.0	52.0	16.0	47.0		10.0	52.0	52.0	42.0	42.0	
Total Split (%)	17.5%	43.3%	43.3%	13.3%	39.2%		8.3%	43.3%	43.3%	35.0%	35.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max		None	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)	46.0	46.0	46.0	41.0	41.0		46.0	46.0	46.0	36.0	36.0	
Actuated g/C Ratio	0.38	0.38	0.38	0.34	0.34		0.38	0.38	0.38	0.30	0.30	
v/c Ratio	0.73	0.78	0.53	0.70	0.56		0.95	1.72	0.89	0.44	0.63	
Control Delay	43.1	38.0	14.8	56.6	33.2		87.4	355.2	39.9	64.6	41.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	43.1	38.0	14.8	56.6	33.2		87.4	355.2	39.9	64.6	41.3	
LOS	D	D	B	E	C		F	F	D	E	D	
Approach Delay		33.6			38.6			275.9			42.2	
Approach LOS		C			D			F			D	
Queue Length 50th (ft)	113	337	77	102	187		101	~1263	279	17	217	
Queue Length 95th (ft)	#191	422	169	#180	247		#240	#1401	#508	m#49	280	
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		
Base Capacity (vph)	283	1220	626	254	1058		198	1220	625	55	939	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.73	0.78	0.53	0.70	0.56		0.95	1.72	0.89	0.44	0.63	

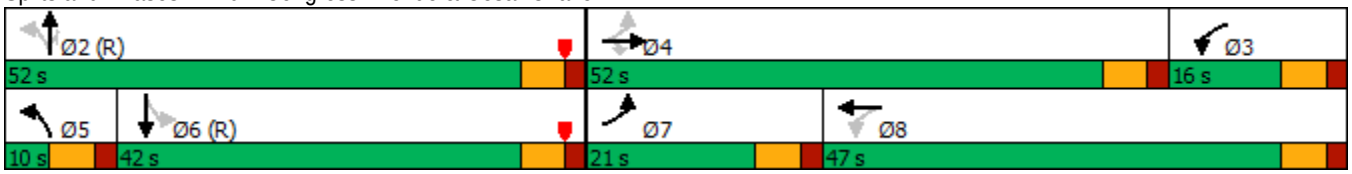
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 54 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.72			
Intersection Signal Delay: 155.6		Intersection LOS: F	
Intersection Capacity Utilization 131.0%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

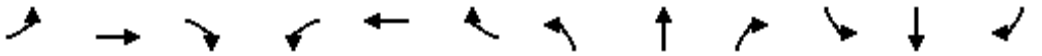
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	439	92	48	23	110	111	87	1993	115	90	450	298
Future Volume (vph)	439	92	48	23	110	111	87	1993	115	90	450	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1744	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.360			0.661			0.476			0.066		
Satd. Flow (perm)	1257	1744	0	1207	1863	1521	861	3539	1519	123	3539	1464
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				154			158			262
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	472	151	0	25	118	119	94	2143	124	97	484	320
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	15.0	45.0	45.0	15.0	45.0	45.0
Total Split (s)	24.0	32.0		10.0	18.0	18.0	18.0	75.0	75.0	18.0	75.0	75.0
Total Split (%)	17.8%	23.7%		7.4%	13.3%	13.3%	13.3%	55.6%	55.6%	13.3%	55.6%	55.6%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	29.4	29.4		12.8	11.1	11.1	75.1	75.1	75.1	70.6	70.6	70.6
Actuated g/C Ratio	0.22	0.22		0.09	0.08	0.08	0.56	0.56	0.56	0.52	0.52	0.52
v/c Ratio	0.83	0.38		0.19	0.77	0.45	0.17	1.09	0.14	0.60	0.26	0.36
Control Delay	62.0	44.1		60.7	91.5	8.9	6.4	57.4	0.0	35.9	18.5	5.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0
Total Delay	62.0	44.1		60.7	91.5	8.9	6.4	62.4	0.0	35.9	18.5	5.0
LOS	E	D		E	F	A	A	E	A	D	B	A
Approach Delay		57.7			51.1			56.9			15.6	
Approach LOS		E			D			E			B	
Queue Length 50th (ft)	201	104		21	102	0	18	~1153	0	42	122	25
Queue Length 95th (ft)	#263	174		51	#193	31	m14	m205	m0	92	158	80
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	572	393		131	165	275	562	1967	914	216	1849	890

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	321	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.38		0.19	0.72	0.43	0.17	1.30	0.14	0.45	0.26	0.36

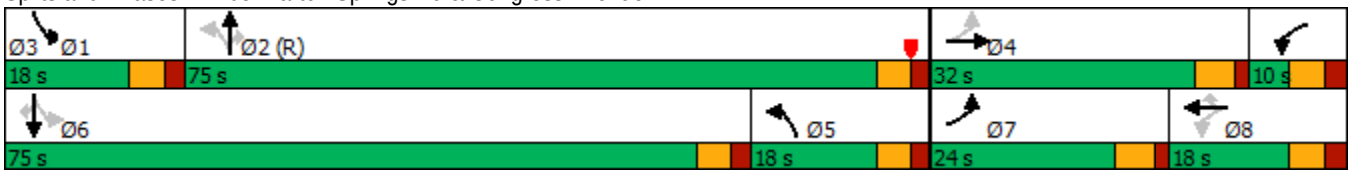
Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 72 (53%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 47.7		Intersection LOS: D	
Intersection Capacity Utilization 98.1%		ICU Level of Service F	
Analysis Period (min) 15			
Description: Barton Springs			

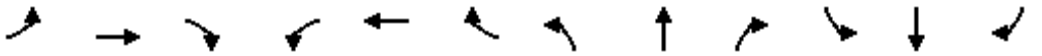
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





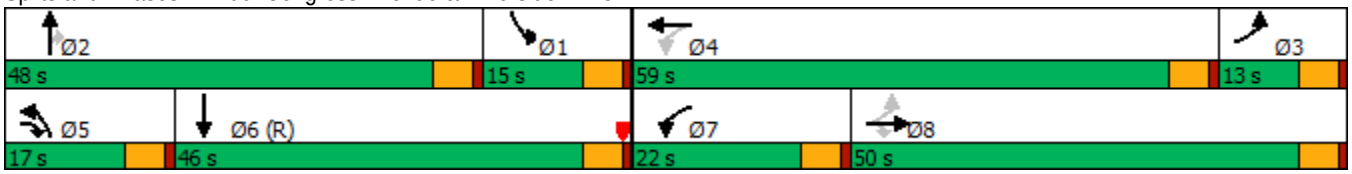
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	519	120	194	1151	458	309	1637	144	137	262	40
Future Volume (vph)	131	519	120	194	1151	458	309	1637	144	137	262	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		0	225		200	180		0
Storage Lanes	1		1	1		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3352	0	3433	3539	1583	3433	3450	0
Flt Permitted	0.099			0.274			0.950			0.950		
Satd. Flow (perm)	184	3539	1577	506	3352	0	3322	3539	1518	3417	3450	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		52				137		13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	135	535	124	200	1659	0	319	1688	148	141	311	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4					2			
Detector Phase	3	8	5	7	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	8.0	10.0	3.0	3.0	10.0		3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	13.0	40.0	8.0	8.0	40.0		8.0	42.0	42.0	8.0	37.0	
Total Split (s)	13.0	50.0	17.0	22.0	59.0		17.0	48.0	48.0	15.0	46.0	
Total Split (%)	9.6%	37.0%	12.6%	16.3%	43.7%		12.6%	35.6%	35.6%	11.1%	34.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min		None	Min	Min	None	C-Max	
Act Effct Green (s)	48.6	48.6	60.6	54.0	54.0		12.0	43.0	43.0	10.0	41.0	
Actuated g/C Ratio	0.36	0.36	0.45	0.40	0.40		0.09	0.32	0.32	0.07	0.30	
v/c Ratio	0.84	0.42	0.16	0.61	1.21		1.05	1.50	0.26	0.56	0.29	
Control Delay	92.4	34.4	3.9	36.0	136.4		122.3	262.5	7.6	56.1	21.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	1.6	0.0	0.0	0.0	
Total Delay	92.4	34.4	3.9	36.0	136.4		122.3	264.1	7.6	56.1	21.9	
LOS	F	C	A	D	F		F	F	A	E	C	
Approach Delay		39.5			125.6			225.5			32.6	
Approach LOS		D			F			F			C	
Queue Length 50th (ft)	82	186	0	117	~921		~156	~1077	7	63	111	
Queue Length 95th (ft)	#197	247	36	179	#1062		#254	#1216	56	100	154	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150			225		200	180		

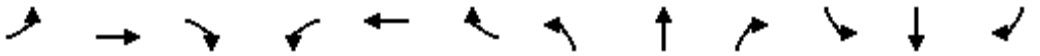
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	160	1273	781	361	1372		305	1127	576	254	1056	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	1		0	309	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.84	0.42	0.16	0.55	1.21		1.05	2.06	0.26	0.56	0.29	

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 60 (44%), Referenced to phase 6:SBT, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 145.5		Intersection LOS: F	
Intersection Capacity Utilization 120.1%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Congress Avenue & Riverside Drive



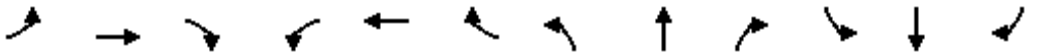


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	401	130	158	319	0	182	0	236	0	0	0
Future Volume (vph)	0	401	130	158	319	0	182	0	236	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3483	0	3433	0	1583	0	1863	0
Flt Permitted					0.657		0.950					
Satd. Flow (perm)	0	3539	1472	0	2305	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						243			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	413	134	0	492	0	188	0	243	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.23	0.17		0.36		0.66		0.63			
Control Delay		16.9	4.8		13.8		78.8		41.8			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		16.9	4.8		13.8		78.8		41.8			
LOS		B	A		B		E		D			
Approach Delay		14.0			13.8			57.9				
Approach LOS		B			B			E				
Queue Length 50th (ft)		90	9		93		78		124			
Queue Length 95th (ft)		123	42		123		118		191			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1365		286		525			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.23	0.17		0.36		0.66		0.46			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 26.8		Intersection LOS: C	
Intersection Capacity Utilization 58.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	271	846	76	244	681	0	0	1422	121
Future Volume (vph)	0	0	0	271	846	76	244	681	0	0	1422	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5623	0	1593	3185	0	0	3127	0
Flt Permitted					0.989		0.075					
Satd. Flow (perm)	0	0	0	0	5553	0	126	3185	0	0	3127	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13						9	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1256	0	257	717	0	0	1624	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		17.0	70.0			53.0	
Total Split (%)				41.7%	41.7%		14.2%	58.3%			44.2%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			48.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.40	
v/c Ratio					0.61		1.20	0.42			1.29	
Control Delay					31.8		147.5	9.9			172.1	
Queue Delay					1.0		0.0	1.9			0.7	
Total Delay					32.9		147.5	11.8			172.8	
LOS					C		F	B			F	
Approach Delay					32.9			47.6			172.8	
Approach LOS					C			D			F	
Queue Length 50th (ft)					225		~184	139			~851	
Queue Length 95th (ft)					264		m#316	161			#994	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2067		214	1725			1256	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		0	810			0	
Spillback Cap Reductn					515		0	0			186	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.81		1.20	0.78			1.52	

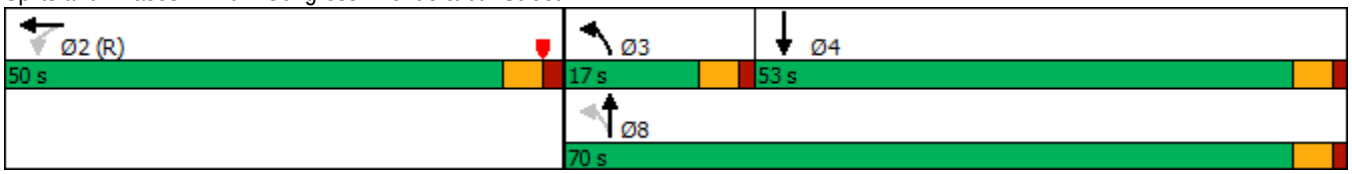
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 95.6		Intersection LOS: F	
Intersection Capacity Utilization 97.0%		ICU Level of Service F	
Analysis Period (min) 15			
Description: 6th Street			

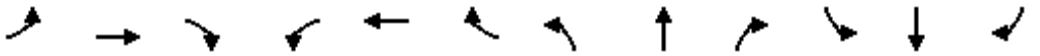
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Congress Avenue & 6th Street





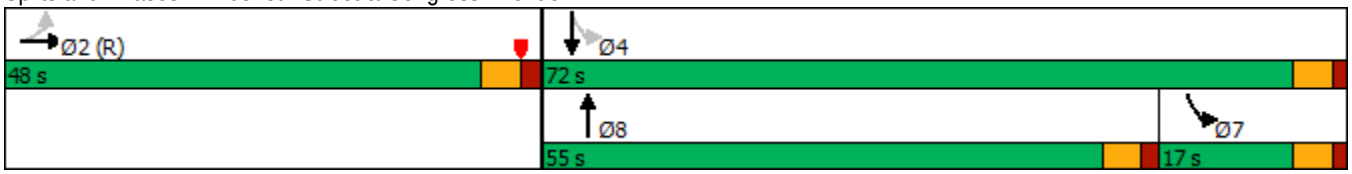
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	904	328	0	0	0	0	764	170	72	1642	0
Future Volume (vph)	115	904	328	0	0	0	0	764	170	72	1642	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4317	0	0	0	0	0	3055	0	1593	3185	0
Flt Permitted	0.950									0.164		
Satd. Flow (perm)	1505	4317	0	0	0	0	0	3055	0	275	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	1311	0	0	0	0	0	994	0	77	1747	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						55.0		17.0	72.0	
Total Split (%)	40.0%	40.0%						45.8%		14.2%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						50.0		67.0	67.0	
Actuated g/C Ratio	0.35	0.35						0.42		0.56	0.56	
v/c Ratio	0.23	0.85						0.77		0.27	0.98	
Control Delay	28.7	42.1						39.1		26.1	37.8	
Queue Delay	0.0	0.0						0.1		0.0	41.3	
Total Delay	28.7	42.1						39.2		26.1	79.1	
LOS	C	D						D		C	E	
Approach Delay		41.0						39.2			76.8	
Approach LOS		D						D			E	
Queue Length 50th (ft)	66	338						385		35	485	
Queue Length 95th (ft)	115	403						m379		m31	m370	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	533	1536						1288		285	1778	

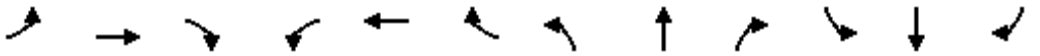
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	609	
Spillback Cap Reductn	0	0						12		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.23	0.85						0.78		0.27	1.49	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 55.9		Intersection LOS: E	
Intersection Capacity Utilization 97.0%		ICU Level of Service F	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	1284	446	457	1070	57	269	916	426	161	1869	214
Future Volume (vph)	89	1284	446	457	1070	57	269	916	426	161	1869	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	3090	1656	0	1593	3185	1425	1593	3097	0
Flt Permitted	0.174			0.950			0.115			0.103		
Satd. Flow (perm)	289	3185	1325	3040	1656	0	193	3185	1317	173	3097	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173		2				173		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	91	1310	455	466	1150	0	274	935	435	164	2125	0
Turn Type	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4		4				2		2	6		
Detector Phase	7	4	4	3	8		5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	5.0	4.0	10.0	
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	11.0	8.0	31.0	
Total Split (s)	15.0	38.0	38.0	24.0	47.0		10.0	31.0	24.0	27.0	48.0	
Total Split (%)	12.5%	31.7%	31.7%	20.0%	39.2%		8.3%	25.8%	20.0%	22.5%	40.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	0.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max		None	Max	Max	None	C-Max	
Act Effct Green (s)	32.0	32.0	32.0	18.0	41.0		38.7	34.7	52.7	53.7	42.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.15	0.34		0.32	0.29	0.44	0.45	0.35	
v/c Ratio	0.52	1.54	0.95	1.01	2.03		2.51	1.02	0.63	0.70	1.95	
Control Delay	56.8	282.4	57.4	94.4	493.4		730.3	76.4	18.3	42.9	452.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	56.8	282.4	57.4	94.4	493.4		730.3	76.4	18.3	42.9	452.6	
LOS	E	F	E	F	F		F	E	B	D	F	
Approach Delay		216.2			378.4			170.0			423.2	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	55	~751	234	~189	~1411		~294	~386	134	83	~1337	
Queue Length 95th (ft)	101	#888	#448	#301	#1674		#502	#593	258	m89	m#1396	
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		
Base Capacity (vph)	174	849	480	463	567		109	920	691	350	1091	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.52	1.54	0.95	1.01	2.03		2.51	1.02	0.63	0.47	1.95	

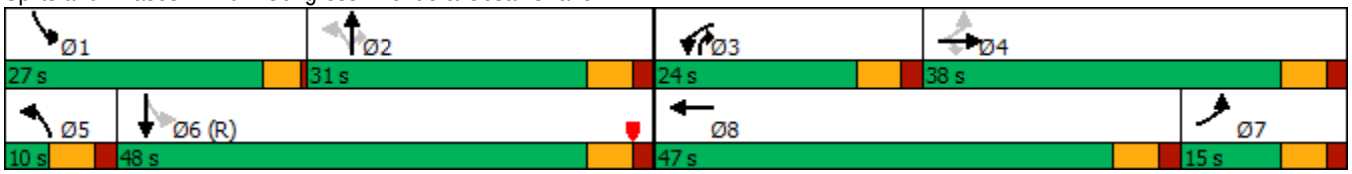
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 2 (2%), Referenced to phase 6:SBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 2.51			
Intersection Signal Delay: 305.3		Intersection LOS: F	
Intersection Capacity Utilization 173.9%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

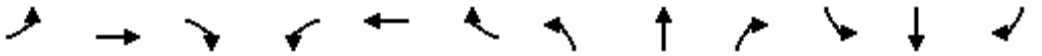
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	314	62	108	67	183	179	90	865	52	57	2269	448
Future Volume (vph)	314	62	108	67	183	179	90	865	52	57	2269	448
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1646	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted							0.054			0.218		
Satd. Flow (perm)	3495	1646	0	1826	1863	1519	101	3539	1518	404	3539	1461
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55				169			152			152
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	338	183	0	72	197	192	97	930	56	61	2440	482
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	8.5	45.0	45.0	8.5	45.0	45.0
Total Split (s)	26.0	32.0		10.0	16.0	16.0	13.0	87.0	87.0	11.0	85.0	85.0
Total Split (%)	18.6%	22.9%		7.1%	11.4%	11.4%	9.3%	62.1%	62.1%	7.9%	60.7%	60.7%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	21.8	20.0		15.6	13.8	13.8	83.3	83.3	83.3	79.5	79.5	79.5
Actuated g/C Ratio	0.16	0.14		0.11	0.10	0.10	0.60	0.60	0.60	0.57	0.57	0.57
v/c Ratio	0.62	0.65		0.36	1.08	0.64	0.67	0.44	0.06	0.22	1.21	0.54
Control Delay	59.8	48.8		65.7	145.6	22.7	68.7	22.6	1.2	15.5	130.6	14.8
Queue Delay	0.0	90.8		105.8	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0
Total Delay	59.8	139.6		171.5	145.6	22.7	68.7	22.6	1.2	15.5	132.0	14.8
LOS	E	F		F	F	C	E	C	A	B	F	B
Approach Delay		87.8			98.5			25.6			110.7	
Approach LOS		F			F			C			F	
Queue Length 50th (ft)	143	105		63	~200	20	67	386	3	24	~1427	177
Queue Length 95th (ft)	194	185		120	#409	#120	m93	460	m4	46	#1553	276
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	599	356		202	183	301	150	2106	965	283	2009	895

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	295		162	0	0	0	0	0	0	727	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	3.00		1.80	1.08	0.64	0.65	0.44	0.06	0.22	1.90	0.54

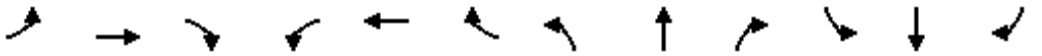
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.21			
Intersection Signal Delay: 89.0		Intersection LOS: F	
Intersection Capacity Utilization 112.1%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Barton Springs			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue



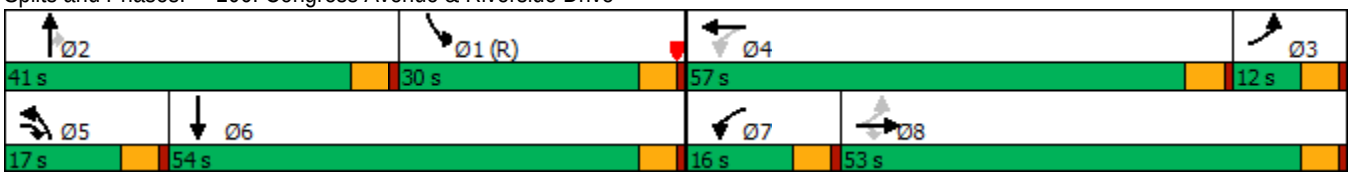
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	972	271	164	803	259	250	672	183	483	1827	57
Future Volume (vph)	81	972	271	164	803	259	250	672	183	483	1827	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		0	225		200	180		0
Storage Lanes	1		1	1		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3378	0	3433	3539	1583	3433	3517	0
Flt Permitted	0.115			0.103			0.950			0.950		
Satd. Flow (perm)	213	3539	1576	192	3378	0	3421	3539	1516	3365	3517	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94		35				161		2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	1002	279	169	1095	0	258	693	189	498	1943	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4					2			
Detector Phase	3	8	5	7	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	3.0	3.0	10.0		3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	10.0	40.0	8.0	8.0	40.0		8.0	32.0	32.0	8.0	37.0	
Total Split (s)	12.0	53.0	17.0	16.0	57.0		17.0	41.0	41.0	30.0	54.0	
Total Split (%)	8.6%	37.9%	12.1%	11.4%	40.7%		12.1%	29.3%	29.3%	21.4%	38.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min		None	Min	Min	C-Max	None	
Act Effct Green (s)	44.9	44.9	57.1	49.6	49.6		12.2	32.2	32.2	31.9	52.0	
Actuated g/C Ratio	0.32	0.32	0.41	0.35	0.35		0.09	0.23	0.23	0.23	0.37	
v/c Ratio	0.61	0.88	0.40	0.89	0.90		0.86	0.85	0.40	0.64	1.49	
Control Delay	70.1	54.9	17.9	75.7	52.0		89.3	62.2	11.8	58.5	255.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	70.1	54.9	17.9	75.7	52.0		89.3	62.2	11.8	58.5	255.6	
LOS	E	D	B	E	D		F	E	B	E	F	
Approach Delay		48.3			55.2			60.0			215.4	
Approach LOS		D			E			E			F	
Queue Length 50th (ft)	53	445	102	107	470		120	317	20	193	~1312	
Queue Length 95th (ft)	94	527	170	#233	565		#200	383	86	m170	m#1004	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150			225		200	180		

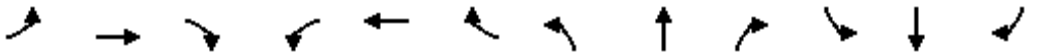
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	147	1213	706	191	1276		305	910	509	783	1307	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	12	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.57	0.83	0.40	0.88	0.86		0.85	0.76	0.37	0.64	1.50	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 1:SBL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.49			
Intersection Signal Delay: 117.5		Intersection LOS: F	
Intersection Capacity Utilization 112.4%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Congress Avenue & Riverside Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	210	34	60	341	0	213	0	213	0	0	0
Future Volume (vph)	0	210	34	60	341	0	213	0	213	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	3433	0	1583	0	1863	0
Flt Permitted					0.865		0.950					
Satd. Flow (perm)	0	3539	1472	0	3043	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						220			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	216	35	0	414	0	220	0	220	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.12	0.04		0.23		0.77		0.60			
Control Delay		15.8	0.1		12.5		50.7		13.9			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.8	0.1		12.5		50.7		13.9			
LOS		B	A		B		D		B			
Approach Delay		13.6			12.5			32.3				
Approach LOS		B			B			C				
Queue Length 50th (ft)		44	0		76		74		71			
Queue Length 95th (ft)		66	0		103		m#140		m109			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1774		286		506			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.12	0.04		0.23		0.77		0.43			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 56.2%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

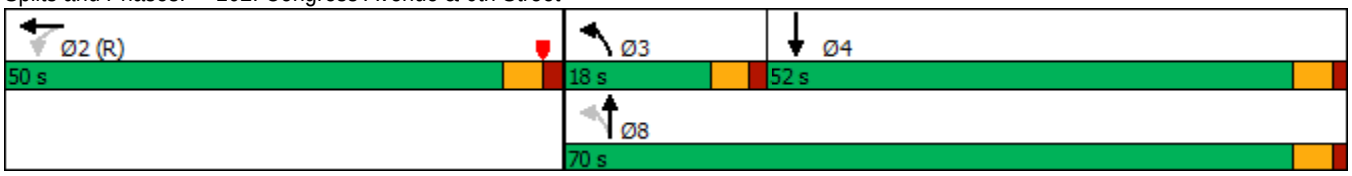
Splits and Phases: 101: 11th Street

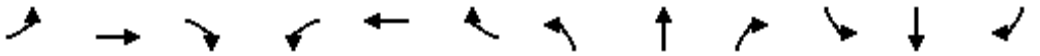
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	209	1125	56	279	856	0	0	258	79
Future Volume (vph)	0	0	0	209	1125	56	279	856	0	0	258	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5677	0	1593	3185	0	0	3014	0
Flt Permitted					0.993		0.452					
Satd. Flow (perm)	0	0	0	0	5631	0	732	3185	0	0	3014	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8						39	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1463	0	294	901	0	0	355	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		18.0	70.0			52.0	
Total Split (%)				41.7%	41.7%		15.0%	58.3%			43.3%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			47.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.39	
v/c Ratio					0.70		0.60	0.52			0.29	
Control Delay					34.1		10.0	8.4			20.9	
Queue Delay					0.0		2.3	2.1			0.0	
Total Delay					34.1		12.3	10.5			20.9	
LOS					C		B	B			C	
Approach Delay					34.1			10.9			20.9	
Approach LOS					C			B			C	
Queue Length 50th (ft)					275		60	153			86	
Queue Length 95th (ft)					319		m73	164			125	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2093		489	1725			1204	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		96	644			0	
Spillback Cap Reductn					0		0	0			0	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.70		0.75	0.83			0.29	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 23.3		Intersection LOS: C	
Intersection Capacity Utilization 77.6%		ICU Level of Service D	
Analysis Period (min) 15			
Description: 6th Street			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 102: Congress Avenue & 6th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	721	79	0	0	0	0	970	193	109	334	0
Future Volume (vph)	77	721	79	0	0	0	0	970	193	109	334	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4479	0	0	0	0	0	3065	0	1593	3185	0
Flt Permitted	0.950									0.122		
Satd. Flow (perm)	1505	4479	0	0	0	0	0	3065	0	205	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	851	0	0	0	0	0	1237	0	116	355	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	43.0	43.0						64.0		13.0	77.0	
Total Split (%)	35.8%	35.8%						53.3%		10.8%	64.2%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	37.5	37.5						59.0		72.0	72.0	
Actuated g/C Ratio	0.31	0.31						0.49		0.60	0.60	
v/c Ratio	0.17	0.60						0.81		0.54	0.19	
Control Delay	31.3	36.4						7.7		31.8	9.4	
Queue Delay	0.0	0.0						0.2		0.0	0.0	
Total Delay	31.3	36.4						7.9		31.8	9.4	
LOS	C	D						A		C	A	
Approach Delay		36.0						7.9			14.9	
Approach LOS		D						A			B	
Queue Length 50th (ft)	46	200						37		43	70	
Queue Length 95th (ft)	87	247						m30		m63	84	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	470	1410						1520		215	1911	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	0	
Spillback Cap Reductn	0	0						25		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.17	0.60						0.83		0.54	0.19	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 77.6%		ICU Level of Service D	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	896	296	164	452	106	176	1956	516	23	482	62
Future Volume (vph)	196	896	296	164	452	106	176	1956	516	23	482	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	1593	3050	0	1593	3185	1425	1593	3104	0
Flt Permitted	0.215			0.312			0.272			0.111		
Satd. Flow (perm)	354	3185	1325	514	3050	0	448	3185	1317	186	3104	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			210		26				195		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	914	302	167	569	0	180	1996	527	23	555	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	29.0	31.0	31.0	
Total Split (s)	21.0	52.0	52.0	16.0	47.0		10.0	52.0	52.0	42.0	42.0	
Total Split (%)	17.5%	43.3%	43.3%	13.3%	39.2%		8.3%	43.3%	43.3%	35.0%	35.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max		None	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)	46.0	46.0	46.0	41.0	41.0		46.0	46.0	46.0	36.0	36.0	
Actuated g/C Ratio	0.38	0.38	0.38	0.34	0.34		0.38	0.38	0.38	0.30	0.30	
v/c Ratio	0.69	0.75	0.47	0.63	0.54		0.86	1.64	0.84	0.42	0.59	
Control Delay	39.7	36.7	11.1	50.4	32.5		67.2	318.0	34.7	62.7	40.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	39.7	36.7	11.1	50.4	32.5		67.2	318.0	34.7	62.7	40.0	
LOS	D	D	B	D	C		E	F	C	E	D	
Approach Delay		31.7			36.6			246.1			40.9	
Approach LOS		C			D			F			D	
Queue Length 50th (ft)	108	318	47	95	177		96	~1175	248	16	201	
Queue Length 95th (ft)	#174	398	127	154	235		#211	#1313	#462	m44	263	
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		
Base Capacity (vph)	290	1220	637	265	1059		209	1220	625	55	939	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.69	0.75	0.47	0.63	0.54		0.86	1.64	0.84	0.42	0.59	

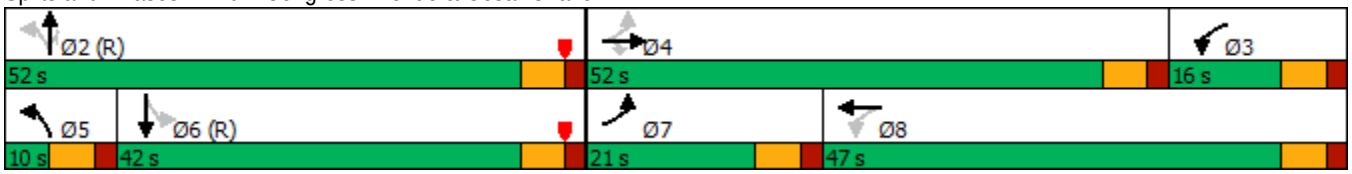
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 54 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Red			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.64			
Intersection Signal Delay: 140.0		Intersection LOS: F	
Intersection Capacity Utilization 126.0%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

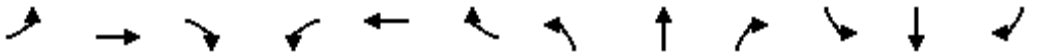
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez



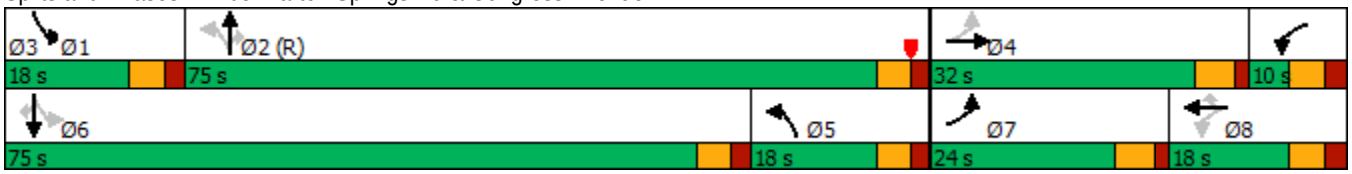


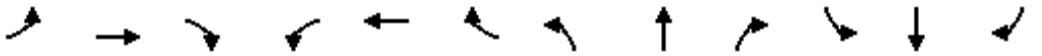
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	419	78	46	20	93	94	82	1902	102	79	427	278
Future Volume (vph)	419	78	46	20	93	94	82	1902	102	79	427	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1737	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.381			0.672			0.488			0.065		
Satd. Flow (perm)	1328	1737	0	1226	1863	1521	882	3539	1519	121	3539	1464
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19				154			158			258
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	451	133	0	22	100	101	88	2045	110	85	459	299
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	15.0	45.0	45.0	15.0	45.0	45.0
Total Split (s)	24.0	32.0		10.0	18.0	18.0	18.0	75.0	75.0	18.0	75.0	75.0
Total Split (%)	17.8%	23.7%		7.4%	13.3%	13.3%	13.3%	55.6%	55.6%	13.3%	55.6%	55.6%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	28.7	28.7		12.2	10.5	10.5	76.4	76.4	76.4	71.3	71.3	71.3
Actuated g/C Ratio	0.21	0.21		0.09	0.08	0.08	0.57	0.57	0.57	0.53	0.53	0.53
v/c Ratio	0.80	0.35		0.17	0.69	0.39	0.15	1.02	0.12	0.55	0.25	0.33
Control Delay	60.3	42.2		60.4	84.4	5.9	6.0	27.3	0.0	32.7	18.0	4.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	31.5	0.0	0.0	0.0	0.0
Total Delay	60.3	42.2		60.4	84.4	5.9	6.0	58.8	0.0	32.7	18.0	4.4
LOS	E	D		E	F	A	A	E	A	C	B	A
Approach Delay		56.1			46.5			53.9			14.6	
Approach LOS		E			D			D			B	
Queue Length 50th (ft)	190	87		18	86	0	16	~1051	0	37	114	17
Queue Length 95th (ft)	#259	152		47	#151	11	m13	m192	m0	78	150	67
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	570	384		127	165	275	581	2003	928	216	1869	894

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	321	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.35		0.17	0.61	0.37	0.15	1.22	0.12	0.39	0.25	0.33

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 72 (53%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 45.3		Intersection LOS: D	
Intersection Capacity Utilization 94.4%		ICU Level of Service F	
Analysis Period (min) 15			
Description: Barton Springs			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





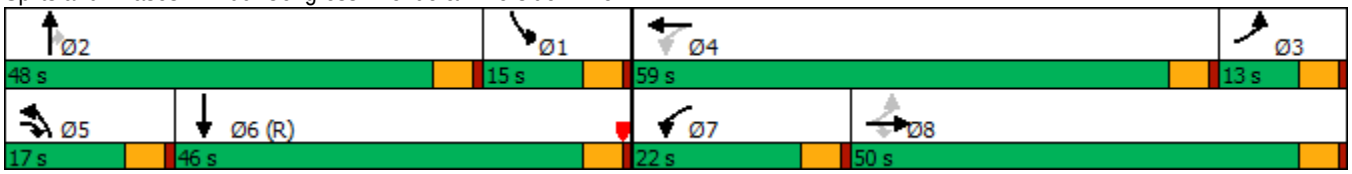
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	495	115	181	1085	427	293	1565	136	129	249	36
Future Volume (vph)	121	495	115	181	1085	427	293	1565	136	129	249	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		0	225		200	180		0
Storage Lanes	1		1	1		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3356	0	3433	3539	1583	3433	3454	0
Flt Permitted	0.097			0.294			0.950			0.950		
Satd. Flow (perm)	180	3539	1577	543	3356	0	3319	3539	1518	3415	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			119		51				137		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	125	510	119	187	1559	0	302	1613	140	133	294	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4					2			
Detector Phase	3	8	5	7	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	8.0	10.0	3.0	3.0	10.0		3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	13.0	40.0	8.0	8.0	45.0		8.0	42.0	42.0	8.0	37.0	
Total Split (s)	13.0	50.0	17.0	22.0	59.0		17.0	48.0	48.0	15.0	46.0	
Total Split (%)	9.6%	37.0%	12.6%	16.3%	43.7%		12.6%	35.6%	35.6%	11.1%	34.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min		None	Min	Min	None	C-Max	
Act Effct Green (s)	49.1	49.1	61.1	54.0	54.0		12.0	43.0	43.0	10.0	41.0	
Actuated g/C Ratio	0.36	0.36	0.45	0.40	0.40		0.09	0.32	0.32	0.07	0.30	
v/c Ratio	0.79	0.40	0.15	0.56	1.14		0.99	1.43	0.24	0.52	0.28	
Control Delay	83.4	33.6	3.9	34.2	107.0		110.0	234.3	6.6	55.2	22.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	1.2	0.0	0.0	0.0	
Total Delay	83.4	33.6	3.9	34.2	107.0		110.0	235.5	6.6	55.2	22.0	
LOS	F	C	A	C	F		F	F	A	E	C	
Approach Delay		37.2			99.2			201.4			32.3	
Approach LOS		D			F			F			C	
Queue Length 50th (ft)	75	174	0	109	~823		138	~1005	2	59	104	
Queue Length 95th (ft)	#175	236	35	168	#965		#236	#1145	50	95	146	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150			225		200	180		

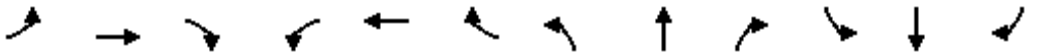
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	159	1287	784	371	1373		305	1127	576	254	1057	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	1		0	246	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.79	0.40	0.15	0.50	1.14		0.99	1.83	0.24	0.52	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 60 (44%), Referenced to phase 6:SBT, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 126.3		Intersection LOS: F	
Intersection Capacity Utilization 114.5%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Congress Avenue & Riverside Drive



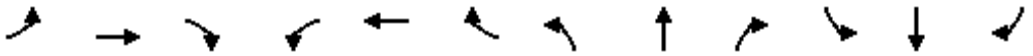


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	385	124	151	306	0	172	0	223	0	0	0
Future Volume (vph)	0	385	124	151	306	0	172	0	223	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3483	0	3433	0	1583	0	1863	0
Flt Permitted					0.663		0.950					
Satd. Flow (perm)	0	3539	1472	0	2325	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						230			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	397	128	0	471	0	177	0	230	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.22	0.16		0.34		0.62		0.61			
Control Delay		16.8	4.5		13.5		77.7		42.2			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		16.8	4.5		13.5		77.7		42.2			
LOS		B	A		B		E		D			
Approach Delay		13.8			13.5			57.6				
Approach LOS		B			B			E				
Queue Length 50th (ft)		86	7		88		74		120			
Queue Length 95th (ft)		118	39		117		111		187			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1376		286		514			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.22	0.16		0.34		0.62		0.45			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 26.4		Intersection LOS: C	
Intersection Capacity Utilization 57.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	259	810	73	230	641	0	0	1359	116
Future Volume (vph)	0	0	0	259	810	73	230	641	0	0	1359	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5623	0	1593	3185	0	0	3127	0
Flt Permitted					0.989		0.075					
Satd. Flow (perm)	0	0	0	0	5553	0	126	3185	0	0	3127	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13						9	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1203	0	242	675	0	0	1553	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		17.0	70.0			53.0	
Total Split (%)				41.7%	41.7%		14.2%	58.3%			44.2%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			48.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.40	
v/c Ratio					0.58		1.13	0.39			1.24	
Control Delay					31.3		122.4	10.1			148.6	
Queue Delay					0.8		0.0	1.4			0.5	
Total Delay					32.1		122.4	11.6			149.1	
LOS					C		F	B			F	
Approach Delay					32.1			40.8			149.1	
Approach LOS					C			D			F	
Queue Length 50th (ft)					212		~160	135			~789	
Queue Length 95th (ft)					251		m#316	159			#932	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2067		214	1725			1256	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		0	810			0	
Spillback Cap Reductn					515		0	0			144	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.78		1.13	0.74			1.40	

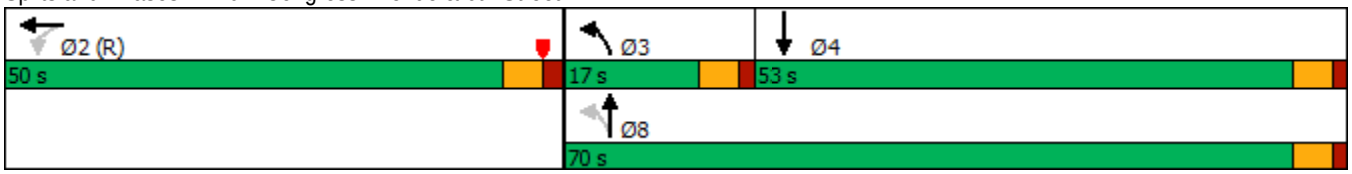
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.24			
Intersection Signal Delay: 83.8		Intersection LOS: F	
Intersection Capacity Utilization 94.0%		ICU Level of Service F	
Analysis Period (min) 15			
Description: 6th Street			

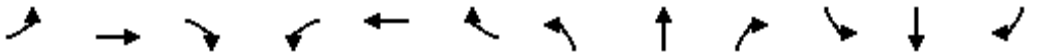
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: Congress Avenue & 6th Street





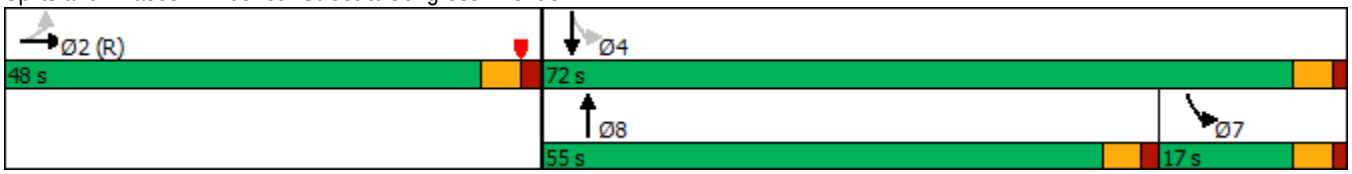
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	867	314	0	0	0	0	715	159	69	1569	0
Future Volume (vph)	110	867	314	0	0	0	0	715	159	69	1569	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4317	0	0	0	0	0	3055	0	1593	3185	0
Flt Permitted	0.950									0.189		
Satd. Flow (perm)	1505	4317	0	0	0	0	0	3055	0	317	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	1256	0	0	0	0	0	930	0	73	1669	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						55.0		17.0	72.0	
Total Split (%)	40.0%	40.0%						45.8%		14.2%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						50.0		67.0	67.0	
Actuated g/C Ratio	0.35	0.35						0.42		0.56	0.56	
v/c Ratio	0.22	0.82						0.72		0.24	0.94	
Control Delay	28.6	40.0						39.1		24.9	34.2	
Queue Delay	0.0	0.0						0.0		0.0	45.6	
Total Delay	28.6	40.0						39.2		24.9	79.7	
LOS	C	D						D		C	E	
Approach Delay		39.1						39.2			77.4	
Approach LOS		D						D			E	
Queue Length 50th (ft)	63	317						358		33	451	
Queue Length 95th (ft)	110	379						m381		m31	m366	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	533	1538						1288		304	1778	

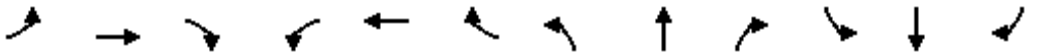
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	611	
Spillback Cap Reductn	0	0						10		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.22	0.82						0.73		0.24	1.43	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 55.6		Intersection LOS: E	
Intersection Capacity Utilization 94.0%		ICU Level of Service F	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	1231	426	437	1026	54	251	854	398	154	1785	205
Future Volume (vph)	85	1231	426	437	1026	54	251	854	398	154	1785	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	3090	1658	0	1593	3185	1425	1593	3097	0
Flt Permitted	0.174			0.950			0.114			0.102		
Satd. Flow (perm)	289	3185	1325	3036	1658	0	191	3185	1317	171	3097	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173		2				173		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	1256	435	446	1102	0	256	871	406	157	2030	0
Turn Type	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4		4				2		2	6		
Detector Phase	7	4	4	3	8		5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	5.0	4.0	10.0	
Minimum Split (s)	11.0	29.0	29.0	11.0	26.0		10.0	29.0	11.0	8.0	31.0	
Total Split (s)	15.0	38.0	38.0	24.0	47.0		10.0	31.0	24.0	27.0	48.0	
Total Split (%)	12.5%	31.7%	31.7%	20.0%	39.2%		8.3%	25.8%	20.0%	22.5%	40.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	0.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max		None	Max	Max	None	C-Max	
Act Effct Green (s)	32.0	32.0	32.0	18.0	41.0		39.1	35.1	53.1	53.7	42.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.15	0.34		0.33	0.29	0.44	0.45	0.35	
v/c Ratio	0.50	1.48	0.91	0.96	1.94		2.35	0.93	0.58	0.69	1.86	
Control Delay	55.5	255.3	49.5	84.6	456.4		655.8	59.4	16.1	43.4	414.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	55.5	255.3	49.5	84.6	456.4		655.8	59.4	16.1	43.4	414.7	
LOS	E	F	D	F	F		F	E	B	D	F	
Approach Delay		195.2			349.3			147.5			388.0	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	52	~705	212	179	~1332		~264	344	114	78	~1273	
Queue Length 95th (ft)	97	#842	#414	#282	#1593		#466	#527	224	m91	m#1376	
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		
Base Capacity (vph)	174	849	480	463	567		109	932	695	349	1091	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.50	1.48	0.91	0.96	1.94		2.35	0.93	0.58	0.45	1.86	

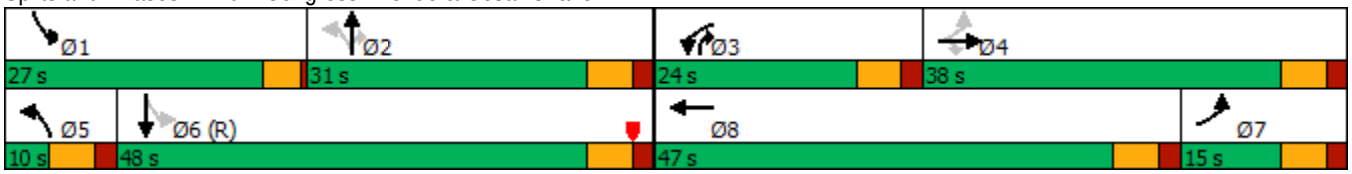
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 2 (2%), Referenced to phase 6:SBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 2.35			
Intersection Signal Delay: 278.5		Intersection LOS: F	
Intersection Capacity Utilization 166.9%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

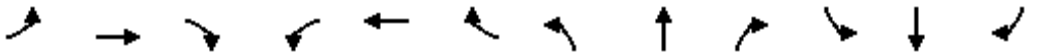
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	53	103	60	157	152	86	817	45	50	2172	427
Future Volume (vph)	292	53	103	60	157	152	86	817	45	50	2172	427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1637	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.426			0.651			0.055			0.233		
Satd. Flow (perm)	1487	1637	0	1188	1863	1519	102	3539	1518	432	3539	1461
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		62				163			152			152
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	314	168	0	65	169	163	92	878	48	54	2335	459
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	8.5	45.0	45.0	8.5	45.0	45.0
Total Split (s)	26.0	32.0		10.0	16.0	16.0	13.0	87.0	87.0	11.0	85.0	85.0
Total Split (%)	18.6%	22.9%		7.1%	11.4%	11.4%	9.3%	62.1%	62.1%	7.9%	60.7%	60.7%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	26.8	25.8		16.5	14.6	14.6	83.3	83.3	83.3	79.5	79.5	79.5
Actuated g/C Ratio	0.19	0.18		0.12	0.10	0.10	0.60	0.60	0.60	0.57	0.57	0.57
v/c Ratio	0.61	0.48		0.38	0.87	0.54	0.64	0.42	0.05	0.18	1.16	0.51
Control Delay	56.9	37.3		67.0	99.1	15.7	66.9	22.3	1.1	15.0	108.5	14.0
Queue Delay	0.0	3.8		92.7	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0
Total Delay	56.9	41.2		159.7	99.1	15.7	66.9	22.3	1.1	15.0	109.9	14.0
LOS	E	D		F	F	B	E	C	A	B	F	B
Approach Delay		51.4			74.8			25.3			92.6	
Approach LOS		D			E			C			F	
Queue Length 50th (ft)	132	85		56	154	0	64	360	2	21	~1323	160
Queue Length 95th (ft)	182	161		#129	#345	73	m91	435	m3	42	#1451	253
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	580	388		171	194	304	150	2105	964	297	2009	895

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	146		114	0	0	0	0	0	0	689	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.69		1.14	0.87	0.54	0.61	0.42	0.05	0.18	1.77	0.51

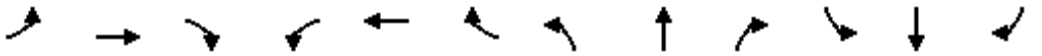
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 72.5		Intersection LOS: E	
Intersection Capacity Utilization 107.9%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Barton Springs			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	923	259	155	763	241	239	639	173	457	1750	51
Future Volume (vph)	73	923	259	155	763	241	239	639	173	457	1750	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		0	225		200	180		0
Storage Lanes	1		1	1		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3382	0	3433	3539	1583	3433	3521	0
Flt Permitted	0.133			0.108			0.950			0.950		
Satd. Flow (perm)	247	3539	1576	201	3382	0	3420	3539	1516	3362	3521	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94		34				160		2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	952	267	160	1035	0	246	659	178	471	1857	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4					2			
Detector Phase	3	8	5	7	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	3.0	3.0	10.0		3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	10.0	40.0	8.0	8.0	40.0		8.0	32.0	32.0	8.0	37.0	
Total Split (s)	12.0	53.0	17.0	16.0	57.0		17.0	41.0	41.0	30.0	54.0	
Total Split (%)	8.6%	37.9%	12.1%	11.4%	40.7%		12.1%	29.3%	29.3%	21.4%	38.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min		None	Min	Min	C-Max	None	
Act Effct Green (s)	43.8	43.8	55.9	47.9	47.9		12.1	31.2	31.2	34.3	53.4	
Actuated g/C Ratio	0.31	0.31	0.40	0.34	0.34		0.09	0.22	0.22	0.24	0.38	
v/c Ratio	0.50	0.86	0.39	0.85	0.88		0.83	0.84	0.39	0.56	1.38	
Control Delay	60.2	53.7	17.7	69.7	51.0		85.7	61.9	10.7	56.7	210.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	60.2	53.7	17.7	69.7	51.0		85.7	61.9	10.7	56.7	210.5	
LOS	E	D	B	E	D		F	E	B	E	F	
Approach Delay		46.7			53.5			58.9			179.4	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	49	425	96	103	444		113	302	13	167	~1209	
Queue Length 95th (ft)	85	493	161	#209	521		#187	361	74	m166	m#995	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150			225		200	180		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	154	1213	695	191	1277		306	910	508	841	1344	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	17	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.49	0.78	0.38	0.84	0.81		0.80	0.72	0.35	0.56	1.40	

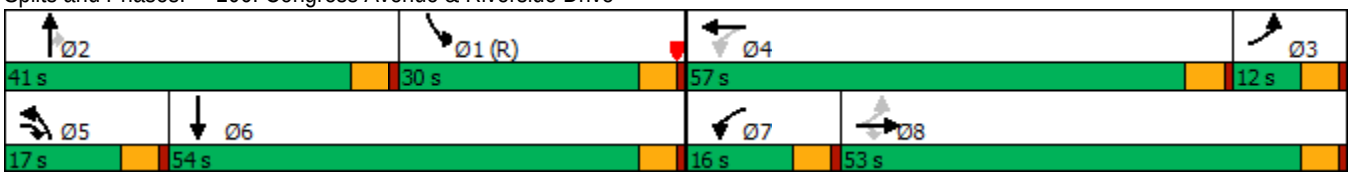
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 1:SBL, Start of Red			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 102.7		Intersection LOS: F	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Riverside			

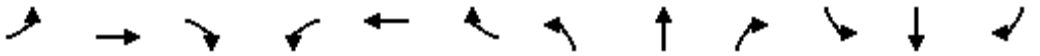
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Congress Avenue & Riverside Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	201	32	56	326	0	203	0	203	0	0	0
Future Volume (vph)	0	201	32	56	326	0	203	0	203	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	3433	0	1583	0	1863	0
Flt Permitted					0.870		0.950					
Satd. Flow (perm)	0	3539	1472	0	3061	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						209			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	33	0	394	0	209	0	209	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.12	0.04		0.22		0.73		0.59			
Control Delay		15.7	0.1		12.4		46.6		14.0			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.7	0.1		12.4		46.6		14.0			
LOS		B	A		B		D		B			
Approach Delay		13.6			12.4			30.3				
Approach LOS		B			B			C				
Queue Length 50th (ft)		42	0		72		70		73			
Queue Length 95th (ft)		64	0		98		#129		112			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1784		286		498			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.12	0.04		0.22		0.73		0.42			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 55.6%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

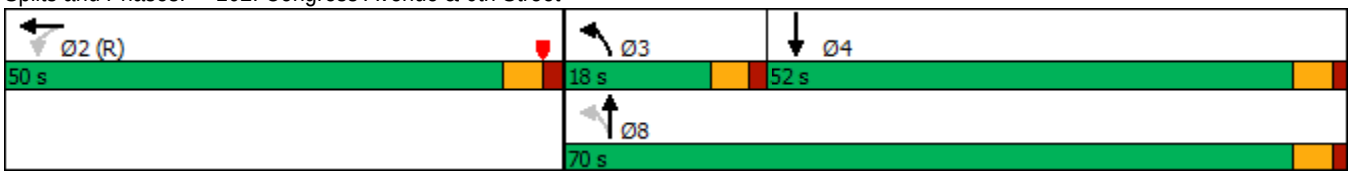
Splits and Phases: 101: 11th Street

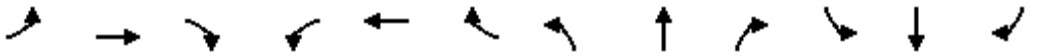
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	197	1076	54	265	813	0	0	243	76
Future Volume (vph)	0	0	0	197	1076	54	265	813	0	0	243	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5677	0	1593	3185	0	0	3010	0
Flt Permitted					0.993		0.465					
Satd. Flow (perm)	0	0	0	0	5631	0	752	3185	0	0	3010	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8						41	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1397	0	279	856	0	0	336	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		18.0	70.0			52.0	
Total Split (%)				41.7%	41.7%		15.0%	58.3%			43.3%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			47.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.39	
v/c Ratio					0.67		0.56	0.50			0.28	
Control Delay					33.3		9.5	8.4			20.4	
Queue Delay					0.0		1.8	1.6			0.0	
Total Delay					33.3		11.3	10.0			20.4	
LOS					C		B	B			C	
Approach Delay					33.3			10.3			20.4	
Approach LOS					C			B			C	
Queue Length 50th (ft)					259		59	147			80	
Queue Length 95th (ft)					301		m76	161			116	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2093		498	1725			1203	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		102	646			0	
Spillback Cap Reductn					0		0	0			0	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.67		0.70	0.79			0.28	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 22.7		Intersection LOS: C	
Intersection Capacity Utilization 75.5%		ICU Level of Service D	
Analysis Period (min) 15			
Description: 6th Street			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 102: Congress Avenue & 6th Street





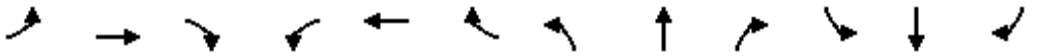
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	690	74	0	0	0	0	921	183	104	313	0
Future Volume (vph)	74	690	74	0	0	0	0	921	183	104	313	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4479	0	0	0	0	0	3065	0	1593	3185	0
Flt Permitted	0.950									0.139		
Satd. Flow (perm)	1505	4479	0	0	0	0	0	3065	0	233	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	813	0	0	0	0	0	1175	0	111	333	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	43.0	43.0						64.0		13.0	77.0	
Total Split (%)	35.8%	35.8%						53.3%		10.8%	64.2%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	37.5	37.5						59.0		72.0	72.0	
Actuated g/C Ratio	0.31	0.31						0.49		0.60	0.60	
v/c Ratio	0.17	0.58						0.77		0.48	0.17	
Control Delay	31.2	35.8						6.7		27.2	9.6	
Queue Delay	0.0	0.0						0.1		0.0	0.0	
Total Delay	31.2	35.8						6.8		27.2	9.6	
LOS	C	D						A		C	A	
Approach Delay		35.4						6.8			14.0	
Approach LOS		D						A			B	
Queue Length 50th (ft)	44	189						34		40	67	
Queue Length 95th (ft)	84	234						m30		m62	82	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	470	1410						1520		230	1911	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	0	
Spillback Cap Reductn	0	0						18		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.17	0.58						0.78		0.48	0.17	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 75.5%		ICU Level of Service D	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	857	267	153	433	101	167	1854	489	22	449	59
Future Volume (vph)	187	857	267	153	433	101	167	1854	489	22	449	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	1593	3048	0	1593	3185	1425	1593	3107	0
Flt Permitted	0.232			0.325			0.296			0.111		
Satd. Flow (perm)	381	3185	1307	533	3048	0	487	3185	1325	186	3107	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			228		26				195		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	874	272	156	545	0	170	1892	499	22	518	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	11.0	25.0	25.0	11.0	25.0		10.0	29.0	29.0	31.0	31.0	
Total Split (s)	21.0	52.0	52.0	16.0	47.0		10.0	52.0	52.0	42.0	42.0	
Total Split (%)	17.5%	43.3%	43.3%	13.3%	39.2%		8.3%	43.3%	43.3%	35.0%	35.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max		None	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)	46.0	46.0	46.0	41.0	41.0		46.0	46.0	46.0	36.0	36.0	
Actuated g/C Ratio	0.38	0.38	0.38	0.34	0.34		0.38	0.38	0.38	0.30	0.30	
v/c Ratio	0.64	0.72	0.42	0.58	0.52		0.76	1.55	0.79	0.40	0.55	
Control Delay	36.8	35.5	7.6	47.0	32.0		52.7	281.1	30.2	60.8	38.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	36.8	35.5	7.6	47.0	32.0		52.7	281.1	30.2	60.8	38.9	
LOS	D	D	A	D	C		D	F	C	E	D	
Approach Delay		30.0			35.4			217.0			39.8	
Approach LOS		C			D			F			D	
Queue Length 50th (ft)	103	298	22	88	167		90	~1087	217	15	184	
Queue Length 95th (ft)	163	376	87	145	224		#177	#1226	#379	m44	246	
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		
Base Capacity (vph)	297	1220	641	270	1058		223	1220	628	55	940	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.64	0.72	0.42	0.58	0.52		0.76	1.55	0.79	0.40	0.55	

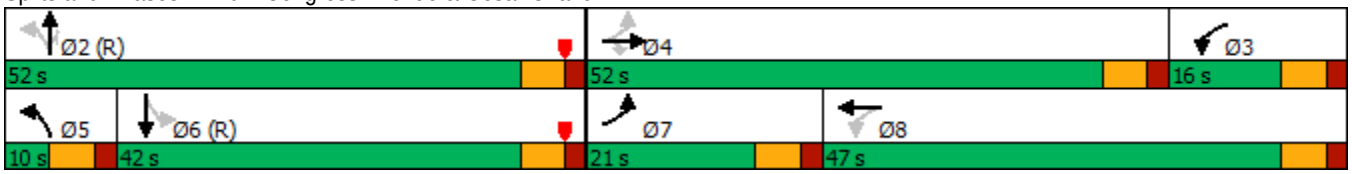
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 54 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Red			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.55			
Intersection Signal Delay: 125.0		Intersection LOS: F	
Intersection Capacity Utilization 121.0%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

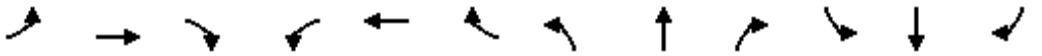
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez



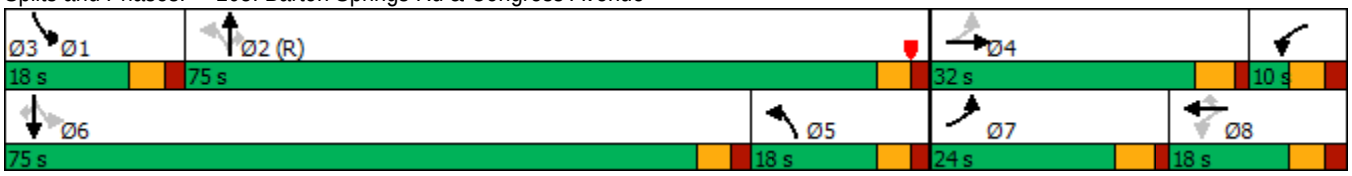


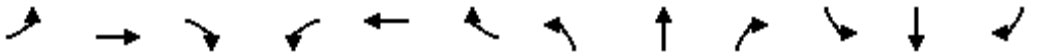
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	65	44	17	76	77	78	1811	88	68	404	258
Future Volume (vph)	400	65	44	17	76	77	78	1811	88	68	404	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1726	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.384			0.682			0.500			0.065		
Satd. Flow (perm)	1335	1726	0	1244	1863	1521	906	3539	1519	121	3539	1474
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				154			158			254
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	430	117	0	18	82	83	84	1947	95	73	434	277
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	15.0	45.0	45.0	15.0	45.0	45.0
Total Split (s)	24.0	32.0		10.0	18.0	18.0	18.0	75.0	75.0	18.0	75.0	75.0
Total Split (%)	17.8%	23.7%		7.4%	13.3%	13.3%	13.3%	55.6%	55.6%	13.3%	55.6%	55.6%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	30.1	30.1		12.8	10.1	10.1	79.6	79.6	79.6	71.9	71.9	71.9
Actuated g/C Ratio	0.22	0.22		0.09	0.07	0.07	0.59	0.59	0.59	0.53	0.53	0.53
v/c Ratio	0.75	0.29		0.13	0.59	0.32	0.14	0.93	0.10	0.50	0.23	0.31
Control Delay	55.9	38.0		57.9	77.2	3.3	5.6	13.8	0.0	29.0	17.6	3.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	44.9	0.0	0.0	0.0	0.0
Total Delay	55.9	38.0		57.9	77.2	3.3	5.6	58.7	0.0	29.0	17.6	3.7
LOS	E	D		E	E	A	A	E	A	C	B	A
Approach Delay		52.1			41.8			53.9			13.8	
Approach LOS		D			D			D			B	
Queue Length 50th (ft)	162	65		14	70	0	15	254	0	31	107	10
Queue Length 95th (ft)	237	132		41	126	0	m13	m178	m0	63	141	55
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	584	401		134	165	275	614	2087	960	216	1885	904

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	321	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.29		0.13	0.50	0.30	0.14	1.10	0.10	0.34	0.23	0.31

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 72 (53%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 44.4		Intersection LOS: D	
Intersection Capacity Utilization 90.8%		ICU Level of Service E	
Analysis Period (min) 15			
Description: Barton Springs			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 105: Barton Springs Rd & Congress Avenue





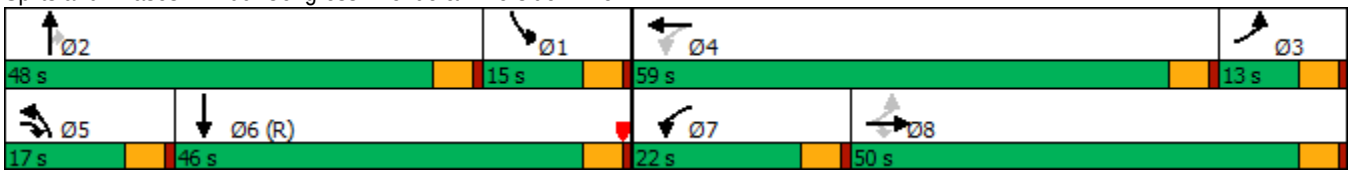
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	471	109	168	1018	395	278	1493	127	121	237	32
Future Volume (vph)	111	471	109	168	1018	395	278	1493	127	121	237	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		0	225		200	180		0
Storage Lanes	1		1	1		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3349	0	3433	3539	1583	3433	3460	0
Flt Permitted	0.096			0.314			0.950			0.950		
Satd. Flow (perm)	179	3539	1568	578	3349	0	3334	3539	1530	3418	3460	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112		50				137		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	486	112	173	1456	0	287	1539	131	125	277	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4					2			
Detector Phase	3	8	5	7	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	8.0	10.0	3.0	3.0	10.0		3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	13.0	40.0	8.0	8.0	40.0		8.0	42.0	42.0	8.0	37.0	
Total Split (s)	13.0	50.0	17.0	22.0	59.0		17.0	48.0	48.0	15.0	46.0	
Total Split (%)	9.6%	37.0%	12.6%	16.3%	43.7%		12.6%	35.6%	35.6%	11.1%	34.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min		None	Min	Min	None	C-Max	
Act Effct Green (s)	49.7	49.7	61.7	54.0	54.0		12.0	43.0	43.0	10.0	41.0	
Actuated g/C Ratio	0.37	0.37	0.46	0.40	0.40		0.09	0.32	0.32	0.07	0.30	
v/c Ratio	0.71	0.37	0.14	0.51	1.06		0.94	1.37	0.23	0.49	0.26	
Control Delay	75.1	32.9	4.0	32.7	81.0		99.2	206.7	5.6	54.3	22.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.4	0.0	0.0	0.0	
Total Delay	75.1	32.9	4.0	32.7	81.0		99.2	207.1	5.6	54.3	22.0	
LOS	E	C	A	C	F		F	F	A	D	C	
Approach Delay		35.1			75.8			177.8			32.0	
Approach LOS		D			E			F			C	
Queue Length 50th (ft)	67	163	0	100	~725		131	~934	0	56	97	
Queue Length 95th (ft)	#151	224	34	157	#867		#221	#1074	43	90	138	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150			225		200	180		

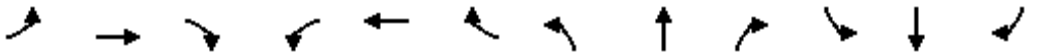
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	160	1303	783	381	1369		305	1127	580	254	1058	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	101	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.71	0.37	0.14	0.45	1.06		0.94	1.50	0.23	0.49	0.26	

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Offset: 60 (44%), Referenced to phase 6:SBT, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.37			
Intersection Signal Delay: 108.4		Intersection LOS: F	
Intersection Capacity Utilization 109.4%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: Congress Avenue & Riverside Drive



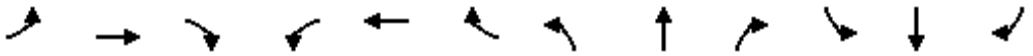


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	368	118	144	292	0	161	0	209	0	0	0
Future Volume (vph)	0	368	118	144	292	0	161	0	209	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3483	0	3433	0	1583	0	1863	0
Flt Permitted					0.671		0.950					
Satd. Flow (perm)	0	3539	1472	0	2352	0	3093	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						215			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	379	122	0	449	0	166	0	215	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.21	0.15		0.32		0.58		0.60			
Control Delay		16.7	4.2		13.3		76.9		42.5			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		16.7	4.2		13.3		76.9		42.5			
LOS		B	A		B		E		D			
Approach Delay		13.7			13.3			57.5				
Approach LOS		B			B			E				
Queue Length 50th (ft)		82	5		83		69		113			
Queue Length 95th (ft)		113	36		112		106		181			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1391		286		503			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.21	0.15		0.32		0.58		0.43			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 26.1		Intersection LOS: C	
Intersection Capacity Utilization 57.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	247	775	70	215	600	0	0	1296	111
Future Volume (vph)	0	0	0	247	775	70	215	600	0	0	1296	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5623	0	1593	3185	0	0	3127	0
Flt Permitted					0.989		0.075					
Satd. Flow (perm)	0	0	0	0	5553	0	126	3185	0	0	3127	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					14						9	
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1179			1529			354			1786	
Travel Time (s)		26.8			34.8			9.7			40.6	
Confl. Peds. (#/hr)				38		38	38		38	38		38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1150	0	226	632	0	0	1481	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		3	8			4	
Permitted Phases				2			8					
Detector Phase				2	2		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0			10.0	
Minimum Split (s)				30.5	30.5		15.0	24.0			24.0	
Total Split (s)				50.0	50.0		17.0	70.0			53.0	
Total Split (%)				41.7%	41.7%		14.2%	58.3%			44.2%	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		1.5	1.5			1.5	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.0	5.0			5.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				C-Max	C-Max		Max	Max			Max	
Act Effct Green (s)					44.5		65.0	65.0			48.0	
Actuated g/C Ratio					0.37		0.54	0.54			0.40	
v/c Ratio					0.56		1.06	0.37			1.18	
Control Delay					30.8		98.2	10.3			125.3	
Queue Delay					0.7		0.0	1.1			0.5	
Total Delay					31.4		98.2	11.4			125.8	
LOS					C		F	B			F	
Approach Delay					31.4			34.3			125.8	
Approach LOS					C			C			F	
Queue Length 50th (ft)					200		~117	130			~726	
Queue Length 95th (ft)					237		#296	153			#869	
Internal Link Dist (ft)		1099			1449			274			1706	
Turn Bay Length (ft)							175					
Base Capacity (vph)					2068		214	1725			1256	

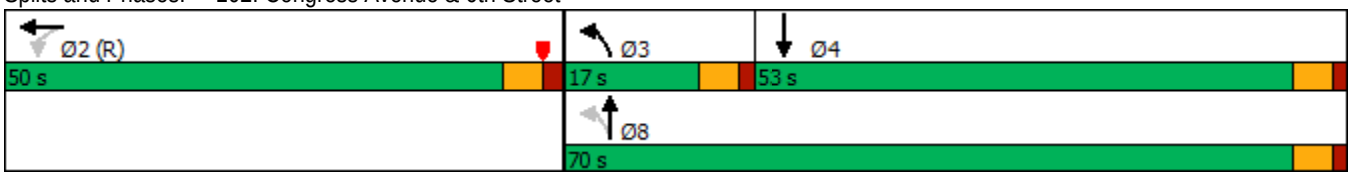
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0		0	811			0	
Spillback Cap Reductn					515		0	0			140	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.74		1.06	0.69			1.33	

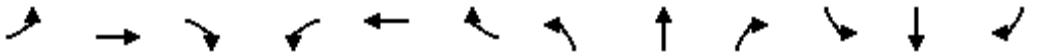
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 61 (51%), Referenced to phase 2:WBTL, Start of Red			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 72.2		Intersection LOS: E	
Intersection Capacity Utilization 91.0%		ICU Level of Service E	
Analysis Period (min) 15			
Description: 6th Street			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Congress Avenue & 6th Street





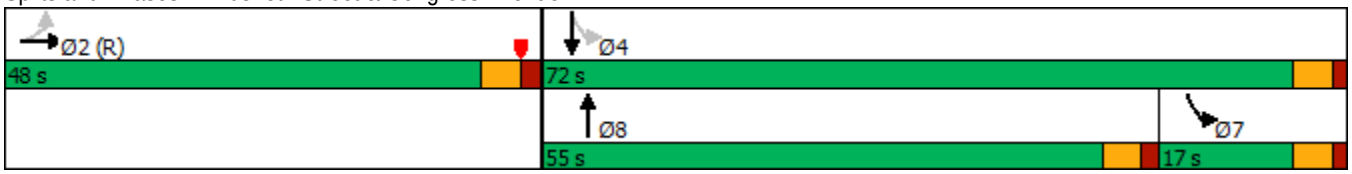
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	829	299	0	0	0	0	667	149	66	1496	0
Future Volume (vph)	105	829	299	0	0	0	0	667	149	66	1496	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	75		0
Storage Lanes	1		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	4317	0	0	0	0	0	3054	0	1593	3185	0
Flt Permitted	0.950									0.215		
Satd. Flow (perm)	1505	4317	0	0	0	0	0	3054	0	357	3185	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19						27				
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1171			1817			1425			354	
Travel Time (s)		26.6			41.3			38.9			8.0	
Confl. Peds. (#/hr)	38		38				38		38	38		38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	112	1200	0	0	0	0	0	869	0	70	1591	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		2						8		7	4	
Permitted Phases	2									4		
Detector Phase	2	2						8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0						10.0		4.0	10.0	
Minimum Split (s)	31.0	31.0						26.0		10.0	26.0	
Total Split (s)	48.0	48.0						55.0		17.0	72.0	
Total Split (%)	40.0%	40.0%						45.8%		14.2%	60.0%	
Yellow Time (s)	3.5	3.5						3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0						1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0						0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5						5.0		5.0	5.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	C-Max	C-Max						Max		Max	Max	
Act Effct Green (s)	42.5	42.5						50.0		67.0	67.0	
Actuated g/C Ratio	0.35	0.35						0.42		0.56	0.56	
v/c Ratio	0.21	0.78						0.67		0.22	0.89	
Control Delay	28.4	38.3						38.6		24.0	32.1	
Queue Delay	0.0	0.0						0.0		0.0	47.2	
Total Delay	28.4	38.3						38.7		24.0	79.3	
LOS	C	D						D		C	E	
Approach Delay		37.4						38.7			76.9	
Approach LOS		D						D			E	
Queue Length 50th (ft)	60	297						332		32	416	
Queue Length 95th (ft)	105	356						m382		m32	m362	
Internal Link Dist (ft)		1091			1737			1345			274	
Turn Bay Length (ft)										75		
Base Capacity (vph)	533	1541						1288		322	1778	

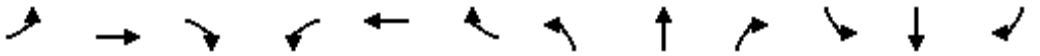
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0						0		0	611	
Spillback Cap Reductn	0	0						7		0	0	
Storage Cap Reductn	0	0						0		0	0	
Reduced v/c Ratio	0.21	0.78						0.68		0.22	1.36	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 43 (36%), Referenced to phase 2:EBTL, Start of Red			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 54.8		Intersection LOS: D	
Intersection Capacity Utilization 91.0%		ICU Level of Service E	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 103: 5th Street & Congress Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	1177	406	416	981	52	233	793	369	147	1701	196
Future Volume (vph)	81	1177	406	416	981	52	233	793	369	147	1701	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	175		0	200		175	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1593	3185	1425	3090	1656	0	1593	3185	1425	1593	3097	0
Flt Permitted	0.174			0.950			0.113			0.134		
Satd. Flow (perm)	289	3185	1325	3032	1656	0	189	3185	1317	225	3097	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173		2				186		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1084			1831			1721			1425	
Travel Time (s)		24.6			41.6			39.1			32.4	
Confl. Peds. (#/hr)	38		38	38		38	38		38	38		38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	1201	414	424	1054	0	238	809	377	150	1936	0
Turn Type	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4		4				2		2	6		
Detector Phase	7	4	4	3	8		5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		4.0	10.0	5.0	4.0	10.0	
Minimum Split (s)	11.0	29.0	29.0	11.0	29.0		10.0	29.0	11.0	8.0	31.0	
Total Split (s)	15.0	38.0	38.0	24.0	47.0		10.0	31.0	24.0	27.0	48.0	
Total Split (%)	12.5%	31.7%	31.7%	20.0%	39.2%		8.3%	25.8%	20.0%	22.5%	40.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	0.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max		None	Max	Max	None	C-Max	
Act Effct Green (s)	32.0	32.0	32.0	18.0	41.0		39.5	35.5	53.5	53.6	42.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.15	0.34		0.33	0.30	0.45	0.45	0.35	
v/c Ratio	0.48	1.41	0.86	0.92	1.86		2.18	0.86	0.53	0.62	1.77	
Control Delay	54.4	227.9	43.0	75.9	419.6		585.5	50.8	13.4	35.0	377.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	54.4	227.9	43.0	75.9	419.6		585.5	50.8	13.4	35.0	377.3	
LOS	D	F	D	E	F		F	D	B	C	F	
Approach Delay		174.4			321.0			130.3			352.7	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	50	~658	189	169	~1254		~236	310	87	62	~1213	
Queue Length 95th (ft)	94	#795	#374	#263	#1513		#430	#465	184	m77	#1315	
Internal Link Dist (ft)		1004			1751			1641			1345	
Turn Bay Length (ft)	200		200	175			200		175	150		
Base Capacity (vph)	174	849	480	463	567		109	943	706	363	1091	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.48	1.41	0.86	0.92	1.86		2.18	0.86	0.53	0.41	1.77	

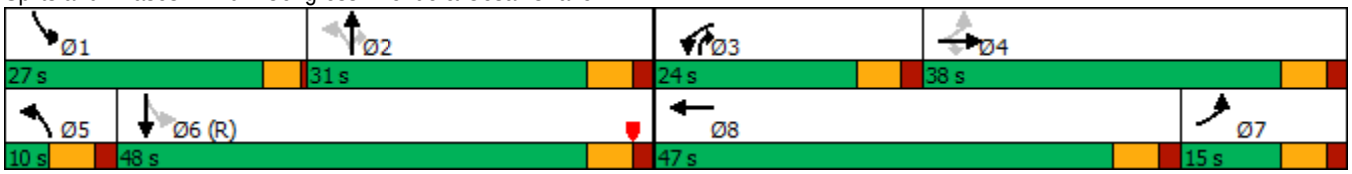
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 2 (2%), Referenced to phase 6:SBTL, Start of Red			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 2.18			
Intersection Signal Delay: 253.0		Intersection LOS: F	
Intersection Capacity Utilization 159.9%		ICU Level of Service H	
Analysis Period (min) 15			
Description: Cesar Chavez			

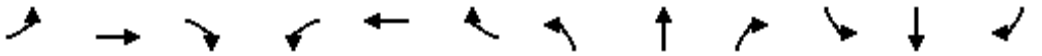
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: Congress Avenue & Cesar Chavez





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	269	44	98	53	130	124	81	770	38	43	2075	407
Future Volume (vph)	269	44	98	53	130	124	81	770	38	43	2075	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	100		100	70		70
Storage Lanes	2		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			45		
Satd. Flow (prot)	3433	1626	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.435			0.660			0.054			0.254		
Satd. Flow (perm)	1516	1626	0	1204	1863	1519	101	3539	1518	470	3539	1461
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71				148			152			152
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		881			261			663			1721	
Travel Time (s)		20.0			5.9			15.1			39.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	289	152	0	57	140	133	87	828	41	46	2231	438
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	5.0		3.0	5.0	5.0	3.0	25.0	25.0	3.0	25.0	25.0
Minimum Split (s)	20.0	38.5		10.0	35.0	35.0	8.5	45.0	45.0	8.5	45.0	45.0
Total Split (s)	26.0	32.0		10.0	16.0	16.0	13.0	87.0	87.0	11.0	85.0	85.0
Total Split (%)	18.6%	22.9%		7.1%	11.4%	11.4%	9.3%	62.1%	62.1%	7.9%	60.7%	60.7%
Yellow Time (s)	4.0	4.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5		2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5		6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	Max	Max
Act Effct Green (s)	25.7	24.6		16.8	14.7	14.7	84.2	84.2	84.2	80.4	80.4	80.4
Actuated g/C Ratio	0.18	0.18		0.12	0.10	0.10	0.60	0.60	0.60	0.57	0.57	0.57
v/c Ratio	0.59	0.44		0.33	0.72	0.46	0.61	0.39	0.04	0.15	1.10	0.48
Control Delay	56.8	31.6		65.0	81.0	12.0	65.1	21.6	1.0	14.5	81.9	13.0
Queue Delay	0.0	1.8		1.2	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Total Delay	56.8	33.5		66.2	81.0	12.0	65.1	21.6	1.0	14.5	83.9	13.0
LOS	E	C		E	F	B	E	C	A	B	F	B
Approach Delay		48.7			50.6			24.7			71.3	
Approach LOS		D			D			C			E	
Queue Length 50th (ft)	121	64		48	125	0	60	332	0	18	~1219	146
Queue Length 95th (ft)	168	135		98	#267	52	m89	406	m3	37	#1350	233
Internal Link Dist (ft)		801			181			583			1641	
Turn Bay Length (ft)							100		100	70		70
Base Capacity (vph)	572	383		175	195	292	150	2128	973	320	2032	904

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	119		37	0	0	0	0	0	0	614	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.58		0.41	0.72	0.46	0.58	0.39	0.04	0.14	1.57	0.48

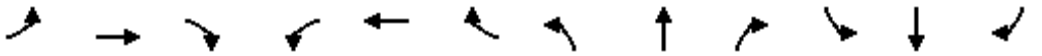
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 25 (18%), Referenced to phase 2:NBTL, Start of Red			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 57.5		Intersection LOS: E	
Intersection Capacity Utilization 103.5%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Barton Springs			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: Barton Springs Rd & Congress Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	875	247	145	723	223	227	606	163	432	1673	46
Future Volume (vph)	64	875	247	145	723	223	227	606	163	432	1673	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	12	12	13	12	12	12	12	12	13
Storage Length (ft)	150		0	150		0	225		200	180		0
Storage Lanes	1		1	1		0	2		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1770	3539	1636	1770	3386	0	3433	3539	1583	3433	3521	0
Flt Permitted	0.168			0.106			0.950			0.950		
Satd. Flow (perm)	311	3539	1576	197	3386	0	3418	3539	1516	3358	3521	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94		33				159		2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		565			1321			571			663	
Travel Time (s)		12.8			30.0			13.0			15.1	
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	902	255	149	975	0	234	625	168	445	1772	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4					2			
Detector Phase	3	8	5	7	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	3.0	3.0	10.0		3.0	5.0	5.0	3.0	4.0	
Minimum Split (s)	10.0	40.0	8.0	8.0	40.0		8.0	32.0	32.0	8.0	37.0	
Total Split (s)	12.0	53.0	17.0	16.0	57.0		17.0	41.0	41.0	30.0	54.0	
Total Split (%)	8.6%	37.9%	12.1%	11.4%	40.7%		12.1%	29.3%	29.3%	21.4%	38.6%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	None	None	Min		None	Min	Min	C-Max	None	
Act Effct Green (s)	42.2	42.2	54.3	48.2	48.2		12.1	30.0	30.0	37.3	55.2	
Actuated g/C Ratio	0.30	0.30	0.39	0.34	0.34		0.09	0.21	0.21	0.27	0.39	
v/c Ratio	0.41	0.85	0.38	0.81	0.82		0.79	0.82	0.37	0.49	1.28	
Control Delay	52.4	53.9	17.5	63.7	47.1		81.2	61.9	9.6	53.9	164.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.1	
Total Delay	52.4	53.9	17.5	63.7	47.1		81.2	61.9	9.6	53.9	164.2	
LOS	D	D	B	E	D		F	E	A	D	F	
Approach Delay		46.2			49.3			57.7			142.1	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	43	403	92	99	421		108	286	7	146	~1091	
Queue Length 95th (ft)	78	461	150	#186	480		#174	341	65	m165	m#1002	
Internal Link Dist (ft)		485			1241			491			583	
Turn Bay Length (ft)	150			150			225		200	180		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	167	1213	680	191	1278		312	910	507	915	1389	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	28	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.40	0.74	0.38	0.78	0.76		0.75	0.69	0.33	0.49	1.30	

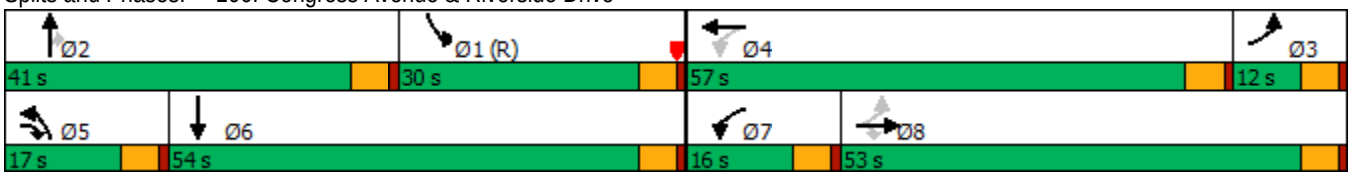
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 1:SBL, Start of Red			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.28			
Intersection Signal Delay: 87.0		Intersection LOS: F	
Intersection Capacity Utilization 104.7%		ICU Level of Service G	
Analysis Period (min) 15			
Description: Riverside			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

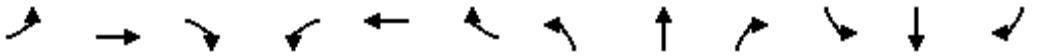
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Congress Avenue & Riverside Drive



Appendix E: 2040 No-Build Alternative 2 Results



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	219	36	63	355	0	224	0	224	0	0	0
Future Volume (vph)	0	219	36	63	355	0	224	0	224	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	1770	0	1583	0	1863	0
Flt Permitted					0.861		0.950					
Satd. Flow (perm)	0	3539	1472	0	3029	0	1664	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						231			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	226	37	0	431	0	231	0	231	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.13	0.05		0.24		1.57		0.62			
Control Delay		15.8	0.1		12.6		311.2		13.9			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.8	0.1		12.6		311.2		13.9			
LOS		B	A		B		F		B			
Approach Delay		13.6			12.6			162.6				
Approach LOS		B			B			F				
Queue Length 50th (ft)		46	0		80		~249		68			
Queue Length 95th (ft)		70	0		107		m#404		m103			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1766		147		515			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.13	0.05		0.24		1.57		0.45			

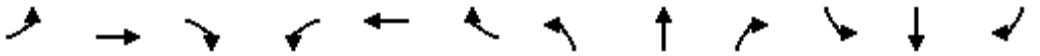
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.57			
Intersection Signal Delay: 72.8		Intersection LOS: E	
Intersection Capacity Utilization 56.6%		ICU Level of Service B	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	401	130	158	319	0	182	0	236	0	0	0
Future Volume (vph)	0	401	130	158	319	0	182	0	236	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3483	0	1770	0	1583	0	1863	0
Flt Permitted					0.657		0.950					
Satd. Flow (perm)	0	3539	1472	0	2305	0	1664	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						243			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	413	134	0	492	0	188	0	243	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.23	0.17		0.36		1.28		0.63			
Control Delay		16.9	4.8		13.8		217.2		41.8			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		16.9	4.8		13.8		217.2		41.8			
LOS		B	A		B		F		D			
Approach Delay		14.0			13.8			118.3				
Approach LOS		B			B			F				
Queue Length 50th (ft)		90	9		93		~190		124			
Queue Length 95th (ft)		123	42		123		#343		191			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1365		147		525			

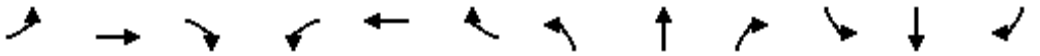
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.23	0.17		0.36		1.28		0.46			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.28			
Intersection Signal Delay: 44.5		Intersection LOS: D	
Intersection Capacity Utilization 58.4%		ICU Level of Service B	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	210	34	60	341	0	213	0	213	0	0	0
Future Volume (vph)	0	210	34	60	341	0	213	0	213	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	1770	0	1583	0	1863	0
Flt Permitted					0.865		0.950					
Satd. Flow (perm)	0	3539	1472	0	3043	0	1664	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						220			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	216	35	0	414	0	220	0	220	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.12	0.04		0.23		1.50		0.60			
Control Delay		15.8	0.1		12.5		280.5		13.9			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.8	0.1		12.5		280.5		13.9			
LOS		B	A		B		F		B			
Approach Delay		13.6			12.5			147.2				
Approach LOS		B			B			F				
Queue Length 50th (ft)		44	0		76		~231		71			
Queue Length 95th (ft)		66	0		103		m#389		m109			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1774		147		506			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.12	0.04		0.23		1.50		0.43			

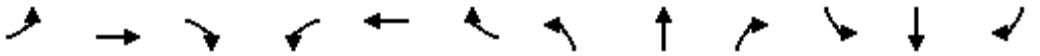
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 66.4		Intersection LOS: E	
Intersection Capacity Utilization 56.2%		ICU Level of Service B	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	385	124	151	306	0	172	0	223	0	0	0
Future Volume (vph)	0	385	124	151	306	0	172	0	223	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3483	0	1770	0	1583	0	1863	0
Flt Permitted					0.663		0.950					
Satd. Flow (perm)	0	3539	1472	0	2325	0	1664	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						230			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	397	128	0	471	0	177	0	230	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.22	0.16		0.34		1.20		0.61			
Control Delay		16.8	4.5		13.5		193.0		42.2			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		16.8	4.5		13.5		193.0		42.2			
LOS		B	A		B		F		D			
Approach Delay		13.8			13.5			107.8				
Approach LOS		B			B			F				
Queue Length 50th (ft)		86	7		88		~172		120			
Queue Length 95th (ft)		118	39		117		#319		187			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1376		147		514			

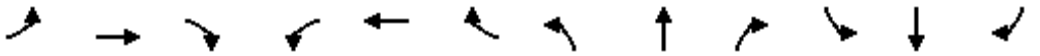
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.22	0.16		0.34		1.20		0.45			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 41.0		Intersection LOS: D	
Intersection Capacity Utilization 57.8%		ICU Level of Service B	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	201	32	56	326	0	203	0	203	0	0	0
Future Volume (vph)	0	201	32	56	326	0	203	0	203	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3514	0	1770	0	1583	0	1863	0
Flt Permitted					0.870		0.950					
Satd. Flow (perm)	0	3539	1472	0	3061	0	1664	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						209			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	33	0	394	0	209	0	209	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.12	0.04		0.22		1.42		0.59			
Control Delay		15.7	0.1		12.4		250.2		14.0			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		15.7	0.1		12.4		250.2		14.0			
LOS		B	A		B		F		B			
Approach Delay		13.6			12.4			132.1				
Approach LOS		B			B			F				
Queue Length 50th (ft)		42	0		72		~214		73			
Queue Length 95th (ft)		64	0		98		#368		112			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1784		147		498			

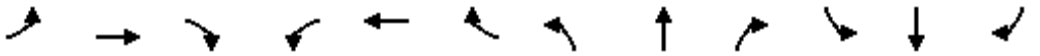
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.12	0.04		0.22		1.42		0.42			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 99 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.42			
Intersection Signal Delay: 60.2		Intersection LOS: E	
Intersection Capacity Utilization 55.6%		ICU Level of Service B	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: 11th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	368	118	144	292	0	161	0	209	0	0	0
Future Volume (vph)	0	368	118	144	292	0	161	0	209	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	125		0	0		0
Storage Lanes	0		1	0		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	1583	0	3483	0	1770	0	1583	0	1863	0
Flt Permitted					0.671		0.950					
Satd. Flow (perm)	0	3539	1472	0	2352	0	1664	0	1483	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109						215			
Link Speed (mph)		30			30			25			30	
Link Distance (ft)		1114			1398			1786			423	
Travel Time (s)		25.3			31.8			48.7			9.6	
Confl. Peds. (#/hr)	38		38	38		38	38		38			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	379	122	0	449	0	166	0	215	0	0	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pm+ov			
Protected Phases		2		1	6		3		1		4	
Permitted Phases			2	6					3	4		
Detector Phase		2	2	1	6		3		1	4	4	
Switch Phase												
Minimum Initial (s)		9.5	9.5	3.0	10.0		5.0		3.0	6.0	6.0	
Minimum Split (s)		28.5	28.5	11.0	20.0		11.0		11.0	28.0	28.0	
Total Split (s)		54.0	54.0	21.0	75.0		15.0		21.0	30.0	30.0	
Total Split (%)		45.0%	45.0%	17.5%	62.5%		12.5%		17.5%	25.0%	25.0%	
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5		3.5	3.5	3.5	
All-Red Time (s)		2.0	2.0	1.5	2.0		1.5		1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.5	5.5		5.5		5.0		5.0		5.0	
Lead/Lag		Lag	Lag	Lead			Lag		Lead	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes		Yes	Yes	Yes	
Recall Mode		C-Max	C-Max	None	C-Max		Max		None	Max	Max	
Act Effct Green (s)		60.9	60.9		69.5		10.0		13.6			
Actuated g/C Ratio		0.51	0.51		0.58		0.08		0.11			
v/c Ratio		0.21	0.15		0.32		1.13		0.60			
Control Delay		16.7	4.2		13.3		171.4		42.5			
Queue Delay		0.0	0.0		0.0		0.0		0.0			
Total Delay		16.7	4.2		13.3		171.4		42.5			
LOS		B	A		B		F		D			
Approach Delay		13.7			13.3			98.7				
Approach LOS		B			B			F				
Queue Length 50th (ft)		82	5		83		~153		113			
Queue Length 95th (ft)		113	36		112		#297		181			
Internal Link Dist (ft)		1034			1318			1706			343	
Turn Bay Length (ft)			50				125					
Base Capacity (vph)		1795	800		1391		147		503			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0		0			
Spillback Cap Reductn		0	0		0		0		0			
Storage Cap Reductn		0	0		0		0		0			
Reduced v/c Ratio		0.21	0.15		0.32		1.13		0.43			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:EBT and 6:WBTL, Start of Red			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 37.9		Intersection LOS: D	
Intersection Capacity Utilization 57.3%		ICU Level of Service B	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: 11th Street