NOTICE AND AGENDA

THIS MEETING WILL BE IN-PERSON (with a virtual option) at
THE FLAGSTAFF AQUAPLEX
COMMUNITY ROOM
To participate in the meeting virtually click the following link:
Click here to join the meeting

Planning & Zoning Commission meetings will be live streamed on the city's website (https://www.flagstaff.az.gov/1461/Streaming-City-Council-Meetings)

The public can submit comments that will be read at the dais by a staff member to CDPandZCommission@flagstaffaz.gov.

PLANNING & ZONING COMMISSION
WEDNESDAY
04/12/2023

FLAGSTAFF AQUAPLEX COMMUNITY ROOM
1702 N FOURTH STREET
4:00 P.M.

1. Call to Order

NOTICE OF OPTION TO RECESS INTO EXECUTIVE SESSION

Pursuant to A.R.S. §38-431.02, notice is hereby given to the members of the Commission and to the general public that, at this regular meeting, the Commission may vote to go into executive session, which will not be open to the public, for legal advice and discussion with the City's attorneys for legal advice on any item listed on the following agenda, pursuant to A.R.S. §38-431.03(A)(3).

2. Roll Call

NOTE: One or more Commission Members may be in attendance telephonically or by other technological means.

MARIE JONES, CHAIR
CAROLE MANDINO, VICE CHAIR
DR. RICARDO GUTHRIE
BOB HARRIS, III
MARY NORTON
IAN SHARP
MARCHELL CAMP

3. Public Comment

At this time, any member of the public may address the Commission on any subject within their jurisdiction that is not scheduled before the Commission on that day. Due to Open Meeting Laws, the Commission cannot discuss or act on items presented during this portion of the agenda. To address the Commission on an item that is on the agenda, please wait for the Chair to call for Public Comment at the time the item is heard.

4. APPROVAL OF MINUTES

Approval of the minutes from the regular meeting on March 22, 2023.

5. PUBLIC HEARING

A. PZ-21-00126-01: Specific Plan request, by Northern Arizona Healthcare (NAH) Corporation, of approximately 172.6 acres located at 1120 W Purple Sage Trail for the NAH Health Village currently zoned Rural Residential (RR – 74.62 acres), Estate Residential (ER – 97.76 acres), and Single Family Residential (R1 – 0.25 acres).

STAFF RECOMMENDED ACTION:

Staff believes that the proposed NAH Health Village Specific Plan is in substantial conformance with the required findings and recommends the Planning & Zoning Commission forward the request to the City Council with a recommendation approving the adoption of the NAH Health Village Specific Plan, subject to the thirteen conditions identified in the staff summary.

This is the second public hearing for this item. Please refer to the March 22 agenda for staff summaries and attachments. New attachments include additional public comment and approved Transportation Impact Analysis.

B. **PZ-21-00126-02:** Concept Zoning Map Amendment request, by Northern Arizona Healthcare (NAH) Corporation, of approximately 98.39 acres located at 1120 W Purple Sage Trail for Phase 1 of the NAH Health Village from Rural Residential (RR – 40.47 acres) and Estate Residential (ER – 57.92 acres) to Highway Commercial (HC – 63.18 acres) and Public Facilities (PF – 35.21 acres). Of the 14 parcels included in this request, all but three (APN 112-10-036, 112-10-037, and 112-05-125) are currently within the Resource Protection Overlay (RPO). These remaining three parcels will be added to the RPO as part of this request.

STAFF RECOMMENDED ACTION:

Staff believes that the proposed Zoning Map amendment is in substantial conformance with the required findings and recommends the Planning & Zoning Commission forward the request to the City Council with a recommendation approving an amendment to the Zoning Map for a total of 93.39 acres from the Rural Residential (RR) and Estate Residential (ER) to the Highway Commercial (HC) zone for 63.18 acres and to the Public Facility zone for 35.21 acres. Additionally, three parcels (112-10-036, 112-10-037, and 112-05-125) will be added to the Resource Protection Overlay (RPO), subject to the eleven conditions in the staff report.

6. **MISCELLANEOUS ITEMS TO/FROM COMMISSION MEMBERS**

7. **ADJOURNMENT**

CERTIFICATE OF POSTING OF NOTICE

The undersigned hereby certifies that a copy of the foregoing notice was duly posted at Flagstaff City Hall on 4/10/23, at 2:00 p.m. This notice has been posted on the City's website and can be downloaded at www.flagstaff.az.gov.

Dated this 10 day of April, 2023.

_____
Tammy Bishop, Administrative Specialist

Planning & Zoning Commission **5. A.**

Meeting Date: 04/12/2023

From: Tiffany Antol, Senior Planner

Information

TITLE:

PZ-21-00126-01: Specific Plan request, by Northern Arizona Healthcare (NAH) Corporation, of approximately 172.6 acres located at 1120 W Purple Sage Trail for the NAH Health Village currently zoned Rural Residential (RR – 74.62 acres), Estate Residential (ER – 97.76 acres), and Single Family Residential (R1 – 0.25 acres).

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This is the second public hearing for this item. Please refer to the March 22 agenda for staff summaries and attachments. New attachments include additional public comment and approved Transportation Impact Analysis.

Attachments

Public Comments Part 1

Public Comments Part 2

Public Comments Part 3

City TIA approval

TIA

From: Valarie Bryant <flagstaffvb@gmail.com>
Sent: Tuesday, March 28, 2023 2:18 PM
To: CD P and Z Commission <CDPandZCommission@flagstaffaz.gov>
Subject: New Hospital

A question or two:
1) How can you move forward with this $1 billion plan with no mention of it's effect on the City's carbon emissions as required by our Climate Action and Regional Plans. PLEASE always consult these plans when making your decisions.
2) With a nod to the great population of Native Americans on the Reservation, why are you not considering the I 40 corridor for the Hospital? I 17 is a disastrous place for this facility. /the ! 40 area may reduce some Helicopter traffic converging with Airport airplane traffic.

Thank You.
Valarie Bryant

From: Jill Stephenson <jillksteph@icloud.com>
Sent: Tuesday, March 28, 2023 10:08 AM
To: CD P and Z Commission <CDPandZCommission@flagstaffaz.gov>
Subject: Proposed Hospital

[You don't often get email from jillksteph@icloud.com. Learn why this is important at https://aka.ms/LearnAboutSenderIdentification]

As a citizen of Flagstaff and Coconino County, I am quite concerned about the proposed hospital and all the possible negative ramifications.

Most importantly, will this plan meet the city and Council sustainability guidelines, aiming at being carbon neutral by 2030, or even by 2050? Will we as taxpayers be supporting construction of new roads and other necessary infrastructure? The cost of fire and police protection? Will there be public transportation available for those of us unable to drive there?

These are serious considerations which I trust you, as the planning and zoning commission, will give much research and thought too.

Thank you for your attention to this impactful matter.

Sincerely, Jill K Stephenson

Sent from my iPhone

Tiffany Antol

From: Simmons, Jessica <jsimmons@coconino.az.gov>
Sent: Monday, March 27, 2023 8:48 AM
To: Tiffany Antol
Subject: Re: Hospital development

Thanks, Tiffany. Here's my comment:

The plan for the hospital calls for reflective windows, which would result in bird strikes. An estimated 100 million to one billion birds are killed each year by strikes with windows, but this can be prevented. There are several options which make windows more visible to birds, thus preventing bird strikes, including:

- pattens etched into the windows
- covering windows with protective screens
- netting coming down from the roof which would "catch" birds flying toward the windows
- zen curtains of paracord or other material

Enacting measures to prevent bird strikes would likely be most cost-effective if considered and implemented during building planning and construction, rather than after the fact. Please consider a change that would save birds' lives.

Jessica Simmons
Urban Wildlife Planner
Parks and Recreation/Community Development
Email: jsimmons@coconino.az.gov
Office: (928) 679-8008

COCONINO
COUNTY ARIZONA

From: Tiffany Antol <TAntol@flagstaffaz.gov>
Sent: Friday, March 24, 2023 9:43 AM
To: Simmons, Jessica <jsimmons@coconino.az.gov>
Subject: RE: Hospital development

Hi Jessica,

You can submit your comments to me and I will make sure they become a part of the official record.

Tiffany Antol, AICP
Zoning Code Manager
City of Flagstaff | Community Development

Greater Flagstaff
Chamber of Commerce

March 22, 2023

City of Flagstaff
Planning and Zoning Commission
211 West Aspen Ave

Dear Planning and Zoning Commission Members:

The Greater Flagstaff Chamber of Commerce on behalf of a thousand member employers across northern Arizona representing more than 30,000 employees supports the two items on your agenda today related to the construction of a new world-class health care delivery system by Northern Arizona Healthcare. The project presents numerous outstanding opportunities for our community from the creation of construction jobs, their economic impact to our local businesses to partnerships with the health educations providers (NAU and CCC) and the opportunity to significantly upgrade our regional health care delivery system for our residents and residents throughout northern Arizona.

We are confident in the local construction companies, specifically McCarthy and Loven Contracting, two extremely reputable entities with longstanding histories of building in the Flagstaff community that they will exceed Flagstaff's goals for commercial construction as they have time again over recent decades.

We support the location, and the transportation infrastructure improvements that come with the new facility.

We would be remiss to not include here a thank you to the City of Flagstaff Community Development staff who have worked so diligently fine-tuning the proposals before you today over recent years to get this important community enhancement near the finish line. We are grateful for your consideration and ask that you support items 5B and 5C on your agenda today by voting in favor of these items.

Thank you for your consideration.

Sincerely,

Julie Pastrick

Julie Pastrick
President/CEO
Greater Flagstaff Chamber of Commerce

101 W. Rt. 66 | Flagstaff, Arizona 86001-5598 | 928.774.4505 | Fax 928.779.1209
FlagstaffChamber.com

From: Peggy Sheldon-Scurlock <rpscurlock@q.com>
Sent: Wednesday, March 22, 2023 2:17 PM
To: CD P and Z Commission <CDPandZCommission@flagstaffaz.gov>
Subject: NAH Healthcare Hospital Campus

Flagstaff Planning and Zoning Commission: Marie Jones-Chair, Carole Mandino-Vice Chair, Dr. Ricardo Guthrie, Bob Harris III, Mary Norton, Ian Sharp and Marchell Camp,

I'm writing to you in regards to Agenda Item PZ 21-00126-01: Northern AZ Healthcare Hospital Campus.

Below are a few concerns and suggestions:
- The location of the new NAZ Healthcare Hospital at the outer edge of Flagstaff City limits is not in line with the recommendations of our Regional Plan, voted upon by citizens. It would be beneficial to incorporate the framework of the Regional Plan as much as feasible.

- There should be adequate, safe and easy access to this Health Care Facility that will serve the community. Access to such a facility should be equitable. Some citizens will use their own vehicle to get to the NAZ Healthcare Hospital Campus, yet many citizens will also take the bus. Whether going to NAZ facility for work, for appointments and for other services, access via bus and public transportation should be calculated in to their costs and design.
- The transportation modes should comply with ADA standards and be easily accessed by all. NAZ Healthcare states they will provide a shuttle service, yet for many with special needs and health issues, I'm concerned this will not be adequate nor safe. In addition, given our current inclement weather, it seems a shuttle bus service would not suffice for all of our seasons.

- Given that this will be a new facility/campus, utilized by the broader community, this campus should also incorporate Sustainable (Green) Building Standards as much as possible. What better way to demonstrate a commitment to health, climate issues and the community.

Respectfully,
Peggy Sheldon-Scurlock
301 W. Juniper Ave.
Flagstaff, AZ 86001

the hospital move to land at the edge of town violates the Regional Plan's principle of infill development; the hospital has no intention of paying for a new bus line (which will cost residents a cool million dollars a year to subsidize); and the hospital seems also not to be very interested in building their vast new complex with attention to sustainable practices

-----Original Message-----
From: Jo Cully <jocully@yahoo.com>
Sent: Wednesday, March 22, 2023 12:56 PM
To: Mayor and Council <council@flagstaffaz.gov>
Subject: No Plan for Out Patient Psychiatric Service in NAH Project

[Some people who received this message don't often get email from jocully@yahoo.com. Learn why this is important at https://aka.ms/LearnAboutSenderIdentification]

I would like to remind the Council that the New NAH campus has no plan to add outpatient psychiatric care to their campus. Psychiatric services are not for the indigent alone. A professional location with all other illnesses reduces the stigma of mental illness. Currently the Psychiatric care at FMC is only available to admitted patients. Hence it is only for emergencies when someone threatens or attempts to take their own life or someone else's. If you're not admitted, you can't see a psychiatrist at FMC. With private insurance that gives you the option of seeing unsupervised psychiatrists in private practice and/or psychologists and social worker/counselors and life coaches that very often do not recognize mental illness. I say this from real experience. The private community needs the supervision of staff and accountability that a medical psychiatric clinic provides. Please put some pressure on FMC to provide walk in outpatient psychiatric care.

Sent from my iPhone

March 22, 2023

To: Planning and Zoning Commissioners
From: Michele James, Executive Director, Friends of Flagstaff's Future
Subject: Agenda Items 5B and 5C, March 22, 2023

F3 is writing to you about two items on the Planning and Zoning Commission agenda for March 23, 2023. These are 1) PZ-21-00126-01: Northern AZ Healthcare Hospital Campus Specific Plan request, by Northern Arizona Healthcare, and 2) PZ-21-00126-02: Northern AZ Healthcare Concept Zoning Map Amendment request. These agenda items are interrelated.

Expansion Outside the City Core

The Specific Plan does not comply with a very important Regional Plan policy and the city's Staff Report clearly states this:

> Policy LU.5.2. "Promote infill development over peripheral expansion to conserve environmental resources, spur economic investments, and reduce the cost of providing infrastructure and services."

F3 is concerned with the lack of compliance with this important policy. The Flagstaff's Regional Plan is created to guide new development and other actions. The proposed location, outside the city core and at the far southern edge of the city, is "peripheral expansion" and is not what the city wants. This policy of our Regional Plan indicates that infill development conserves environmental resources and reduces the costs involved with providing infrastructure. Given the Specific Plan's lack of compliance with this important policy, P&Z must carefully consider ways to mitigate the impact to the community's goals if approved.

Carbon Reduction and Neutrality

In the same vein, the Specific Plan, as written, does not adequately address multiple Regional Plan goals and policies related to carbon reduction and carbon neutrality goals. F3 is concerned with the lack of specificity and commitments made in the Specific Plan around sustainability in general, and reducing carbon emissions in particular. The Specific Plan does not comply with the following:

> Goal E&C.2. "Achieve carbon neutrality for the Flagstaff community by 2030."
> Policy E&C.2.1."Encourage the reduction of energy and material consumption."
> Policy E&C.2.4. "Promote developments that help the community achieve carbon neutrality through strategies that reduce the project's emissions from transportation, energy, and consumption."

While the Specific Plan indicates partial electrification of the hospital, it is unclear if this applies to the ACC as well. Natural gas will also be used. While F3 understands that some components of the new hospital may require use of natural gas, NAH provides no overall goals for reduced

energy consumption or assisting the City in achieving carbon neutrality by 2030. The Specific Plan indicates eventual carbon neutrality of the hospital, but no goal date is provided. Further, the Specific Plan indicates that eventual carbon neutrality is contingent upon conducting an economic analysis to determine cost feasibility of renewable energy and storage systems. Could NAH determine the costs are too high to use renewable energy and abandon reaching carbon neutrality?

While F3 supports the use of renewable energy and storage systems, again there is no commitment in the Specific Plan to conduct the economic analysis by a set date and no commitment to using renewable energy by a set date. It is very feasible for the Specific Plan to at least indicate as an overall goal that NAH plans to achieve the maximum possible use of electricity, limit the use of natural gas to the bare minimum needed, conduct a renewable energy economic analysis within a year of occupancy, and install renewable energy collection such as solar panels on the roof of the hospital within two years of occupancy. A related topic is the Specific Plans' recommendations for design elements and green certifications. Again, no commitment is made. Installation of water conservation systems inside the hospital are not mentioned although this seems like logical low-hanging fruit and simple ways to demonstrate basic sustainability practices.

The City's goals to reduce carbon emissions is extremely important for a large development such as the proposed hospital as they directly address Flagstaff's Climate Emergency and implementation of Flagstaff's Carbon Neutrality Plan. In-patient hospitals are among the largest commercial consumers of energy, and thus large carbon emitters (Commercial Buildings Energy Consumption Survey (CBECS). The proposed new hospital has an expected lifetime of 25 years once it's occupied in about 2027. A hospital, as proposed by NAH, will be creating emissions prior to and up through and beyond the year 2030 which is the City's goal date to reach carbon neutrality. The lack of a firm commitment by NAH to keep emissions as low as possible leaves Flagstaff with a great amount of uncertainty about meeting the City's carbon neutrality goals.

Public Transit:

> Policy T.1.6. "Provide and promote strategies that increase alternate modes of travel and demand for vehicular travel to reduce peak period traffic."

Unlike the situation at the current hospital location, accessible and convenient transportation to the proposed new hospital remains an unaddressed service despite much effort on the part of Mountain Line to negotiate a cost share agreement with NAH for a new bus route to the proposed new hospital. The new hospital location outside of the core of the city, is not an easily walkable distance for many in our community. The Staff Report (pg 16) indicates that until Mountain Line is able to fund a new route to the proposed hospital, it wants a condition that NAHI provide a 20-minute shuttle service of some sort, but details are not provided. The Staff Report (pg 16) indicates that despite this condition, concerns remain about how underserved members of the Flagstaff community will access the Hospital.

Transportation Infrastructure

The Staff Report (pg 16) indicates that city staff requested that NAH develop a Transportation Demand Management (TDM) plan or strategy for the proposed Health Village. F3 assumes that in the absence of such a plan/strategy in or amended to the Specific Plan, NAH did not prepare such a report. This is disappointing as TDM plans are the best way to strategize to reduce travel demand or to redistribute the demand. A TDM plan/strategy, although not yet required by the city, could have resulted in a commitment by NAH to co-fund a public transit route in the short term.

In addition to this concern, the Staff Report (Pg 16) indicates that there is concern about how the relocation of the hospital will affect greenhouse gas emissions from transportation. This is a very good question and one that the Specific Plan does not address whatsoever. While a long list of transportation improvements are required in order for the new hospital and other NAH developments in the area to be built, and a Traffic Impact Analysis indicates that the expected trip generation in 2045, is 53,190 daily trips; with 5,031a.m. peak hour trips, 4,998 midday peak hour trips, and 3,824 p.m. peak hour trips (including anticipated internal capture). That's a lot of vehicles and with them come increased carbon emissions. The Specific Plan does not provide any information regarding expected carbon emissions from increased travel to the proposed new hospital.

A TDM Plan could be conducted, if required by the Commission, to determine alternative ways to reduce Vehicle Miles Traveled and address alternative means of transport for hospital employees without building over a thousand extra parking spaces for individual vehicles.

Parking

Although the Specific Plan does not discuss proposed parking in any detail, the Staff Report indicates that NAH is proposing to build a parking garage with 1350 parking spaces *and* 1000 additional parking spaces provided in a "parking field" located between Beulah Blvd and the hospital building. This is 1,190 more parking spaces than are required by City code or a 50 percent increase in the total amount of required parking.

The Staff Report indicates that the site is allowed to exceed maximum parking requirements because a parking garage is provided. But should an extra one-thousand parking spaces be provided when Flagstaff has a goal to move away from single occupancy vehicle use? Flagstaff now has a Multimodal Transportation Master Plan that will put into place infrastructure to provide many more options for safe biking and walking. An increase in usable and safe infrastructure such as trails and protected intersections is necessary in order for Flagstaff to move toward and meet its carbon neutrality goals. The location of the proposed hospital will allow access from Lake Mary Rd south along the FUTS trail and a wide sidewalk along the widened Beulah Boulevard. Employees can be encouraged to use other modes of transportation than their cars. This would result in fewer parking spaces being needed.

Another related concern is that exceeding parking standards, as NAH has proposed, can induce demand for vehicle trips and result in less of an incentive for employees of this location to utilize other modes of transportation (Staff Report Pg. 7). Induced demand can be summarized as "if you build it, they will come." Basically, if NAH provides lots of parking, it will be used. F3 encourages the Commission to reduce the number of parking spaces.

Flagstaff's Carbon Neutrality Plan states that the number of "vehicle miles traveled" needs to be maintained at 2019 levels. This is good for the City and NAH as reduction in VMT will result in less congestion on Flagstaff's streets. Providing an abundance of parking is going to result in additional "vehicle miles traveled" especially given that the current hospital, in contrast, is located in the urban center and along multiple public transit routes.

This proposal is out of compliance with multiple Regional Plan policies and goals:

> Policy T.1.5. "Manage the operation and interaction of all modal systems for efficiency, effectiveness, safety, and to best mitigate traffic congestion."
> Policy T.1.6. "Provide and promote strategies that increase alternate modes of travel and demand for vehicular travel to reduce peak period traffic."
> Goal T.3. "Provide transportation infrastructure that is conducive to conservation, preservation, and development goals to avoid, minimize, or mitigate impacts on the natural and built environment."
> Policy T.3.2. "Promote transportation systems that reduce the use of fossil fuels and eventually replace with carbon neutral alternatives."

F3 would like for the Commission to address this disconnect with the City's carbon reduction goals and to require that the proposed hospital provide a smaller number of parking spaces and a smaller "parking field." Doing this will assist the project to be more in compliance with the above policies and goals.

The Development Agreement

The Staff Report indicates that the Development Agreement has not been finalized. This document is extremely important in understanding commitments, both monetary and non-monetary, made by NAH related to both the Specific Plan and the Rezoning Request. F3 encourages the Commission to request review of the Development Agreement prior to making a decision on April 12th as it will surely provide important information to assist the Commission in their decision making process.

In Conclusion

This proposal is not in compliance with a major element of Flagstaff's Regional Plan. Building a large development such as this, in a peripheral region of our city as proposed by NAH, brings with it a huge amount of secondary impacts to our community. If the decision is made to allow this development, it is imperative that NAH meets the needs of the Flagstaff community. Carbon

neutrality and emissions reduction are a major focus of our community as we strive to address the Climate Emergency. Reducing Vehicle Miles Traveled, induced demand, and parking spaces is needed for Flagstaff to meet its carbon neutrality goals. NAH must make firm commitments to meet the climate goals outlined in the Regional Plan.

The decision to approve this development cannot be taken lightly and will require a close consideration of specific required conditions that address these concerns. Adding carbon neutrality and emission reduction goals to the staff recommendation is critical. Agreement by NAH to implement the staff recommendations and include these in a revised Specific Plan is necessary.

Tania Boeskin

823 w Lone Star Trail

Flagstaff, AZ 86005

To: NAH, AWD, and The Flagstaff City Council

I am writing to express my concerns over the proposed NAH hospital project. I am a citizen of Flagstaff since 1997. I am a homeowner in Ponderosa Trails and am an employee of NAH.

NAH makes a case that it needs a larger hospital and I generally take no issue with this. As an employee at FMC for the past eight years, I am aware that our current facility needs upgrades, and more capacity is likely warranted, however, the scale of the new hospital they are proposing seems unnecessary. However, my main concern is with the notion of a full blown "Health and Wellness Village" that includes a "broad mix of commercial, retail and housing opportunities." That seems completely unnecessary and of suspect benefit. The project sounds like it has more to do with increasing the tax base for the city, and financial growth opportunities for NAH than it is about providing basic, affordable health care services for all. It seems like under the cover of something seemingly benevolent, the city is taking the opportunity to encourage rampant development even though they claim a commitment to managing growth and protecting open space.

It says in correspondence I received from AWD that the proposed area is to be rezoned from Rural Residential and Estate Residential to Highway Commercial and Public Facilities. These seem like major amendments that do not take into account the character of the surrounding neighborhoods and open areas, and will certainly increase traffic, noise and safety concerns to in the nearby residential neighborhoods.

More specifically in terms of traffic, I understand there will be funding (theoretical at this point) to widen Beulah, but what about all the adjacent roads that feed into Beulah? Woodlands is frequently backed up into South Milton and Lake Mary Road is congested (specifically from High Country to Beulah) and will only become more so due to a large apartment complex currently being built on High Country. This will be a daily problem, but what about in the not so unlikely event of a forest fire? It will make it even more difficult for residents to evacuate given all the additional traffic and congestion. Or is this really only the beginning of even larger plans to further over develop the area and add additional roads?

Finally , I said generally I take no issue with NAH wanting a bigger hospital, however since it is already difficult to adequately staff the one we have it seems a bit of a moot point. When senior management spoke to our team about the new hospital it did not seem it was its intention to actually work on solutions for employees in terms of affordable housing or providing childcare, or any other things that might help with retention and employee satisfaction. Further congesting the city's traffic and pushing open and green space further outside the city doesn't seem like a big draw either.

Growth is not always the answer. I hope that NAH and the City Council recognize that the addition of a "Wellness Village" is not in the best interest of hospital employees or the citizens of Flagstaff.

Sincerely,

Tania Boeskin

As a retired registered nurse of 40 years and a University Heights resident since 1987 I feel the need to educate the community regarding some comments made by Northern Arizona Healthcare representatives at the recent March 22,2013 planning and zoning commission(P&Z). This meeting presented finding from city staff regarding the proposed Health care village to be located near purple sage road. The proposed site is at the edge of the city of flagstaff southern boundary. Relocating the Hospital facility (phase I) and the additional development (phase 2) will require the delivery of massive infrastructure improvements to proposed area. After watching the meeting (4 hours) and reviewing the stream for a second time, there seems to be no clear admission of fiscal responsibility for these improvements. Two of the biggest infrastructure impacts that have been identified, (again no clear or committed payment source) are fire department infrastructure and transportation issues. Transportation issues include the widening of Beulah Blvd to four lanes and mitigation of 32 intersections within the city as identified by city staff. Right now, there is currently estimated to be 3,823 vehicular trips on Beulah. By the time the phase I (hospital and

ambulatory care center completed, 2025) that vehicular traffic is estimated to be A26,982 vehicular trips per day. For comparison, this increased vehicular load is like that of Butler Avenue today. The residents of University Heights and Mountain Dell will experience negative effects related to this increased vehicular traffic and associated noise. Another issue that was not addressed, is the traffic on West University Height Drive South. More families use DeMiguel who do not live in the neighborhood.

The new facility is proposed to add 35 beds for a total of 276 patient beds. Thirty-five Beds. During the presentation the NAH representatives stated "5600 patients were diverted to other facilities due to unit capacity".
In addition, these representatives stated that these diversions were not for "acuity". Acuity means, patients being referred to other facilities for higher needs of care not available at the referring facility, in this case Flagstaff Medical Center. The representative failed to define unit capacity. What I want the public to understand, is unit capacity is not just an available bed, but the necessary STAFF, to care of the patient in

that bed. This staff includes, not just the hospitalist MD, but nurses, lab, pharmacy, respiratory therapy and the rest of the healthcare team. The representatives also stated an expanded Emergency department will result in faster service. Poor emergency waits times have more to do with the overall dysfunction US health care system and staffing issues. These staffing issues will persist and will not be remedied because a new facility is built, with only an increased bed capacity of 35.

A speaker at the end of the meeting stated that Flagstaff medical center has lost half of the nursing staff since the beginning of COVID. I would direct you to an internet search of nursing shortages. Nursing shortages are national. Anecdotal conversations with current and previous staff, suggests, that lack of retention is often the fault of "adversarial; and ineffective management".

Northern Arizona health care has consistently presented that sixty percent of the patient population they serve is out of the
Flagstaff area. Yet the community of Flagstaff, from city staff time and resources and proposed needed

instruction improvements, put the heavy lifting on the taxpayers of Flagstaff. I am not reassured by city staff promises of possible grant funding. If you live in University Heights or Mountain Dell, the traffic and noise impacts will be especially hard.

Without a NAH management shift, that focuses on retention of not only physician and nursing talent, but also all the others of the health care team, is critical. A new campus will not change employee retention.
Dana Jolly, RN., MSN, CNM, RNP. CNE (retired)

Tiffany Antol

From: Simmons, Jessica <jsimmons@coconino.az.gov>
Sent: Tuesday, April 4, 2023 11:58 AM
To: Tiffany Antol
Subject: Comment on NAH

Hi Tiffany, I have another comment I'd like to add:

> NAH should consider landscaping with native flowering plants. This would help native pollinators, which are vital to our ecosystem, and help offset the impacts of this development on the ecosystem.

Thanks!

Jessica Simmons
Urban Wildlife Planner
Parks and Recreation/Community Development
Email: jsimmons@coconino.az.gov
Office: (928) 679-8008

COCONINO
COUNTY ARIZONA

Tiffany Antol

From: CD P and Z Commission
Sent: Tuesday, April 4, 2023 4:03 PM
To: Tiffany Antol
Cc: Alaxandra Pucciarelli
Subject: FW: Health and Wellness Village - Vote Yes

Thanks,
Becky

Becky Cardiff
Development Services Manager
City of Flagstaff
211 W Aspen
Flagstaff, Az 86001
Office-928-213-2618

From: Scott Watson <swatson659@gmail.com>
Sent: Monday, April 3, 2023 11:35 AM
To: CD P and Z Commission <CDPandZCommission@flagstaffaz.gov>
Subject: Health and Wellness Village - Vote Yes

As a full time resident of Munds Park, i am extremely interested in seeing the new hospital and ambulatory care center be approved. This project would bring access to the level of care my wife and I would want to access while living in Northern Arizona. This is huge opportunity for the City to bring the highest level of care to so many folks within our regional community.

I work full time in Flagstaff and see the opportunity to improve our city, its infrastructure and most importantly the healthcare that we deserve! I do not want to drive to Phoenix to access my providers. This is a huge investment in the long term future of this community. Upon retirement i will not live in this community if in fact the new hospital and all the services is not provided. Myself along with my family strongly encourage you to grant this request.

Please approve this request and invest in this community's long term future!

Respectfully,

Scott & Shannon Watson
17135 Elk Pl, Munds Park, AZ 86017

Tiffany Antol

From: CD P and Z Commission
Sent: Tuesday, April 4, 2023 4:04 PM
To: Tiffany Antol; Alaxandra Pucciarelli
Subject: FW: New Hospital and carbon emissions

Thanks,
Becky

Becky Cardiff
Development Services Manager
City of Flagstaff
211 W Aspen
Flagstaff, Az 86001
Office-928-213-2618

-----Original Message-----
From: Pat Ellsworth <flagsanta@gmail.com>
Sent: Monday, April 3, 2023 11:47 AM
To: CD P and Z Commission <CDPandZCommission@flagstaffaz.gov>
Subject: New Hospital and carbon emissions

[You don't often get email from flagsanta@gmail.com. Learn why this is important at https://aka.ms/LearnAboutSenderIdentification]

Dear Planning and Zoning Commission:
The new hospital plan is a huge undertaking and requires much of your attention. In the midst of that, please don't forget about limiting carbon emissions as required in the Regional Plan.
Thank you .

Pat Ellsworth
Flagstaff 87005
928-226-0799
****
"The things that will destroy us are politics without principle; pleasure without conscience; wealth without work; knowledge without character; business without morality; science without humanity;
and worship without sacrifice." --Mahatma Gandhi

Tiffany Antol

From: Scott Watson <swatson659@gmail.com>
Sent: Thursday, April 6, 2023 12:42 PM
To: Tiffany Antol
Subject: Health and Wellness Center- Vote Yes

As a full time resident of Munds Park, i am extremely interested in seeing the new hospital and ambulatory care center be approved. This project would bring access to the level of care my wife and I would want to access while living in Northern Arizona. This is huge opportunity for the City to bring the highest level of care to so many folks within our regional community.

I work full time in Flagstaff and see the opportunity to improve our city, its infrastructure and most importantly the healthcare that we deserve! I do not want to drive to Phoenix to access providers. This is a huge investment in the long term future of this community. Upon retirement i will not live in this community if in fact the new hospital and all the services is not provided. Myself along with my family respectfully request you to approve this application.

Please approve this request and invest in this community's long term future!

Respectfully,

Scott & Shannon Watson

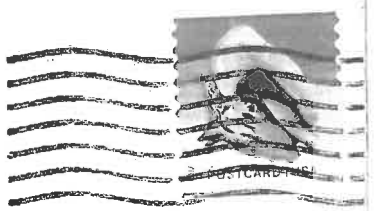
17135 Elk Pl, Munds Park, AZ 86017

Prison art flag created from folded
candy and cigarette wrappers in the 1950s.

Case #PZ-21-002130-1
Parcel # 115-03-001A

PHOENIX AZ 850
PM
MAR
2023

JIMMY HINRICHS COLLECTION · PHOTO BY JERRY HEFFERNAN



City of Flagstaff Planning &
~~Development Services~~
~~Department~~ Zoning

211 West Aspen Ave.
Flagstaff, AZ 86001

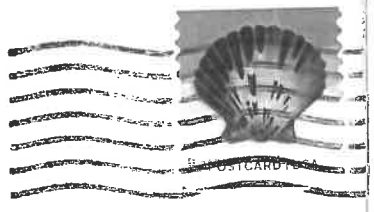
PLEASE do NOT approve zoning change request referenced above - there are no public transportation options in this area to support a high density housing development and safely commute from the development to town. - Brian Schmitz

Buy War Bond flag emblazoned with
"Remember Pearl Harbor," a rallying cry during World W

Case #PZ-21-002130-1
Parcel # 115-03-001A

PHOENIX AZ 850
PM
MAR
2023

PLEASE do NOT approve
zoning change request
referenced above - the already
slated high density projects,
JW Powell extension, Lone
Tree overpass, and development
proposed for this area of Flagstaff
will unnecessarily burden our
already lacking existing infrastructure. Beth Schmitz



City of Flagstaff Planning &
~~Development Services~~
~~Department~~ Zoning

211 West Aspen Ave.
Flagstaff, AZ 86001

Glass whi

Admiral George Dewey, bald eagle, and American flags.

Case #PZ-21-002130-1
Parcel # 115-03-001A

PLEASE do NOT approve zoning change request referenced above - there are no municipal sewer systems in this area and the cost is estimated to be between $1.5-2M. There are other areas with existing services for this development. ~ Brian Schmitz

HINRICHS COLLECTION · PHOTO BY TERRY HEFFERNAN

City of Flagstaff Planning &
~~Development Services~~
~~Department~~ Zoning

211 West Aspen Ave.
Flagstaff, AZ 86001

To: **Dawn Cartier, CivTech Inc.**

From: **Stephanie Santana, Sr. Transportation Engineer** ʃʃ

Date: **March 30, 2023**

RE: **Review of the NAH Phase 1 TIA, sealed March 30, 2023**

CC: **Paul Mood, City Engineer**
Jeffrey Bauman, Traffic Engineer

The City of Flagstaff Transportation Engineering Section has reviewed the NAH Phase 1 TIA sealed March 30, 2023. The Phase 1 TIA is approved.

NORTHERN ARIZONA HEALTHCARE CAMPUS

TRAFFIC IMPACT ANALYSIS

Confined Scope • 2027 Study Year

March 2023

CivTech Project No. 20-1380

West of Interstate 17
North of Fairgrounds Road
in Flagstaff, Arizona

Prepared for:
Northern Arizona Healthcare
1200 North Beaver Street
Flagstaff, AZ 86001

Submittal to:
City of Flagstaff
Coconino County
Arizona Department
of Transportation

10605 North Hayden Road, Suite 140 • Scottsdale, Arizona 85260 • 480.659.4250

CivTech

NORTHERN ARIZONA HEALTHCARE CAMPUS
TRAFFIC IMPACT ANALYSIS
CONFINED SCOPE • 2027 STUDY YEAR

West of Interstate 17
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Prepared for:
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Prepared By:

CivTech Inc.

10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
Office: (480) 659-4250
Fax: (480) 659-0566

March 2023

CivTech Project No. 20-1380

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EXECUTIVE SUMMARY

Northern Arizona Healthcare (NAH) proposes the development of a 751,850 square foot hospital with 205,042 square feet of ambulatory care facility complex located west of Beulah Boulevard south of the planned Healthcare Boulevard alignment on currently undeveloped property. Access to the site is to be provided by three (3) access points, one from Healthcare Boulevard on the north, one from Beulah Boulevard, and one from Purple Sage Trail. Purple Sage Trail is a roadway proposed to align south of the study site. All access points are accessed from Beulah Boulevard in the 2027 study year.

The following conclusions and recommendations have been documented in this study:

EXISTING

- The results of the Synchro analysis indicate that all study intersections operate with overall acceptable levels of service (LOS D or better for Flagstaff intersections and LOS C or better for ADOT intersections), with the exception of **Beulah Blvd. & University Heights Dr North/Lake Mary Road**, **Beulah Blvd. & Woodlands Village Blvd**, and **Beulah Blvd. & McConnell Dr**.

FUTURE ROADWAY IMPROVEMENTS

- No future roadway improvements are considered in the 2027 opening study year No Build scenario. In the 2027 unmitigated Build scenario, it is assumed that Beulah Boulevard will be improved to a four-lane road with two lanes of travel in each direction along the frontage of the site. As a result, the free-flow channelized westbound right-turn lane at the intersection of Beulah Boulevard and Lake Mary Road will become a signal controlled dedicated right-turn lane. An exclusive northbound left-turn lane will be added to the intersection of Beulah Boulevard and University Heights Drive South.

- Also in the 2027 unmitigated Build scenario, it is assumed that the intersection of Beulah Boulevard and Mountain Dell Road will be improved such that Mountain Dell Road intersects Beulah Boulevard at right angles and that an exclusive northbound left-turn lane will be added.

PROJECT IMPROVEMENTS AND ACCESS

There are a total of three (3) proposed access points on Beulah Boulevard.

- *Intersection A* – is Beulah Boulevard and Healthcare Boulevard. Healthcare Boulevard is a future collector roadway planned for alignment approximately 3,660 feet south of the existing Mountain Dell Road alignment.

    - *Access F* is a full movement driveway on the northern frontage of the site along Healthcare Boulevard, approximately 475-feet west of Beulah Boulevard.

- *Access B* – is the planned main full movement driveway on the eastern frontage of the site along Beulah Boulevard, approximately 715-feet south of the Healthcare Boulevard alignment.

- *Intersection C* – is Beulah Boulevard and Purple Sage Boulevard. Purple Sage Boulevard is a future collector roadway planned for alignment approximately 1,033-feet south of the existing Mountain Dell Road alignment.
    - *Access G* is one of two (2) full movement site driveway on the southern frontage of the site along Purple Sage Boulevard, located approximately 560-feet west of Beulah Boulevard.
    - *Access M* is one of two (2) full movement site driveway on the southern frontage of the site along Purple Sage Boulevard, located approximately 800-feet west of Access G.

The proposed development site plans are provided in **Figure 4**.

2027 Trip Generation

- For study year 2027, the proposed development is anticipated to generate 14,834 weekday daily trips, 1,119 trips during the AM peak hour, and 1,398 trips during the PM peak hour.

Capacity Analysis

- The results of the Synchro analysis indicate that all study intersections operate with overall acceptable levels of service (LOS D or better for Flagstaff intersections and LOS C or better for ADOT intersections), apart from **Beulah Blvd. & University Heights Dr South**, **Beulah Blvd. & University Heights Dr North/Lake Mary Road**, **Beulah Blvd. & Woodlands Village Blvd**, **Beulah Blvd. & McConnell Dr**, and **I-17 NB Ramp & J. W. Powell Blvd**.
- The unsignalized intersection of **Beulah Blvd. & University Heights Dr South** in the Build scenario is projected to experience an overall delay of 39.0 seconds per vehicle (sec/veh) (LOS E) and 7.1 seconds per vehicle (sec/veh) during the AM and PM peak hour. The eastbound approach is projected to experience a delay of 121.5 sec/veh (LOS F) and 53.8 sec/veh (LOS F) during the AM and PM peak hours, respectively.
    - Mitigation in the form of signalization results in all approaches operating acceptably with an AM peak hour overall delay of 12.7 sec/veh (LOS B).
- The signalized intersection of **Beulah Blvd. & University Heights Dr North/Lake Mary Road** in the No Build scenario could experience a northbound approach delay of 60.4 sec/veh (LOS E) and 62.1 sec/veh (LOS E) during the AM and PM peak hours, respectively. The eastbound approach could experience a delay of 77.6 sec/veh (LOS E) and 57.9 sec/veh (LOS E) during the AM and PM peak hours, respectively.

  In the Build scenario, the intersection could experience a northbound approach delay of 58.8 sec/veh (LOS E) and 86.5 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach could experience delay of 76.2 sec/veh (LOS E) and 57.7 sec/veh (LOS E) during the AM and PM peak hours, respectively.
    - Mitigation resulting in all approaches operating acceptably can be achieved by:
        - Configuring the dedicated northbound right-turn lane into a shared thru/right-turn lane.

  - Configuring the channelized westbound right-turn lane into a dedicated right-turn lane.
  - Change the eastbound and westbound left-turn phases from lagging to leading.
  - Adjust the northbound and southbound recall mode from minimum to maximum.

- The signalized intersection of **Beulah Blvd. & Woodlands Village Blvd** in the No Build scenario could experience a westbound approach delay of 57.8 sec/veh (LOS E) during the AM peak hour.

  In the Build scenario, the intersection could experience a westbound approach delay of 57.8 sec/veh (LOS E) during the AM peak hour.

  - Mitigation in the form of an additional northbound left-turn lane and signal timing adjustments results in all approaches operating acceptably with an AM peak hour westbound approach delay of 46.6 sec/veh (LOS D).

- The signalized intersection of **Beulah Blvd. & McConnell Dr** in the No Build scenario is projected to experience an overall delay of 58.4 sec/veh (LOS E) during the PM peak hour. The westbound approach is projected to experience a delay of 80.0 sec/veh (LOS E) during the PM peak hour.

  In the Build scenario, the intersection could experience an overall delay of 58.5 sec/veh (LOS E) during the PM peak hour. The southbound approach is projected to experience a delay of 60.4 sec/veh (LOS E) during the AM peak hour. The westbound approach is projected to experience a delay of 84.4 sec/veh (LOS F) during the PM peak hour.

  - Mitigation in the form of an additional westbound left-turn lane and signal timing adjustments results in all approaches operating acceptably with a PM peak hour overall delay of 30.0 sec/veh (LOS C). The additional westbound left-turn lane requires the removal of an east leg receiving lane. Removing this receiving lane requires removing the dedicated eastbound right-turn lane at the intersection of **I-17 SB Ramp On-Ramp & McConnell Dr**. The intersection continues to operate acceptably.

- The unsignalized intersection of **I-17 NB Ramp & J. W. Powell Blvd** in the Build scenario is projected to experience an overall delay of 60.1 sec/veh (LOS F) during the PM peak hour. The northbound shared movement is projected to experience a delay of 69.1 sec/veh (LOS F) and over 300 sec/veh (LOS F) during the AM and PM peak hours, respectively.

  - Mitigation in the form of improvement to a single lane roundabout with two approach lanes northbound and eastbound, and one approach lane westbound results in all approaches operating acceptably with a PM peak hour overall delay of 9.8 sec/veh (LOS A).

QUEUE STORAGE

- The recommended storage lengths are provided for study horizon year 2027 using the traffic volumes previously presented in the NAH Master TIA. The 2025 and 2030 horizon years were both reviewed and the higher of each was recommended at each lane.

SIGNAL WARRANT ANALYSIS

- CivTech utilized projected 2027 total traffic volumes at select study intersections to conduct a signal warrant analysis utilizing the warrant criteria specified within the MUTCD.
    - At the intersection of Beulah Boulevard and Healthcare Boulevard (Intersection A), signal warrant criteria 1 and 2 are anticipated to be met by buildout study horizon year 2027, for the planned Phase 1 development. Signal warrant criteria 3 is not anticipated to be met by horizon year 2027. All though warrant 3 is not met due to surrounding signalized intersection spacing and the classification of Beulah Boulevard it is recommended that a signal be built/constructed at Beulah Boulevard and Healthcare Boulevard (Intersection A) upon buildout of Phase 1, horizon year 2027.
    - At the intersection of **Beulah Boulevard and Access B**, signal warrant criteria 1 and 2 are anticipated to be met by buildout study horizon year 2027, for the planned Phase 1 development. Signal warrant criteria 3 is not anticipated to be met by horizon year 2027. All though signal warrants 1 and 2 are met signalization at Beulah Boulevard and Access B is not recommended for immediate installation upon buildout of Phase 1, horizon year 2027. Signalization is not recommended for immediate installation due to the projected acceptable signal platooning from the recommended surrounding signals at Intersection A and Intersection C along Beulah Boulevard.
    - At the intersection of **Beulah Boulevard and Purple Sage Boulevard (Intersection C)** all three (3) signal warrant criteria (Warrants 1, 2, and 3) are anticipated to be met by Phase 1, buildout year 2027. It is recommended that a signal be built/constructed at Intersection C by buildout year 2027.
    - At the intersection of **Access F and Healthcare Boulevard**, the three (3) signal warrant criteria (Warrants 1, 2, and 3) are not anticipated to be met by Phase 1, buildout year 2027. Signalization is not recommended at site Access F by buildout of the Phase I development, study horizon year 2027.
    - At the intersection of **Access G and Purple Sage Boulevard**, the three (3) signal warrant criteria (Warrants 1, 2, and 3) are not anticipated to be met by Phase 1, buildout year 2027. Therefore, signalization is not recommended at site Access G by buildout of the Phase I development, study horizon year 2027.
    - At the intersection of **Beulah Blvd. & University Heights Dr South**, the results of the three (3) signal warrant criteria (Warrants 1, 2, and 3) are not anticipated to be met by Phase 1, buildout year 2027. Therefore, signalization is not recommended at the intersection of Beulah Boulevard and University Heights Drive South by buildout of the Phase I development, study horizon year 2027.

INTRODUCTION

Northern Arizona Healthcare (NAH) proposes the development of a 751,850 square foot hospital with 205,042 square feet of ambulatory care facility complex located west of Beulah Boulevard south of the planned Healthcare Boulevard alignment on currently undeveloped property. Access to the site is to be provided by three (3) access points, one from Healthcare Boulevard on the north, one from Beulah Boulevard, and one from Purple Sage Trail. Purple Sage Trail is a roadway proposed to align south of the study site. All access points are accessed from Beulah Boulevard in the 2027 study year. The vicinity of the site is provided in **Figure 1**.

CivTech, Inc. has been retained by NAH to perform the traffic impact analysis (TIA) for the proposed development. The purpose of this assessment is to address the traffic and transportation impacts of the proposed development on the surrounding streets and intersections. The scope for this TIA is confined to Beulah Boulevard from J. W. Powell Boulevard to Forest Meadows Street including J. W. Powell Boulevard and the I-17 ramp intersection. The scope of the study considers just the opening year, 2027.

STUDY REQUIREMENTS

This study analyzes the traffic impact due to the proposed complex on the surrounding street network. The specific objectives of the study are:

- To determine whether the planned street system in the vicinity of the site is adequate to accommodate the increased traffic that results from the proposed development.
- To recommend additional street improvements or traffic control devices, where necessary, to mitigate the additional site-generated traffic.

STUDY AREA AND YEARS

The study area has been defined as including the following intersections:

- Beulah Blvd. & J.W. Powell Blvd.
- Beulah Blvd. & Univ. Heights Dr. North/ Lake Mary Rd.
- Beulah Blvd. & McConnell Dr.
- I-17 SB On-Ramp & McConnell Dr.
- Beulah Blvd. & Healthcare Blvd. (Access A)
- Beulah Blvd. & Purple Sage Trl. (Access C)
- Grey Mint St. & Purple Sage Blvd. (Access G)
- I-17 SB On-Ramp & J.W. Powell Blvd.
- Beulah Blvd. & University Heights Dr. South
- Beulah Blvd. & Woodlands Village Blvd.
- Beulah Blvd. & Forest Meadows St.
- Beulah Blvd. & Fairgrounds Drwy.
- Beulah Blvd. & Main Driveway (Access B)
- Driveway & Healthcare Blvd (Access F)
- Driveway & Purple Sage Blvd. (Access M)
- I-17 NB On-Ramp & J.W. Powell Blvd.

The proposed development is anticipated to open during 2027. The analysis year for this study is the 2027 opening year.

Figure 1: Vicinity Map

EXISTING CONDITIONS

LAND USE

The existing 60-acre parcel is currently zoned as RR (Rural Residential) and ER (Estate Residential) allowing for only large lot residential construction. The land is currently undeveloped. As part of this this development, the land will be rezoned.

SURROUNDING LAND USE

Directly surrounding the site is the Flying Horse Ranch Flagstaff Vacation Rental, Posse Arena, Fort Tuthill County Park. North, south, and west of the site is undeveloped vacant land. To the east the Veterans Memorial Highway Interstate 17 (I-17) borders Beulah Boulevard.

ROADWAY NETWORK

The existing roadway network within the study area includes Beulah Boulevard, Fairgrounds Road/J.W. Powell Boulevard, University Heights Drive (North and South), Lake Mary Road, Woodlands Village Boulevard, McConnell Drive, Forest Meadows Street, I-17. Roadway classifications were obtained from the City of Flagstaff Roadway Functional Classification Map dated August 2015, and the ADOT ArcGIS Federal Functional Classification Map.

Beulah Boulevard (SR-89A) is a north-south roadway classified as a minor arterial. Beulah Boulevard is a two (2) lane roadway with one (1) lane in each travel direction north of Forest Meadows Street and south of Lake Mary Road. Between Forest Meadows Street and Lake Mary Road the roadway consists of four (4) lanes with two (2) lanes in each travel direction and center medians with breaks for left turn lanes. The roadway begins just north of Forest Meadows Street and transitions into State Route (SR-89) south of Fairgrounds Road, providing direct access to Arizona Veterans Highway (I-17) and SR-89A. The posted speed limit is 45 miles per hour (mph) within the vicinity of the site.

Fairgrounds Road/J.W. Powell Boulevard is an east-west two (2) lane roadway, classified as a minor arterial, with one (1) lane in each travel direction. J.W. Powell Boulevard begins east of Lone Tree Road and extends west where it terminates at Lake Mary Road. Within the vicinity of the site, the roadway begins just east of Pulliam Drive as J.W. Powell Boulevard and transitions into Fairgrounds Road west of I-17. The Fairgrounds Road effectively acts as a loop road providing access to SR-89A and I-17 for the Fort Tuthill Park. The posted speed limit is 20 mph within the vicinity of the site.

University Heights Drive (North and South) is a two (2) lane curvilinear loop roadway, classified as a collector, that connects to Beulah Boulevard at two (2) locations**.** University Heights Drive North connects into Beulah Boulevard at Lake Mary Road and University Heights Drive South connects into Beulah Boulevard approximately 1,690 feet south of Lake Mary Road (centerline to centerline). The posted speed limit is 25 mph.

Lake Mary Road is a northwest to southeast roadway classified as a minor arterial. Lake Mary Road begins at Beulah Road and transverses southeasterly to its terminus at SR-87. South of Dohmen Drive, Lake Mary Road is a three (3) lane road with a center TWLTL and one (1) lane and a bike lane in each travel direction. North of Dohmen Drive to Walapai Drive, Lake Mary Road is a four (4) lane roadway

with two (2) lanes in the southeast travel direction, one (1) lane in the northwest travel direction, a center TWLTL, and a bike lane in each direction. North of Walapai Drive to Mohawk Drive, Lake Mary Road is a five (5) roadway with a center TWLTL and two (2) lanes and a bike lane in each travel direction. North of Mohawk Drive to Anita Avenue, Lake Mary Road transitions back to a four (4) lane road with a center TWLTL and with two(2) lanes in southeast travel direction and one (1) lane in the northwest travel direction and has a bike lane in each travel direction. From Anita Avenue to east of the I-17 overpass, Lake Mary Road transitions back to a five (5) lane roadway with center TWLTL and two (2) lanes and a bike lane in each travel direction. From east of the I-17 overpass to Beulah Road, Lake Mary Road transitions to a four (4) lane median divided roadway with two (2) lanes and a bike lane in each travel direction. The posted speed limit is 45 mph.

Woodlands Village Boulevard is a north-south four (4) lane roadway, classified as a minor arterial, with two (2) lanes in each travel direction and center medians with breaks for left turn lanes. Woodlands Village Boulevard begins west of Beulah Road at the Courtyard by Marriott Flagstaff Hotel and extends northwesterly where it terminates at Kaibab Lane. Woodland Village Boulevard between W. Route 66 and Kaibab Lane is a three (3) lane roadway with a center TWLTL and one (1) lane in each travel direction. The speed limit is not posted for this section of Woodland Village Boulevard. The posted speed limit south Kaibab Lane is 40 mph.

McConnell Drive is considered an east-west roadway classified as a major collector. West of Beulah Boulevard, McConnell Drive is a three (3) lane road with a center TWLTL and one (1) lane and a bike lane in each travel direction. East of Beulah Boulevard, McConnell Drive transitions to a two (2) lane road with one (1) lane in each travel direction. McConnell Drive begins to the west at Woodlands Village Boulevard extending northeast where it terminates at San Francisco Street. From Woodlands Village Boulevard to the I-17 NB-Off Ramp, McConnell Drive has a posted speed limit of 35 mph, and west of I-17 NB-Off Ramp, McConnell Drive has a speed limit of 15 mph through the Northern Arizona University (NAU) campus.

Forest Meadows Street is an east-west four (4) lane roadway, classified as a minor arterial, from Beulah Boulevard to Milton Road with two (2) lanes in each travel direction. West of Beulah Boulevard to Woodlands Village Boulevard, Forest Meadows Street is an east-west three (3) lane roadway, classified as a major collector, with a center TWLTL and one (1) lane and a bike lane in each travel direction. The posted speed limit for this segment is 35 mph. West of Woodlands Village Boulevard, Forest Meadows Streets transitions to a northwest-southeast two (2) lane major collector roadway with one (1) lane and bike lane in each travel direction with a posted speed limit of 30 mph. Forest Meadows Street begins east of Milton Road and extends northwest to a cul-de-sac approximately 735 feet north of University Avenue.

I-17 is a north-south interstate highway with three (3) lanes in each travel direction. I-17 begins to the north at McConnell Drive in the City of Flagstaff extending south to transitions into I-10 in the City of Phoenix. The posted speed limit of the road is 65 mph.

Mountain Dell Road is an east-west two (2) lane roadway, classified as a collector, with one (1) lane in each direction of travel. Mountain Dell Road transitions from Palmer Avenue at Sinclair Street and extends east where it terminates at Beulah Boulevard. The posted speed limit is 25 mph within the vicinity of the site.

Fairgrounds Driveway is an east-west two (2) lane private roadway, with one (1) lane in each direction of travel. Fairgrounds Driveway begins in the west at the one-way Fairgrounds Loop and extends east where it terminates at Beulah Boulevard. The speed limit is 25 mph within the vicinity of the site.

INTERSECTION CONFIGURATION

1. The intersection of **Beulah Boulevard (SR-89A) and Fairgrounds Road/J.W. Powell Boulevard** is a four-legged roundabout intersection with yield control in all approaches. All approaches consist of a shared left/through/right lane.

2. The intersection of **Beulah Boulevard and University Heights Drive (South)** is a "T" intersection with stop control on the eastbound approach. For this study, Beulah Boulevard will be a north-south road and University Heights Drive South will be an east-west road. The northbound approach consists of a shared left/through lane. The southbound approach consists of one (1) through lane and a dedicated right-turn lane. The eastbound approach consists of a shared left/right-turn lane.

3. The intersection of **Beulah Boulevard and Lake Mary Road/University Heights Drive (North)** is a four-way signalized intersection with flashing yellow phasing in all approaches. For this study, Beulah Boulevard will be a north-south road and Lake Mary Road/University Drive North will be an east-west road. The northbound approach consists of an exclusive left-turn lane, a striped tapered median, one (1) through lane, and a dedicated right-turn lane. The southbound approach consists of dual left-turn lane, one (1) through lane, a bike lane, and a dedicated right-turn lane. The eastbound approach consists of an exclusive left-turn lane, a shared through/right-turn lane, and a bike lane. The westbound approach consists of an exclusive left-turn lane, one (1) through lane, and a free-flow right-turn lane. A striped crosswalk is provided at all legs of the intersection.

4. The intersection of **Beulah Boulevard and Woodlands Village Boulevard** is a four-way signalized intersection with flashing yellow left turn phasing in all approaches. For this study, Beulah Boulevard will be a north-south road and Woodlands Village Boulevard will be an east-west road. The northbound and southbound approaches consist of an exclusive left-turn lane, two (2) through lanes, a bike lane, and a dedicated right-turn lane. The eastbound approach consists of an exclusive left-turn lane, a shared through/right-turn lane, and a dedicated right-turn lane. The westbound approach consists of an exclusive let turn lane and a shared through/right-turn lane. Striped crosswalks are provided at all legs of the intersection.

5. The intersection of **Beulah Boulevard and McConnell Drive** is a four-way signalized intersection with flashing yellow left turn phasing in all approaches. The northbound approach consists of an exclusive left-turn lane, two (2) through lanes, a bike lane, and a dedicated right-turn lane. The southbound approach consists of an exclusive left-turn lane, one (1) through lane, and a shared through/right-turn lane. The eastbound approach consists of an exclusive left-turn lane and a shared through/right-turn lane. The westbound approach consists of an exclusive left-turn lane, one (1) through lane, a bike lane, and a dedicated right-turn lane. Striped crosswalks are provided at all legs of the intersection.

6. The intersection of **Beulah Boulevard and Forest Meadows Street** is a four-way signalized intersection with protected/permitted left turn phasing in all approaches. The northbound approach consists of an exclusive left-turn lane, one (1) through lane, and dual right-turn lanes. The southbound approach consists of an exclusive left-turn lane and a shared through/right-turn lane. The eastbound approach consists of an exclusive left-turn lane, one (1) through lane, and a shared through/right-turn lane. The westbound approach consists of dual left-turn lanes and a shared through/right-turn lane. Striped crosswalks are provided at all legs of the intersection.

7. The intersection of **I-17 SB On Ramp and McConnell Drive** is a "T" intersection with permitted after yield to on-coming traffic movements in the eastbound and westbound approaches and the south leg functions as the I-17 SB On-Ramp. The eastbound approach consists of one (1) through lane and a dedicated right-turn lane. The westbound approach consists of an exclusive left-turn lane, one (1) through lane, and a bike lane.

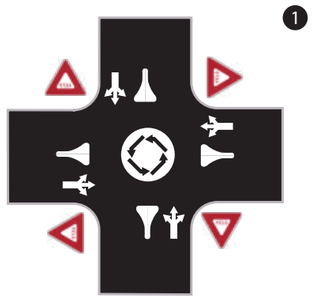
9. The intersection of **Beulah Boulevard and Fairgrounds Driveway** is a 'T" intersection with stop control on the eastbound approach. The northbound approach consists of an exclusive left-turn lane and one (1) through lane. The southbound approach consists of one (1) through lane and a dedicated right-turn lane. The eastbound approach consists of an exclusive left-turn lane and a dedicated right-turn lane.

10. The intersection of **I-17 SB Ramps and J.W. Powell Boulevard** is a four-legged roundabout intersection with yield control in the southbound, eastbound, and westbound approaches and the south leg is the I-17 SB On Ramp. The southbound approach consists of a shared left/through/right lane. The eastbound approach consists of a shared through/right turn lane. The westbound approach consists of a shared left/through lane.

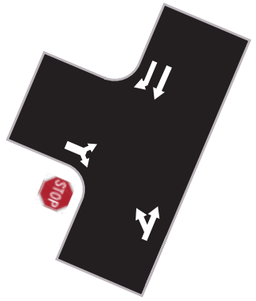
11. The intersection of **I-17 NB Ramps and J.W. Powell Boulevard** is a four-way intersection with stop control on the northbound approach (the south leg) and the north leg is the I-17 NB On Ramp. The northbound approach consists of a shared left/through lane and a dedicated right-turn lane. The eastbound approach consists of an exclusive left-turn lane and one (1) through lane. The westbound approach consists of a shared through/right turn lane.

12. The intersection of **Beulah Boulevard and Mountain Dell Road** is a "T" intersection with stop control on the eastbound approach. For this study, Beulah Boulevard will be analyzed as a north-south road and Mountain Dell Road will be an east-west road. The northbound approach consists of a shared left/through lane. The southbound approach consists of a shared through/right-turn lane. The eastbound approach consists of a shared left/right-turn lane.

The existing intersection lane configurations and traffic control is illustrated in **Figure 2**.



Beulah Blvd & Fairgrounds Rd/JW Powell Blvd



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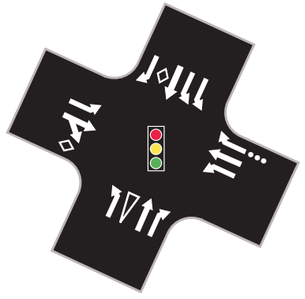

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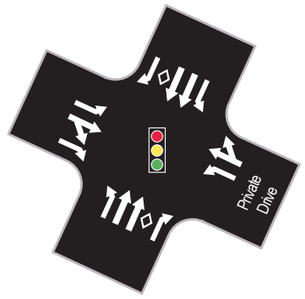
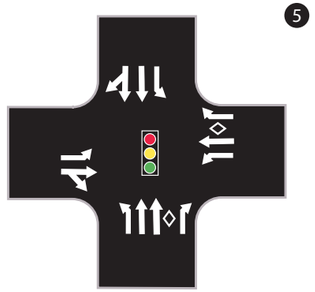
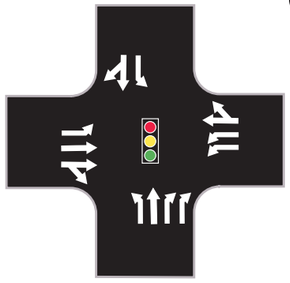


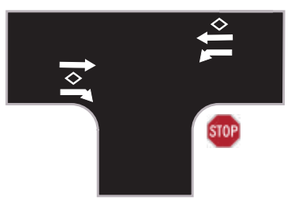
Beulah Blvd & Woodlands Village Blvd



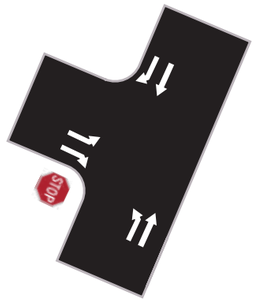
Beulah Blvd & McConnell Dr



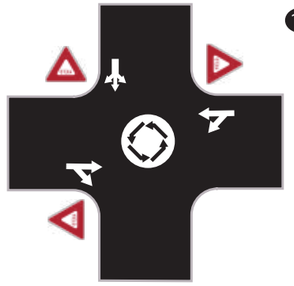
Beulah Blvd & Forest Meadows St



I-17 SB On-Ramp & McConnell Dr



Beulah Blvd & Fairgrounds Drwy.



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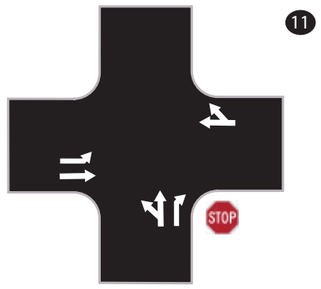

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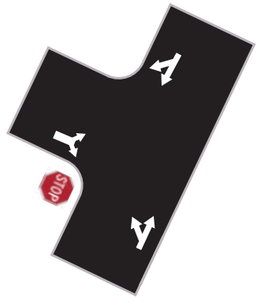


Beulah Blvd & Mountain Dells Rd.

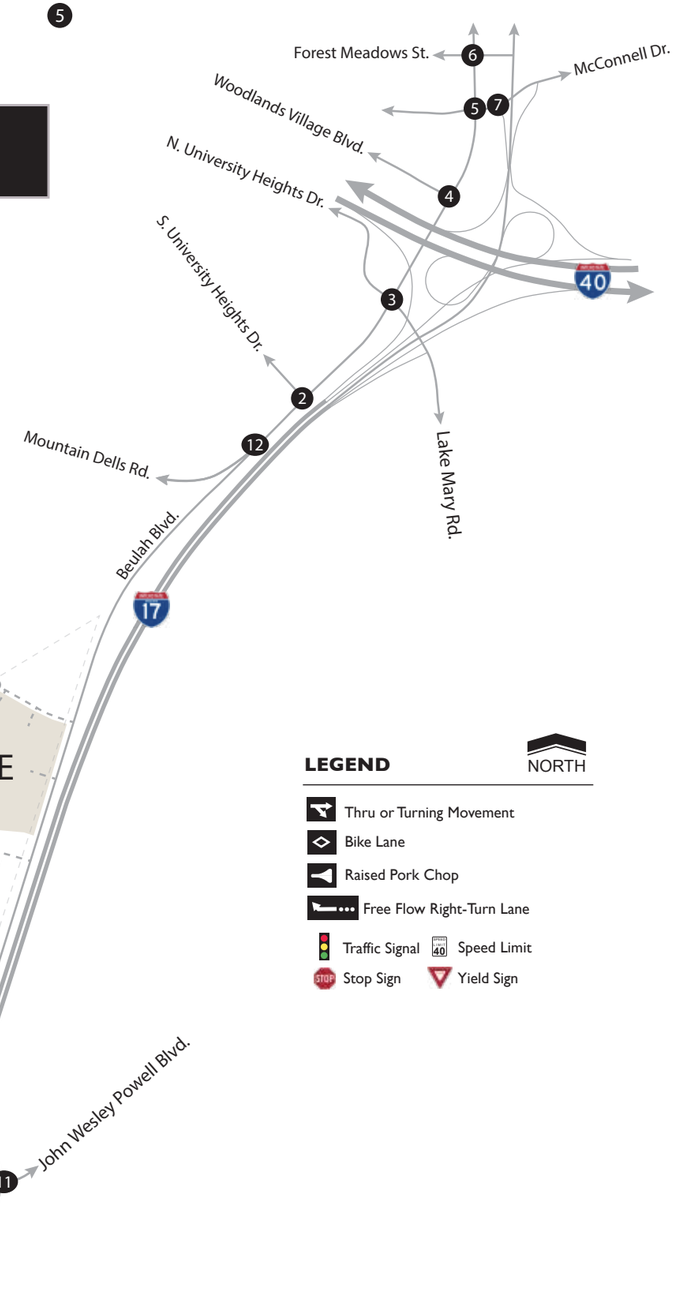


Figure 2: Existing Lane Configurations and Traffic Controls

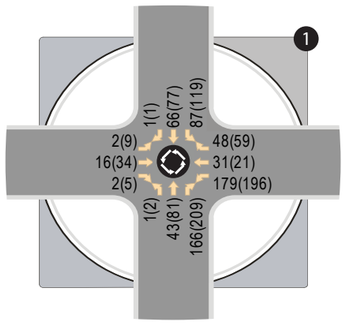
TRAFFIC VOLUMES

CivTech engaged Field Data Services of Arizona, Inc. to record traffic volumes at eight (8) study intersections within the project vicinity. Peak hour volume turning movement counts were performed from 7:00-9:00 AM and 4:00-6:00 PM on Wednesday, September 1, 2021. Peak hour turning movement counts were conducted at the following study intersections:

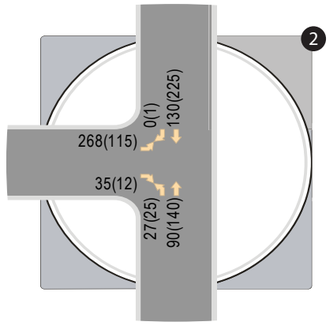
- Beulah Boulevard & Fairgrounds Road/J.W. Powell Boulevard
- Beulah Boulevard & Lake Mary Road /University Heights Drive (North)
- Beulah Boulevard & McConnell Drive
- I-17 SB On-Ramp & McConnell Drive
- I-17 SB-Ramps & J.W. Powell Rd
- Beulah Boulevard & Mountain Dell Road
- Beulah Boulevard & University Heights Drive (South)
- Beulah Boulevard & Woodlands Village Boulevard
- Beulah Boulevard & Forest Meadows Street
- I-17 NB-Ramps & J.W. Powell Rd

The intersection of Beulah Boulevard and Fairgrounds Driveway turning movement data was estimated using existing surrounding count data in the area.

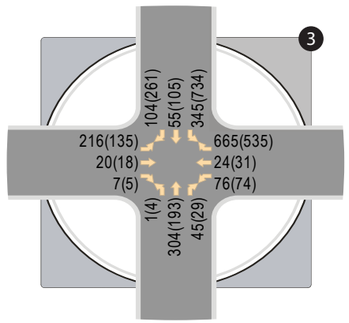
The existing traffic volumes observed for this study are presented in **Figure 3** for the weekday AM and PM peak hours. Traffic volume data obtained for this study have been included in **Appendix B**.



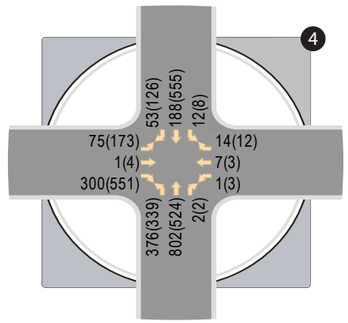
Beulah Blvd & Fairgrounds Rd/JW Powell Blvd



Beulah Blvd & University Heights Dr South

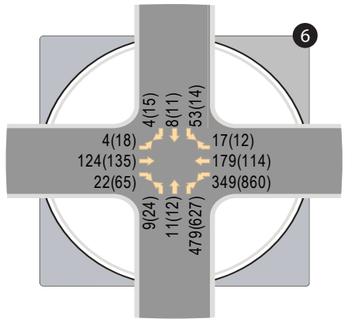


Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N

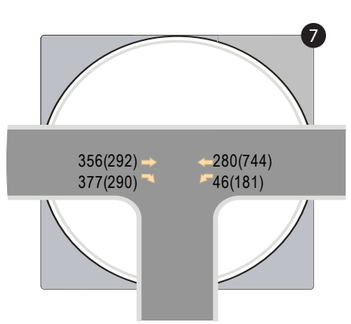


Beulah Blvd & Woodlands Village Blvd

Beulah Blvd & McConnell Dr



Beulah Blvd & Forest Meadows St



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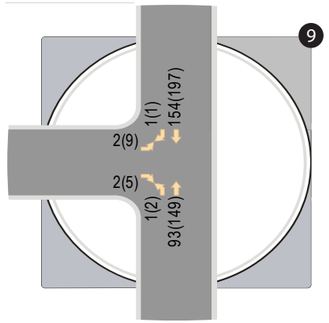
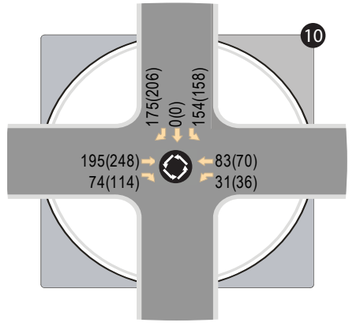


Beulah Blvd & Fairgrounds Drwy



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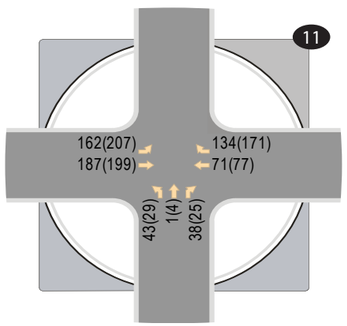

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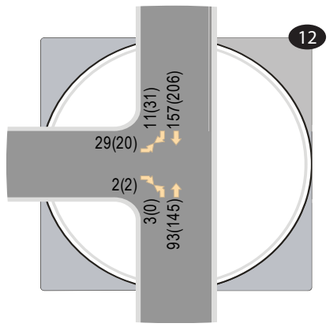
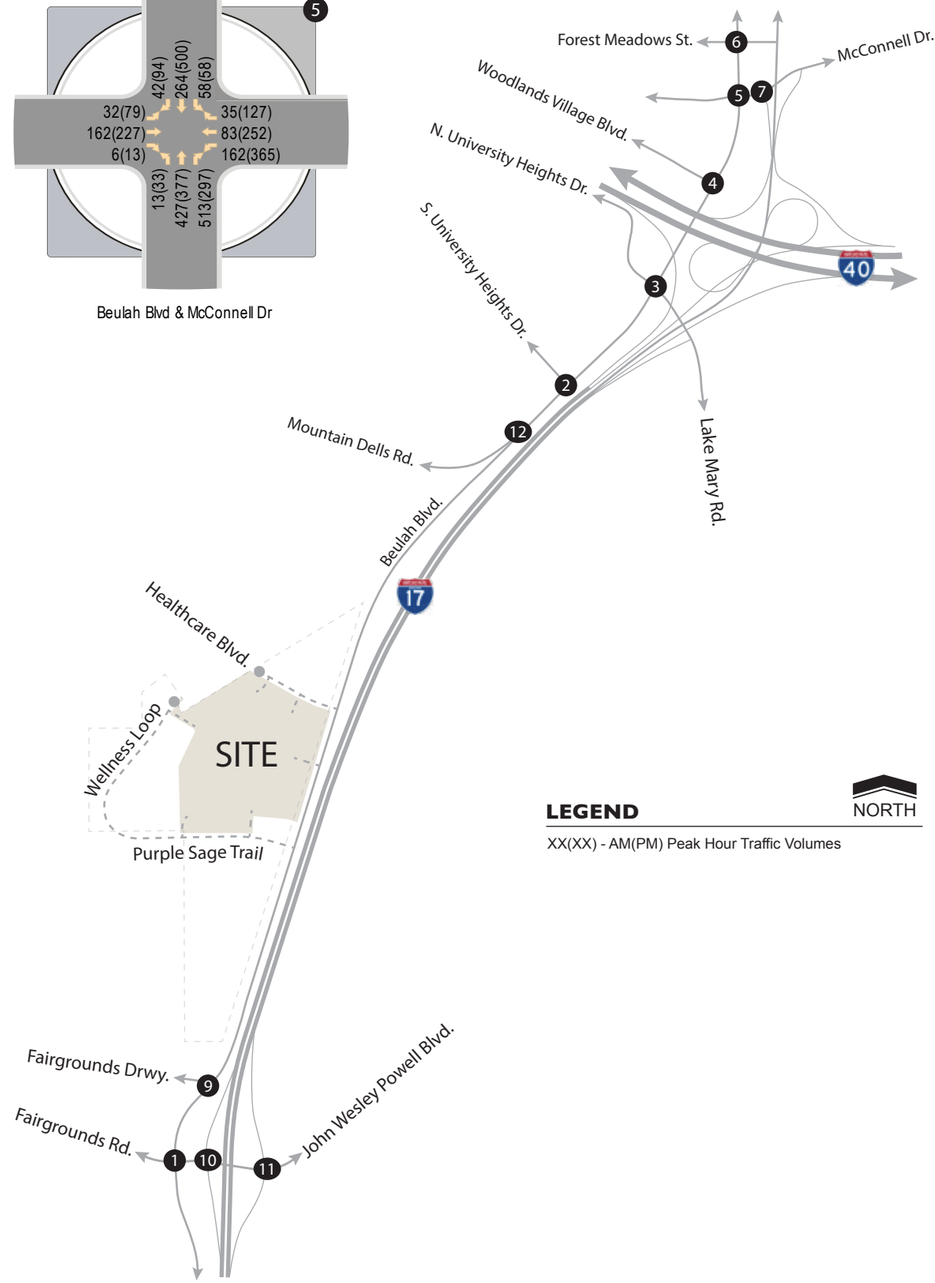


Beulah Blvd & Mountain Dell Rd



LEGEND

NORTH

XX(XX) - AM(PM) Peak Hour Traffic Volumes

Figure 3: Existing Traffic Volumes

CAPACITY ANALYSIS

Peak hour capacity analyses have been conducted for the study intersections based on existing intersection configurations, traffic volumes, and signal timing. Intersections have been analyzed using the methodologies presented in the *Highway Capacity Manual 6th edition (HCM 6th),* updated 2016, using Synchro software, version 11.0 under the HCM 6th edition methodology. Some intersections whose configuration was not compatible with HCM 6th edition methodology were analyzed using the HCM 2000 methodology; these intersections are indicated as such.

The concept of level of service (LOS) uses qualitative measures that characterize operational conditions within the traffic stream. The individual levels of service are described by factors that include speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations A through F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions. Levels of service for intersections are defined within ranges of average control delay per vehicle, the number of seconds a vehicle can expect to wait due to the presence of a traffic control device. **Table 1** lists the level of service criteria for signalized and unsignalized intersections, respectively.

Table 1 – Level of Service Criteria for Controlled Intersections

Level-of-Service	Signalized Control Delay (sec/veh)	Unsignalized Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80 (or v/c > 1)	> 50 (or v/c > 1)

Source: Exhibits 19-8, 20-2, 21-8, and 22-8, Highway Capacity Manual, 6th Edition (2016)

Synchro 11.0 software calculates the LOS per the HCM 6th edition methodology. The 6th edition HCM documents the signalized LOS calculation methodology which takes into account lane geometry, traffic volumes and cycle length/phasing to compute LOS. Synchro analysis worksheets report individual movement delay/LOS and overall delay/LOS for signalized intersections; unsignalized intersection worksheets report the worst-case delay/LOS and the average overall intersection delay.

The Existing Synchro Scenario for (year 2022) was created with the current geometry, obtained signal timing as modified per City of Flagstaff requests, and pedestrian walk times from City of Flagstaff and ADOT (verified by Jeff Bauman in meetings on May 18, 2022). The counts obtained by Field Data Services (FDS) were implemented in the model along with HCM 2000 right-turn-on-red (RTOR) reductions and with the existing peak hour factors (PHF) associated with each movement.

At signalized intersections, a number of right turning vehicles will, when allowed, make a RTOR clearing the intersection before their green phase comes. To calculate the number of vehicles which make a RTOR, HCM 2000 RTOR methodology is used. These RTOR values are then considered in the LOS analysis. The value of RTOR reduction is capped at ¼ of the total right-turn vehicles.

Results of the existing level of service analyses are shown in **Table 2** for both AM and PM peak hours. The existing conditions analysis worksheets have been included in **Appendix C**.

Table 2 – Existing Peak Hour Levels of Service

ID	Intersection	Intersection Control	Approach/ Movement	Existing LOS AM (PM)
1.	Beulah Blvd. & J.W. Powell Blvd.	Roundabout	NB Shared SB Shared EB Shared WB Shared	A (A) A (A) A (A) A (A)
2.	Beulah Blvd. & University Heights Dr South	1-Way Stop (EB)	NB Left NB Thru EB Shared	A (A) A (A) C (B)
3.	Beulah Blvd. & Lake Mary Rd/ University Heights Dr North	Signalized	NB SB EB WB Overall	E (E) C (C) E (D) D (D) D (D)
4.	Beulah Blvd. & Woodlands Village Blvd.	Signalized	NB SB EB WB Overall	D (D) D (D) B (C) E (D) D (D)
5.	Beulah Blvd. & McConnell Dr	Signalized	NB SB EB WB Overall	D (D) D (E) D (D) D (E) D (E)
6.	Beulah Blvd. & Forest Meadows St	Signalized	NB SB EB WB Overall	B (C) C (C) C (C) C (B) C (B)
7.(1)	I-17 SB On-Ramp & McConnell Dr	1-Way Yield	WB Left	A (A)
9.	Beulah Blvd. & Fairgrounds Drwy. *(Note: existing counts at this intersection were estimated using surrounding count data in the area)*	1-Way Stop (EB)	NB Shared SB Shared EB Shared WB Shared Overall	A (A) A (A) A (A) A (A) A (A)
10.	I-17 SB-Ramps & J.W. Powell Blvd.	Roundabout	SB Shared EB Shared WB Shared Overall	A (A) A (A) A (A) A (A)
11.	I-17 NB-Ramps & J.W. Powell Blvd.	1-Way Stop (NB)	NB Shared NB Right EB Left Overall	C (C) A (A) A (A) A (A)

Table 2 – Existing Peak Hour Levels of Service

ID	Intersection	Intersection Control	Approach/ Movement	Existing LOS AM (PM)
12.	Beulah Blvd. & Mountain Dell Rd	1-Way Stop (EB)	NB Left NB Thru EB Shared Overall	A (A) A (A) B (B) A (A)

(1) Analyzed with HCM 2000 methodology.

The results of the existing conditions analysis summarized in **Table 2** indicate that all study intersections operate with acceptable levels of service with the exception of three (3) intersections. City of Flagstaff defines "acceptable" Levels of Service as: Level of Service D or better, or for intersections already performing worse than Level of Service D, the level of service should not be made worse. ADOT defines "acceptable" Levels of Service as: Level of Service C or better, or for intersections already performing worse than Level of Service C, the level of service should not be made worse.

3. The signalized intersection of **Beulah Blvd & University Heights Dr (North)/Lake Mary Rd** operates with an overall intersection delay below 55 seconds per vehicle (sec/veh) for all peak hours. It has delay of 74.9 sec/veh (LOS E) and 60.3 sec/veh (LOS E) in the eastbound overall approach and northbound overall approach respectively during the AM peak hour. It has delay of 60.9 sec/veh (LOS E) in the northbound overall approach during the PM peak hour.

4. The signalized intersection of **Beulah Blvd & Woodlands Village Blvd** operates with an overall intersection delay exceeding 55 seconds per vehicle (sec/veh) for all peak hours. It has delay of 57.9 sec/veh (LOS E), and 57.6 sec/veh (LOS E) in the westbound shared movement, and westbound overall approach respectively during the AM peak hour. It has delay of 57.6 sec/veh (LOS E), in the northbound through movement during the PM peak hour.

5. The signalized intersection of **Beulah Blvd & McConnell Drive** operates with an overall intersection delay exceeding 55 seconds per vehicle (sec/veh) for all peak hours. It has delay of 59.7 sec/veh (LOS E), and 60.6 sec/veh (LOS E) in the southbound shared movement, and southbound through approach respectively during the AM peak hour. It has delay of 59.6 sec/veh (LOS E), 61.6 sec/veh (LOS E), 62.6 sec/veh (LOS E), 58.1 sec/veh (LOS E), 92.9 sec/veh (LOS F) and a delay of 72.4 sec/veh (LOS E) in the northbound right-turn movement, southbound through movement, southbound shared movement, southbound overall approach, westbound left-turn movement and westbound overall approach respectively during the PM peak hour.

FUTURE ROADWAY IMPROVEMENTS

No future roadway improvements are considered in the 2027 opening study year No Build scenario. In the 2027 unmitigated Build scenario, it is assumed that Beulah Boulevard will be improved to a four-lane road with two lanes of travel in each direction along the frontage of the site. As a result, the free-flow channelized westbound right-turn lane at the intersection of Beulah Boulevard and Lake Mary Road will become a signal controlled dedicated right-turn lane. An exclusive northbound left-turn lane will be added to the intersection of Beulah Boulevard and University Heights Drive South.

Also in the 2027 unmitigated Build scenario, it is assumed that the intersection of Beulah Boulevard and Mountain Dell Road will be improved such that Mountain Dell Road intersects Beulah Boulevard at right angles and that an exclusive northbound left-turn lane will be added.

PROPOSED DEVELOPMENT

SITE LOCATION/DENSITY/INTENSITY

Northern Arizona Healthcare (NAH) proposes the development of a 60-acre parcel located west of Beulah Boulevard south of the planned Healthcare Boulevard alignment on currently undeveloped property. This development consists of a 751,850 square foot hospital with 205,042 square feet ambulatory care facility.

SITE ACCESS

There are a total of three (3) proposed access points on Beulah Boulevard.

- *Intersection A* – is Beulah Boulevard and Healthcare Boulevard. Healthcare Boulevard is a future collector roadway planned for alignment approximately 3,660 feet south of the existing Mountain Dell Road alignment.
    - *Access F* is a full movement driveway on the northern frontage of the site along Healthcare Boulevard, approximately 475-feet west of Beulah Boulevard.
- *Access B* – is the planned main full movement driveway on the eastern frontage of the site along Beulah Boulevard, approximately 715-feet south of the Healthcare Boulevard alignment.
- *Intersection C* – is Beulah Boulevard and Purple Sage Boulevard. Purple Sage Boulevard is a future collector roadway planned for alignment approximately 1,033-feet south of the existing Mountain Dell Road alignment.
    - *Access G* is one of two (2) full movement site driveway on the southern frontage of the site along Purple Sage Boulevard, located approximately 560-feet west of Beulah Boulevard.
    - *Access M* is one of two (2) full movement site driveway on the southern frontage of the site along Purple Sage Boulevard, located approximately 800-feet west of Access G.

The proposed development site plans are provided in **Figure 4**.

TRIP GENERATION

The potential trip generation for the proposed development was estimated utilizing the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition* and *Trip Generation Handbook, 3rd Edition*. The ITE *Trip Generation Manual* contains data collected by various transportation professionals for a wide range of different land uses. The data are summarized in the report and average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized land use. The report provides information for daily and peak hour trips.

No internal capture, multi-modal, or pass-by/diverted link trip reductions are applied to the trip generation. The anticipated trip generation is summarized in **Table 3**. Detailed trip generation calculations are provided in **Appendix D**.

Table 3 – Trip Generation

Land Use	ITE Code	ITE Land Use Name	Quantity	Units+
Hospital	610	Hospital	751.850	KSF
Ambulatory Care Facility	630	Clinic	205.042	KSF

Land Use	ADT		*AM (IN/Out)*		*PM (IN/Out)*	
	Avg. Rate	Total	Avg. Rate	Total	Avg. Rate	Total
Hospital	9.90	7,446	0.88	443/218	0.89	235/436
Ambulatory Care Facility	36.03	7,388	2.23	371/87	3.54	218/509
Total		**14,834**		**814/305**		**453/945**

The proposed development is anticipated to generate 14,834 weekday daily trips, 1,119 trips during the AM peak hour, and 1,398 trips during the PM peak hour.

Figure 4: Site Plan and Access

VEHICLE TRIP DISTRIBUTION AND ASSIGNMENT

A single trip distribution pattern was assumed for the proposed development. The traffic distribution percentages were calculated using regional model data provided by MetroPlan. The resulting trip distribution percentages for the study area are shown in **Table 4**.

Figure 5 illustrates the trip distribution percentages noted in **Table 4** on the roadway network within the study area. The percentages presented in **Figure 5** were applied to the site trips generated to determine the AM and PM peak hour site traffic at the intersections within the study area. **Figure 6** presents the resulting site generated traffic for the proposed development.

Table 4 – Site Trip Distribution

Roadway	Direction(s) (To/From)	Outbound Distribution
Beulah Boulevard	North of Site	42.5%
Beulah Boulevard	South of Site	57.5%
Beulah Boulevard	N. of Forest Meadows St	7%
Forest Meadows St	W. of Beulah Blvd	2%
Forest Meadows St	E. of Beulah Blvd	5.5%
McConnell Dr	E. of I-17	2%
Woodlands Village Blvd	W. of Beulah Blvd	15%
University Heights Dr North	W. of Beulah Blvd	2%
Lake Mary Road	E. of Beulah Blvd	7%
University Heights Dr South	W. of Beulah Blvd	2%
Beulah Boulevard	S. of JW Powell Blvd	2.5%
JW Powell Blvd	E. of I-17	5%
I-17	N. of JW Powell	46%
I-17	S. of JW Powell	4%

FUTURE TRAFFIC

CivTech in coordination with the City of Flagstaff determined that a 1% annual growth rate (1.062 annual expansion factor for study year 2027) would be applied to the volumes at the Beulah Boulevard intersections between J.W. Powell Boulevard and Lake Mary Road. The intersections of I-17 ramps and J. W. Powell utilized an annual growth factor of 2.2% from 2021 to 2025 then 1% from 2025 to 2027 (1.113 annual expansion factor for study year 2027). All other study intersections utilized an annual growth factor of 0.2% from 2021 to 2025 then 1% from 2025 to 2027 (1.028 annual expansion factor for study year 2027). The expansion factors were applied to 2021 existing study intersection volumes to obtain the future background traffic volumes. Background traffic calculations are located within **Appendix E**. The background volumes for the opening year of 2027 are presented in **Figure 7**. Total traffic was determined by adding the site generated traffic to the estimated projected background traffic. Total peak hour traffic volumes for the opening year of 2027 are shown in **Figure 8**.

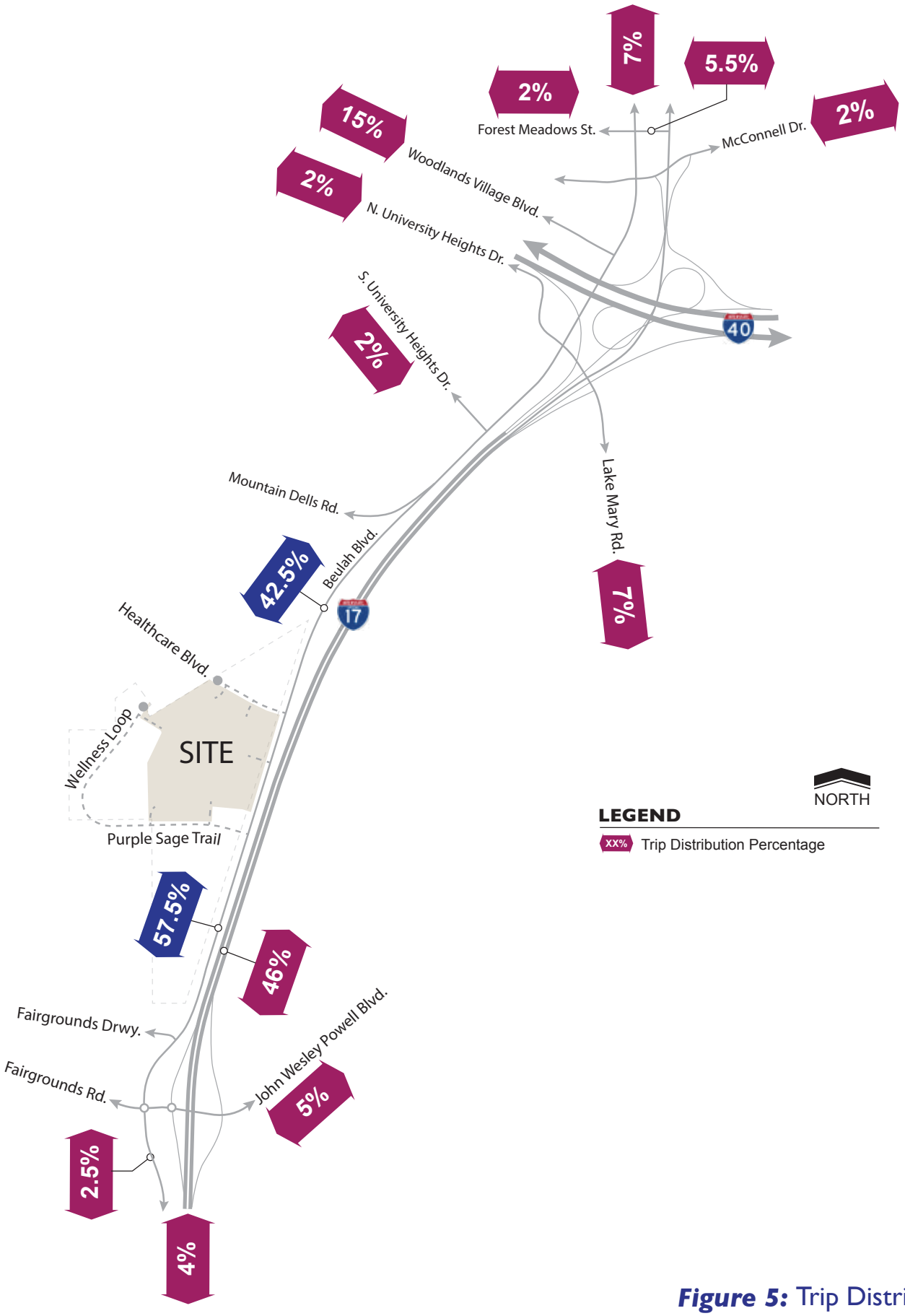
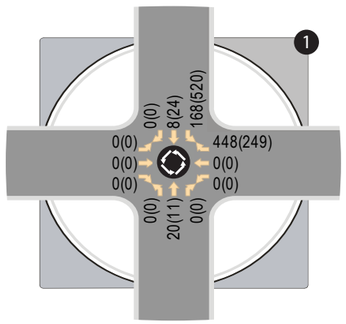


Figure 5: Trip Distribution



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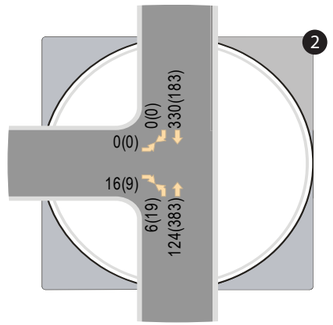

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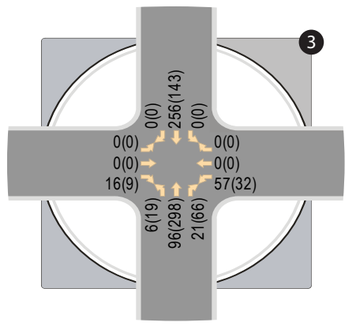

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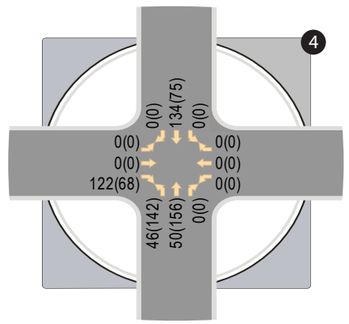
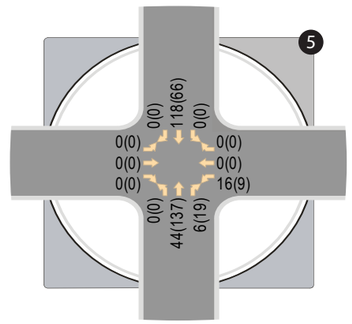


Beulah Blvd & Woodlands Village Blvd



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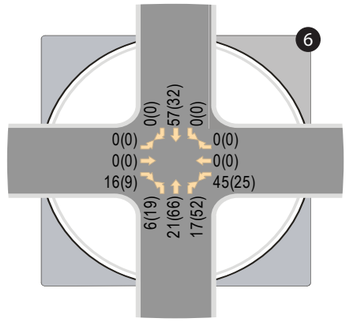
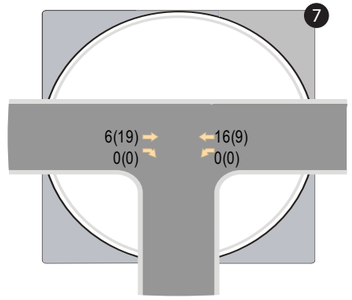


Beulah Blvd & Forest Meadows St



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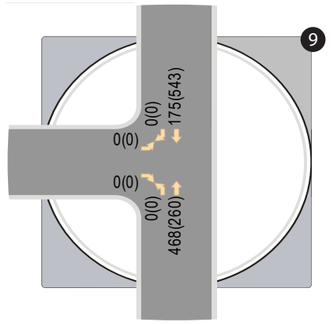

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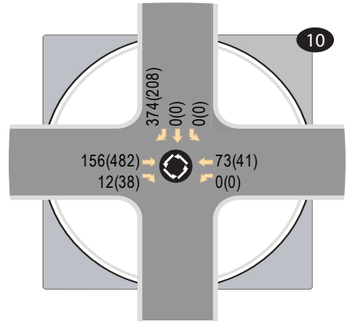

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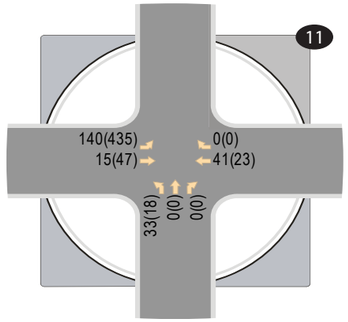

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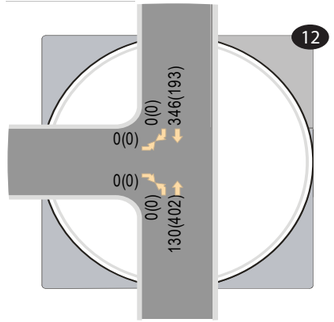

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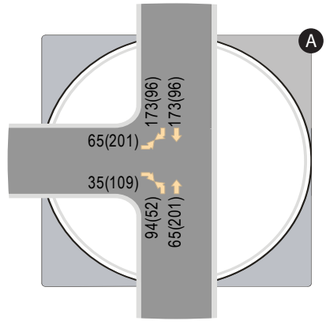

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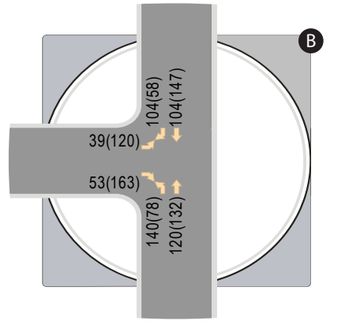

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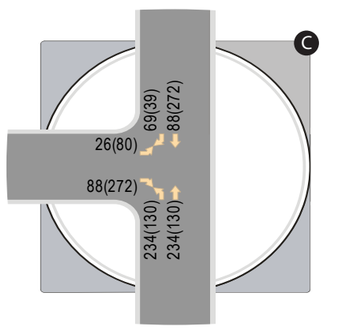
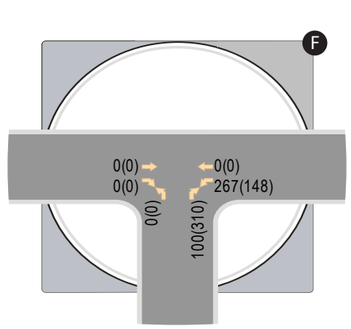
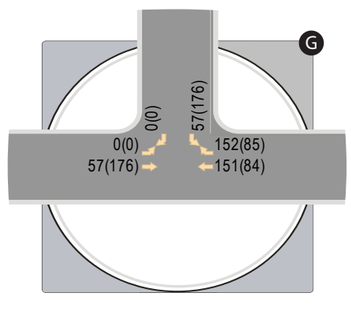


Beulah Blvd & Purple Sage Blvd



Access F & Healthcare Blvd



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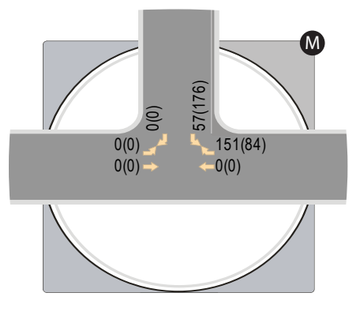


Vitality St & Purple Sage Blvd

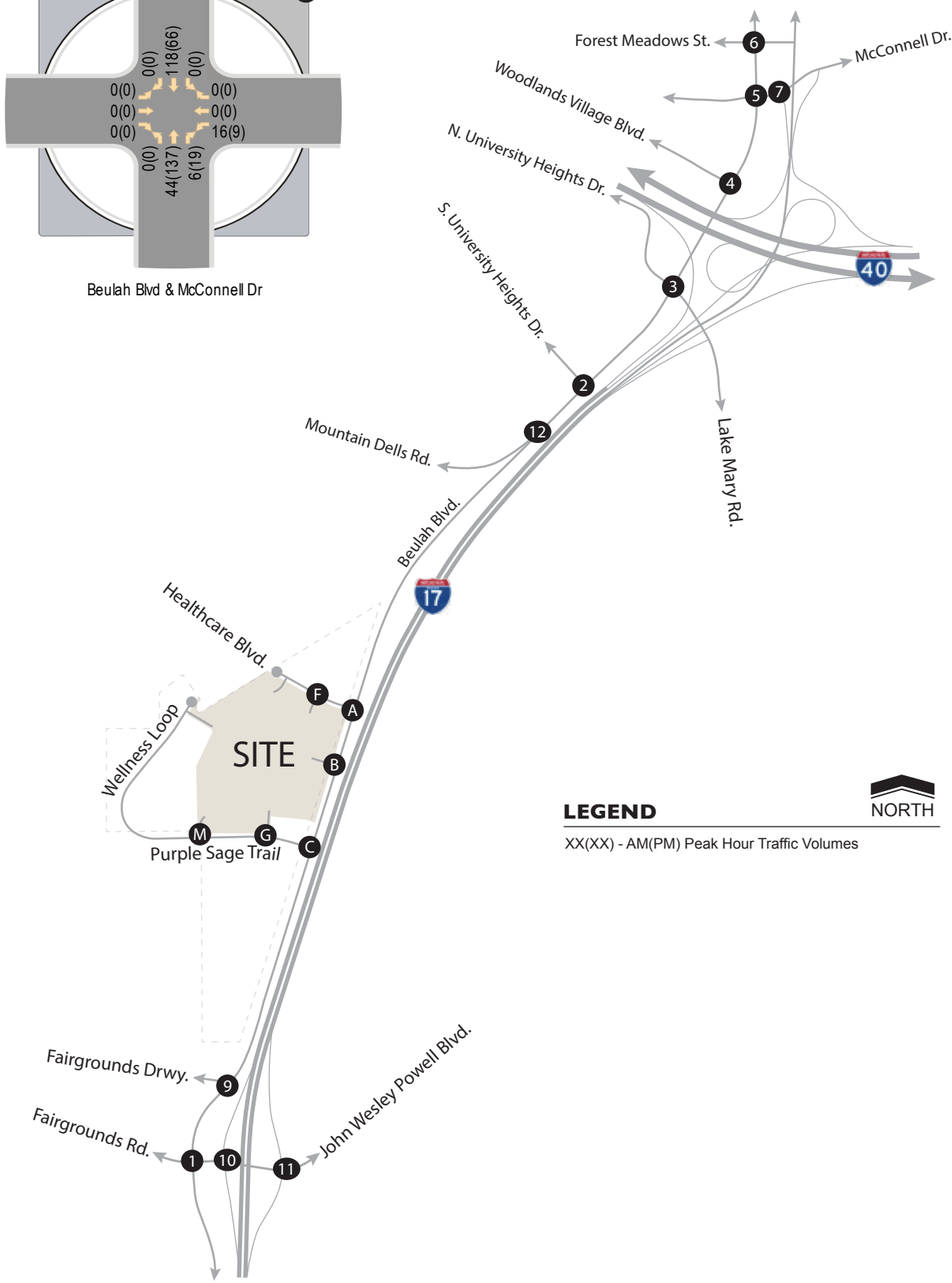
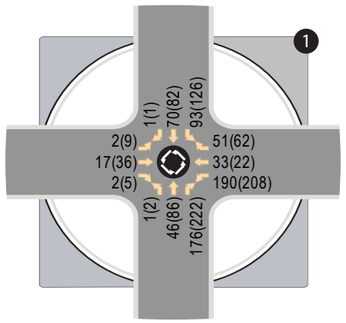
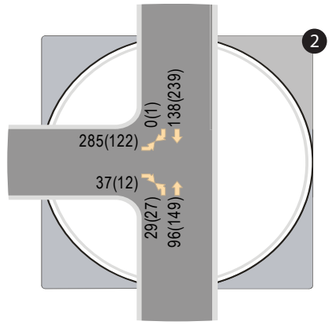


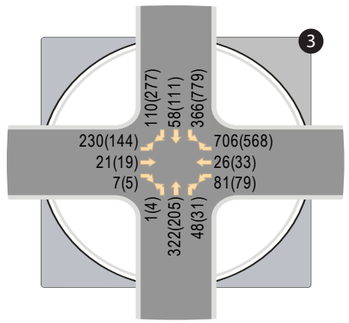
Figure 6: 2027 Site Generated Traffic Volumes



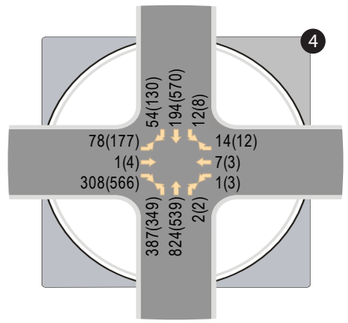
Beulah Blvd & Fairgrounds Rd/JW Powell Blvd



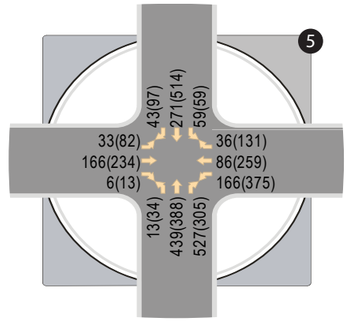
Beulah Blvd & University Heights Dr South



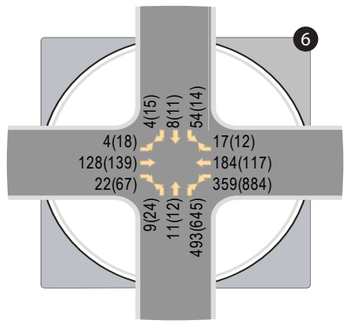
Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N



Beulah Blvd & Woodlands Village Blvd



Beulah Blvd & McConnell Dr



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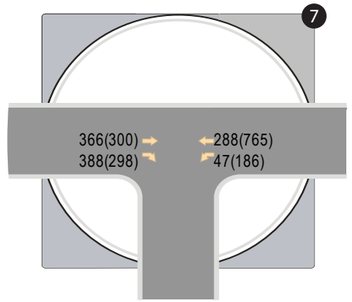
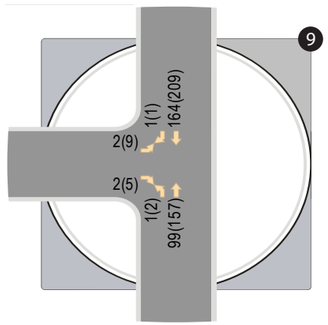
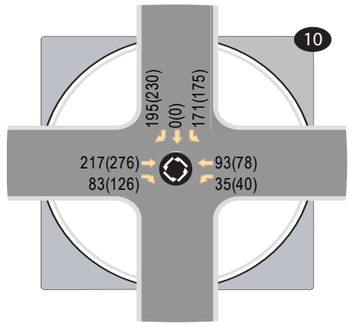


I-17 SB On-Ramp & McConnell Dr



Beulah Blvd & Fairgrounds Drwy



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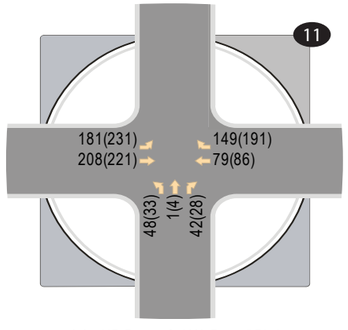

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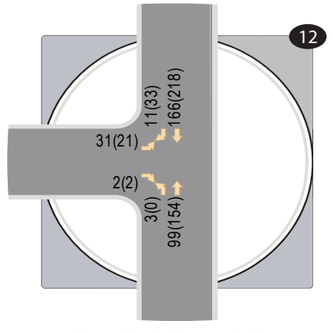

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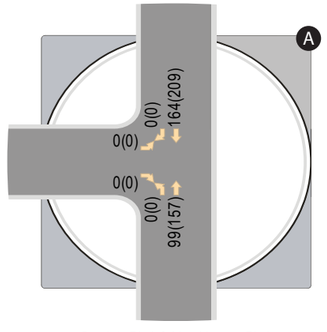

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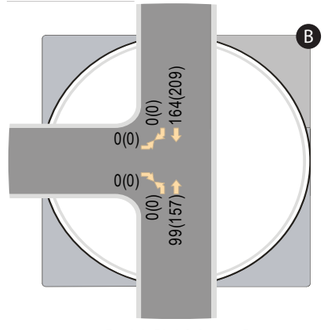
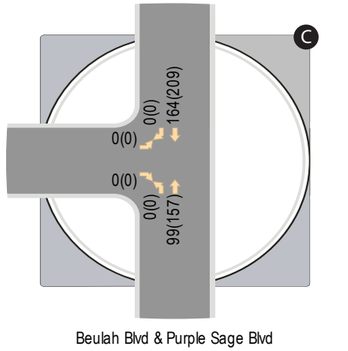
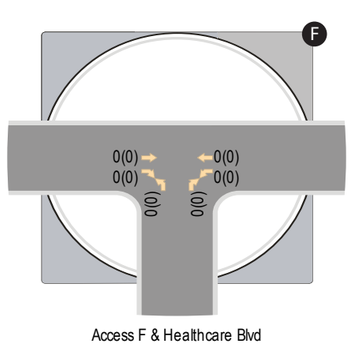


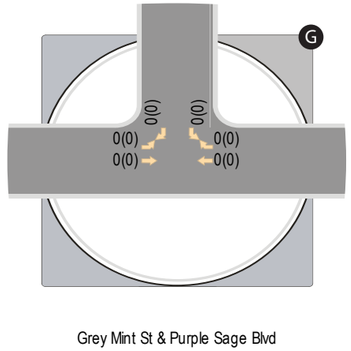
Beulah Blvd & Access B



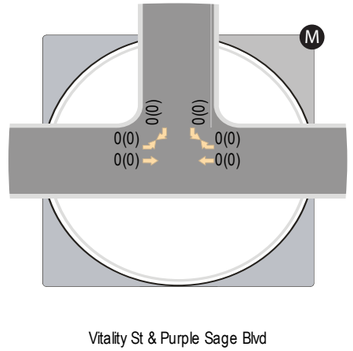
Beulah Blvd & Purple Sage Blvd



Access F & Healthcare Blvd



Grey Mint St & Purple Sage Blvd



Vitality St & Purple Sage Blvd

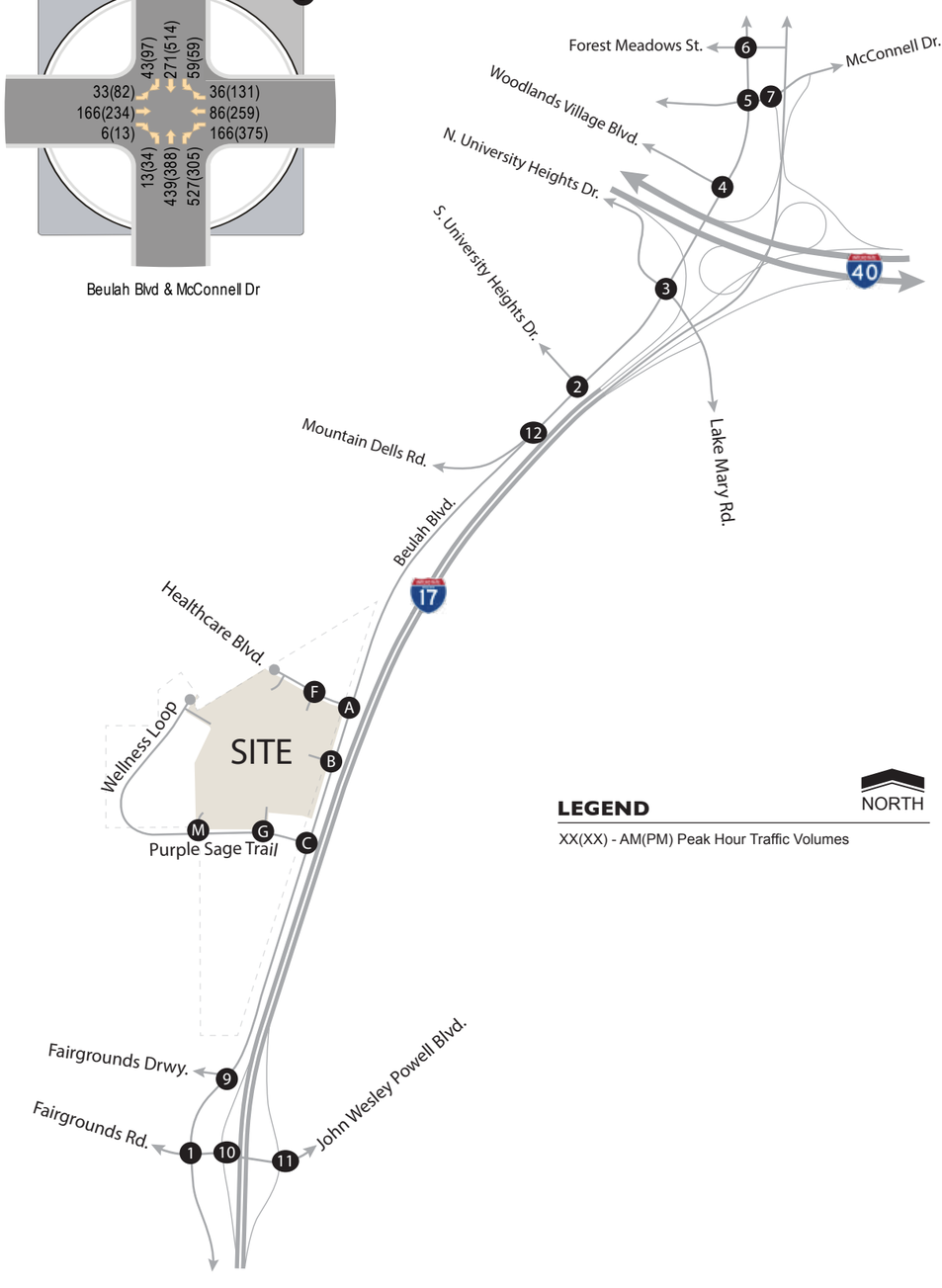
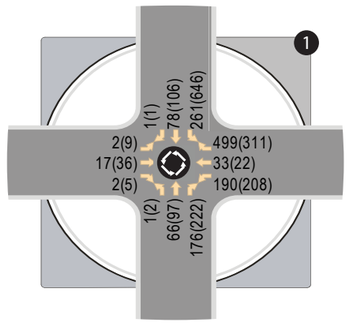
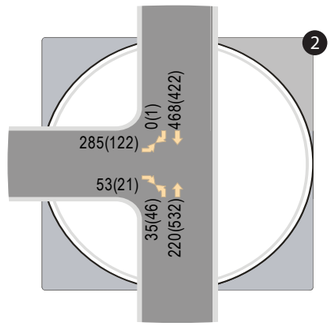


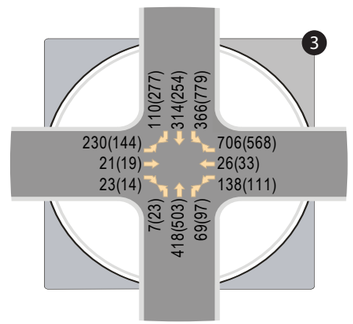
Figure 7: 2027 Background Traffic Volumes



Beulah Blvd & Fairgrounds Rd/JW Powell Blvd



Beulah Blvd & University Heights Dr South



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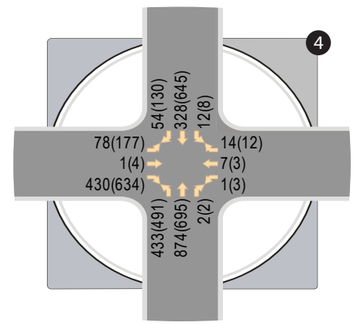
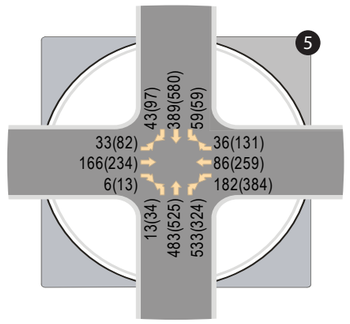
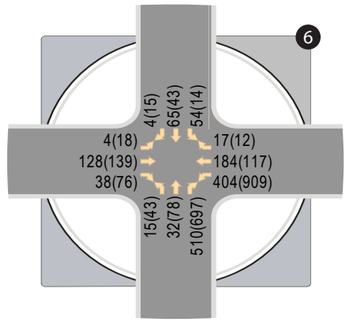


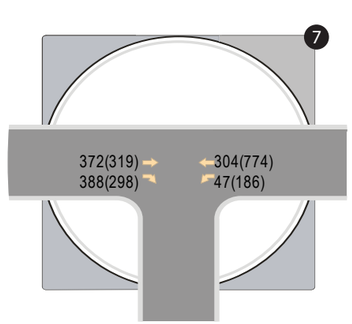
Beulah Blvd & Woodlands Village Blvd



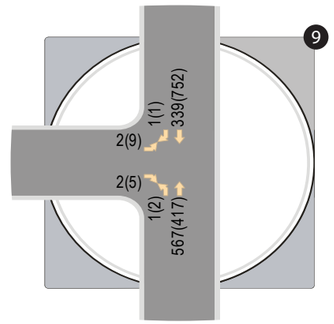
Beulah Blvd & McConnell Dr



Beulah Blvd & Forest Meadows St



I-17 SB On-Ramp & McConnell Dr



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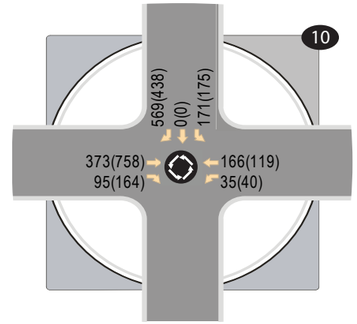

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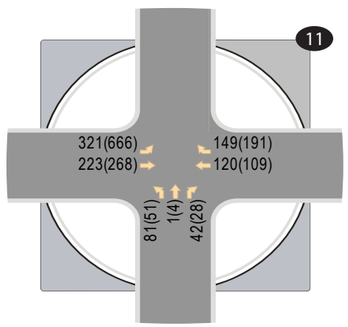

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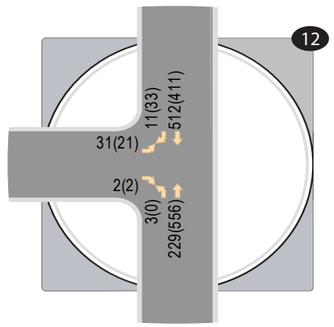
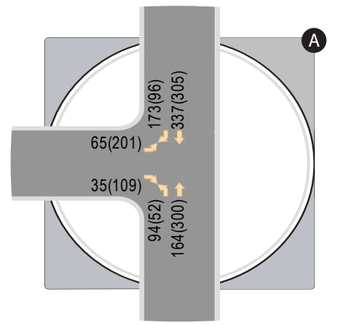


Beulah Blvd & Mountain Dell Rd



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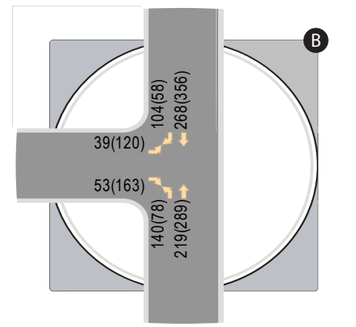
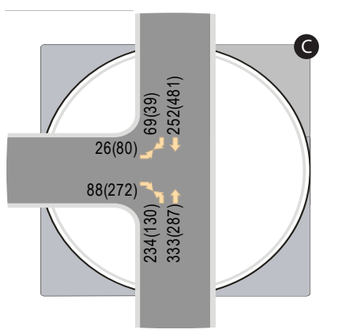
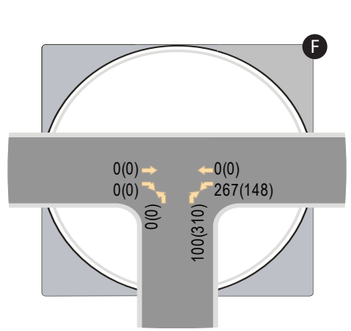


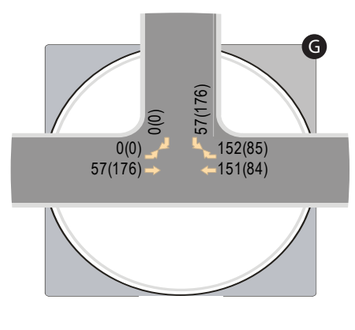
Beulah Blvd & Access B



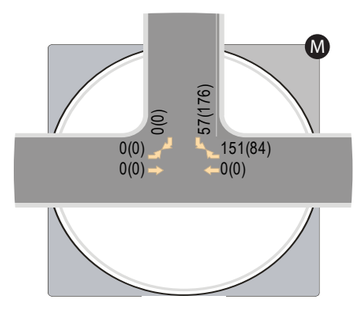
Beulah Blvd & Purple Sage Blvd



Access F & Healthcare Blvd



Grey Mint St & Purple Sage Blvd



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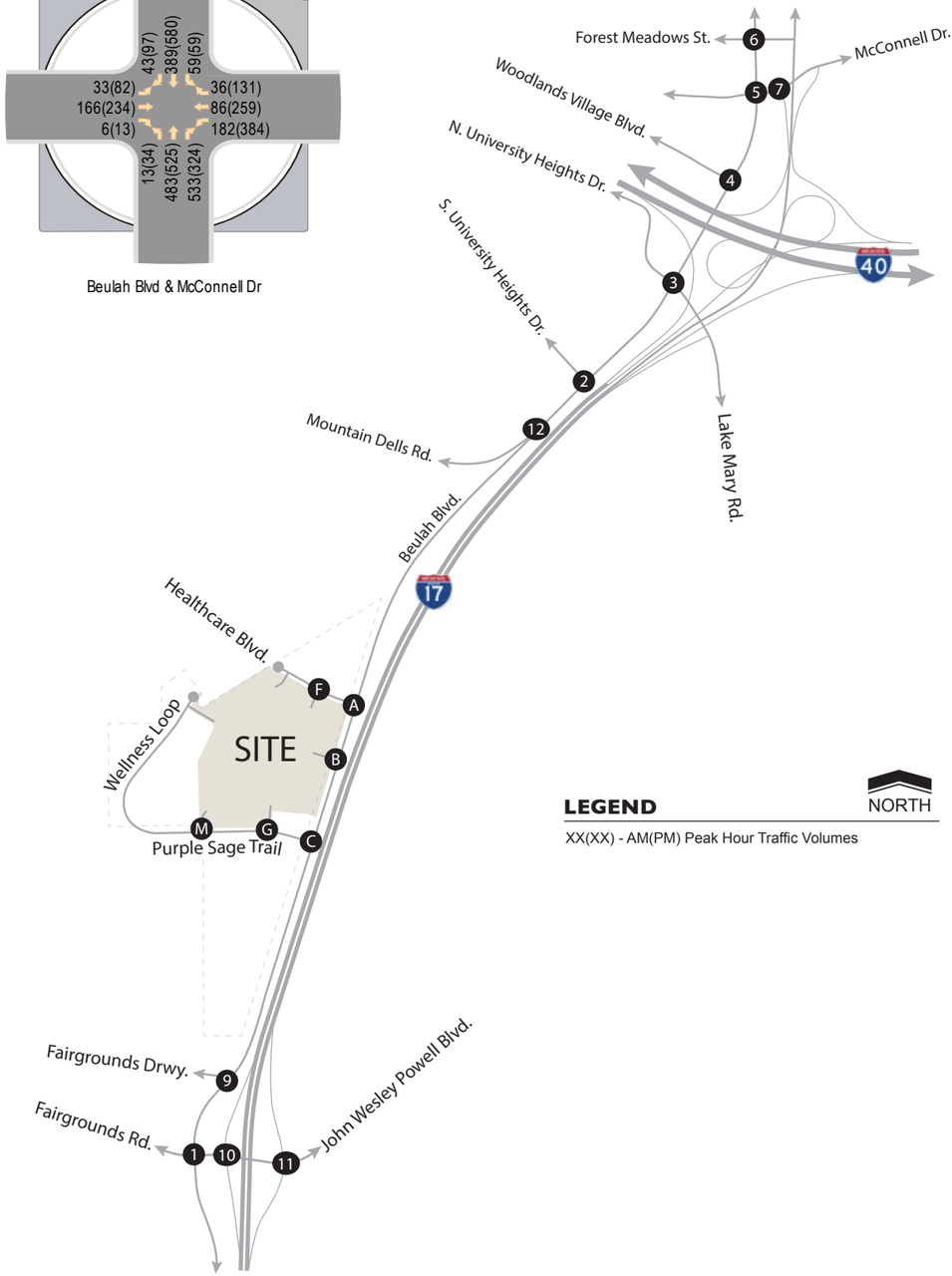


Figure 8: 2027 Total Traffic Volumes

TRAFFIC AND IMPROVEMENT ANALYSIS

CAPACITY ANALYSIS

The overall intersection and approach levels of service are summarized in **Table 5** for the 2027 background (No Build) and total (Build) traffic conditions. Detailed analysis worksheets for the 2027 background analysis can be found in **Appendix F**, worksheets for the 2027 total traffic analysis can be found in **Appendix G**, and 2027 mitigation analysis can be found in **Appendix H**.

Table 5 – Peak Hour Levels of Service

ID	Intersection	Intersection Control	Approach/ Movement	2027		
				No Build	Build	Mitigated
				AM (PM)	AM(PM)	AM(PM)
1.	Beulah Blvd. & J.W. Powell Blvd.	Roundabout	NB SB EB WB Overall	A 5.0 (A 6.5) A 5.2 (A 5.8) A 4.3 (A 5.1) A 5.0 (A 5.6) A 5.0 (A 5.9)	A 6.7 (C 18.3) A 5.4 (B 11.7) A 5.3 (B 10.3) B 11.6 (A 8.9) A 9.0 (B 12.1)	A 6.7 (C 18.3) A 5.4 (B 11.7) A 5.3 (B 10.3) B 11.6 (A 8.9) A 9.0 (B 12.1)
2.	Beulah Blvd. & University Heights Dr. South	1-Way Stop (EB) Mitigated: Signalized	NB SB EB Overall	A 1.8 (A 1.2) A 0.0 (A 0.0) C 16.8 (B 14.5) A 9.6 (A 3.9)	A 8.6 (A 8.5) - (-) F 121.5 (F 53.8) E 39 (A 7.1)	A 5.9 (A 3.6) A 7.2 (A 3.1) C 25.9 (C 31.8) B 12.7 (A 6.8)
3.	Beulah Blvd. & University Heights Dr. North/Lake Mary Rd.	Signalized	NB SB EB WB Overall	E 60.4 (E 62.1) C 30.6 (C 28.3) E 77.6 (E 57.9) D 48.7 (D 51.9) D 50.5 (D 37.6)	E 58.8 (F 86.5) D 41.0 (D 39.7) E 76.2 (E 57.7) D 51.0 (D 53.5) D 52.7 (E 55.1)	D 39.9 (D 42.8) D 45.9 (D 39.9) C 27.6 (D 36.8) C 25.5 (B 20.5) D 35.9 (D 36.1)
4.	Beulah Blvd. & Woodlands Village Blvd.	Signalized	NB SB EB WB Overall	D 38.0 (D 40.3) D 39.2 (D 42.0) B 19.5 (C 23.9) E 57.8 (D 51.2) D 35.5 (D 36.4)	D 37.7 (D 39.4) D 46.3 (D 39.6) B 15.7 (C 23.5) E 57.8 (D 51.2) D 35.2 (D 35.5)	D 39.3 (D 38.0) D 46.8 (D 40.6) B 19.0 (C 23.2) D 46.6 (D 51.2) D 36.8 (D 35.1)
5.	Beulah Blvd. & McConnell Dr.	Signalized	NB SB EB WB Overall	D 36.2 (D 42.4) D 52.7 (D 54.9) D 45.9 (D 49.0) D 52.0 (E 80.0) D 43.5 (E 58.4)	D 35.4 (D 42.1) E 60.4 (D 54.2) D 45.8 (D 49.0) D 52.5 (F 84.4) D 45.6 (E 58.5)	A 1.0 (A 6.2) B 10.0 (C 24.5) D 45.1 (D 50.6) D 36.4 (D 51.8) B 13.7 (C 30.0)
6.	Beulah Blvd. & Forest Meadows St.	Signalized	NB SB EB WB Overall	B 15.2 (B 14.8) C 25.3 (C 26.6) C 32.4 (C 32.0) C 24.4 (C 25.0) C 22.4 (C 22.9)	B 16.0 (B 10.9) C 26.6 (C 27.4) C 32.7 (C 32.3) C 24.2 (C 25.5) C 22.8 (C 21.5)	B 16.0 (B 10.9) C 26.6 (C 27.4) C 32.7 (C 32.3) C 24.2 (C 25.5) C 22.8 (C 21.5)
7.	I-17 SB On-Ramp & McConnell Dr.	1-Way Yield	WB Left Overall	A 9.9 (B 10.2) A 0.5 (A 1.3)	A 9.9 (B 10.3) A 0.5 (A 1.3)	B 10.1 (B 10.6) A 0.5 (A 1.3)
9.	Beulah Blvd. & Fairgrounds Drwy.	1-Way Stop (EB)	NB Left SB Right EB Left EB Right Overall	A 7.6 (A 7.7) - (-) B 10.2 (B 11.1) A 9.2 (A 9.5) A 0.2 (A 0.4)	A 8.0 (A 9.5) - (-) B 14.4 (C 21.9) A 9.4 (B 11.1) A 0.1 (A 0.2)	A 8.0 (A 9.5) - (-) B 14.4 (C 21.9) A 9.4 (B 11.1) A 0.1 (A 0.2)

Table 5 – Peak Hour Levels of Service

ID	Intersection	Intersection Control	Approach/ Movement	2027		
				No Build	Build	Mitigated
				AM (PM)	AM(PM)	AM(PM)
10.	I-17 SB Ramps & J.W. Powell Blvd.	Roundabout	SB EB WB Overall	A 6.7 (A 7.1) A 6.7 (A 8.4) A 3.6 (B 3.5) A 6.2 (A 7.1)	C 18.8 (B 11.6) A 9.3 (A 47.7) A 4.1 (B 3.8) B 13.5 (A 3.8)	C 18.8 (B 11.6) A 6.4 (B 14.7) A 3.5 (A 3.2) B 12.5 (B 12.5)
11.	I-17 NB Ramps & J.W. Powell Blvd.	1-Way Stop (NB) Mitigated: Roundabout	NB Shared NB Right EB Left EB Shared WB Shared Overall	C 20.6 (D 26) A 9.9 (A 9.8) A 8.3 (A 8.7) - - (-) A 4.1 (A 4.1)	F 69.1 (F 1182.3) B 10.0 (B 10.2) A 9.1 (B 12.6) - - (-) A 9.6 (F 60.1)	A 5.6 (8.3) A 5.2 (A 7.8) A 4.8 (A 8.1) A 4.1 (A 4.5) A 8.6 (B 18.3) A 5.9 (A 9.8)
12.	Beulah Blvd. & Mountain Dell Rd.	1-Way Stop (EB)	NB Shared SB Shared EB Shared Overall	A 7.6 (A 0.0) - (-) B 10.5 (B 11.3) A 1.2 (A 0.6)	A 8.6 (A 0.0) - (-) C 16.7 (C 21) A 0.7 (A 0.5)	A 8.6 (A 0.0) - (-) C 16.7 (C 21.0) A 0.7 (A 0.5)
A	Beulah Blvd. & Healthcare Blvd.	Signalized	NB SB EB Overall	-	A 7.9 (B 17.2) A 7.3 (B 11.3) A 9.8 (A 6.9) A 7.8 (B 12.3)	A 7.9 (B 17.8) A 7.3 (B 11.3) A 9.8 (A 6.9) A 7.8 (A 12.8)
B	Beulah Blvd. & Main Driveway	1-Way Stop (EB)	NB Left EB Left EB Right Overall	-	A 8.3 (A 8.0) B 12.4 (B 12.5) A 8.8 (A 9.6) A 2.5 (A 3.5)	A 8.3 (A 8.0) B 12.4 (B 12.5) A 8.8 (A 9.6) A 2.5 (A 3.5)
C	Beulah Blvd. & Purple Sage Blvd.	Signalized	NB SB EB Overall	-	B 10.2 (C 22.2) A 8.9 (C 20.5) A 7.8 (A 11.6) A 9.6 (B 18.9)	A 8.8 (C 22.2) C 20.9 (C 20.5) A 8.9 (B 11.6) A 12.0 (A 18.9)
F	Driveway & Healthcare Blvd.	1-Way Stop (NB)	NB Shared WB Left Overall	-	A 9.2 (A 9.9) A 8.0 (A 7.5) A 8.3 (A 9.1)	A 9.2 (A 9.9) A 8.0 (A 7.5) A 8.3 (B 9.1)
G	Grey Mint St. & Purple Sage Blvd.	1-Way Stop (SB)	EB Left SB Shared Overall	-	A 0.0 (A 0.0) B 11 (B 13.1) A 1.5 (B 4.4)	A 0.0 (A 0.0) B 11.0 (B 13.1) A 1.5 (A 4.4)
M	Driveway & Purple Sage Blvd.	1-Way Stop (SB)	EB Left SB Shared Overall	-	A 0.0 (A 0.0) A 9.1 (A 9.9) A 0.0 (A 0.0)	A 0.0 (A 0.0) A 9.1 (A 9.9) A 0.0 (A 0.0)

The results of the Synchro analysis summarized in **Table 5** indicate that all study intersections operate with overall acceptable levels of service (LOS D or better for Flagstaff intersections and LOS C or better for ADOT intersections), with the exception of **Beulah Blvd. & University Heights Dr South**, **Beulah Blvd. & University Heights Dr North/Lake Mary Road**, **Beulah Blvd. & Woodlands Village Blvd**, **Beulah Blvd. & McConnell Dr**, and **I-17 NB Ramp & J. W. Powell Blvd**.

The unsignalized intersection of **Beulah Blvd. & University Heights Dr South** in the Build scenario is projected to experience an overall delay of 39.0 seconds per vehicle (sec/veh) (LOS E) and 7.1

seconds per vehicle (sec/veh) during the AM and PM peak hour. The eastbound approach is projected to experience a delay of 121.5 sec/veh (LOS F) and 53.8 sec/veh (LOS F) during the AM and PM peak hours, respectively.

Mitigation in the form of signalization results in all approaches operating acceptably with an AM peak hour overall delay of 12.7 sec/veh (LOS B).

The signalized intersection of **Beulah Blvd. & University Heights Dr North/Lake Mary Road** in the No Build scenario could experience a northbound approach delay of 60.4 sec/veh (LOS E) and 62.1 sec/veh (LOS E) during the AM and PM peak hours, respectively. The eastbound approach could experience a delay of 77.6 sec/veh (LOS E) and 57.9 sec/veh (LOS E) during the AM and PM peak hours, respectively.

In the Build scenario, the intersection could experience a northbound approach delay of 58.8 sec/veh (LOS E) and 86.5 sec/veh (LOS E) during the AM and PM peak hours, respectively. The eastbound approach could experience delay of 76.2 sec/veh (LOS E) and 57.7 sec/veh (LOS E) during the AM and PM peak hours, respectively.

Mitigation resulting in all approaches operating acceptably can be achieved by:

- Configuring the dedicated northbound right-turn lane into a shared thru/right-turn lane.
- Configuring the channelized westbound right-turn lane into a dedicated right-turn lane.
- Change the eastbound and westbound left-turn phases from lagging to leading.
- Adjust the northbound and southbound recall mode from minimum to maximum.

The signalized intersection of **Beulah Blvd. & Woodlands Village Blvd** in the No Build scenario could experience a westbound approach delay of 57.8 sec/veh (LOS E) during the AM peak hour.

In the Build scenario, the intersection could experience a westbound approach delay of 57.8 sec/veh (LOS E) during the AM peak hour.

Mitigation in the form of an additional northbound left-turn lane and signal timing adjustments results in all approaches operating acceptably with an AM peak hour westbound approach delay of 46.6 sec/veh (LOS D).

The signalized intersection of **Beulah Blvd. & McConnell Dr** in the No Build scenario is projected to experience an overall delay of 58.4 sec/veh (LOS E) during the PM peak hour. The westbound approach is projected to experience a delay of 80.0 sec/veh (LOS E) during the PM peak hour.

In the Build scenario, the intersection could experience an overall delay of 58.5 sec/veh (LOS E) during the PM peak hour. The southbound approach is projected to experience a delay of 60.4 sec/veh (LOS E) during the AM peak hour. The westbound approach is projected to experience a delay of 84.4 sec/veh (LOS F) during the PM peak hour.

Mitigation in the form of an additional westbound left-turn lane and signal timing adjustments results in all approaches operating acceptably with a PM peak hour overall delay of 30.0 sec/veh (LOS C). The

additional westbound left-turn lane requires the removal of an east leg receiving lane. Removing this receiving lane requires removing the dedicated eastbound right-turn lane at the intersection of **I-17 SB Ramp On-Ramp & McConnell Dr**. The intersection continues to operate acceptably.

The unsignalized intersection of **I-17 NB Ramp & J. W. Powell Blvd** in the Build scenario is projected to experience an overall delay of 60.1 sec/veh (LOS F) during the PM peak hour. The northbound shared movement is projected to experience a delay of 69.1 sec/veh (LOS F) and over 300 sec/veh (LOS F) during the AM and PM peak hours, respectively.

Mitigation in the form of improvement to a single lane roundabout with two approach lanes northbound and eastbound, and one approach lane westbound results in all approaches operating acceptably with a PM peak hour overall delay of 9.8 sec/veh (LOS A).

The mitigation recommendations at each intersection are summarized in **Table 6** for the 2027 study year.

Table 6 – Recommendations

ID	Intersection	Recommended Mitigation/Improvements
1.	Beulah Blvd. & J.W. Powell Blvd.	Add bypass lane from southbound I-17 Off Ramp to northbound travel lanes north of J. W. Powell Blvd. Add a southbound left-turn approach lane and 2nd eastbound receiving lane.
2.	Beulah Blvd. & University Heights Dr. South	Signalize. Add an exclusive northbound left-turn lane. Add separate eastbound exclusive left-turn and dedicated right-turn lanes.
3.	Beulah Blvd. & University Heights Dr. North/Lake Mary Rd.	Configure the dedicated northbound right-turn lane into a shared thru/right-turn lane. Configure the channelized westbound right-turn lane into a dedicated right-turn lane. Change eastbound and westbound left-turn phases from lagging to leading. Adjust northbound and southbound recall mode from minimum to maximum.
4.	Beulah Blvd. & Woodlands Village Blvd.	Add a second northbound left-turn lane. Adjust signal timing.
5.	Beulah Blvd. & McConnell Dr.	Add a second westbound left-turn lane. Adjust signal timing.
6.	Beulah Blvd. & Forest Meadows St.	None.
7.	I-17 SB On-Ramp & McConnell Dr.	Remove the eastbound through lane. Replace the eastbound dedicated right-turn lane with a shared eastbound through/right-turn lane.
9.	Beulah Blvd. & Fairgrounds Drwy.	Add a second northbound and second southbound through lane.
10.	I-17 SB Ramps & J.W. Powell Blvd.	Add a southbound bypass lane which feeds directly to northbound Beulah Blvd. Add a second eastbound channelized right-turn lane.
11.	I-17 NB Ramps & J.W. Powell Blvd.	Improve to a single lane roundabout with two approach lanes northbound and eastbound, and one approach lane westbound. Improve to have two receiving lanes on the west leg (eastbound exiting the roundabout).

Table 6 – Recommendations

ID	Intersection	Recommended Mitigation/Improvements
12.	Beulah Blvd. & Mountain Dell Rd.	Realign Mountain Dell Rd. to intersect Beulah Blvd. at right angles. Add an exclusive northbound left-turn lane and a second northbound through lane. Add a second southbound through lane. Construct a refuge lane for eastbound two-stage left-turns.
A	Beulah Blvd. & Healthcare Blvd.	Add an exclusive northbound left-turn lane and a second northbound through lane. Add a dedicated southbound right-turn lane and a second southbound through lane. Construct dual exclusive left-turn lanes and a dedicated right-turn lane.
B	Beulah Blvd. & Main Driveway	Add an exclusive northbound left-turn lane and a second northbound through lane. Add a dedicated southbound right-turn lane and a second southbound through lane. Construct an exclusive eastbound left-turn lane and a dedicated eastbound right-turn lane. Construct a refuge lane for eastbound two-stage left-turns.
C	Beulah Blvd. & Purple Sage Blvd.	Add an exclusive northbound left-turn lane and a second northbound through lane. Add a dedicated southbound right-turn lane and a second southbound through lane. Construct dual exclusive left-turn lanes and a dedicated right-turn lane.
F	Driveway & Healthcare Blvd.	Construct an exclusive northbound left-turn lane and a dedicated northbound right-turn lane. Construct two eastbound through lanes and a dedicated eastbound right-turn lane. Provide for a future exclusive eastbound left-turn lane. Construct an exclusive westbound left-turn lane and two westbound through lanes. Provide for a future dedicated westbound right-turn lane.
G	Grey Mint St. & Purple Sage Blvd.	Construct an exclusive southbound left-turn lane and a dedicated southbound right-turn lane. Construct an exclusive eastbound left-turn lane and an eastbound through lane. Provide for a future dedicated eastbound right-turn lane. Construct two westbound through lanes and a dedicated westbound right-turn lane. Provide for a future exclusive westbound left-turn lane.
M	Driveway & Purple Sage Blvd.	Construct separate southbound exclusive left-turn and dedicated right-turn lanes. Construct an exclusive eastbound left-turn lane and an eastbound through lane. Construct a westbound through lane and a channelized yield controlled westbound right-turn lane. Include westbound TWLTL.

(1) The improvements listed here are minimum recommended improvements and should not be construed as a limit on what can be constructed beyond these recommendations.

GAP ANALYSIS

The operation of an unsignalized intersection on a roadway with signalized intersection upstream and downstream is heavily influenced by the gaps in traffic traveling through the unsignalized intersection. The gaps in this traffic are determined by the attributes of the upstream and downstream signalized intersections. A gap is formed when through traffic travels in platoons. The space between platoons is a gap. These gaps allow turning vehicles to enter and exit the roadway from the side street at the unsignalized intersection.

At the request of the City of Flagstaff, CivTech analyzed the gaps at the unsignalized intersection of Beulah Boulevard & Main Driveway (Access B) between the signalized intersections of Beulah Boulevard & Healthcare Boulevard (Access A) and Beulah Boulevard & Purple Sage Boulevard (Access C) in the study year 2027 total mitigated configuration. Two methods for analyzing gaps were used; a Time-Space diagram review of traffic bandwidths, and an HCM 6th edition percentage blocked by platoon review.

A Time-Space diagram shows the green and red phases for the signalized intersections with time going forward to the right. From top to bottom the spacing between intersections represents the actual distance between intersections. By tracing lines, the angle of which represent the design speed of the roadway (50 MPH) bandwidths can be observed. A bandwidth is a band of time that a vehicle can travel in at the design speed and continue to meet signalized intersects during a green phase. The wider this bandwidth, the greater the flow of traffic will not be delayed by the traffic signal. As these bandwidths pass over an unsignalized intersection the flow of traffic (the platoon) could be expected to block the unsignalized intersection. The time between bandwidths represents time when few if any vehicles will be present to prevent turning vehicles to enter or exit Beulah Boulevard. From the Time-Space diagrams shown in **Figure 9** and **Figure 10**, an AM peak hour gap of 42 seconds between bandwidths can be expected at Access B. In the PM peak hour a gap of 44 seconds between bandwidths can be expected at Access B.

With Synchro 11 software, HCM 6th edition methodology can be used to analyze the percentage of time during a cycle that an unsignalized intersection would experience blockage by platooning traffic (the length of the cycle is not relevant because we are dealing with percentage of time). HCM determines this value through an interactive process of accounting for vehicle behavior at signalized intersections, determine platooning behavior, updating actuated signal behavior due to changes is platoon behavior then repeating the analysis of vehicle behavior at the signal. This process is repeated until a behavior for traffic and actuated signal timing is found that converges on itself. At that time, the platooning behavior in the corridor can be measured. This value is included in **Appendix I**. Any time that is not blocked by platooning traffic is time that presents a gap for traffic to enter or exit Beulah Boulevard from the side street Access B. The analysis indicates that time <u>not</u> blocked by the platoon in the AM peak hour is 88% for the eastbound left, 94% for the eastbound right, and 94% for the northbound left. The time <u>not</u> blocked by the platoon in the PM peak hour is 83% for the eastbound left, 89% for the eastbound right, and 89% for the northbound left.

The availability of gaps for turning vehicles at Access B to enter and exit Beulah Boulevard acts to confirm the conclusion that Access B will operate with acceptable levels of service in the 2027 total mitigated scenario.

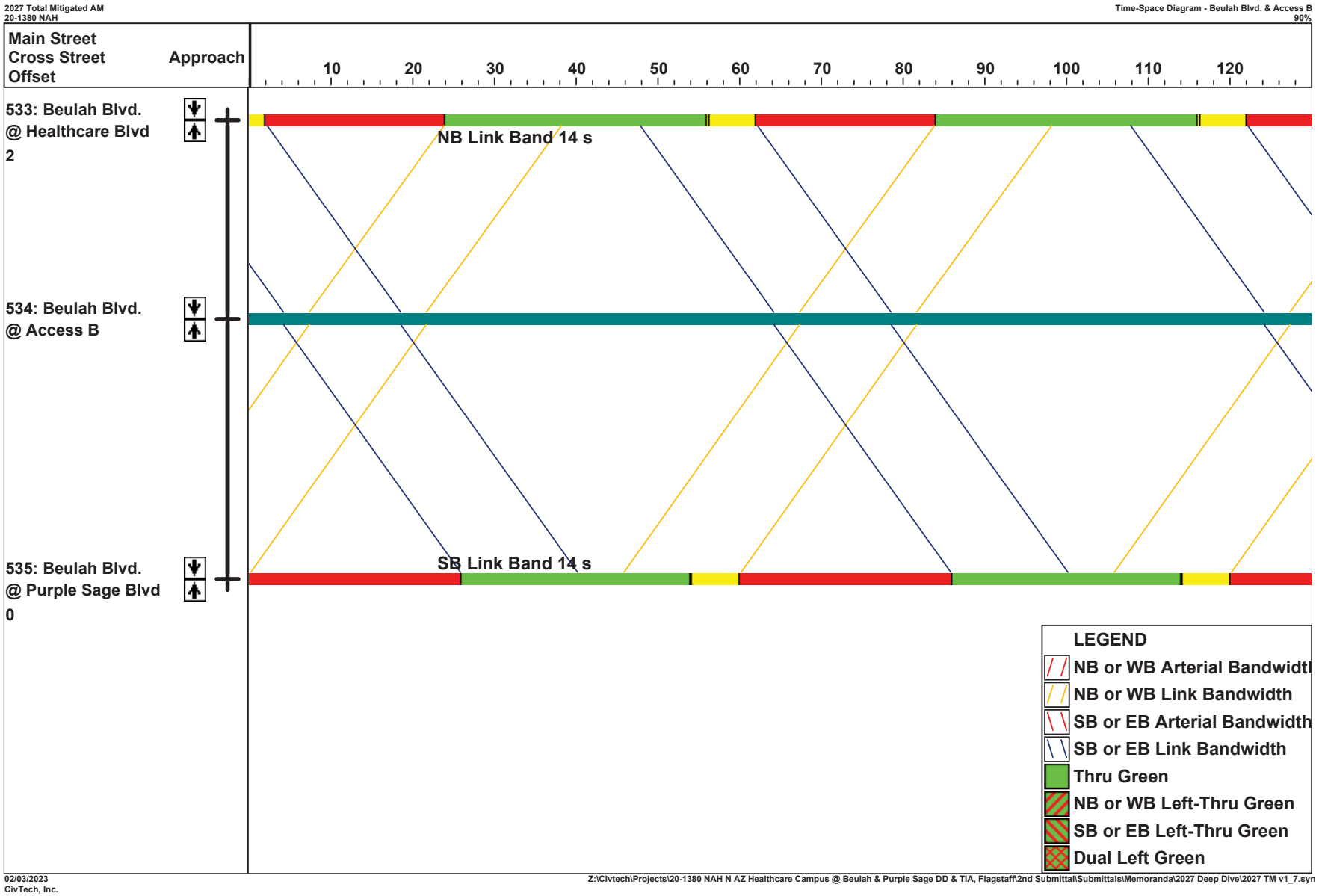


Figure 9: AM Time Space Diagram

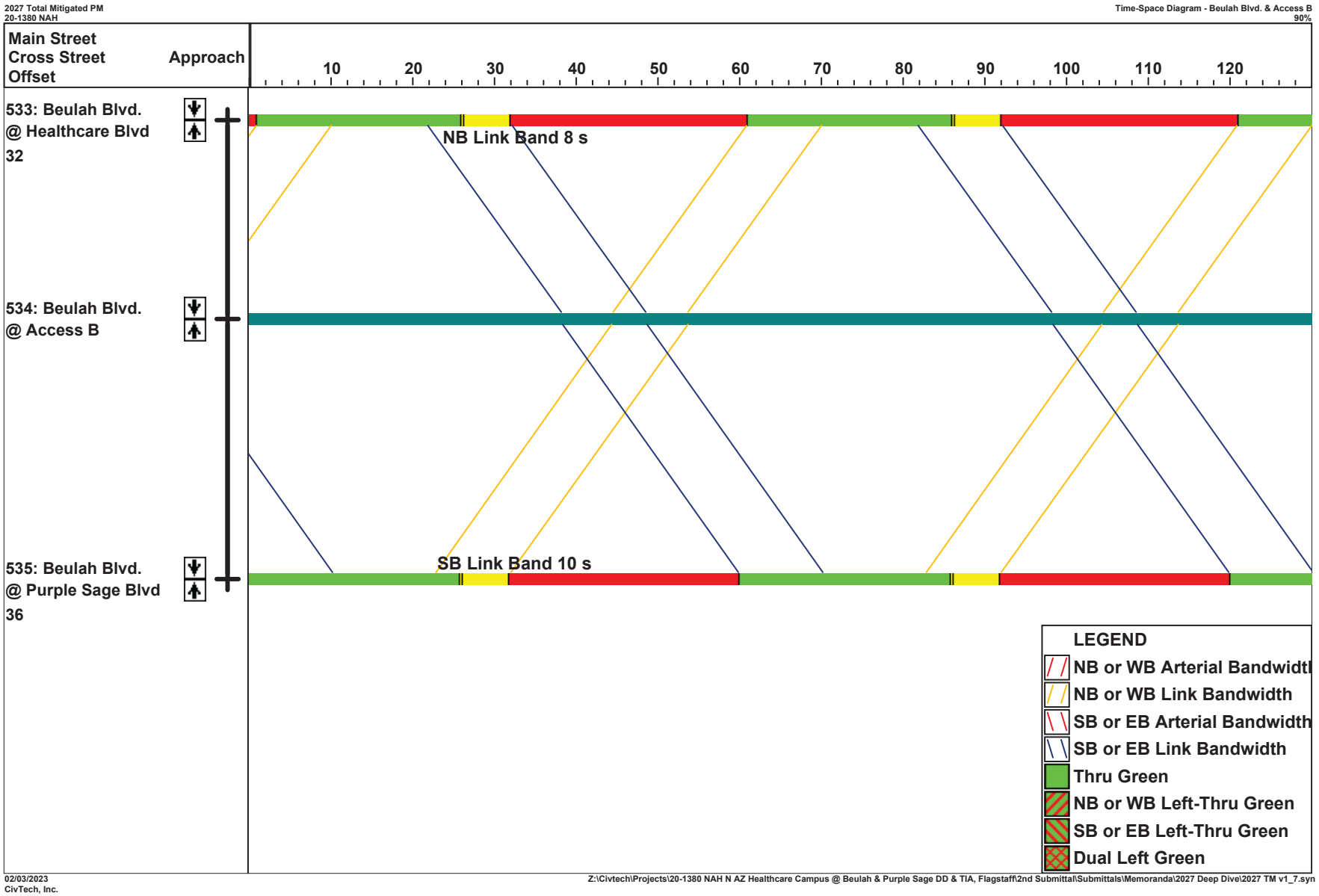


Figure 10: PM Time Space Diagram

QUEUE LENGTH ANALYSIS

Adequate turn storage should be supplied on any approach where turn lanes are permitted and/or warranted. A queuing analysis was prepared according to the HCM 95th percentile methodology. The study intersections were analyzed to determine the left-turn and right-turn storage needed to accommodate the expected traffic volumes in the 2027 opening year. The resulting turn lane storage requirements for the study intersections are summarized in **Table 7**.

Table 7 – Queue Storage Lengths

ID	Intersection	Movement	HCM 95th (veh/ln)	HCM Storage	Existing	Existing Calculated	2030 Recommended[4]
1.	Beulah Blvd & Fairgrounds Rd/ JW Powell Blvd	NB Shared	4.0	100'	375′	25'	375′
		SB Left	5.0	125′	-	-	125′
		SB Shared	0.0	-	170′	<25'	170′
		EB Shared	0.0	-	185′	<25'	185′
		WB Shared	5.0	-	250′	30'	250′
2.	Beulah Blvd & University Heights Dr South	NB Left	0.4	25'	75′	<25	75′
		SB Right	0.0	-	300'	105	300'
		EB Left	8.6	215'	200′	<25	300′
3.	Beulah Blvd & Lake Mary Rd/ University Heights Dr North	NB Left	0.7	<25'	210'	25'	210'
		SB Left	18.3	**915'**	**1,105**	**410'**	**1,105'**
		EB Left	8.8	220'	240'	345'	250'
		WB Left	6.0	150'	145'	105'	225'
		NB Thru-Right	13.8	345'	615'	<25'	615'
		SB Right	7.8	195'	600'	300'	600'
		EB Thru-Right	1.6	40'	-	40'	100′
		WB Right	13.9	350'	150′	<25'	300′
4.	Beulah Blvd & Woodlands Village Blvd	NB Left	7.1	**355'**	230'	205'	230'
		SB Left	0.2	<25'	90'	<25'	90'
		EB Left	9.8	245'	110'	285'	225'
		WB Left	0.1	<25'	60'	25'	60'
		NB Right	0.1	<25'	105'	25'	105'
		SB Right	3.6	90'	285'	95'	285'
		EB Thru-Right	5.7	145'	-	30'	145′
		EB Right	5.7	145'	350′	65'	350′
		WB Thru-Right	1.0	25'	-	30'	30′
5.	Beulah Blvd & McConnell Dr	NB Left	0.8	<25'	80′	25'	80′
		SB Left	1.4	35'	120′	65'	120′
		EB Left	4.5	115'	90′	100'	100′
		WB Left	10.4	**520'**	610′	585'	610′
		NB Right	2.5	65'	415′	460'	415′
		SB Thru-Right	11.1	280'	-	390′	390′
		EB Thru-Right	12.8	320'	-	305′	325′
		WB Right	5.1	130'	200′	125'	200′

Table 7 – Queue Storage Lengths

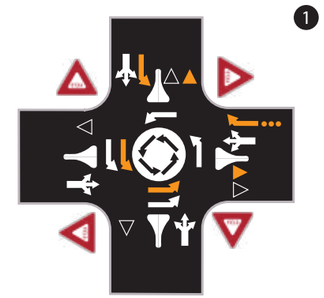
ID	Intersection	Movement	HCM 95th (veh/ln)	HCM Storage	Existing	Existing Calculated	2030 Recommended[4]
6.	Beulah Blvd & Forest Meadows St	NB Left	1.8	45'	100'	30'	100'
		SB Left	2.0	50'	65'	50'	65'
		EB Left	0.5	25'	100'	25'	100'
		WB Left	11.3	**565'**	**450'**	**640'**	**450'**
		NB Right	5.4	**135'**	**240'**	**310'**	**250'**
		SB Right	2.7	70'	-	25'	25'
		EB Shared	5.1	130'	-	100'	150'
		WB Right	9.2	230'	-	215'	200'
7.	I-17 SB On-Ramp & McConnell Dr	WB Left	1.0	25'	340'	<25'	340'
		EB Right	-	-	210'	<25'	210'
		EB Thru-Right	0.0	-	-	-	-
9.	Beulah Blvd & Fairgrounds Drwy	NB Left	0.0	<25'	175'	<25'	175'
		EB Left	0.1	<25'	-	<25'	25'
		SB Right	-	-	100'	-	100'
		EB Right	0.0	<25'	125'	<25'	125'
10.	I-17 SB Ramps & J.W. Powell Blvd	SB Shared	9.0	225'	165'	35'	165'
		SB Right	-	-	-	-	25'
		EB Shared	8.0	200'	265'	35'	200'
		EB Right	1.0	25'	-	-	25'
		WB Shared	0.0	<25'	110'	<25'	110'
11.	I-17 NB Ramps & J.W. Powell Blvd	NB Shared	0.0	<25'	175'	<25'	175'
		NB Right	0.0	<25'	175'	<25'	175'
		EB Left	3.0	75'	125'	<25'	125'
		EB Shared	1.0	25'	-	<25'	125'
		WB Shared	4.0	100'	-	<25'	95'
12.	Beulah Blvd & Mountain Dell Rd	NB Shared	-	-	-	<25'	25'
		NB Left	0.0	<25'	-	-	25'
		SB Shared	-	-	-	<25'	25'
		EB Left	0.4	<25'	-	<25'	25'
		EB Right	-	-	-	<25'	25'
A	Beulah Blvd. & Healthcare Blvd. (Access A)	NB Left	1.5	40'	-	-	150'
		SB Right	1.2	30'			250'
		EB Left	2.3	60'			**125'**
		EB Right	1.0	25'			250'
B	Beulah Blvd. & Main Driveway (Access B)	NB Left	0.4	<25'	-	-	50'
		SB Right	-	<25'			25'
		EB Left	0.8	<25'			100'
		EB Right	0.7	<25'			25'
C	Beulah Blvd. & Purple Sage Blvd. (Access C)	NB Left	4.1	105'	-	-	275'
		SB Right	0.0	<25'			250'
		EB Left	1.2	30'			**125'**
		EB Right	3.7	95'			175'
F	Driveway & Healthcare Blvd. (Access F)	NB Left	-	<25'	-	-	50'
		NB Right	1.4	35'			125'
		WB Left	0.7	<25'			200'

Table 7 – Queue Storage Lengths

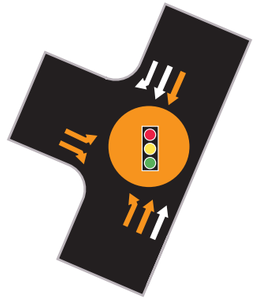
ID	Intersection	Movement	HCM 95th (veh/ln)	HCM Storage	Existing	Existing Calculated	2030 Recommended(4)
G	Grey Mint St. & Purple Sage Blvd. (Access G)	SB Left SB Right EB Left WB Right	0.3 - 0.0 -	<25' <25' <25' <25'	-	-	100' 50' 50' 150'
M	Driveway & Purple Sage Blvd. (Access M)	SB Left SB Right EB Left WB Right	0.8 - 0.0 -	<25' - <25' <25'	-	-	50' 50' 25' 25'

(1) Measured from beginning of stop bar to end of stripe.
(2) HCM 95th percentile queue reported in vehicles/lane, assuming 1 vehicle ~ 25 feet.
(3) Bold values indicate dual lanes. Value shown is sum of both lanes.
(4) Calculations are based on the projected traffic shown within this report. Recommended values were determined from the NAH September Master TIA and are based on the higher of the 2025 or 2030 queue storage.
(5) Due to geometric restrictions and existing calculations.

The recommended storage lengths in **Table 7** are provided for study horizon year 2027 using the total traffic projections. Proposed lane configurations are shown in **Figure 11**.



Beulah Blvd & Fairgrounds Rd/JW Powell Blvd



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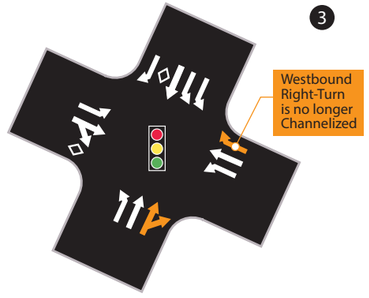
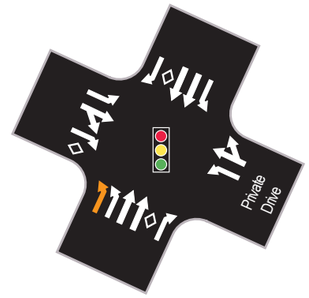
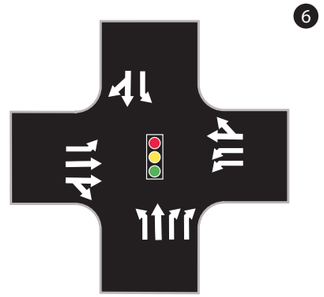


Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N

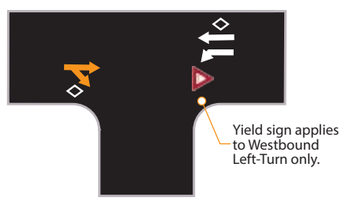


Beulah Blvd & Woodlands Village Blvd

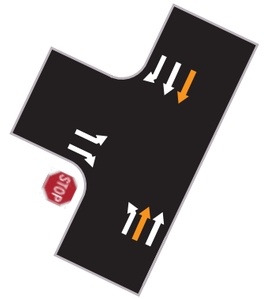
Beulah Blvd & McConnell Dr



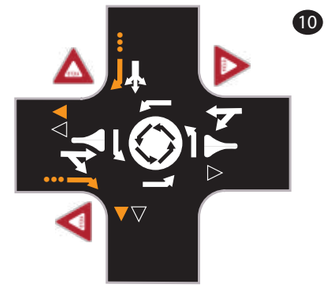
Beulah Blvd & Forest Meadows St



I-17 SB On-Ramp & McConnell Dr



Beulah Blvd & Fairgrounds Drwy.



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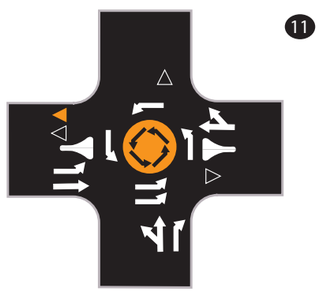

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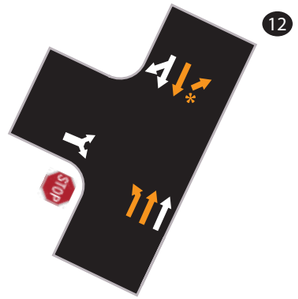
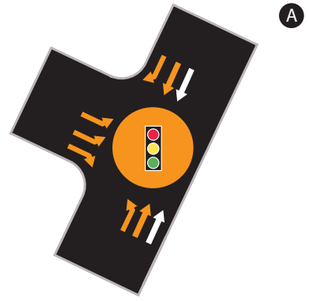
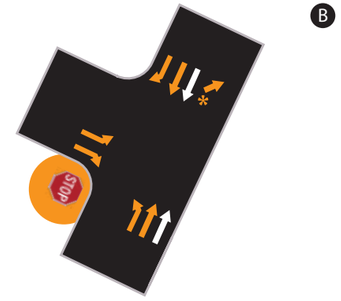


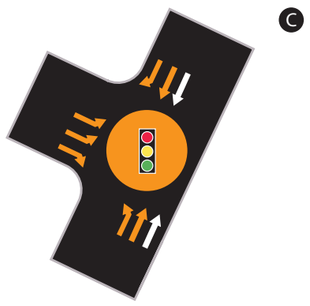
Beulah Blvd & Mountain Dells Rd.



Beulah Blvd & Healthcare Blvd

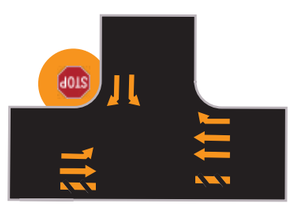


Beulah Blvd & Access B

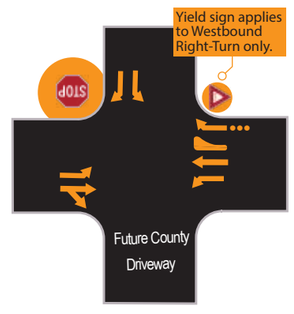


Beulah Blvd & Purple Sage Blvd

Access F & Healthcare Blvd



Grey Mint St & Purple Sage Blvd



Vitality St & Purple Sage Blvd

Figure 11: Proposed Lane Configurations and Traffic Controls

2027 FUTURE TRAFFIC SIGNAL WARRANT ANALYSIS

CivTech utilized projected 2027 total traffic volumes at the intersections of **Beulah Blvd. & University Heights Dr South**, **Beulah Blvd. & Access A**, **Beulah Blvd. & Access B**, **Beulah Blvd. & Access C**, **Access F & Healthcare Blvd.**, and **Access G & Purple Sage Blvd** in the signal warrant analysis below. The signal warrant analysis results are presented in **Table 9** for Warrants 1 through 3. Detailed signal warrant analysis sheets are located within **Appendix J**.

The traffic signal warrant analysis was accomplished in accordance with standard traffic signal warranting criteria found in the Manual on Uniform Traffic Control Devices, 2009 Edition (MUTCD). The MUTCD describes nine conditions under which a traffic signal might be warranted, designated Warrants 1 through 9. It indicates that, "The investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the [nine] traffic signal warrants and other factors related to existing operation and safety at the study location." It then cautions that, "The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal."

The MUTCD indicates that traffic control signals should be installed only after one or more of the signal warrants are met; however, as provided in the MUTCD itself (see previous paragraph), the satisfaction of a warrant or warrants is not in itself justification for a signal. Every situation is unique and warrant guidelines must be supplemented by the effects of specific site conditions and the application of good engineering judgment. Installation of a traffic signal should improve the overall safety and/or operation of an intersection and should be considered only when deemed necessary by careful traffic analysis and after less restrictive solutions have been attempted.

Signal warrant analysis was conducted at the following proposed site intersections per the request of the City of Flagstaff:

- Beulah Boulevard & Healthcare Boulevard/Access A
- Beulah Boulevard & Access B
- Beulah Boulevard & Purple Sage Boulevard/Access C
- Access F & Healthcare Boulevard
- Access G & Purple Sage Boulevard
- Beulah Boulevard & University Heights

Traffic volumes at the subject intersection were compared to the MUTCD criteria to determine if a traffic signal would be warranted prior to the proposed development. The MUTCD methodology calls for signal warrants to be analyzed using 24-hour directional approach counts at the intersection; for this study only the AM peak hour, PM peak hour, and daily volumes are projected. The published ADOT Traffic Engineering Guidelines and Processes (TGP) 611 provides an hourly adjustment factor to estimate projected hourly volumes when approach volumes are not obtained or when future projections are utilized to evaluate the need for signal control. The factors are given here in **Table 8**.

The methodology applies the first highest, fourth highest, and eighth highest hourly adjustment factors to the daily volumes to provide an estimate of the eighth, fourth, and first highest projected hourly volumes. The adjusted volumes can then be applied to the MUTCD volume-based signal warrants 1 through 3.

When not counted or estimated with other methods, daily volumes can be projected from the highest peak hour, AM or PM. If this is done, the 1st Highest Hour volume is assumed to be the same as the highest of the AM or PM peak hour and the daily volume is calculated by dividing that value by the 1st Highest Hour adjustment factor of 0.00771.

Table 8 – Adjustment Factors

Hour	Factor
1st Highest Hour	0.0771
4th Highest Hour	0.0656
8th Highest Hour	0.0572

WARRANT 1: EIGHT-HOUR VEHICULAR VOLUME

The Eight-Hour Vehicular Volume Warrant is intended for locations where either of the following two conditions, or a combination of both, exist for each of any 8 hours of an average day and is, thus, the principle reason to consider the installation of a traffic signal: a large volume of intersecting traffic or traffic volumes so heavy on the major street that entering vehicles suffer extensive delay or conflict.

CONDITION A: MINIMUM VEHICULAR VOLUME

Condition A, the Minimum Vehicular Volume, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The need for a traffic control signal shall be considered if the vehicles per hour given in both of the 100 percent columns of Condition A in Table 4C-1 of the MUTCD (reproduced below) occur on the major-street and the higher-volume minor-street approaches, respectively, to the intersection for each of any 8 hours of an average day.

CONDITION B: INTERRUPTION OF CONTINUOUS TRAFFIC

Condition B, the Interruption of Continuous Traffic, is intended for application at locations where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. The need for a traffic control signal shall be considered if the vehicles per hour given in both of the 100 percent columns of Condition B in Table 4C-1 of the MUTCD occur on the major-street and the higher-volume minor-street approaches, respectively, to the intersection for each of any 8 hours of an average day.

COMBINATION OF CONDITIONS A AND B

The combination of Conditions A and B is intended for application at locations where Condition A is not satisfied and Condition B is not satisfied *and should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems*. (Emphasis added. CivTech was not made aware by either agency of any specific operational concerns with this intersection; therefore, it will be assumed for purposes of this analysis that this "combination warrant" is not applicable.) The need for a traffic control signal shall be considered if the vehicles per hour given in both of the 80 percent columns of Conditions A and Condition B in Table 4C-1 of the MUTCD occur on the major-street and the higher-volume minor-street approaches, respectively, to the intersection for each of any 8 hours of an average day.

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1.....	1.....	500	400	350	280	150	120	105	84
2 or more...	1.....	600	480	420	336	150	120	105	84
2 or more...	2 or more ...	600	480	420	336	200	160	140	112
1.....	2 or more ...	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1.....	1.....	750	600	525	420	75	60	53	42
2 or more...	1.....	900	720	630	504	75	60	53	42
2 or more...	2 or more ...	900	720	630	504	100	80	70	56
1.....	2 or more ...	750	600	525	420	100	80	70	56

[a] Basic minimum hourly volume.
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.
[c] May be used when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major- street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

Excerpt from MUTCD page 438

For each of the above, if the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 70 percent columns in Table 4C-1 may be used in place of the 100 percent columns.

WARRANT 2: FOUR-HOUR VEHICULAR VOLUME

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in Figure 4C-1 (this and all other referenced figures are attached) for the existing combination of approach lanes.

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mph or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-2 may be used in place of Figure 4C-1. The posted speed limit on Beulah Boulevard is 45 mph; therefore, Figure 4C-1 was used for this analysis.

WARRANT 3: PEAK-HOUR

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering

or crossing the major street. It shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:

   1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and

   2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and

   3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

(For this warrant, CivTech prefers the less data-intensive Category B.)

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-4 may be used in place of Figure 4C-3 to satisfy the criteria in the second category of the Standard. The posted speed limit on Beulah Boulevard is 45 mph; therefore, Figure 4C-3 was used for this analysis.

Table 9 – Traffic Signal Analysis Summary Warrants 1 – 3

Warrant		Hour(s) of the Day	Beulah Blvd & Access A	Beulah Blvd & Access B	Beulah Blvd & Access C	Access F & Healthcare Blvd	Access G & Purple Sage Blvd	Beulah Blvd & University
Warrant 1. Eight-Hour Vehicular Volume	Condition A: Minimum Vehicular Volume	Any Eight (8) Hours	Met	Met	Met	Not Met	Not Met	Met
	Condition B: Interruption of Continuous Traffic	Any Eight (8) Hours	Not Met	Not Met	Met	Not Met	Not Met	Met
	Combination of Condition A & Condition B	Any Eight (8) Hours	Met	Met	Met	Not Met	Not Met	Met
	Overall (Either Condition A or B satisfied meets warrant)		**Met**	**Met**	**Met**	**Not Met**	**Not Met**	**Met**
Warrant 2. Four-Hour Vehicular Volume		Any Four (4) Hours	**Met**	**Met**	**Met**	**Not Met**	**Not Met**	**Met**
Warrant 3. Peak Hour		Any One (1) Hour	**Not Met**	**Not Met**	**Met**	**Not Met**	**Not Met**	**Met**

Table 9 summarizes the volume-based warrant analysis results for the existing conditions. The warranting criteria for Warrants 2 and 3 were automatically calculated using formulae, not determined by the plotting method described in the MUTCD. The formulae, which approximate the curves of the MUTCD, were published in the *2011 Indiana MUTCD Revisions 1 & 2 & 3*.

RESULTS:

At the intersection of Beulah Boulevard and Healthcare Boulevard (Access A), signal warrant criteria 1 and 2 are anticipated to be met by buildout of Phase 1, study horizon year 2027. Signal warrant criteria 3 is not anticipated to be met by build of horizon year 2027. All though warrant 3 is not met due to surrounding signalized intersection spacing and the classification of Beulah Boulevard it is recommended that a signal be built/constructed at Beulah Boulevard and Healthcare Boulevard (Intersection A) upon buildout of Phase 1, horizon year 2027.

At the intersection of Beulah Boulevard and Access B, signal warrant criteria 1 and 2 are anticipated to be met by buildout of Phase 1, study horizon year 2027. Signal warrant criteria 3 is not anticipated to be met by build of horizon year 2027. All though signal warrants 1 and 2 are met signalization at Beulah Boulevard and Access B is not recommended for immediate installation upon buildout of Phase 1, horizon year 2027. Signalization is not recommended for immediate installation due to the projected

acceptable signal platooning from the recommended surrounding signals at Intersection A and Intersection C along Beulah Boulevard.

At the intersection of Beulah Boulevard and Purple Sage Boulevard (Access C) all three (3) signal warrant criteria (Warrants 1, 2, and 3) are anticipated to be met by buildout of Phase 1, study horizon year 2027. It is recommended that a signal be built/constructed at Intersection C by buildout year 2027.

At the intersection of Access F and Healthcare Boulevard, the three (3) signal warrant criteria (Warrants 1, 2, and 3) are not anticipated to be met by buildout of Phase 1, study horizon year 2027. Signalization is not recommended at site Access F by buildout of the Phase I development, study horizon year 2027.

At the intersection of Access G and Purple Sage Boulevard, the three (3) signal warrant criteria (Warrants 1, 2, and 3) are not anticipated to be met by buildout of Phase 1, study horizon year 2027. Therefore, signalization is not recommended at site Access G by buildout of the Phase I development, study horizon year 2027.

At the intersection of Beulah Blvd. & University Heights Dr South, the results of the three (3) signal warrants (Warrants 1, 2, and 3) are anticipated to be met by buildout of Phase 1, study horizon year 2027. Therefore, signalization is not recommended at the intersection of Beulah Boulevard and University Heights Drive South by buildout of the Phase I development, study horizon year 2027.

CONCLUSIONS

The following conclusions and recommendations have been documented in this study:

EXISTING

- The results of the Synchro analysis indicate that all study intersections operate with overall acceptable levels of service (LOS D or better for Flagstaff intersections and LOS C or better for ADOT intersections), with the exception of **Beulah Blvd. & University Heights Dr North/Lake Mary Road**, **Beulah Blvd. & Woodlands Village Blvd**, and **Beulah Blvd. & McConnell Dr**.

FUTURE ROADWAY IMPROVEMENTS

- No future roadway improvements are considered in the 2027 opening study year No Build scenario. In the 2027 unmitigated Build scenario, it is assumed that Beulah Boulevard will be improved to a four-lane road with two lanes of travel in each direction along the frontage of the site. As a result, the free-flow channelized westbound right-turn lane at the intersection of Beulah Boulevard and Lake Mary Road will become a signal controlled dedicated right-turn lane. An exclusive northbound left-turn lane will be added to the intersection of Beulah Boulevard and University Heights Drive South.

- Also in the 2027 unmitigated Build scenario, it is assumed that the intersection of Beulah Boulevard and Mountain Dell Road will be improved such that Mountain Dell Road intersects Beulah Boulevard at right angles and that an exclusive northbound left-turn lane will be added.

PROJECT IMPROVEMENTS AND ACCESS

There are a total of three (3) proposed access points on Beulah Boulevard.

- *Intersection A* – is Beulah Boulevard and Healthcare Boulevard. Healthcare Boulevard is a future collector roadway planned for alignment approximately 3,660 feet south of the existing Mountain Dell Road alignment.
    - *Access F* is a full movement driveway on the northern frontage of the site along Healthcare Boulevard, approximately 475-feet west of Beulah Boulevard.
- *Access B* – is the planned main full movement driveway on the eastern frontage of the site along Beulah Boulevard, approximately 715-feet south of the Healthcare Boulevard alignment.
- *Intersection C* – is Beulah Boulevard and Purple Sage Boulevard. Purple Sage Boulevard is a future collector roadway planned for alignment approximately 1,033-feet south of the existing Mountain Dell Road alignment.
    - *Access G* is one of two (2) full movement site driveway on the southern frontage of the site along Purple Sage Boulevard, located approximately 560-feet west of Beulah Boulevard.
    - *Access M* is one of two (2) full movement site driveway on the southern frontage of the site along Purple Sage Boulevard, located approximately 800-feet west of Access G.

The proposed development site plans are provided in **Figure 4**.

2027 TRIP GENERATION

- For study year 2027, the proposed development is anticipated to generate 14,834 weekday daily trips, 1,119 trips during the AM peak hour, and 1,398 trips during the PM peak hour.

CAPACITY ANALYSIS

- The results of the Synchro analysis indicate that all study intersections operate with overall acceptable levels of service (LOS D or better for Flagstaff intersections and LOS C or better for ADOT intersections), apart from **Beulah Blvd. & University Heights Dr South**, **Beulah Blvd. & University Heights Dr North/Lake Mary Road**, **Beulah Blvd. & Woodlands Village Blvd**, **Beulah Blvd. & McConnell Dr**, and **I-17 NB Ramp & J. W. Powell Blvd**.
- The unsignalized intersection of **Beulah Blvd. & University Heights Dr South** in the Build scenario is projected to experience an overall delay of 39.0 seconds per vehicle (sec/veh) (LOS E) and 7.1 seconds per vehicle (sec/veh) during the AM and PM peak hour. The eastbound approach is projected to experience a delay of 121.5 sec/veh (LOS F) and 53.8 sec/veh (LOS F) during the AM and PM peak hours, respectively.

- Mitigation in the form of signalization results in all approaches operating acceptably with an AM peak hour overall delay of 12.7 sec/veh (LOS B).

- The signalized intersection of **Beulah Blvd. & University Heights Dr North/Lake Mary Road** in the No Build scenario could experience a northbound approach delay of 60.4 sec/veh (LOS E) and 62.1 sec/veh (LOS E) during the AM and PM peak hours, respectively. The eastbound approach could experience a delay of 77.6 sec/veh (LOS E) and 57.9 sec/veh (LOS E) during the AM and PM peak hours, respectively.

  In the Build scenario, the intersection could experience a northbound approach delay of 58.8 sec/veh (LOS E) and 86.5 sec/veh (LOS F) during the AM and PM peak hours, respectively. The eastbound approach could experience delay of 76.2 sec/veh (LOS E) and 57.7 sec/veh (LOS E) during the AM and PM peak hours, respectively.

  - Mitigation resulting in all approaches operating acceptably can be achieved by:
    - Configuring the dedicated northbound right-turn lane into a shared thru/right-turn lane.
    - Configuring the channelized westbound right-turn lane into a dedicated right-turn lane.
    - Change the eastbound and westbound left-turn phases from lagging to leading.
    - Adjust the northbound and southbound recall mode from minimum to maximum.

- The signalized intersection of **Beulah Blvd. & Woodlands Village Blvd** in the No Build scenario could experience a westbound approach delay of 57.8 sec/veh (LOS E) during the AM peak hour.

  In the Build scenario, the intersection could experience a westbound approach delay of 57.8 sec/veh (LOS E) during the AM peak hour.

  - Mitigation in the form of an additional northbound left-turn lane and signal timing adjustments results in all approaches operating acceptably with an AM peak hour westbound approach delay of 46.6 sec/veh (LOS D).

- The signalized intersection of **Beulah Blvd. & McConnell Dr** in the No Build scenario is projected to experience an overall delay of 58.4 sec/veh (LOS E) during the PM peak hour. The westbound approach is projected to experience a delay of 80.0 sec/veh (LOS E) during the PM peak hour.

  In the Build scenario, the intersection could experience an overall delay of 58.5 sec/veh (LOS E) during the PM peak hour. The southbound approach is projected to experience a delay of 60.4 sec/veh (LOS E) during the AM peak hour. The westbound approach is projected to experience a delay of 84.4 sec/veh (LOS F) during the PM peak hour.

  - Mitigation in the form of an additional westbound left-turn lane and signal timing adjustments results in all approaches operating acceptably with a PM peak hour overall delay of 30.0 sec/veh (LOS C). The additional westbound left-turn lane requires the removal of an east leg receiving lane. Removing this receiving lane requires removing

the dedicated eastbound right-turn lane at the intersection of **I-17 SB Ramp On-Ramp & McConnell Dr**. The intersection continues to operate acceptably.

- The unsignalized intersection of **I-17 NB Ramp & J. W. Powell Blvd** in the Build scenario is projected to experience an overall delay of 60.1 sec/veh (LOS F) during the PM peak hour. The northbound shared movement is projected to experience a delay of 69.1 sec/veh (LOS F) and over 300 sec/veh (LOS F) during the AM and PM peak hours, respectively.
    - Mitigation in the form of improvement to a single lane roundabout with two approach lanes northbound and eastbound, and one approach lane westbound results in all approaches operating acceptably with a PM peak hour overall delay of 9.8 sec/veh (LOS A).

QUEUE STORAGE

- The recommended storage lengths are provided for study horizon year 2027 using the total traffic projections.

SIGNAL WARRANT ANALYSIS

- CivTech utilized projected 2027 total traffic volumes at select study intersections to conduct a signal warrant analysis utilizing the warrant criteria specified within the MUTCD.
    - At the intersection of Beulah Boulevard and Healthcare Boulevard (Intersection A), signal warrant criteria 1 and 2 are anticipated to be met by buildout study horizon year 2027, for the planned Phase 1 development. Signal warrant criteria 3 is not anticipated to be met by horizon year 2027. All though warrant 3 is not met due to surrounding signalized intersection spacing and the classification of Beulah Boulevard it is recommended that a signal be built/constructed at Beulah Boulevard and Healthcare Boulevard (Intersection A) upon buildout of Phase 1, horizon year 2027.
    - At the intersection of **Beulah Boulevard and Access B**, signal warrant criteria 1 and 2 are anticipated to be met by buildout study horizon year 2027, for the planned Phase 1 development. Signal warrant criteria 3 is not anticipated to be met by horizon year 2027. All though signal warrants 1 and 2 are met signalization at Beulah Boulevard and Access B is not recommended for immediate installation upon buildout of Phase 1, horizon year 2027. Signalization is not recommended for immediate installation due to the projected acceptable signal platooning from the recommended surrounding signals at Intersection A and Intersection C along Beulah Boulevard.
    - At the intersection of **Beulah Boulevard and Purple Sage Boulevard (Intersection C)** all three (3) signal warrant criteria (Warrants 1, 2, and 3) are anticipated to be met by Phase 1, buildout year 2027. It is recommended that a signal be built/constructed at Intersection C by buildout year 2027.
    - At the intersection of **Access F and Healthcare Boulevard**, the three (3) signal warrant criteria (Warrants 1, 2, and 3) are not anticipated to be met by Phase 1,

buildout year 2027. Signalization is not recommended at site Access F by buildout of the Phase I development, study horizon year 2027.

- At the intersection of **Access G and Purple Sage Boulevard**, the three (3) signal warrant criteria (Warrants 1, 2, and 3) are not anticipated to be met by Phase 1, buildout year 2027. Therefore, signalization is not recommended at site Access G by buildout of the Phase I development, study horizon year 2027.

- At the intersection of **Beulah Blvd. & University Heights Dr South**, the results of the three (3) signal warrant criteria (Warrants 1, 2, and 3) are not anticipated to be met by Phase 1, buildout year 2027. Therefore, signalization is not recommended at the intersection of Beulah Boulevard and University Heights Drive South by buildout of the Phase I development, study horizon year 2027.

LIST OF REFERENCES

Flagstaff Area Regional Land Use and Transportation Plan, City of Flagstaff.

FMPO and Coconino County, Flagstaff, Arizona, September 2013.

Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis. Transportation Research Board, Washington, D.C., 2018.

*Manual on Uniform Traffic Control Devices. U.*S. Department of Transportation, Federal Highways Administration, Washington, D.C., 2009.

Trip Generation Manual, 10th Edition, Institute of Transportation Engineers, Washington, D.C., 2017.

Trip Generation Handbook, 3rd Edition, Institute of Transportation Engineers, Washington, D.C., 2014.

TECHNICAL APPENDICES

APPENDIX A: REVIEW COMMENTS AND RESPONSES (RESERVED)

APPENDIX B: EXISTING TRAFFIC COUNTS

APPENDIX C: EXISTING PEAK HOUR ANALYSIS

APPENDIX D: TRIP GENERATION CALCULATIONS

APPENDIX E: BACKGROUND GROWTH CALCULATIONS

APPENDIX F: 2027 NO BUILD PEAK HOUR ANALYSIS

APPENDIX G: 2027 BUILD PEAK HOUR ANALYSIS

APPENDIX H: 2027 MITIGATION PEAK HOUR ANALYSIS

APPENDIX I: PERCENTAGE OF TIME BLOCKED BY PLATOON

APPENDIX J: TRAFFIC SIGNAL WARRANT ANALYSIS

APPENDIX A

REVIEW COMMENTS AND RESPONSES (Reserved)

To: **Dawn Cartier, CivTech Inc.**

From: **Stephanie Santana, Sr. Transportation Engineer** ʃʃ

Date: **March 24, 2023**

RE: **Review of the NAH Phase 1 TIA, sealed March 22, 2023**

CC: **Paul Mood, City Engineer**
Jeffrey Bauman, Traffic Engineer

The City of Flagstaff Transportation Engineering Section has reviewed the TIA sealed March 22, 2023. Please address the following comments and resubmit.

1. PDF page 33 – Table 6 – Recommendations – Does not match Figure 11 – Proposed Lane Configurations and Traffic Controls.
2. PDF page 30 – Table 7 – Queue Storage Lengths – Referring to the Existing lengths as Drop is unacceptable. There are clearly striped storage lanes. The length of the solid striped line needs to be included in this table, as it was shown in the TIA from September 9, 2022.
3. PDF page 30 – Table 7 – Queue Storage Lengths – Superscript (4) – "Recommended values are minimums. Actual turn lane lengths to be determined during roadway design." It was agreed to that NAH would build all newly constructed or reconstructed turn lane queue storage lengths to at least the higher of the 2025 or 2030 calculations. Please either edit this superscript, or we can make this a condition of approval on the next submittal.
4. PDF page 30 – Table 7 – Queue Storage Lengths – Beulah & Fairgrounds Dr – Missing SBR.
5. PDF page 30 – Table 7 – Queue Storage Lengths – Beulah & Mtn Dell – Missing SBR.
6. PDF page 41 – Figure 11 – Intersection 10 is missing the SB free-flow/by-pass right turn lane.
7. PDF page 41 – Figure 11 – Intersection 9 and 12 are labeled wrong (opposite). Intersection 9 should be Fairgrounds Dr and Intersection 12 should be Mt Dell.
8. PDF page 41 – Figure 11 – Intersection 12 (Mt Dell) SBR needs to be orange (Developer Improvement), as it does not exist today.
9. PDF page 41 – Figure 11 – Please show internal circulation lanes and receiving lanes on all roundabouts.

10. PDF page 180 & 193 – Synchro – Beulah & University Heights Dr S – The eastbound approach shall be analyzed as separate left and right turn lanes.
11. Please provide these comments and future comments with comment responses in the resubmittal.

NAH Phase 1 TIA (2027 Deep Dive) **CivTech, Inc.** **Review Comments & Responses**
2nd Submittal

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Stephanie Santana, City of Flagstaff**

Item	Location	Code	Review Comment	Response
1.	Table 6	1	Recommendations does not match **Figure 11** - Proposed Lane Configurations and Traffic Controls.	Adding SB Bypass lane to Int 10 in Fig 11. Switched names for Int 9 and Int 12 in Fig 11. Removed two-stage left-turn lane from Int 12 in Fig 11. Added 2nd through lanes NB and SB to Int 9 in Fig 11. Added 2nd through lane text NB and SB to Int 9 and Int 12 of Table 6.
2.	Table 7	1	Queue Storage Lengths - Referring to the Existing lengths as Drop is unacceptable. There are clearly striped storage lanes. The length of the solid striped line needs to be included in this table, as it was shown in the TIA from September 9, 2022.	Existing storage lengths were updated to match the approved Master TIA.
3.	Table 7	1	Queue Storage Lengths - Superscript (4) - "Recommended values are minimums. Actual turn lane lengths to be determined during roadway design." It was agreed to that NAH would build all newly constructed or reconstructed turn lane queue storage lengths to at least the higher of the 2025 or 2030 calculations. Please either edit this superscript, or we can make this a condition of approval on the next submittal.	Calculations are based on the projected traffic shown within this report. Recommended values were determined from the NAH September Master TIA and are based on the higher of the 2025 or 2030 queue storage
4.	Table 7	1	Queue Storage Lengths - Beulah & Fairground Dr. - Missing SBR.	This movement has been added to Table 7.
5.	Table 7	3	Queue Storage Lengths - Beulah & Mtn Dell - Missing SBR.	Beulah and Mnt Dell is proposed with a shared SB Thru/Right, not a dedicated SBR. The SB Shared movement is included in Table 7.

Reviewed Date:03/22/2023
CivTech Received Date:03/24/2023
CivTech Entered Date: 03/27/2023
CivTech Response Date: 03/27/2023

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Stephanie Santana, City of Flagstaff**

Item	Location	Code	Review Comment	Response
6.	Figure 11	1	Intersection 10 is missing the SB free-flow/by-pass right turn lane.	Adding SB Bypass lane to Int 10 in Fig 11.
7.	Figure 11	1	Intersection 9 and 12 are labeled wrong (opposite). Intersection 9 should be Fairgrounds Dr. and Intersection should be Mt Dell.	Switched names for Int 9 and Int 12 in Fig 11.
8.	Figure 11	1	Intersection 12 (Mt Dell) SBR needs to be orange (Developer Improvement), as it does not exist today.	Beulah and Mnt Dell is proposed with a shared SB Thru/Right, not a dedicated SBR. The configuration in Fig 11 has been updated.
9.	Figure 11	1	Please show internal circulation lanes and receiving lanes on all roundabouts.	Figure 11 updated.
10.	Appendix H	1	Synchro - (2027 Mitigated) Synchro - Beulah & University Heights Dr. S - The eastbound approach shall be analyzed as separate left and right-turn lanes.	Appendix H has been updated.
11.	General	1	Please provide these comments and future comments with comment responses in the resubmittal.	Agreed

Reviewed Date:03/22/2023
CivTech Received Date:03/24/2023
CivTech Entered Date: 03/27/2023
CivTech Response Date: 03/27/2023

MEMORANDUM Transportation Engineering Section

To: **Tiffany Antol, Zoning Code Manager**

From: **Stephanie Santana, Sr. Transportation Engineer** SS

Date: **March 10, 2023**

RE: **Review of the NAH Phase 1 TIA, sealed March 1, 2023**

CC: **Paul Mood, City Engineer**
Jeffrey Bauman, Traffic Engineer

The City of Flagstaff Transportation Engineering Section has reviewed the TIA, sealed March 1, 2023. Please address the following comments and resubmit.

1. The analysis does not match the agreed upon mitigation that has been included in the draft development agreement. Please provide an analysis based on the mitigation that has been discussed and agreed upon to this point. If different mitigation is now being proposed, we will need to delay scheduled public hearings to review and vet the new TIA and have additional discussion with ADOT.
2. Beulah Boulevard is analyzed as a two-lane roadway at the intersections of Mountain Dell in the northbound and southbound directions, University Heights Drive South in the northbound and southbound directions, and Lake Mary in the southbound direction. PDF page 5 of the TIA states that Beulah will be improved to a four-lane roadway, but the analysis does not show this.
3. The distributions shown on Figure 5 does not match the 2025 Hospital distributions that CivTech, the City, ADOT, Metroplan, and Coconino County had agreed to during the Pre-Scoping. The scope of this Phase 1 TIA (Hospital and Ambulatory Center) matches the original 2025 Hospital scope, so these distributions should be used to calculate volumes at the study intersections.
4. The intersection of Beulah and Lake Mary experiences very high volumes in the southbound left turn direction during the PM peak hour (779 vehicles per hour). The City is currently running timing that consists of 30 seconds of

protected green for this movement and is running as permitted/protected (meaning vehicles are able to turn on a green ball when safe to do so, then will also get a protected green arrow). Since northbound traffic is going from one-lane to two-lanes of travel, this southbound left turn needs to be protected only (vehicles may only progress through the intersection on a green arrow). CivTech had proposed 10.9 seconds on a previous submittal and the City expressed their concern with this movement being served with such a small amount of green time. During a meeting on February 24, 2023, the City was told that the green time was increased to 24 seconds in the PM peak hour. After reviewing this TIA, this movement, in the PM peak hour is only receiving 17.9 seconds of green time, which is just over half the amount of time that is currently given to this phase. This intersection needs to be analyzed per the development agreement and the timing needs to be reasonably comparable to the existing timing card.

5. Other items found after a quick review. If these changes can be incorporated, that is great, but we would possibly be able to approve with conditions if these specific items do not get addressed.
    a. Figure 2 – At Intersection 4 a bike lane in the EB direction does not exist today. At Intersection 9 there are designated EB left and right turn lanes, a designated NB left turn lane, and a dedicated SB right turn lane existing today. At Intersection 12 the EB movement is a shared left and right turn lane.
    b. PDF Page 16 – There are eleven (11) intersections shown. The introduction states that counts were taken at all intersections, but the counts at the Beulah & Fairgrounds Driveway were estimated. The counts for the intersections of I-17 SB Ramps & JWP, Beulah & Mtn Dell, and I-17 NB Ramps & JWP are not included in Appendix B.
    c. Appendix A – The previous comments and response to comments need to be included here.
    d. Appendix B – There are many counts included that are not part of this TIA.
    e. Synchro – No conflicting peds are included at Beulah & Access B. This needs to be checked at all intersections.

The following intersection improvements are included in the on-site transportation improvements:

- Signalized intersection for Beulah Blvd and Woody Mountain Rd
- Stop-Controlled intersection for Beulah Blvd and Main Entrance of the Hospital and ACC to include underground utilities for a future signal and to be constructed with correct signal ramp slopes. Intersection shall be analyzed prior to Phase 2 development and a traffic signal shall be installed if signal warrants are met or other mitigation considered if there are failing levels of service and delays. If warrants are not met the City may require future intersection analysis and a traffic signal shall be installed if signal warrants are met or other mitigation considered if there are failing levels of service and delays
- Re-alignment of Purple Sage Rd
- Signalized intersection at Beulah Blvd and the re-aligned Purple Sage Rd to include construction at the correct grades for a future underpass at I-17
- Improvements to the intersection of Beulah Blvd and Infantry Rd (current Purple Sage Rd) to include underground utilities for a future signal and to be constructed with correct signal ramp slopes. Intersection shall be analyzed prior to Phase 2 development and a traffic signal shall be installed if signal warrants are met or other mitigation considered if there are failing levels of service and delays. If warrants are not met the City may require future intersection analysis and a traffic signal shall be installed if signal warrants are met or other mitigation considered if there are failing levels of service and delays
- Improvements to the Cosmic Ray Tunnel on Sheep Crossing Trail to accommodate the widening of Beulah Blvd
- Internal intersection improvements as determined by the TIA

NAH will be responsible for certain off-site improvements as identified within the TIA including but not limited to the following. Widening Beulah Blvd from Woodlands Village Blvd to JW Powell Blvd to a 4-lane cross section with 10-foot FUTS and 5-foot parkway on the west side, buffered bicycle lanes, a median, drainage improvements and curb and gutter on the east side.

- Improvements to the intersection of Beulah Blvd and McConnell Dr to include:
  - Addition of a second westbound left turn lane
  - Restriping the eastbound left turn lane to add storage capacity
  - Make the driveway into Walmart right in/right out
  - Restrict the lefts out of the driveway at the Comfort Inn 1-17 & I40
- Improvements to the intersection of Beulah Blvd and Woodlands Village Blvd:
  - Addition of a second northbound left turn lane and extending the storage
  - Extending the eastbound left turn lane storage and creating side by side left turn lanes
- Improvements to the intersection of Beulah Blvd and University Heights Dr N/Lake Mary Rd:
  - Addition of a second northbound and southbound through lane
  - Addition of a westbound channelized right turn lane
  - Addition of a second westbound left turn lane and extending the storage
  - Addition of northbound and southbound buffered bicycle lanes

    - Addition of a westbound bicycle lane.
- Improvements to the intersection of Beulah Blvd and University Heights Dr S:
    - Addition of a signal,
    - Addition of a new northbound left turn lane
    - Addition of a second northbound and southbound through lane
    - Addition of northbound and southbound buffered bicycle lanes
    - Providing dedicated eastbound left and right turn lanes
- Re-alignment of Mountain Dell Rd and improvements to the intersection of Beulah Blvd and the re-aligned Mountain Dell Rd:
    - Addition of underground utilities for a future signal and to be constructed with correct signal ramp slopes
    - Intersection shall be analyzed prior to Phase 2 development and a traffic signal shall be installed if signal warrants are met or other mitigation considered if there are failing levels of service and delays. If warrants are not met the City may require future intersection analysis and a traffic signal shall be installed if signal warrants are met or other mitigation considered if there are failing levels of service and delays
    - Addition of a new southbound right turn lane
    - Addition of a new northbound left turn lane
    - Addition of a second northbound and southbound through lane
    - Addition of a northbound and southbound buffered bicycle lanes
    - Providing an eastbound left turn refuge lane for at least one vehicle on Beulah Blvd
- Improvements to the roundabout at Beulah Blvd and Fairgrounds Rd:
    - Addition of underground utilities for a future signal and to be constructed with correct signal ramp slopes
    - Intersection shall be analyzed prior to Phase 2 development and a traffic signal shall be installed if signal warrants are met or other mitigation considered if there are failing levels of service and delays. If warrants are not met the City may require future intersection analysis and a traffic signal shall be installed if signal warrants are met or other mitigation considered if there are failing levels of service and delays
    - Addition of a second northbound and southbound through lane
    - Addition of a northbound and southbound buffered bicycle lanes
- Improvements to the roundabout at Beulah Blvd and JW Powell Blvd:
    - Addition of a westbound right by-pass/U-turn lane adjacent to the dual roundabouts
    - Addition of a north leg receiving lane and transitioning bicycle lanes and buffers into the roundabout
- Improvements to the roundabout at JW Powell Blvd and the I-17 southbound ramps:
    - Addition of a southbound right by-pass/U-turn lane adjacent to the dual roundabouts
    - Addition of an eastbound right to southbound channelized right turn lane and a south leg receiving lane

- Improvements to the intersection of JW Powell Blvd and the I-17 northbound ramps:
  - Addition of a roundabout with dual internal circulating lanes in eastbound direction, single internal circulating lanes in northbound, westbound, and southbound directions, single entering westbound lane, dual entering eastbound lanes to start immediately after the bridge, dual entering northbound lanes, single receiving lanes on the east and north legs, dual receiving lanes on the west leg to end immediately before the bridge, and, if necessary, bicycle and pedestrian facilities

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Stephanie Santana, City of Flagstaff**

Item	Location	Code	Review Comment	Response
1.		1	The analysis does not match the agreed upon mitigation that has been included in the draft development agreement. Please provide an analysis based on the mitigation that has been discussed and agreed upon to this point. If different mitigation is now being proposed, we will need to delay scheduled public hearings to review and vet the new TIA and have additional discussion with ADOT.	The recommended mitigation within this Phase 1 TIA is for the 2027 horizon year with the Phase 1 land use data. All recommendations were projected to align with the 2025/2030 Master TIA mitigation recommendations.
2.		1	Beulah Boulevard is analyzed as a two-lane roadway at the intersections of Mountain Dell in the northbound and southbound directions, University Heights Drive South in the northbound and southbound directions, and Lake Mary in the southbound direction. PDF page 5 of the TIA states that Beulah will be improved to a four-lane roadway, but the analysis does not show this.	Beulah Blvd. was updated in the Synchro analysis to include the proposed 4-lane cross section based on the Raise Grant memo and Roadway design plans.

Reviewed Date:03/01/2023
CivTech Received Date:03/03/2023
CivTech Entered Date: 03/21/2023
CivTech Response Date: 03/22/2023

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Stephanie Santana, City of Flagstaff**

Item	Location	Code	Review Comment	Response
3.	Figure 5	3	The distributions shown on Figure 5 does not match the 2025 Hospital distributions that CivTech, the City, ADOT, Metroplan, and Coconino County had agreed to during the Pre-Scoping. The scope of this Phase 1 TIA (Hospital and Ambulatory Center) matches the original 2025 Hospital scope, so these distributions should be used to calculate volumes at the study intersections.	Per the meeting w/the City on 3/22/2023 the Trip Distribution percentages within the Phase 1 report were accepted.

Reviewed Date:03/01/2023
CivTech Received Date:03/03/2023
CivTech Entered Date: 03/21/2023
CivTech Response Date: 03/22/2023

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Stephanie Santana, City of Flagstaff**

Item	Location	Code	Review Comment	Response
4.		3	The intersection of Beulah and Lake Mary experiences very high volumes in the southbound left turn direction during the PM peak hour (779 vehicles per hour). The City is currently running timing that consists of 30 seconds of protected green for this movement and is running as permitted/protected (meaning vehicles are able to turn on a green ball when safe to do so, then will also get a protected green arrow). Since northbound traffic is going from one-lane to two-lanes of travel, this southbound left turn needs to be protected only (vehicles may only progress through the intersection on a green arrow). CivTech had proposed 10.9 seconds on a previous submittal and the City expressed their concern with this movement being served with such a small amount of green time. During a meeting on February 24, 2023, the City was told that the green time was increased to 24 seconds in the PM peak hour. After reviewing this TIA, this movement, in the PM peak hour is only receiving 17.9 seconds of green time, which is just over half the amount of time that is currently given to this phase. This intersection needs to be analyzed per the development agreement and the timing needs to be reasonably comparable to the existing timing card.	Per the meeting w/the City on 3/22/2023 it was understood that the maximum SBL green time allowed was 20-secs do to the minimum splits at this intersection. Mitigated Synchro models were provided to the City on 3/22/2023 after the meeting which the City agreed with the model upon further review.

Reviewed Date:03/01/2023
CivTech Received Date:03/03/2023
CivTech Entered Date: 03/21/2023
CivTech Response Date: 03/22/2023

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Stephanie Santana, City of Flagstaff**

Item	Location	Code	Review Comment	Response
5.	General	1	Other items found after a quick review. If these changes can be incorporated, that is great, but we would possibly be able to approve with conditions if these specific items do not get addressed.	All updates have been made/addressed.
		1	a.) **Figure 2** – At Intersection 4 a bike lane in the EB direction does not exist today. At Intersection 9 there are designated EB left and right turn lanes, a designated NB left turn lane, and a dedicated SB right turn lane existing today. At Intersection 12 the EB movement is a shared left and right turn lane.	The configurations for 9 and 12 are switched. We can fix simply.
		1	b.) PDF Page 16 – There are eleven (11) intersections shown. The introduction states that counts were taken at all intersections, but the counts at the Beulah & Fairgrounds Driveway were estimated. The counts for the intersections of I-17 SB Ramps & JWP, Beulah & Mtn Dell, and I-17 NB Ramps & JWP are not included in Appendix B.	An added footnote was included in the text of the report to note that volumes at this intersection were estimated using count data from surrounding intersections.
		1	c.) Appendix A – The previous comments and response to comments need to be included here.	All informal email comments are included herein.
		1	d.) Appendix B – There are many counts included that are not part of this TIA.	Appendix B has been updated to include just relevant study intersections within this Phase I memo.

Reviewed Date:03/01/2023
CivTech Received Date:03/03/2023
CivTech Entered Date: 03/21/2023
CivTech Response Date: 03/22/2023

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Stephanie Santana, City of Flagstaff**

Item	Location	Code	Review Comment	Response
		1	e.) Synchro – No conflicting peds are included at Beulah & Access B. This needs to be checked at all intersections.	Conflicting peds were included at all signalized intersections. Unsignalized intersections such as Access B did not include conflicting peds.

Reviewed Date:03/01/2023
CivTech Received Date:03/03/2023
CivTech Entered Date: 03/21/2023
CivTech Response Date: 03/22/2023

Ruth Gutierrez

From: Ruth Gutierrez
Sent: Wednesday, March 22, 2023 3:36 PM
To: Ruth Gutierrez
Subject: RE: NAH - 2027 Phase I TIA

From: Steph Santana <SSantana@flagstaffaz.gov>
Sent: Tuesday, February 14, 2023 8:18 PM
To: Bill Selby <BSelby@civtech.com>; Dawn Cartier <dcartier@civtech.com>
Cc: Jeff Bauman <jbauman@flagstaffaz.gov>; Tiffany Antol <TAntol@flagstaffaz.gov>; Paul A. Mood <paul.mood@flagstaffaz.gov>; Michelle J. McNulty <Michelle.McNulty@flagstaffaz.gov>; Chris Lininger <Chris.Lininger@nahealth.com>
Subject: NAH - 2027 Phase I TIA

Good Evening,

After a quick review of the TIA there are some initial concerns that will be changing the analysis.

- The Synchro analysis is missing many of the volumes. Analysis & tables need to be updated.
- All of the TBD sections need to be completed
- Table 3 – Hospital ADT 4,446 - needs to be 7,447 – maybe a typo?
- Need to include Mtn Dell intersection – this has been the main topic of public meetings
- Need to include Fairground & Beulah intersection – County said they have been requesting this intersection to be analyzed since the beginning
- Need to include JWP & SB ramps
- Need to include JWP & NB ramps
- Remove intersection 8 - McConnell & NB Off Ramp – this was never in the original City memo, and the mitigation of restricting the NB left turns is not acceptable as the Pine Knoll roundabout has not been constructed
- We still have unanswered concerns with the intersection of Lake Mary & Beulah. Does 10.9 seconds for a SBL dual movement with 780 vph seem acceptable? This is reducing the existing green time from 30sec to 10.9sec.

Thank you,

Stephanie Santana, P.E., PTOE
Senior Transportation Engineer
City of Flagstaff
211 W. Aspen Ave. | Flagstaff, AZ | 86001
SSantana@flagstaffaz.gov
(928) 213-2692

APPENDIX B

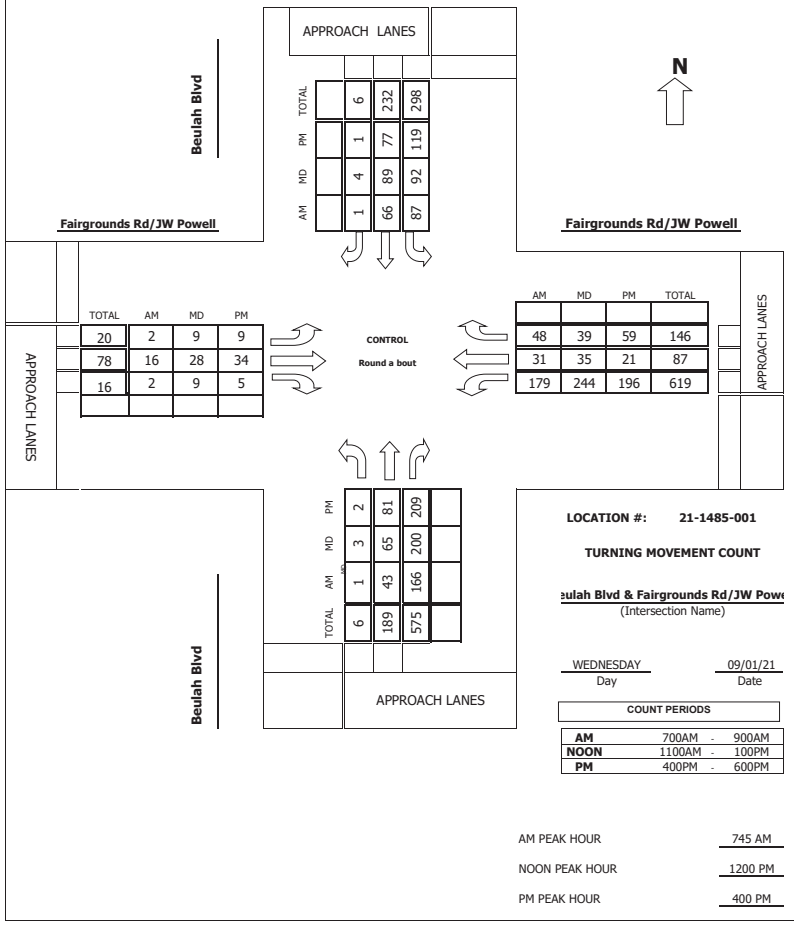
EXISTING TRAFFIC COUNTS

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1485-001

TMC SUMMARY OF Beulah Blvd & Fairgrounds Rd/JW Powell



	TOTAL	AM	MD	PM
	20	2	9	9
	78	16	28	34
	16	2	9	5

	AM	MD	PM	TOTAL
	48	39	59	146
	31	35	21	87
	179	244	196	619

TOTAL	6	232	298	
PM	1	77	119	
MD	4	89	92	
AM	1	66	87	

PM	2	81	209	
MD	3	65	200	
AM	1	43	166	
TOTAL	6	189	575	

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Fairgrounds Rd/JW Powell DAY: WEDNESDAY PROJECT# 21-1485-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	10	24	15	11	1	1	0	1	39	4	9	115
7:15 AM	0	8	36	12	17	0	1	1	3	26	5	9	118
7:30 AM	0	9	32	16	16	2	1	1	0	31	3	13	124
7:45 AM	0	9	34	18	21	1	0	2	1	46	13	10	155
8:00 AM	1	12	43	14	14	0	1	6	0	50	9	12	162
8:15 AM	0	13	38	26	17	0	1	5	1	34	4	12	151
8:30 AM	0	9	51	29	14	0	0	3	0	49	5	14	174
8:45 AM	0	12	33	18	14	1	2	5	1	45	6	8	145
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	1	82	291	148	124	5	7	23	7	320	49	87	1144
Approach %	0.27	21.93	77.81	53.43	44.77	1.81	18.92	62.16	18.92	70.18	10.75	19.08	
App/Depart	374	/	176	277	/	451	37	/	462	456	/	55	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	1	43	166	87	66	1	2	16	2	179	31	48	642
Approach %	0.48	20.48	79.05	56.49	42.86	0.65	10.00	80.00	10.00	69.38	12.02	18.60	

PEAK HR. FACTOR:	0.875	0.895	0.714	0.908	0.922

CONTROL: Round a bout
COMMENT 1:
GPS: 35.139942, -111.687025

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Fairgrounds Rd/JW Powell DAY: WEDNESDAY PROJECT# 21-1485-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	0	21	39	18	16	0	7	7	3	58	5	8	182
11:15 AM	0	24	59	17	19	0	3	5	0	43	13	17	200
11:30 AM	0	18	51	36	18	0	1	13	1	49	9	16	212
11:45 AM	0	22	59	17	19	0	2	5	3	50	9	13	199
12:00 PM	1	14	43	24	23	2	1	6	1	51	8	9	183
12:15 PM	1	18	46	27	13	2	1	10	4	67	7	11	207
12:30 PM	0	12	54	19	24	0	5	7	3	66	8	13	211
12:45 PM	1	21	57	22	29	0	2	5	1	60	12	6	216
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	3	150	408	180	161	4	22	58	16	444	71	93	1610
Approach %	0.53	26.74	72.73	52.17	46.67	1.16	22.92	60.42	16.67	73.03	11.68	15.30	
App/Depart	561	/	265	345	/	621	96	/	646	608	/	78	

NOON Peak Hr Begins at: 1200 PM

PEAK													
Volumes	3	65	200	92	89	4	9	28	9	244	35	39	817
Approach %	1.12	24.25	74.63	49.73	48.11	2.16	19.57	60.87	19.57	76.73	11.01	12.26	
PEAK HR. FACTOR:		0.848			0.907			0.767			0.914		0.946

CONTROL: Round a bout
COMMENT 1: 0
GPS: 35.139942, -111.687025

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Fairgrounds Rd/JW Powell DAY: WEDNESDAY PROJECT# 21-1485-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	19	64	33	20	0	3	12	1	47	8	18	225
4:15 PM	0	26	57	29	16	0	2	7	2	50	5	15	209
4:30 PM	1	15	45	34	17	0	2	7	1	51	4	10	187
4:45 PM	1	21	43	23	24	1	2	8	1	48	4	16	192
5:00 PM	2	17	56	30	11	0	5	7	1	33	8	16	186
5:15 PM	2	18	44	25	17	1	4	7	2	36	7	7	170
5:30 PM	0	11	58	24	13	0	6	4	4	37	10	10	177
5:45 PM	0	21	48	24	6	1	2	5	0	43	8	7	165
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	6	148	415	222	124	3	26	57	12	345	54	99	1511
Approach %	1.05	26.01	72.93	63.61	35.53	0.86	27.37	60.00	12.63	69.28	10.84	19.88	
App/Depart	569	/	273	349	/	481	95	/	694	498	/	63	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	2	81	209	119	77	1	9	34	5	196	21	59	813
Approach %	0.68	27.74	71.58	60.41	39.09	0.51	18.75	70.83	10.42	71.01	7.61	21.38	
PEAK HR. FACTOR:		0.880			0.929			0.750			0.945		0.903

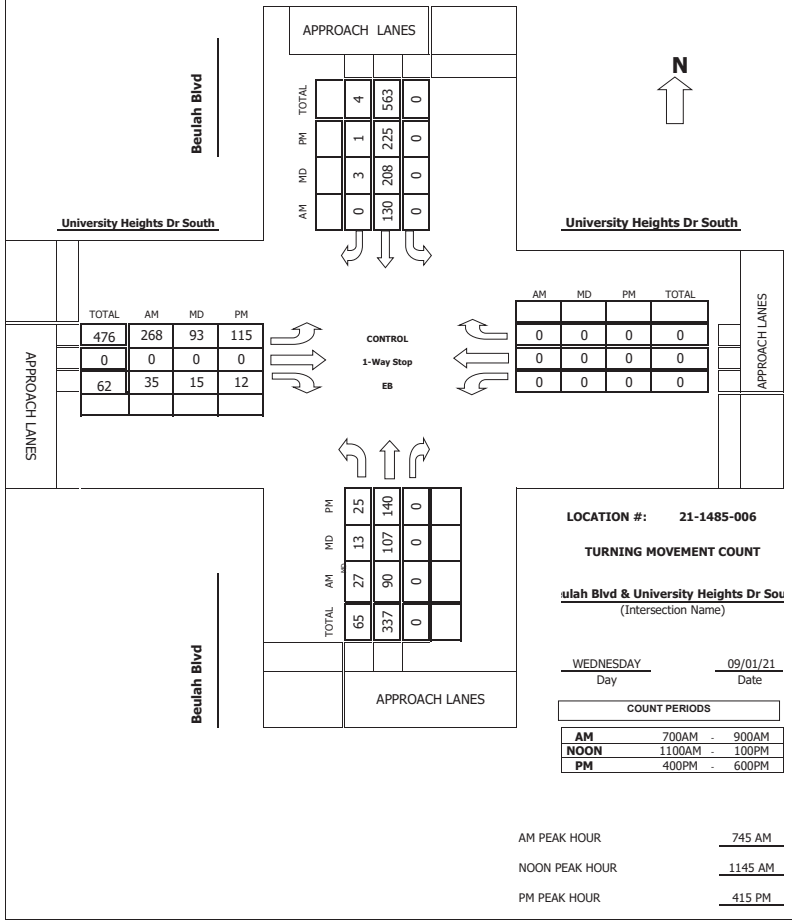
CONTROL: Round a bout
COMMENT 1: 0
GPS: 35.139942, -111.687025

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1485-006

TMC SUMMARY OF Beulah Blvd & University Heights Dr South



LOCATION #: 21-1485-006

TURNING MOVEMENT COUNT

ulah Blvd & University Heights Dr Sou
(Intersection Name)

WEDNESDAY (Day) 09/01/21 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON	1100AM	-	100PM
PM	400PM	-	600PM

AM PEAK HOUR 745 AM

NOON PEAK HOUR 1145 AM

PM PEAK HOUR 415 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: University Heights Dr South DAY: WEDNESDAY PROJECT# 21-1485-006

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 1	EL 0	ET 1	ER 0	WL 0	WT 0	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	7	23	0	0	29	0	58	0	4	0	0	0	121
7:15 AM	3	21	0	0	17	0	60	0	5	0	0	0	106
7:30 AM	3	30	0	0	38	0	43	0	4	0	0	0	118
7:45 AM	8	21	0	0	31	0	44	0	2	0	0	0	106
8:00 AM	8	24	0	0	32	0	73	0	5	0	0	0	142
8:15 AM	6	22	0	0	38	0	93	0	18	0	0	0	177
8:30 AM	5	23	0	0	29	0	58	0	10	0	0	0	125
8:45 AM	2	27	0	0	29	0	26	0	6	0	0	0	90
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	42	191	0	0	243	0	455	0	54	0	0	0	985
Approach %	18.03	81.97	0.00	0.00	100.00	0.00	89.39	0.00	10.61	####	####	####	
App/Depart	233	/	646	243	/	297	509	/	0	0	/	42	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	27	90	0	0	130	0	268	0	35	0	0	0	550
Approach %	23.08	76.92	0.00	0.00	100.00	0.00	88.45	0.00	11.55	####	####	####	
PEAK HR. FACTOR:		0.914			0.855			0.682			0.000		0.777

CONTROL: 1-Way Stop (EB)
COMMENT 1:
GPS: 35.167005, -111.670341

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd
E-W STREET: University Heights Dr South
DATE: 09/01/21
DAY: WEDNESDAY
LOCATION: Flagstaff
PROJECT#: 21-1485-006

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 1	EL 0	ET 1	ER 0	WL 0	WT 0	WR 0	TOTAL
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	1	22	0	0	36	2	17	0	3	0	0	0	81
11:15 AM	2	20	0	0	43	1	21	0	2	0	0	0	89
11:30 AM	4	24	0	0	41	1	20	0	5	0	0	0	95
11:45 AM	0	26	0	0	54	2	22	0	2	0	0	0	106
12:00 PM	5	25	0	0	51	0	27	0	3	0	0	0	111
12:15 PM	3	26	0	0	52	0	24	0	5	0	0	0	110
12:30 PM	5	30	0	0	51	1	20	0	5	0	0	0	112
12:45 PM	3	23	0	0	38	1	25	0	8	0	0	0	98
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	23	196	0	0	366	8	176	0	33	0	0	0	802
Approach %	10.50	89.50	0.00	0.00	97.86	2.14	84.21	0.00	15.79	####	####	####	
App/Depart	219	/	372	374	/	399	209	/	0	0	/	31	

NOON Peak Hr Begins at: 1145 AM

PEAK													
Volumes	13	107	0	0	208	3	93	0	15	0	0	0	439
Approach %	10.83	89.17	0.00	0.00	98.58	1.42	86.11	0.00	13.89	####	####	####	

PEAK HR. FACTOR:	0.857	0.942	0.900	0.000	0.980

CONTROL: 1-Way Stop (EB)
COMMENT 1: 0
GPS: 35.167005, -111.670341

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd
E-W STREET: University Heights Dr South
DATE: 09/01/21
DAY: WEDNESDAY
LOCATION: Flagstaff
PROJECT#: 21-1485-006

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 1	EL 0	ET 1	ER 0	WL 0	WT 0	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	7	33	0	0	43	0	20	0	8	0	0	0	111
4:15 PM	9	38	0	0	67	0	36	0	1	0	0	0	151
4:30 PM	3	35	0	0	49	1	37	0	5	0	0	0	130
4:45 PM	6	34	0	0	56	0	18	0	2	0	0	0	116
5:00 PM	7	33	0	0	53	0	24	0	4	0	0	0	121
5:15 PM	3	33	0	0	39	0	35	0	2	0	0	0	112
5:30 PM	2	27	0	0	36	0	22	0	4	0	0	0	91
5:45 PM	7	27	0	0	38	0	21	0	5	0	0	0	98
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	44	260	0	0	381	1	213	0	31	0	0	0	930
Approach %	14.47	85.53	0.00	0.00	99.74	0.26	87.30	0.00	12.70	####	####	####	
App/Depart	304	/	473	382	/	412	244	/	0	0	/	45	

PM Peak Hr Begins at: 415 PM

PEAK													
Volumes	25	140	0	0	225	1	115	0	12	0	0	0	518
Approach %	15.15	84.85	0.00	0.00	99.56	0.44	90.55	0.00	9.45	####	####	####	

PEAK HR. FACTOR:	0.878	0.843	0.756	0.000	0.858

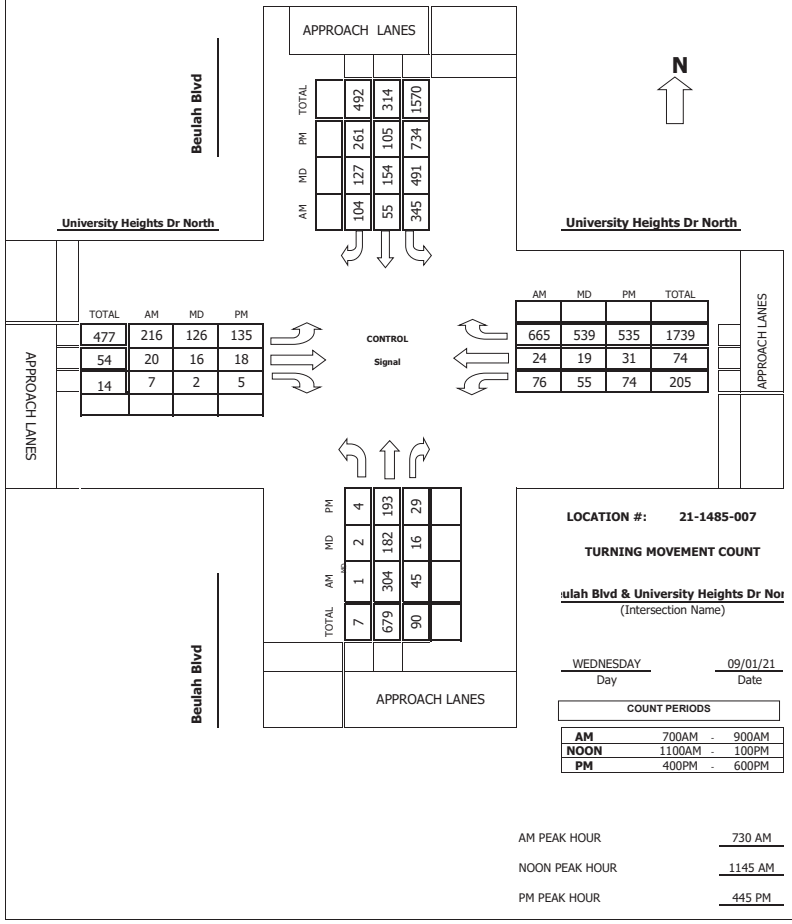
CONTROL: 1-Way Stop (EB)
COMMENT 1: 0
GPS: 35.167005, -111.670341

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1485-007

TMC SUMMARY OF Beulah Blvd & University Heights Dr North



LOCATION #: 21-1485-007

TURNING MOVEMENT COUNT

ulah Blvd & University Heights Dr Nor
(Intersection Name)

WEDNESDAY (Day) 09/01/21 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON	1100AM	-	100PM
PM	400PM	-	600PM

AM PEAK HOUR 730 AM

NOON PEAK HOUR 1145 AM

PM PEAK HOUR 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: University Heights Dr North DAY: WEDNESDAY PROJECT# 21-1485-007

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 1	EL 1	ET 1	ER 0	WL 1	WT 1	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	1	75	5	50	14	14	47	4	1	14	5	147	377
7:15 AM	1	74	6	47	6	21	80	4	1	10	6	211	467
7:30 AM	0	66	7	73	19	15	86	4	2	17	3	228	520
7:45 AM	0	54	11	92	12	19	44	7	1	18	4	135	397
8:00 AM	0	86	11	94	10	33	55	6	1	20	8	137	461
8:15 AM	1	98	16	86	14	37	31	3	3	21	9	165	484
8:30 AM	0	71	10	75	15	17	44	4	2	12	3	163	416
8:45 AM	1	47	5	74	13	21	46	2	4	12	4	143	372
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	4	571	71	591	103	177	433	34	15	124	42	1329	3494
Approach %	0.62	88.39	10.99	67.85	11.83	20.32	89.83	7.05	3.11	8.29	2.81	88.90	
App/Depart	646	/	2333	871	/	242	482	/	696	1495	/	223	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	1	304	45	345	55	104	216	20	7	76	24	665	1862
Approach %	0.29	86.86	12.86	68.45	10.91	20.63	88.89	8.23	2.88	9.93	3.14	86.93	

PEAK HR. FACTOR:	0.761	0.920	0.660	0.771	0.895

CONTROL: Signal
COMMENT 1:
GPS: 35.170441, -111.666586

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd
E-W STREET: University Heights Dr North
DATE: 09/01/21
DAY: WEDNESDAY
LOCATION: Flagstaff
PROJECT#: 21-1485-007

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 1	EL 1	ET 1	ER 0	WL 1	WT 1	WR 1	TOTAL
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	0	37	2	111	26	28	28	2	1	11	6	128	380
11:15 AM	1	35	5	104	33	24	32	5	1	10	5	133	388
11:30 AM	0	42	2	108	27	29	33	4	1	14	2	131	393
11:45 AM	1	43	4	105	43	27	34	5	1	12	5	125	405
12:00 PM	0	46	6	127	34	27	35	5	0	17	7	138	442
12:15 PM	0	47	3	121	36	33	37	3	1	15	5	135	436
12:30 PM	1	46	3	138	41	40	20	3	0	11	2	141	446
12:45 PM	0	40	8	112	31	29	22	6	0	8	6	130	392
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	3	336	33	926	271	237	241	33	5	98	38	1061	3282
Approach %	0.81	90.32	8.87	64.57	18.90	16.53	86.38	11.83	1.79	8.19	3.17	88.64	
App/Depart	372	/	1638	1434	/	374	279	/	992	1197	/	278	

NOON Peak Hr Begins at: 1145 AM

PEAK													
Volumes	2	182	16	491	154	127	126	16	2	55	19	539	1729
Approach %	1.00	91.00	8.00	63.60	19.95	16.45	87.50	11.11	1.39	8.97	3.10	87.93	
PEAK HR. FACTOR:	0.962			0.881			0.878			0.946			0.969

CONTROL: Signal
COMMENT 1: 0
GPS: 35.170441, -111.666586

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd
E-W STREET: University Heights Dr North
DATE: 09/01/21
DAY: WEDNESDAY
LOCATION: Flagstaff
PROJECT#: 21-1485-007

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 1	EL 1	ET 1	ER 0	WL 1	WT 1	WR 1	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	2	46	5	164	28	57	23	5	1	14	7	122	474
4:15 PM	1	65	8	136	37	51	27	8	1	29	7	121	491
4:30 PM	0	63	9	159	30	47	43	7	1	19	6	137	521
4:45 PM	0	45	7	166	27	58	25	4	2	27	8	153	522
5:00 PM	1	52	4	168	33	73	38	5	1	19	5	124	523
5:15 PM	2	53	13	219	23	56	28	4	1	15	8	122	544
5:30 PM	1	43	5	181	22	74	44	5	1	13	10	136	535
5:45 PM	0	39	9	158	24	45	30	3	0	14	5	124	451
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	7	406	60	1351	224	461	258	41	8	150	56	1039	4061
Approach %	1.48	85.84	12.68	66.36	11.00	22.64	84.04	13.36	2.61	12.05	4.50	83.45	
App/Depart	473	/	1703	2036	/	382	307	/	1452	1245	/	524	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	4	193	29	734	105	261	135	18	5	74	31	535	2124
Approach %	1.77	85.40	12.83	66.73	9.55	23.73	85.44	11.39	3.16	11.56	4.84	83.59	
PEAK HR. FACTOR:	0.831			0.923			0.790			0.851			0.976

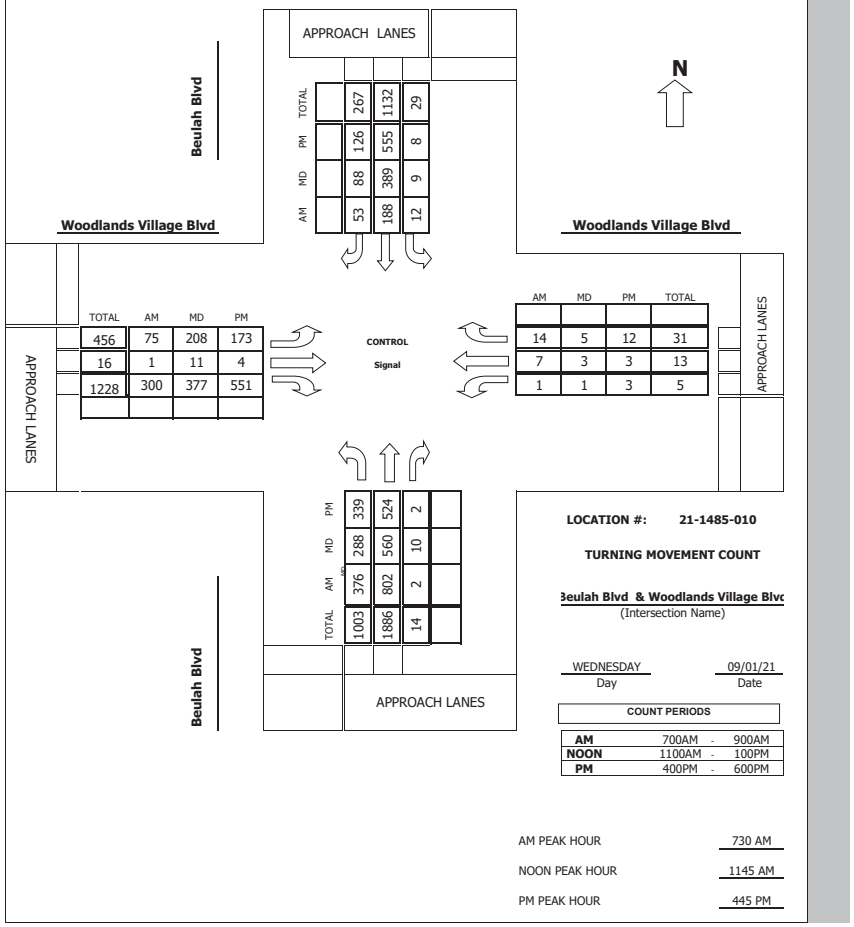
CONTROL: Signal
COMMENT 1: 0
GPS: 35.170441, -111.666586

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1485-010

TMC SUMMARY OF Beulah Blvd & Woodlands Village Blvd



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Woodlands Village Blvd DAY: WEDNESDAY PROJECT# 21-1485-010

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 0.5	ER 1.5	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	71	196	0	2	29	6	13	2	48	2	0	5	374
7:15 AM	107	254	0	2	25	11	16	0	57	0	0	9	481
7:30 AM	97	269	1	5	33	7	20	0	68	0	1	4	505
7:45 AM	77	160	0	2	41	17	13	0	77	1	4	3	395
8:00 AM	109	163	0	3	45	13	23	0	90	0	0	4	450
8:15 AM	93	210	1	2	69	16	19	1	65	0	2	3	481
8:30 AM	90	189	0	1	50	21	26	1	72	0	0	7	457
8:45 AM	61	176	0	0	54	9	22	0	64	0	1	4	391
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	705	1617	2	17	346	100	152	4	541	3	8	39	3534
Approach %	30.34	69.58	0.09	3.67	74.73	21.60	21.81	0.57	77.62	6.00	16.00	78.00	
App/Depart	2324	/	1808	463	/	890	697	/	23	50	/	813	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	376	802	2	12	188	53	75	1	300	1	7	14	1831
Approach %	31.86	67.97	0.17	4.74	74.31	20.95	19.95	0.27	79.79	4.55	31.82	63.64	
PEAK HR. FACTOR:	0.804			0.727			0.832			0.688			0.906

CONTROL: Signal
COMMENT 1:
GPS: 35.174164, -111.664056

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Woodlands Village Blvd DAY: WEDNESDAY PROJECT# 21-1485-010

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1	0.5	1.5	0	1	0	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	58	129	1	1	84	11	41	1	78	1	2	1	408
11:15 AM	65	136	1	5	76	20	43	6	89	0	1	2	444
11:30 AM	60	143	2	2	74	24	45	2	90	1	0	1	444
11:45 AM	66	136	5	2	78	16	50	5	98	0	1	1	458
12:00 PM	69	151	1	1	99	20	54	2	87	1	0	2	487
12:15 PM	73	145	2	2	98	21	51	1	91	0	2	2	488
12:30 PM	80	128	2	4	114	31	53	3	101	0	0	0	516
12:45 PM	73	121	0	1	84	33	35	2	89	1	3	6	448
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	544	1089	14	18	707	176	372	22	723	4	9	15	3693
Approach %	33.03	66.12	0.85	2.00	78.47	19.53	33.30	1.97	64.73	14.29	32.14	53.57	
App/Depart	1647	/	1476	901	/	1434	1117	/	54	28	/	729	

NOON Peak Hr Begins at: 1145 AM

PEAK													
Volumes	288	560	10	9	389	88	208	11	377	1	3	5	1949
Approach %	33.57	65.27	1.17	1.85	80.04	18.11	34.90	1.85	63.26	11.11	33.33	55.56	

PEAK HR. FACTOR:	0.971	0.815	0.949	0.563	0.944

CONTROL: Signal
COMMENT 1: 0
GPS: 35.174164, -111.664056

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Woodlands Village Blvd DAY: WEDNESDAY PROJECT# 21-1485-010

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1	0.5	1.5	0	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	70	126	3	5	131	38	35	1	120	1	0	0	530
4:15 PM	83	131	1	1	104	31	38	3	125	1	1	8	527
4:30 PM	98	143	1	4	113	30	38	0	124	0	0	3	554
4:45 PM	92	136	0	1	128	36	43	1	127	1	3	1	569
5:00 PM	86	131	0	3	113	36	41	1	166	2	0	5	584
5:15 PM	73	128	1	3	169	28	43	1	128	0	0	0	574
5:30 PM	88	129	1	1	145	26	46	1	130	0	0	6	573
5:45 PM	73	119	3	4	117	31	47	2	112	0	1	3	512
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	663	1043	10	22	1020	256	331	10	1032	5	5	26	4423
Approach %	38.64	60.78	0.58	1.69	78.58	19.72	24.11	0.73	75.16	13.89	13.89	72.22	
App/Depart	1716	/	1400	1298	/	2057	1373	/	42	36	/	924	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	339	524	2	8	555	126	173	4	551	3	3	12	2300
Approach %	39.19	60.58	0.23	1.16	80.55	18.29	23.76	0.55	75.69	16.67	16.67	66.67	

PEAK HR. FACTOR:	0.948	0.861	0.875	0.643	0.985

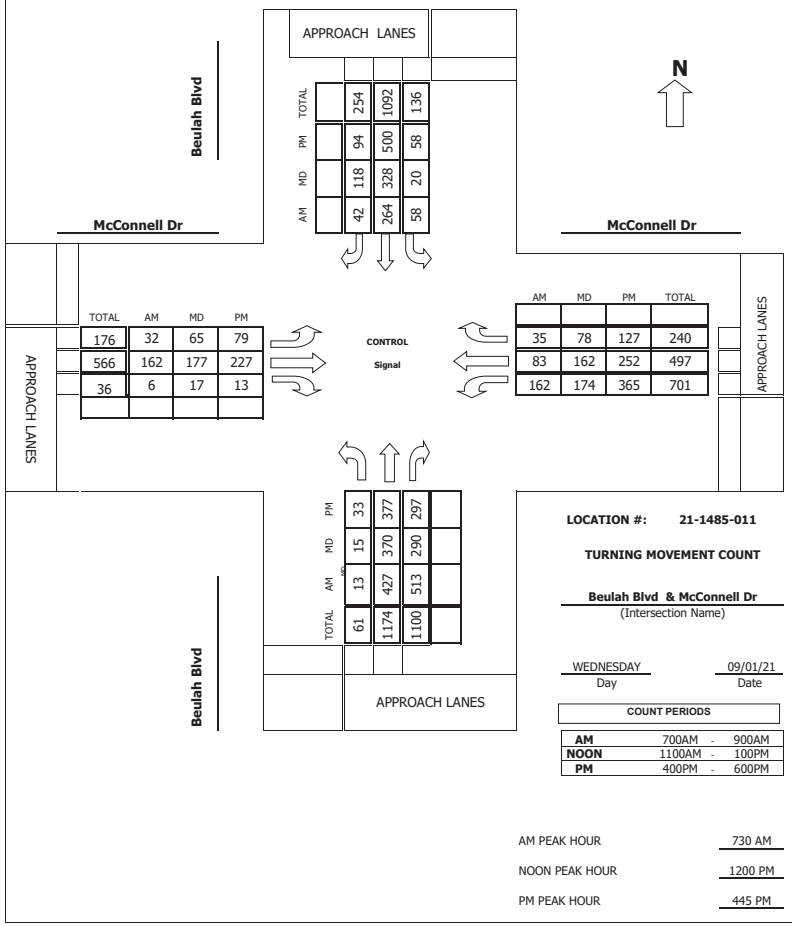
CONTROL: Signal
COMMENT 1: 0
GPS: 35.174164, -111.664056

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1485-011

TMC SUMMARY OF Beulah Blvd & McConnell Dr



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: McConnell Dr DAY: WEDNESDAY PROJECT# 21-1485-011

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 1	ET 0.5	ER 0.5	WL 1	WT 1	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	2	80	91	12	31	5	3	32	0	29	20	5	310
7:15 AM	2	103	128	11	44	5	5	30	1	28	11	9	377
7:30 AM	3	138	165	13	93	10	10	44	3	26	21	9	535
7:45 AM	1	103	156	11	59	10	7	61	0	43	21	7	479
8:00 AM	3	81	66	14	44	13	5	25	1	45	22	8	327
8:15 AM	6	105	126	20	68	9	10	32	2	48	19	11	456
8:30 AM	7	99	112	15	64	12	10	45	1	40	34	11	450
8:45 AM	9	93	94	24	57	13	14	44	3	31	27	12	421
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	33	802	938	120	460	77	64	313	11	290	175	72	3355
Approach %	1.86	45.23	52.90	18.26	70.02	11.72	16.49	80.67	2.84	54.00	32.59	13.41	
App/Depart	1773	/	938	657	/	761	388	/	1371	537	/	285	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	13	427	513	58	264	42	32	162	6	162	83	35	1797
Approach %	1.36	44.81	53.83	15.93	72.53	11.54	16.00	81.00	3.00	57.86	29.64	12.50	

PEAK HR. FACTOR:	0.779	0.784	0.735	0.897	0.840

CONTROL: Signal
COMMENT 1:
GPS: 35.177218, -111.663009

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd
E-W STREET: McConnell Dr
DATE: 09/01/21
DAY: WEDNESDAY
LOCATION: Flagstaff
PROJECT#: 21-1485-011

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 1	ET 0.5	ER 0.5	WL 1	WT 1	WR 1	TOTAL
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	5	87	52	4	60	28	16	41	2	39	24	28	386
11:15 AM	2	85	58	1	66	24	14	43	5	30	28	19	375
11:30 AM	3	89	65	5	59	28	20	45	2	54	32	16	418
11:45 AM	6	99	60	2	80	29	16	50	3	41	30	13	429
12:00 PM	2	90	69	6	78	33	13	54	6	45	39	20	455
12:15 PM	5	98	76	3	74	30	18	41	2	41	43	21	452
12:30 PM	4	87	74	5	87	32	17	42	5	44	40	17	454
12:45 PM	4	95	71	6	89	23	17	40	4	44	40	20	453
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	31	730	525	32	593	227	131	356	29	338	276	154	3422
Approach %	2.41	56.77	40.82	3.76	69.60	26.64	25.39	68.99	5.62	44.01	35.94	20.05	
App/Depart	1286	/	1015	852	/	960	516	/	913	768	/	534	

NOON Peak Hr Begins at: 1200 PM

PEAK													
Volumes	15	370	290	20	328	118	65	177	17	174	162	78	1814
Approach %	2.22	54.81	42.96	4.29	70.39	25.32	25.10	68.34	6.56	42.03	39.13	18.84	
PEAK HR. FACTOR:		0.943			0.940			0.887			0.986		0.997

CONTROL: Signal
COMMENT 1: 0
GPS: 35.177218, -111.663009

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd
E-W STREET: McConnell Dr
DATE: 09/01/21
DAY: WEDNESDAY
LOCATION: Flagstaff
PROJECT#: 21-1485-011

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 1	ET 0.5	ER 0.5	WL 1	WT 1	WR 1	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	10	90	76	14	127	26	17	47	5	90	66	48	616
4:15 PM	5	84	68	7	120	21	29	55	4	99	49	27	568
4:30 PM	5	77	93	7	119	24	11	49	2	65	53	14	519
4:45 PM	5	104	68	7	136	20	22	48	5	87	57	30	589
5:00 PM	11	97	71	17	117	19	20	61	1	93	58	23	588
5:15 PM	9	96	87	23	133	31	18	65	2	86	72	34	656
5:30 PM	8	80	71	11	114	24	19	53	5	99	65	40	589
5:45 PM	9	96	70	13	112	28	27	46	9	85	68	18	581
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	62	724	604	99	978	193	163	424	33	704	488	234	4706
Approach %	4.46	52.09	43.45	7.80	77.01	15.20	26.29	68.39	5.32	49.37	34.22	16.41	
App/Depart	1390	/	1121	1270	/	1715	620	/	1127	1426	/	743	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	33	377	297	58	500	94	79	227	13	365	252	127	2422
Approach %	4.67	53.32	42.01	8.90	76.69	14.42	24.76	71.16	4.08	49.06	33.87	17.07	
PEAK HR. FACTOR:		0.921			0.872			0.938			0.912		0.923

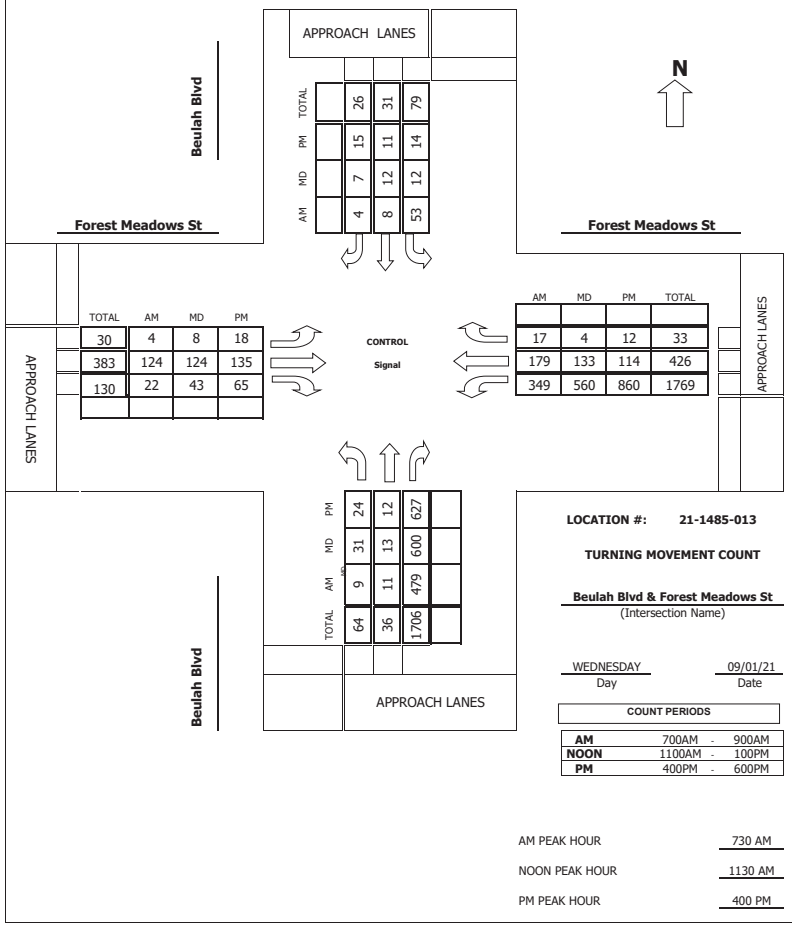
CONTROL: Signal
COMMENT 1: 0
GPS: 35.177218, -111.663009

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1485-013

TMC SUMMARY OF Beulah Blvd & Forest Meadows St



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Forest Meadows St DAY: WEDNESDAY PROJECT# 21-1485-013

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	2	0	1	0	1	1.5	0.5	2	0.5	0.5	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	1	2	149	10	1	1	1	24	5	106	28	2	330
7:15 AM	2	3	126	11	2	1	0	25	2	103	24	3	302
7:30 AM	1	3	122	13	1	1	1	32	6	78	41	6	305
7:45 AM	4	1	128	16	4	2	2	30	3	85	43	4	322
8:00 AM	1	2	122	14	1	1	0	33	8	101	45	2	330
8:15 AM	3	5	107	10	2	0	1	29	5	85	50	5	302
8:30 AM	2	1	106	11	1	1	2	24	9	63	41	8	269
8:45 AM	1	4	82	8	3	2	1	28	6	58	43	2	238
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	15	21	942	93	15	9	8	225	44	679	315	32	2398
Approach %	1.53	2.15	96.32	79.49	12.82	7.69	2.89	81.23	15.88	66.18	30.70	3.12	
App/Depart	978	/	61	117	/	738	277	/	1260	1026	/	339	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	9	11	479	53	8	4	4	124	22	349	179	17	1259
Approach %	1.80	2.20	95.99	81.54	12.31	6.15	2.67	82.67	14.67	64.04	32.84	3.12	

PEAK HR. FACTOR:	0.938	0.739	0.915	0.921	0.954

CONTROL: Signal
COMMENT 1:
GPS: 35.179013, -111.663064

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 — veracitytrafficgroup

N-S STREET: Beulah Blvd | DATE: 09/01/21 | LOCATION: Flagstaff

E-W STREET: Forest Meadows St | DAY: WEDNESDAY | PROJECT# 21-1485-013

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	2	0	1	0	1	1.5	0.5	2	0.5	0.5	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	4	2	149	6	3	1	1	24	7	128	28	1	354
11:15 AM	8	5	123	2	2	2	2	25	8	136	24	0	337
11:30 AM	5	2	155	5	5	3	1	32	5	143	29	1	386
11:45 AM	9	3	158	1	2	1	4	30	9	141	33	2	393
12:00 PM	6	6	136	4	4	2	1	33	16	163	30	1	402
12:15 PM	11	2	151	2	1	1	2	29	13	113	41	0	366
12:30 PM	10	5	128	5	5	4	5	24	11	142	43	1	383
12:45 PM	14	2	123	2	2	1	2	28	10	125	36	2	347
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	67	27	1123	27	24	15	18	225	79	1091	264	8	2968
Approach %	5.51	2.22	92.28	40.91	36.36	22.73	5.59	69.88	24.53	80.04	19.37	0.59	
App/Depart	1217	/	53	66	/	1194	322	/	1375	1363	/	346	

NOON Peak Hr Begins at: 1130 AM

PEAK													
Volumes	31	13	600	12	12	7	8	124	43	560	133	4	1547
Approach %	4.81	2.02	93.17	38.71	38.71	22.58	4.57	70.86	24.57	80.34	19.08	0.57	

PEAK HR. FACTOR:	0.947	0.596	0.875	0.898	0.962

CONTROL: Signal
COMMENT 1: 0
GPS: 35.179013, -111.663064

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

N-S STREET: Beulah Blvd | DATE: 09/01/21 | LOCATION: Flagstaff

E-W STREET: Forest Meadows St | DAY: WEDNESDAY | PROJECT# 21-1485-013

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	2	0	1	0	1	1.5	0.5	2	0.5	0.5	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	7	2	158	6	2	2	4	24	22	196	28	2	453
4:15 PM	4	5	163	2	2	5	1	28	14	228	24	5	481
4:30 PM	8	2	155	5	2	2	8	42	16	214	29	2	485
4:45 PM	5	3	151	1	5	6	5	41	13	222	33	3	488
5:00 PM	9	6	128	4	2	6	6	30	11	205	30	6	443
5:15 PM	11	2	123	2	4	2	3	33	10	163	28	2	383
5:30 PM	10	5	136	5	2	5	8	29	14	189	24	5	432
5:45 PM	14	2	135	2	5	2	5	28	18	143	41	2	397
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	68	27	1149	27	24	30	40	255	118	1560	237	27	3562
Approach %	5.47	2.17	92.36	33.33	29.63	37.04	9.69	61.74	28.57	85.53	12.99	1.48	
App/Depart	1244	/	94	81	/	1702	413	/	1431	1824	/	335	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	24	12	627	14	11	15	18	135	65	860	114	12	1907
Approach %	3.62	1.81	94.57	35.00	27.50	37.50	8.26	61.93	29.82	87.22	11.56	1.22	

PEAK HR. FACTOR:	0.964	0.833	0.826	0.955	0.977

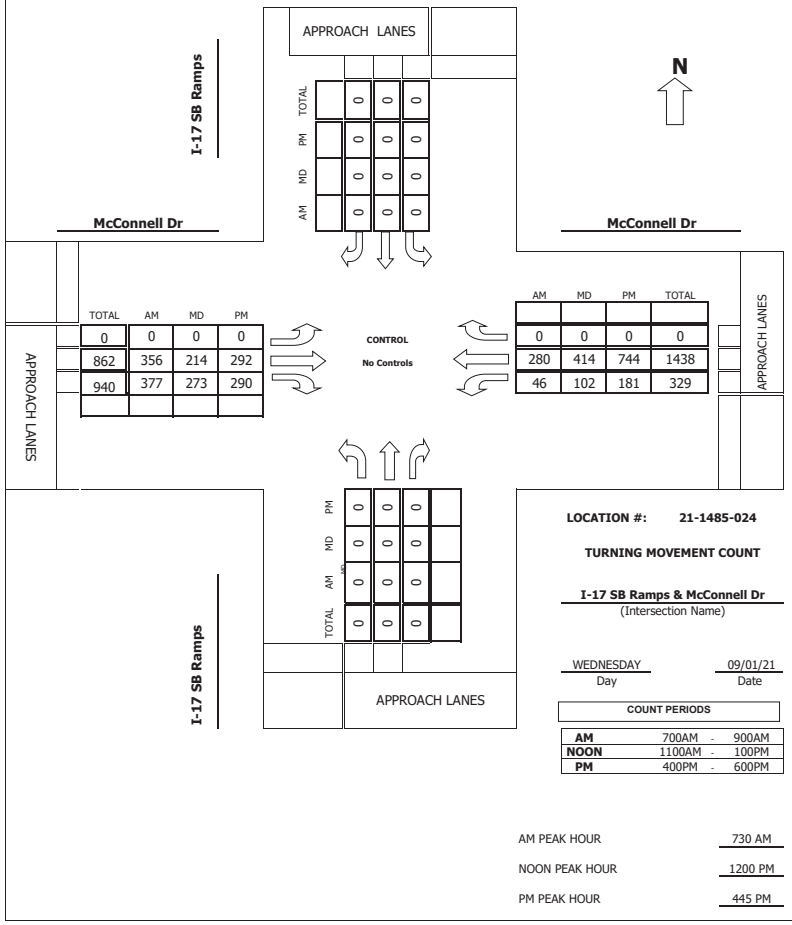
CONTROL: Signal
COMMENT 1: 0
GPS: 35.179013, -111.663064

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1485-024

TMC SUMMARY OF I-17 SB Ramps & McConnell Dr



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: I-17 SB Ramps DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: McConnell Dr DAY: WEDNESDAY PROJECT# 21-1485-024

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 0	NR 0	SL 0	ST 0	SR 0	EL 0	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	0	0	0	0	38	97	16	54	0	205
7:15 AM	0	0	0	0	0	0	0	64	105	8	48	0	225
7:30 AM	0	0	0	0	0	0	0	101	121	9	56	0	287
7:45 AM	0	0	0	0	0	0	0	129	99	14	71	0	313
8:00 AM	0	0	0	0	0	0	0	41	64	9	75	0	189
8:15 AM	0	0	0	0	0	0	0	85	93	14	78	0	270
8:30 AM	0	0	0	0	0	0	0	86	86	9	85	0	266
8:45 AM	0	0	0	0	0	0	0	92	70	8	70	0	240
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	0	0	0	0	636	735	87	537	0	1995
Approach %	####	####	####	####	####	####	0.00	46.39	53.61	13.94	86.06	0.00	
App/Depart	0	/	0	0	/	822	1371	/	636	624	/	537	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	0	0	0	0	0	0	0	356	377	46	280	0	1059
Approach %	####	####	####	####	####	####	0.00	48.57	51.43	14.11	85.89	0.00	

PEAK HR. FACTOR:	0.000	0.000	0.804	0.886	0.846

CONTROL: No Controls
COMMENT 1:
GPS: 35.177327, -111.661970

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: I-17 SB Ramps
E-W STREET: McConnell Dr
DATE: 09/01/21
DAY: WEDNESDAY
LOCATION: Flagstaff
PROJECT#: 21-1485-024

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	0	0	0	0	1	1	1	1	0	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	0	0	0	0	0	0	0	37	60	25	91	0	213
11:15 AM	0	0	0	0	0	0	0	37	65	32	77	0	211
11:30 AM	0	0	0	0	0	0	0	57	58	30	102	0	247
11:45 AM	0	0	0	0	0	0	0	58	54	33	84	0	229
12:00 PM	0	0	0	0	0	0	0	55	74	29	104	0	262
12:15 PM	0	0	0	0	0	0	0	45	75	24	105	0	249
12:30 PM	0	0	0	0	0	0	0	63	58	28	101	0	250
12:45 PM	0	0	0	0	0	0	0	51	66	21	104	0	242
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	0	0	0	0	403	510	222	768	0	1903
Approach %	####	####	####	####	####	####	0.00	44.14	55.86	22.42	77.58	0.00	
App/Depart	0	/	0	0	/	732	913	/	403	990	/	768	

NOON Peak Hr Begins at: 1200 PM

PEAK													
Volumes	0	0	0	0	0	0	0	214	273	102	414	0	1003
Approach %	####	####	####	####	####	####	0.00	43.94	56.06	19.77	80.23	0.00	

PEAK HR. FACTOR:	0.000	0.000	0.000	0.000	0.957

CONTROL: No Controls
COMMENT 1: 0
GPS: 35.177327, -111.661970

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: I-17 SB Ramps
E-W STREET: McConnell Dr
DATE: 09/01/21
DAY: WEDNESDAY
LOCATION: Flagstaff
PROJECT#: 21-1485-024

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	0	0	0	0	1	1	1	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	0	0	0	0	0	0	75	62	54	204	0	395
4:15 PM	0	0	0	0	0	0	0	60	70	24	175	0	329
4:30 PM	0	0	0	0	0	0	0	43	106	20	132	0	301
4:45 PM	0	0	0	0	0	0	0	52	71	31	174	0	328
5:00 PM	0	0	0	0	0	0	0	75	74	57	174	0	380
5:15 PM	0	0	0	0	0	0	0	102	73	53	192	0	420
5:30 PM	0	0	0	0	0	0	0	63	72	40	204	0	379
5:45 PM	0	0	0	0	0	0	0	62	67	25	171	0	325
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	0	0	0	0	532	595	304	1426	0	2857
Approach %	####	####	####	####	####	####	0.00	47.20	52.80	17.57	82.43	0.00	
App/Depart	0	/	0	0	/	899	1127	/	532	1730	/	1426	

PM Peak Hr Begins at: 445 PM

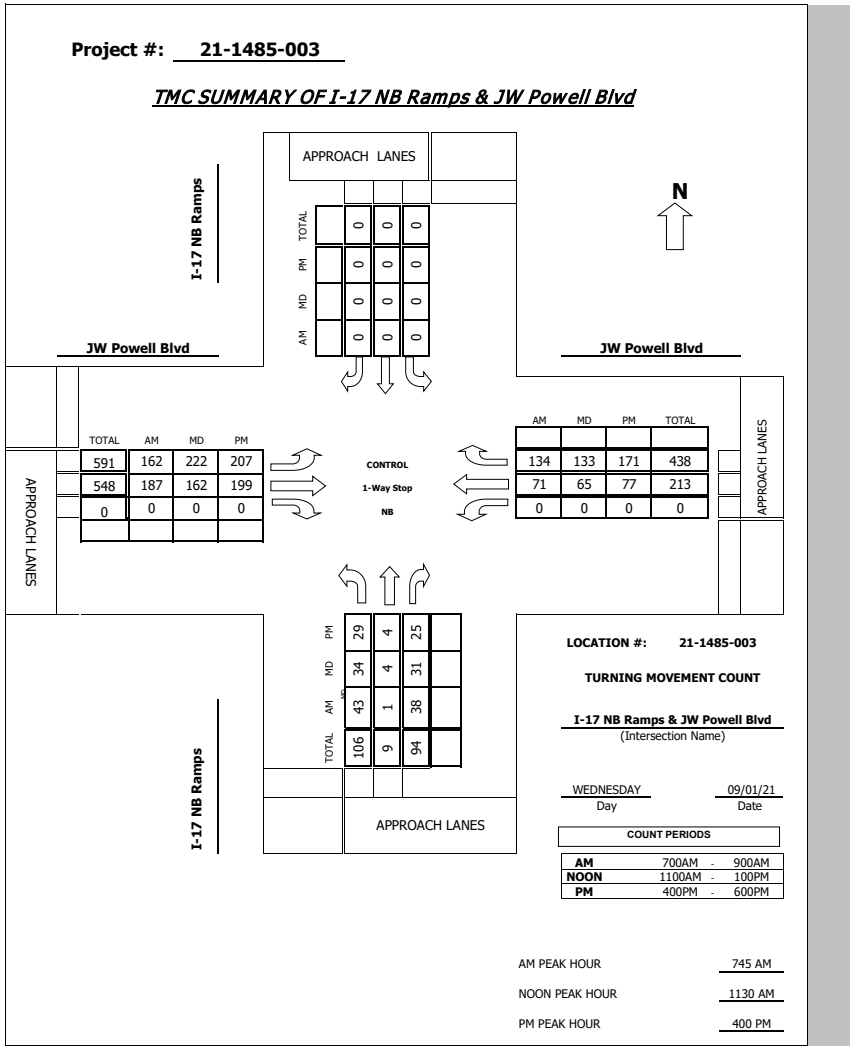
PEAK													
Volumes	0	0	0	0	0	0	0	292	290	181	744	0	1507
Approach %	####	####	####	####	####	####	0.00	50.17	49.83	19.57	80.43	0.00	

PEAK HR. FACTOR:	0.000	0.000	0.831	0.944	0.897

CONTROL: No Controls
COMMENT 1: 0
GPS: 35.177327, -111.661970

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: I-17 NB Ramps | DATE: 09/01/21 | LOCATION: Flagstaff
E-W STREET: JW Powell Blvd | DAY: WEDNESDAY | PROJECT#: 21-1485-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0.5	NT 0.5	NR 1	SL 0	ST 0	SR 0	EL 1	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	6	0	8	0	0	0	28	32	0	0	12	71	157
7:15 AM	16	0	12	0	0	0	32	30	0	0	11	45	146
7:30 AM	16	1	7	0	0	0	29	43	0	0	16	41	153
7:45 AM	13	1	6	0	0	0	47	38	0	0	19	31	155
8:00 AM	15	0	12	0	0	0	24	58	0	0	17	31	157
8:15 AM	7	0	8	0	0	0	38	46	0	0	19	40	158
8:30 AM	8	0	12	0	0	0	53	45	0	0	16	32	166
8:45 AM	6	0	7	0	0	0	34	26	0	0	15	24	112
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	87	2	72	0	0	0	285	318	0	0	125	315	1204
Approach %	54.04	1.24	44.72	####	####	####	47.26	52.74	0.00	0.00	28.41	71.59	
App/Depart	161	/	602	0	/	0	603	/	390	440	/	212	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	43	1	38	0	0	0	162	187	0	0	71	134	636
Approach %	52.44	1.22	46.34	####	####	####	46.42	53.58	0.00	0.00	34.63	65.37	

PEAK HR. FACTOR:	0.759	0.000	0.890	0.869	0.958

CONTROL: 1-Way Stop (NB)
COMMENT 1:
GPS: 35.139591, -111.683187

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 — veracitytrafficgroup

N-S STREET: I-17 NB Ramps | DATE: 09/01/21 | LOCATION: Flagstaff

E-W STREET: JW Powell Blvd | DAY: WEDNESDAY | PROJECT#: 21-1485-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	0	1	1	0	0	1	0	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	15	0	9	0	0	0	46	22	0	0	16	21	129
11:15 AM	16	0	6	0	0	0	57	20	0	0	19	19	137
11:30 AM	9	0	7	0	0	0	83	29	0	0	15	29	172
11:45 AM	10	1	6	0	0	0	46	47	0	0	11	29	150
12:00 PM	8	1	11	0	0	0	35	48	0	0	19	32	154
12:15 PM	7	2	7	0	0	0	58	38	0	0	20	43	175
12:30 PM	11	0	5	0	0	0	42	48	0	0	13	29	148
12:45 PM	16	0	5	0	0	0	50	47	0	0	16	26	160
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	92	4	56	0	0	0	417	299	0	0	129	228	1225
Approach %	60.53	2.63	36.84	####	####	####	58.24	41.76	0.00	0.00	36.13	63.87	
App/Depart	152	/	649	0	/	0	716	/	355	357	/	221	

NOON Peak Hr Begins at: 1130 AM

PEAK													
Volumes	34	4	31	0	0	0	222	162	0	0	65	133	651
Approach %	49.28	5.80	44.93	####	####	####	57.81	42.19	0.00	0.00	32.83	67.17	

PEAK HR. FACTOR:	0.863	0.000	0.857	0.000	0.930

CONTROL: 1-Way Stop (NB)
COMMENT 1: 0
GPS: 35.139591, -111.683187

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

N-S STREET: I-17 NB Ramps | DATE: 09/01/21 | LOCATION: Flagstaff

E-W STREET: JW Powell Blvd | DAY: WEDNESDAY | PROJECT#: 21-1485-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0.5	0.5	1	0	0	0	1	1	0	0	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	11	1	7	0	0	0	58	55	0	0	15	36	183
4:15 PM	9	1	11	0	0	0	51	50	0	0	13	44	179
4:30 PM	2	1	2	0	0	0	55	45	0	0	25	52	182
4:45 PM	7	1	5	0	0	0	43	49	0	0	24	39	168
5:00 PM	3	2	6	0	0	0	52	51	0	0	16	45	175
5:15 PM	5	1	4	0	0	0	46	32	0	0	17	17	122
5:30 PM	5	1	3	0	0	0	52	45	0	0	9	25	140
5:45 PM	6	1	8	0	0	0	32	31	0	0	10	17	105
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	48	9	46	0	0	0	389	358	0	0	129	275	1254
Approach %	46.60	8.74	44.66	####	####	####	52.07	47.93	0.00	0.00	31.93	68.07	
App/Depart	103	/	673	0	/	0	747	/	404	404	/	177	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	29	4	25	0	0	0	207	199	0	0	77	171	712
Approach %	50.00	6.90	43.10	####	####	####	50.99	49.01	0.00	0.00	31.05	68.95	

PEAK HR. FACTOR:	0.690	0.000	0.898	0.805	0.973

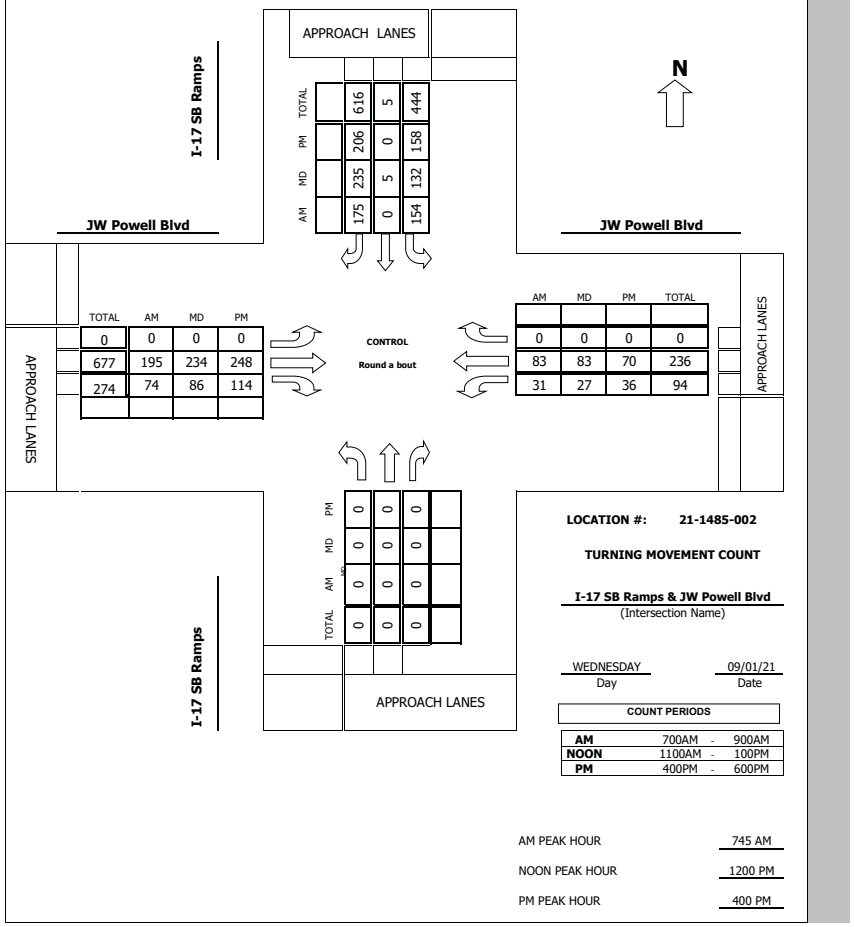
CONTROL: 1-Way Stop (NB)
COMMENT 1: 0
GPS: 35.139591, -111.683187

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1485-002

TMC SUMMARY OF I-17 SB Ramps & JW Powell Blvd



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: I-17 SB Ramps DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: JW Powell Blvd DAY: WEDNESDAY PROJECT# 21-1485-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 0	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	23	0	38	0	37	2	4	14	0	118
7:15 AM	0	0	0	25	1	18	0	37	12	5	22	0	120
7:30 AM	0	0	0	33	0	21	0	39	10	6	26	0	135
7:45 AM	0	0	0	43	0	44	0	42	12	7	25	0	173
8:00 AM	0	0	0	42	0	47	0	40	23	8	24	0	184
8:15 AM	0	0	0	40	0	30	0	44	25	6	20	0	165
8:30 AM	0	0	0	29	0	54	0	69	14	10	14	0	190
8:45 AM	0	0	0	21	1	44	0	39	17	6	15	0	143
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	256	2	296	0	347	115	52	160	0	1228
Approach %	####	####	####	46.21	0.36	53.43	0.00	75.11	24.89	24.53	75.47	0.00	
App/Depart	0	/	0	554	/	169	462	/	603	212	/	456	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	0	0	0	154	0	175	0	195	74	31	83	0	712
Approach %	####	####	####	46.81	0.00	53.19	0.00	72.49	27.51	27.19	72.81	0.00	

PEAK HR. FACTOR:	0.000	0.924	0.810	0.891	0.937

CONTROL: Round a bout
COMMENT 1:
GPS: 35.139878, -111.685663

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: I-17 SB Ramps | DATE: 09/01/21 | LOCATION: Flagstaff

E-W STREET: JW Powell Blvd | DAY: WEDNESDAY | PROJECT# 21-1485-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 0	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	0	0	0	26	0	48	0	42	22	8	23	0	169
11:15 AM	0	0	0	21	0	48	0	56	25	10	25	0	185
11:30 AM	0	0	0	32	1	53	0	80	20	3	21	0	210
11:45 AM	0	0	0	32	0	58	0	61	20	7	14	0	192
12:00 PM	0	0	0	37	2	49	0	46	27	8	19	0	188
12:15 PM	0	0	0	33	3	64	0	63	20	6	21	0	210
12:30 PM	0	0	0	31	0	70	0	59	21	7	17	0	205
12:45 PM	0	0	0	31	0	52	0	66	18	6	26	0	199
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	243	6	442	0	473	173	55	166	0	1558
Approach %	####	####	####	35.17	0.87	63.97	0.00	73.22	26.78	24.89	75.11	0.00	
App/Depart	0	/	0	691	/	234	646	/	716	221	/	608	

NOON Peak Hr Begins at: 1200 PM

PEAK													
Volumes	0	0	0	132	5	235	0	234	86	27	83	0	802
Approach %	####	####	####	35.48	1.34	63.17	0.00	73.13	26.88	24.55	75.45	0.00	
PEAK HR. FACTOR:		0.000			0.921			0.000			0.859		0.955

CONTROL: Round a bout
COMMENT 1: 0
GPS: 35.139878, -111.685663

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: I-17 SB Ramps | DATE: 09/01/21 | LOCATION: Flagstaff

E-W STREET: JW Powell Blvd | DAY: WEDNESDAY | PROJECT# 21-1485-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 0	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	0	0	35	0	54	0	78	31	7	19	0	224
4:15 PM	0	0	0	41	0	58	0	60	33	10	12	0	214
4:30 PM	0	0	0	40	0	46	0	60	26	8	19	0	199
4:45 PM	0	0	0	42	0	48	0	50	24	11	20	0	195
5:00 PM	0	0	0	37	0	48	0	66	27	10	9	0	197
5:15 PM	0	0	0	30	0	37	0	48	28	9	13	0	165
5:30 PM	0	0	0	35	0	48	0	62	24	5	9	0	183
5:45 PM	0	0	0	17	0	47	0	46	31	5	11	0	157
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	277	0	386	0	470	224	65	112	0	1534
Approach %	####	####	####	41.78	0.00	58.22	0.00	67.72	32.28	36.72	63.28	0.00	
App/Depart	0	/	0	663	/	289	694	/	747	177	/	498	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	0	0	0	158	0	206	0	248	114	36	70	0	832
Approach %	####	####	####	43.41	0.00	56.59	0.00	68.51	31.49	33.96	66.04	0.00	
PEAK HR. FACTOR:		0.000			0.919			0.830			0.855		0.929

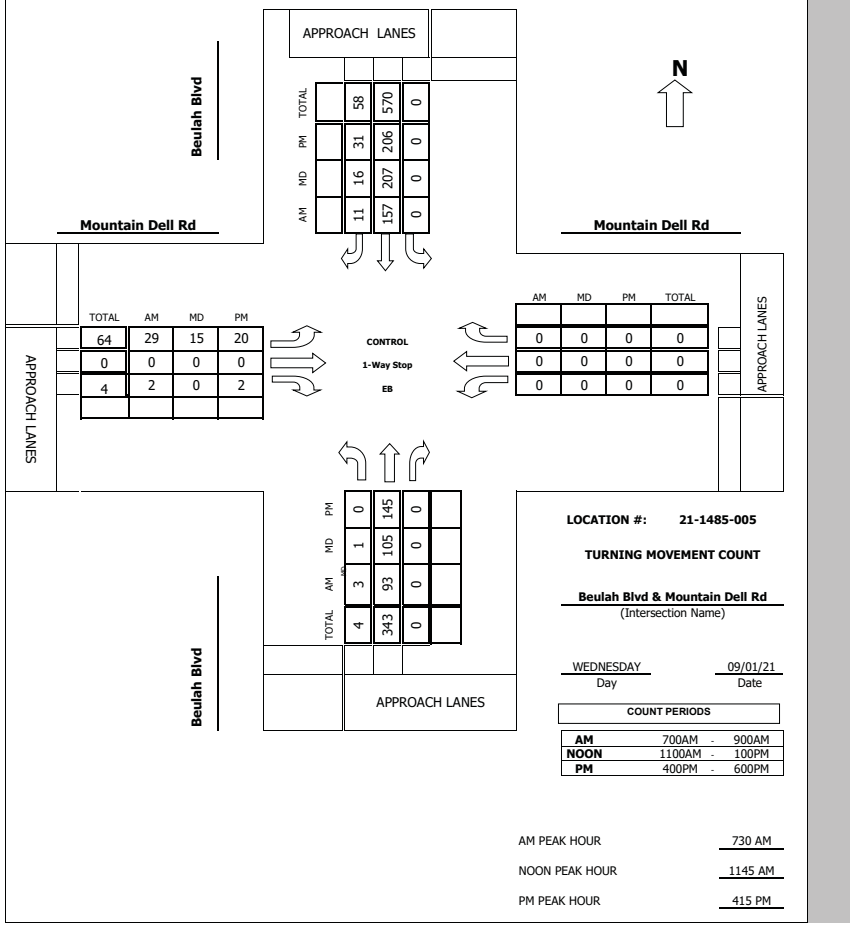
CONTROL: Round a bout
COMMENT 1: 0
GPS: 35.139878, -111.685663

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1485-005

TMC SUMMARY OF Beulah Blvd & Mountain Dell Rd



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Mountain Dell Rd DAY: WEDNESDAY PROJECT# 21-1485-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 0	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	22	0	0	30	3	8	0	1	0	0	0	64
7:15 AM	0	20	0	0	21	1	4	0	1	0	0	0	47
7:30 AM	0	27	0	0	41	1	6	0	0	0	0	0	75
7:45 AM	0	19	0	0	32	1	10	0	0	0	0	0	62
8:00 AM	1	22	0	0	32	5	10	0	0	0	0	0	70
8:15 AM	2	25	0	0	52	4	3	0	2	0	0	0	88
8:30 AM	0	22	0	0	38	1	6	0	1	0	0	0	68
8:45 AM	0	25	0	0	29	6	4	0	1	0	0	0	65
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	3	182	0	0	275	22	51	0	6	0	0	0	539
Approach %	1.62	98.38	0.00	0.00	92.59	7.41	89.47	0.00	10.53	####	####	####	
App/Depart	185	/	233	297	/	281	57	/	0	0	/	25	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	3	93	0	0	157	11	29	0	2	0	0	0	295
Approach %	3.13	96.88	0.00	0.00	93.45	6.55	93.55	0.00	6.45	####	####	####	

PEAK HR. FACTOR:	0.889	0.750	0.775	0.000	0.838

CONTROL: 1-Way Stop (EB)
COMMENT 1:
GPS: 35.165349, -111.672346

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Mountain Dell Rd DAY: WEDNESDAY PROJECT# 21-1485-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 0	WR 0	TOTAL
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	0	21	0	0	38	1	2	0	0	0	0	0	62
11:15 AM	1	17	0	0	43	2	5	0	1	0	0	0	69
11:30 AM	0	26	0	0	45	1	2	0	1	0	0	0	75
11:45 AM	0	22	0	0	53	3	4	0	0	0	0	0	82
12:00 PM	0	27	0	0	53	1	3	0	0	0	0	0	84
12:15 PM	1	24	0	0	54	3	5	0	0	0	0	0	87
12:30 PM	0	32	0	0	47	9	3	0	0	0	0	0	91
12:45 PM	0	21	0	0	41	5	5	0	0	0	0	0	72
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	2	190	0	0	374	25	29	0	2	0	0	0	622
Approach %	1.04	98.96	0.00	0.00	93.73	6.27	93.55	0.00	6.45	####	####	####	
App/Depart	192	/	219	399	/	376	31	/	0	0	/	27	

NOON Peak Hr Begins at: 1145 AM

PEAK													
Volumes	1	105	0	0	207	16	15	0	0	0	0	0	344
Approach %	0.94	99.06	0.00	0.00	92.83	7.17	100.00	0.00	0.00	####	####	####	
PEAK HR. FACTOR:	0.828			0.978			0.750			0.000			0.945

CONTROL: 1-Way Stop (EB)
COMMENT 1: 0
GPS: 35.165349, -111.672346

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	400	PM	600	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Beulah Blvd DATE: 09/01/21 LOCATION: Flagstaff

E-W STREET: Mountain Dell Rd DAY: WEDNESDAY PROJECT# 21-1485-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 0	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	37	0	0	49	2	3	0	1	0	0	0	92
4:15 PM	0	43	0	0	62	6	4	0	0	0	0	0	115
4:30 PM	0	33	0	0	45	9	5	0	1	0	0	0	93
4:45 PM	0	38	0	0	50	8	2	0	0	0	0	0	98
5:00 PM	0	31	0	0	49	8	9	0	1	0	0	0	98
5:15 PM	0	33	0	0	29	12	3	0	3	0	0	0	80
5:30 PM	1	21	0	0	34	6	8	0	0	0	0	0	70
5:45 PM	1	31	0	0	38	5	3	0	3	0	0	0	81
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	2	267	0	0	356	56	37	0	9	0	0	0	727
Approach %	0.74	99.26	0.00	0.00	86.41	13.59	80.43	0.00	19.57	####	####	####	
App/Depart	269	/	304	412	/	365	46	/	0	0	/	58	

PM Peak Hr Begins at: 415 PM

PEAK													
Volumes	0	145	0	0	206	31	20	0	2	0	0	0	404
Approach %	0.00	100.00	0.00	0.00	86.92	13.08	90.91	0.00	9.09	####	####	####	
PEAK HR. FACTOR:	0.843			0.871			0.550			0.000			0.878

CONTROL: 1-Way Stop (EB)
COMMENT 1: 0
GPS: 35.165349, -111.672346

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Wednesday, September 1, 2021 City: Flagstaff Project #: 21-1485-035

Location: Beulah Blvd north of Fairgrounds Rd / JW Powell Blvd

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	2		0					12:00	24		49				
00:15	1		1					12:15	30		42				
00:30	2		2					12:30	30		43				
00:45	3	8	0	3			11	12:45	29	113	51	185			298
01:00	2		0					13:00	28		38				
01:15	1		0					13:15	35		43				
01:30	0		0					13:30	29		42				
01:45	0	3	1	1			4	13:45	32	124	45	168			292
02:00	1		1					14:00	33		44				
02:15	0		0					14:15	38		40				
02:30	0		0					14:30	35		50				
02:45	2	3	2	3			6	14:45	33	139	47	181			320
03:00	0		2					15:00	42		39				
03:15	1		1					15:15	38		48				
03:30	0		2					15:30	44		48				
03:45	0	1	4	9			10	15:45	31	155	52	187			342
04:00	0		1					16:00	40		53				
04:15	0		1					16:15	43		45				
04:30	2		3					16:30	27		51				
04:45	0	2	6	11			13	16:45	39	149	48	197			346
05:00	5		9					17:00	38		41				
05:15	2		15					17:15	29		43				
05:30	2		10					17:30	27		37				
05:45	3	12	7	41			53	17:45	30	124	31	152			276
06:00	2		6					18:00	29		29				
06:15	8		18					18:15	35		24				
06:30	11		18					18:30	22		25				
06:45	8	29	20	62			91	18:45	26	112	22	100			212
07:00	20		27					19:00	9		17				
07:15	18		29					19:15	16		19				
07:30	23		34					19:30	13		9				
07:45	19	80	40	130			210	19:45	13	51	11	56			107
08:00	25		28					20:00	14		13				
08:15	26		43					20:15	8		12				
08:30	23		43					20:30	13		20				
08:45	22	96	33	147			243	20:45	13	48	12	57			105
09:00	18		24					21:00	11		13				
09:15	31		38					21:15	9		17				
09:30	28		46					21:30	3		3				
09:45	40	117	23	131			248	21:45	15	38	4	37			75
10:00	26		35					22:00	3		4				
10:15	32		26					22:15	2		1				
10:30	30		27					22:30	4		2				
10:45	26	114	28	116			230	22:45	4	13	7	14			27
11:00	36		34					23:00	5		3				
11:15	44		36					23:15	2		3				
11:30	35		54					23:30	0		1				
11:45	37	152	36	160			312	23:45	1	8	2	9			17
Total Vol.	617		814				**1431**		1074		1343				**2417**

GPS Coordinates: 35.140891, -111.686948

Daily Totals

NB	SB	EB	WB	Combined
1691	2157			**3848**

	AM			PM		
Split %	43.1%	56.9%	**37.2%**	44.4%	55.6%	**62.8%**
Peak Hour	11:00	11:30	**11:15**	15:30	15:15	**15:30**
Volume	152	181	**315**	158	201	**356**
P.H.F.	0.86	0.84	**0.88**	0.90	0.95	**0.96**

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Wednesday, September 1, 2021 City: Flagstaff Project #: 21-1485-036

Location: Beulah Blvd south of Forest Meadows St

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	5		4					12:00	148		183				
00:15	2		5					12:15	164		127				
00:30	3		8					12:30	143		158				
00:45	6	16	5	22			38	12:45	139	594	137	605			1199
01:00	9		2					13:00	145		139				
01:15	5		3					13:15	152		166				
01:30	8		6					13:30	155		161				
01:45	4	26	9	20			46	13:45	166	618	154	620			1238
02:00	7		5					14:00	161		178				
02:15	5		8					14:15	154		185				
02:30	8		14					14:30	174		189				
02:45	6	26	11	38			64	14:45	145	634	199	751			1385
03:00	9		6					15:00	152		204				
03:15	13		9					15:15	163		233				
03:30	16		5					15:30	166		225				
03:45	18	56	8	28			84	15:45	161	642	245	907			1549
04:00	14		14					16:00	167		220				
04:15	21		21					16:15	172		244				
04:30	42		32					16:30	165		232				
04:45	54	131	30	97			228	16:45	159	663	240	936			1599
05:00	65		33					17:00	143		218				
05:15	60		43					17:15	136		177				
05:30	69		52					17:30	151		205				
05:45	86	280	60	188			468	17:45	151	581	166	766			1347
06:00	85		76					18:00	143		163				
06:15	104		87					18:15	128		147				
06:30	122		80					18:30	122		155				
06:45	143	454	98	341			795	18:45	117	510	152	617			1127
07:00	152		112					19:00	111		154				
07:15	131		107					19:15	107		143				
07:30	126		85					19:30	85		128				
07:45	133	542	92	396			938	19:45	69	372	122	547			919
08:00	125		110					20:00	60		104				
08:15	115		92					20:15	85		77				
08:30	109		73					20:30	74		70				
08:45	87	436	67	342			778	20:45	75	294	78	329			623
09:00	89		78					21:00	50		80				
09:15	101		89					21:15	54		69				
09:30	103		107					21:30	42		60				
09:45	136	429	106	380			809	21:45	21	167	63	272			439
10:00	131		103					22:00	17		55				
10:15	125		111					22:15	19		50				
10:30	154		121					22:30	16		43				
10:45	147	557	125	460			1017	22:45	13	65	32	180			245
11:00	155		138					23:00	9		28				
11:15	136		146					23:15	11		21				
11:30	162		153					23:30	10		14				
11:45	170	623	152	589			1212	23:45	14	44	8	71			115
Total Vol.	3576		2901				**6477**		5184		6601				**11785**

GPS Coordinates: 35.178444, -111.663052

Daily Totals

NB	SB	EB	WB	Combined
8760	9502			**18262**

	AM			PM		
Split %	55.2%	44.8%	**35.5%**	44.0%	56.0%	**64.5%**
Peak Hour	11:30	11:15	**11:30**	15:30	15:45	**15:45**
Volume	644	634	**1259**	666	941	**1606**
P.H.F.	0.95	0.87	**0.95**	0.97	0.96	**0.97**

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Wednesday, September 1, 2021 City: Flagstaff Project #: 21-1485-039

Location: Beaver St south of Forest Ave

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	2		0					12:00	37		105				
00:15	1		3					12:15	57		93				
00:30	1		2					12:30	47		82				
00:45	2	6	2	7			13	12:45	56	197	100	380			577
01:00	1		2					13:00	41		87				
01:15	1		1					13:15	42		89				
01:30	0		0					13:30	50		66				
01:45	0	2	1	4			6	13:45	39	172	105	347			519
02:00	0		0					14:00	61		106				
02:15	1		2					14:15	49		132				
02:30	0		2					14:30	66		119				
02:45	1	2	3	7			9	14:45	61	237	133	490			727
03:00	0		2					15:00	50		127				
03:15	1		2					15:15	50		96				
03:30	0		1					15:30	48		124				
03:45	1	2	1	6			8	15:45	56	204	142	489			693
04:00	0		4					16:00	47		120				
04:15	1		4					16:15	55		124				
04:30	0		4					16:30	42		117				
04:45	3	4	2	14			18	16:45	53	197	153	514			711
05:00	2		6					17:00	46		137				
05:15	2		10					17:15	48		125				
05:30	9		22					17:30	45		113				
05:45	5	18	31	69			87	17:45	34	173	95	470			643
06:00	17		29					18:00	31		88				
06:15	18		48					18:15	42		73				
06:30	31		56					18:30	38		60				
06:45	29	95	54	187			282	18:45	26	137	65	286			423
07:00	32		83					19:00	32		45				
07:15	46		150					19:15	28		40				
07:30	68		187					19:30	31		44				
07:45	76	222	156	576			798	19:45	13	104	29	158			262
08:00	45		158					20:00	20		22				
08:15	43		110					20:15	14		21				
08:30	36		114					20:30	22		27				
08:45	27	151	86	468			619	20:45	16	72	12	82			154
09:00	38		65					21:00	21		20				
09:15	36		83					21:15	7		18				
09:30	44		80					21:30	9		13				
09:45	52	170	85	313			483	21:45	8	45	12	63			108
10:00	42		88					22:00	11		5				
10:15	37		78					22:15	6		6				
10:30	31		80					22:30	4		8				
10:45	27	137	82	328			465	22:45	3	24	6	25			49
11:00	32		83					23:00	4		13				
11:15	36		92					23:15	3		4				
11:30	32		101					23:30	3		5				
11:45	39	139	96	372			511	23:45	2	12	4	26			38
Total Vol.	948		2351				**3299**		1574		3330				**4904**

GPS Coordinates: 35.210151, -111.644653

Daily Totals

NB	SB	EB	WB	Combined
2522	5681			**8203**

	AM			PM		
Split %	28.7%	71.3%	**40.2%**	32.1%	67.9%	**59.8%**
Peak Hour	07:15	07:15	**07:15**	14:00	16:30	**14:15**
Volume	235	651	**886**	237	532	**737**
P.H.F.	0.77	0.87	**0.87**	0.90	0.87	**0.95**

APPENDIX C

EXISTING PEAK HOUR ANALYSIS

APPENDIX C

EXISTING PEAK HOUR ANALYSIS

2021 EXISTING RIGHT TURN ON RED REPORTS

7: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

HCM Signalized Intersection Capacity Analysis

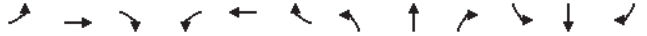
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	20	7	76	24	665	1	304	45	345	55	104
Future Volume (vph)	216	20	7	76	24	665	1	304	45	345	55	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9	5.0	4.0	4.1	6.5	5.0	4.1	6.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1766	1768		1763	1863	1578	1770	1863	1558	3430	1863	1583
Flt Permitted	0.74	1.00		0.74	1.00	1.00	0.72	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	1375	1768		1369	1863	1578	1336	1863	1558	1406	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	240	22	8	84	27	739	1	338	50	383	61	116
RTOR Reduction (vph)	0	7	0	0	0	173	0	0	33	0	0	51
Lane Group Flow (vph)	240	23	0	84	27	566	1	338	17	383	61	65
Confl. Peds. (#/hr)	3		3	3		3			3	3		
Confl. Bikes (#/hr)			5						1			
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6	6	6
Actuated Green, G (s)	23.8	10.6		20.6	9.0	44.1	48.4	39.7	39.7	81.3	67.1	67.1
Effective Green, g (s)	23.8	13.2		20.6	11.6	44.1	48.4	42.1	39.7	81.3	69.5	67.1
Actuated g/C Ratio	0.20	0.11		0.17	0.10	0.37	0.40	0.35	0.33	0.68	0.58	0.56
Clearance Time (s)	4.0	7.5		4.0	7.5	5.0	4.0	6.5	6.5	5.0	6.5	6.5
Vehicle Extension (s)	1.5	1.5		1.5	1.5	2.0	1.5	2.0	2.0	2.0	1.5	1.5
Lane Grp Cap (vph)	315	194		273	180	645	570	653	515	1544	1078	885
v/s Ratio Prot	c0.08	0.01		0.03	0.01	c0.26	0.00	c0.18		0.07	0.03	
v/s Ratio Perm	0.07			0.02		0.10	0.00		0.01	0.10		0.04
v/c Ratio	0.76	0.12		0.31	0.15	0.88	0.00	0.52	0.03	0.25	0.06	0.07
Uniform Delay, d1	44.2	48.2		43.9	49.7	35.4	21.4	30.9	27.2	14.2	11.0	12.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.76	1.04	1.17
Incremental Delay, d2	9.4	0.1		0.2	0.1	12.4	0.0	2.9	0.1	0.0	0.1	0.2
Delay (s)	53.7	48.2		44.1	49.8	47.9	21.4	33.8	27.3	10.9	11.5	14.4
Level of Service	D	D		D	D	D	C	C	C	B	B	B
Approach Delay (s)		53.1			47.6			32.9			11.7	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	90.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

10: Beulah Blvd & Woodlands Village Blvd

HCM Signalized Intersection Capacity Analysis



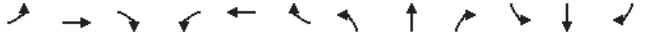
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	1	300	1	7	14	376	802	2	12	188	53
Future Volume (vph)	75	1	300	1	7	14	376	802	2	12	188	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.4	7.1	2.4	4.0	7.1		4.0	3.8	5.7	4.0	3.8	3.8
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	0.85	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1506	1504	1770	1681		1768	3539	1583	1770	3539	1561
Flt Permitted	0.74	1.00	1.00	0.74	1.00		0.62	1.00	1.00	0.27	1.00	1.00
Satd. Flow (perm)	1383	1506	1504	1380	1681		1158	3539	1583	511	3539	1561
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	82	1	330	1	8	15	413	881	2	13	207	58
RTOR Reduction (vph)	0	149	115	0	14	0	0	0	1	0	0	26
Lane Group Flow (vph)	82	17	50	1	9	0	413	881	1	13	207	32
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)												1
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4			2		2	6		6
Actuated Green, G (s)	18.5	11.4	33.2	6.5	5.4		92.4	79.3	79.3	72.3	64.9	64.9
Effective Green, g (s)	21.2	11.4	36.4	6.5	5.4		92.4	81.2	79.3	72.3	66.8	66.8
Actuated g/C Ratio	0.18	0.10	0.30	0.05	0.05		0.77	0.68	0.66	0.60	0.56	0.56
Clearance Time (s)	4.0	7.1	4.0	4.0	7.1		4.0	5.7	5.7	4.0	5.7	5.7
Vehicle Extension (s)	3.0	3.0	1.0	3.0	3.0		1.0	1.5	1.5	3.0	1.5	1.5
Lane Grp Cap (vph)	272	143	486	78	75		1002	2394	1046	385	1970	868
v/s Ratio Prot	c0.02	0.01	0.02	0.00	0.01		c0.07	0.25		0.00	0.06	
v/s Ratio Perm	c0.03		0.01	0.00			c0.24		0.00	0.02		0.02
v/c Ratio	0.30	0.12	0.10	0.01	0.12		0.41	0.37	0.00	0.03	0.11	0.04
Uniform Delay, d1	43.2	49.7	30.1	55.0	55.0		4.9	8.4	6.9	14.0	12.5	12.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.16	0.83	1.00	0.62	0.32	3.84
Incremental Delay, d2	0.6	0.4	0.0	0.1	0.7		0.1	0.2	0.0	0.0	0.1	0.1
Delay (s)	43.9	50.1	30.1	55.1	55.7		5.8	7.2	6.9	8.7	4.1	46.3
Level of Service	D	D	C	E	E		A	A	A	A	A	D
Approach Delay (s)		40.9			55.7			6.8			13.1	
Approach LOS		D			E			A			B	

Intersection Summary				
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

11: Beulah Blvd & McConnell Dr

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	162	6	162	83	35	13	427	513	58	264	42
Future Volume (vph)	32	162	6	162	83	35	13	427	513	58	264	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.2	3.2		1.2	3.2	3.2	2.4	4.1	4.1	2.4	4.1	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1768	1851		1761	1863	1557	1767	3539	1526	1762	3454	
Flt Permitted	0.60	1.00		0.35	1.00	1.00	0.52	1.00	1.00	0.43	1.00	
Satd. Flow (perm)	1125	1851		655	1863	1557	964	3539	1526	797	3454	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	38	193	7	193	99	42	15	508	611	69	314	50
RTOR Reduction (vph)	0	1	0	0	0	35	0	0	272	0	7	0
Lane Group Flow (vph)	38	199	0	193	99	7	15	508	339	69	357	0
Confl. Peds. (#/hr)	1		16	16		1	2		13	13		2
Confl. Bikes (#/hr)			1			2			2			1
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		
Actuated Green, G (s)	28.1	17.2		30.3	18.3	18.3	69.2	64.9	64.9	73.0	66.8	
Effective Green, g (s)	33.7	20.0		35.9	21.1	21.1	72.4	66.5	66.5	76.2	68.4	
Actuated g/C Ratio	0.28	0.17		0.30	0.18	0.18	0.60	0.55	0.55	0.64	0.57	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	5.7	5.7	4.0	5.7	
Vehicle Extension (s)	3.0	2.0		3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	389	308		332	327	273	621	1961	845	568	1968	
v/s Ratio Prot	0.01	c0.11		c0.07	0.05		0.00	0.14		c0.01	0.10	
v/s Ratio Perm	0.02			0.10		0.00	0.01		c0.22	0.07		
v/c Ratio	0.10	0.65		0.58	0.30	0.03	0.02	0.26	0.40	0.12	0.18	
Uniform Delay, d1	33.9	46.7		41.6	43.0	40.9	10.4	13.9	15.3	10.9	12.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.72	0.68	1.84	1.84	1.68	
Incremental Delay, d2	0.1	3.5		2.6	0.2	0.0	0.0	0.3	1.4	0.1	0.2	
Delay (s)	34.0	50.2		44.2	43.2	41.0	7.6	9.8	29.6	20.1	21.0	
Level of Service	C	D		D	D	D	A	A	C	C	C	
Approach Delay (s)		47.6			43.5			20.4			20.9	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	60.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	124	22	349	179	17	9	11	479	53	8	4
Future Volume (vph)	4	124	22	349	179	17	9	11	479	53	8	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	3.3		5.0	3.3		5.0	4.1	2.8	2.8	4.1	
Lane Util. Factor	1.00	0.95		0.97	1.00		1.00	1.00	0.88	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1766	3451		3429	1833		1754	1863	2768	1763	1746	
Flt Permitted	0.49	1.00		0.64	1.00		0.75	1.00	1.00	0.70	1.00	
Satd. Flow (perm)	909	3451		2309	1833		1384	1863	2768	1307	1746	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	131	23	367	188	18	9	12	504	56	8	4
RTOR Reduction (vph)	0	12	0	0	3	0	0	0	239	0	3	0
Lane Group Flow (vph)	4	142	0	367	203	0	9	12	265	56	9	0
Confl. Peds. (#/hr)	2		1	1		2	4		4	4		4
Confl. Bikes (#/hr)			4			4			2			4
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	3	8		7	4		5	2	7	1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	69.8	32.2		69.8	32.2		26.6	21.1	58.7	29.6	22.6	
Effective Green, g (s)	74.8	34.7		69.8	34.7		26.6	23.3	63.1	34.0	24.8	
Actuated g/C Ratio	0.62	0.29		0.58	0.29		0.22	0.19	0.53	0.28	0.21	
Clearance Time (s)	5.0	5.8		5.0	5.8		5.0	6.3	5.0	5.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	3.0	2.5	
Lane Grp Cap (vph)	852	997		1694	530		323	361	1455	405	360	
v/s Ratio Prot	0.00	0.04		c0.07	c0.11		0.00	0.01	c0.06	c0.01	0.01	
v/s Ratio Perm	0.00			0.06			0.00		0.04	0.03		
v/c Ratio	0.00	0.14		0.22	0.38		0.03	0.03	0.18	0.14	0.02	
Uniform Delay, d1	8.8	31.6		11.8	34.1		36.5	39.2	14.9	31.8	38.0	
Progression Factor	1.00	1.00		1.00	1.00		0.93	0.85	3.15	1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.3	2.1		0.0	0.2	0.3	0.2	0.0	
Delay (s)	8.8	31.9		12.1	36.2		34.0	33.5	47.2	32.0	38.0	
Level of Service	A	C		B	D		C	C	D	C	D	
Approach Delay (s)		31.3			20.7			46.7			33.0	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.4	
Intersection Capacity Utilization	64.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

7: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

HCM Signalized Intersection Capacity Analysis

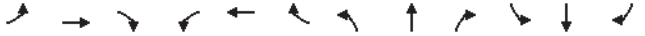
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	18	5	74	31	535	4	193	29	734	105	261
Future Volume (vph)	135	18	5	74	31	535	4	193	29	734	105	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.0	4.9	5.0	4.0	4.1	6.5	5.0	4.1	6.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1764	1783		1767	1863	1573	1770	1863	1558	3425	1863	1583
Flt Permitted	0.74	1.00		0.74	1.00	1.00	0.69	1.00	1.00	0.61	1.00	1.00
Satd. Flow (perm)	1367	1783		1381	1863	1573	1281	1863	1558	2206	1863	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	138	18	5	76	32	546	4	197	30	749	107	266
RTOR Reduction (vph)	0	4	0	0	0	383	0	0	14	0	0	104
Lane Group Flow (vph)	138	19	0	76	32	163	4	197	16	749	107	162
Confl. Peds. (#/hr)	4		1	1		4			3	3		
Confl. Bikes (#/hr)			7			1			2			
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6	6	6
Actuated Green, G (s)	17.3	9.6		16.3	9.1	25.1	72.1	64.2	64.2	86.7	73.3	73.3
Effective Green, g (s)	17.3	12.2		16.3	11.7	25.1	72.1	66.6	64.2	86.7	75.7	73.3
Actuated g/C Ratio	0.14	0.10		0.14	0.10	0.21	0.60	0.55	0.54	0.72	0.63	0.61
Clearance Time (s)	4.0	7.5		4.0	7.5	5.0	4.0	6.5	6.5	5.0	6.5	6.5
Vehicle Extension (s)	1.5	1.5		1.5	1.5	2.0	1.5	2.0	2.0	2.0	1.5	1.5
Lane Grp Cap (vph)	222	181		210	181	394	801	1033	833	1756	1175	966
v/s Ratio Prot	c0.04	0.01		0.02	0.02	c0.06	0.00	0.11		c0.06	0.06	
v/s Ratio Perm	c0.05			0.03		0.05	0.00		0.01	c0.25		0.10
v/c Ratio	0.62	0.10		0.36	0.18	0.41	0.00	0.19	0.02	0.43	0.09	0.17
Uniform Delay, d1	48.2	48.9		47.4	49.7	41.1	9.6	13.3	13.1	7.9	8.7	10.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.35	2.41
Incremental Delay, d2	3.9	0.1		0.4	0.2	0.3	0.0	0.4	0.0	0.1	0.1	0.4
Delay (s)	52.1	49.0		47.8	49.9	41.3	9.6	13.7	13.2	8.1	11.9	24.8
Level of Service	D	D		D	D	D	A	B	B	A	B	C
Approach Delay (s)		51.6			42.5			13.6			12.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

10: Beulah Blvd & Woodlands Village Blvd

HCM Signalized Intersection Capacity Analysis



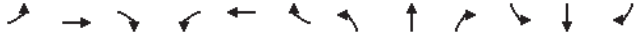
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	4	551	3	3	12	339	524	2	8	555	126
Future Volume (vph)	173	4	551	3	3	12	339	524	2	8	555	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.4	7.1	2.4	4.0	7.1		4.0	3.8	5.7	4.0	3.8	3.8
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99	0.99	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	0.85	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1756	1486	1496	1769	1610		1766	3539	1546	1768	3539	1538
Flt Permitted	0.75	1.00	1.00	0.56	1.00		0.38	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	1382	1486	1496	1034	1610		710	3539	1546	786	3539	1538
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	177	4	562	3	3	12	346	535	2	8	566	129
RTOR Reduction (vph)	0	244	178	0	11	0	0	0	1	0	0	65
Lane Group Flow (vph)	177	41	103	3	4	0	346	535	1	8	566	64
Confl. Peds. (#/hr)	7		1	1		7	10		1	1		10
Confl. Bikes (#/hr)			1									
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	3	8	5	7	4		5	2		1	6	
Permitted Phases	8		8	4			2		2	6		6
Actuated Green, G (s)	24.1	15.9	40.8	8.3	7.2		87.9	76.7	76.7	62.8	57.3	57.3
Effective Green, g (s)	25.7	15.9	44.0	8.3	7.2		87.9	78.6	76.7	62.8	59.2	59.2
Actuated g/C Ratio	0.21	0.13	0.37	0.07	0.06		0.73	0.65	0.64	0.52	0.49	0.49
Clearance Time (s)	4.0	7.1	4.0	4.0	7.1		4.0	5.7	5.7	4.0	5.7	5.7
Vehicle Extension (s)	3.0	3.0	1.0	3.0	3.0		1.0	1.5	1.5	3.0	1.5	1.5
Lane Grp Cap (vph)	331	196	578	78	96		739	2318	988	456	1745	758
v/s Ratio Prot	c0.05	0.03	0.04	0.00	0.00		c0.10	0.15		0.00	0.16	
v/s Ratio Perm	c0.06		0.03	0.00			c0.25		0.00	0.01		0.04
v/c Ratio	0.53	0.21	0.18	0.04	0.04		0.47	0.23	0.00	0.02	0.32	0.08
Uniform Delay, d1	42.5	46.4	25.7	55.1	53.1		11.8	8.4	7.8	15.7	18.3	16.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.29	0.99	1.00	0.36	0.48	0.47
Incremental Delay, d2	1.7	0.5	0.1	0.2	0.2		0.1	0.2	0.0	0.0	0.4	0.2
Delay (s)	44.2	47.0	25.8	55.3	53.3		15.3	8.5	7.8	5.6	9.2	7.7
Level of Service	D	D	C	E	D		B	A	A	A	A	A
Approach Delay (s)		38.3			53.6			11.2			8.9	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

11: Beulah Blvd & McConnell Dr

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	227	13	365	252	127	33	377	297	58	500	94
Future Volume (vph)	79	227	13	365	252	127	33	377	297	58	500	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.2	3.2		1.2	3.2	3.2	2.4	4.1	4.1	2.4	4.1	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.95	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1769	1845		1766	1863	1561	1769	3539	1497	1756	3440	
Flt Permitted	0.27	1.00		0.31	1.00	1.00	0.30	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	497	1845		572	1863	1561	568	3539	1497	833	3440	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	247	14	397	274	138	36	410	323	63	543	102
RTOR Reduction (vph)	0	2	0	0	0	104	0	0	199	0	12	0
Lane Group Flow (vph)	86	259	0	397	274	34	36	410	124	63	633	0
Confl. Peds. (#/hr)	1		11	11		1	2		21	21		2
Confl. Bikes (#/hr)			1						8			3
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		
Actuated Green, G (s)	40.0	21.0		51.4	26.7	26.7	48.0	44.5	44.5	60.3	51.1	
Effective Green, g (s)	45.6	23.8		54.5	29.5	29.5	51.2	46.1	46.1	61.9	52.7	
Actuated g/C Ratio	0.38	0.20		0.45	0.25	0.25	0.43	0.38	0.38	0.52	0.44	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	5.7	5.7	4.0	5.7	
Vehicle Extension (s)	3.0	2.0		3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	419	365		533	457	383	293	1359	575	519	1510	
v/s Ratio Prot	0.04	0.14		c0.17	c0.15		0.01	0.12		c0.01	c0.18	
v/s Ratio Perm	0.04			c0.17		0.02	0.05		0.08	0.05		
v/c Ratio	0.21	0.71		0.74	0.60	0.09	0.12	0.30	0.22	0.12	0.42	
Uniform Delay, d1	34.6	44.9		33.8	40.0	34.9	28.2	25.7	24.8	18.3	23.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.62	0.73	0.82	1.50	1.84	
Incremental Delay, d2	0.2	5.4		5.6	1.4	0.0	0.2	0.6	0.8	0.1	0.8	
Delay (s)	34.8	50.2		39.4	41.4	34.9	17.8	19.3	21.2	27.6	43.4	
Level of Service	C	D		D	D	C	B	B	C	C	D	
Approach Delay (s)		46.4			39.3			20.0			42.0	
Approach LOS		D			D			B			D	

Intersection Summary				
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	135	65	860	114	12	24	12	627	14	11	15
Future Volume (vph)	18	135	65	860	114	12	24	12	627	14	11	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	3.3		5.0	3.3		5.0	4.1	2.8	2.8	4.1	
Lane Util. Factor	1.00	0.95		0.97	1.00		1.00	1.00	0.88	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1749	3347		3424	1828		1767	1863	2766	1762	1672	
Flt Permitted	0.61	1.00		0.58	1.00		0.64	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1127	3347		2101	1828		1192	1863	2766	1391	1672	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	18	138	66	878	116	12	24	12	640	14	11	15
RTOR Reduction (vph)	0	47	0	0	3	0	0	0	281	0	12	0
Lane Group Flow (vph)	18	157	0	878	125	0	24	12	359	14	14	0
Confl. Peds. (#/hr)	7		3	3		7	1		4	4		1
Confl. Bikes (#/hr)			4			4			1			4
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	3	8		7	4		5	2	7	1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	69.8	32.2		69.8	32.2		31.5	25.3	62.9	24.7	21.9	
Effective Green, g (s)	74.8	34.7		69.8	34.7		31.5	27.5	67.3	29.1	24.1	
Actuated g/C Ratio	0.62	0.29		0.58	0.29		0.26	0.23	0.56	0.24	0.20	
Clearance Time (s)	5.0	5.8		5.0	5.8		5.0	6.3	5.0	5.0	6.3	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	3.0	2.5	
Lane Grp Cap (vph)	910	967		1636	528		342	426	1551	352	335	
v/s Ratio Prot	0.01	0.05		c0.17	0.07		c0.00	0.01	c0.08	0.00	0.01	
v/s Ratio Perm	0.01			c0.14			0.01		0.05	0.01		
v/c Ratio	0.02	0.16		0.54	0.24		0.07	0.03	0.23	0.04	0.04	
Uniform Delay, d1	8.6	31.8		14.2	32.5		33.1	35.9	13.3	34.7	38.6	
Progression Factor	1.00	1.00		1.00	1.00		0.84	0.84	1.45	1.00	1.00	
Incremental Delay, d2	0.0	0.4		1.3	1.1		0.1	0.1	0.3	0.0	0.0	
Delay (s)	8.7	32.2		15.4	33.6		27.9	30.4	19.6	34.8	38.7	
Level of Service	A	C		B	C		C	C	B	C	D	
Approach Delay (s)		30.3			17.7			20.1			37.3	
Approach LOS		C			B			C			D	

Intersection Summary					
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.43				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.4		
Intersection Capacity Utilization	78.6%	ICU Level of Service	D		
Analysis Period (min)	15				

c Critical Lane Group

AM Peak Hour

Intersection 7 - Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N	EBR	WBR	NBR	SBR
25% of Turns	1	166	11	26
HCM 2000	7	173	33	51
Reduction Used	**1**	**166**	**11**	**26**

Intersection 9 - High Country Trl & Lake Mary Rd	EBR	WBR	NBR	SBR
25% of Turns	23	0	0	41
HCM 2000	71	0	0	119
Reduction Used	**23**	**0**	**0**	**41**

Intersection 10 - Beulah Blvd & Woodlands Village Blvd	EBR	WBR	NBR	SBR
25% of Turns	75	3	0	13
HCM 2000	264	14	1	26
Reduction Used	**75**	**3**	**0**	**13**

Intersection 11 - Beulah Blvd & McConnell Dr	EBR	WBR	NBR	SBR
25% of Turns	1	8	128	10
HCM 2000	1	35	272	7
Reduction Used	**1**	**8**	**128**	**7**

Intersection 12 - Woodlands Village Blvd & Forest Meadows St	EBR	WBR	NBR	SBR
25% of Turns	28	25	2	3
HCM 2000	91	84	3	3
Reduction Used	**28**	**25**	**2**	**3**

Intersection 13 - Beulah Blvd & Forest Meadows St	EBR	WBR	NBR	SBR
25% of Turns	5	4	119	1
HCM 2000	12	3	239	3
Reduction Used	**5**	**3**	**119**	**1**

Intersection 14 - Milton Rd/I-17 & Forest Meadows St	EBR	WBR	NBR	SBR
25% of Turns	32	0	0	89
HCM 2000	108	1	0	140
Reduction Used	**32**	**0**	**0**	**89**

Intersection 15 - Woodlands Village Blvd & University Ave	EBR	WBR	NBR	SBR
25% of Turns	7	19	15	14
HCM 2000	15	40	12	12
Reduction Used	**7**	**19**	**12**	**12**

Intersection 17 - Milton Road & Clay Avenue/Butler Avenue	EBR	WBR	NBR	SBR
25% of Turns	3	14	109	10
HCM 2000	6	38	256	2
Reduction Used	**3**	**14**	**109**	**2**

Intersection 18 - Milton Rd & Route 66	EBR	WBR	NBR	SBR
25% of Turns	2	0	0	167
HCM 2000	5	0	0	99
Reduction Used	**2**	**0**	**0**	**99**

Intersection 20 - Milton Rd & University Dr	EBR	WBR	NBR	SBR
25% of Turns	0	11	43	0
HCM 2000	0	44	69	0
Reduction Used	**0**	**11**	**43**	**0**

Intersection 21- Woodlands Village Blvd & Route 66	EBR	WBR	NBR	SBR
25% of Turns	42	13	91	2
HCM 2000	26	8	174	10
Reduction Used	**26**	**8**	**91**	**2**

Intersection 25- Country Club Dr & I-40 EB Ramps	EBR	WBR	NBR	SBR
25% of Turns	23	0	9	0
HCM 2000	76	0	4	0
Reduction Used	**23**	**0**	**4**	**0**

Intersection 26- Country Club Dr & I-40 WB Ramps	EBR	WBR	NBR	SBR
25% of Turns	0	27	0	115
HCM 2000	0	50	0	300
Reduction Used	**0**	**27**	**0**	**115**

Intersection 27- I-40 EB Ramps & Butler Ave	EBR	WBR	NBR	SBR
25% of Turns	0	17	112	0
HCM 2000	0	9	323	0
Reduction Used	**0**	**9**	**112**	**0**

Intersection 28- I-40 WB Ramps & Butler Ave	EBR	WBR	NBR	SBR
25% of Turns	67	0	0	70
HCM 2000	143	0	0	66
Reduction Used	**67**	**0**	**0**	**66**

PM Peak Hour

Intersection 7 - Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N	EBR	WBR	NBR	SBR
25% of Turns	1	133	7	65
HCM 2000	4	383	14	104
Reduction Used	**1**	**133**	**7**	**65**

Intersection 9 - High Country Trl & Lake Mary Rd	EBR	WBR	NBR	SBR
25% of Turns	12	0	0	75
HCM 2000	41	0	0	174
Reduction Used	**12**	**0**	**0**	**75**

Intersection 10 - Beulah Blvd & Woodlands Village Blvd	EBR	WBR	NBR	SBR
25% of Turns	137	3	0	31
HCM 2000	422	11	1	65
Reduction Used	**137**	**3**	**0**	**31**

Intersection 11 - Beulah Blvd & McConnell Dr	EBR	WBR	NBR	SBR
25% of Turns	3	31	74	23
HCM 2000	2	104	199	12
Reduction Used	**2**	**31**	**74**	**12**

Intersection 12 - Woodlands Village Blvd & Forest Meadows St	EBR	WBR	NBR	SBR
25% of Turns	42	11	13	3
HCM 2000	134	23	10	2
Reduction Used	**42**	**11**	**10**	**2**

Intersection 13 - Beulah Blvd & Forest Meadows St	EBR	WBR	NBR	SBR
25% of Turns	16	3	156	3
HCM 2000	47	3	281	12
Reduction Used	**16**	**3**	**156**	**3**

Intersection 14 - Milton Rd/I-17 & Forest Meadows St	EBR	WBR	NBR	SBR
25% of Turns	33	2	1	188
HCM 2000	106	8	0	152
Reduction Used	**33**	**2**	**0**	**152**

Intersection 15 - Woodlands Village Blvd & University Ave	EBR	WBR	NBR	SBR
25% of Turns	17	20	21	27
HCM 2000	37	42	13	13
Reduction Used	**17**	**20**	**13**	**13**

Intersection 17 - Milton Road & Clay Avenue/Butler Avenue	EBR	WBR	NBR	SBR
25% of Turns	9	29	144	9
HCM 2000	17	29	322	2
Reduction Used	**9**	**29**	**144**	**2**

Intersection 18 - Milton Rd & Route 66	EBR	WBR	NBR	SBR
25% of Turns	3	0	1	183
HCM 2000	16	0	0	115
Reduction Used	**3**	**0**	**0**	**115**

Intersection 20 - Milton Rd & University Dr	EBR	WBR	NBR	SBR
25% of Turns	0	51	41	0
HCM 2000	0	168	90	0
Reduction Used	**0**	**51**	**41**	**0**

Intersection 21- Woodlands Village Blvd & Route 66	EBR	WBR	NBR	SBR
25% of Turns	45	19	106	3
HCM 2000	38	8	166	11
Reduction Used	**38**	**8**	**106**	**3**

Intersection 25- Country Club Dr & I-40 EB Ramps	EBR	WBR	NBR	SBR
25% of Turns	50	0	12	0
HCM 2000	144	0	8	0
Reduction Used	**50**	**0**	**8**	**0**

Intersection 26- Country Club Dr & I-40 WB Ramps	EBR	WBR	NBR	SBR
25% of Turns	0	24	0	159
HCM 2000	0	50	0	385
Reduction Used	**0**	**24**	**0**	**159**

Intersection 27- I-40 EB Ramps & Butler Ave	EBR	WBR	NBR	SBR
25% of Turns	0	14	99	0
HCM 2000	0	9	308	0
Reduction Used	**0**	**9**	**99**	**0**

Intersection 28- I-40 WB Ramps & Butler Ave	EBR	WBR	NBR	SBR
25% of Turns	106	0	0	58
HCM 2000	112	0	0	205
Reduction Used	**106**	**0**	**0**	**58**

Midday Peak Hour

Intersection 7 - Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N

	EBR	WBR	NBR	SBR
25% of Turns	0	134	4	31
HCM 2000	2	408	8	52
Reduction Used	**0**	**134**	**4**	**31**

Intersection 9 - High Country Trl & Lake Mary Rd

	EBR	WBR	NBR	SBR
25% of Turns	12	0	0	40
HCM 2000	44	0	0	56
Reduction Used	**12**	**0**	**0**	**40**

Intersection 10 - Beulah Blvd & Woodlands Village Blvd

	EBR	WBR	NBR	SBR
25% of Turns	94	1	2	22
HCM 2000	318	5	4	45
Reduction Used	**94**	**1**	**2**	**22**

Intersection 11 - Beulah Blvd & McConnell Dr

	EBR	WBR	NBR	SBR
25% of Turns	4	19	72	29
HCM 2000	3	66	111	19
Reduction Used	**3**	**19**	**72**	**19**

Intersection 12 - Woodlands Village Blvd & Forest Meadows St

	EBR	WBR	NBR	SBR
25% of Turns	14	33	4	3
HCM 2000	29	110	3	1
Reduction Used	**14**	**33**	**3**	**1**

Intersection 13 - Beulah Blvd & Forest Meadows St

	EBR	WBR	NBR	SBR
25% of Turns	10	1	150	1
HCM 2000	28	1	286	6
Reduction Used	**10**	**1**	**150**	**1**

Intersection 14 - Milton Rd/I-17 & Forest Meadows St

	EBR	WBR	NBR	SBR
25% of Turns	25	1	1	150
HCM 2000	78	5	0	178
Reduction Used	**25**	**1**	**0**	**150**

Intersection 15 - Woodlands Village Blvd & University Ave

	EBR	WBR	NBR	SBR
25% of Turns	11	26	13	22
HCM 2000	20	39	8	12
Reduction Used	**11**	**26**	**8**	**12**

Intersection 17 - Milton Road & Clay Avenue/Butler Avenue

	EBR	WBR	NBR	SBR
25% of Turns	8	17	145	7
HCM 2000	27	25	325	2
Reduction Used	**8**	**17**	**145**	**2**

Intersection 18 - Milton Rd & Route 66	EBR	WBR	NBR	SBR
25% of Turns	3	0	1	183
HCM 2000	18	0	0	121
Reduction Used	**3**	**0**	**0**	**121**

Intersection 20 - Milton Rd & University Dr	EBR	WBR	NBR	SBR
25% of Turns	0	54	46	0
HCM 2000	0	188	92	0
Reduction Used	**0**	**54**	**46**	**0**

Intersection 21- Woodlands Village Blvd & Route 66	EBR	WBR	NBR	SBR
25% of Turns	43	14	89	3
HCM 2000	49	9	219	13
Reduction Used	**43**	**9**	**89**	**3**

Intersection 25- Country Club Dr & I-40 EB Ramps	EBR	WBR	NBR	SBR
25% of Turns	29	0	4	0
HCM 2000	89	0	3	0
Reduction Used	**29**	**0**	**3**	**0**

Intersection 26- Country Club Dr & I-40 WB Ramps	EBR	WBR	NBR	SBR
25% of Turns	0	27	0	155
HCM 2000	0	50	0	358
Reduction Used	**0**	**27**	**0**	**155**

Intersection 27- I-40 EB Ramps & Butler Ave	EBR	WBR	NBR	SBR
25% of Turns	0	3	50	0
HCM 2000	0	3	180	0
Reduction Used	**0**	**3**	**50**	**0**

Intersection 28- I-40 WB Ramps & Butler Ave	EBR	WBR	NBR	SBR
25% of Turns	51	0	0	47
HCM 2000	81	0	0	178
Reduction Used	**51**	**0**	**0**	**47**

2021 EXISTING CAPACITY ANALYSIS REPORTS

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	162	187	0	0	71	134	43	1	38	0	0	0
Future Vol, veh/h	162	187	0	0	71	134	43	1	38	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	-	-	-	-	-	175	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	169	195	0	0	74	140	45	1	40	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	214	0	-	-	-	0	677	747	195
Stage 1	-	-	-	-	-	-	533	533	-
Stage 2	-	-	-	-	-	-	144	214	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1356	-	0	0	-	-	418	341	846
Stage 1	-	-	0	0	-	-	588	525	-
Stage 2	-	-	0	0	-	-	883	725	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1356	-	-	-	-	-	366	0	846
Mov Cap-2 Maneuver	-	-	-	-	-	-	366	0	-
Stage 1	-	-	-	-	-	-	515	0	-
Stage 2	-	-	-	-	-	-	883	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.7	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	366	846	1356	-	-	-
HCM Lane V/C Ratio	0.125	0.047	0.124	-	-	-
HCM Control Delay (s)	16.2	9.5	8	-	-	-
HCM Lane LOS	C	A	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.1	0.4	-	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	2	3	93	157	11
Future Vol, veh/h	29	2	3	93	157	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	2	4	111	187	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	313	194	200	0	-	0
Stage 1	194	-	-	-	-	-
Stage 2	119	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	680	847	1372	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	906	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	678	847	1372	-	-	-
Mov Cap-2 Maneuver	678	-	-	-	-	-
Stage 1	836	-	-	-	-	-
Stage 2	906	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1372	-	687	-	-
HCM Lane V/C Ratio	0.003	-	0.054	-	-
HCM Control Delay (s)	7.6	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	11

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	268	35	27	90	130	0
Future Vol, veh/h	268	35	27	90	130	0
Conflicting Peds, #/hr	0	0	9	0	0	9
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	310
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	344	45	35	115	167	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	361	176	176	0	-	0
Stage 1	176	-	-	-	-	-
Stage 2	185	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	638	867	1400	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	847	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	612	860	1390	-	-	-
Mov Cap-2 Maneuver	612	-	-	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	841	-	-	-	-	-

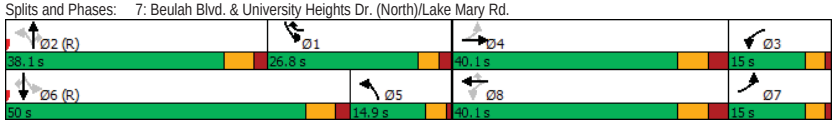
Approach	EB	NB	SB
HCM Control Delay, s	19.3	1.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1390	-	633	-	-
HCM Lane V/C Ratio	0.025	-	0.614	-	-
HCM Control Delay (s)	7.7	0	19.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	4.2	-	-

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	Min	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	26.8	38.1	15	40.1	14.9	50	15	40.1
Maximum Split (%)	22.3%	31.8%	12.5%	33.4%	12.4%	41.7%	12.5%	33.4%
Minimum Split (s)	10	38.1	10	39.1	10	34.9	10	40.1
Yellow Time (s)	3	4.4	3	4.4	3	4.4	3	4.4
All-Red Time (s)	2	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	10	5	5	5	10	5	5
Vehicle Extension (s)	2	2	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	3	1.5	3	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		27.6		27.6		23.6		28.6
Dual Entry	No	No	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
End Time (s)	64.9	38.1	0	105	64.9	50	0	105
Yield/Force Off (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Yield/Force Off 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9
Local Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
Local Yield (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Local Yield 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	216	20	7	76	24	665	1	304	45	345	55	104
Future Volume (veh/h)	216	20	7	76	24	665	1	304	45	345	55	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.93	0.98		1.00	0.99		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	240	22	7	84	27	0	1	338	38	383	61	87
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	266	113	36	264	160		1137	406	307	1743	220	152
Arrive On Green	0.08	0.08	0.06	0.08	0.09	0.00	0.57	0.22	0.20	0.47	0.12	0.10
Sat Flow, veh/h	1781	1332	424	1781	1870	1585	1781	1870	1557	3456	1870	1561
Grp Volume(v), veh/h	240	0	29	84	27	0	1	338	38	383	61	87
Grp Sat Flow(s),veh/h/ln	1781	0	1755	1781	1870	1585	1781	1870	1557	1728	1870	1561
Q Serve(g_s), s	7.3	0.0	1.9	0.0	1.6	0.0	0.0	20.7	2.4	3.2	3.6	6.4
Cycle Q Clear(g_c), s	7.3	0.0	1.9	0.0	1.6	0.0	0.0	20.7	2.4	3.2	3.6	6.4
Prop In Lane	1.00		0.24	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	266	0	149	264	160		1137	406	307	1743	220	152
V/C Ratio(X)	0.90	0.00	0.19	0.32	0.17		0.00	0.83	0.12	0.22	0.28	0.57
Avail Cap(c_a), veh/h	291	0	515	288	549		1137	530	410	1743	715	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	0.0	51.4	48.8	50.9	0.0	8.6	44.9	39.6	17.2	48.3	51.7
Incr Delay (d2), s/veh	26.1	0.0	0.2	0.3	0.2	0.0	0.0	17.8	0.8	0.0	3.1	14.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	13.7	0.0	1.5	4.1	1.3	0.0	0.0	16.8	1.8	5.3	3.4	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.7	0.0	51.6	49.0	51.1	0.0	8.6	62.6	40.5	17.2	51.4	66.4
LnGrp LOS	E	A	D	D	D		A	E	D	B	D	E
Approach Vol, veh/h		269			111			377			531	
Approach Delay, s/veh		74.9			49.5			60.3			29.2	
Approach LOS		E			D			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	61.4	30.2	13.4	15.1	73.3	18.2	13.3	15.1
Change Period (Y+Rc), s	5.0	6.5	4.0	7.5	5.0	* 6.5	4.0	7.5
Max Green Setting (Gmax), s	21.8	31.6	11.0	32.6	10.9	* 44	11.0	32.6
Max Q Clear Time (g_c+I1), s	5.2	22.7	2.0	3.9	2.0	8.4	9.3	3.6
Green Ext Time (p_c), s	1.0	0.5	0.0	0.0	0.0	0.2	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay	49.6	
HCM 6th LOS	D	

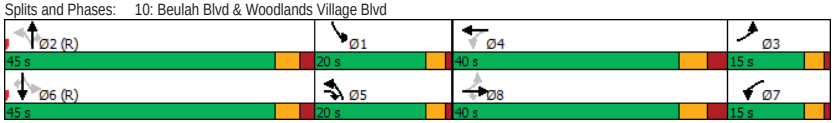
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	C-Min	None	None	Min	C-Min	None	None
Maximum Split (s)	20	45	15	40	20	45	15	40
Maximum Split (%)	16.7%	37.5%	12.5%	33.3%	16.7%	37.5%	12.5%	33.3%
Minimum Split (s)	9	21.1	9	31.1	9	27.1	9	33.1
Yellow Time (s)	3	3.6	3	4	3	3.6	3	4
All-Red Time (s)	1	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	1.5	3	3	1	1.5	3	3
Minimum Gap (s)	3	1.5	3	3	1	1.5	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		11.4		20		17.4		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	14	119	79	59	14	119	79
End Time (s)	79	59	14	119	79	59	14	119
Yield/Force Off (s)	75	53.3	10	111.9	75	53.3	10	111.9
Yield/Force Off 170(s)	75	41.9	10	91.9	75	35.9	10	89.9
Local Start Time (s)	45	0	105	65	45	0	105	65
Local Yield (s)	61	39.3	116	97.9	61	39.3	116	97.9
Local Yield 170(s)	61	27.9	116	77.9	61	21.9	116	75.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green	

Splits and Phases: 10: Beulah Blvd & Woodlands Village Blvd



10: Beulah Blvd & Woodlands Village Blvd

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	1	300	1	7	14	376	802	2	12	188	53
Future Volume (veh/h)	75	1	300	1	7	14	376	802	2	12	188	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	0	248	1	8	12	413	881	2	13	207	44
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	0	2180	177	28	42	1234	999	420	916	507	220
Arrive On Green	0.05	0.00	0.05	0.04	0.04	0.04	0.62	0.28	0.27	0.96	0.29	0.29
Sat Flow, veh/h	1781	0	3170	1781	675	1013	1781	3554	1583	1781	3554	1544
Grp Volume(v), veh/h	82	0	248	1	0	20	413	881	2	13	207	44
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1688	1781	1777	1583	1781	1777	1544
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.4	2.3	28.4	0.1	0.0	5.7	2.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	1.4	2.3	28.4	0.1	0.0	5.7	2.6
Prop In Lane	1.00		1.00	1.00		0.60	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	214	0	2180	177	0	70	1234	999	420	916	507	220
V/C Ratio(X)	0.38	0.00	0.11	0.01	0.00	0.28	0.33	0.88	0.00	0.01	0.41	0.20
Avail Cap(c_a), veh/h	308	0	2917	270	0	463	1234	1220	519	916	1220	530
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh	52.0	0.0	6.4	50.8	0.0	55.8	8.1	41.2	32.4	1.2	38.8	37.7
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.0	0.0	2.2	0.1	11.1	0.0	0.0	2.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.3	0.0	1.7	0.1	0.0	1.1	7.2	19.8	0.1	0.0	4.4	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.1	0.0	6.4	50.8	0.0	57.9	8.2	52.3	32.4	1.2	41.1	39.6
LnGrp LOS	D	A	A	D	A	E	A	D	C	A	D	D
Approach Vol, veh/h		330			21			1296			264	
Approach Delay, s/veh		18.0			57.6			38.2			38.9	
Approach LOS		B			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	61.7	37.5	8.7	12.1	78.3	20.9	8.7	12.1
Change Period (Y+Rc), s	4.0	5.7	4.0	7.1	4.0	5.7	4.0	7.1
Max Green Setting (Gmax), s	16.0	39.3	11.0	32.9	16.0	39.3	11.0	32.9
Max Q Clear Time (g_c+I1), s	2.0	30.4	2.0	3.4	4.3	7.7	2.0	2.0
Green Ext Time (p_c), s	0.0	1.4	0.1	0.1	0.3	0.4	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

11: Beulah Blvd & McConnell Dr

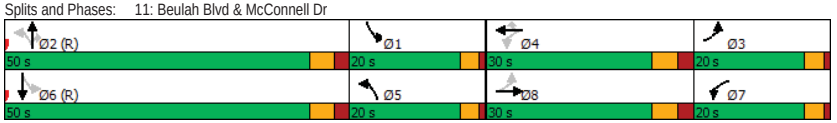
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	50	20	30	20	50	20	30
Maximum Split (%)	16.7%	41.7%	16.7%	25.0%	16.7%	41.7%	16.7%	25.0%
Minimum Split (s)	9	25.7	9	24.4	9	25.7	9	29.4
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	1	2.1	1	2.4	1	2.1	1	2.4
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	2	3	2	3	2	3	2
Minimum Gap (s)	3	2	3	2	3	2	3	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		15.4		14.4		15.4		19.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	9	109	79	59	9	109	79
End Time (s)	79	59	9	109	79	59	9	109
Yield/Force Off (s)	75	53.3	5	103	75	53.3	5	103
Yield/Force Off 170(s)	75	37.9	5	103	75	37.9	5	103
Local Start Time (s)	50	0	100	70	50	0	100	70
Local Yield (s)	66	44.3	116	94	66	44.3	116	94
Local Yield 170(s)	66	28.9	116	94	66	28.9	116	94

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75

Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 11: Beulah Blvd & McConnell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	162	6	162	83	35	13	427	513	58	264	42
Future Volume (veh/h)	32	162	6	162	83	35	13	427	513	58	264	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.96	0.98		0.95	0.99		0.96	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	193	6	193	99	32	15	508	459	69	314	42
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	363	313	10	262	237	190	957	1158	495	658	475	63
Arrive On Green	0.14	0.17	0.15	0.10	0.13	0.13	0.82	0.54	0.54	0.31	0.15	0.14
Sat Flow, veh/h	1781	1801	56	1781	1870	1502	1781	3554	1519	1781	3137	415
Grp Volume(v), veh/h	38	0	199	193	99	32	15	508	459	69	176	180
Grp Sat Flow(s),veh/h/ln	1781	0	1857	1781	1870	1502	1781	1777	1519	1781	1777	1775
Q Serve(g_s), s	0.0	0.0	11.9	6.2	5.9	2.3	0.0	10.3	33.4	0.0	11.2	11.5
Cycle Q Clear(g_c), s	0.0	0.0	11.9	6.2	5.9	2.3	0.0	10.3	33.4	0.0	11.2	11.5
Prop In Lane	1.00		0.03	1.00		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	363	0	323	262	237	190	957	1158	495	658	269	269
V/C Ratio(X)	0.10	0.00	0.62	0.74	0.42	0.17	0.02	0.44	0.93	0.10	0.66	0.67
Avail Cap(c_a), veh/h	389	0	415	371	418	335	957	1359	581	658	680	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.99	0.99	0.99
Uniform Delay (d), s/veh	41.3	0.0	45.9	50.2	48.3	46.8	5.1	20.8	26.1	26.0	48.0	48.3
Incr Delay (d2), s/veh	0.1	0.0	0.7	4.6	0.4	0.2	0.0	1.1	25.1	0.1	11.7	12.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	0.0	9.4	9.8	4.9	1.5	0.1	7.0	18.4	2.5	9.7	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	0.0	46.6	54.8	48.8	46.9	5.1	21.9	51.1	26.1	59.7	60.6
LnGrp LOS	D	A	D	D	D	D	A	C	D	C	E	E
Approach Vol, veh/h		237			324			982			425	
Approach Delay, s/veh		45.8			52.2			35.3			54.6	
Approach LOS		D			D			D			D	

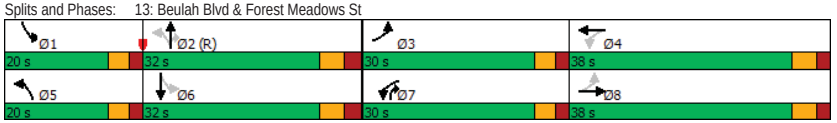
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	40.1	43.2	18.3	18.4	61.1	22.3	12.6	24.0
Change Period (Y+Rc), s	4.0	5.7	4.0	6.0	4.0	5.7	4.0	6.0
Max Green Setting (Gmax), s	16.0	44.3	16.0	24.0	16.0	44.3	16.0	24.0
Max Q Clear Time (g_c+I1), s	2.0	35.4	2.0	7.9	2.0	13.5	8.2	13.9
Green Ext Time (p_c), s	0.1	2.1	0.1	0.2	0.0	0.7	0.4	0.3

Intersection Summary	
HCM 6th Ctrl Delay	43.5
HCM 6th LOS	D

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes		Yes				Yes
Recall Mode	None	C-Min	Max	Max	Min	Min	Max	Max
Maximum Split (s)	20	32	30	38	20	32	30	38
Maximum Split (%)	16.7%	26.7%	25.0%	31.7%	16.7%	26.7%	25.0%	31.7%
Minimum Split (s)	10	31.7	10	22.2	10	25.7	10	33.2
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	2	2.7	2	2.2	2	2.7	2	2.2
Minimum Initial (s)	5	10	5	10	5	8.7	5	10
Vehicle Extension (s)	3	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Minimum Gap (s)	3	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		21.4		12.4		15.4		23.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	102	2	34	64	102	2	34	64
End Time (s)	2	34	64	102	2	34	64	102
Yield/Force Off (s)	117	27.7	59	96.2	117	27.7	59	96.2
Yield/Force Off 170(s)	117	6.3	59	83.8	117	27.7	59	72.8
Local Start Time (s)	100	0	32	62	100	0	32	62
Local Yield (s)	115	25.7	57	94.2	115	25.7	57	94.2
Local Yield 170(s)	115	4.3	57	81.8	115	25.7	57	70.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 2 (2%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 13: Beulah Blvd & Forest Meadows St



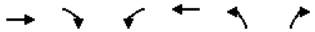
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	124	22	349	179	17	9	11	479	53	8	4
Future Volume (veh/h)	4	124	22	349	179	17	9	11	479	53	8	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	131	18	367	188	15	9	12	379	56	8	3
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	705	906	122	1407	494	39	544	603	1506	468	407	153
Arrive On Green	0.23	0.29	0.29	0.21	0.29	0.27	0.04	0.32	0.32	0.05	0.32	0.30
Sat Flow, veh/h	1781	3134	422	3456	1707	136	1781	1870	2711	1781	1289	483
Grp Volume(v), veh/h	4	73	76	367	0	203	9	12	379	56	0	11
Grp Sat Flow(s),veh/h/ln	1781	1777	1780	1728	0	1843	1781	1870	1355	1781	0	1772
Q Serve(g_s), s	0.1	3.7	3.8	7.5	0.0	10.6	0.4	0.5	8.8	2.5	0.0	0.5
Cycle Q Clear(g_c), s	0.1	3.7	3.8	7.5	0.0	10.6	0.4	0.5	8.8	2.5	0.0	0.5
Prop In Lane	1.00		0.24	1.00		0.07	1.00		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	705	514	515	1407	0	533	544	603	1506	468	0	560
V/C Ratio(X)	0.01	0.14	0.15	0.26	0.00	0.38	0.02	0.02	0.25	0.12	0.00	0.02
Avail Cap(c_a), veh/h	705	514	515	1407	0	533	693	603	1506	628	0	560
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.89	0.00	0.89	0.98	0.98	0.98	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.4	31.6	31.7	18.5	0.0	34.1	26.3	27.7	14.2	24.6	0.0	28.5
Incr Delay (d2), s/veh	0.0	0.6	0.6	0.4	0.0	1.8	0.0	0.1	0.4	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	3.0	3.1	5.6	0.0	8.6	0.3	0.4	4.9	1.9	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	32.2	32.3	18.9	0.0	36.0	26.3	27.8	14.6	24.7	0.0	28.5
LnGrp LOS	B	C	C	B	A	D	C	C	B	C	A	C
Approach Vol, veh/h		153			570			400			67	
Approach Delay, s/veh		31.8			25.0			15.2			25.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	42.8	30.0	38.0	10.0	42.0	30.0	38.0
Change Period (Y+Rc), s	5.0	* 6.3	5.0	* 5.8	5.0	* 6.3	5.0	* 5.8
Max Green Setting (Gmax), s	15.0	* 26	25.0	* 32	15.0	* 26	25.0	* 32
Max Q Clear Time (g_c+I1), s	4.5	10.8	2.1	12.6	2.4	2.5	9.5	5.8
Green Ext Time (p_c), s	0.1	1.4	0.0	0.6	0.0	0.0	1.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay	22.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	356	377	46	280	0	0
Future Volume (Veh/h)	356	377	46	280	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	419	444	54	329	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	334					
pX, platoon unblocked						
vC, conflicting volume			863		856	419
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			863		856	419
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	100
cM capacity (veh/h)			779		305	634

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	419	444	54	329
Volume Left	0	0	54	0
Volume Right	0	444	0	0
cSH	1700	1700	779	1700
Volume to Capacity	0.25	0.26	0.07	0.19
Queue Length 95th (ft)	0	0	6	0
Control Delay (s)	0.0	0.0	10.0	0.0
Lane LOS			A	
Approach Delay (s)	0.0		1.4	
Approach LOS				

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	35.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	207	199	0	0	77	171	29	4	25	0	0	0
Future Vol, veh/h	207	199	0	0	77	171	29	4	25	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	-	-	-	-	-	175	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	213	205	0	0	79	176	30	4	26	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	255	0	-	-	-	0	798	886	205
Stage 1	-	-	-	-	-	-	631	631	-
Stage 2	-	-	-	-	-	-	167	255	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1310	-	0	0	-	-	355	284	836
Stage 1	-	-	0	0	-	-	530	474	-
Stage 2	-	-	0	0	-	-	863	696	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1310	-	-	-	-	-	297	0	836
Mov Cap-2 Maneuver	-	-	-	-	-	-	297	0	-
Stage 1	-	-	-	-	-	-	444	0	-
Stage 2	-	-	-	-	-	-	863	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.2	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	297	836	1310	-	-	-
HCM Lane V/C Ratio	0.115	0.031	0.163	-	-	-
HCM Control Delay (s)	18.7	9.4	8.3	-	-	-
HCM Lane LOS	C	A	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.1	0.6	-	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	2	0	145	206	31
Future Vol, veh/h	20	2	0	145	206	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	2	0	165	234	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	417	252	269	0	-	0
Stage 1	252	-	-	-	-	-
Stage 2	165	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	592	787	1295	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	864	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	592	787	1295	-	-	-
Mov Cap-2 Maneuver	592	-	-	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	864	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1295	-	606	-	-
HCM Lane V/C Ratio	-	-	0.041	-	-
HCM Control Delay (s)	0	-	11.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	115	12	25	140	225	1
Future Vol, veh/h	115	12	25	140	225	1
Conflicting Peds, #/hr	0	0	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	310
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	134	14	29	163	262	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	490	269	270	0	-	0
Stage 1	269	-	-	-	-	-
Stage 2	221	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	537	770	1293	-	-	-
Stage 1	776	-	-	-	-	-
Stage 2	816	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	517	766	1285	-	-	-
Mov Cap-2 Maneuver	517	-	-	-	-	-
Stage 1	752	-	-	-	-	-
Stage 2	811	-	-	-	-	-

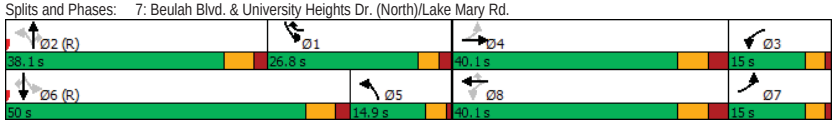
Approach	EB	NB	SB
HCM Control Delay, s	14.3	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1285	-	533	-	-
HCM Lane V/C Ratio	0.023	-	0.277	-	-
HCM Control Delay (s)	7.9	0	14.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	Min	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	26.8	38.1	15	40.1	14.9	50	15	40.1
Maximum Split (%)	22.3%	31.8%	12.5%	33.4%	12.4%	41.7%	12.5%	33.4%
Minimum Split (s)	10	38.1	10	39.1	10	34.9	10	40.1
Yellow Time (s)	3	4.4	3	4.4	3	4.4	3	4.4
All-Red Time (s)	2	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	10	5	5	5	10	5	5
Vehicle Extension (s)	2	2	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	3	1.5	3	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		27.6		27.6		23.6		28.6
Dual Entry	No	No	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	41.3	3.2	108.2	68.1	53.2	3.2	108.2	68.1
End Time (s)	68.1	41.3	3.2	108.2	68.1	53.2	3.2	108.2
Yield/Force Off (s)	63.1	34.8	119.2	100.7	64.1	46.7	119.2	100.7
Yield/Force Off 170(s)	63.1	7.2	119.2	73.1	64.1	23.1	119.2	72.1
Local Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
Local Yield (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Local Yield 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 3.2 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	18	5	74	31	535	4	193	29	734	105	261
Future Volume (veh/h)	135	18	5	74	31	535	4	193	29	734	105	261
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.92	0.97		1.00	0.99		0.98	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	138	18	4	76	32	0	4	197	23	749	107	200
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	207	133	30	214	172		1111	275	197	2148	323	240
Arrive On Green	0.04	0.09	0.07	0.04	0.09	0.00	0.54	0.15	0.13	0.57	0.17	0.15
Sat Flow, veh/h	1781	1454	323	1781	1870	1585	1781	1870	1550	3456	1870	1570
Grp Volume(v), veh/h	138	0	22	76	32	0	4	197	23	749	107	200
Grp Sat Flow(s),veh/h/ln	1781	0	1777	1781	1870	1585	1781	1870	1550	1728	1870	1570
Q Serve(g_s), s	0.0	0.0	1.4	0.0	1.9	0.0	0.0	12.0	1.6	6.3	6.0	14.8
Cycle Q Clear(g_c), s	0.0	0.0	1.4	0.0	1.9	0.0	0.0	12.0	1.6	6.3	6.0	14.8
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	0	163	214	172		1111	275	197	2148	323	240
V/C Ratio(X)	0.67	0.00	0.14	0.36	0.19		0.00	0.72	0.12	0.35	0.33	0.83
Avail Cap(c_a), veh/h	297	0	521	302	549		1111	530	408	2148	715	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.4	0.0	50.4	51.5	50.3	0.0	8.7	48.8	46.4	11.6	43.5	49.3
Incr Delay (d2), s/veh	1.4	0.0	0.1	0.4	0.2	0.0	0.0	14.8	1.2	0.0	2.7	27.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.2	0.0	1.1	3.9	1.6	0.0	0.1	10.8	1.2	8.2	5.5	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.8	0.0	50.5	51.8	50.5	0.0	8.7	63.5	47.6	11.6	46.3	76.8
LnGrp LOS	D	A	D	D	D		A	E	D	B	D	E
Approach Vol, veh/h		160			108			224			1056	
Approach Delay, s/veh		54.2			51.4			60.9			27.5	
Approach LOS		D			D			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	73.3	21.8	9.0	15.9	70.2	24.8	8.9	16.0
Change Period (Y+Rc), s	5.0	6.5	4.0	7.5	5.0	* 6.5	4.0	7.5
Max Green Setting (Gmax), s	21.8	31.6	11.0	32.6	10.9	* 44	11.0	32.6
Max Q Clear Time (g_c+I1), s	8.3	14.0	2.0	3.4	2.0	16.8	2.0	3.9
Green Ext Time (p_c), s	2.0	0.4	0.0	0.0	0.0	0.5	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay		36.8
HCM 6th LOS		D

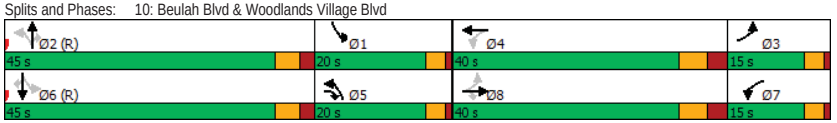
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	C-Min	None	None	Min	C-Min	None	None
Maximum Split (s)	20	45	15	40	20	45	15	40
Maximum Split (%)	16.7%	37.5%	12.5%	33.3%	16.7%	37.5%	12.5%	33.3%
Minimum Split (s)	9	21.9	9	31.1	14	37.9	9	33.1
Yellow Time (s)	3	3.6	3	4	3	3.6	3	4
All-Red Time (s)	1	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	1.5	3	3	1	1.5	3	3
Minimum Gap (s)	3	1.5	3	3	1	1.5	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		11.4		20		17.4		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	14	119	79	59	14	119	79
End Time (s)	79	59	14	119	79	59	14	119
Yield/Force Off (s)	75	53.3	10	111.9	75	53.3	10	111.9
Yield/Force Off 170(s)	75	41.9	10	91.9	75	35.9	10	89.9
Local Start Time (s)	45	0	105	65	45	0	105	65
Local Yield (s)	61	39.3	116	97.9	61	39.3	116	97.9
Local Yield 170(s)	61	27.9	116	77.9	61	21.9	116	75.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green	

Splits and Phases: 10: Beulah Blvd & Woodlands Village Blvd



10: Beulah Blvd & Woodlands Village Blvd

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	4	551	3	3	12	339	524	2	8	555	126
Future Volume (veh/h)	173	4	551	3	3	12	339	524	2	8	555	126
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.94	0.98		0.97	0.99		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	177	0	425	3	3	9	346	535	2	8	566	97
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	0	2016	199	30	91	1034	657	263	1045	673	292
Arrive On Green	0.05	0.00	0.09	0.04	0.08	0.08	0.54	0.18	0.17	1.00	0.38	0.38
Sat Flow, veh/h	1781	0	2976	1781	403	1209	1781	3554	1557	1781	3554	1543
Grp Volume(v), veh/h	177	0	425	3	0	12	346	535	2	8	566	97
Grp Sat Flow(s),veh/h/ln	1781	0	1488	1781	0	1612	1781	1777	1557	1781	1777	1543
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.8	6.9	17.3	0.1	0.0	17.4	5.4
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.8	6.9	17.3	0.1	0.0	17.4	5.4
Prop In Lane	1.00		1.00	1.00		0.75	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	0	2016	199	0	121	1034	657	263	1045	673	292
V/C Ratio(X)	0.66	0.00	0.21	0.02	0.00	0.10	0.33	0.81	0.01	0.01	0.84	0.33
Avail Cap(c_a), veh/h	359	0	2598	295	0	442	1034	1220	510	1045	1220	530
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	50.5	0.0	8.9	47.3	0.0	51.7	13.6	46.9	41.5	0.0	35.6	31.9
Incr Delay (d2), s/veh	2.7	0.0	0.1	0.0	0.0	0.4	0.1	10.7	0.1	0.0	10.1	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.9	0.0	3.8	0.1	0.0	0.6	8.2	13.3	0.1	0.0	10.9	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.2	0.0	8.9	47.4	0.0	52.1	13.7	57.6	41.5	0.0	45.7	34.3
LnGrp LOS	D	A	A	D	A	D	B	E	D	A	D	C
Approach Vol, veh/h		602			15			883			671	
Approach Delay, s/veh		22.0			51.1			40.4			43.5	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	68.9	26.0	9.0	16.1	68.4	26.5	8.6	16.5
Change Period (Y+Rc), s	4.0	5.7	4.0	7.1	4.0	5.7	4.0	7.1
Max Green Setting (Gmax), s	16.0	39.3	11.0	32.9	16.0	39.3	11.0	32.9
Max Q Clear Time (g_c+I1), s	2.0	19.3	2.0	2.8	8.9	19.4	2.0	2.0
Green Ext Time (p_c), s	0.0	1.0	0.4	0.0	0.2	1.2	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	36.3
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

11: Beulah Blvd & McConnell Dr

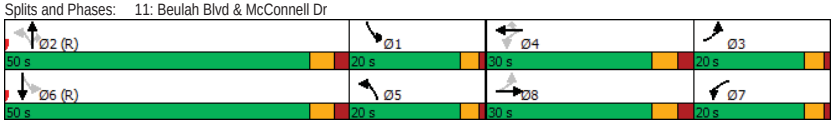
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	50	20	30	20	50	20	30
Maximum Split (%)	16.7%	41.7%	16.7%	25.0%	16.7%	41.7%	16.7%	25.0%
Minimum Split (s)	9	25.7	9	24.4	9	25.7	9	29.4
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	1	2.1	1	2.4	1	2.1	1	2.4
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	2	3	2	3	2	3	2
Minimum Gap (s)	3	2	3	2	3	2	3	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		15.4		14.4		15.4		19.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	9	109	79	59	9	109	79
End Time (s)	79	59	9	109	79	59	9	109
Yield/Force Off (s)	75	53.3	5	103	75	53.3	5	103
Yield/Force Off 170(s)	75	37.9	5	103	75	37.9	5	103
Local Start Time (s)	50	0	100	70	50	0	100	70
Local Yield (s)	66	44.3	116	94	66	44.3	116	94
Local Yield 170(s)	66	28.9	116	94	66	28.9	116	94

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75

Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 11: Beulah Blvd & McConnell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	227	13	365	252	127	33	377	297	58	500	94
Future Volume (veh/h)	79	227	13	365	252	127	33	377	297	58	500	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	0.99		0.98	1.00		0.91	0.99		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	247	12	397	274	104	36	410	243	63	543	89
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	391	332	16	396	344	286	704	702	286	796	649	106
Arrive On Green	0.16	0.19	0.16	0.16	0.18	0.18	0.70	0.40	0.40	0.37	0.21	0.20
Sat Flow, veh/h	1781	1766	86	1781	1870	1557	1781	3554	1448	1781	3035	495
Grp Volume(v), veh/h	86	0	259	397	274	104	36	410	243	63	317	315
Grp Sat Flow(s),veh/h/ln	1781	0	1851	1781	1870	1557	1781	1777	1448	1781	1777	1753
Q Serve(g_s), s	0.0	0.0	15.9	18.8	16.8	7.0	0.0	10.9	18.3	0.0	20.5	20.7
Cycle Q Clear(g_c), s	0.0	0.0	15.9	18.8	16.8	7.0	0.0	10.9	18.3	0.0	20.5	20.7
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	391	0	348	396	344	286	704	702	286	796	380	375
V/C Ratio(X)	0.22	0.00	0.74	1.00	0.80	0.36	0.05	0.58	0.85	0.08	0.83	0.84
Avail Cap(c_a), veh/h	391	0	413	396	418	348	704	1359	554	796	680	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96	0.84	0.84	0.84
Uniform Delay (d), s/veh	40.9	0.0	46.0	47.4	46.8	42.8	11.0	32.4	34.7	18.1	45.1	45.4
Incr Delay (d2), s/veh	0.3	0.0	4.5	45.5	7.0	0.3	0.0	3.4	24.9	0.0	16.4	17.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.9	0.0	12.2	23.4	13.2	4.9	0.5	7.7	11.3	1.8	15.5	15.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.2	0.0	50.5	92.9	53.9	43.1	11.0	35.8	59.6	18.1	61.6	62.6
LnGrp LOS	D	A	D	F	D	D	B	D	E	B	E	E
Approach Vol, veh/h		345			775			689			695	
Approach Delay, s/veh		48.2			72.4			42.9			58.1	
Approach LOS		D			E			D			E	

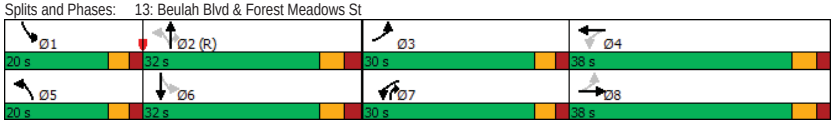
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	46.4	27.8	20.5	25.2	44.5	29.8	20.0	25.8
Change Period (Y+Rc), s	4.0	5.7	4.0	6.0	4.0	5.7	4.0	6.0
Max Green Setting (Gmax), s	16.0	44.3	16.0	24.0	16.0	44.3	16.0	24.0
Max Q Clear Time (g_c+I1), s	2.0	20.3	2.0	18.8	2.0	22.7	20.8	17.9
Green Ext Time (p_c), s	0.1	1.8	0.2	0.4	0.1	1.4	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	57.0
HCM 6th LOS	E

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes					Yes	
Recall Mode	None	C-Min	Max	Max	Min	Min	Max	Max
Maximum Split (s)	20	32	30	38	20	32	30	38
Maximum Split (%)	16.7%	26.7%	25.0%	31.7%	16.7%	26.7%	25.0%	31.7%
Minimum Split (s)	10	31.7	10	22.2	10	25.7	10	33.2
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	2	2.7	2	2.2	2	2.7	2	2.2
Minimum Initial (s)	5	10	5	10	5	8.7	5	10
Vehicle Extension (s)	3	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Minimum Gap (s)	3	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		21.4		12.4		15.4		23.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	102	2	34	64	102	2	34	64
End Time (s)	2	34	64	102	2	34	64	102
Yield/Force Off (s)	117	27.7	59	96.2	117	27.7	59	96.2
Yield/Force Off 170(s)	117	6.3	59	83.8	117	27.7	59	72.8
Local Start Time (s)	100	0	32	62	100	0	32	62
Local Yield (s)	115	25.7	57	94.2	115	25.7	57	94.2
Local Yield 170(s)	115	4.3	57	81.8	115	25.7	57	70.8

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 2 (2%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 13: Beulah Blvd & Forest Meadows St



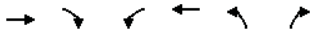
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	135	65	860	114	12	24	12	627	14	11	15
Future Volume (veh/h)	18	135	65	860	114	12	24	12	627	14	11	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		0.98	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	138	50	878	116	9	24	12	481	14	11	12
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	768	741	256	1359	495	38	533	640	1561	405	255	279
Arrive On Green	0.23	0.29	0.29	0.21	0.29	0.27	0.04	0.34	0.34	0.03	0.32	0.30
Sat Flow, veh/h	1781	2564	884	3456	1710	133	1781	1870	2715	1781	809	882
Grp Volume(v), veh/h	18	94	94	878	0	125	24	12	481	14	0	23
Grp Sat Flow(s),veh/h/ln	1781	1777	1671	1728	0	1843	1781	1870	1357	1781	0	1691
Q Serve(g_s), s	0.6	4.7	5.1	21.4	0.0	6.2	1.1	0.5	11.1	0.6	0.0	1.1
Cycle Q Clear(g_c), s	0.6	4.7	5.1	21.4	0.0	6.2	1.1	0.5	11.1	0.6	0.0	1.1
Prop In Lane	1.00		0.53	1.00		0.07	1.00		1.00	1.00		0.52
Lane Grp Cap(c), veh/h	768	514	483	1359	0	533	533	640	1561	405	0	534
V/C Ratio(X)	0.02	0.18	0.20	0.65	0.00	0.23	0.05	0.02	0.31	0.03	0.00	0.04
Avail Cap(c_a), veh/h	768	514	483	1359	0	533	681	640	1561	600	0	534
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.63	0.00	0.63	0.97	0.97	0.97	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.2	32.0	32.1	22.2	0.0	32.6	26.5	26.1	13.6	25.6	0.0	28.9
Incr Delay (d2), s/veh	0.1	0.8	0.9	1.5	0.0	0.7	0.0	0.1	0.5	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	3.9	3.9	12.8	0.0	5.1	0.8	0.4	6.1	0.5	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	32.8	33.0	23.7	0.0	33.2	26.5	26.2	14.1	25.6	0.0	28.9
LnGrp LOS	B	C	C	C	A	C	C	C	B	C	A	C
Approach Vol, veh/h		206			1003			517			37	
Approach Delay, s/veh		31.3			24.9			14.9			27.7	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	45.1	30.0	38.0	10.0	42.0	30.0	38.0
Change Period (Y+Rc), s	5.0	* 6.3	5.0	* 5.8	5.0	* 6.3	5.0	* 5.8
Max Green Setting (Gmax), s	15.0	* 26	25.0	* 32	15.0	* 26	25.0	* 32
Max Q Clear Time (g_c+I1), s	2.6	13.1	2.6	8.2	3.1	3.1	23.4	7.1
Green Ext Time (p_c), s	0.0	1.7	0.0	0.3	0.0	0.0	0.7	0.5

Intersection Summary	
HCM 6th Ctrl Delay	22.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	292	290	181	744	0	0
Future Volume (Veh/h)	292	290	181	744	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	324	322	201	827	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	334					
pX, platoon unblocked						
vC, conflicting volume			646		1553	324
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			646		1553	324
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			79		100	100
cM capacity (veh/h)			939		98	717

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	324	322	201	827
Volume Left	0	0	201	0
Volume Right	0	322	0	0
cSH	1700	1700	939	1700
Volume to Capacity	0.19	0.19	0.21	0.49
Queue Length 95th (ft)	0	0	20	0
Control Delay (s)	0.0	0.0	9.9	0.0
Lane LOS			A	
Approach Delay (s)	0.0		1.9	
Approach LOS				

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	55.6%	ICU Level of Service	B	
Analysis Period (min)	15			

AM Peak Hour

Intersection 7 - Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N

	EB	WB	NB	SB
Pedestrian Volumes	3	3	3	0
Pedestrian Calls	3	3	3	0

Intersection 9 - High Country Trl & Lake Mary Rd

	EB	WB	NB	SB
Pedestrian Volumes	7	-	-	5
Pedestrian Calls	7	-	-	5

Intersection 10 - Beulah Blvd & Woodlands Village Blvd

	EB	WB	NB	SB
Pedestrian Volumes	0	0	0	1
Pedestrian Calls	0	0	0	1

Intersection 11 - Beulah Blvd & McConnell Dr

	EB	WB	NB	SB
Pedestrian Volumes	16	1	13	2
Pedestrian Calls	10	1	10	2

Intersection 12 - Woodlands Village Blvd & Forest Meadows St

	EB	WB	NB	SB
Pedestrian Volumes	2	3	4	2
Pedestrian Calls	2	3	4	2

Intersection 13 - Beulah Blvd & Forest Meadows St

	EB	WB	NB	SB
Pedestrian Volumes	1	2	4	4
Pedestrian Calls	1	2	4	4

Intersection 14 - Milton Rd/I-17 & Forest Meadows St

	EB	WB	NB	SB
Pedestrian Volumes	8	-	0	1
Pedestrian Calls	8	-	0	1

Intersection 15 - Woodlands Village Blvd & University Ave

	EB	WB	NB	SB
Pedestrian Volumes	7	2	5	4
Pedestrian Calls	7	2	5	4

Intersection 17 - Milton Road & Clay Avenue/Butler Avenue

	EB	WB	NB	SB
Pedestrian Volumes	-	11	38	8
Pedestrian Calls	-	10	19	8

Intersection 18 - Milton Rd & Route 66

	EB	WB	NB	SB
Pedestrian Volumes	4	-	1	8
Pedestrian Calls	4	-	1	8

Intersection 20 - Milton Rd & University Dr

	EB	WB	NB	SB
Pedestrian Volumes	-	25	4	0
Pedestrian Calls	-	13	4	0

Intersection 21- Woodlands Village Blvd & Route 66								
		EB		WB		NB		SB
Pedestrian Volumes		2		4		2		4
Pedestrian Calls		2		4		2		4

Intersection 25- Country Club Dr & I-40 EB Ramps								
		EB		WB		NB		SB
Pedestrian Volumes		-		-		12		0
Pedestrian Calls		-		-		10		0

Intersection 26- Country Club Dr & I-40 WB Ramps								
		EB		WB		NB		SB
Pedestrian Volumes		-		0		0		-
Pedestrian Calls		-		0		0		-

Intersection 27- I-40 EB Ramps & Butler Ave								
		EB		WB		NB		SB
Pedestrian Volumes		2		0		0		-
Pedestrian Calls		2		0		0		-

Intersection 28- I-40 WB Ramps & Butler Ave								
		EB		WB		NB		SB
Pedestrian Volumes		0		1		-		4
Pedestrian Calls		-		1		-		4

PM Peak Hour

Intersection 7 - Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N

	EB		WB		NB		SB
Pedestrian Volumes	1		4		3		0
Pedestrian Calls	1		4		3		0

Intersection 9 - High Country Trl & Lake Mary Rd

	EB		WB		NB		SB
Pedestrian Volumes	3		-		-		2
Pedestrian Calls	3		-		-		2

Intersection 10 - Beulah Blvd & Woodlands Village Blvd

	EB		WB		NB		SB
Pedestrian Volumes	1		7		1		10
Pedestrian Calls	1		7		1		10

Intersection 11 - Beulah Blvd & McConnell Dr

	EB		WB		NB		SB
Pedestrian Volumes	11		1		21		2
Pedestrian Calls	10		1		11		2

Intersection 12 - Woodlands Village Blvd & Forest Meadows St

	EB		WB		NB		SB
Pedestrian Volumes	4		4		4		2
Pedestrian Calls	4		4		4		2

Intersection 13 - Beulah Blvd & Forest Meadows St

	EB		WB		NB		SB
Pedestrian Volumes	3		7		4		1
Pedestrian Calls	3		7		4		1

Intersection 14 - Milton Rd/I-17 & Forest Meadows St

	EB		WB		NB		SB
Pedestrian Volumes	10		-		0		2
Pedestrian Calls	10		-		0		2

Intersection 15 - Woodlands Village Blvd & University Ave

	EB		WB		NB		SB
Pedestrian Volumes	20		3		3		4
Pedestrian Calls	10		3		3		4

Intersection 17 - Milton Road & Clay Avenue/Butler Avenue

	EB		WB		NB		SB
Pedestrian Volumes	-		62		21		48
Pedestrian Calls	-		31		11		24

Intersection 18 - Milton Rd & Route 66

	EB		WB		NB		SB
Pedestrian Volumes	6		-		0		13
Pedestrian Calls	6		-		0		10

Intersection 20 - Milton Rd & University Dr

	EB		WB		NB		SB
Pedestrian Volumes	-		59		17		0
Pedestrian Calls	-		30		10		0

Intersection 21- Woodlands Village Blvd & Route 66								
		EB		WB		NB		SB
Pedestrian Volumes		4		1		2		3
Pedestrian Calls		4		1		2		3

Intersection 25- Country Club Dr & I-40 EB Ramps								
		EB		WB		NB		SB
Pedestrian Volumes		-		-		6		0
Pedestrian Calls		-		-		6		0

Intersection 26- Country Club Dr & I-40 WB Ramps								
		EB		WB		NB		SB
Pedestrian Volumes		-		0		0		-
Pedestrian Calls		-		0		0		-

Intersection 27- I-40 EB Ramps & Butler Ave								
		EB		WB		NB		SB
Pedestrian Volumes		0		0		0		-
Pedestrian Calls		0		0		0		-

Intersection 28- I-40 WB Ramps & Butler Ave								
		EB		WB		NB		SB
Pedestrian Volumes		3		5		-		1
Pedestrian Calls		3		5		-		1

Midday Peak Hour

Intersection 7 - Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N	EB	WB	NB	SB
Pedestrian Volumes	1	4	1	0
Pedestrian Calls	1	4	1	0

Intersection 9 - High Country Trl & Lake Mary Rd	EB	WB	NB	SB
Pedestrian Volumes	1	-	-	3
Pedestrian Calls	1	-	-	3

Intersection 10 - Beulah Blvd & Woodlands Village Blvd	EB	WB	NB	SB
Pedestrian Volumes	0	5	0	2
Pedestrian Calls	0	5	0	2

Intersection 11 - Beulah Blvd & McConnell Dr	EB	WB	NB	SB
Pedestrian Volumes	11	2	12	1
Pedestrian Calls	10	2	10	1

Intersection 12 - Woodlands Village Blvd & Forest Meadows St	EB	WB	NB	SB
Pedestrian Volumes	4	4	2	1
Pedestrian Calls	4	4	2	1

Intersection 13 - Beulah Blvd & Forest Meadows St	EB	WB	NB	SB
Pedestrian Volumes	1	4	2	4
Pedestrian Calls	1	4	2	4

Intersection 14 - Milton Rd/I-17 & Forest Meadows St	EB	WB	NB	SB
Pedestrian Volumes	2	-	0	3
Pedestrian Calls	2	-	0	3

Intersection 15 - Woodlands Village Blvd & University Ave	EB	WB	NB	SB
Pedestrian Volumes	17	1	0	3
Pedestrian Calls	10	1	0	3

Intersection 17 - Milton Road & Clay Avenue/Butler Avenue	EB	WB	NB	SB
Pedestrian Volumes	-	41	30	25
Pedestrian Calls	-	21	15	13

Intersection 18 - Milton Rd & Route 66	EB	WB	NB	SB
Pedestrian Volumes	7	0	2	15
Pedestrian Calls	7	-	2	10

Intersection 20 - Milton Rd & University Dr	EB	WB	NB	SB
Pedestrian Volumes	-	44	9	0
Pedestrian Calls	-	22	9	0

Intersection 21- Woodlands Village Blvd & Route 66								
		EB		WB		NB		SB
Pedestrian Volumes		1		2		3		4
Pedestrian Calls		1		2		3		4

Intersection 25- Country Club Dr & I-40 EB Ramps								
		EB		WB		NB		SB
Pedestrian Volumes		-		-		2		0
Pedestrian Calls		-		-		2		0

Intersection 26- Country Club Dr & I-40 WB Ramps								
		EB		WB		NB		SB
Pedestrian Volumes		-		0		0		-
Pedestrian Calls		-		0		0		-

Intersection 27- I-40 EB Ramps & Butler Ave								
		EB		WB		NB		SB
Pedestrian Volumes		0		0		0		-
Pedestrian Calls		0		0		0		-

Intersection 28- I-40 WB Ramps & Butler Ave								
		EB		WB		NB		SB
Pedestrian Volumes		0		0		-		0
Pedestrian Calls		0		0		-		0

2021 EXISTING RODEL ANALYSIS REPORTS

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	SB Beulah Blvd	0	0	12.00	1	19.00	1	98.00	65.00	22.50
2	EB Fairgrounds Rd	90	0	15.00	1	17.00	1	98.00	65.00	22.50
3	NB Beulah Blvd	180	0	13.00	1	16.00	1	98.00	65.00	22.50
4	WB JW Powell Blvd	270	0	13.00	1	17.00	1	98.00	65.00	22.50

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB Beulah Blvd	145.00	20.50	1	17.00	1	12.00	1
2	EB Fairgrounds Rd	145.00	20.50	1	19.00	1	15.00	1
3	NB Beulah Blvd	145.00	20.50	1	20.00	1	13.00	1
4	WB JW Powell Blvd	145.00	20.50	1	17.00	1	16.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB Beulah Blvd	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
2	EB Fairgrounds Rd	0	1.000	0	1.000	20.00	2240	0	15.00	2240	0
3	NB Beulah Blvd	0	1.000	0	1.000	20.00	1942	0	13.00	1942	0
4	WB JW Powell Blvd	0	1.000	0	1.000	20.00	1942	0	16.00	2390	0

Traffic Flow Data (veh/hr)

2021 AM Peak Peak Hour Flows

Leg	Leg Names	Turning Flows					Flow Modifiers		
		U-Turn	Exit-3	Exit-2	Exit-1	Bypass	Trucks %	Flow Factor	Peak Hour Factor
1	SB Beulah Blvd	0	87	66	1	0	5.0	1.00	0.850
2	EB Fairgrounds Rd	0	2	16	2	0	5.0	1.00	0.800
3	NB Beulah Blvd	0	1	43	166	0	5.0	1.00	0.850
4	WB JW Powell Blvd	0	179	31	48	0	5.0	1.00	0.850

Operational Results

2021 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB Beulah Blvd	None	154		211		93	1088		0.1415	
2	EB Fairgrounds Rd	None	20		332		33	1033		0.0194	
3	NB Beulah Blvd	None	210		105		247	1154		0.1820	
4	WB JW Powell Blvd	None	258		46		269	1186		0.2175	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB Beulah Blvd	None	3.68		3.68	0.52		A		A
2	EB Fairgrounds Rd	None	3.41		3.41	0.07		A		A
3	NB Beulah Blvd	None	3.63		3.63	0.69		A		A
4	WB JW Powell Blvd	None	3.68		3.68	0.86		A		A

2021 AM Peak - 15 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB Beulah Blvd	None	181		248		110	1068		0.1697	
2	EB Fairgrounds Rd	None	25		390		39	1001		0.0250	
3	NB Beulah Blvd	None	247		125		291	1143		0.2161	
4	WB JW Powell Blvd	None	304		54		317	1182		0.2569	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB Beulah Blvd	None	3.65		3.65	0.52		A		A
2	EB Fairgrounds Rd	None	3.30		3.30	0.07		A		A
3	NB Beulah Blvd	None	3.59		3.59	0.69		A		A
4	WB JW Powell Blvd	None	3.65		3.65	0.86		A		A

Approach Flow Profile

2021 AM Peak - Approach Flows (Veh / Hour)

Time Slice	SB Beulah Blvd	EB Fairgrounds Rd	NB Beulah Blvd	WB JW Powell Blvd
0.0 - 7.5	18.12	2.29	24.71	30.35
7.5 - 15.0	18.12	2.29	24.71	30.35
15.0 - 22.5	18.12	2.29	24.71	30.35
22.5 - 30.0	22.65	3.13	30.88	37.94
30.0 - 37.5	22.65	3.13	30.88	37.94
37.5 - 45.0	18.12	2.29	24.71	30.35
45.0 - 52.5	18.12	2.29	24.71	30.35
52.5 - 60.0	18.12	2.29	24.71	30.35
Peak 15 min	22.65	3.13	30.88	37.94
Peak 60 min	19.25	2.50	26.25	32.25

Exit Flow Profile

2021 AM Peak - Exit Flows (Veh / Hour)

Time Slice	SB Beulah Blvd	EB Fairgrounds Rd	NB Beulah Blvd	WB JW Powell Blvd
0.0 - 7.5	10.92	3.88	29.02	31.57
7.5 - 15.0	10.94	3.88	29.05	31.60
15.0 - 22.5	10.94	3.88	29.05	31.60
22.5 - 30.0	13.68	4.85	36.30	39.66
30.0 - 37.5	13.69	4.85	36.34	39.71
37.5 - 45.0	10.95	3.89	29.09	31.64
45.0 - 52.5	10.94	3.88	29.05	31.60
52.5 - 60.0	10.94	3.88	29.05	31.60
0-60	93	33	247	269
%Trucks	5.00	5.00	5.00	5.00

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	SB I-17 Off Ramp	0	0	12.00	1	15.00	1	158.00	65.00	22.50
2	EB JW Powell Blvd	90	0	12.00	1	16.50	1	98.00	65.00	22.50
3	NB I-17 On Ramp	180	0	6.50	1	10.00	1	158.00	65.00	15.00
4	WB JW Powell Blvd	270	0	10.00	1	16.00	1	158.00	65.00	34.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB I-17 Off Ramp	140.00	20.50	1	13.00	1	10.00	1
2	EB JW Powell Blvd	140.00	20.50	1	19.00	1	10.00	1
3	NB I-17 On Ramp	140.00	20.50	1	17.50	1	12.00	1
4	WB JW Powell Blvd	140.00	20.50	1	14.00	1	13.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB I-17 Off Ramp	0	1.000	0	1.000	20.00	1792	0	10.00	1494	0
2	EB JW Powell Blvd	0	1.000	0	1.000	20.00	1792	0	10.00	1494	0
3	NB I-17 On Ramp	0	1.000	0	1.000	20.00	971	0	12.00	1792	0
4	WB JW Powell Blvd	0	1.000	0	1.000	20.00	1494	0	13.00	1942	0

Traffic Flow Data (veh/hr)

2021 AM Peak Peak Hour Flows

Leg	Leg Names	Turning Flows					Flow Modifiers		
		U-Turn	Exit-3	Exit-2	Exit-1	Bypass	Trucks %	Flow Factor	Peak Hour Factor
1	SB I-17 Off Ramp	0	154	0	175	0	5.0	1.00	0.900
2	EB JW Powell Blvd	0	0	195	74	0	5.0	1.00	0.850
3	NB I-17 On Ramp	0	0	0	0	0	5.0	1.00	0.800
4	WB JW Powell Blvd	0	31	83	0	0	5.0	1.00	0.850

Operational Results

2021 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB I-17 Off Ramp	None	329		114		0	1145		0.2874	
2	EB JW Powell Blvd	None	269		185		258	1101		0.2442	
3	NB I-17 On Ramp	None	0		0		105	0		0.0000	
4	WB JW Powell Blvd	None	114		0		349	1141		0.0999	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB I-17 Off Ramp	None	4.17		4.17	1.18		A		A
2	EB JW Powell Blvd	None	4.10		4.10	1.02		A		A
3	NB I-17 On Ramp	None	0.00		0.00	0.00		A		A
4	WB JW Powell Blvd	None	3.35		3.35	0.34		A		A

2021 AM Peak
50% Confidence Level
Daylight conditions

Project: NAH 20-1380
Scheme: Existing 2021
Rodel-Win1 - Full Geometry

Approach Flow Profile

2021 AM Peak - Approach Flows (Veh / Hour)

Time Slice	SB I-17 Off Ramp	EB JW Powell Blvd	NB I-17 On Ramp	WB JW Powell Blvd
0.0 - 7.5	39.60	31.65	0.00	13.41
7.5 - 15.0	39.60	31.65	0.00	13.41
15.0 - 22.5	39.60	31.65	0.00	13.41
22.5 - 30.0	45.69	39.56	0.00	16.76
30.0 - 37.5	45.69	39.56	0.00	16.76
37.5 - 45.0	39.60	31.65	0.00	13.41
45.0 - 52.5	39.60	31.65	0.00	13.41
52.5 - 60.0	39.60	31.65	0.00	13.41
Peak 15 min	45.69	39.56	0.00	16.76
Peak 60 min	41.13	33.62	0.00	14.25

Exit Flow Profile

2021 AM Peak - Exit Flows (Veh / Hour)

Time Slice	SB I-17 Off Ramp	EB JW Powell Blvd	NB I-17 On Ramp	WB JW Powell Blvd
0.0 - 7.5	0.00	30.80	12.34	41.44
7.5 - 15.0	0.00	30.83	12.35	41.48
15.0 - 22.5	0.00	30.83	12.35	41.48
22.5 - 30.0	0.00	36.48	15.42	50.01
30.0 - 37.5	0.00	36.51	15.44	50.07
37.5 - 45.0	0.00	30.86	12.37	41.53
45.0 - 52.5	0.00	30.83	12.35	41.48
52.5 - 60.0	0.00	30.83	12.35	41.48
0-60	0	258	105	349
%Trucks	0.00	5.00	5.00	5.00

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	SB Beulah Blvd	0	0	12.00	1	19.00	1	98.00	65.00	22.50
2	EB Fairgrounds Rd	90	0	15.00	1	17.00	1	98.00	65.00	22.50
3	NB Beulah Blvd	180	0	13.00	1	16.00	1	98.00	65.00	22.50
4	WB JW Powell Blvd	270	0	13.00	1	17.00	1	98.00	65.00	22.50

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB Beulah Blvd	145.00	20.50	1	17.00	1	12.00	1
2	EB Fairgrounds Rd	145.00	20.50	1	19.00	1	15.00	1
3	NB Beulah Blvd	145.00	20.50	1	20.00	1	13.00	1
4	WB JW Powell Blvd	145.00	20.50	1	17.00	1	16.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB Beulah Blvd	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
2	EB Fairgrounds Rd	0	1.000	0	1.000	20.00	2240	0	15.00	2240	0
3	NB Beulah Blvd	0	1.000	0	1.000	20.00	1942	0	13.00	1942	0
4	WB JW Powell Blvd	0	1.000	0	1.000	20.00	1942	0	16.00	2390	0

Traffic Flow Data (veh/hr)

2021 PM Peak Peak Hour Flows

Leg	Leg Names	Turning Flows					Flow Modifiers		
		U-Turn	Exit-3	Exit-2	Exit-1	Bypass	Trucks %	Flow Factor	Peak Hour Factor
1	SB Beulah Blvd	0	119	77	1	0	2.0	1.00	0.850
2	EB Fairgrounds Rd	0	9	34	5	0	2.0	1.00	0.800
3	NB Beulah Blvd	0	2	81	209	0	2.0	1.00	0.850
4	WB JW Powell Blvd	0	196	21	59	0	2.0	1.00	0.850

Operational Results

2021 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB Beulah Blvd	None	197		219		149	1152		0.1710	
2	EB Fairgrounds Rd	None	48		392		24	1067		0.0450	
3	NB Beulah Blvd	None	292		162		278	1192		0.2449	
4	WB JW Powell Blvd	None	276		92		362	1232		0.2241	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB Beulah Blvd	None	3.72		3.72	0.67		A		A
2	EB Fairgrounds Rd	None	3.49		3.49	0.16		A		A
3	NB Beulah Blvd	None	3.94		3.94	1.07		A		A
4	WB JW Powell Blvd	None	3.71		3.71	0.94		A		A

2021 PM Peak - 15 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB Beulah Blvd	None	232		258		176	1130		0.2050	
2	EB Fairgrounds Rd	None	60		461		28	1028		0.0584	
3	NB Beulah Blvd	None	344		194		327	1175		0.2925	
4	WB JW Powell Blvd	None	325		109		428	1222		0.2656	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB Beulah Blvd	None	3.71		3.71	0.67		A		A
2	EB Fairgrounds Rd	None	3.41		3.41	0.16		A		A
3	NB Beulah Blvd	None	3.97		3.97	1.07		A		A
4	WB JW Powell Blvd	None	3.70		3.70	0.94		A		A

Approach Flow Profile

2021 PM Peak - Approach Flows (Veh / Hour)

Time Slice	SB Beulah Blvd	EB Fairgrounds Rd	NB Beulah Blvd	WB JW Powell Blvd
0.0 - 7.5	23.18	5.50	34.35	32.47
7.5 - 15.0	23.18	5.50	34.35	32.47
15.0 - 22.5	23.18	5.50	34.35	32.47
22.5 - 30.0	28.97	7.50	42.94	40.59
30.0 - 37.5	28.97	7.50	42.94	40.59
37.5 - 45.0	23.18	5.50	34.35	32.47
45.0 - 52.5	23.18	5.50	34.35	32.47
52.5 - 60.0	23.18	5.50	34.35	32.47
Peak 15 min	28.97	7.50	42.94	40.59
Peak 60 min	24.63	6.00	36.50	34.50

Exit Flow Profile

2021 PM Peak - Exit Flows (Veh / Hour)

Time Slice	SB Beulah Blvd	EB Fairgrounds Rd	NB Beulah Blvd	WB JW Powell Blvd
0.0 - 7.5	17.48	2.82	32.66	42.44
7.5 - 15.0	17.50	2.82	32.69	42.48
15.0 - 22.5	17.50	2.82	32.69	42.48
22.5 - 30.0	21.97	3.53	40.88	53.48
30.0 - 37.5	21.99	3.53	40.93	53.55
37.5 - 45.0	17.53	2.83	32.74	42.55
45.0 - 52.5	17.50	2.82	32.69	42.48
52.5 - 60.0	17.50	2.82	32.69	42.48
0-60	149	24	278	362
%Trucks	2.00	2.00	2.00	2.00

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle Phi
1	SB I-17 Off Ramp	0	0	12.00	1	15.00	1	158.00	65.00	22.50
2	EB JW Powell Blvd	90	0	12.00	1	16.50	1	98.00	65.00	22.50
3	NB I-17 On Ramp	180	0	6.50	1	10.00	1	158.00	65.00	15.00
4	WB JW Powell Blvd	270	0	10.00	1	16.00	1	158.00	65.00	34.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB I-17 Off Ramp	140.00	20.50	1	13.00	1	10.00	1
2	EB JW Powell Blvd	140.00	20.50	1	19.00	1	10.00	1
3	NB I-17 On Ramp	140.00	20.50	1	17.50	1	12.00	1
4	WB JW Powell Blvd	140.00	20.50	1	14.00	1	13.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB I-17 Off Ramp	0	1.000	0	1.000	20.00	1792	0	10.00	1494	0
2	EB JW Powell Blvd	0	1.000	0	1.000	20.00	1792	0	10.00	1494	0
3	NB I-17 On Ramp	0	1.000	0	1.000	20.00	971	0	12.00	1792	0
4	WB JW Powell Blvd	0	1.000	0	1.000	20.00	1494	0	13.00	1942	0

Traffic Flow Data (veh/hr)

2021 PM Peak Peak Hour Flows

Leg	Leg Names	Turning Flows					Flow Modifiers		
		U-Turn	Exit-3	Exit-2	Exit-1	Bypass	Trucks %	Flow Factor	Peak Hour Factor
1	SB I-17 Off Ramp	0	158	0	206	0	2.0	1.00	0.900
2	EB JW Powell Blvd	0	0	248	114	0	2.0	1.00	0.900
3	NB I-17 On Ramp	0	0	0	0	0	2.0	1.00	0.800
4	WB JW Powell Blvd	0	36	70	0	0	2.0	1.00	0.850

Operational Results

2021 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB I-17 Off Ramp	None	364		106		0	1219		0.2985	
2	EB JW Powell Blvd	None	362		194		276	1165		0.3107	
3	NB I-17 On Ramp	None	0		0		150	0		0.0000	
4	WB JW Powell Blvd	None	106		0		406	1209		0.0877	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB I-17 Off Ramp	None	4.14		4.14	1.29		A		A
2	EB JW Powell Blvd	None	4.41		4.41	1.38		A		A
3	NB I-17 On Ramp	None	0.00		0.00	0.00		A		A
4	WB JW Powell Blvd	None	3.22		3.22	0.30		A		A

2021 PM Peak
50% Confidence Level
Daylight conditions

Project: NAH 20-1380
Scheme: Existing 2021
Rodel-Win1 - Full Geometry

Approach Flow Profile

2021 PM Peak - Approach Flows (Veh / Hour)

Time Slice	SB I-17 Off Ramp	EB JW Powell Blvd	NB I-17 On Ramp	WB JW Powell Blvd
0.0 - 7.5	43.81	43.57	0.00	12.47
7.5 - 15.0	43.81	43.57	0.00	12.47
15.0 - 22.5	43.81	43.57	0.00	12.47
22.5 - 30.0	50.56	50.28	0.00	15.59
30.0 - 37.5	50.56	50.28	0.00	15.59
37.5 - 45.0	43.81	43.57	0.00	12.47
45.0 - 52.5	43.81	43.57	0.00	12.47
52.5 - 60.0	43.81	43.57	0.00	12.47
Peak 15 min	50.56	50.28	0.00	15.59
Peak 60 min	45.50	45.25	0.00	13.25

Exit Flow Profile

2021 PM Peak - Exit Flows (Veh / Hour)

Time Slice	SB I-17 Off Ramp	EB JW Powell Blvd	NB I-17 On Ramp	WB JW Powell Blvd
0.0 - 7.5	0.00	33.01	17.94	48.83
7.5 - 15.0	0.00	33.03	17.96	48.87
15.0 - 22.5	0.00	33.03	17.96	48.87
22.5 - 30.0	0.00	38.87	21.11	56.33
30.0 - 37.5	0.00	38.91	21.13	56.39
37.5 - 45.0	0.00	33.07	17.98	48.92
45.0 - 52.5	0.00	33.03	17.96	48.87
52.5 - 60.0	0.00	33.03	17.96	48.87
0-60	0	276	150	406
%Trucks	0.00	2.00	2.00	2.00

Report dated 13-Apr-2022
Rodel Version 1.96 Run number 89

APPENDIX D

TRIP GENERATION CALCULATIONS

Methodology Overview

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 11th Edition and methodology described within ITE's Trip Generation Handbook, 3rd Edition. These references will be referred to as Manual and Handbook, respectively. The Manual contains data collected by various transportation professionals for a wide range of different land uses, with each land use category represented by a land use code (LUC). Average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized LUC in various settings and time periods. The Handbook indicates an established methodology for how to use data contained within the Manual when to use the fitted curve instead of the average rate and when to adjustments to the volume of trips are appropriate and how to do so. The methodology steps are represented visually in boxes in Figure 3.1. This worksheet applies calculations for each box if applicable.

Box 1 - Define Study Site Land Use Type & Site Characteristics

The analyst is to pick an appropriate LUC(s) based on the subject's zoning/land use(s)/future land use(s). The size of the land use(s) is described in reference to an independent variable(s) specific to (each) the land use (example: 1,000 square feet of building area is relatively common).

Land Use Types and Size

Proposed Use	Amount	Units	ITE LUC	ITE Land Use Name
Hospital	751.850	1,000 square feet	610	Hospital
Clinic	205.042	1,000 square feet	630	Clinic

Box 2 - Define Site Context

Context assessment is to "simply determine whether the study sites is in a multimodal setting" and "could have persons accessing the site by walking, bicycling, or riding transit." This assessment is used in Box 4. The Manual separates data into 4 setting categories - Rural, General Urban/Suburban, Dense Multi-Urban Use and Center City Core. This worksheet uses the following abbreviations, respectively: R, G, D, and C. The Manual does not have data for all settings of all land use codes. See the table on the next page titled "Site Context and Time Periods" - if this table is not provided, the "General Urban/Suburban" setting is used by default.

Box 3 - Define Analysis Objectives Types of Trips & Time Period

This tool will focus on vehicular trips for a 24-hour period on a typical weekday as well as its AM peak hour and PM peak hour. Other time period(s) may be of interest.

Site Context and Time Periods - Actual Setting, Setting Data Available for LUC, Setting Used in Analyses

Proposed Use	Setting		ADT		AM Peak Hour		PM Peak Hour		(not used)	
			Available	Used	Available	Used	Available	Used		
Hospital	General Urban/Suburban	G	G	G	G	G	G	G		
Clinic	General Urban/Suburban	G	G D	G	G	G	G D	G		

If the desired setting is not available within the *Manual,* adjustments may be made in Boxes 6 through 8.

Box 4 - Is Study Site Multimodal?

Per the Handbook, "if the objective is to establish a local trip generation rate for a particular land use or study site, the simplified approach (Box 9) may be acceptable but the Box 5 through 8 approach is required if the study site is located in an infill setting, contains a mix of uses on-site, or is near significant transit service."

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Determine Equation)

Vehicle trips are estimated using rates/equations applicable to each LUC. When the appropriate graph has a fitted curve, the Handbook has a process (Figure 4.2) to determine when to use it versus using the weighted average rate or collecting local data. The methodology requires for engineering judgement in some circumstances and permits engineering judgement to override or make adjustments when appropriate to best project (example 1: study site is expected to operate differently than data in the applicable land use code - such as restaurant that is closed in the morning or in the evening; example 2: LUC data in a localized area fails to be represented by the typically selected fitted curve/weighted average rate - a small shop/LUC 820, AM peak hour is skewed by the high y-intercept).

Equation Type: Equation Used [Equated Rate] (Type Abbreviations: Weighted Average Rate ("WA"), Fitted Curve ("FC"), or Custom ("C"))

Proposed Use	ADT	AM Peak Hour	PM Peak Hour	(not used)
Hospital	FC: T=5.29*X+3469.05 [9.90]	FC: LN(T)=0.6*LN(X)+2.52 [0.88]	FC: LN(T)=0.64*LN(X)+2.27 [0.89]	
Clinic	FC: T=35.86*X+34.88 [36.03]	FC: T=2.19*X+8.68 [2.23]	FC: T=3.53*X+2.98 [3.54]	

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Apply Equations and in/out Distributions)

Baseline Vehicular Trips

	ADT				AM Peak Hour				PM Peak Hour				(not used)			
Proposed Use	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total				
Hospital	50%	3,723	3,723	7,446	67%	443	218	661	35%	235	436	671				
Clinic	50%	3,694	3,694	7,388	81%	371	87	458	30%	218	509	727				
Totals		**7,417**	**7,417**	**14,834**		**814**	**305**	**1,119**		**453**	**945**	**1,398**				

APPENDIX E

BACKGROUND GROWTH CALCULATIONS

Location of counts: **City intersections south of the I-40 ONLY**

Beulah Blvd & Fairgrounds Rd/JW Powell Blvd
Beulah Blvd & University Heights Dr South
Beulah Blvd & Lake Mary Rd/Uni. Heights Dr N

Growth Rate Used	1.0%
Per-Year Multiplier	1.010

Year	Expansion Factor(s)
2021	1.000
2022	1.010
2023	1.020
2024	1.030
2025	1.041
2026	1.051
2027	**1.062**

Location of counts: **City intersections north of the I-40 ONLY**
Beulah Blvd & Woodlands Village Blvd
Beulah Blvd & McConnell Dr
Beulah Blvd & Forest Meadows St

Growth Rate Used	0.2%	1.0%
Per-Year Multiplier	1.002	1.010

Year	Expansion Factor(s)
2021	1.000
2022	1.002
2023	1.004
2024	1.006
2025	1.008
2026	1.018
2027	**1.028**

APPENDIX F

2027 NO BUILD PEAK HOUR ANALYSIS

1: Beulah Blvd. & Fairgrounds Rd./J.W. Powell Blvd.

HCM 6th Roundabout

Intersection	
Intersection Delay, s/veh	5.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	25	322	262	186
Demand Flow Rate, veh/h	25	328	267	190
Vehicles Circulating, veh/h	417	58	128	271
Vehicles Exiting, veh/h	44	337	314	115
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.3	5.0	5.0	5.2
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	25	328	267	190
Cap Entry Lane, veh/h	902	1301	1211	1047
Entry HV Adj Factor	0.984	0.982	0.981	0.981
Flow Entry, veh/h	25	322	262	186
Cap Entry, veh/h	887	1277	1188	1027
V/C Ratio	0.028	0.252	0.220	0.182
Control Delay, s/veh	4.3	5.0	5.0	5.2
LOS	A	A	A	A
95th %tile Queue, veh	0	1	1	1

6: Beulah Blvd. & University Heights Dr. (South)

HCM 6th TWSC

Intersection	
Int Delay, s/veh	9.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	285	37	29	96	138	0
Future Vol, veh/h	285	37	29	96	138	0
Conflicting Peds, #/hr	0	0	9	0	0	9
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	155	-	-	310
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	317	41	32	107	153	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	333	162	162	0	-	0
Stage 1	162	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	662	883	1417	-	-	-
Stage 1	867	-	-	-	-	-
Stage 2	859	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	638	876	1406	-	-	-
Mov Cap-2 Maneuver	638	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	853	-	-	-	-	-

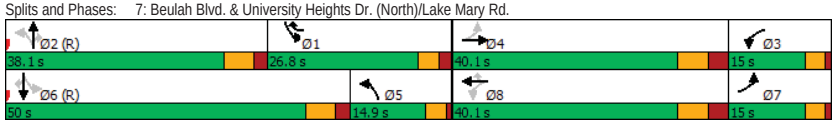
Approach	EB	NB	SB
HCM Control Delay, s	16.8	1.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1406	-	659	-	-
HCM Lane V/C Ratio	0.023	-	0.543	-	-
HCM Control Delay (s)	7.6	-	16.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	3.3	-	-

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	Min	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	26.8	38.1	15	40.1	14.9	50	15	40.1
Maximum Split (%)	22.3%	31.8%	12.5%	33.4%	12.4%	41.7%	12.5%	33.4%
Minimum Split (s)	10	38.1	10	39.1	10	34.9	10	40.1
Yellow Time (s)	3	4.4	3	4.4	3	4.4	3	4.4
All-Red Time (s)	2	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	10	5	5	5	10	5	5
Vehicle Extension (s)	2	2	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	3	1.5	3	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		27.6		27.6		23.6		28.6
Dual Entry	No	No	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
End Time (s)	64.9	38.1	0	105	64.9	50	0	105
Yield/Force Off (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Yield/Force Off 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9
Local Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
Local Yield (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Local Yield 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	21	7	81	26	706	1	322	48	366	58	110
Future Volume (veh/h)	230	21	7	81	26	706	1	322	48	366	58	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.93	0.98		1.00	0.99		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	256	23	2	90	29	0	1	358	34	407	64	92
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	282	143	12	285	160		1118	424	322	1677	220	152
Arrive On Green	0.09	0.08	0.06	0.09	0.09	0.00	0.56	0.23	0.21	0.45	0.12	0.10
Sat Flow, veh/h	1781	1684	146	1781	1870	1585	1781	1870	1558	3456	1870	1561
Grp Volume(v), veh/h	256	0	25	90	29	0	1	358	34	407	64	92
Grp Sat Flow(s),veh/h/ln	1781	0	1831	1781	1870	1585	1781	1870	1558	1728	1870	1561
Q Serve(g_s), s	8.4	0.0	1.5	0.0	1.7	0.0	0.0	22.0	2.1	4.1	3.8	6.8
Cycle Q Clear(g_c), s	8.4	0.0	1.5	0.0	1.7	0.0	0.0	22.0	2.1	4.1	3.8	6.8
Prop In Lane	1.00		0.08	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	282	0	155	285	160		1118	424	322	1677	220	152
V/C Ratio(X)	0.91	0.00	0.16	0.32	0.18		0.00	0.84	0.11	0.24	0.29	0.60
Avail Cap(c_a), veh/h	290	0	537	292	549		1118	530	410	1677	715	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	0.0	51.0	47.6	51.0	0.0	9.2	44.3	38.6	18.6	48.4	51.9
Incr Delay (d2), s/veh	29.2	0.0	0.2	0.2	0.2	0.0	0.0	18.2	0.7	0.0	3.3	16.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	14.7	0.0	1.2	4.4	1.4	0.0	0.0	17.7	1.5	5.9	3.5	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.2	0.0	51.2	47.9	51.2	0.0	9.2	62.5	39.2	18.7	51.7	68.4
LnGrp LOS	F	A	D	D	D		A	E	D	B	D	E
Approach Vol, veh/h		281			119			393			563	
Approach Delay, s/veh		77.6			48.7			60.4			30.6	
Approach LOS		E			D			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	59.1	31.3	14.5	15.1	72.2	18.2	14.5	15.1
Change Period (Y+Rc), s	5.0	6.5	4.0	7.5	5.0	* 6.5	4.0	7.5
Max Green Setting (Gmax), s	21.8	31.6	11.0	32.6	10.9	* 44	11.0	32.6
Max Q Clear Time (g_c+I1), s	6.1	24.0	2.0	3.5	2.0	8.8	10.4	3.7
Green Ext Time (p_c), s	1.0	0.5	0.1	0.0	0.0	0.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	50.5
HCM 6th LOS	D

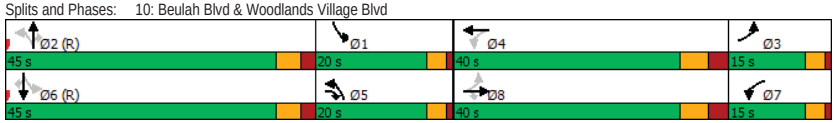
Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	C-Min	None	None	Min	C-Min	None	None
Maximum Split (s)	20	45	15	40	20	45	15	40
Maximum Split (%)	16.7%	37.5%	12.5%	33.3%	16.7%	37.5%	12.5%	33.3%
Minimum Split (s)	9	21.1	9	31.1	9	27.1	9	33.1
Yellow Time (s)	3	3.6	3	4	3	3.6	3	4
All-Red Time (s)	1	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	1.5	3	3	1	1.5	3	3
Minimum Gap (s)	3	1.5	3	3	1	1.5	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		11.4		20		17.4		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	14	119	79	59	14	119	79
End Time (s)	79	59	14	119	79	59	14	119
Yield/Force Off (s)	75	53.3	10	111.9	75	53.3	10	111.9
Yield/Force Off 170(s)	75	41.9	10	91.9	75	35.9	10	89.9
Local Start Time (s)	45	0	105	65	45	0	105	65
Local Yield (s)	61	39.3	116	97.9	61	39.3	116	97.9
Local Yield 170(s)	61	27.9	116	77.9	61	21.9	116	75.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80

Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Splits and Phases: 10: Beulah Blvd & Woodlands Village Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1	308	1	7	14	387	824	2	12	194	54
Future Volume (veh/h)	78	1	308	1	7	14	387	824	2	12	194	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	0	224	1	8	13	430	916	2	13	216	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	0	2178	178	27	43	1230	1032	435	899	507	220
Arrive On Green	0.05	0.00	0.05	0.04	0.04	0.04	0.62	0.29	0.27	0.94	0.29	0.29
Sat Flow, veh/h	1781	0	3170	1781	641	1042	1781	3554	1583	1781	3554	1544
Grp Volume(v), veh/h	87	0	224	1	0	21	430	916	2	13	216	46
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1683	1781	1777	1583	1781	1777	1544
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.5	3.2	29.6	0.1	0.0	5.9	2.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	1.5	3.2	29.6	0.1	0.0	5.9	2.7
Prop In Lane	1.00		1.00	1.00		0.62	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	214	0	2178	178	0	70	1230	1032	435	899	507	220
V/C Ratio(X)	0.41	0.00	0.10	0.01	0.00	0.30	0.35	0.89	0.00	0.01	0.43	0.21
Avail Cap(c_a), veh/h	307	0	2916	271	0	461	1230	1220	519	899	1220	530
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh	52.1	0.0	6.3	50.7	0.0	55.8	8.3	40.7	31.6	1.8	38.9	37.7
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.0	0.0	2.4	0.1	11.3	0.0	0.0	2.5	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	0.0	1.6	0.1	0.0	1.2	7.5	20.5	0.1	0.0	4.7	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.3	0.0	6.3	50.7	0.0	58.2	8.3	52.0	31.6	1.8	41.4	39.8
LnGrp LOS	D	A	A	D	A	E	A	D	C	A	D	D
Approach Vol, veh/h		311			22			1348			275	
Approach Delay, s/veh		19.5			57.8			38.0			39.2	
Approach LOS		B			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	60.5	38.7	8.7	12.1	78.3	20.9	8.7	12.1
Change Period (Y+Rc), s	4.0	5.7	4.0	7.1	4.0	5.7	4.0	7.1
Max Green Setting (Gmax), s	16.0	39.3	11.0	32.9	16.0	39.3	11.0	32.9
Max Q Clear Time (g_c+I1), s	2.0	31.6	2.0	3.5	5.2	7.9	2.0	2.0
Green Ext Time (p_c), s	0.0	1.4	0.1	0.1	0.3	0.4	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

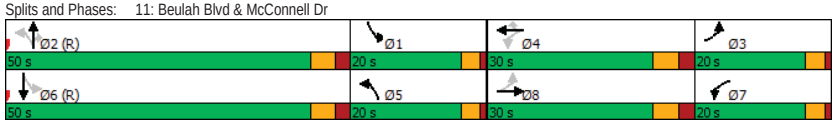
Notes

User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	50	20	30	20	50	20	30
Maximum Split (%)	16.7%	41.7%	16.7%	25.0%	16.7%	41.7%	16.7%	25.0%
Minimum Split (s)	9	25.7	9	24.4	9	25.7	9	29.4
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	1	2.1	1	2.4	1	2.1	1	2.4
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	2	3	2	3	2	3	2
Minimum Gap (s)	3	2	3	2	3	2	3	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		15.4		14.4		15.4		19.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	9	109	79	59	9	109	79
End Time (s)	79	59	9	109	79	59	9	109
Yield/Force Off (s)	75	53.3	5	103	75	53.3	5	103
Yield/Force Off 170(s)	75	37.9	5	103	75	37.9	5	103
Local Start Time (s)	50	0	100	70	50	0	100	70
Local Yield (s)	66	44.3	116	94	66	44.3	116	94
Local Yield 170(s)	66	28.9	116	94	66	28.9	116	94

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 11: Beulah Blvd & McConnell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	166	6	166	86	36	13	439	527	59	271	43
Future Volume (veh/h)	33	166	6	166	86	36	13	439	527	59	271	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.95	0.98		0.95	0.99		0.96	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	184	6	184	96	30	14	488	438	66	301	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	350	307	10	253	235	189	981	1114	476	700	480	58
Arrive On Green	0.13	0.17	0.15	0.09	0.13	0.13	0.83	0.52	0.52	0.34	0.15	0.14
Sat Flow, veh/h	1781	1798	59	1781	1870	1501	1781	3554	1517	1781	3173	386
Grp Volume(v), veh/h	37	0	190	184	96	30	14	488	438	66	167	171
Grp Sat Flow(s),veh/h/ln	1781	0	1857	1781	1870	1501	1781	1777	1517	1781	1777	1781
Q Serve(g_s), s	0.0	0.0	11.3	5.4	5.7	2.1	0.0	10.2	31.9	0.0	10.6	10.8
Cycle Q Clear(g_c), s	0.0	0.0	11.3	5.4	5.7	2.1	0.0	10.2	31.9	0.0	10.6	10.8
Prop In Lane	1.00		0.03	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	350	0	317	253	235	189	981	1114	476	700	269	270
V/C Ratio(X)	0.11	0.00	0.60	0.73	0.41	0.16	0.01	0.44	0.92	0.09	0.62	0.63
Avail Cap(c_a), veh/h	392	0	415	376	418	335	981	1359	580	700	680	681
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.94	0.94	0.94	0.99	0.99	0.99
Uniform Delay (d), s/veh	42.0	0.0	46.0	50.6	48.3	46.8	4.4	22.1	27.2	24.0	47.7	48.0
Incr Delay (d2), s/veh	0.1	0.0	0.7	4.0	0.4	0.1	0.0	1.2	24.5	0.1	10.2	10.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	0.0	9.0	9.4	4.8	1.4	0.1	7.0	17.8	2.3	9.2	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	0.0	46.7	54.6	48.8	46.9	4.4	23.2	51.7	24.0	57.9	58.7
LnGrp LOS	D	A	D	D	D	D	A	C	D	C	E	E
Approach Vol, veh/h		227			310			940			404	
Approach Delay, s/veh		45.9			52.0			36.2			52.7	
Approach LOS		D			D			D			D	

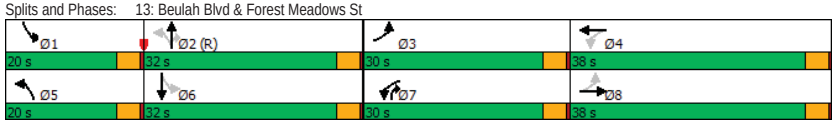
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.8	41.7	17.2	18.3	62.3	22.3	11.7	23.7
Change Period (Y+Rc), s	4.0	5.7	4.0	6.0	4.0	5.7	4.0	6.0
Max Green Setting (Gmax), s	16.0	44.3	16.0	24.0	16.0	44.3	16.0	24.0
Max Q Clear Time (g_c+I1), s	2.0	33.9	2.0	7.7	2.0	12.8	7.4	13.3
Green Ext Time (p_c), s	0.1	2.1	0.1	0.2	0.0	0.7	0.4	0.3

Intersection Summary		
HCM 6th Ctrl Delay		43.5
HCM 6th LOS		D

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes						
Recall Mode	None	C-Min	Max	Max	Min	Min	Max	Max
Maximum Split (s)	20	32	30	38	20	32	30	38
Maximum Split (%)	16.7%	26.7%	25.0%	31.7%	16.7%	26.7%	25.0%	31.7%
Minimum Split (s)	8	20	8	20	8	20	8	20
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum Initial (s)	4	4	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	102	2	34	64	102	2	34	64
End Time (s)	2	34	64	102	2	34	64	102
Yield/Force Off (s)	118	30	60	98	118	30	60	98
Yield/Force Off 170(s)	118	19	60	87	118	30	60	87
Local Start Time (s)	100	0	32	62	100	0	32	62
Local Yield (s)	116	28	58	96	116	28	58	96
Local Yield 170(s)	116	17	58	85	116	28	58	85

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 2 (2%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 13: Beulah Blvd & Forest Meadows St



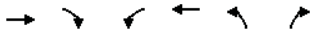
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	128	22	359	184	17	9	11	493	54	8	4
Future Volume (veh/h)	4	128	22	359	184	17	9	11	493	54	8	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	139	14	390	200	14	10	12	398	59	9	3
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	667	925	92	1470	490	34	580	623	1534	441	447	149
Arrive On Green	0.22	0.28	0.28	0.22	0.28	0.28	0.03	0.33	0.33	0.03	0.33	0.33
Sat Flow, veh/h	1781	3264	325	3456	1728	121	1781	1870	2790	1781	1342	447
Grp Volume(v), veh/h	4	75	78	390	0	214	10	12	398	59	0	12
Grp Sat Flow(s),veh/h/ln	1781	1777	1812	1728	0	1849	1781	1870	1395	1781	0	1790
Q Serve(g_s), s	0.1	3.8	3.9	7.6	0.0	11.3	0.4	0.5	9.0	2.6	0.0	0.5
Cycle Q Clear(g_c), s	0.1	3.8	3.9	7.6	0.0	11.3	0.4	0.5	9.0	2.6	0.0	0.5
Prop In Lane	1.00		0.18	1.00		0.07	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	667	503	513	1470	0	524	580	623	1534	441	0	597
V/C Ratio(X)	0.01	0.15	0.15	0.27	0.00	0.41	0.02	0.02	0.26	0.13	0.00	0.02
Avail Cap(c_a), veh/h	667	503	513	1470	0	524	759	623	1534	618	0	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.99	0.99	0.99	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	32.2	32.2	17.0	0.0	34.9	24.2	26.9	14.2	24.9	0.0	26.8
Incr Delay (d2), s/veh	0.0	0.6	0.6	0.4	0.0	2.4	0.0	0.1	0.4	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	3.1	3.2	5.5	0.0	9.2	0.3	0.4	5.1	2.0	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	32.8	32.8	17.4	0.0	37.2	24.2	26.9	14.6	25.0	0.0	26.9
LnGrp LOS	B	C	C	B	A	D	C	C	B	C	A	C
Approach Vol, veh/h		157			604			420			71	
Approach Delay, s/veh		32.4			24.4			15.2			25.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	44.0	30.0	38.0	8.0	44.0	30.0	38.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	28.0	26.0	34.0	16.0	28.0	26.0	34.0
Max Q Clear Time (g_c+I1), s	4.6	11.0	2.1	13.3	2.4	2.5	9.6	5.9
Green Ext Time (p_c), s	0.1	1.5	0.0	1.1	0.0	0.0	1.2	0.8

Intersection Summary	
HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

23: I-17 SB On-Ramp & McConnell Dr

HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	366	388	47	288	0	0
Future Volume (Veh/h)	366	388	47	288	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.80	0.90	0.80	0.80
Hourly flow rate (vph)	407	431	59	320	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	334					
pX, platoon unblocked						
vC, conflicting volume			838		845	407
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			838		845	407
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	100
cM capacity (veh/h)			796		308	644

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	407	431	59	320
Volume Left	0	0	59	0
Volume Right	0	431	0	0
cSH	1700	1700	796	1700
Volume to Capacity	0.24	0.25	0.07	0.19
Queue Length 95th (ft)	0	0	6	0
Control Delay (s)	0.0	0.0	9.9	0.0
Lane LOS			A	
Approach Delay (s)	0.0		1.5	
Approach LOS				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

24: I-17 NB Off-Ramp & McConnell Dr

HCM 6th TWSC

Intersection	
Int Delay, s/veh	5.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	366	0	0	179	156	164
Future Vol, veh/h	366	0	0	179	156	164
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	80	80	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	407	0	0	211	184	193

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	618	407
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	211	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	0	-	*511	*790
Stage 1	-	0	0	-	*744	-
Stage 2	-	0	0	-	*824	-
Platoon blocked, %	-			-	1	1
Mov Cap-1 Maneuver	-	-	-	-	*511	*790
Mov Cap-2 Maneuver	-	-	-	-	*511	-
Stage 1	-	-	-	-	*744	-
Stage 2	-	-	-	-	*824	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	WBT
Capacity (veh/h)	511	790	-	-
HCM Lane V/C Ratio	0.359	0.244	-	-
HCM Control Delay (s)	15.9	11	-	-
HCM Lane LOS	C	B	-	-
HCM 95th %tile Q(veh)	1.6	1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

1: Beulah Blvd. & Fairgrounds Rd./J.W. Powell Blvd.

HCM 6th Roundabout

Intersection	
Intersection Delay, s/veh	5.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	62	342	364	237
Demand Flow Rate, veh/h	63	349	371	242
Vehicles Circulating, veh/h	491	116	200	281
Vehicles Exiting, veh/h	32	455	354	184
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.1	5.6	6.5	5.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	63	349	371	242
Cap Entry Lane, veh/h	836	1226	1125	1036
Entry HV Adj Factor	0.986	0.981	0.981	0.980
Flow Entry, veh/h	62	342	364	237
Cap Entry, veh/h	824	1203	1104	1015
V/C Ratio	0.075	0.285	0.330	0.234
Control Delay, s/veh	5.1	5.6	6.5	5.8
LOS	A	A	A	A
95th %tile Queue, veh	0	1	1	1

6: Beulah Blvd. & University Heights Dr. (South)

HCM 6th TWSC

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	122	12	27	149	239	1
Future Vol, veh/h	122	12	27	149	239	1
Conflicting Peds, #/hr	0	0	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	155	-	-	310
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	13	30	166	266	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	499	273	274	0	-	0
Stage 1	273	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	531	766	1289	-	-	-
Stage 1	773	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	512	762	1281	-	-	-
Mov Cap-2 Maneuver	512	-	-	-	-	-
Stage 1	751	-	-	-	-	-
Stage 2	807	-	-	-	-	-

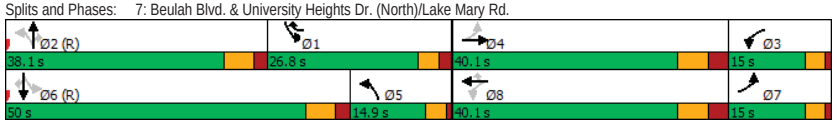
Approach	EB	NB	SB
HCM Control Delay, s	14.5	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1281	-	527	-	-
HCM Lane V/C Ratio	0.023	-	0.283	-	-
HCM Control Delay (s)	7.9	-	14.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	Min	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	26.8	38.1	15	40.1	14.9	50	15	40.1
Maximum Split (%)	22.3%	31.8%	12.5%	33.4%	12.4%	41.7%	12.5%	33.4%
Minimum Split (s)	10	38.1	10	39.1	10	34.9	10	40.1
Yellow Time (s)	3	4.4	3	4.4	3	4.4	3	4.4
All-Red Time (s)	2	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	10	5	5	5	10	5	5
Vehicle Extension (s)	2	2	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	3	1.5	3	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		27.6		27.6		23.6		28.6
Dual Entry	No	No	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
End Time (s)	64.9	38.1	0	105	64.9	50	0	105
Yield/Force Off (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Yield/Force Off 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9
Local Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
Local Yield (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Local Yield 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	19	5	79	33	568	4	205	31	779	111	277
Future Volume (veh/h)	144	19	5	79	33	568	4	205	31	779	111	277
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.92	0.97		1.00	0.99		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	21	3	88	37	0	4	228	7	866	123	231
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	145	21	213	173		1083	304	221	2092	357	268
Arrive On Green	0.04	0.09	0.07	0.04	0.09	0.00	0.53	0.16	0.14	0.55	0.19	0.17
Sat Flow, veh/h	1781	1580	226	1781	1870	1585	1781	1870	1551	3456	1870	1571
Grp Volume(v), veh/h	160	0	24	88	37	0	4	228	7	866	123	231
Grp Sat Flow(s),veh/h/ln	1781	0	1805	1781	1870	1585	1781	1870	1551	1728	1870	1571
Q Serve(g_s), s	1.8	0.0	1.5	0.0	2.2	0.0	0.0	14.0	0.5	9.7	6.8	17.2
Cycle Q Clear(g_c), s	1.8	0.0	1.5	0.0	2.2	0.0	0.0	14.0	0.5	9.7	6.8	17.2
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	0	165	213	173		1083	304	221	2092	357	268
V/C Ratio(X)	0.79	0.00	0.15	0.41	0.21		0.00	0.75	0.03	0.41	0.34	0.86
Avail Cap(c_a), veh/h	293	0	530	301	549		1083	530	409	2092	715	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	0.0	50.3	52.0	50.4	0.0	9.1	47.9	44.3	13.0	42.0	48.4
Incr Delay (d2), s/veh	5.1	0.0	0.1	0.5	0.2	0.0	0.0	15.7	0.3	0.0	2.6	28.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.5	0.0	1.2	4.5	1.8	0.0	0.1	12.2	0.3	10.0	6.2	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.0	0.0	50.5	52.5	50.7	0.0	9.1	63.6	44.6	13.1	44.7	76.8
LnGrp LOS	E	A	D	D	D		A	E	D	B	D	E
Approach Vol, veh/h		184			125			239			1220	
Approach Delay, s/veh		57.9			51.9			62.1			28.3	
Approach LOS		E			D			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	71.5	23.6	9.1	15.9	68.0	27.0	9.0	16.0
Change Period (Y+Rc), s	5.0	6.5	4.0	7.5	5.0	* 6.5	4.0	7.5
Max Green Setting (Gmax), s	21.8	31.6	11.0	32.6	10.9	* 44	11.0	32.6
Max Q Clear Time (g_c+I1), s	11.7	16.0	2.0	3.5	2.0	19.2	3.8	4.2
Green Ext Time (p_c), s	2.2	0.4	0.1	0.0	0.0	0.6	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay	37.6	
HCM 6th LOS	D	

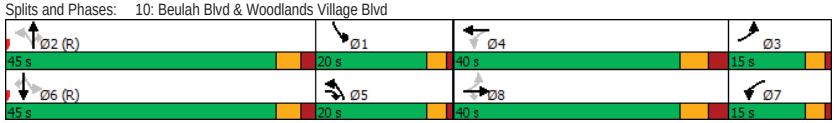
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	C-Min	None	None	Min	C-Min	None	None
Maximum Split (s)	20	45	15	40	20	45	15	40
Maximum Split (%)	16.7%	37.5%	12.5%	33.3%	16.7%	37.5%	12.5%	33.3%
Minimum Split (s)	9	21.1	9	31.1	9	27.1	9	33.1
Yellow Time (s)	3	3.6	3	4	3	3.6	3	4
All-Red Time (s)	1	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	1.5	3	3	1	1.5	3	3
Minimum Gap (s)	3	1.5	3	3	1	1.5	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		11.4		20		17.4		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	14	119	79	59	14	119	79
End Time (s)	79	59	14	119	79	59	14	119
Yield/Force Off (s)	75	53.3	10	111.9	75	53.3	10	111.9
Yield/Force Off 170(s)	75	41.9	10	91.9	75	35.9	10	89.9
Local Start Time (s)	45	0	105	65	45	0	105	65
Local Yield (s)	61	39.3	116	97.9	61	39.3	116	97.9
Local Yield 170(s)	61	27.9	116	77.9	61	21.9	116	75.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green	

Splits and Phases: 10: Beulah Blvd & Woodlands Village Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	4	566	3	3	12	349	539	2	8	570	130
Future Volume (veh/h)	177	4	566	3	3	12	349	539	2	8	570	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.94	0.99		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	197	0	456	3	3	10	388	599	2	9	633	108
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	0	1963	197	28	93	1003	721	292	1012	733	319
Arrive On Green	0.05	0.00	0.09	0.04	0.08	0.08	0.52	0.20	0.19	1.00	0.41	0.41
Sat Flow, veh/h	1781	0	2976	1781	371	1235	1781	3554	1560	1781	3554	1547
Grp Volume(v), veh/h	197	0	456	3	0	13	388	599	2	9	633	108
Grp Sat Flow(s),veh/h/ln	1781	0	1488	1781	0	1606	1781	1777	1560	1781	1777	1547
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.9	9.4	19.4	0.1	0.0	19.5	5.7
Cycle Q Clear(g_c), s	1.2	0.0	0.0	0.0	0.0	0.9	9.4	19.4	0.1	0.0	19.5	5.7
Prop In Lane	1.00		1.00	1.00		0.77	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	0	1963	197	0	121	1003	721	292	1012	733	319
V/C Ratio(X)	0.73	0.00	0.23	0.02	0.00	0.11	0.39	0.83	0.01	0.01	0.86	0.34
Avail Cap(c_a), veh/h	358	0	2545	293	0	440	1003	1220	511	1012	1220	531
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	50.9	0.0	9.9	47.3	0.0	51.7	15.1	45.8	39.7	0.0	33.7	29.7
Incr Delay (d2), s/veh	5.2	0.0	0.1	0.0	0.0	0.4	0.1	10.7	0.0	0.0	10.6	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.9	0.0	4.4	0.1	0.0	0.7	9.6	14.6	0.1	0.0	11.7	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.1	0.0	9.9	47.4	0.0	52.1	15.2	56.6	39.7	0.0	44.3	32.0
LnGrp LOS	E	A	A	D	A	D	B	E	D	A	D	C
Approach Vol, veh/h		653			16			989			750	
Approach Delay, s/veh		23.9			51.2			40.3			42.0	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	66.7	28.2	9.0	16.1	66.3	28.5	8.6	16.5
Change Period (Y+Rc), s	4.0	5.7	4.0	7.1	4.0	5.7	4.0	7.1
Max Green Setting (Gmax), s	16.0	39.3	11.0	32.9	16.0	39.3	11.0	32.9
Max Q Clear Time (g_c+I1), s	2.0	21.4	3.2	2.9	11.4	21.5	2.0	2.0
Green Ext Time (p_c), s	0.0	1.1	0.4	0.0	0.2	1.3	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	36.4
HCM 6th LOS	D

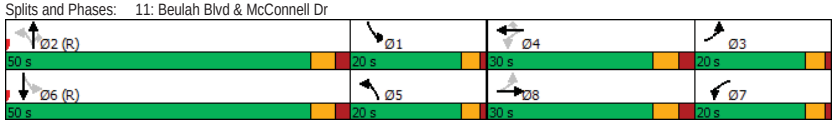
Notes

User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	50	20	30	20	50	20	30
Maximum Split (%)	16.7%	41.7%	16.7%	25.0%	16.7%	41.7%	16.7%	25.0%
Minimum Split (s)	9	25.7	9	24.4	9	25.7	9	29.4
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	1	2.1	1	2.4	1	2.1	1	2.4
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	2	3	2	3	2	3	2
Minimum Gap (s)	3	2	3	2	3	2	3	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		15.4		14.4		15.4		19.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	9	109	79	59	9	109	79
End Time (s)	79	59	9	109	79	59	9	109
Yield/Force Off (s)	75	53.3	5	103	75	53.3	5	103
Yield/Force Off 170(s)	75	37.9	5	103	75	37.9	5	103
Local Start Time (s)	50	0	100	70	50	0	100	70
Local Yield (s)	66	44.3	116	94	66	44.3	116	94
Local Yield 170(s)	66	28.9	116	94	66	28.9	116	94

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 11: Beulah Blvd & McConnell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	234	13	375	259	131	34	388	305	59	514	97
Future Volume (veh/h)	82	234	13	375	259	131	34	388	305	59	514	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	0.99		0.98	1.00		0.92	0.99		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	91	260	12	417	288	110	38	431	249	66	571	81
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	386	341	16	396	357	297	687	716	292	778	679	96
Arrive On Green	0.16	0.19	0.17	0.16	0.19	0.19	0.68	0.40	0.40	0.36	0.22	0.21
Sat Flow, veh/h	1781	1771	82	1781	1870	1558	1781	3554	1450	1781	3105	439
Grp Volume(v), veh/h	91	0	272	417	288	110	38	431	249	66	326	326
Grp Sat Flow(s),veh/h/ln	1781	0	1852	1781	1870	1558	1781	1777	1450	1781	1777	1767
Q Serve(g_s), s	0.0	0.0	16.7	18.8	17.7	7.4	0.0	11.5	18.7	0.0	21.1	21.2
Cycle Q Clear(g_c), s	0.0	0.0	16.7	18.8	17.7	7.4	0.0	11.5	18.7	0.0	21.1	21.2
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	386	0	357	396	357	297	687	716	292	778	388	386
V/C Ratio(X)	0.24	0.00	0.76	1.05	0.81	0.37	0.06	0.60	0.85	0.08	0.84	0.84
Avail Cap(c_a), veh/h	386	0	414	396	418	348	687	1359	555	778	680	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.65	0.65	0.65
Uniform Delay (d), s/veh	41.2	0.0	45.9	47.4	46.4	42.3	11.9	32.0	34.2	18.9	44.9	45.1
Incr Delay (d2), s/veh	0.3	0.0	5.7	59.9	8.3	0.3	0.0	3.5	24.6	0.0	13.3	13.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	0.0	12.8	25.9	13.9	5.1	0.6	7.9	11.5	1.9	14.9	15.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	0.0	51.5	107.3	54.7	42.6	12.0	35.6	58.8	18.9	58.1	58.8
LnGrp LOS	D	A	D	F	D	D	B	D	E	B	E	E
Approach Vol, veh/h		363			815			718			718	
Approach Delay, s/veh		49.0			80.0			42.4			54.9	
Approach LOS		D			E			D			D	

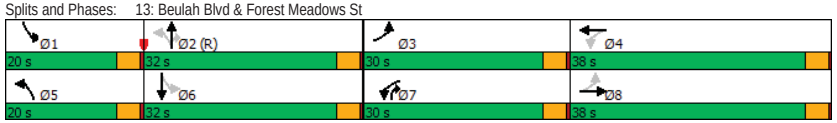
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	45.4	28.3	20.3	26.1	43.3	30.3	20.0	26.3
Change Period (Y+Rc), s	4.0	5.7	4.0	6.0	4.0	5.7	4.0	6.0
Max Green Setting (Gmax), s	16.0	44.3	16.0	24.0	16.0	44.3	16.0	24.0
Max Q Clear Time (g_c+I1), s	2.0	20.7	2.0	19.7	2.0	23.2	20.8	18.7
Green Ext Time (p_c), s	0.1	1.9	0.2	0.4	0.1	1.4	0.0	0.3

Intersection Summary		
HCM 6th Ctrl Delay	58.4	
HCM 6th LOS	E	

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes						
Recall Mode	None	C-Max	Max	Max	Min	Min	Max	Max
Maximum Split (s)	20	32	30	38	20	32	30	38
Maximum Split (%)	16.7%	26.7%	25.0%	31.7%	16.7%	26.7%	25.0%	31.7%
Minimum Split (s)	8	20	8	20	8	20	8	20
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum Initial (s)	4	4	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	102	2	34	64	102	2	34	64
End Time (s)	2	34	64	102	2	34	64	102
Yield/Force Off (s)	118	30	60	98	118	30	60	98
Yield/Force Off 170(s)	118	19	60	87	118	30	60	87
Local Start Time (s)	100	0	32	62	100	0	32	62
Local Yield (s)	116	28	58	96	116	28	58	96
Local Yield 170(s)	116	17	58	85	116	28	58	85

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 2 (2%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 13: Beulah Blvd & Forest Meadows St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	139	67	884	117	12	24	12	645	14	11	15
Future Volume (veh/h)	18	139	67	884	117	12	24	12	645	14	11	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	151	52	961	127	10	26	13	512	15	12	13
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	729	742	247	1413	485	38	568	661	1591	550	274	296
Arrive On Green	0.22	0.28	0.28	0.22	0.28	0.28	0.03	0.35	0.35	0.01	0.33	0.33
Sat Flow, veh/h	1781	2620	870	3456	1711	135	1781	1870	2790	1781	821	889
Grp Volume(v), veh/h	20	101	102	961	0	137	26	13	512	15	0	25
Grp Sat Flow(s),veh/h/ln	1781	1777	1714	1728	0	1846	1781	1870	1395	1781	0	1710
Q Serve(g_s), s	0.7	5.2	5.5	23.1	0.0	6.9	1.1	0.5	11.6	0.7	0.0	1.2
Cycle Q Clear(g_c), s	0.7	5.2	5.5	23.1	0.0	6.9	1.1	0.5	11.6	0.7	0.0	1.2
Prop In Lane	1.00		0.51	1.00		0.07	1.00		1.00	1.00		0.52
Lane Grp Cap(c), veh/h	729	503	486	1413	0	523	568	661	1591	550	0	570
V/C Ratio(X)	0.03	0.20	0.21	0.68	0.00	0.26	0.05	0.02	0.32	0.03	0.00	0.04
Avail Cap(c_a), veh/h	729	503	486	1413	0	523	746	661	1591	765	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.96	0.96	0.96	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.4	32.7	32.8	21.0	0.0	33.3	24.2	25.2	13.6	25.8	0.0	27.1
Incr Delay (d2), s/veh	0.1	0.9	1.0	2.7	0.0	1.2	0.0	0.1	0.5	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	4.2	4.3	14.6	0.0	5.8	0.9	0.5	6.5	0.5	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.4	33.6	33.8	23.7	0.0	34.5	24.2	25.3	14.1	25.9	0.0	27.1
LnGrp LOS	B	C	C	C	A	C	C	C	B	C	A	C
Approach Vol, veh/h		223			1098			551			40	
Approach Delay, s/veh		32.0			25.0			14.8			26.6	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	46.4	30.0	38.0	8.0	44.0	30.0	38.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	28.0	26.0	34.0	16.0	28.0	26.0	34.0
Max Q Clear Time (g_c+I1), s	2.7	13.6	2.7	8.9	3.1	3.2	25.1	7.5
Green Ext Time (p_c), s	0.0	1.9	0.0	0.7	0.0	0.1	0.4	1.1

Intersection Summary		
HCM 6th Ctrl Delay		22.9
HCM 6th LOS		C

23: I-17 SB On-Ramp & McConnell Dr

HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	300	298	186	765	0	0
Future Volume (Veh/h)	300	298	186	765	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.85	0.85	0.90	0.80	0.80
Hourly flow rate (vph)	333	351	219	850	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	334					
pX, platoon unblocked						
vC, conflicting volume			684		1621	333
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			684		1621	333
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			76		100	100
cM capacity (veh/h)			909		86	709

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	333	351	219	850
Volume Left	0	0	219	0
Volume Right	0	351	0	0
cSH	1700	1700	909	1700
Volume to Capacity	0.20	0.21	0.24	0.50
Queue Length 95th (ft)	0	0	24	0
Control Delay (s)	0.0	0.0	10.2	0.0
Lane LOS			B	
Approach Delay (s)	0.0		2.1	
Approach LOS				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

24: I-17 NB Off-Ramp & McConnell Dr

HCM 6th TWSC

Intersection	
Int Delay, s/veh	58.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	310	0	0	669	272	84
Future Vol, veh/h	310	0	0	669	272	84
Conflicting Peds, #/hr	0	6	6	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	80	80	90	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	344	0	0	743	320	99

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	1087	344
Stage 1	-	-	-	-	344	-
Stage 2	-	-	-	-	743	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	0	0	-	~ 219	830
Stage 1	-	0	0	-	786	-
Stage 2	-	0	0	-	470	-
Platoon blocked, %	-			-	1	1
Mov Cap-1 Maneuver	-	-	-	-	~ 219	830
Mov Cap-2 Maneuver	-	-	-	-	~ 219	-
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	470	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	210.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	WBT
Capacity (veh/h)	219	830	-	-
HCM Lane V/C Ratio	1.461	0.119	-	-
HCM Control Delay (s)	272.1	9.9	-	-
HCM Lane LOS	F	A	-	-
HCM 95th %tile Q(veh)	19	0.4	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

APPENDIX G

2027 BUILD PEAK HOUR ANALYSIS

1: Beulah Blvd. & Fairgrounds Rd./J.W. Powell Blvd.

HCM 6th Roundabout

Intersection	
Intersection Delay, s/veh	9.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	25	819	286	383
Demand Flow Rate, veh/h	25	835	292	391
Vehicles Circulating, veh/h	618	83	319	271
Vehicles Exiting, veh/h	44	528	324	647
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.3	11.6	6.7	5.4
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	L	TR
Assumed Moves	LTR	LTR	LTR	L	TR
RT Channelized					
Lane Util	1.000	1.000	1.000	0.757	0.243
Follow-Up Headway, s	2.609	2.609	2.609	2.535	2.535
Critical Headway, s	4.976	4.976	4.976	4.544	4.544
Entry Flow, veh/h	25	835	292	296	95
Cap Entry Lane, veh/h	735	1268	997	1110	1110
Entry HV Adj Factor	0.984	0.981	0.981	0.980	0.981
Flow Entry, veh/h	25	819	286	290	93
Cap Entry, veh/h	723	1244	978	1087	1088
V/C Ratio	0.034	0.659	0.293	0.267	0.086
Control Delay, s/veh	5.3	11.6	6.7	5.8	4.0
LOS	A	B	A	A	A
95th %tile Queue, veh	0	5	1	1	0

2: Beulah Blvd. & University Heights Dr. (South)

HCM 6th TWSC

Intersection	
Int Delay, s/veh	39

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	285	53	35	220	468	0
Future Vol, veh/h	285	53	35	220	468	0
Conflicting Peds, #/hr	0	0	9	0	0	9
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	155	-	-	310
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	317	59	39	244	520	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	851	529	529	0	-	0
Stage 1	529	-	-	-	-	-
Stage 2	322	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	330	550	1038	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 313	546	1030	-	-	-
Mov Cap-2 Maneuver	~ 313	-	-	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	730	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	121.5	1.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1030	-	335	-	-
HCM Lane V/C Ratio	0.038	-	1.121	-	-
HCM Control Delay (s)	8.6	-	121.5	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q(veh)	0.1	-	14.7	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

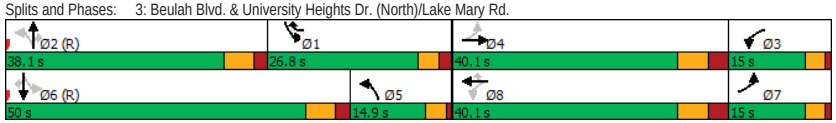
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	Min	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	26.8	38.1	15	40.1	14.9	50	15	40.1
Maximum Split (%)	22.3%	31.8%	12.5%	33.4%	12.4%	41.7%	12.5%	33.4%
Minimum Split (s)	10	38.1	10	39.1	10	34.9	10	40.1
Yellow Time (s)	3	4.4	3	4.4	3	4.4	3	4.4
All-Red Time (s)	2	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	10	5	5	5	10	5	5
Vehicle Extension (s)	2	2	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	3	1.5	3	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		27.6		27.6		23.6		28.6
Dual Entry	No	No	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
End Time (s)	64.9	38.1	0	105	64.9	50	0	105
Yield/Force Off (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Yield/Force Off 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9
Local Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
Local Yield (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Local Yield 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.



3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	21	23	138	26	706	7	418	69	366	314	110
Future Volume (veh/h)	230	21	23	138	26	706	7	418	69	366	314	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.93	0.98		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	256	23	20	153	29	0	8	464	58	407	349	92
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	282	75	66	268	160		877	518	401	1504	417	320
Arrive On Green	0.09	0.08	0.06	0.09	0.09	0.00	0.45	0.28	0.26	0.40	0.22	0.20
Sat Flow, veh/h	1781	888	772	1781	1870	1585	1781	1870	1559	3456	1870	1573
Grp Volume(v), veh/h	256	0	43	153	29	0	8	464	58	407	349	92
Grp Sat Flow(s),veh/h/ln	1781	0	1661	1781	1870	1585	1781	1870	1559	1728	1870	1573
Q Serve(g_s), s	8.4	0.0	2.9	2.0	1.7	0.0	0.0	28.6	3.4	4.9	21.4	5.9
Cycle Q Clear(g_c), s	8.4	0.0	2.9	2.0	1.7	0.0	0.0	28.6	3.4	4.9	21.4	5.9
Prop In Lane	1.00		0.47	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	282	0	141	268	160		877	518	401	1504	417	320
V/C Ratio(X)	0.91	0.00	0.31	0.57	0.18		0.01	0.90	0.14	0.27	0.84	0.29
Avail Cap(c_a), veh/h	290	0	487	275	549		877	530	411	1504	715	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	0.0	52.2	49.3	51.0	0.0	17.5	41.7	34.4	22.3	44.5	40.5
Incr Delay (d2), s/veh	29.2	0.0	0.4	1.6	0.2	0.0	0.0	20.7	0.8	0.0	17.7	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	14.7	0.0	2.2	7.7	1.4	0.0	0.2	22.2	2.4	6.6	17.6	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.2	0.0	52.6	50.9	51.2	0.0	17.5	62.5	35.2	22.4	62.2	42.7
LnGrp LOS	F	A	D	D	D		B	E	D	C	E	D
Approach Vol, veh/h		299			182			530			848	
Approach Delay, s/veh		76.2			51.0			58.8			41.0	
Approach LOS		E			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	53.0	37.3	14.5	15.1	59.5	30.9	14.5	15.2
Change Period (Y+Rc), s	5.0	6.5	4.0	7.5	5.0	* 6.5	4.0	7.5
Max Green Setting (Gmax), s	21.8	31.6	11.0	32.6	10.9	* 44	11.0	32.6
Max Q Clear Time (g_c+I1), s	6.9	30.6	4.0	4.9	2.0	23.4	10.4	3.7
Green Ext Time (p_c), s	1.0	0.2	0.1	0.0	0.0	0.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	52.7
HCM 6th LOS	D

Notes

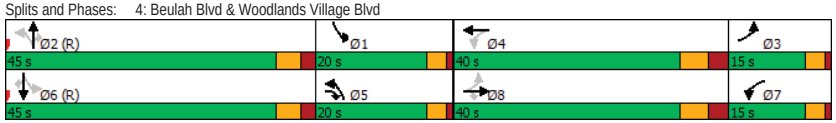
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	C-Min	None	None	Min	C-Min	None	None
Maximum Split (s)	20	45	15	40	20	45	15	40
Maximum Split (%)	16.7%	37.5%	12.5%	33.3%	16.7%	37.5%	12.5%	33.3%
Minimum Split (s)	9	21.1	9	31.1	9	27.1	9	33.1
Yellow Time (s)	3	3.6	3	4	3	3.6	3	4
All-Red Time (s)	1	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	1.5	3	3	1	1.5	3	3
Minimum Gap (s)	3	1.5	3	3	1	1.5	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		11.4		20		17.4		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	14	119	79	59	14	119	79
End Time (s)	79	59	14	119	79	59	14	119
Yield/Force Off (s)	75	53.3	10	111.9	75	53.3	10	111.9
Yield/Force Off 170(s)	75	41.9	10	91.9	75	35.9	10	89.9
Local Start Time (s)	45	0	105	65	45	0	105	65
Local Yield (s)	61	39.3	116	97.9	61	39.3	116	97.9
Local Yield 170(s)	61	27.9	116	77.9	61	21.9	116	75.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80

Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Splits and Phases: 4: Beulah Blvd & Woodlands Village Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1	430	1	7	14	433	874	2	12	328	54
Future Volume (veh/h)	78	1	430	1	7	14	433	874	2	12	328	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	0	360	1	8	13	481	971	2	13	364	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	0	2178	173	27	43	1180	1083	457	874	507	220
Arrive On Green	0.05	0.00	0.05	0.04	0.04	0.04	0.62	0.30	0.29	0.91	0.29	0.29
Sat Flow, veh/h	1781	0	3170	1781	641	1042	1781	3554	1583	1781	3554	1544
Grp Volume(v), veh/h	87	0	360	1	0	21	481	971	2	13	364	46
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1683	1781	1777	1583	1781	1777	1544
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.5	9.8	31.4	0.1	0.0	11.0	2.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	1.5	9.8	31.4	0.1	0.0	11.0	2.7
Prop In Lane	1.00		1.00	1.00		0.62	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	214	0	2178	173	0	70	1180	1083	457	874	507	220
V/C Ratio(X)	0.41	0.00	0.17	0.01	0.00	0.30	0.41	0.90	0.00	0.01	0.72	0.21
Avail Cap(c_a), veh/h	307	0	2915	266	0	461	1180	1220	519	874	1220	530
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.94	0.94	0.94
Uniform Delay (d), s/veh	52.1	0.0	6.6	50.7	0.0	55.8	9.8	39.9	30.4	2.8	40.7	37.7
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.0	0.0	2.4	0.1	11.6	0.0	0.0	8.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	0.0	2.6	0.1	0.0	1.2	9.2	21.5	0.1	0.1	8.3	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.3	0.0	6.7	50.7	0.0	58.2	9.8	51.5	30.4	2.8	48.7	39.8
LnGrp LOS	D	A	A	D	A	E	A	D	C	A	D	D
Approach Vol, veh/h		447			22			1454			423	
Approach Delay, s/veh		15.7			57.8			37.7			46.3	
Approach LOS		B			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	58.8	40.4	8.7	12.1	78.3	20.9	8.7	12.1
Change Period (Y+Rc), s	4.0	5.7	4.0	7.1	4.0	5.7	4.0	7.1
Max Green Setting (Gmax), s	16.0	39.3	11.0	32.9	16.0	39.3	11.0	32.9
Max Q Clear Time (g_c+I1), s	2.0	33.4	2.0	3.5	11.8	13.0	2.0	2.0
Green Ext Time (p_c), s	0.0	1.3	0.1	0.1	0.3	0.7	0.0	1.8

Intersection Summary		
HCM 6th Ctrl Delay		35.2
HCM 6th LOS		D

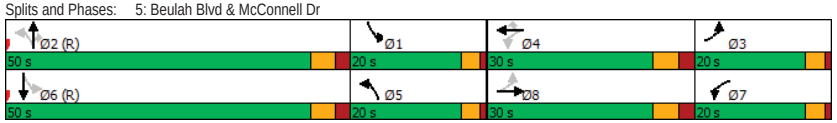
Notes

User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	50	20	30	20	50	20	30
Maximum Split (%)	16.7%	41.7%	16.7%	25.0%	16.7%	41.7%	16.7%	25.0%
Minimum Split (s)	9	25.7	9	24.4	9	25.7	9	29.4
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	1	2.1	1	2.4	1	2.1	1	2.4
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	2	3	2	3	2	3	2
Minimum Gap (s)	3	2	3	2	3	2	3	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		15.4		14.4		15.4		19.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	9	109	79	59	9	109	79
End Time (s)	79	59	9	109	79	59	9	109
Yield/Force Off (s)	75	53.3	5	103	75	53.3	5	103
Yield/Force Off 170(s)	75	37.9	5	103	75	37.9	5	103
Local Start Time (s)	50	0	100	70	50	0	100	70
Local Yield (s)	66	44.3	116	94	66	44.3	116	94
Local Yield 170(s)	66	28.9	116	94	66	28.9	116	94

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 5: Beulah Blvd & McConnell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	166	6	182	86	36	13	483	533	59	389	43
Future Volume (veh/h)	33	166	6	182	86	36	13	483	533	59	389	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.95	0.98		0.95	0.99		0.96	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	184	6	202	96	30	14	537	444	66	432	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	367	307	10	270	235	189	913	1128	482	677	555	47
Arrive On Green	0.14	0.17	0.15	0.10	0.13	0.13	0.79	0.53	0.53	0.32	0.17	0.15
Sat Flow, veh/h	1781	1798	59	1781	1870	1501	1781	3554	1518	1781	3302	281
Grp Volume(v), veh/h	37	0	190	202	96	30	14	537	444	66	231	238
Grp Sat Flow(s),veh/h/ln	1781	0	1857	1781	1870	1501	1781	1777	1518	1781	1777	1807
Q Serve(g_s), s	0.0	0.0	11.3	6.5	5.7	2.1	0.0	11.4	32.2	0.0	15.0	15.1
Cycle Q Clear(g_c), s	0.0	0.0	11.3	6.5	5.7	2.1	0.0	11.4	32.2	0.0	15.0	15.1
Prop In Lane	1.00		0.03	1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	367	0	317	270	235	189	913	1128	482	677	298	303
V/C Ratio(X)	0.10	0.00	0.60	0.75	0.41	0.16	0.02	0.48	0.92	0.10	0.78	0.78
Avail Cap(c_a), veh/h	392	0	415	376	418	335	913	1359	581	677	680	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.93	0.93	0.93	0.98	0.98	0.98
Uniform Delay (d), s/veh	41.0	0.0	46.0	49.9	48.3	46.8	6.4	21.9	26.8	24.7	47.8	47.9
Incr Delay (d2), s/veh	0.1	0.0	0.7	5.2	0.4	0.1	0.0	1.3	24.2	0.1	17.4	17.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	0.0	9.0	10.2	4.8	1.4	0.1	7.5	17.9	2.3	12.6	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.1	0.0	46.7	55.1	48.8	46.9	6.4	23.3	51.0	24.8	65.2	65.7
LnGrp LOS	D	A	D	E	D	D	A	C	D	C	E	E
Approach Vol, veh/h		227			328			995			535	
Approach Delay, s/veh		45.8			52.5			35.4			60.4	
Approach LOS		D			D			D			E	

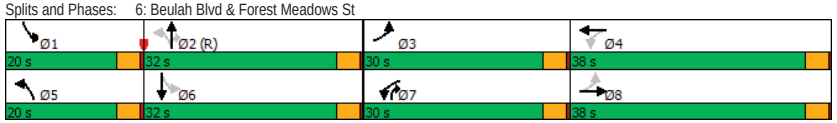
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	41.2	42.2	18.3	18.3	59.1	24.3	12.9	23.7
Change Period (Y+Rc), s	4.0	5.7	4.0	6.0	4.0	5.7	4.0	6.0
Max Green Setting (Gmax), s	16.0	44.3	16.0	24.0	16.0	44.3	16.0	24.0
Max Q Clear Time (g_c+I1), s	2.0	34.2	2.0	7.7	2.0	17.1	8.5	13.3
Green Ext Time (p_c), s	0.1	2.3	0.1	0.2	0.0	1.0	0.4	0.3

Intersection Summary	
HCM 6th Ctrl Delay	45.6
HCM 6th LOS	D

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes						
Recall Mode	None	C-Min	Max	Max	Min	Min	Max	Max
Maximum Split (s)	20	32	30	38	20	32	30	38
Maximum Split (%)	16.7%	26.7%	25.0%	31.7%	16.7%	26.7%	25.0%	31.7%
Minimum Split (s)	8	20	8	20	8	20	8	20
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum Initial (s)	4	4	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	102	2	34	64	102	2	34	64
End Time (s)	2	34	64	102	2	34	64	102
Yield/Force Off (s)	118	30	60	98	118	30	60	98
Yield/Force Off 170(s)	118	19	60	87	118	30	60	87
Local Start Time (s)	100	0	32	62	100	0	32	62
Local Yield (s)	116	28	58	96	116	28	58	96
Local Yield 170(s)	116	17	58	85	116	28	58	85

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 2 (2%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 6: Beulah Blvd & Forest Meadows St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	128	38	404	184	17	15	32	510	54	65	4
Future Volume (veh/h)	4	128	38	404	184	17	15	32	510	54	65	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	139	31	439	200	14	16	35	416	59	71	3
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	667	822	179	1449	490	34	525	623	1534	421	594	25
Arrive On Green	0.22	0.28	0.28	0.22	0.28	0.28	0.03	0.33	0.33	0.03	0.33	0.33
Sat Flow, veh/h	1781	2903	631	3456	1728	121	1781	1870	2790	1781	1782	75
Grp Volume(v), veh/h	4	84	86	439	0	214	16	35	416	59	0	74
Grp Sat Flow(s),veh/h/ln	1781	1777	1757	1728	0	1849	1781	1870	1395	1781	0	1857
Q Serve(g_s), s	0.1	4.3	4.4	8.7	0.0	11.3	0.7	1.5	9.5	2.6	0.0	3.3
Cycle Q Clear(g_c), s	0.1	4.3	4.4	8.7	0.0	11.3	0.7	1.5	9.5	2.6	0.0	3.3
Prop In Lane	1.00		0.36	1.00		0.07	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	667	503	498	1449	0	524	525	623	1534	421	0	619
V/C Ratio(X)	0.01	0.17	0.17	0.30	0.00	0.41	0.03	0.06	0.27	0.14	0.00	0.12
Avail Cap(c_a), veh/h	667	503	498	1449	0	524	703	623	1534	599	0	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.98	0.98	0.98	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	32.3	32.4	17.3	0.0	34.9	24.3	27.2	14.3	24.9	0.0	27.8
Incr Delay (d2), s/veh	0.0	0.7	0.8	0.5	0.0	2.4	0.0	0.2	0.4	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	3.5	3.6	6.3	0.0	9.2	0.5	1.3	5.4	2.0	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	33.1	33.2	17.8	0.0	37.2	24.4	27.4	14.7	25.1	0.0	27.9
LnGrp LOS	B	C	C	B	A	D	C	C	B	C	A	C
Approach Vol, veh/h		174			653			467			133	
Approach Delay, s/veh		32.7			24.2			16.0			26.6	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	44.0	30.0	38.0	8.0	44.0	30.0	38.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	28.0	26.0	34.0	16.0	28.0	26.0	34.0
Max Q Clear Time (g_c+I1), s	4.6	11.5	2.1	13.3	2.7	5.3	10.7	6.4
Green Ext Time (p_c), s	0.1	1.7	0.0	1.1	0.0	0.3	1.4	0.9

Intersection Summary	
HCM 6th Ctrl Delay	22.8
HCM 6th LOS	C

7: I-17 SB On-Ramp & McConnell Dr

HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	372	388	47	304	0	0
Future Volume (Veh/h)	372	388	47	304	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.80	0.90	0.80	0.80
Hourly flow rate (vph)	413	431	59	338	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	334					
pX, platoon unblocked						
vC, conflicting volume			844		869	413
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			844		869	413
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	100
cM capacity (veh/h)			792		298	639

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	413	431	59	338
Volume Left	0	0	59	0
Volume Right	0	431	0	0
cSH	1700	1700	792	1700
Volume to Capacity	0.24	0.25	0.07	0.20
Queue Length 95th (ft)	0	0	6	0
Control Delay (s)	0.0	0.0	9.9	0.0
Lane LOS			A	
Approach Delay (s)	0.0		1.5	
Approach LOS				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

9: Beulah Blvd. & Fort Tuthill Loop

HCM 6th TWSC

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	1	567	339	1
Future Vol, veh/h	2	2	1	567	339	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	125	0	180	-	-	115
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	2	1	616	368	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	678	184	369	0	-	0
Stage 1	368	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	386	827	1186	-	-	-
Stage 1	670	-	-	-	-	-
Stage 2	717	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	386	827	1186	-	-	-
Mov Cap-2 Maneuver	386	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	717	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1186	-	386	827	-	-
HCM Lane V/C Ratio	0.001	-	0.006	0.003	-	-
HCM Control Delay (s)	8	-	14.4	9.4	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Intersection	
Intersection Delay, s/veh	13.5
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	0	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	526	239	0	833
Demand Flow Rate, veh/h	536	244	0	850
Vehicles Circulating, veh/h	250	0	627	244
Vehicles Exiting, veh/h	844	627	159	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.3	4.1	0.0	18.8
Approach LOS	A	A	-	C

Lane	Left	Left	Left
Designated Moves	TR	LT	LTR
Assumed Moves	TR	LT	LTR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	536	244	850
Cap Entry Lane, veh/h	1069	1380	1076
Entry HV Adj Factor	0.981	0.980	0.980
Flow Entry, veh/h	526	239	833
Cap Entry, veh/h	1049	1352	1054
V/C Ratio	0.501	0.177	0.790
Control Delay, s/veh	9.3	4.1	18.8
LOS	A	A	C
95th %tile Queue, veh	3	1	9

Intersection	
Int Delay, s/veh	9.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	321	223	0	0	120	149	81	1	42	0	0	0
Future Vol, veh/h	321	223	0	0	120	149	81	1	42	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	175	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	85	80	80	85	85	85	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	357	262	0	0	141	175	95	1	53	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	316	0	-	-	-	0	1205	1292	262
Stage 1	-	-	-	-	-	-	976	976	-
Stage 2	-	-	-	-	-	-	229	316	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1244	-	0	0	-	-	203	163	777
Stage 1	-	-	0	0	-	-	365	329	-
Stage 2	-	-	0	0	-	-	809	655	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1244	-	-	-	-	-	145	0	777
Mov Cap-2 Maneuver	-	-	-	-	-	-	145	0	-
Stage 1	-	-	-	-	-	-	260	0	-
Stage 2	-	-	-	-	-	-	809	0	-

Approach	EB	WB	NB
HCM Control Delay, s	5.2	0	48.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	145	777	1244	-	-	-
HCM Lane V/C Ratio	0.666	0.068	0.287	-	-	-
HCM Control Delay (s)	69.1	10	9.1	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	3.7	0.2	1.2	-	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	2	3	229	512	11
Future Vol, veh/h	31	2	3	229	512	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	155	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	2	3	254	569	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	835	575	581	0	-	0
Stage 1	575	-	-	-	-	-
Stage 2	260	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	338	518	993	-	-	-
Stage 1	563	-	-	-	-	-
Stage 2	783	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	337	518	993	-	-	-
Mov Cap-2 Maneuver	337	-	-	-	-	-
Stage 1	561	-	-	-	-	-
Stage 2	783	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.7	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	993	-	344	-	-
HCM Lane V/C Ratio	0.003	-	0.107	-	-
HCM Control Delay (s)	8.6	-	16.7	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

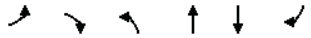
Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	Max	C-Max	Max
Maximum Split (s)	38	22	38
Maximum Split (%)	63.3%	36.7%	63.3%
Minimum Split (s)	11	10.2	13.7
Yellow Time (s)	4.5	3	4.2
All-Red Time (s)	1.5	2.2	1.5
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			4
Flash Dont Walk (s)			4
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	2	40	2
End Time (s)	40	2	40
Yield/Force Off (s)	34	56.8	34.3
Yield/Force Off 170(s)	34	56.8	30.3
Local Start Time (s)	22	0	22
Local Yield (s)	54	16.8	54.3
Local Yield 170(s)	54	16.8	50.3

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 40 (67%), Referenced to phase 4:EBL, Start of Green	

Splits and Phases: 533: Beulah Blvd. & Healthcare Blvd

533: Beulah Blvd. & Healthcare Blvd

HCM 6th Signalized Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	35	94	164	337	173
Future Volume (veh/h)	65	35	94	164	337	173
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	72	18	104	182	374	109
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	793	705	560	1913	1913	822
Arrive On Green	0.44	0.44	0.54	0.54	0.54	0.54
Sat Flow, veh/h	1781	1585	910	3647	3647	1527
Grp Volume(v), veh/h	72	18	104	182	374	109
Grp Sat Flow(s),veh/h/ln	1781	1585	910	1777	1777	1527
Q Serve(g_s), s	1.4	0.4	4.0	1.5	3.3	2.1
Cycle Q Clear(g_c), s	1.4	0.4	7.3	1.5	3.3	2.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	793	705	560	1913	1913	822
V/C Ratio(X)	0.09	0.03	0.19	0.10	0.20	0.13
Avail Cap(c_a), veh/h	793	705	560	1913	1913	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	9.3	9.0	6.7	7.1	6.9
Incr Delay (d2), s/veh	0.2	0.1	0.7	0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	0.2	1.4	0.9	1.9	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.9	9.4	9.7	6.8	7.4	7.2
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	90			286	483	
Approach Delay, s/veh	9.8			7.9	7.3	
Approach LOS	A			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		38.3		32.2		38.3
Change Period (Y+Rc), s		6.0		* 5.2		* 6
Max Green Setting (Gmax), s		32.0		* 17		* 32
Max Q Clear Time (g_c+I1), s		9.3		3.4		5.3
Green Ext Time (p_c), s		1.7		0.2		3.0

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

534: Beulah Blvd. & Access B

HCM 6th TWSC

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	53	140	219	268	104
Future Vol, veh/h	39	53	140	219	268	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	155
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	59	156	243	298	116

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	732	149	414	0	-	0
Stage 1	298	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	498	*1016	1238	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	709	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	436	*1016	1238	-	-	-
Mov Cap-2 Maneuver	528	-	-	-	-	-
Stage 1	732	-	-	-	-	-
Stage 2	709	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	3.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1238	-	528	1016	-	-
HCM Lane V/C Ratio	0.126	-	0.082	0.058	-	-
HCM Control Delay (s)	8.3	-	12.4	8.8	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.4	-	0.3	0.2	-	-

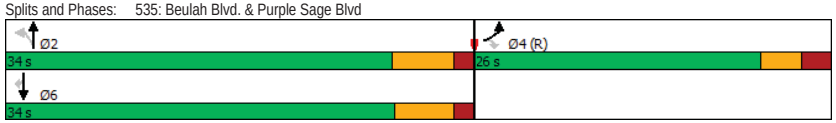
Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	Min	C-Max	Min
Maximum Split (s)	34	26	34
Maximum Split (%)	56.7%	43.3%	56.7%
Minimum Split (s)	11	10.2	13.8
Yellow Time (s)	4.5	3	4.3
All-Red Time (s)	1.5	2.2	1.5
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			4
Flash Dont Walk (s)			4
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	26	0	26
End Time (s)	0	26	0
Yield/Force Off (s)	54	20.8	54.2
Yield/Force Off 170(s)	54	20.8	54.2
Local Start Time (s)	26	0	26
Local Yield (s)	54	20.8	54.2
Local Yield 170(s)	54	20.8	54.2

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green	

Splits and Phases: 535: Beulah Blvd. & Purple Sage Blvd



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	88	234	333	252	69
Future Volume (veh/h)	26	88	234	333	252	69
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	0.99			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	58	260	370	280	-20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	892	794	428	1110	1110	495
Arrive On Green	0.50	0.50	0.62	0.62	0.62	0.00
Sat Flow, veh/h	1781	1585	1110	3647	3647	1585
Grp Volume(v), veh/h	29	58	260	370	280	-20
Grp Sat Flow(s),veh/h/ln	1781	1585	1110	1777	1777	1585
Q Serve(g_s), s	0.5	1.1	11.8	3.0	2.1	0.0
Cycle Q Clear(g_c), s	0.5	1.1	13.9	3.0	2.1	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	892	794	428	1110	1110	495
V/C Ratio(X)	0.03	0.07	0.61	0.33	0.25	-0.04
Avail Cap(c_a), veh/h	892	794	599	1658	1670	745
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.6	7.8	11.2	8.3	8.1	0.0
Incr Delay (d2), s/veh	0.1	0.2	1.4	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.7	3.0	1.7	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.7	7.9	12.6	8.5	8.3	0.0
LnGrp LOS	A	A	B	A	A	A
Approach Vol, veh/h	87			630	260	
Approach Delay, s/veh	7.8			10.2	8.9	
Approach LOS	A			B	A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	24.7	35.3	24.7
Change Period (Y+Rc), s	6.0	* 5.2	* 6
Max Green Setting (Gmax), s	28.0	* 21	* 28
Max Q Clear Time (g_c+I1), s	15.9	3.1	4.1
Green Ext Time (p_c), s	2.9	0.2	1.8

Intersection Summary	
HCM 6th Ctrl Delay	9.6
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

538: Access F & Healthcare Blvd

HCM 6th TWSC

Intersection	
Int Delay, s/veh	8.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	267	0	0	100
Future Vol, veh/h	0	0	267	0	0	100
Conflicting Peds, #/hr	0	48	48	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	297	0	0	111

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	49	0	643	49
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	594	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1556	-	406	1009
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	514	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1494	-	312	969
Mov Cap-2 Maneuver	-	-	-	-	312	-
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	412	-

Approach	EB	WB	NB
HCM Control Delay, s	0	8	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	969	-	-	1494	-
HCM Lane V/C Ratio	-	0.115	-	-	0.199	-
HCM Control Delay (s)	0	9.2	-	-	8	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	0.4	-	-	0.7	-

539: Purple Sage Blvd & Grey Mint St

HCM 6th TWSC

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	57	151	152	57	0
Future Vol, veh/h	0	57	151	152	57	0
Conflicting Peds, #/hr	60	0	0	60	6	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	100	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	63	168	169	63	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	397	0	-	0	297	237
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1162	-	-	-	694	802
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1104	-	-	-	627	756
Mov Cap-2 Maneuver	-	-	-	-	659	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	906	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1104	-	-	-	659	-
HCM Lane V/C Ratio	-	-	-	-	0.096	-
HCM Control Delay (s)	0	-	-	-	11	0
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3	-

545: Purple Sage Blvd & Access M

HCM 6th TWSC

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	1	151	57	0
Future Vol, veh/h	0	1	1	151	57	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	90	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	1	168	63	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1021	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1021	1084
Mov Cap-2 Maneuver	-	-	-	-	932	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	932
HCM Lane V/C Ratio	-	-	-	-	0.068
HCM Control Delay (s)	0	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

1: Beulah Blvd. & Fairgrounds Rd./J.W. Powell Blvd.

HCM 6th Roundabout

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	62	619	377	844
Demand Flow Rate, veh/h	63	632	384	861
Vehicles Circulating, veh/h	1109	129	789	281
Vehicles Exiting, veh/h	32	1044	383	480
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.3	8.9	18.3	11.7
Approach LOS	B	A	C	B

Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	L	TR
Assumed Moves	LTR	LTR	LTR	L	TR
RT Channelized					
Lane Util	1.000	1.000	1.000	0.850	0.150
Follow-Up Headway, s	2.609	2.609	2.609	2.535	2.535
Critical Headway, s	4.976	4.976	4.976	4.544	4.544
Entry Flow, veh/h	63	632	384	732	129
Cap Entry Lane, veh/h	445	1210	617	1100	1100
Entry HV Adj Factor	0.986	0.980	0.981	0.981	0.981
Flow Entry, veh/h	62	619	377	718	126
Cap Entry, veh/h	439	1186	605	1079	1078
V/C Ratio	0.141	0.522	0.622	0.666	0.117
Control Delay, s/veh	10.3	8.9	18.3	13.0	4.4
LOS	B	A	C	B	A
95th %tile Queue, veh	0	3	4	5	0

2: Beulah Blvd. & University Heights Dr. (South)

HCM 6th TWSC

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	122	21	46	532	422	1
Future Vol, veh/h	122	21	46	532	422	1
Conflicting Peds, #/hr	0	0	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	155	-	-	310
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	23	51	591	469	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1169	476	477	0	-	0
Stage 1	476	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	213	589	1085	-	-	-
Stage 1	625	-	-	-	-	-
Stage 2	496	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	201	586	1079	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	53.8	0.7	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1079	-	222	-	-
HCM Lane V/C Ratio	0.047	-	0.716	-	-
HCM Control Delay (s)	8.5	-	53.8	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q(veh)	0.1	-	4.7	-	-

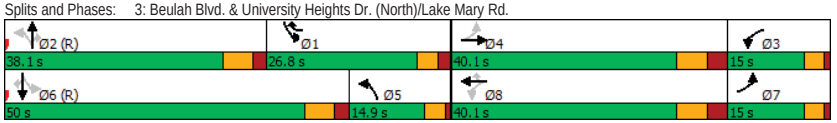
3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBTL	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize								
Recall Mode	Min	C-Min	None	None	None	C-Min	None	None
Maximum Split (s)	26.8	38.1	15	40.1	14.9	50	15	40.1
Maximum Split (%)	22.3%	31.8%	12.5%	33.4%	12.4%	41.7%	12.5%	33.4%
Minimum Split (s)	10	38.1	10	39.1	10	34.9	10	40.1
Yellow Time (s)	3	4.4	3	4.4	3	4.4	3	4.4
All-Red Time (s)	2	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	10	5	5	5	10	5	5
Vehicle Extension (s)	2	2	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	3	1.5	3	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		27.6		27.6		23.6		28.6
Dual Entry	No	No	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
End Time (s)	64.9	38.1	0	105	64.9	50	0	105
Yield/Force Off (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Yield/Force Off 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9
Local Start Time (s)	38.1	0	105	64.9	50	0	105	64.9
Local Yield (s)	59.9	31.6	116	97.5	60.9	43.5	116	97.5
Local Yield 170(s)	59.9	4	116	69.9	60.9	19.9	116	68.9

Intersection Summary		
Cycle Length		120
Control Type	Actuated-Coordinated	
Natural Cycle		120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		

Splits and Phases: 3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.



3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	19	14	111	33	568	23	503	97	779	254	277
Future Volume (veh/h)	144	19	14	111	33	568	23	503	97	779	254	277
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.92	0.98		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	21	13	123	37	0	26	559	81	866	282	231
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	95	59	204	173		1003	530	410	1615	361	272
Arrive On Green	0.04	0.09	0.07	0.04	0.09	0.00	0.52	0.28	0.26	0.43	0.19	0.17
Sat Flow, veh/h	1781	1040	644	1781	1870	1585	1781	1870	1558	3456	1870	1571
Grp Volume(v), veh/h	160	0	34	123	37	0	26	559	81	866	282	231
Grp Sat Flow(s),veh/h/ln	1781	0	1685	1781	1870	1585	1781	1870	1558	1728	1870	1571
Q Serve(g_s), s	1.8	0.0	2.3	0.0	2.2	0.0	0.0	34.0	4.8	17.2	17.2	17.1
Cycle Q Clear(g_c), s	1.8	0.0	2.3	0.0	2.2	0.0	0.0	34.0	4.8	17.2	17.2	17.1
Prop In Lane	1.00		0.38	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	0	154	204	173		1003	530	410	1615	361	272
V/C Ratio(X)	0.79	0.00	0.22	0.60	0.21		0.03	1.05	0.20	0.54	0.78	0.85
Avail Cap(c_a), veh/h	293	0	494	292	549		1003	530	410	1615	715	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	0.0	51.0	53.3	50.4	0.0	13.3	43.0	34.3	23.0	46.0	48.1
Incr Delay (d2), s/veh	5.1	0.0	0.3	1.1	0.2	0.0	0.0	54.3	1.1	0.2	15.4	26.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.5	0.0	1.7	6.4	1.8	0.0	0.6	31.9	3.4	13.4	14.6	13.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.0	0.0	51.3	54.4	50.6	0.0	13.3	97.3	35.4	23.2	61.4	74.9
LnGrp LOS	E	A	D	D	D		B	F	D	C	E	E
Approach Vol, veh/h		194			160			666			1379	
Approach Delay, s/veh		57.7			53.5			86.5			39.7	
Approach LOS		E			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	56.9	38.1	9.1	15.9	67.8	27.3	9.0	16.0
Change Period (Y+Rc), s	5.0	6.5	4.0	7.5	5.0	* 6.5	4.0	7.5
Max Green Setting (Gmax), s	21.8	31.6	11.0	32.6	10.9	* 44	11.0	32.6
Max Q Clear Time (g_c+I1), s	19.2	36.0	2.0	4.3	2.0	19.2	3.8	4.2
Green Ext Time (p_c), s	0.9	0.0	0.1	0.0	0.0	0.8	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	55.1
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

4: Beulah Blvd & Woodlands Village Blvd

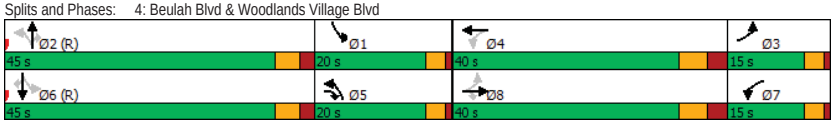
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	C-Min	None	None	Min	C-Min	None	None
Maximum Split (s)	20	45	15	40	20	45	15	40
Maximum Split (%)	16.7%	37.5%	12.5%	33.3%	16.7%	37.5%	12.5%	33.3%
Minimum Split (s)	9	21.1	9	31.1	9	27.1	9	33.1
Yellow Time (s)	3	3.6	3	4	3	3.6	3	4
All-Red Time (s)	1	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	1.5	3	3	1	1.5	3	3
Minimum Gap (s)	3	1.5	3	3	1	1.5	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		11.4		20		17.4		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	14	119	79	59	14	119	79
End Time (s)	79	59	14	119	79	59	14	119
Yield/Force Off (s)	75	53.3	10	111.9	75	53.3	10	111.9
Yield/Force Off 170(s)	75	41.9	10	91.9	75	35.9	10	89.9
Local Start Time (s)	45	0	105	65	45	0	105	65
Local Yield (s)	61	39.3	116	97.9	61	39.3	116	97.9
Local Yield 170(s)	61	27.9	116	77.9	61	21.9	116	75.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Splits and Phases: 4: Beulah Blvd & Woodlands Village Blvd



4: Beulah Blvd & Woodlands Village Blvd

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	4	634	3	3	12	491	695	2	8	645	130
Future Volume (veh/h)	177	4	634	3	3	12	491	695	2	8	645	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.94	0.99		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	197	0	531	3	3	10	546	772	2	9	717	108
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	0	1894	192	28	93	965	893	369	908	812	354
Arrive On Green	0.05	0.00	0.09	0.04	0.08	0.08	0.50	0.25	0.24	0.95	0.46	0.46
Sat Flow, veh/h	1781	0	2977	1781	371	1235	1781	3554	1565	1781	3554	1550
Grp Volume(v), veh/h	197	0	531	3	0	13	546	772	2	9	717	108
Grp Sat Flow(s),veh/h/ln	1781	0	1488	1781	0	1606	1781	1777	1565	1781	1777	1550
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.9	19.0	24.9	0.1	0.0	22.0	5.3
Cycle Q Clear(g_c), s	1.2	0.0	0.0	0.0	0.0	0.9	19.0	24.9	0.1	0.0	22.0	5.3
Prop In Lane	1.00		1.00	1.00		0.77	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	0	1894	192	0	121	965	893	369	908	812	354
V/C Ratio(X)	0.73	0.00	0.28	0.02	0.00	0.11	0.57	0.86	0.01	0.01	0.88	0.30
Avail Cap(c_a), veh/h	358	0	2474	288	0	440	965	1220	512	908	1220	532
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.77	0.77	0.77
Uniform Delay (d), s/veh	50.9	0.0	11.4	47.4	0.0	51.7	18.5	43.0	35.1	1.6	31.1	26.6
Incr Delay (d2), s/veh	5.2	0.0	0.1	0.0	0.0	0.4	0.5	10.9	0.0	0.0	10.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.9	0.0	5.7	0.1	0.0	0.7	14.8	17.8	0.1	0.0	12.5	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.1	0.0	11.4	47.4	0.0	52.1	19.0	53.8	35.1	1.6	41.8	28.3
LnGrp LOS	E	A	B	D	A	D	B	D	D	A	D	C
Approach Vol, veh/h		728			16			1320			834	
Approach Delay, s/veh		23.5			51.2			39.4			39.6	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	60.9	34.0	9.0	16.1	63.7	31.2	8.5	16.6
Change Period (Y+Rc), s	4.0	5.7	4.0	7.1	4.0	5.7	4.0	7.1
Max Green Setting (Gmax), s	16.0	39.3	11.0	32.9	16.0	39.3	11.0	32.9
Max Q Clear Time (g_c+I1), s	2.0	26.9	3.2	2.9	21.0	24.0	2.0	2.0
Green Ext Time (p_c), s	0.0	1.3	0.4	0.0	0.0	1.5	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

5: Beulah Blvd & McConnell Dr

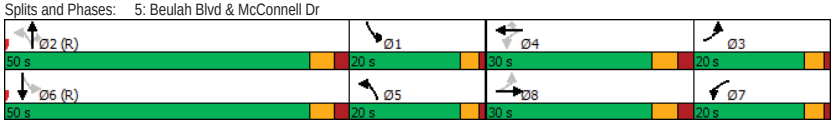
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Min	None	C-Min	None	Min
Maximum Split (s)	20	50	20	30	20	50	20	30
Maximum Split (%)	16.7%	41.7%	16.7%	25.0%	16.7%	41.7%	16.7%	25.0%
Minimum Split (s)	9	25.7	9	24.4	9	25.7	9	29.4
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	1	2.1	1	2.4	1	2.1	1	2.4
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	2	3	2	3	2	3	2
Minimum Gap (s)	3	2	3	2	3	2	3	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		15.4		14.4		15.4		19.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	9	109	79	59	9	109	79
End Time (s)	79	59	9	109	79	59	9	109
Yield/Force Off (s)	75	53.3	5	103	75	53.3	5	103
Yield/Force Off 170(s)	75	37.9	5	103	75	37.9	5	103
Local Start Time (s)	50	0	100	70	50	0	100	70
Local Yield (s)	66	44.3	116	94	66	44.3	116	94
Local Yield 170(s)	66	28.9	116	94	66	28.9	116	94

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75

Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 5: Beulah Blvd & McConnell Dr



5: Beulah Blvd & McConnell Dr

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	234	13	384	259	131	34	525	324	59	580	97
Future Volume (veh/h)	82	234	13	384	259	131	34	525	324	59	580	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	0.99		0.98	1.00		0.92	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	91	260	12	427	288	110	38	583	270	66	644	81
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	386	341	16	396	357	297	647	770	316	719	753	95
Arrive On Green	0.16	0.19	0.17	0.16	0.19	0.19	0.64	0.43	0.43	0.34	0.24	0.23
Sat Flow, veh/h	1781	1771	82	1781	1870	1558	1781	3554	1457	1781	3159	397
Grp Volume(v), veh/h	91	0	272	427	288	110	38	583	270	66	362	363
Grp Sat Flow(s),veh/h/ln	1781	0	1852	1781	1870	1558	1781	1777	1457	1781	1777	1778
Q Serve(g_s), s	0.0	0.0	16.7	18.8	17.7	7.4	0.0	16.6	20.0	0.0	23.4	23.5
Cycle Q Clear(g_c), s	0.0	0.0	16.7	18.8	17.7	7.4	0.0	16.6	20.0	0.0	23.4	23.5
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	386	0	357	396	357	297	647	770	316	719	424	424
V/C Ratio(X)	0.24	0.00	0.76	1.08	0.81	0.37	0.06	0.76	0.86	0.09	0.85	0.86
Avail Cap(c_a), veh/h	386	0	414	396	418	348	647	1359	557	719	680	680
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.93	0.93	0.93	0.64	0.64	0.64
Uniform Delay (d), s/veh	41.2	0.0	45.9	47.4	46.4	42.3	14.1	31.4	32.3	22.7	43.7	43.9
Incr Delay (d2), s/veh	0.3	0.0	5.7	67.8	8.3	0.3	0.0	6.4	23.1	0.0	13.2	13.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	0.0	12.8	27.3	13.9	5.1	0.7	10.1	11.8	2.2	16.2	16.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	0.0	51.5	115.2	54.7	42.6	14.1	37.8	55.5	22.8	56.9	57.3
LnGrp LOS	D	A	D	F	D	D	B	D	E	C	E	E
Approach Vol, veh/h		363			825			891			791	
Approach Delay, s/veh		49.0			84.4			42.1			54.2	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	43.6	30.1	20.3	26.1	40.9	32.7	20.0	26.3
Change Period (Y+Rc), s	4.0	5.7	4.0	6.0	4.0	5.7	4.0	6.0
Max Green Setting (Gmax), s	16.0	44.3	16.0	24.0	16.0	44.3	16.0	24.0
Max Q Clear Time (g_c+I1), s	2.0	22.0	2.0	19.7	2.0	25.5	20.8	18.7
Green Ext Time (p_c), s	0.1	2.4	0.2	0.4	0.1	1.6	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	58.5
HCM 6th LOS	E

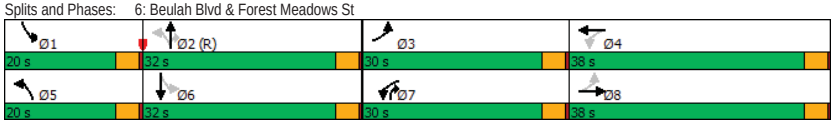
6: Beulah Blvd & Forest Meadows St

Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes						
Recall Mode	None	C-Max	Max	Max	Min	Min	Max	Max
Maximum Split (s)	20	32	30	38	20	32	30	38
Maximum Split (%)	16.7%	26.7%	25.0%	31.7%	16.7%	26.7%	25.0%	31.7%
Minimum Split (s)	8	20	8	20	8	20	8	20
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum Initial (s)	4	4	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	102	2	34	64	102	2	34	64
End Time (s)	2	34	64	102	2	34	64	102
Yield/Force Off (s)	118	30	60	98	118	30	60	98
Yield/Force Off 170(s)	118	19	60	87	118	30	60	87
Local Start Time (s)	100	0	32	62	100	0	32	62
Local Yield (s)	116	28	58	96	116	28	58	96
Local Yield 170(s)	116	17	58	85	116	28	58	85

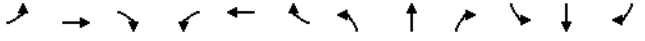
Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 2 (2%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 6: Beulah Blvd & Forest Meadows St



6: Beulah Blvd & Forest Meadows St

HCM 6th Signalized Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	139	76	909	117	12	43	78	697	14	43	15
Future Volume (veh/h)	18	139	76	909	117	12	43	78	697	14	43	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	151	62	988	127	10	47	85	569	15	47	13
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	729	706	278	1401	485	38	536	661	1591	520	469	130
Arrive On Green	0.22	0.28	0.28	0.22	0.28	0.28	0.06	0.59	0.59	0.01	0.33	0.33
Sat Flow, veh/h	1781	2490	980	3456	1711	135	1781	1870	2790	1781	1410	390
Grp Volume(v), veh/h	20	106	107	988	0	137	47	85	569	15	0	60
Grp Sat Flow(s),veh/h/ln	1781	1777	1694	1728	0	1846	1781	1870	1395	1781	0	1800
Q Serve(g_s), s	0.7	5.4	5.8	24.0	0.0	6.9	2.0	2.4	10.1	0.7	0.0	2.8
Cycle Q Clear(g_c), s	0.7	5.4	5.8	24.0	0.0	6.9	2.0	2.4	10.1	0.7	0.0	2.8
Prop In Lane	1.00		0.58	1.00		0.07	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	729	503	480	1401	0	523	536	661	1591	520	0	599
V/C Ratio(X)	0.03	0.21	0.22	0.71	0.00	0.26	0.09	0.13	0.36	0.03	0.00	0.10
Avail Cap(c_a), veh/h	729	503	480	1401	0	523	713	661	1591	734	0	599
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.93	0.93	0.93	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.4	32.8	32.9	21.3	0.0	33.3	23.9	16.4	8.4	25.9	0.0	27.6
Incr Delay (d2), s/veh	0.1	0.9	1.1	3.0	0.0	1.2	0.1	0.4	0.6	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	4.4	4.5	15.1	0.0	5.8	1.5	2.0	4.4	0.5	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.4	33.7	34.0	24.3	0.0	34.5	23.9	16.8	9.0	25.9	0.0	27.7
LnGrp LOS	B	C	C	C	A	C	C	B	A	C	A	C
Approach Vol, veh/h		233			1125			701			75	
Approach Delay, s/veh		32.3			25.5			10.9			27.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	46.4	30.0	38.0	8.1	43.9	30.0	38.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	28.0	26.0	34.0	16.0	28.0	26.0	34.0
Max Q Clear Time (g_c+I1), s	2.7	12.1	2.7	8.9	4.0	4.8	26.0	7.8
Green Ext Time (p_c), s	0.0	2.6	0.0	0.7	0.1	0.2	0.0	1.2

Intersection Summary		
HCM 6th Ctrl Delay		21.5
HCM 6th LOS		C

7: I-17 SB On-Ramp & McConnell Dr

HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	319	298	186	774	0	0
Future Volume (Veh/h)	319	298	186	774	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.85	0.85	0.90	0.80	0.80
Hourly flow rate (vph)	354	351	219	860	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	334					
pX, platoon unblocked						
vC, conflicting volume			705		1652	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			705		1652	354
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			75		100	100
cM capacity (veh/h)			893		82	690

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	354	351	219	860
Volume Left	0	0	219	0
Volume Right	0	351	0	0
cSH	1700	1700	893	1700
Volume to Capacity	0.21	0.21	0.25	0.51
Queue Length 95th (ft)	0	0	24	0
Control Delay (s)	0.0	0.0	10.3	0.0
Lane LOS			B	
Approach Delay (s)	0.0		2.1	
Approach LOS				

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization		57.4%	ICU Level of Service	B
Analysis Period (min)		15		

9: Beulah Blvd. & Fort Tuthill Loop

HCM 6th TWSC

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	5	2	417	752	1
Future Vol, veh/h	9	5	2	417	752	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	125	0	180	-	-	115
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	5	2	453	817	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1048	409	818	0	-	0
Stage 1	817	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	223	592	806	-	-	-
Stage 1	395	-	-	-	-	-
Stage 2	785	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	223	592	806	-	-	-
Mov Cap-2 Maneuver	223	-	-	-	-	-
Stage 1	394	-	-	-	-	-
Stage 2	785	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	806	-	223	592	-	-
HCM Lane V/C Ratio	0.003	-	0.044	0.009	-	-
HCM Control Delay (s)	9.5	-	21.9	11.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

10: J.W. Powell Blvd. & I-17SB Ramp

HCM 6th Roundabout

Intersection	
Intersection Delay, s/veh	30.3
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	0	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1035	190	0	693
Demand Flow Rate, veh/h	1056	194	0	707
Vehicles Circulating, veh/h	261	0	1069	194
Vehicles Exiting, veh/h	640	1069	248	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	47.7	3.8	0.0	11.6
Approach LOS	E	A	-	B

Lane	Left	Left	Left
Designated Moves	TR	LT	LTR
Assumed Moves	TR	LT	LTR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	1056	194	707
Cap Entry Lane, veh/h	1057	1380	1132
Entry HV Adj Factor	0.980	0.980	0.980
Flow Entry, veh/h	1035	190	693
Cap Entry, veh/h	1036	1353	1110
V/C Ratio	0.999	0.141	0.624
Control Delay, s/veh	47.7	3.8	11.6
LOS	E	A	B
95th %tile Queue, veh	20	0	5

11: I-17 NB Ramp & J.W. Powell Blvd.

HCM 6th TWSC

Intersection	
Int Delay, s/veh	60.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	666	268	0	0	109	191	51	4	28	0	0	0
Future Vol, veh/h	666	268	0	0	109	191	51	4	28	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	175	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	85	80	80	85	85	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	740	315	0	0	128	225	64	5	35	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	353	0	-	-	-	0	2036	2148	315
Stage 1	-	-	-	-	-	-	1795	1795	-
Stage 2	-	-	-	-	-	-	241	353	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1206	-	0	0	-	-	~ 62	48	725
Stage 1	-	-	0	0	-	-	146	132	-
Stage 2	-	-	0	0	-	-	799	631	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1206	-	-	-	-	-	~ 24	0	725
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 24	0	-
Stage 1	-	-	-	-	-	-	~ 56	0	-
Stage 2	-	-	-	-	-	-	799	0	-

Approach	EB	WB	NB
HCM Control Delay, s	8.8	0	$ 786.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	24	725	1206	-	-	-
HCM Lane V/C Ratio	2.865	0.048	0.614	-	-	-
HCM Control Delay (s)	$ 1182.3	10.2	12.6	-	-	-
HCM Lane LOS	F	B	B	-	-	-
HCM 95th %tile Q(veh)	8.6	0.2	4.4	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

12: Mountain Dell Rd. & Beulah Blvd.

HCM 6th TWSC

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	2	0	556	411	33
Future Vol, veh/h	21	2	0	556	411	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	155	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	2	0	618	457	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1094	476	494	0	-	0
Stage 1	476	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	237	589	1070	-	-	-
Stage 1	625	-	-	-	-	-
Stage 2	538	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	237	589	1070	-	-	-
Mov Cap-2 Maneuver	237	-	-	-	-	-
Stage 1	625	-	-	-	-	-
Stage 2	538	-	-	-	-	-

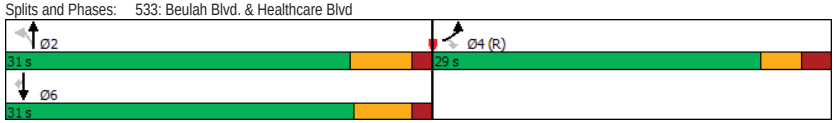
Approach	EB	NB	SB
HCM Control Delay, s	21	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1070	-	250	-	-
HCM Lane V/C Ratio	-	-	0.102	-	-
HCM Control Delay (s)	0	-	21	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	Max	C-Max	Max
Maximum Split (s)	31	29	31
Maximum Split (%)	51.7%	48.3%	51.7%
Minimum Split (s)	11	10.2	13.7
Yellow Time (s)	4.5	3	4.2
All-Red Time (s)	1.5	2.2	1.5
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			4
Flash Dont Walk (s)			4
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	1	32	1
End Time (s)	32	1	32
Yield/Force Off (s)	26	55.8	26.3
Yield/Force Off 170(s)	26	55.8	22.3
Local Start Time (s)	29	0	29
Local Yield (s)	54	23.8	54.3
Local Yield 170(s)	54	23.8	50.3

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 32 (53%), Referenced to phase 4:EBL, Start of Green	

Splits and Phases: 533: Beulah Blvd. & Healthcare Blvd



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	201	109	52	300	305	96
Future Volume (veh/h)	201	109	52	300	305	96
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	223	101	58	333	339	74
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1000	890	470	1498	1498	647
Arrive On Green	0.56	0.56	0.14	0.14	0.42	0.42
Sat Flow, veh/h	1781	1585	971	3647	3647	1535
Grp Volume(v), veh/h	223	101	58	333	339	74
Grp Sat Flow(s),veh/h/ln	1781	1585	971	1777	1777	1535
Q Serve(g_s), s	3.8	1.8	3.2	5.0	3.7	1.8
Cycle Q Clear(g_c), s	3.8	1.8	6.9	5.0	3.7	1.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1000	890	470	1498	1498	647
V/C Ratio(X)	0.22	0.11	0.12	0.22	0.23	0.11
Avail Cap(c_a), veh/h	1000	890	470	1498	1498	647
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.6	6.2	19.5	17.1	11.1	10.5
Incr Delay (d2), s/veh	0.5	0.3	0.5	0.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.3	1.0	1.5	3.6	2.4	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.1	6.4	20.1	17.4	11.4	10.9
LnGrp LOS	A	A	C	B	B	B
Approach Vol, veh/h	324			391	413	
Approach Delay, s/veh	6.9			17.8	11.3	
Approach LOS	A			B	B	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	31.3	39.2	31.3
Change Period (Y+Rc), s	6.0	* 5.2	* 6
Max Green Setting (Gmax), s	25.0	* 24	* 25
Max Q Clear Time (g_c+I1), s	8.9	5.8	5.7
Green Ext Time (p_c), s	2.2	0.9	2.3

Intersection Summary		
HCM 6th Ctrl Delay	12.3	
HCM 6th LOS	B	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

534: Beulah Blvd. & Access B

HCM 6th TWSC

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	120	163	78	289	356	58
Future Vol, veh/h	120	163	78	289	356	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	155
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	181	87	321	396	64

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	731	198	460	0	-	0
Stage 1	396	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	585	*964	1276	-	-	-
Stage 1	836	-	-	-	-	-
Stage 2	800	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	546	*964	1276	-	-	-
Mov Cap-2 Maneuver	610	-	-	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	800	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	1.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1276	-	610	964	-	-
HCM Lane V/C Ratio	0.068	-	0.219	0.188	-	-
HCM Control Delay (s)	8	-	12.5	9.6	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.8	0.7	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

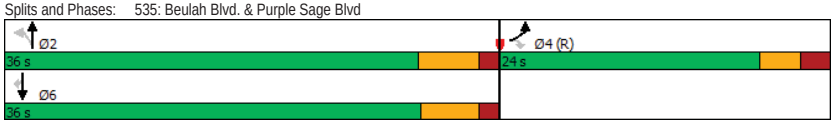
535: Beulah Blvd. & Purple Sage Blvd

Timing Report, Sorted By Phase

Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	Min	C-Max	Min
Maximum Split (s)	36	24	36
Maximum Split (%)	60.0%	40.0%	60.0%
Minimum Split (s)	11	10.2	13.8
Yellow Time (s)	4.5	3	4.3
All-Red Time (s)	1.5	2.2	1.5
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			4
Flash Dont Walk (s)			4
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	0	36	0
End Time (s)	36	0	36
Yield/Force Off (s)	30	54.8	30.2
Yield/Force Off 170(s)	30	54.8	30.2
Local Start Time (s)	24	0	24
Local Yield (s)	54	18.8	54.2
Local Yield 170(s)	54	18.8	54.2

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 36 (60%), Referenced to phase 4:EBL, Start of Green	

Splits and Phases: 535: Beulah Blvd. & Purple Sage Blvd



535: Beulah Blvd. & Purple Sage Blvd

HCM 6th Signalized Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	272	130	287	481	39
Future Volume (veh/h)	80	272	130	287	481	39
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	241	144	319	534	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	792	705	320	1309	1309	565
Arrive On Green	0.44	0.44	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1781	1585	870	3647	3647	1533
Grp Volume(v), veh/h	89	241	144	319	534	1
Grp Sat Flow(s),veh/h/ln	1781	1585	870	1777	1777	1533
Q Serve(g_s), s	1.8	6.0	9.7	4.9	8.3	0.0
Cycle Q Clear(g_c), s	1.8	6.0	18.0	4.9	8.3	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	792	705	320	1309	1309	565
V/C Ratio(X)	0.11	0.34	0.45	0.24	0.41	0.00
Avail Cap(c_a), veh/h	792	705	434	1777	1789	772
HCM Platoon Ratio	1.00	1.00	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.7	10.9	28.6	18.8	20.3	16.7
Incr Delay (d2), s/veh	0.3	1.3	1.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	3.7	4.1	3.5	6.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.0	12.2	29.6	18.9	20.5	16.7
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	330			463	535	
Approach Delay, s/veh	11.6			22.2	20.5	
Approach LOS	B			C	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		28.1		31.9		28.1
Change Period (Y+Rc), s		6.0		* 5.2		* 6
Max Green Setting (Gmax), s		30.0		* 19		* 30
Max Q Clear Time (g_c+I1), s		20.0		8.0		10.3
Green Ext Time (p_c), s		2.1		0.8		3.5

Intersection Summary		
HCM 6th Ctrl Delay		18.9
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

538: Access F & Healthcare Blvd

HCM 6th TWSC

Intersection	
Int Delay, s/veh	9.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	148	0	0	310
Future Vol, veh/h	0	0	148	0	0	310
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	164	0	0	344

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	329	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	328	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1620	-	640	1083
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	702	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1620	-	575	1083
Mov Cap-2 Maneuver	-	-	-	-	575	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.5	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	1083	-	-	1620	-
HCM Lane V/C Ratio	-	0.318	-	-	0.102	-
HCM Control Delay (s)	0	9.9	-	-	7.5	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	1.4	-	-	0.3	-

539: Purple Sage Blvd & Grey Mint St

HCM 6th TWSC

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	176	84	85	176	0
Future Vol, veh/h	0	176	84	85	176	0
Conflicting Peds, #/hr	60	0	0	60	1	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	100	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	196	93	94	196	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	247	0	-	0	350	156
Stage 1	-	-	-	-	153	-
Stage 2	-	-	-	-	197	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1319	-	-	-	647	890
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	836	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1253	-	-	-	584	843
Mov Cap-2 Maneuver	-	-	-	-	637	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	794	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1253	-	-	-	637	-
HCM Lane V/C Ratio	-	-	-	-	0.307	-
HCM Control Delay (s)	0	-	-	-	13.1	0
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	1.3	-

545: Purple Sage Blvd & Access M

HCM 6th TWSC

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	1	84	176	0
Future Vol, veh/h	0	1	1	84	176	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	90	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	1	93	196	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1021	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1021	1084
Mov Cap-2 Maneuver	-	-	-	-	932	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	932
HCM Lane V/C Ratio	-	-	-	-	0.21
HCM Control Delay (s)	0	-	-	-	9.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.8

APPENDIX H

2027 MITIGATION PEAK HOUR ANALYSIS

1: Beulah Blvd. & Fairgrounds Rd./J.W. Powell Blvd.

HCM 6th Roundabout

Intersection	
Intersection Delay, s/veh	9.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	25	819	286	383
Demand Flow Rate, veh/h	25	835	292	391
Vehicles Circulating, veh/h	618	83	319	271
Vehicles Exiting, veh/h	44	528	324	647
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.3	11.6	6.7	5.4
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	L	TR
Assumed Moves	LTR	LTR	LTR	L	TR
RT Channelized					
Lane Util	1.000	1.000	1.000	0.757	0.243
Follow-Up Headway, s	2.609	2.609	2.609	2.535	2.535
Critical Headway, s	4.976	4.976	4.976	4.544	4.544
Entry Flow, veh/h	25	835	292	296	95
Cap Entry Lane, veh/h	735	1268	997	1110	1110
Entry HV Adj Factor	0.984	0.981	0.981	0.980	0.981
Flow Entry, veh/h	25	819	286	290	93
Cap Entry, veh/h	723	1244	978	1087	1088
V/C Ratio	0.034	0.659	0.293	0.267	0.086
Control Delay, s/veh	5.3	11.6	6.7	5.8	4.0
LOS	A	B	A	A	A
95th %tile Queue, veh	0	5	1	1	0

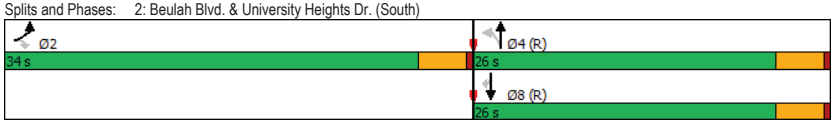
2: Beulah Blvd. & University Heights Dr. (South)

Timing Report, Sorted By Phase

Phase Number	2	4	8
Movement	EBL	NBTL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	None	C-Max	C-Max
Maximum Split (s)	34	26	26
Maximum Split (%)	56.7%	43.3%	43.3%
Minimum Split (s)	20	20	20
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5
Minimum Initial (s)	4	4	4
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	5	5	5
Flash Dont Walk (s)	11	11	11
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	51	25	25
End Time (s)	25	51	51
Yield/Force Off (s)	21	47	47
Yield/Force Off 170(s)	10	36	36
Local Start Time (s)	26	0	0
Local Yield (s)	56	22	22
Local Yield 170(s)	45	11	11

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 25 (42%), Referenced to phase 4:NBTL and 8:SBT, Start of Green	

Splits and Phases: 2: Beulah Blvd. & University Heights Dr. (South)



2: Beulah Blvd. & University Heights Dr. (South)

HCM 6th Signalized Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	285	53	35	220	468	0
Future Volume (veh/h)	285	53	35	220	468	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	317	45	39	244	520	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	390	347	636	2301	2301	1026
Arrive On Green	0.22	0.22	0.65	0.65	0.65	0.00
Sat Flow, veh/h	1781	1585	879	3647	3647	1585
Grp Volume(v), veh/h	317	45	39	244	520	0
Grp Sat Flow(s),veh/h/ln	1781	1585	879	1777	1777	1585
Q Serve(g_s), s	10.1	1.4	1.1	1.6	3.6	0.0
Cycle Q Clear(g_c), s	10.1	1.4	4.8	1.6	3.6	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	390	347	636	2301	2301	1026
V/C Ratio(X)	0.81	0.13	0.06	0.11	0.23	0.00
Avail Cap(c_a), veh/h	891	793	636	2301	2301	1026
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.3	18.8	5.3	4.0	4.4	0.0
Incr Delay (d2), s/veh	4.1	0.2	0.2	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.9	0.4	0.8	1.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.4	19.0	5.5	4.1	4.6	0.0
LnGrp LOS	C	B	A	A	A	A
Approach Vol, veh/h	362			283	520	
Approach Delay, s/veh	25.5			4.3	4.6	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		8
Phs Duration (G+Y+Rc), s		17.1		42.9		42.9
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		30.0		22.0		22.0
Max Q Clear Time (g_c+I1), s		12.1		6.8		5.6
Green Ext Time (p_c), s		1.0		1.5		3.2

Intersection Summary		
HCM 6th Ctrl Delay		11.0
HCM 6th LOS		B

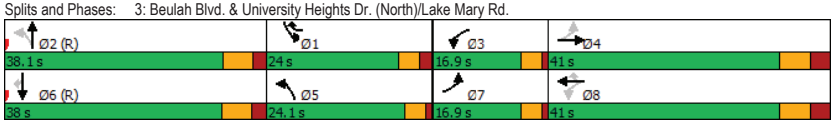
3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize								
Recall Mode	Min	C-Max	Max	None	None	C-Max	None	Max
Maximum Split (s)	24	38.1	16.9	41	24.1	38	16.9	41
Maximum Split (%)	20.0%	31.8%	14.1%	34.2%	20.1%	31.7%	14.1%	34.2%
Minimum Split (s)	10.9	38.1	16	39.1	10	34.9	9	40.1
Yellow Time (s)	3	4.4	3	4.4	3	4.4	3	4.4
All-Red Time (s)	2	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5.9	5	12	5	5	5	5	15
Vehicle Extension (s)	2	2	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	3	1.5	3	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		27.6		27.6		23.6		28.6
Dual Entry	No	No	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	27.2	109.1	51.2	68.1	27.1	109.1	51.2	68.1
End Time (s)	51.2	27.2	68.1	109.1	51.2	27.1	68.1	109.1
Yield/Force Off (s)	46.2	20.7	64.1	101.6	47.2	20.6	64.1	101.6
Yield/Force Off 170(s)	46.2	113.1	64.1	74	47.2	117	64.1	73
Local Start Time (s)	38.1	0	62.1	79	38	0	62.1	79
Local Yield (s)	57.1	31.6	75	112.5	58.1	31.5	75	112.5
Local Yield 170(s)	57.1	4	75	84.9	58.1	7.9	75	83.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 109.1 (91%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.



3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	21	23	138	26	706	7	418	69	366	314	110
Future Volume (veh/h)	230	21	23	138	26	706	7	418	69	366	314	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	256	23	20	153	29	588	8	464	58	407	349	92
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	467	273	238	605	563	692	436	899	112	547	528	414
Arrive On Green	0.11	0.30	0.28	0.11	0.30	0.28	0.16	0.28	0.26	0.16	0.28	0.26
Sat Flow, veh/h	1781	908	790	1781	1870	1580	1781	3174	395	3456	1870	1576
Grp Volume(v), veh/h	256	0	43	153	29	588	8	259	263	407	349	92
Grp Sat Flow(s),veh/h/ln	1781	0	1698	1781	1870	1580	1781	1777	1792	1728	1870	1576
Q Serve(g_s), s	12.4	0.0	2.2	6.9	1.3	13.5	0.0	14.7	14.9	13.5	19.8	4.0
Cycle Q Clear(g_c), s	12.4	0.0	2.2	6.9	1.3	13.5	0.0	14.7	14.9	13.5	19.8	4.0
Prop In Lane	1.00		0.47	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	467	0	511	605	563	692	436	503	508	547	528	414
V/C Ratio(X)	0.55	0.00	0.08	0.25	0.05	0.85	0.02	0.51	0.52	0.74	0.66	0.22
Avail Cap(c_a), veh/h	467	0	511	605	563	692	451	503	508	547	528	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.4	0.0	30.5	24.7	29.8	12.8	33.4	36.1	36.4	48.2	38.0	18.8
Incr Delay (d2), s/veh	0.8	0.0	0.0	1.0	0.2	12.4	0.0	3.7	3.8	4.8	6.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.8	0.0	1.6	5.4	1.1	13.9	0.3	10.9	11.1	10.2	15.1	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	0.0	30.6	25.7	30.0	25.3	33.4	39.8	40.1	53.0	44.3	20.0
LnGrp LOS	C	A	C	C	C	C	C	D	D	D	D	B
Approach Vol, veh/h		299			770			530			848	
Approach Delay, s/veh		27.6			25.5			39.9			45.9	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	38.1	16.9	41.0	24.1	38.0	16.9	41.0
Change Period (Y+Rc), s	5.0	6.5	4.0	7.5	5.0	* 6.5	4.0	7.5
Max Green Setting (Gmax), s	19.0	31.6	12.9	33.5	20.1	* 32	12.9	33.5
Max Q Clear Time (g_c+I1), s	15.5	16.9	8.9	4.2	2.0	21.8	14.4	15.5
Green Ext Time (p_c), s	0.4	0.9	0.1	0.0	0.0	0.5	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	35.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

4: Beulah Blvd & Woodlands Village Blvd

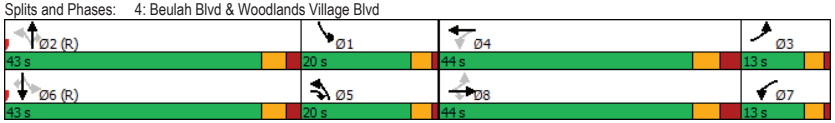
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	C-Min	None	None	Min	C-Min	None	None
Maximum Split (s)	20	43	13	44	20	43	13	44
Maximum Split (%)	16.7%	35.8%	10.8%	36.7%	16.7%	35.8%	10.8%	36.7%
Minimum Split (s)	9	21.1	9	31.1	9	27.1	9	33.1
Yellow Time (s)	3	3.6	3	4	3	3.6	3	4
All-Red Time (s)	1	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	15	5	15	5	15	5	5
Vehicle Extension (s)	3	1.5	3	3	1	1.5	3	3
Minimum Gap (s)	3	1.5	3	3	1	1.5	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		11.4		20		17.4		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	57	14	1	77	57	14	1	77
End Time (s)	77	57	14	1	77	57	14	1
Yield/Force Off (s)	73	51.3	10	113.9	73	51.3	10	113.9
Yield/Force Off 170(s)	73	39.9	10	93.9	73	33.9	10	91.9
Local Start Time (s)	43	0	107	63	43	0	107	63
Local Yield (s)	59	37.3	116	99.9	59	37.3	116	99.9
Local Yield 170(s)	59	25.9	116	79.9	59	19.9	116	77.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80

Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Splits and Phases: 4: Beulah Blvd & Woodlands Village Blvd



4: Beulah Blvd & Woodlands Village Blvd

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1	430	1	7	14	433	874	2	12	328	54
Future Volume (veh/h)	78	1	430	1	7	14	433	874	2	12	328	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	0	360	1	8	13	481	971	2	13	364	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	0	1914	304	80	130	2005	1076	454	728	507	220
Arrive On Green	0.05	0.00	0.05	0.12	0.12	0.12	0.54	0.30	0.29	0.75	0.29	0.29
Sat Flow, veh/h	1781	0	3170	1781	641	1042	3456	3554	1583	1781	3554	1544
Grp Volume(v), veh/h	87	0	360	1	0	21	481	971	2	13	364	46
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1683	1728	1777	1583	1781	1777	1544
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.3	2.8	31.5	0.1	0.0	11.0	2.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	1.3	2.8	31.5	0.1	0.0	11.0	2.7
Prop In Lane	1.00		1.00	1.00		0.62	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	215	0	1914	304	0	210	2005	1076	454	728	507	220
V/C Ratio(X)	0.40	0.00	0.19	0.00	0.00	0.10	0.24	0.90	0.00	0.02	0.72	0.21
Avail Cap(c_a), veh/h	278	0	2757	304	0	517	2005	1161	492	728	1161	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	52.0	0.0	10.6	43.6	0.0	46.5	13.1	40.1	30.5	9.4	40.7	37.7
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.0	0.0	0.2	0.0	12.1	0.0	0.0	8.3	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	0.0	3.6	0.0	0.0	1.0	5.5	21.7	0.1	0.2	8.4	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.2	0.0	10.7	43.6	0.0	46.7	13.1	52.2	30.6	9.4	49.0	39.8
LnGrp LOS	D	A	B	D	A	D	B	D	C	A	D	D
Approach Vol, veh/h		447			22			1454			423	
Approach Delay, s/veh		19.0			46.6			39.3			46.8	
Approach LOS		B			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	49.0	40.1	8.7	22.1	68.3	20.9	18.7	12.1
Change Period (Y+Rc), s	4.0	5.7	4.0	7.1	4.0	5.7	4.0	7.1
Max Green Setting (Gmax), s	16.0	37.3	9.0	36.9	16.0	37.3	9.0	36.9
Max Q Clear Time (g_c+I1), s	2.0	33.5	2.0	3.3	4.8	13.0	2.0	2.0
Green Ext Time (p_c), s	0.0	1.0	0.1	0.1	0.5	0.7	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay	36.8
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

5: Beulah Blvd & McConnell Dr

Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	Min	None	C-Max	None	Min
Maximum Split (s)	19	50	21	30	19	50	21	30
Maximum Split (%)	15.8%	41.7%	17.5%	25.0%	15.8%	41.7%	17.5%	25.0%
Minimum Split (s)	9	25.7	9	24.4	9	25.7	9	29.4
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	1	2.1	1	2.4	1	2.1	1	2.4
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	2	3	2	3	2	3	2
Minimum Gap (s)	3	2	3	2	3	2	3	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		15.4		14.4		15.4		19.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	110	9	59	80	110	9	59	80
End Time (s)	9	59	80	110	9	59	80	110
Yield/Force Off (s)	5	53.3	76	104	5	53.3	76	104
Yield/Force Off 170(s)	5	37.9	76	104	5	37.9	76	104
Local Start Time (s)	101	0	50	71	101	0	50	71
Local Yield (s)	116	44.3	67	95	116	44.3	67	95
Local Yield 170(s)	116	28.9	67	95	116	28.9	67	95

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75

Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 5: Beulah Blvd & McConnell Dr

5: Beulah Blvd & McConnell Dr

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	166	6	182	86	36	13	483	533	59	389	43
Future Volume (veh/h)	33	166	6	182	86	36	13	483	533	59	389	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.95	0.98		0.96	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	184	6	202	96	30	14	537	444	66	432	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	358	307	10	602	388	317	629	2127	918	492	2048	175
Arrive On Green	0.05	0.17	0.15	0.09	0.21	0.21	0.05	1.00	1.00	0.05	0.62	0.61
Sat Flow, veh/h	1781	1798	59	3456	1870	1527	1781	3554	1535	1781	3304	282
Grp Volume(v), veh/h	37	0	190	202	96	30	14	537	444	66	231	238
Grp Sat Flow(s),veh/h/ln	1781	0	1857	1728	1870	1527	1781	1777	1535	1781	1777	1809
Q Serve(g_s), s	2.0	0.0	11.3	5.4	5.1	1.9	0.3	0.0	0.0	1.5	6.8	6.9
Cycle Q Clear(g_c), s	2.0	0.0	11.3	5.4	5.1	1.9	0.3	0.0	0.0	1.5	6.8	6.9
Prop In Lane	1.00		0.03	1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	358	0	317	602	388	317	629	2127	918	492	1102	1122
V/C Ratio(X)	0.10	0.00	0.60	0.34	0.25	0.09	0.02	0.25	0.48	0.13	0.21	0.21
Avail Cap(c_a), veh/h	557	0	415	863	418	341	824	2127	918	649	1102	1122
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.94	0.94	0.94	0.98	0.98	0.98
Uniform Delay (d), s/veh	36.9	0.0	46.0	34.1	39.7	38.4	8.3	0.0	0.0	7.0	10.0	10.0
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.3	0.1	0.0	0.0	0.3	1.7	0.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	0.0	9.0	4.1	4.3	1.3	0.2	0.1	0.8	1.0	4.8	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	0.0	46.7	34.5	39.8	38.5	8.3	0.3	1.7	7.1	10.4	10.5
LnGrp LOS	D	A	D	C	D	D	A	A	A	A	B	B
Approach Vol, veh/h		227			328			995			535	
Approach Delay, s/veh		45.1			36.4			1.0			10.0	
Approach LOS		D			D			A			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	75.9	7.5	28.1	5.9	78.5	11.9	23.7
Change Period (Y+Rc), s	4.0	5.7	4.0	6.0	4.0	5.7	4.0	6.0
Max Green Setting (Gmax), s	15.0	44.3	17.0	24.0	15.0	44.3	17.0	24.0
Max Q Clear Time (g_c+I1), s	3.5	2.0	4.0	7.1	2.3	8.9	7.4	13.3
Green Ext Time (p_c), s	0.1	2.9	0.1	0.2	0.0	1.0	0.5	0.3

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

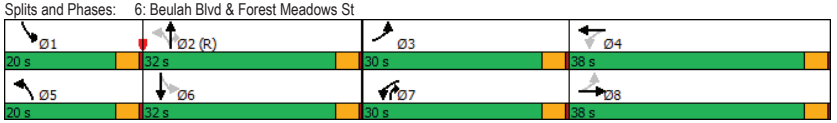
6: Beulah Blvd & Forest Meadows St

Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes						
Recall Mode	None	C-Min	Max	Max	Min	Min	Max	Max
Maximum Split (s)	20	32	30	38	20	32	30	38
Maximum Split (%)	16.7%	26.7%	25.0%	31.7%	16.7%	26.7%	25.0%	31.7%
Minimum Split (s)	8	20	8	20	8	20	8	20
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum Initial (s)	4	4	4	4	4	4	4	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	102	2	34	64	102	2	34	64
End Time (s)	2	34	64	102	2	34	64	102
Yield/Force Off (s)	118	30	60	98	118	30	60	98
Yield/Force Off 170(s)	118	19	60	87	118	30	60	87
Local Start Time (s)	100	0	32	62	100	0	32	62
Local Yield (s)	116	28	58	96	116	28	58	96
Local Yield 170(s)	116	17	58	85	116	28	58	85

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 2 (2%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 6: Beulah Blvd & Forest Meadows St



6: Beulah Blvd & Forest Meadows St

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	128	38	404	184	17	15	32	510	54	65	4
Future Volume (veh/h)	4	128	38	404	184	17	15	32	510	54	65	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	139	31	439	200	14	16	35	416	59	71	3
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	667	822	179	1449	490	34	525	623	1534	421	594	25
Arrive On Green	0.22	0.28	0.28	0.22	0.28	0.28	0.03	0.33	0.33	0.03	0.33	0.33
Sat Flow, veh/h	1781	2903	631	3456	1728	121	1781	1870	2790	1781	1782	75
Grp Volume(v), veh/h	4	84	86	439	0	214	16	35	416	59	0	74
Grp Sat Flow(s),veh/h/ln	1781	1777	1757	1728	0	1849	1781	1870	1395	1781	0	1857
Q Serve(g_s), s	0.1	4.3	4.4	8.7	0.0	11.3	0.7	1.5	9.5	2.6	0.0	3.3
Cycle Q Clear(g_c), s	0.1	4.3	4.4	8.7	0.0	11.3	0.7	1.5	9.5	2.6	0.0	3.3
Prop In Lane	1.00		0.36	1.00		0.07	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	667	503	498	1449	0	524	525	623	1534	421	0	619
V/C Ratio(X)	0.01	0.17	0.17	0.30	0.00	0.41	0.03	0.06	0.27	0.14	0.00	0.12
Avail Cap(c_a), veh/h	667	503	498	1449	0	524	703	623	1534	599	0	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.98	0.98	0.98	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	32.3	32.4	17.3	0.0	34.9	24.3	27.2	14.3	24.9	0.0	27.8
Incr Delay (d2), s/veh	0.0	0.7	0.8	0.5	0.0	2.4	0.0	0.2	0.4	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	3.5	3.6	6.3	0.0	9.2	0.5	1.3	5.4	2.0	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	33.1	33.2	17.8	0.0	37.2	24.4	27.4	14.7	25.1	0.0	27.9
LnGrp LOS	B	C	C	B	A	D	C	C	B	C	A	C
Approach Vol, veh/h		174			653			467			133	
Approach Delay, s/veh		32.7			24.2			16.0			26.6	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	44.0	30.0	38.0	8.0	44.0	30.0	38.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	28.0	26.0	34.0	16.0	28.0	26.0	34.0
Max Q Clear Time (g_c+I1), s	4.6	11.5	2.1	13.3	2.7	5.3	10.7	6.4
Green Ext Time (p_c), s	0.1	1.7	0.0	1.1	0.0	0.3	1.4	0.9

Intersection Summary		
HCM 6th Ctrl Delay	22.8	
HCM 6th LOS	C	

7: I-17 SB On-Ramp & McConnell Dr

HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	372	388	47	304	0	0
Future Volume (Veh/h)	372	388	47	304	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.80	0.90	0.80	0.80
Hourly flow rate (vph)	413	431	59	338	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	334					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			844		1084	628
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			778		1042	540
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		100	100
cM capacity (veh/h)			762		213	492

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	844	59	338
Volume Left	0	59	0
Volume Right	431	0	0
cSH	1700	762	1700
Volume to Capacity	0.50	0.08	0.20
Queue Length 95th (ft)	0	6	0
Control Delay (s)	0.0	10.1	0.0
Lane LOS		B	
Approach Delay (s)	0.0	1.5	
Approach LOS			

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	Err%	ICU Level of Service	H	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	1	567	339	1
Future Vol, veh/h	2	2	1	567	339	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	125	0	180	-	-	115
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	2	1	616	368	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	678	184	369	0	-	0
Stage 1	368	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	386	827	1186	-	-	-
Stage 1	670	-	-	-	-	-
Stage 2	717	-	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	386	827	1186	-	-	-
Mov Cap-2 Maneuver	386	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	717	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1186	-	386	827	-	-
HCM Lane V/C Ratio	0.001	-	0.006	0.003	-	-
HCM Control Delay (s)	8	-	14.4	9.4	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	526	239	0	833
Demand Flow Rate, veh/h	536	244	0	850
Vehicles Circulating, veh/h	250	0	627	244
Vehicles Exiting, veh/h	844	627	159	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.4	3.5	0.0	18.8
Approach LOS	A	A	-	C

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	R	L	TR	R	LTR
Assumed Moves	LT	R	L	TR	R	LTR
RT Channelized						
Lane Util	0.787	0.213	0.184	0.816	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.544	4.544	4.976	4.976
Entry Flow, veh/h	422	114	45	199	0	850
Cap Entry Lane, veh/h	1131	1131	1420	1420	728	1076
Entry HV Adj Factor	0.980	0.982	0.978	0.980	1.000	0.980
Flow Entry, veh/h	414	112	44	195	0	833
Cap Entry, veh/h	1109	1111	1389	1392	728	1054
V/C Ratio	0.373	0.101	0.032	0.140	0.000	0.790
Control Delay, s/veh	7.0	4.1	2.8	3.7	4.9	18.8
LOS	A	A	A	A	A	C
95th %tile Queue, veh	2	0	0	0	0	9

Intersection						
Intersection Delay, s/veh	5.9					
Intersection LOS	A					

Approach	EB	WB	NB	SB
Entry Lanes	2	1	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	619	316	148	0
Demand Flow Rate, veh/h	631	322	151	0
Vehicles Circulating, veh/h	0	462	631	241
Vehicles Exiting, veh/h	241	320	0	543
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.5	8.6	5.6	0.0
Approach LOS	A	A	A	-

Lane	Left	Right	Left	Left	Right	Left
Designated Moves	L	TR	TR	LT	R	R
Assumed Moves	L	TR	TR	LT	R	R
RT Channelized						
Lane Util	0.577	0.423	1.000	0.649	0.351	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.535	2.535	2.609
Critical Headway, s	4.544	4.544	4.976	4.544	4.544	4.976
Entry Flow, veh/h	364	267	322	98	53	0
Cap Entry Lane, veh/h	1420	1420	861	800	800	1079
Entry HV Adj Factor	0.981	0.980	0.982	0.979	0.981	1.000
Flow Entry, veh/h	357	262	316	96	52	0
Cap Entry, veh/h	1393	1392	846	783	785	1079
V/C Ratio	0.256	0.188	0.374	0.123	0.066	0.000
Control Delay, s/veh	4.8	4.1	8.6	5.9	5.2	3.3
LOS	A	A	A	A	A	A
95th %tile Queue, veh	1	1	2	0	0	0

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	2	3	229	512	11
Future Vol, veh/h	31	2	3	229	512	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	155	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	2	3	254	569	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	708	291	581	0	-	0
Stage 1	575	-	-	-	-	-
Stage 2	133	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	369	706	989	-	-	-
Stage 1	526	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	368	706	989	-	-	-
Mov Cap-2 Maneuver	368	-	-	-	-	-
Stage 1	524	-	-	-	-	-
Stage 2	879	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.5	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	989	-	379	-	-
HCM Lane V/C Ratio	0.003	-	0.097	-	-
HCM Control Delay (s)	8.7	-	15.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	Max	C-Max	Max
Maximum Split (s)	38	22	38
Maximum Split (%)	63.3%	36.7%	63.3%
Minimum Split (s)	11	10.2	13.7
Yellow Time (s)	4.5	3	4.2
All-Red Time (s)	1.5	2.2	1.5
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			4
Flash Dont Walk (s)			4
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	24	2	24
End Time (s)	2	24	2
Yield/Force Off (s)	56	18.8	56.3
Yield/Force Off 170(s)	56	18.8	52.3
Local Start Time (s)	22	0	22
Local Yield (s)	54	16.8	54.3
Local Yield 170(s)	54	16.8	50.3

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 2 (3%), Referenced to phase 4:EBL, Start of Green	

Splits and Phases: 533: Beulah Blvd. & Healthcare Blvd

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	35	94	164	337	173
Future Volume (veh/h)	65	35	94	164	337	173
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	72	18	104	182	374	109
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	793	705	560	1913	1913	822
Arrive On Green	0.44	0.44	0.54	0.54	0.54	0.54
Sat Flow, veh/h	1781	1585	910	3647	3647	1527
Grp Volume(v), veh/h	72	18	104	182	374	109
Grp Sat Flow(s),veh/h/ln	1781	1585	910	1777	1777	1527
Q Serve(g_s), s	1.4	0.4	4.0	1.5	3.3	2.1
Cycle Q Clear(g_c), s	1.4	0.4	7.3	1.5	3.3	2.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	793	705	560	1913	1913	822
V/C Ratio(X)	0.09	0.03	0.19	0.10	0.20	0.13
Avail Cap(c_a), veh/h	793	705	560	1913	1913	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	9.3	9.0	6.7	7.1	6.9
Incr Delay (d2), s/veh	0.2	0.1	0.7	0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	0.2	1.4	0.9	1.9	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.9	9.4	9.7	6.8	7.4	7.2
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	90			286	483	
Approach Delay, s/veh	9.8			7.9	7.3	
Approach LOS	A			A	A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	38.3	32.2	38.3
Change Period (Y+Rc), s	6.0	* 5.2	* 6
Max Green Setting (Gmax), s	32.0	* 17	* 32
Max Q Clear Time (g_c+I1), s	9.3	3.4	5.3
Green Ext Time (p_c), s	1.7	0.2	3.0

Intersection Summary		
HCM 6th Ctrl Delay	7.8	
HCM 6th LOS	A	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	53	140	219	268	104
Future Vol, veh/h	39	53	140	219	268	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	155
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	59	156	243	298	116

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	732	149	414	0	-	0
Stage 1	298	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	498	*1016	1238	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	709	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	436	*1016	1238	-	-	-
Mov Cap-2 Maneuver	528	-	-	-	-	-
Stage 1	732	-	-	-	-	-
Stage 2	709	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	3.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1238	-	528	1016	-	-
HCM Lane V/C Ratio	0.126	-	0.082	0.058	-	-
HCM Control Delay (s)	8.3	-	12.4	8.8	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.4	-	0.3	0.2	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	Min	C-Max	Min
Maximum Split (s)	34	26	34
Maximum Split (%)	56.7%	43.3%	56.7%
Minimum Split (s)	11	10.2	13.8
Yellow Time (s)	4.5	3	4.3
All-Red Time (s)	1.5	2.2	1.5
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			4
Flash Dont Walk (s)			4
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	26	0	26
End Time (s)	0	26	0
Yield/Force Off (s)	54	20.8	54.2
Yield/Force Off 170(s)	54	20.8	54.2
Local Start Time (s)	26	0	26
Local Yield (s)	54	20.8	54.2
Local Yield 170(s)	54	20.8	54.2

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 0 (0%), Referenced to phase 4:EBL, Start of Green	

Splits and Phases: 535: Beulah Blvd. & Purple Sage Blvd

535: Beulah Blvd. & Purple Sage Blvd

HCM 6th Signalized Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	88	234	333	252	69
Future Volume (veh/h)	26	88	234	333	252	69
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	58	260	370	280	-20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	834	742	425	1227	1227	547
Arrive On Green	0.47	0.47	0.69	0.69	0.11	0.00
Sat Flow, veh/h	1781	1585	1114	3647	3647	1585
Grp Volume(v), veh/h	29	58	260	370	280	-20
Grp Sat Flow(s),veh/h/ln	1781	1585	1114	1777	1777	1585
Q Serve(g_s), s	0.5	1.2	11.9	2.4	4.3	0.0
Cycle Q Clear(g_c), s	0.5	1.2	16.2	2.4	4.3	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	834	742	425	1227	1227	547
V/C Ratio(X)	0.03	0.08	0.61	0.30	0.23	-0.04
Avail Cap(c_a), veh/h	834	742	560	1658	1670	745
HCM Platoon Ratio	1.00	1.00	2.00	2.00	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.6	8.8	10.4	6.4	19.3	0.0
Incr Delay (d2), s/veh	0.1	0.2	1.4	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.7	2.6	1.4	3.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.7	9.0	11.8	6.6	19.4	0.0
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	87			630	260	
Approach Delay, s/veh	8.9			8.8	20.9	
Approach LOS	A			A	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		26.7		33.3		26.7
Change Period (Y+Rc), s		6.0		* 5.2		* 6
Max Green Setting (Gmax), s		28.0		* 21		* 28
Max Q Clear Time (g_c+I1), s		18.2		3.2		6.3
Green Ext Time (p_c), s		2.5		0.2		1.7

Intersection Summary		
HCM 6th Ctrl Delay		12.0
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

538: Access F & Healthcare Blvd

HCM 6th TWSC

Intersection	
Int Delay, s/veh	8.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	267	0	0	100
Future Vol, veh/h	0	0	267	0	0	100
Conflicting Peds, #/hr	0	48	48	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	297	0	0	111

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	49	0	643	49
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	594	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1556	-	406	1009
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	514	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1494	-	312	969
Mov Cap-2 Maneuver	-	-	-	-	312	-
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	412	-

Approach	EB	WB	NB
HCM Control Delay, s	0	8	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	969	-	-	1494	-
HCM Lane V/C Ratio	-	0.115	-	-	0.199	-
HCM Control Delay (s)	0	9.2	-	-	8	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	0.4	-	-	0.7	-

539: Purple Sage Blvd & Grey Mint St

HCM 6th TWSC

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	57	151	152	57	0
Future Vol, veh/h	0	57	151	152	57	0
Conflicting Peds, #/hr	60	0	0	60	6	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	100	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	63	168	169	63	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	397	0	-	0	297	237
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1162	-	-	-	694	802
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1104	-	-	-	627	756
Mov Cap-2 Maneuver	-	-	-	-	659	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	906	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1104	-	-	-	659	-
HCM Lane V/C Ratio	-	-	-	-	0.096	-
HCM Control Delay (s)	0	-	-	-	11	0
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3	-

545: Purple Sage Blvd & Access M

HCM 6th TWSC

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	1	151	57	0
Future Vol, veh/h	0	1	1	151	57	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	90	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	1	168	63	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1021	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1021	1084
Mov Cap-2 Maneuver	-	-	-	-	932	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	932
HCM Lane V/C Ratio	-	-	-	-	0.068
HCM Control Delay (s)	0	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

1: Beulah Blvd. & Fairgrounds Rd./J.W. Powell Blvd.

HCM 6th Roundabout

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	62	619	377	844
Demand Flow Rate, veh/h	63	632	384	861
Vehicles Circulating, veh/h	1109	129	789	281
Vehicles Exiting, veh/h	32	1044	383	480
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.3	8.9	18.3	11.7
Approach LOS	B	A	C	B

Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	L	TR
Assumed Moves	LTR	LTR	LTR	L	TR
RT Channelized					
Lane Util	1.000	1.000	1.000	0.850	0.150
Follow-Up Headway, s	2.609	2.609	2.609	2.535	2.535
Critical Headway, s	4.976	4.976	4.976	4.544	4.544
Entry Flow, veh/h	63	632	384	732	129
Cap Entry Lane, veh/h	445	1210	617	1100	1100
Entry HV Adj Factor	0.986	0.980	0.981	0.981	0.981
Flow Entry, veh/h	62	619	377	718	126
Cap Entry, veh/h	439	1186	605	1079	1078
V/C Ratio	0.141	0.522	0.622	0.666	0.117
Control Delay, s/veh	10.3	8.9	18.3	13.0	4.4
LOS	B	A	C	B	A
95th %tile Queue, veh	0	3	4	5	0

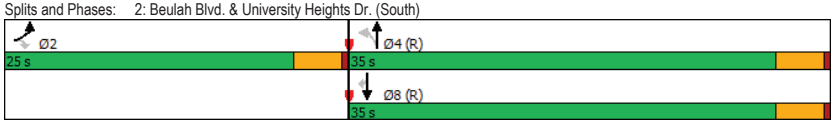
2: Beulah Blvd. & University Heights Dr. (South)

Timing Report, Sorted By Phase

Phase Number	2	4	8
Movement	EBL	NBTL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	None	C-Max	C-Max
Maximum Split (s)	25	35	35
Maximum Split (%)	41.7%	58.3%	58.3%
Minimum Split (s)	20	20	20
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5
Minimum Initial (s)	4	4	4
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	5	5	5
Flash Dont Walk (s)	11	11	11
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	35	0	0
End Time (s)	0	35	35
Yield/Force Off (s)	56	31	31
Yield/Force Off 170(s)	45	20	20
Local Start Time (s)	35	0	0
Local Yield (s)	56	31	31
Local Yield 170(s)	45	20	20

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBT, Start of Green	

Splits and Phases: 2: Beulah Blvd. & University Heights Dr. (South)



2: Beulah Blvd. & University Heights Dr. (South)

HCM 6th Signalized Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	122	21	46	532	422	1
Future Volume (veh/h)	122	21	46	532	422	1
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	136	17	51	591	469	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	185	165	789	2710	2710	1176
Arrive On Green	0.10	0.10	0.76	0.76	0.76	0.76
Sat Flow, veh/h	1781	1585	921	3647	3647	1542
Grp Volume(v), veh/h	136	17	51	591	469	1
Grp Sat Flow(s),veh/h/ln	1781	1585	921	1777	1777	1542
Q Serve(g_s), s	4.4	0.6	1.0	2.8	2.2	0.0
Cycle Q Clear(g_c), s	4.4	0.6	3.1	2.8	2.2	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	185	165	789	2710	2710	1176
V/C Ratio(X)	0.73	0.10	0.06	0.22	0.17	0.00
Avail Cap(c_a), veh/h	623	555	789	2710	2710	1176
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	24.3	2.4	2.0	1.9	1.7
Incr Delay (d2), s/veh	5.5	0.3	0.2	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.7	0.4	0.2	0.8	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.6	24.6	2.5	2.2	2.1	1.7
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	153			642	470	
Approach Delay, s/veh	30.8			2.2	2.1	
Approach LOS	C			A	A	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	10.2	49.8	49.8
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	21.0	31.0	31.0
Max Q Clear Time (g_c+I1), s	6.4	5.1	4.2
Green Ext Time (p_c), s	0.3	4.6	3.3

Intersection Summary	
HCM 6th Ctrl Delay	5.6
HCM 6th LOS	A

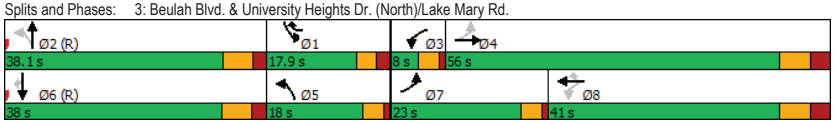
3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize								
Recall Mode	Min	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	17.9	38.1	8	56	18	38	23	41
Maximum Split (%)	14.9%	31.8%	6.7%	46.7%	15.0%	31.7%	19.2%	34.2%
Minimum Split (s)	10	38.1	8	39.1	10	34.9	20	40.1
Yellow Time (s)	3	4.4	3	4.4	3	4.4	3	4.4
All-Red Time (s)	2	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	10	4	5	5	10	15	5
Vehicle Extension (s)	2	2	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	3	1.5	3	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		27.6		27.6		23.6		28.6
Dual Entry	No	No	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	38.1	0	56	64	38	0	56	79
End Time (s)	56	38.1	64	0	56	38	79	0
Yield/Force Off (s)	51	31.6	60	112.5	52	31.5	75	112.5
Yield/Force Off 170(s)	51	4	60	84.9	52	7.9	75	83.9
Local Start Time (s)	38.1	0	56	64	38	0	56	79
Local Yield (s)	51	31.6	60	112.5	52	31.5	75	112.5
Local Yield 170(s)	51	4	60	84.9	52	7.9	75	83.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.



3: Beulah Blvd. & University Heights Dr. (North)/Lake Mary Rd.

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	19	14	111	33	568	23	503	97	779	254	277
Future Volume (veh/h)	144	19	14	111	33	568	23	503	97	779	254	277
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.98		0.98	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	21	13	123	37	473	26	559	81	866	282	231
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	369	243	150	276	258	662	724	881	127	1052	528	414
Arrive On Green	0.12	0.23	0.21	0.03	0.14	0.12	0.31	0.28	0.26	0.30	0.28	0.26
Sat Flow, veh/h	1781	1061	657	1781	1870	1547	1781	3108	449	3456	1870	1576
Grp Volume(v), veh/h	160	0	34	123	37	473	26	319	321	866	282	231
Grp Sat Flow(s),veh/h/ln	1781	0	1718	1781	1870	1547	1781	1777	1780	1728	1870	1576
Q Serve(g_s), s	8.8	0.0	1.9	4.0	2.1	8.3	0.0	18.8	19.0	27.9	15.3	10.8
Cycle Q Clear(g_c), s	8.8	0.0	1.9	4.0	2.1	8.3	0.0	18.8	19.0	27.9	15.3	10.8
Prop In Lane	1.00		0.38	1.00		1.00	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	369	0	393	276	258	662	724	503	504	1052	528	414
V/C Ratio(X)	0.43	0.00	0.09	0.44	0.14	0.71	0.04	0.63	0.64	0.82	0.53	0.56
Avail Cap(c_a), veh/h	430	0	732	276	563	914	724	503	504	1052	528	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	0.0	36.8	46.9	45.5	10.8	19.4	37.6	37.9	38.7	36.4	19.4
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.1	0.8	0.0	6.0	6.0	5.0	3.8	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.8	0.0	1.4	6.0	1.7	8.5	0.7	13.6	13.8	18.3	12.0	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	0.0	36.8	47.3	45.6	11.5	19.4	43.5	43.9	43.8	40.2	24.8
LnGrp LOS	D	A	D	D	D	B	B	D	D	D	D	C
Approach Vol, veh/h		194			633			666			1379	
Approach Delay, s/veh		36.8			20.5			42.8			39.9	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	41.5	38.1	8.0	32.4	41.6	38.0	18.9	21.4
Change Period (Y+Rc), s	5.0	6.5	4.0	7.5	5.0	* 6.5	4.0	7.5
Max Green Setting (Gmax), s	12.9	31.6	4.0	48.5	14.0	* 32	19.0	33.5
Max Q Clear Time (g_c+I1), s	29.9	21.0	6.0	3.9	2.0	17.3	10.8	10.3
Green Ext Time (p_c), s	0.0	1.1	0.0	0.0	0.0	0.8	0.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	36.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

4: Beulah Blvd & Woodlands Village Blvd

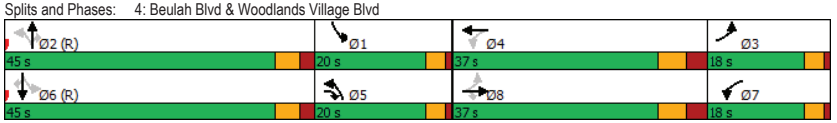
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes			Yes	Yes
Recall Mode	None	C-Min	None	None	Min	C-Min	None	None
Maximum Split (s)	20	45	18	37	20	45	18	37
Maximum Split (%)	16.7%	37.5%	15.0%	30.8%	16.7%	37.5%	15.0%	30.8%
Minimum Split (s)	9	21.1	9	31.1	9	27.1	9	33.1
Yellow Time (s)	3	3.6	3	4	3	3.6	3	4
All-Red Time (s)	1	2.1	1	3.1	1	2.1	1	3.1
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	1.5	3	3	1	1.5	3	3
Minimum Gap (s)	3	1.5	3	3	1	1.5	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		11.4		20		17.4		22
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	59	14	116	79	59	14	116	79
End Time (s)	79	59	14	116	79	59	14	116
Yield/Force Off (s)	75	53.3	10	108.9	75	53.3	10	108.9
Yield/Force Off 170(s)	75	41.9	10	88.9	75	35.9	10	86.9
Local Start Time (s)	45	0	102	65	45	0	102	65
Local Yield (s)	61	39.3	116	94.9	61	39.3	116	94.9
Local Yield 170(s)	61	27.9	116	74.9	61	21.9	116	72.9

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80

Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Splits and Phases: 4: Beulah Blvd & Woodlands Village Blvd



4: Beulah Blvd & Woodlands Village Blvd

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	4	634	3	3	12	491	695	2	8	645	130
Future Volume (veh/h)	177	4	634	3	3	12	491	695	2	8	645	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.94	0.99		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	197	0	531	3	3	10	546	772	2	9	717	108
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	0	1893	192	28	93	1875	893	369	908	812	354
Arrive On Green	0.05	0.00	0.09	0.04	0.08	0.08	0.50	0.25	0.24	0.95	0.46	0.46
Sat Flow, veh/h	1781	0	2976	1781	371	1235	3456	3554	1565	1781	3554	1550
Grp Volume(v), veh/h	197	0	531	3	0	13	546	772	2	9	717	108
Grp Sat Flow(s),veh/h/ln	1781	0	1488	1781	0	1606	1728	1777	1565	1781	1777	1550
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.9	4.8	24.9	0.1	0.0	22.0	5.3
Cycle Q Clear(g_c), s	1.2	0.0	0.0	0.0	0.0	0.9	4.8	24.9	0.1	0.0	22.0	5.3
Prop In Lane	1.00		1.00	1.00		0.77	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	0	1893	192	0	121	1875	893	369	908	812	354
V/C Ratio(X)	0.73	0.00	0.28	0.02	0.00	0.11	0.29	0.86	0.01	0.01	0.88	0.30
Avail Cap(c_a), veh/h	403	0	2400	333	0	400	1875	1220	512	908	1220	532
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.86	0.86	0.86
Uniform Delay (d), s/veh	50.9	0.0	11.4	47.3	0.0	51.7	15.6	43.0	35.1	1.6	31.1	26.6
Incr Delay (d2), s/veh	3.8	0.0	0.1	0.0	0.0	0.4	0.0	10.9	0.0	0.0	11.8	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.8	0.0	5.7	0.1	0.0	0.7	7.1	17.8	0.1	0.0	12.9	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	0.0	11.5	47.4	0.0	52.1	15.6	53.8	35.1	1.6	42.9	28.5
LnGrp LOS	D	A	B	D	A	D	B	D	D	A	D	C
Approach Vol, veh/h		728			16			1320			834	
Approach Delay, s/veh		23.2			51.2			38.0			40.6	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	60.9	34.0	9.0	16.1	63.7	31.2	8.6	16.6
Change Period (Y+Rc), s	4.0	5.7	4.0	7.1	4.0	5.7	4.0	7.1
Max Green Setting (Gmax), s	16.0	39.3	14.0	29.9	16.0	39.3	14.0	29.9
Max Q Clear Time (g_c+I1), s	2.0	26.9	3.2	2.9	6.8	24.0	2.0	2.0
Green Ext Time (p_c), s	0.0	1.3	0.5	0.0	0.6	1.5	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	35.1
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

5: Beulah Blvd & McConnell Dr

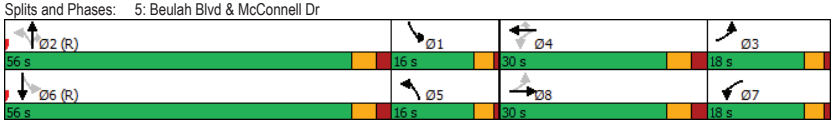
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	Min	None	C-Max	None	Min
Maximum Split (s)	16	56	18	30	16	56	18	30
Maximum Split (%)	13.3%	46.7%	15.0%	25.0%	13.3%	46.7%	15.0%	25.0%
Minimum Split (s)	9	25.7	9	24.4	9	25.7	9	29.4
Yellow Time (s)	3	3.6	3	3.6	3	3.6	3	3.6
All-Red Time (s)	1	2.1	1	2.4	1	2.1	1	2.4
Minimum Initial (s)	5	15	5	5	5	15	5	5
Vehicle Extension (s)	3	2	3	2	3	2	3	2
Minimum Gap (s)	3	2	3	2	3	2	3	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		4		4		4		4
Flash Dont Walk (s)		15.4		14.4		15.4		19.4
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	65	9	111	81	65	9	111	81
End Time (s)	81	65	9	111	81	65	9	111
Yield/Force Off (s)	77	59.3	5	105	77	59.3	5	105
Yield/Force Off 170(s)	77	43.9	5	105	77	43.9	5	105
Local Start Time (s)	56	0	102	72	56	0	102	72
Local Yield (s)	68	50.3	116	96	68	50.3	116	96
Local Yield 170(s)	68	34.9	116	96	68	34.9	116	96

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75

Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 5: Beulah Blvd & McConnell Dr



5: Beulah Blvd & McConnell Dr

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	234	13	384	259	131	34	525	324	59	580	97
Future Volume (veh/h)	82	234	13	384	259	131	34	525	324	59	580	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	0.99		0.98	1.00		0.95	0.99		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	91	260	12	427	288	110	38	583	270	66	644	81
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	341	16	574	357	297	597	1537	651	645	1365	171
Arrive On Green	0.10	0.19	0.17	0.10	0.19	0.19	0.37	0.87	0.87	0.18	0.43	0.42
Sat Flow, veh/h	1781	1771	82	3456	1870	1558	1781	3554	1505	1781	3156	396
Grp Volume(v), veh/h	91	0	272	427	288	110	38	583	270	66	362	363
Grp Sat Flow(s),veh/h/ln	1781	0	1852	1728	1870	1558	1781	1777	1505	1781	1777	1776
Q Serve(g_s), s	0.0	0.0	16.7	6.1	17.7	7.4	0.0	4.0	4.5	0.0	17.4	17.6
Cycle Q Clear(g_c), s	0.0	0.0	16.7	6.1	17.7	7.4	0.0	4.0	4.5	0.0	17.4	17.6
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	284	0	357	574	357	297	597	1537	651	645	768	768
V/C Ratio(X)	0.32	0.00	0.76	0.74	0.81	0.37	0.06	0.38	0.41	0.10	0.47	0.47
Avail Cap(c_a), veh/h	352	0	414	714	418	348	597	1537	651	645	768	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.94	0.94	0.94	0.64	0.64	0.64
Uniform Delay (d), s/veh	47.2	0.0	45.9	49.0	46.4	42.3	13.6	4.9	4.9	11.6	24.3	24.4
Incr Delay (d2), s/veh	0.6	0.0	5.7	3.3	8.3	0.3	0.0	0.7	1.8	0.0	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.5	0.0	12.8	10.4	13.9	5.1	0.8	2.3	2.5	1.4	11.0	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.8	0.0	51.5	52.2	54.7	42.6	13.6	5.5	6.7	11.6	25.6	25.8
LnGrp LOS	D	A	D	D	D	D	B	A	A	B	C	C
Approach Vol, veh/h		363			825			891			791	
Approach Delay, s/veh		50.6			51.8			6.2			24.5	
Approach LOS		D			D			A			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.5	56.0	13.4	26.1	24.5	56.0	13.1	26.3
Change Period (Y+Rc), s	4.0	5.7	4.0	6.0	4.0	5.7	4.0	6.0
Max Green Setting (Gmax), s	12.0	50.3	14.0	24.0	12.0	50.3	14.0	24.0
Max Q Clear Time (g_c+I1), s	2.0	6.5	2.0	19.7	2.0	19.6	8.1	18.7
Green Ext Time (p_c), s	0.1	2.4	0.2	0.4	0.0	1.6	1.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	30.0
HCM 6th LOS	C

6: Beulah Blvd & Forest Meadows St

Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes						
Recall Mode	None	C-Min	Max	Max	Min	Min	Max	Max
Maximum Split (s)	20	20	42	38	19	21	50	30
Maximum Split (%)	16.7%	16.7%	35.0%	31.7%	15.8%	17.5%	41.7%	25.0%
Minimum Split (s)	8	20	8	20	8	20	24	20
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum Initial (s)	4	4	4	4	4	4	20	4
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		11		11		11		11
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	102	2	22	64	102	1	22	72
End Time (s)	2	22	64	102	1	22	72	102
Yield/Force Off (s)	118	18	60	98	117	18	68	98
Yield/Force Off 170(s)	118	7	60	87	117	18	68	87
Local Start Time (s)	100	0	20	62	100	119	20	70
Local Yield (s)	116	16	58	96	115	16	66	96
Local Yield 170(s)	116	5	58	85	115	16	66	85

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 2 (2%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 6: Beulah Blvd & Forest Meadows St

6: Beulah Blvd & Forest Meadows St

HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	139	76	909	117	12	43	78	697	14	43	15
Future Volume (veh/h)	18	139	76	909	117	12	43	78	697	14	43	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	151	62	988	127	10	47	85	569	15	47	13
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	895	540	212	1816	485	38	398	474	1777	379	324	90
Arrive On Green	0.32	0.22	0.22	0.38	0.28	0.28	0.06	0.42	0.42	0.01	0.23	0.23
Sat Flow, veh/h	1781	2490	980	3456	1711	135	1781	1870	2790	1781	1410	390
Grp Volume(v), veh/h	20	106	107	988	0	137	47	85	569	15	0	60
Grp Sat Flow(s),veh/h/ln	1781	1777	1694	1728	0	1846	1781	1870	1395	1781	0	1800
Q Serve(g_s), s	0.6	6.0	6.3	18.4	0.0	6.9	2.3	3.4	10.4	0.8	0.0	3.2
Cycle Q Clear(g_c), s	0.6	6.0	6.3	18.4	0.0	6.9	2.3	3.4	10.4	0.8	0.0	3.2
Prop In Lane	1.00		0.58	1.00		0.07	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	895	385	367	1816	0	523	398	474	1777	379	0	414
V/C Ratio(X)	0.02	0.28	0.29	0.54	0.00	0.26	0.12	0.18	0.32	0.04	0.00	0.14
Avail Cap(c_a), veh/h	895	385	367	1816	0	523	556	474	1777	593	0	414
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.96	0.96	0.96	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.2	39.1	39.3	12.9	0.0	33.3	31.8	26.8	7.6	34.7	0.0	36.8
Incr Delay (d2), s/veh	0.0	1.8	2.0	1.2	0.0	1.2	0.1	0.8	0.5	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	5.0	5.1	11.3	0.0	5.8	1.8	2.9	4.4	0.6	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.3	40.9	41.3	14.0	0.0	34.5	31.9	27.6	8.0	34.7	0.0	37.0
LnGrp LOS	B	D	D	B	A	C	C	C	A	C	A	D
Approach Vol, veh/h		233			1125			701			75	
Approach Delay, s/veh		38.7			16.5			12.0			36.5	
Approach LOS		D			B			B			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	34.4	42.0	38.0	8.4	31.6	50.0	30.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	16.0	38.0	34.0	15.0	17.0	46.0	26.0
Max Q Clear Time (g_c+I1), s	2.8	12.4	2.6	8.9	4.3	5.2	20.4	8.3
Green Ext Time (p_c), s	0.0	1.1	0.0	0.7	0.0	0.1	4.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	18.2
HCM 6th LOS	B

7: I-17 SB On-Ramp & McConnell Dr

HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	319	298	186	774	0	0
Future Volume (Veh/h)	319	298	186	774	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.85	0.85	0.90	0.80	0.80
Hourly flow rate (vph)	354	351	219	860	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	334					
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			705		1828	530
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			577		1880	373
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			74		100	100
cM capacity (veh/h)			858		50	580

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	705	219	860
Volume Left	0	219	0
Volume Right	351	0	0
cSH	1700	858	1700
Volume to Capacity	0.41	0.26	0.51
Queue Length 95th (ft)	0	25	0
Control Delay (s)	0.0	10.6	0.0
Lane LOS		B	
Approach Delay (s)	0.0	2.2	
Approach LOS			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

9: Beulah Blvd. & Fort Tuthill Loop

HCM 6th TWSC

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	5	2	417	752	1
Future Vol, veh/h	9	5	2	417	752	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	125	0	180	-	-	115
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	5	2	453	817	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1048	409	818	0	-	0
Stage 1	817	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	223	592	806	-	-	-
Stage 1	395	-	-	-	-	-
Stage 2	785	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	223	592	806	-	-	-
Mov Cap-2 Maneuver	223	-	-	-	-	-
Stage 1	394	-	-	-	-	-
Stage 2	785	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	806	-	223	592	-	-
HCM Lane V/C Ratio	0.003	-	0.044	0.009	-	-
HCM Control Delay (s)	9.5	-	21.9	11.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

10: J.W. Powell Blvd. & I-17SB Ramp

HCM 6th Roundabout

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1035	190	0	693
Demand Flow Rate, veh/h	1056	194	0	707
Vehicles Circulating, veh/h	261	0	1069	194
Vehicles Exiting, veh/h	640	1069	248	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	14.7	3.2	0.0	11.6
Approach LOS	B	A	-	B

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	R	L	TR	R	LTR
Assumed Moves	LT	R	L	TR	R	LTR
RT Channelized						
Lane Util	0.813	0.187	0.263	0.737	1.000	1.000
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.609	2.609
Critical Headway, s	4.544	4.544	4.544	4.544	4.976	4.976
Entry Flow, veh/h	859	197	51	143	0	707
Cap Entry Lane, veh/h	1120	1120	1420	1420	464	1132
Entry HV Adj Factor	0.980	0.980	0.980	0.980	1.000	0.980
Flow Entry, veh/h	842	193	50	140	0	693
Cap Entry, veh/h	1098	1097	1392	1392	464	1110
V/C Ratio	0.767	0.176	0.036	0.101	0.000	0.624
Control Delay, s/veh	17.0	4.9	2.9	3.4	7.8	11.6
LOS	C	A	A	A	A	B
95th %tile Queue, veh	8	1	0	0	0	5

11: I-17 NB Ramp & J.W. Powell Blvd.

HCM 6th Roundabout

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	1	2	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1055	353	104	0
Demand Flow Rate, veh/h	1076	361	106	0
Vehicles Circulating, veh/h	0	825	1076	196
Vehicles Exiting, veh/h	196	357	0	989
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.0	18.3	8.3	0.0
Approach LOS	A	C	A	-

Lane	Left	Right	Left	Left	Right	Left
Designated Moves	L	TR	TR	LT	R	R
Assumed Moves	L	TR	TR	LT	R	R
RT Channelized						
Lane Util	0.702	0.298	1.000	0.660	0.340	1.000
Follow-Up Headway, s	2.535	2.535	2.609	2.535	2.535	2.609
Critical Headway, s	4.544	4.544	4.976	4.544	4.544	4.976
Entry Flow, veh/h	755	321	361	70	36	0
Cap Entry Lane, veh/h	1420	1420	595	533	533	1130
Entry HV Adj Factor	0.980	0.980	0.979	0.984	0.972	1.000
Flow Entry, veh/h	740	315	353	69	35	0
Cap Entry, veh/h	1392	1392	582	525	519	1130
V/C Ratio	0.532	0.226	0.607	0.131	0.067	0.000
Control Delay, s/veh	8.1	4.5	18.3	8.5	7.8	3.2
LOS	A	A	C	A	A	A
95th %tile Queue, veh	3	1	4	0	0	0

12: Mountain Dell Rd. & Beulah Blvd.

HCM 6th TWSC

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	2	0	556	411	33
Future Vol, veh/h	21	2	0	556	411	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	155	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	2	0	618	457	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	785	247	494	0	-	0
Stage 1	476	-	-	-	-	-
Stage 2	309	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	330	753	1066	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	718	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	330	753	1066	-	-	-
Mov Cap-2 Maneuver	330	-	-	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	718	-	-	-	-	-

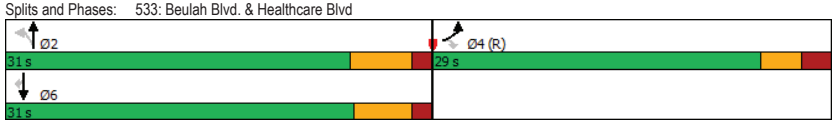
Approach	EB	NB	SB
HCM Control Delay, s	16.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1066	-	347	-	-
HCM Lane V/C Ratio	-	-	0.074	-	-
HCM Control Delay (s)	0	-	16.2	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	Max	C-Max	Max
Maximum Split (s)	31	29	31
Maximum Split (%)	51.7%	48.3%	51.7%
Minimum Split (s)	11	10.2	13.7
Yellow Time (s)	4.5	3	4.2
All-Red Time (s)	1.5	2.2	1.5
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			4
Flash Dont Walk (s)			4
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	1	32	1
End Time (s)	32	1	32
Yield/Force Off (s)	26	55.8	26.3
Yield/Force Off 170(s)	26	55.8	22.3
Local Start Time (s)	29	0	29
Local Yield (s)	54	23.8	54.3
Local Yield 170(s)	54	23.8	50.3

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 32 (53%), Referenced to phase 4:EBL, Start of Green	

Splits and Phases: 533: Beulah Blvd. & Healthcare Blvd



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	201	109	52	300	305	96
Future Volume (veh/h)	201	109	52	300	305	96
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	223	101	58	333	339	74
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1000	890	470	1498	1498	647
Arrive On Green	0.56	0.56	0.14	0.14	0.42	0.42
Sat Flow, veh/h	1781	1585	971	3647	3647	1535
Grp Volume(v), veh/h	223	101	58	333	339	74
Grp Sat Flow(s),veh/h/ln	1781	1585	971	1777	1777	1535
Q Serve(g_s), s	3.8	1.8	3.2	5.0	3.7	1.8
Cycle Q Clear(g_c), s	3.8	1.8	6.9	5.0	3.7	1.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1000	890	470	1498	1498	647
V/C Ratio(X)	0.22	0.11	0.12	0.22	0.23	0.11
Avail Cap(c_a), veh/h	1000	890	470	1498	1498	647
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.6	6.2	19.5	17.1	11.1	10.5
Incr Delay (d2), s/veh	0.5	0.3	0.5	0.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.3	1.0	1.5	3.6	2.4	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.1	6.4	20.1	17.4	11.4	10.9
LnGrp LOS	A	A	C	B	B	B
Approach Vol, veh/h	324			391	413	
Approach Delay, s/veh	6.9			17.8	11.3	
Approach LOS	A			B	B	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	31.3	39.2	31.3
Change Period (Y+Rc), s	6.0	* 5.2	* 6
Max Green Setting (Gmax), s	25.0	* 24	* 25
Max Q Clear Time (g_c+I1), s	8.9	5.8	5.7
Green Ext Time (p_c), s	2.2	0.9	2.3

Intersection Summary		
HCM 6th Ctrl Delay	12.3	
HCM 6th LOS	B	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	120	163	78	289	356	58
Future Vol, veh/h	120	163	78	289	356	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	90	-	-	155
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	181	87	321	396	64

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	731	198	460	0	-	0
Stage 1	396	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	585	*964	1276	-	-	-
Stage 1	836	-	-	-	-	-
Stage 2	800	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	546	*964	1276	-	-	-
Mov Cap-2 Maneuver	610	-	-	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	800	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	1.7	0
HCM LOS	B		

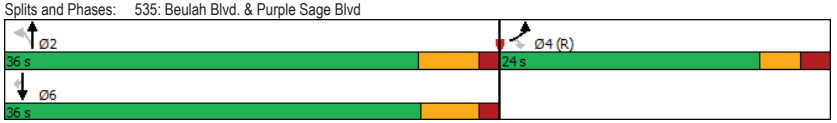
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1276	-	610	964	-	-
HCM Lane V/C Ratio	0.068	-	0.219	0.188	-	-
HCM Control Delay (s)	8	-	12.5	9.6	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.8	0.7	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	Min	C-Max	Min
Maximum Split (s)	36	24	36
Maximum Split (%)	60.0%	40.0%	60.0%
Minimum Split (s)	11	10.2	13.8
Yellow Time (s)	4.5	3	4.3
All-Red Time (s)	1.5	2.2	1.5
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			4
Flash Dont Walk (s)			4
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	0	36	0
End Time (s)	36	0	36
Yield/Force Off (s)	30	54.8	30.2
Yield/Force Off 170(s)	30	54.8	30.2
Local Start Time (s)	24	0	24
Local Yield (s)	54	18.8	54.2
Local Yield 170(s)	54	18.8	54.2

Intersection Summary	
Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40
Offset: 36 (60%), Referenced to phase 4:EBL, Start of Green	

Splits and Phases: 535: Beulah Blvd. & Purple Sage Blvd



535: Beulah Blvd. & Purple Sage Blvd

HCM 6th Signalized Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	272	130	287	481	39
Future Volume (veh/h)	80	272	130	287	481	39
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	241	144	319	534	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	792	705	320	1309	1309	565
Arrive On Green	0.44	0.44	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1781	1585	870	3647	3647	1533
Grp Volume(v), veh/h	89	241	144	319	534	1
Grp Sat Flow(s),veh/h/ln	1781	1585	870	1777	1777	1533
Q Serve(g_s), s	1.8	6.0	9.7	4.9	8.3	0.0
Cycle Q Clear(g_c), s	1.8	6.0	18.0	4.9	8.3	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	792	705	320	1309	1309	565
V/C Ratio(X)	0.11	0.34	0.45	0.24	0.41	0.00
Avail Cap(c_a), veh/h	792	705	434	1777	1789	772
HCM Platoon Ratio	1.00	1.00	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.7	10.9	28.6	18.8	20.3	16.7
Incr Delay (d2), s/veh	0.3	1.3	1.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	3.7	4.1	3.5	6.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.0	12.2	29.6	18.9	20.5	16.7
LnGrp LOS	B	B	C	B	C	B
Approach Vol, veh/h	330			463	535	
Approach Delay, s/veh	11.6			22.2	20.5	
Approach LOS	B			C	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		28.1		31.9		28.1
Change Period (Y+Rc), s		6.0		* 5.2		* 6
Max Green Setting (Gmax), s		30.0		* 19		* 30
Max Q Clear Time (g_c+I1), s		20.0		8.0		10.3
Green Ext Time (p_c), s		2.1		0.8		3.5

Intersection Summary		
HCM 6th Ctrl Delay		18.9
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

538: Access F & Healthcare Blvd

HCM 6th TWSC

Intersection	
Int Delay, s/veh	9.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	148	0	0	310
Future Vol, veh/h	0	0	148	0	0	310
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	164	0	0	344

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	329	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	328	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1620	-	640	1083
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	702	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1620	-	575	1083
Mov Cap-2 Maneuver	-	-	-	-	575	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.5	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	1083	-	-	1620	-
HCM Lane V/C Ratio	-	0.318	-	-	0.102	-
HCM Control Delay (s)	0	9.9	-	-	7.5	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	1.4	-	-	0.3	-

539: Purple Sage Blvd & Grey Mint St

HCM 6th TWSC

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	57	151	152	57	0
Future Vol, veh/h	0	57	151	152	57	0
Conflicting Peds, #/hr	60	0	0	60	6	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	100	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	63	168	169	63	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	397	0	-	0	297	237
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1162	-	-	-	694	802
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1104	-	-	-	627	756
Mov Cap-2 Maneuver	-	-	-	-	659	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	906	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1104	-	-	-	659	-
HCM Lane V/C Ratio	-	-	-	-	0.096	-
HCM Control Delay (s)	0	-	-	-	11	0
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3	-

545: Purple Sage Blvd & Access M

HCM 6th TWSC

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	1	84	176	0
Future Vol, veh/h	0	1	1	84	176	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	None
Storage Length	90	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	1	93	196	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1021	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1021	1084
Mov Cap-2 Maneuver	-	-	-	-	932	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-

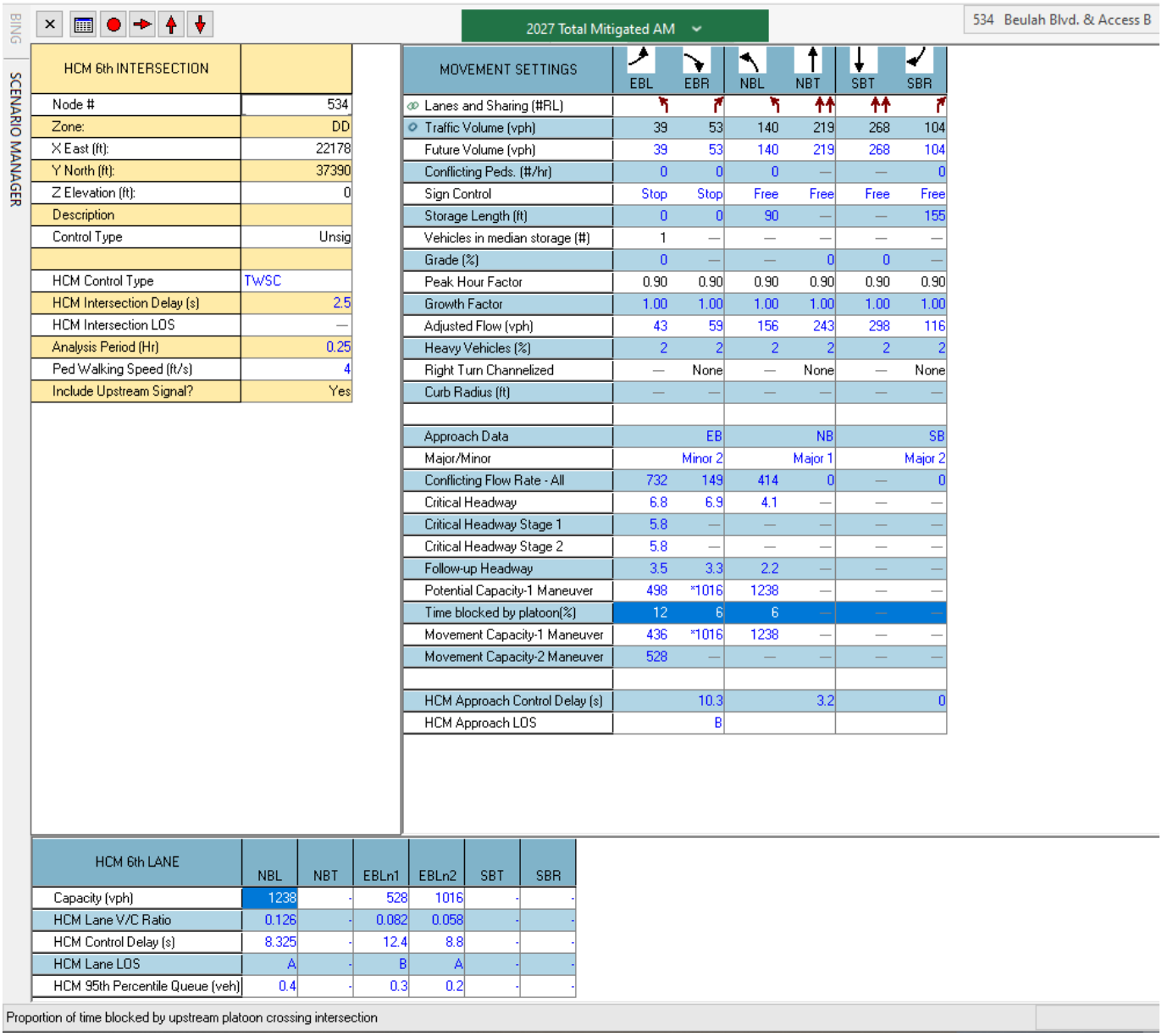
Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	932
HCM Lane V/C Ratio	-	-	-	-	0.21
HCM Control Delay (s)	0	-	-	-	9.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.8

APPENDIX I

PERCENTAGE OF TIME BLOCKED BY PLATOON

Appendix I – Total AM Peak Hour



BING

SCENARIO MANAGER

2027 Total Mitigated AM

534 Beulah Blvd. & Access B

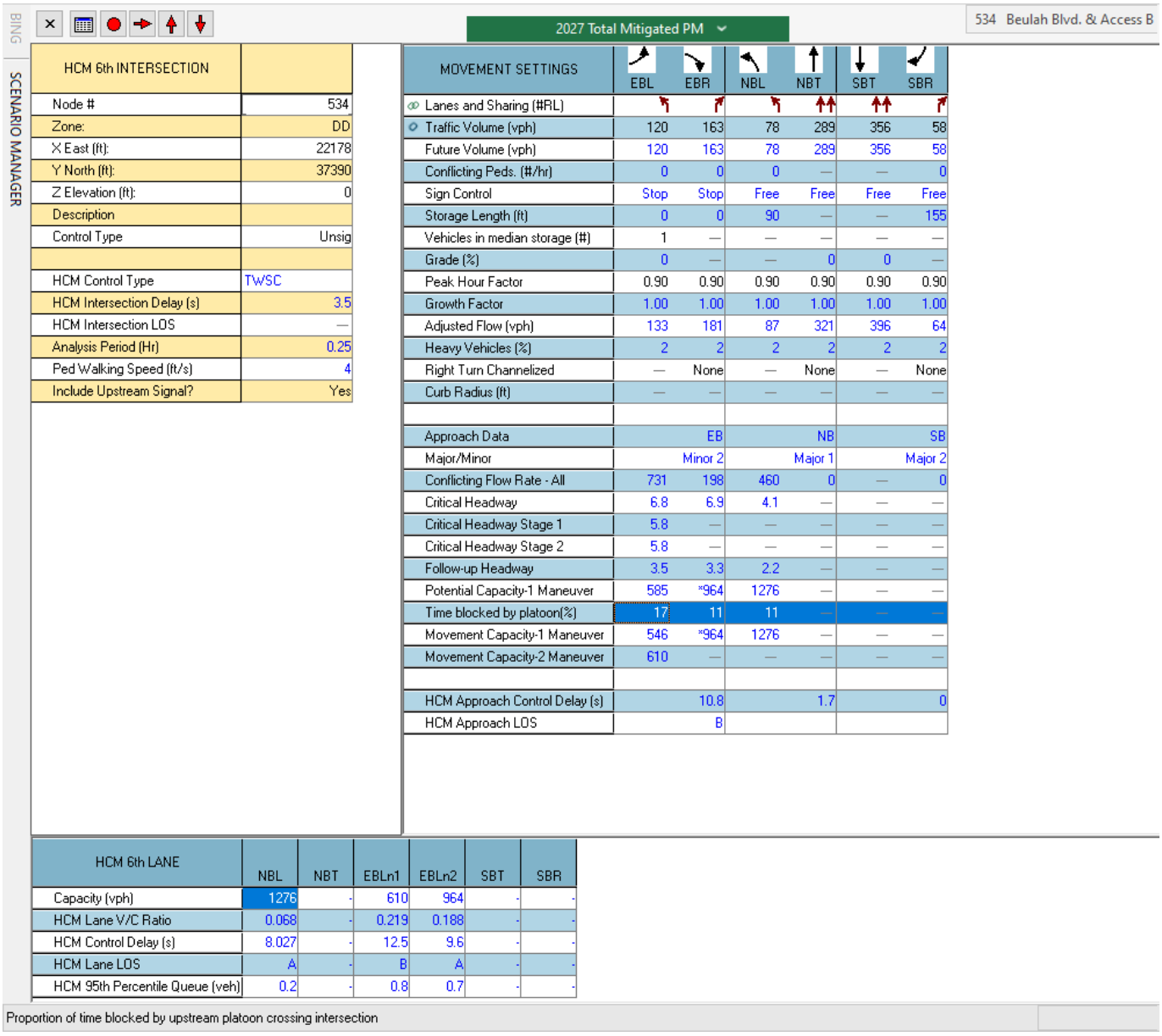
HCM 6th INTERSECTION	
Node #	534
Zone:	DD
X East (ft):	22178
Y North (ft):	37390
Z Elevation (ft):	0
Description	
Control Type	Unsig
HCM Control Type	TWSC
HCM Intersection Delay (s)	2.5
HCM Intersection LOS	—
Analysis Period (Hr)	0.25
Ped Walking Speed (ft/s)	4
Include Upstream Signal?	Yes

MOVEMENT SETTINGS	EBL	EBR	NBL	NBT	SBT	SBR
Lanes and Sharing (#RL)						
Traffic Volume (vph)	39	53	140	219	268	104
Future Volume (vph)	39	53	140	219	268	104
Conflicting Peds. (#/hr)	0	0	0	—	—	0
Sign Control	Stop	Stop	Free	Free	Free	Free
Storage Length (ft)	0	0	90	—	—	155
Vehicles in median storage (#)	1	—	—	—	—	—
Grade (%)	0	—	—	0	0	—
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adjusted Flow (vph)	43	59	156	243	298	116
Heavy Vehicles (%)	2	2	2	2	2	2
Right Turn Channelized	—	None	—	None	—	None
Curb Radius (ft)	—	—	—	—	—	—
Approach Data		EB		NB		SB
Major/Minor		Minor 2		Major 1		Major 2
Conflicting Flow Rate - All	732	149	414	0	—	0
Critical Headway	6.8	6.9	4.1	—	—	—
Critical Headway Stage 1	5.8	—	—	—	—	—
Critical Headway Stage 2	5.8	—	—	—	—	—
Follow-up Headway	3.5	3.3	2.2	—	—	—
Potential Capacity-1 Maneuver	498	*1016	1238	—	—	—
Time blocked by platoon(%)	12	6	6	—	—	—
Movement Capacity-1 Maneuver	436	*1016	1238	—	—	—
Movement Capacity-2 Maneuver	528	—	—	—	—	—
HCM Approach Control Delay (s)		10.3		3.2		0
HCM Approach LOS		B				

HCM 6th LANE	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (vph)	1238	-	528	1016	-	-
HCM Lane V/C Ratio	0.126	-	0.082	0.058	-	-
HCM Control Delay (s)	8.325	-	12.4	8.8	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th Percentile Queue (veh)	0.4	-	0.3	0.2	-	-

Proportion of time blocked by upstream platoon crossing intersection

Appendix I – Total PM Peak Hour



2027 Total Mitigated PM

534 Beulah Blvd. & Access B

HCM 6th INTERSECTION	
Node #	534
Zone:	DD
X East (ft):	22178
Y North (ft):	37390
Z Elevation (ft):	0
Description	
Control Type	Unsig
HCM Control Type	TWSC
HCM Intersection Delay (s)	3.5
HCM Intersection LOS	—
Analysis Period (Hr)	0.25
Ped Walking Speed (ft/s)	4
Include Upstream Signal?	Yes

MOVEMENT SETTINGS	EBL	EBR	NBL	NBT	SBT	SBR
Lanes and Sharing (#RL)						
Traffic Volume (vph)	120	163	78	289	356	58
Future Volume (vph)	120	163	78	289	356	58
Conflicting Peds. (#/hr)	0	0	0	—	—	0
Sign Control	Stop	Stop	Free	Free	Free	Free
Storage Length (ft)	0	0	90	—	—	155
Vehicles in median storage (#)	1	—	—	—	—	—
Grade (%)	0	—	—	0	0	—
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adjusted Flow (vph)	133	181	87	321	396	64
Heavy Vehicles (%)	2	2	2	2	2	2
Right Turn Channelized	—	None	—	None	—	None
Curb Radius (ft)	—	—	—	—	—	—
Approach Data		EB		NB		SB
Major/Minor		Minor 2		Major 1		Major 2
Conflicting Flow Rate - All	731	198	460	0	—	0
Critical Headway	6.8	6.9	4.1	—	—	—
Critical Headway Stage 1	5.8	—	—	—	—	—
Critical Headway Stage 2	5.8	—	—	—	—	—
Follow-up Headway	3.5	3.3	2.2	—	—	—
Potential Capacity-1 Maneuver	585	*964	1276	—	—	—
Time blocked by platoon(%)	17	11	11	—	—	—
Movement Capacity-1 Maneuver	546	*964	1276	—	—	—
Movement Capacity-2 Maneuver	610	—	—	—	—	—
HCM Approach Control Delay (s)		10.8		1.7		0
HCM Approach LOS		B				

HCM 6th LANE	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (vph)	1276	-	610	964	-	-
HCM Lane V/C Ratio	0.068	-	0.219	0.188	-	-
HCM Control Delay (s)	8.027	-	12.5	9.6	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th Percentile Queue (veh)	0.2	-	0.8	0.7	-	-

Proportion of time blocked by upstream platoon crossing intersection

APPENDIX J

TRAFFIC SIGNAL WARRANT ANALYSIS

NAH (Phase 1) - University Heights Dr South & Beulah Blvd

Signal Warrant Analysis

MUTCD Warrants 1-3

Major Street: Beulah Blvd. Speed Limit: 45 Lanes:* 2
Minor Street: University Heights Dr South Speed Limit: 25 Lanes:* 1
Locale: Flagstaff, AZ
*Number of Approach Lanes of Moving Traffic:

Major Street vph - total of both approaches	30	10	15	24	32	131	229	533	619	640	596	807	756	747	820	879	886	709	552	276	270	194	70	44
Minor Street volume - higher-volume approach (vph)	8	6	3	6	17	34	108	190	175	122	136	147	156	170	187	204	255	249	204	147	133	96	45	28
Direction of higher-volume minor approach	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB
Beginning of hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00

Critical speed of major street traffic above 40 mph X
In built-up area of isolated community less than 10,000 population
Urban x

Warrant 1, Eight-Hour Vehicular Volume

Condition A *Minimum Vehicular Volume*					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	500	600	600	500																									
(100%[a])	150	150	200	200																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Minimum Reqmts	350	420	420	350	**420**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(70%[c])	105	105	140	140	**105**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**

Condition B *Interruption of Cont. Traffic*					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	750	900	900	750																									
(100%[a])	75	75	100	100																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Minimum Reqmts	525	630	630	525	**630**	No	No	No	No	No	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
(70%[c])	53	53	70	70	**53**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Combination *of Conditions A & B*					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Condition A	400	480	480	400																									
(80%[b])	120	120	160	160																									
Condition B	600	720	720	600																									
(80%[b])	60	60	80	80																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Condition A	280	336	336	280	**336**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(56%[d])	84	84	112	112	**84**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Condition B	420	504	504	420	**504**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(56%[d])	42	42	56	56	**42**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**

Warrant 2, Four Hour Vehicular Volume					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**

Warrant 3, Peak Hour					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

CivTech

February 2023

NAH (Phase 1) - Access A

Signal Warrant Analysis

MUTCD Warrants 1-3

Major Street: Beulah Blvd. Speed Limit: 45 Lanes:* 2
Minor Street: Healthcare Blvd. Speed Limit: 25 Lanes:* 2
Locale: Flagstaff, AZ
*Number of Approach Lanes of Moving Traffic:

Major Street vph - total of both approaches	25	9	14	24	32	127	216	497	575	583	540	732	705	689	755	805	817	650	496	252	247	176	63	40
Minor Street volume - higher-volume approach (vph)	7	15	5	2	0	7	150	164	184	152	155	167	198	172	162	186	172	152	140	118	63	27	15	5
Direction of higher-volume minor approach	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB
Beginning of hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00

Critical speed of major street traffic above 40 mph X
In built-up area of isolated community less than 10,000 population
Urban x

Warrant 1, Eight-Hour Vehicular Volume

Condition A *Minimum Vehicular Volume*					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	500	600	600	500																									
(100%[a])	150	150	200	200																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**																								
Minimum Reqmts	350	420	420	350	**420**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(70%[c])	105	105	140	140	**140**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**

Condition B *Interruption of Cont. Traffic*					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	750	900	900	750																									
(100%[a])	75	75	100	100																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**																								
Minimum Reqmts	525	630	630	525	**630**	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
(70%[c])	53	53	70	70	**70**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Combination *of Conditions A & B*					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Condition A	400	480	480	400																									
(80%[b])	120	120	160	160																									
Condition B	600	720	720	600																									
(80%[b])	60	60	80	80																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**																								
Condition A	280	336	336	280	**336**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(56%[d])	84	84	112	112	**112**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Condition B	420	504	504	420	**504**	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
(56%[d])	42	42	56	56	**56**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 2, Four Hour Vehicular Volume					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 3, Peak Hour					Criteria	Hour																					
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

NAH (Phase 1) - Access B

Signal Warrant Analysis

MUTCD Warrants 1-3

Major Street: Beulah Blvd. Speed Limit: 45 Lanes:* 2

Minor Street: Access B Speed Limit: 25 Lanes:* 2

Locale: Flagstaff, AZ *Number of Approach Lanes of Moving Traffic:

Major Street vph - total of both approaches	26	9	13	21	28	115	201	469	544	562	522	708	665	657	720	772	778	623	484	243	238	171	61	39
Minor Street volume - higher-volume approach (vph)	7	13	4	2	0	7	138	151	169	140	142	154	183	158	149	171	158	140	129	109	58	24	13	4
Direction of higher-volume minor approach	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB
Beginning of hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00

Critical speed of major street traffic above 40 mph X

In built-up area of isolated community less than 10,000 population

Urban x

Warrant 1, Eight-Hour Vehicular Volume

Condition A *Minimum Vehicular Volume*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	500	600	600	500																									
(100%[a])	150	150	200	200																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**																								
Minimum Reqmts	350	420	420	350	**420**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(70%[c])	105	105	140	140	**140**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Condition B *Interruption of Cont. Traffic*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	750	900	900	750																									
(100%[a])	75	75	100	100																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**																								
Minimum Reqmts	525	630	630	525	**630**	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
(70%[c])	53	53	70	70	**70**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Combination *of Conditions A & B*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Condition A	400	480	480	400																									
(80%[b])	120	120	160	160																									
Condition B	600	720	720	600																									
(80%[b])	60	60	80	80																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**																								
Condition A	280	336	336	280	**336**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(56%[d])	84	84	112	112	**112**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Condition B	420	504	504	420	**504**	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
(56%[d])	42	42	56	56	**56**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 2, Four Hour Vehicular Volume

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 3, Peak Hour

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

CivTech

November 2022

NAH (Phase 1) - Access C

Signal Warrant Analysis

MUTCD Warrants 1-3

Major Street: Beulah Blvd. Speed Limit: 45 Lanes:* 2

Minor Street: Purple Sage Blvd. Speed Limit: 25 Lanes:* 2

Locale: Flagstaff, AZ *Number of Approach Lanes of Moving Traffic:

Major Street vph - total of both approaches	34	12	17	23	32	132	237	559	651	685	641	867	793	792	871	937	940	756	598	296	288	210	75	47
Minor Street volume - higher-volume approach (vph)	8	17	6	3	0	8	172	189	211	175	178	191	227	197	186	214	197	175	161	136	72	31	17	6
Direction of higher-volume minor approach	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB	EB
Beginning of hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00

Critical speed of major street traffic above 40 mph X

In built-up area of isolated community less than 10,000 population

Urban x

Warrant 1, Eight-Hour Vehicular Volume

Condition A *Minimum Vehicular Volume*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	500	600	600	500																									
(100%[a])	150	150	200	200																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**																								
Minimum Reqmts	350	420	420	350	**420**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(70%[c])	105	105	140	140	**140**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**

Condition B *Interruption of Cont. Traffic*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	750	900	900	750																									
(100%[a])	75	75	100	100																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**																								
Minimum Reqmts	525	630	630	525	**630**	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
(70%[c])	53	53	70	70	**70**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Combination *of Conditions A & B*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Condition A	400	480	480	400																									
(80%[b])	120	120	160	160																									
Condition B	600	720	720	600																									
(80%[b])	60	60	80	80																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/2**																								
Condition A	280	336	336	280	**336**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(56%[d])	84	84	112	112	**112**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Condition B	420	504	504	420	**504**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
(56%[d])	42	42	56	56	**56**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**

Warrant 2, Four Hour Vehicular Volume

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 3, Peak Hour

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	Yes	Yes	Yes	No	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

CivTech

November 2022

NAH (Phase 1) - Access F

Signal Warrant Analysis

MUTCD Warrants 1-3

Major Street: Healthcre Blvd. Speed Limit: 25 Lanes:* 2
Minor Street: Access F Speed Limit: 25 Lanes:* 2
Locale: Flagstaff, AZ *Number of Approach Lanes of Moving Traffic:

Major Street vph - total of both approaches	7	15	5	2	0	7	151	166	185	154	156	168	200	173	163	188	173	154	142	120	63	27	15	5
Minor Street volume - higher-volume approach (vph)	7	15	5	2	0	7	150	164	184	152	155	167	198	172	162	186	172	152	140	118	63	27	15	5
Direction of higher-volume minor approach	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
Beginning of hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00

Critical speed of major street traffic above 40 mph
In built-up area of isolated community less than 10,000 population
Urban x

Warrant 1, Eight-Hour Vehicular Volume

Condition A *Minimum Vehicular Volume*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	500	600	600	500	**600**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
(100%[a])	150	150	200	200	**200**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+																									
Minimum Reqmts	350	420	420	350																									
(70%[c])	105	105	140	140																									
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Condition B *Interruption of Cont. Traffic*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	750	900	900	750	**900**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
(100%[a])	75	75	100	100	**100**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+																									
Minimum Reqmts	525	630	630	525																									
(70%[c])	53	53	70	70																									
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Combination *of Conditions A & B*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Condition A	400	480	480	400	**480**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
(80%[b])	120	120	160	160	**160**	No	No	No	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Condition B	600	720	720	600	**720**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
(80%[b])	60	60	80	80	**80**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+																									
Condition A	280	336	336	280																									
(56%[d])	84	84	112	112																									
Condition B	420	504	504	420																									
(56%[d])	42	42	56	56																									
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 2, Four Hour Vehicular Volume

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
70% *See to the right*																													
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 3, Peak Hour

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
70% *See to the right*																													
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

NAH (Phase 1) - Access G

Signal Warrant Analysis

MUTCD Warrants 1-3

Major Street: Purple Sage Blvd. Speed Limit: 25 Lanes:* 2

Minor Street: Grey Mint St. Speed Limit: 25 Lanes:* 2

Locale: Flagstaff, AZ *Number of Approach Lanes of Moving Traffic:

Major Street vph - total of both approaches	8	17	3	3	0	8	171	187	209	173	176	190	226	195	184	212	195	173	160	135	72	30	17	6
Minor Street volume - higher-volume approach (vph)	8	17	8	3	0	8	172	189	211	175	178	191	227	197	186	214	197	175	161	136	72	31	17	6
Direction of higher-volume minor approach	SB	SB	SB	SB	NB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
Beginning of hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00

Critical speed of major street traffic above 40 mph

In built-up area of isolated community less than 10,000 population

Urban x

Warrant 1, Eight-Hour Vehicular Volume

Condition A *Minimum Vehicular Volume*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	500	600	600	500	**600**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
(100%[a])	150	150	200	200	**200**	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No	No
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+																									
Minimum Reqmts	350	420	420	350																									
(70%[c])	105	105	140	140																									
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Condition B *Interruption of Cont. Traffic*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	750	900	900	750	**900**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
(100%[a])	75	75	100	100	**100**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+																									
Minimum Reqmts	525	630	630	525																									
(70%[c])	53	53	70	70																									
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Combination *of Conditions A & B*

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria **2/2**	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Condition A	400	480	480	400	**480**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
(80%[b])	120	120	160	160	**160**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Condition B	600	720	720	600	**720**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
(80%[b])	60	60	80	80	**80**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+																									
Condition A	280	336	336	280																									
(56%[d])	84	84	112	112																									
Condition B	420	504	504	420																									
(56%[d])	42	42	56	56																									
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 2, Four Hour Vehicular Volume

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
70% *See to the right*																													
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 3, Peak Hour

Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	Criteria	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
70% *See to the right*																													
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Planning & Zoning Commission **5. B.**

Meeting Date: 04/12/2023

From: Tiffany Antol, Senior Planner

Information

TITLE:

PZ-21-00126-02: Concept Zoning Map Amendment request, by Northern Arizona Healthcare (NAH) Corporation, of approximately 98.39 acres located at 1120 W Purple Sage Trail for Phase 1 of the NAH Health Village from Rural Residential (RR – 40.47 acres) and Estate Residential (ER – 57.92 acres) to Highway Commercial (HC – 63.18 acres) and Public Facilities (PF – 35.21 acres). Of the 14 parcels included in this request, all but three (APN 112-10-036, 112-10-037, and 112-05-125) are currently within the Resource Protection Overlay (RPO). These remaining three parcels will be added to the RPO as part of this request.

STAFF RECOMMENDED ACTION:

Staff believes that the proposed Zoning Map amendment is in substantial conformance with the required findings and recommends the Planning & Zoning Commission forward the request to the City Council with a recommendation approving an amendment to the Zoning Map for a total of 93.39 acres from the Rural Residential (RR) and Estate Residential (ER) to the Highway Commercial (HC) zone for 63.18 acres and to the Public Facility zone for 35.21 acres. Additionally, three parcels (112-10-036, 112-10-037, and 112-05-125) will be added to the Resource Protection Overlay (RPO), subject to the eleven conditions in the staff report.