COBURN

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302

coburnpartners.com

August 25, 2022

Steven Williams
Planning and Building Manager
Town of Superior
124 E. Coal Creek Drive
Superior, CO 80027

RE: SUPERIOR MARKETPLACE PLANNED DEVELOPMENT / ZONE DISTRICT PLAN AMENDMENT #6

PROJECT NARRATIVE

Introduction & Background

On behalf of Boulder County Housing Authority (BCHA) we submit this Planned Development / Zone District Plan Application to allow for a residential mixed-use Transit-Oriented Development (TOD) containing affordable housing located on the current Regional Transportation District (RTD) parcel (Lot 5 Filing 5, consisting of Pads 12 and 13) and the adjacent privately-owned undeveloped parcel (Lot 1 Filing 5, consisting of Pad 8) in the northeast corner of the Superior Marketplace shopping center. The overall intent of the Superior TOD is to develop the Town of Superior's first permanently affordable housing and facilitate the Town of Superior's goal of affordable housing by adding residential uses to these specific two parcels within the Superior Marketplace.

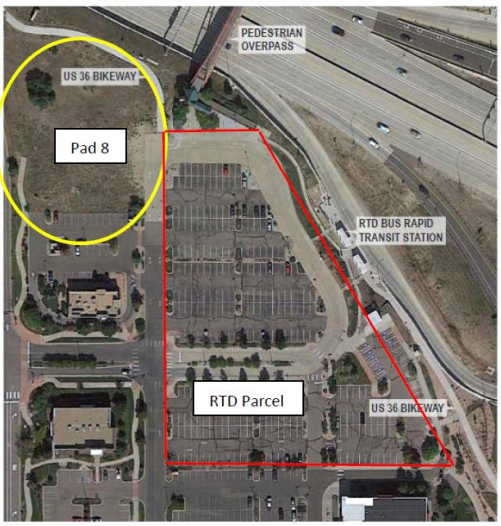


Figure 1 Project Location

COBURN

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302

coburnpartners.com

In selecting this location Superior for its next affordable housing development, BCHA seeks to:

- Make a meaningful contribution to the affordable housing supply and respond to the growing shortage of affordable homes in the region, thus working towards the Boulder County Regional Housing Partnership's (BCRHP's) regional goal of securing 12% of the housing inventory as permanently affordable to low- and middle-income households by 2035.
- Alleviate the stress of housing insecurity that many members of our community are experiencing, focusing on homes for rent to households below 60% of the Area Median Income (AMI).
- Create a well-connected neighborhood, where residents can live, work, shop, and play, with a range of transportation options and less dependence on cars.
- Align with the Town of Superior's sustainability goals, including increasing the efficiency of homes by reducing energy intensity of buildings and reducing cost to heat homes, using electric only Energy Star rated appliances, installing photovoltaic (PV) panels to offset energy use, using sustainable materials and recycling materials in the construction process, providing recycling and composting (if available) to residents, and ensuring availability of various transportation options to reduce reliance on cars and reduce greenhouse gas emissions.
- Support the region's economic vitality by ensuring that the current workforce can remain in the community while creating opportunities for workers, who are currently forced to commute, to live near their jobs.
- Create a thriving and successful affordable neighborhood that connects residents to the surrounding community in downtown Superior and Louisville, and to regional areas such as Boulder and Denver.

There are currently no permanently affordable homes for rent or for sale in Superior, Colorado. In October 2021, the median cost of a home in Superior rose 36.1% compared to the previous year with a median value of $786,000. According to data collected from the US Census Bureau, in 2020 the median for individuals and households was $50,932 (55%-60% AMI) and $126,600 (family of 4, 100%-120% AMI), respectively. Permanently affordable housing serves households whose income is 30%-60% AMI. As shown in Table 1 the percent of the population making up to $60,000 annually (approx. 30%-60% AMI) is significantly lower than the number of households making over 60% AMI.

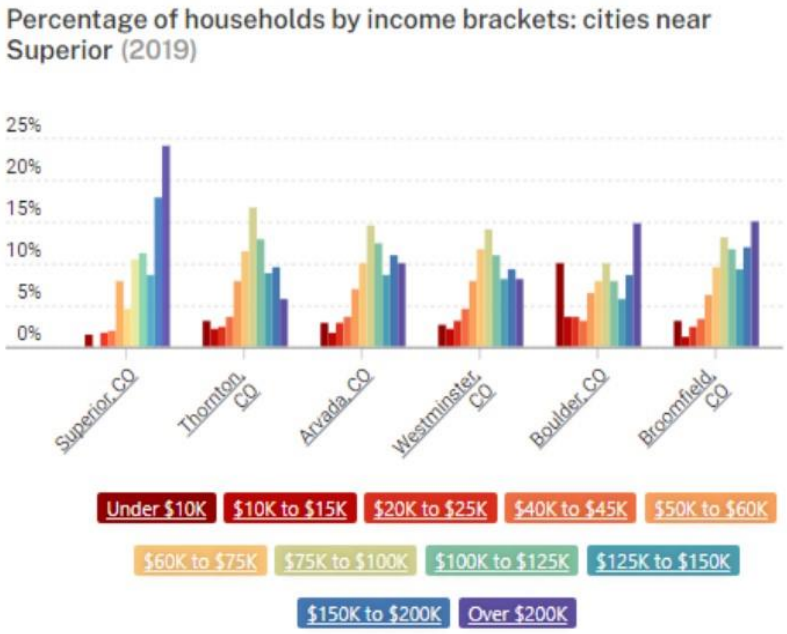


Table 1

COBURN

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302

coburnpartners.com

Policy 4.2.a of the Town's Comprehensive Plan makes it a long-term goal of the Town to "[p]rovide for a mix of attached and detached residential housing types at varied densities and price ranges to accommodate residents of all ages". Furthermore, “a housing shortage for low-income persons and families (80% of Area Median Income) is detrimental to public health, safety, and welfare. Furthermore, the inability of residents to afford housing within the Town negatively affects the community's jobs and housing balance and includes serious and detrimental transportation and environmental consequences.” In 2018, the Town adopted Resolution No. R-10 (Series 2018) supporting the goals of the Boulder County Regional Housing Partnership’s Regional Housing Strategy as part of the Town’s commitment to affordable housing in Superior.

In 2020, the Town of Superior ("Town") passed Ordinance No. O-18 (Series 2020) to adopt inclusionary housing requirements in support of the Boulder County Regional Housing Partnership's goal of ensuring that 12% of the housing inventory is designated permanently affordable to low, moderate, and middle-income households by 2035. Ordinance No. O-18 requires that new residential developments of 10 units or more are required to have 15% of the units as restricted residential units serving persons making up to 80% AMI.

The Town has designated the RTD site as a priority site for affordable housing and it’s been a goal of the Town to include residential uses in the Superior Marketplace. In 2017, the Town initiated a community engagement effort to identify issues of community-wide concern for Northwest Superior, and to explore the potential need for a subarea plan or other policy or regulatory changes to address these issues. One of the areas studied was Superior Marketplace.

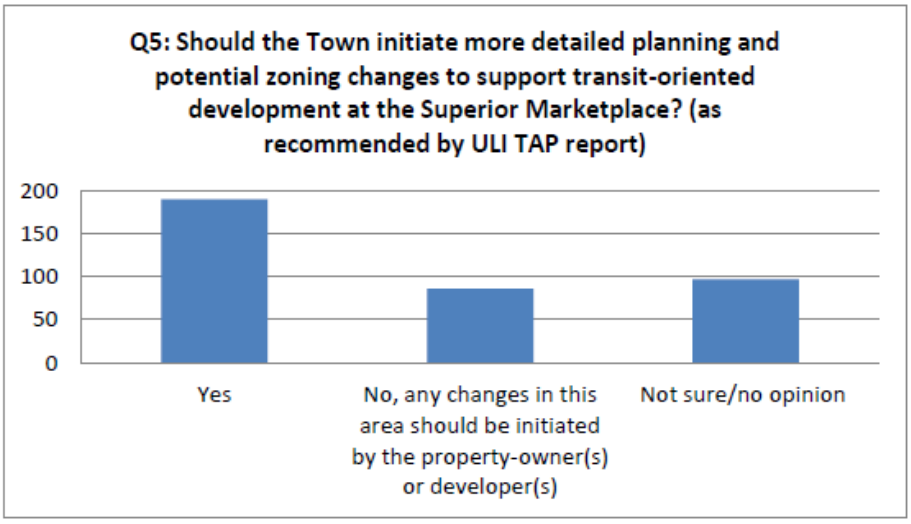


Figure 2 Northwest Superior Community Engagement Outreach Summary and Preliminary Recommendations: November 2017

In May 2021, BCHA provided the Town of Superior Board of Trustees (the “Board”) an overview of BCHA’s mission and work within Boulder County. The discussion included several potential sites as noted in the Comprehensive Plan, including the RTD PnR. The Board was supportive of BCHA approaching RTD to begin conversations about the development process. In July 2021, BCHA requested an initial meeting with RTD regarding development on the parcel within Superior Marketplace. In August 2021, BCHA returned to a Board meeting and presented two concept plans for affordable housing at the RTD location within Superior Marketplace. At this Board meeting, the majority of the Board was in support of the direction BCHA was headed. Therefore, BCHA proceeded in looking at this location for Superior’s first affordable housing community.

COBURN

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302

coburnpartners.com

The Planned Development (PD) Amendment would add permanently affordable residential as an allowed use on specific lots within the Superior Marketplace. The amendment sets density, parking, and height standards as well as design guidelines for future residential development. If the maximum number of homes are built, this neighborhood would contribute 5.95% to the Boulder County Regional Housing Partnership's goal of 12% (or 543 homes) affordable housing stock in Superior.

Maximum Number of Homes Allowed by Proposed PD Amendment	**Percentage of Homes Designated Affordable**	**Number of Homes Designated Affordable**	**Percentage of Total Goal of 543 Homes**
269	15% *(minimum required by Town)*	40.35	7.43%
269	100% *(BCHA proposal)*	269	49.54%

(4,521 housing units in Superior, pre-Marshall Fire, census.gov)

The Effects of the Marshall Fire

On December 30, 2021 the Marshall Fire devastated the Town of Superior, the City of Louisville, and areas of unincorporated Boulder County, destroying and damaging over 1,000 homes and businesses. It is unknown at this time how the aftermath of the fire will alter the Town's priorities for development within the Superior Marketplace PD or RTD's ridership at this location. What we do know is the need for safe, affordable homes more necessary than ever. BCHA is committed to providing safe, well-constructed homes for the Town of Superior.

BCHA has 98 households living in Louisville and Superior with Housing Choice Voucher (HCV) or Project Based Vouchers (PBV), which provide rental assistance through the U.S. Department of Housing and Urban Development (HUD). All households were evacuated and safely returned for those living in BCHA-owned homes. In Superior, one BCHA HCV voucher holder was permanently displaced by the Marshall Fire. The voucher holder's rental was destroyed, and they were able to stay with family while they searched for a new rental. Another voucher holder in Superior whose home was damaged was able to return to the property and plans to continue utilizing their assistance to remain in place while the landlord makes repairs. BCHA continues to work with displaced residents on finding temporary and permanent rental homes. After this initial PD Amendment application, the project timeline does not anticipate another Town of Superior development application review until late 2023 and will not divert valuable Town resources away from rebuilding efforts.

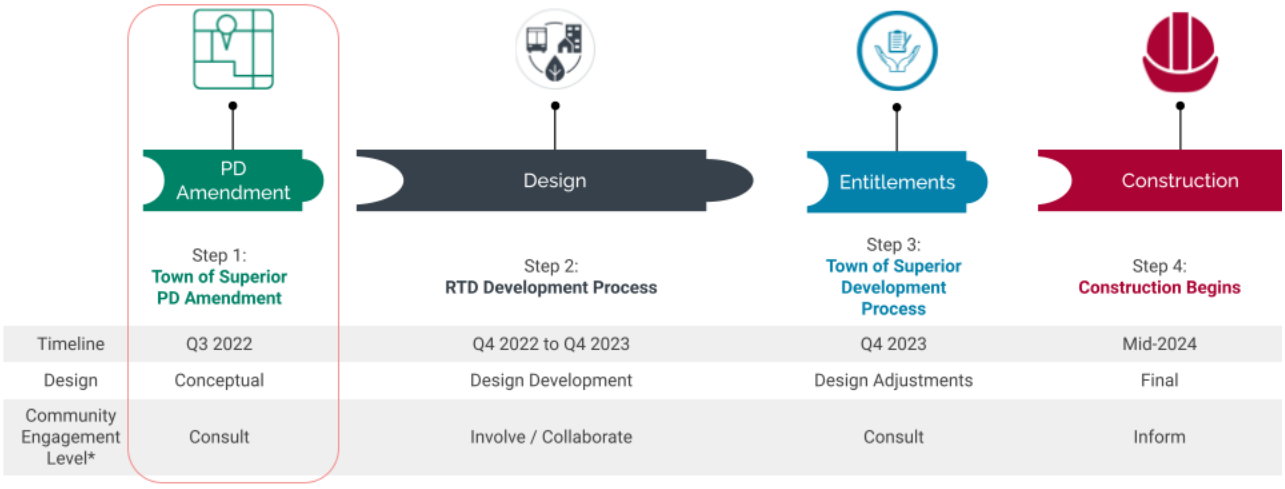
Community Engagement
Boulder County Housing Authority (BCHA) is committed to continuing to engage with neighbors and others with an interest in this community of affordable homes in a productive conversation around how to meet the community's broader needs around diverse housing, environmental sustainability, mobility, and connectivity, and more. The engagement opportunities will be tailored to each phase of the project and focused on meeting the community and stakeholders where they are to gain an understanding of the neighborhood context, site characteristics, neighbors, and active community members in the area. Different strategies are presented in the following graphics, along with a project high-level timeline.

COBURN

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302

coburnpartners.com

Tentative, High-Level Timeline



	Step 1: Town of Superior PD Amendment	Step 2: RTD Development Process	Step 3: Town of Superior Development Process	Step 4: Construction Begins
Timeline	Q3 2022	Q4 2022 to Q4 2023	Q4 2023	Mid-2024
Design	Conceptual	Design Development	Design Adjustments	Final
Community Engagement Level*	Consult	Involve / Collaborate	Consult	Inform

*iap2 Engagement Categories	https://cdn.ymaws.com/www.iap2.org/resource/resmgr/pillars/Spectrum_8.5x11_Print.pdf
Inform	Ensure the public has fair & balanced information to help them understand and make sense of issues, alternatives and/ or solution options.
Consult	Get feedback from the public on current analysis, options or potential decisions.
Involve	Work on an ongoing basis with the public to ensure that their issues, concerns and aspirations are being understood, analyzed and considered.
Collaborate	Partner with the public or interest groups in each aspect of a decision, including getting their help in generating alternatives, analyzing impacts and identifying preferred solutions.

At this stage of the project, the team is seeking approval to add mixed-use residential uses to the property through a PD Amendment. The team has been available throughout this phase to meet with the community.

Superior Marketplace Transit-Oriented Development
Step 1: Rezoning

	Step 1: Town of Superior PD Amendment & Rezoning
Timeline	Q3 2022
Design	Conceptual
Community Engagement Opportunities	• Coffee Meet Ups • Ongoing Virtual Office Hours • Public Hearings • Process Committee Formation
How Your Feedback Will Be Used	• Provide feedback on proposed upcoming engagement plan, including process committee, outreach goals, and advisory committee • Provide feedback on proposed PD amendment

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302
coburnpartners.com

More specifically, the following events were organized and facilitated by the project team to date:

- Tuesday, July 26, 2022, 8:30-10am: Coffee hour at Serendipity Tap & Café, Superior Community Center
- Thursday, August 4, 2022, 8:30-10am: Coffee hour at Serendipity Tap & Café, Superior Community Center
- Thursday, August 11, 2022, 8:30-10am: Coffee hour at Serendipity Tap & Café,
- Weekly on Thursdays, 3-4pm, starting on Thursday, July 28, 2022: Virtual office hour with team members on Zoom

In addition, we have developed a website to provide updated project information, Frequently Asked Questions, information about other BCHA affordable housing communities, project documents, project timeline, upcoming engagement events, and research about Transit Oriented Developments. We have started a project email list to provide updates to interested parties. In response to questions posed through this engagement, we have developed a running list of Recently Asked Questions to address incoming questions and concerns, which will be updated as the project progresses and available online through the project's website: www.boco.org/SuperiorTODHousing.

A total of 20 people participated in these various events to learn about the project, provide feedback on the public outreach plan and schedule and share their comments, concerns, and questions. Below is a summary of what we've heard:

- A desire for reduced height to maintain views
- Concern about additional density in the project area
- Concerns about the timing of this project with respect to the Marshall Fire recovery
- General support for affordable housing in Superior
- Desire for activated public spaces
- Concerns about traffic and impacts to surrounding neighborhoods
- Concerns about this project enabling additional residential development within the Superior Town Center
- Support for affordable housing next to transit

PD Amendment Application Changes Based on Community Feedback

BCHA has benefited greatly from the community engagement since the initial application in January 2022, and much effort has been made to hear the voices of the surrounding community and address any concerns about the added use. Through ongoing community engagement efforts, the community of Superior has been able to ask questions, vocalize concerns, and learn more about the process. Based on public feedback, the current PD Amendment application has been updated from the initial submission with the following changes:

- Maximum height decreased from 5 stories to 4 stories above the existing grade to preserve views (from 65 ft to 55 ft);
- Maximum density decreased from 60 dwelling units per acre to 50 dwelling units per acre. The inclusion of Lot 1 reduces the scale of development from initial plans to only develop Lot 5;
- Inclusion of Lot 1 in the application, increasing the area for additional affordable housing typologies including deed-restricted affordable for-sale and affordable rental homes, variation in building types, and public community space; and,
- Updated traffic study to reflect the inclusion of Lot 1.

If the PD Amendment is approved by the Town, BCHA is committed to a robust and inclusive involvement of the community in the design phase of the project in which the community will play a key role in shaping the look, feel, and style of the future neighborhood. Future engagement will include the formation of an Advisory Committee made up of community members, neighbors, business owners, schools district, major employers, faith communities, and other stakeholders. The Advisory Committee will help evaluate potential aspects of the development and provide feedback on

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302
coburnpartners.com

how best to encourage public participation throughout the planning and development processes. Examples of future engagement activities and participation opportunities will include:

- Design charrette and site planning workshop
- Pop ups and micro engagements to meet the community to discuss design ideas and specific project details (mobility, community space, landscape design, etc.)
- Youth engagement with local schools and non-profits
- Virtual and in person "office" hours
- Small group and targeted community roundtables around specific issues
- Community wide updates
- Meetings with neighborhood organizations, HOAs, businesses and other stakeholder groups
- Site walks (as permitted by RTD)
- Updating website
- Email Newsletters

Project Description

The project site is comprised of two parcels (Lots 1 and 5, Superior Marketplace Filing 5). Lot 5 is owned and operated by the RTD, and its current use is a surface level parking lot adjacent to the US 36/McCaslin Park-n-Ride (PnR) - South. The undeveloped Lot 1 is privately owned and bordered by Marshall Road and US 36. The inclusion of Lot 1 allows for a significant amount of affordable housing and a variety of building types, allowing the project to better meet the community's housing demands and to help achieve the Town's affordability goals. The expansion of the project boundaries also opens more opportunities for increased design flexibility and the inclusion of public community space, which both integrates the project within, and serves as an amenity to, the larger surrounding area. In 2021, RTD passed the Equitable Transit-Oriented Development Policy that provides guidance to permit and encourage the development of affordable housing on RTD real property. BCHA submitted to RTD's Step 2 – Technical Review Request under the Unsolicited Proposal Procedure for Real Property to develop the property in November 2021.

The development of the Superior Transit-Oriented Development (TOD) within the Amendment #6 boundaries will provide the opportunity for up to 50 dwelling units per acre. There will be a variety of housing types, including some deed-restricted for sale homes and permanently affordable rental homes. All rental units will be for low- to moderate-income residents earning up to 80% of the Area Median Income (AMI). For Boulder County, 80% AMI would translate to a maximum income of $100,320 for a family of four or a maximum income of $70,240 for a single-person household in 2022, the typical income for a nurse, firefighter, or bank teller. Community amenities could include a community gathering space, resident services and property management office, green spaces and potentially a community garden, pedestrian plaza, and an improved multi-use path connector. The mixed-use residential neighborhood will include community benefits such as non-profit commercial uses, public gathering spaces at the ground level. Site amenities will be explored as part of the community engagement process after the PD Amendment.

COBURN

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302

coburnpartners.com

AMI	2022 Maximum Rents				
	0 Bdrm	1 Bdrm	2 Bdrm	3 Bdrm	4 Bdrm
120%	$ 2,634	$ 2,823	$ 3,387	$ 3,913	$ 4,365
100%	$ 2,195	$ 2,352	$ 2,822	$ 3,261	$ 3,637
80%	$ 1,756	$ 1,882	$ 2,258	$ 2,609	$ 2,910
60%	$ 1,317	$ 1,411	$ 1,693	$ 1,956	$ 2,182
30%	$ 658	$ 705	$ 846	$ 978	$ 1,091

AMI	2022 Income Limits					
	1 Person	2 Person	3 Person	4 Person	5 Person	6 Person
120%	$ 105,360	$ 120,480	$ 135,480	$ 150,480	$ 162,600	$ 174,600
100%	$ 87,800	$ 100,400	$ 112,900	$ 125,400	$ 135,500	$ 145,500
80%	$ 70,240	$ 80,320	$ 90,320	$ 100,320	$ 108,400	$ 116,400
60%	$ 52,680	$ 60,240	$ 67,740	$ 75,240	$ 81,300	$ 87,300
30%	$ 26,340	$ 30,120	$ 33,870	$ 37,620	$ 40,650	$ 43,650

Redevelopment of the site would allow for enough structured parking to replace RTD's 294 existing Park-n-Ride (PnR) spaces and provide 0.30 spaces for each proposed residential dwelling unit as well as one parking space per 1,000 sq. ft. of commercial floor area. TODs allow residents to live near mass transit and reduce the burden of relying on vehicles for transit. For many, transportation costs account for the second highest cost of living expense after housing. BCHA's own parking study at its other affordable housing communities within Boulder County supports a reduction in parking at this site. *See* attached Parking Study.

The residential parking will be supplemented by a Transportation Demand Management (TDM) plan, which may include the following: RTD or other parking share agreement, Neighborhood EcoPass program for residents, car share program (e.g., Colorado CarShare), bike sharing program, e-bike charging stations, and resident bike storage (in addition to the County's RTD Bike-n-Ride storage). The proposed parking ratio of 0.30 spaces per residence is supported by a study of parking within two of BCHA's nearby affordable housing communities, Aspinwall and Josephine Commons. While the location of these two developments is more suburban in nature, the parking demand was found to support a reduction in parking for this site dwelling units and in alignment with the parking developed at BCHA's newest affordable housing community, The Spoke on Coffman, a 73-unit development in downtown Longmont near the 8th and Coffman PnR.

Movement of the Flex and Access-a-Ride buses as well as individual passenger drop-offs through the site would be maintained and pedestrian/multimodal circulation and connectivity to surrounding parks and businesses improved by simplifying the existing RTD station. The route for the adjacent Bus Rapid Transit (BRT) stop at US 36 & McCaslin – South would be unaffected by the development. A phased development approach will be explored, with Lot 1 and portions of Lot 5, north and south of Center Drive, following separate development schedules. The PnR surface parking on the second phase site would be retained to the greatest extent possible during construction of the first phase, a requirement by RTD.

Architectural requirements for the PD are set forth in the original Planned Development documents. Any changes to the architectural requirements will be brought for review after extensive community engagement. BCHA intends to design the site plan, elevations, building materials, and massing with input from the community. BCHA will also provide updated engineering reports after the second PD amendment for Architecture at the time of the Final Development Plan.

The proposed development will utilize adjacent storm-water facilities existing in the Superior Marketplace PD boundaries to accommodate drainage and/or reconfigure existing facilities. Because Lot 1 has always been anticipated for development and Lot 5 exists as an impervious surface, the existing facilities are sufficient to accommodate development. More information will be available as civil engineering further studies the site.

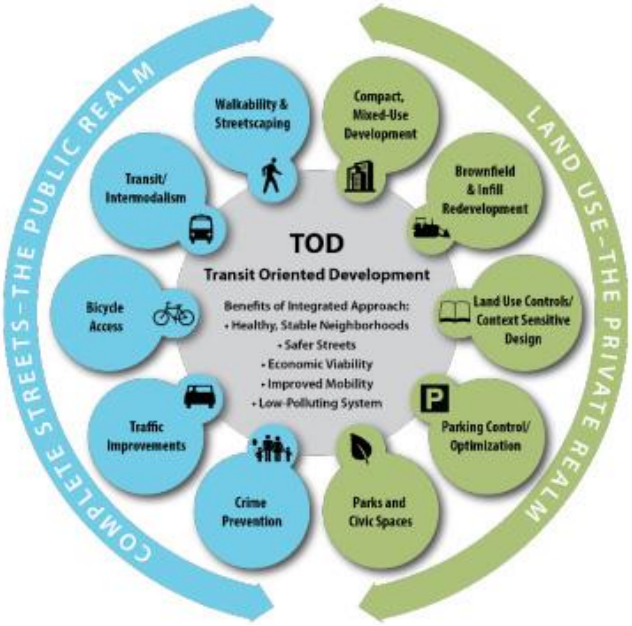
The project also proposes a change in grade to provide improved ADA access to the BRT station and rerouting U.S. 36 Bikeway to improve the flow of bicycle traffic through the project site.

COBURN

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302

coburnpartners.com

Transit-Oriented Development



This location is ideal for a TOD because of its proximity to shopping, dining, jobs, parks, and Downtown Superior—easily accessible from home by foot, bicycle, and transit. Situated 8 miles from Downtown Boulder and 22 miles from Downtown Denver, this site is centrally located with access to major employment and amenity hubs, with the ability to reach both via the public transit bus system.

Transit oriented development creates walkable communities for people of all ages, abilities, and incomes while providing more transportation and housing choices to the community. Furthermore, as demand for housing increases, the desire for a transit-connected, convenient, and walkable community has emerged. Demographics have also changed over time with more single person households, households headed by single parents, and seniors. These demographic groups that are increasing in size are the same demographic groups that have historically shown a preference for higher density housing near transit. These are also the demographics that have a high need for affordable housing within Boulder County.

Transit-Oriented Development has shown to provide connectivity to regional areas, innovation in providing a transit community that is environmentally, socially, and economically sustainable, and an efficient place to live, work, and play. Furthermore, TODs reduce the burden on infrastructure, provide more opportunity for equity, support RTDs transit system and mission, and provides various multi-modal access. Pairing affordable housing with this TOD site will further not only RTD's and BCHA's missions of providing equitable access points to both transportation and safe, affordable housing, but also bring needed affordable housing to the Town of Superior and contribute to the Boulder County Regional Housing Partnership's 12% goal.

According to RTD's parking study, "co-locating income restricted housing and high-frequency transit service benefits both low-income households and the transit agency. Reducing parking supply at station-area developments reduces development cost, helping residents to reduce housing and transportation costs and RTD to increase ridership on its expansive transit
network."

Furthermore, RTD's research from the "Residential Parking in Station Areas: A Study of Metro Denver (December 2020)" shows:

- 61 percent of low-income households have no car, while 93 percent of market-rate households have at least one car.
- 63 percent of low-income households ride the bus once a week or more, while 88 percent of market-rate households ride the bus once a week or less.

COBURN

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302

coburnpartners.com

Sustainability

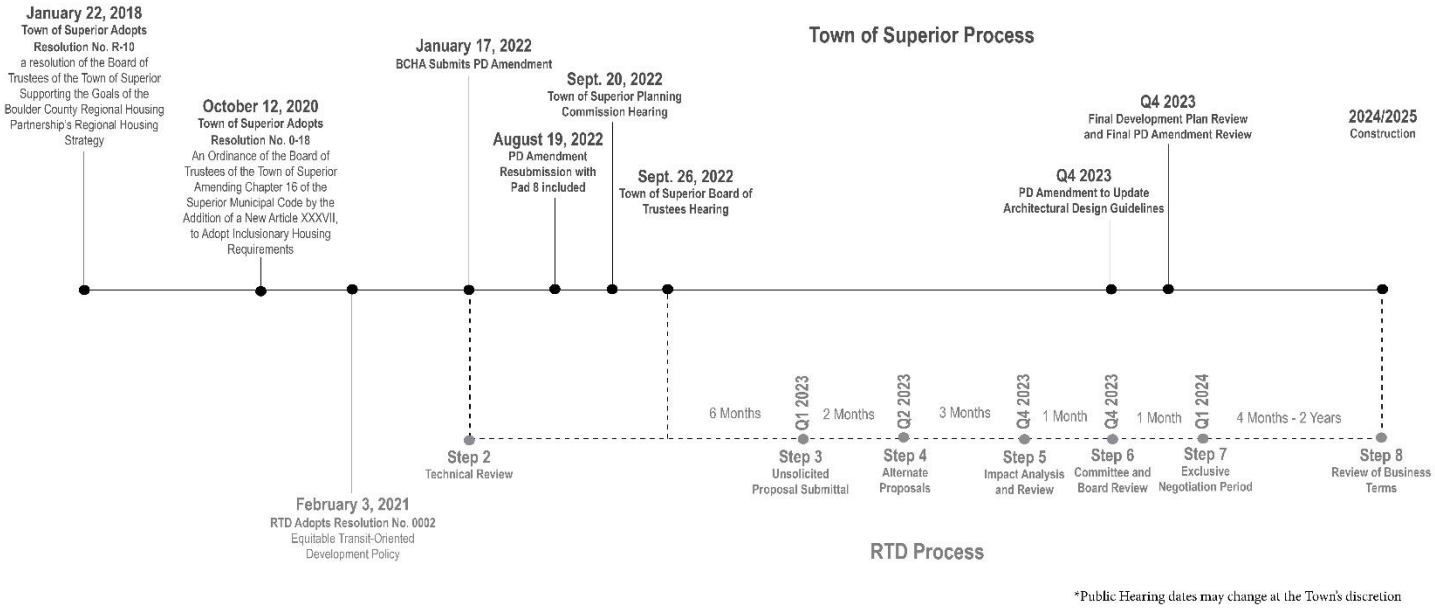
Part of BCHA's goals and mission is to develop homes based on the principle of sustainability. BCHA's projects exceed the requirements of Enterprise Green Communities, which is required by the Colorado Housing and Finance Authority (CHFA).

In additional to sustainable materials and construction practices, sustainable design and features of the Superior TOD may include:

- Photovoltaic Ready Buildings (PV Ready)
- Electronic Vehicle Ready Infrastructure (EV Ready) & EV Bicycle Charging
- Site Connectivity and Mobility Hub
- Encourages alternative modes of transportation
- Improved US 36 Bike & Trail connections to encourage biking and walking and improved ADA access to these amenities
- Urban green space allows for community gardens
- Use of native, drought tolerant plants and trees to reduce water use
- All EnergyStar electric appliances for improved energy efficiency
- Tight building envelope for improved energy efficiency

These goals align with and compliment the Town's own climate and sustainability goals to reduce energy usage, offset the effects of climate change, and reduce carbon emissions not only from transportation, but also buildings.

Project Timeline



*Public Hearing dates may change at the Town's discretion

COBURN

PHONE 303.442.3351
2718 Pine Street, Suite 100
Boulder, CO 80302

coburnpartners.com

As mentioned above, parallel to the entitlement process with the Town of Superior, BCHA is currently engaged in an Unsolicited Proposal Procedure for Real Property with RTD. Through this multi-step process, RTD evaluates development proposals for its properties in line with its operational goals and procedures. In November 2021, BCHA submitted their Step 2 Technical Review Application to RTD and, after receiving comments and feedback, is currently preparing the next step in RTD's development process. BCHA will proceed with Step 3 of RTD's process only after receiving rezoning approval and community feedback. Because RTD's process is expected to take many months, the next Town of Superior development review application is not expected until late 2023, ensuring that valuable Town resources are not diverted away from Marshall Fire rebuild efforts and there is time to meaningfully engage the community, especially the communities immediately surrounding the site that have been displaced by the Marshall Fire.

BCHA's goal with the Superior TOD development is to provide as much affordable housing as possible while balancing the needs of PnR at the US 36/McCaslin station. While there is ample data to support a reduction of parking for residents of the development, parking utilization at the PnR has decreased during pandemic times and it is unknown how ridership in this area will be affected long term. We hope that this proposed plan, supported by RTD's research and Equitable Transit-Oriented Development Policy, will be the start to the Town of Superior's first affordable housing development, as well as the first 100% affordable TOD under RTD's Equitable Transit-Oriented Development Policy.

EXHIBIT A - BCHA PARKING STUDY

Boulder County

Department of Housing & Human Services

1333 Iris • Boulder, Colorado 80304 • Tel: 303.441.1000 Fax: 720.564.2283
3460 Broadway • Boulder, Colorado 80304 • Tel: 303.441.1000 Fax: 303.441.1523
515 Coffman Street • Longmont, Colorado 80501 • Tel: 303.441.1000

www.BoulderCountyHHS.org

PARKING STUDY OF SIMILAR AFFORDABLE HOUSING DEVELOPMENTS IN BOULDER COUNTY.

BCHA conducted a parking count at three of our developments in Lafayette and Louisville, Josephine Commons, Aspinwall, and Kestrel, to inform appropriate parking ratios proposed at future BCHA developments. By comparison, the Lafayette developments are suburban in nature and have less access to public transportation and bike and pedestrian infrastructure than is available at the Superior TOD site. BCHA's newest affordable housing project – The Spoke on Coffman in Longmont, on target to open in Spring 2022 – features a creative shared-use agreement for the parking garage and was approved for a reduced parking ratio of 0.5 cars/1 unit, see attached letter from the City of Longmont. Upon completion, a similar parking count will be conducted at The Spoke, providing further data to substantiate reduced parking ratios.

A summary of the unit type and mix for each Josephine Commons, Aspinwall, Kestrel, and The Spoke on Coffman is below:

Unit Mix Comparison

Building Type	Units	1 Bed	2 Bed	3 Bed	4 Bed
Josephine Commons Senior	74	44	30		
Aspinwall Multifamily	72	22	26	22	2
Kestrel Multifamily & Senior	200	107	63	30	
The Spoke on Coffman	73	59	10	4	

BCHA staff counted cars parked within the Josephine Commons and Aspinwall developments as well as along Dounce Street, the public right of way that offers on-street parking that is proximal to the developments. The parking count was taken every two hours between 7:00 AM and 7:00 PM on July 21, 22, 24, and 25, 2015, a Tuesday, Wednesday, Friday, and Saturday, respectively.

Parking Counts

Josephine Commons	7:00 AM	9:00 AM	11:00 AM	1:00 PM	3:00 PM	5:00 PM	7:00 PM
Tuesday – July 21	52	44	52	51	46	49	60
Wednesday – July 22	43	49	65	37	50	45	48
Friday – July 24	75	51	49	52	41	66	58
Saturday – July 25	51	42	43	43	46	52	45
Aspinwall							
Tuesday – July 21	53	46	37	27	35	38	44
Wednesday – July 22	52	37	35	31	30	35	32
Friday – July 24	50	37	34	30	35	42	50
Saturday – July 25	63	52	39	44	34	42	47

Based on the total units of Josephine Commons and Aspinwall, the above parking counts result in the parking ratios (cars to units) below. At only one time, at Josephine Commons, did the ratio reach a 1:1 ratio of one car parked per unit. It is important to note, Josephine Commons has a higher parking ratio than Aspinwall, because Meals on Wheels begins breakfast and lunch preparation starting at 7:00am Monday through Friday at Josephine Commons. The program,

hosted at the Josephine Commons dining hall, is also open to the broader community, again increasing the number of cars on site weekdays during lunch hours.

Ratios of Parked Cars/Unit

Development	7:00 AM	9:00 AM	11:00 AM	1:00 PM	3:00 PM	5:00 PM	7:00 PM
Josephine Commons							
Tuesday – July 21	0.70	0.59	0.70	0.69	0.64	0.68	0.83
Wednesday – July 22	0.58	0.66	0.88	0.50	0.69	0.63	0.67
Friday – July 24	1.01	0.69	0.66	0.72	0.57	0.92	0.81
Saturday – July 25	0.69	0.57	0.58	0.60	0.64	0.72	0.63
Aspinwall							
Tuesday – July 21	0.74	0.64	0.51	0.38	0.49	0.53	0.61
Wednesday - July 22	0.72	0.51	0.49	0.43	0.42	0.49	0.44
Friday - July 24	0.69	0.51	0.47	0.42	0.49	0.58	0.69
Saturday - July 25	0.88	0.72	0.54	0.61	0.47	0.58	0.65

In 2022, a similar study of Kestrel Multifamily and Senior parking was completed by Fox Tuttle. Kestrel has over 300 parking spaces in several parking lots as well as street parking on E Hecla Drive, W Hecla Drive, N Kestrel Lane and S Kestrel Lane. To accommodate a parking utilization study of this size, Kestrel was divided into parking zones associated with different street blocks and on-site parking lots. Figure 1 shows the parking zones and is attached to this document. Parking counts were performed by Fox Tuttle on Thursday, February 10th, 2022. Table 2 below details the parking supply and the parking observed for each zone, during each time periods studied on Thursday, February 10th, 2022.

Parking Counts

Zone Designation	Parking Supply	Parking Demand							
		5am-6am	7am-8am	9am-10am	11am-12am	1pm-2pm	3pm-4pm	5pm-6pm	7pm-8pm
A	21	8	8	4	4	6	6	13	8
B	14	11	10	7	7	6	6	6	8
C	22	12	11	7	10	9	3	11	12
D	34	12	12	11	12	10	9	11	11
E	57	53	49	45	37	40	39	43	52
F	28	9	8	6	7	9	5	5	3
1	18	13	12	7	8	7	6	7	8
2	9	4	4	3	2	2	2	4	5
3	5	3	3	2	2	1	3	5	4
4	16	13	11	12	12	12	10	10	11
5	12	10	10	10	8	8	8	9	11
6	23	20	19	12	14	10	6	15	18
7	28	15	12	9	7	10	8	7	11

8	18	12	11	7	5	9	6	7	9
TOTAL	305	195	180	142	135	139	117	153	171

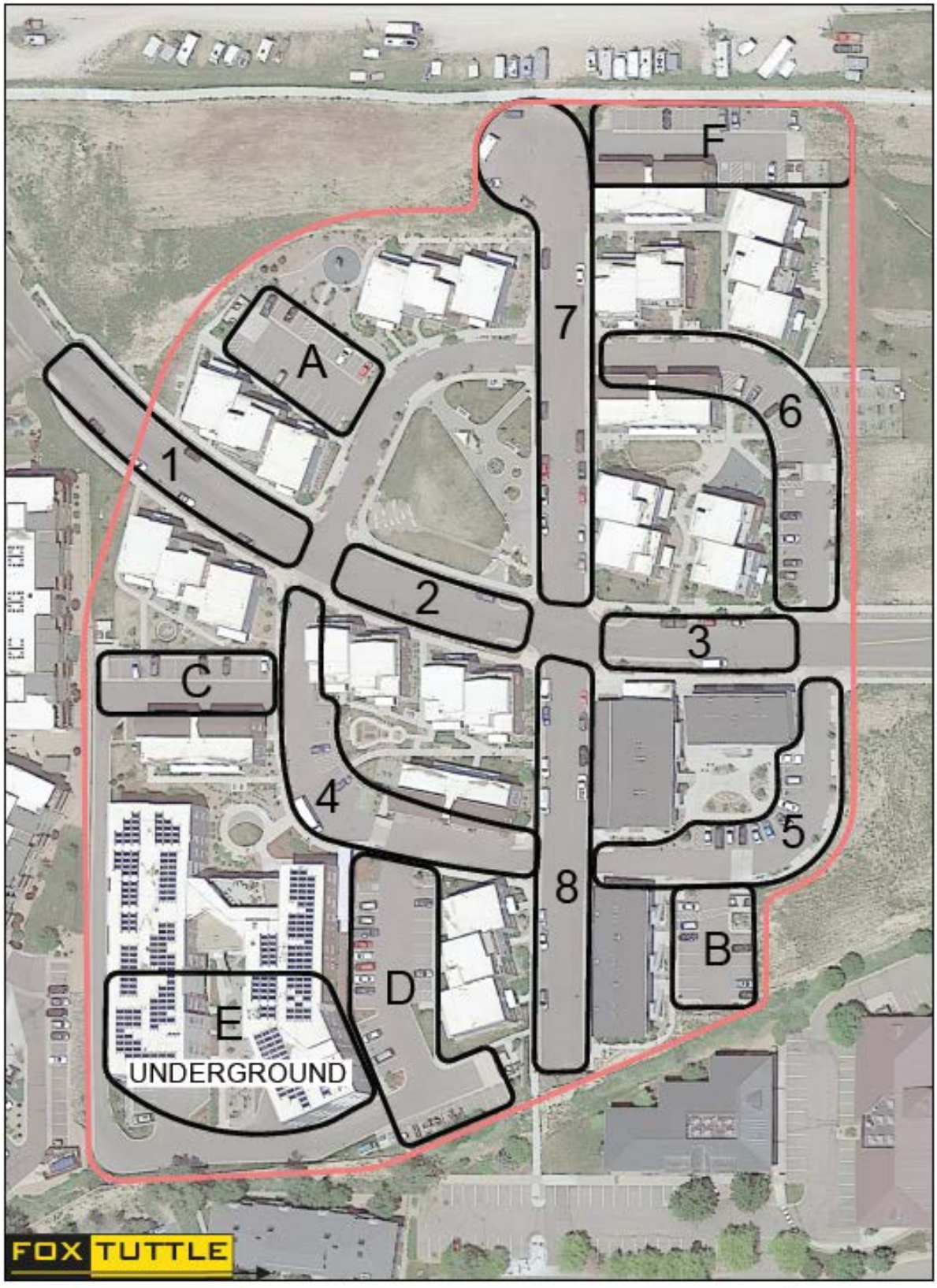
Based on the total units of Kestrel, the above parking counts result in the parking ratios (cars to units) below.

	Parking Ratios							
	5am-6am	7am-8am	9am-10am	11am-12am	1pm-2pm	3pm-4pm	5pm-6pm	7pm-8pm
TOTAL	0.98	0.90	0.71	0.68	0.70	0.59	0.77	0.86

Parking use in the Kestrel Housing center varies throughout the day, with the highest general utilization rate in Zone E (the structured parking lot dedicated to age 55 and over housing). The parking utilization for the majority of the zones, most times of the day is 50% of the parking supply or less. Consequently, at most times of the day, the demand for parking across Kestrel was 50% or less than the parking required in the Planned Unit Development (PUD).

In conclusion, based on parking usage at BCHA's suburban developments in Lafayette and Louisville, a reduced parking ratio of .30 cars to 1 unit at the Superior TOD site will adequately serve the residents of the affordable housing development. The residential parking ratio will be augmented by a Transportation Demand Management (TDM) plan, which includes the following: Neighborhood EcoPass program for residents, car share program (e.g., Colorado CarShare), bike sharing program, e-bike charging stations, and resident bike storage (in addition to the County's RTD Bike-n-Ride storage).

Figure 1
Kestrel Housing – Parking Zones



SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT / ZONE DISTRICT PLAN AMENDMENT #4

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

A PORTION OF THE SE 1/4 OF SECTION 13 AND THE N 1/2 OF THE NE 1/4 OF SECTION 24, T1S,R70W OF THE 6TH P.M.

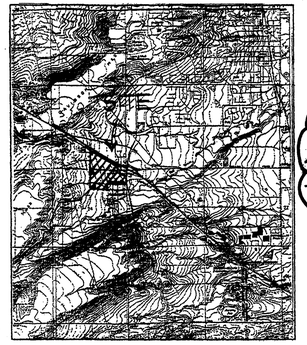
SITE DEVELOPMENT CRITERIA

Maximum Building Height :	
Retail:	35' (flat parapet height) 50' (entry elements, towers, or sloped roofs)
Theater building:	55'
Retail Building Setbacks	
From Public R.O.W.* :	20' min.
From Internal Property Lines :	0'
Min. Separation Between Freestanding Buildings :	0'
Parking Setbacks	
From all Public R.O.W.:	20' min.
From Internal Arterios :	10' min.
Typical Parking Stall :	9' x 18'
Typical Handicap Space :	14' x 18' (includes aisle)
Typical Parking Aisle :	24' wide
Internal Arterios :	25' min. flowline to flowline

* Rear of in-line buildings facing a R.O.W. shall be setback a minimum of 20' from R.O.W.

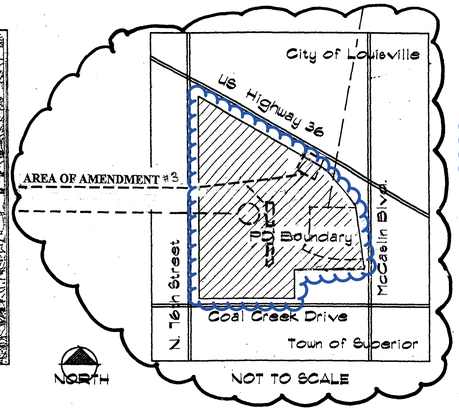
* Rears of buildings at 70th Street shall be setback a minimum of 30' from R.O.W.

VICINITY MAPS



1 : 48000

AREA OF AMENDMENT #4



LAND USE TABLE

SURA Site Area :	97.8 Acres	100%
Future Development Parcel :	9.1 Acres	9.3%
Gross Development Area :	88.7 Acres	90.7%

Gross Development Area includes R.O.W. areas as well as Retail Development.

Density :	Commercial : 7,565 s.f./acre (F.A.R. Of .17)	
Breakdown:		
Building Area Subtotal :	672,476 S.F. (15.5 Ac)	17.4%
Unobstructed Open Space:	22.8 Acres	25.7%
Other Open Space:	3.3 Acres	3.8%
Walks in front of buildings Plazas less than 5,000 s.f. Islands less than 400 s.f.		
Paving Area Subtotal :	47.1 Acres	53.1%
Roadways, drives, loading areas, and parking lots		
Total:	88.7 Acres	100% of gross

Parking Data/Requirements :

Provided: Total site spaces:	4,261 Spaces	
Retail Development:	3,861 Spaces	5.7/1000 s.f.
RTD Park-n-Ride	400 Spaces	

Required Ratios:
Retail : 4.8 spaces/1000 s.f. (min.)
Freestanding Restaurants : 8 spaces/1000 s.f. (min.)

Net Right-of-Way Area :	11.6 Acres	12.0%

Right-of-Ways

Marshall Rd.	5.64 Acres	5.8%
Extended Sycamore St.	2.38 Acres	2.4%
Extended Fifth Ave.	0.40 Acres	0.4%
East Side of 70th St.	2.94 Acres	2.6%
North Side of Coal Cr.	0.30 Acres	0.3%

Estimated Water Usage
208,000 Gallons daily use

Estimated Sewer Usage
.32 cfs daily use

ENTIRE PD BOUNDARY

A TRACT OF LAND IN THE N1/2, NE1/4, SECTION 24 AND IN THE S1/2, SE1/4, SECTION 13, ALL IN TOWNSHIP 1 SOUTH, RANGE 70 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF BOULDER, STATE OF COLORADO, DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SECTION 24, T1S, R70 W; THENCE S89°08'40"W, ALONG THE NORTH LINE OF THE NE1/4 OF SAID SECTION 24, A DISTANCE OF 621.20 FEET TO THE NORTHEAST CORNER OF THAT TRACT OF LAND DESCRIBED ON FILM 626 AS RECEPTION NO. 869600 OF THE RECORDS OF BOULDER COUNTY, COLORADO, WHICH CORNER IS THE TRUE POINT OF BEGINNING;

THENCE S32°34'10"E, ALONG THE EASTERLY LINE OF THAT TRACT OF LAND DESCRIBED ON SAID FILM 626 AS RECEPTION NO. 869600, A DISTANCE OF 240.50 FEET; THENCE S56°47'24"E, CONTINUING ALONG THE EASTERLY LINE OF THAT TRACT OF LAND DESCRIBED ON SAID FILM 626 AS RECEPTION NO. 869600, A DISTANCE OF 354.72 FEET; THENCE S8°01'22"E, CONTINUING ALONG THE EASTERLY LINE OF THAT TRACT OF LAND DESCRIBED ON SAID FILM 626 AS RECEPTION NO. 869600, A DISTANCE OF 530.65 FEET TO THE SOUTHEAST CORNER OF THAT TRACT OF LAND DESCRIBED ON SAID FILM 626 AS RECEPTION NO. 869600, WHICH CORNER IS ON THE NORTH LINE OF MAPLE STREET IN MINK'S ADDITION TO THE TOWN OF SUPERIOR, RECORDED IN PLAT BOOK 3 AT PAGE 36 OF THE RECORDS OF BOULDER COUNTY, COLORADO; THENCE S89°48'20"W, ALONG THE NORTH LINE OF SAID MAPLE STREET, A DISTANCE OF 1273.53 FEET TO THE WEST LINE OF FOURTH AVENUE IN SAID MINK'S ADDITION TO THE TOWN OF SUPERIOR; THENCE S0°11'40"E, ALONG THE WEST LINE OF SAID FOURTH AVENUE, A DISTANCE OF 366.60 FEET TO THE SOUTH LINE OF THE N1/2, NE1/4, OF SAID SECTION 24; THENCE S89°44'22"W, ALONG THE SOUTH LINE OF SAID N1/2, NE1/4, A DISTANCE OF 1262.71 FEET TO THE SOUTHWEST CORNER OF SAID N1/2, NE1/4; THENCE N0°11'17"W, ALONG THE WEST LINE OF SAID N1/2, NE1/4, A DISTANCE OF 1292.99 FEET TO THE NORTHWEST CORNER OF SAID N1,2, NE1/4; THENCE N0°00'56"E, ALONG THE WEST LINE OF THE S1/2, SE1/4, SECTION 13, T1S, R70W, A DISTANCE OF 1249.98 FEET TO THE SOUTHWESTERLY LINE OF U.S. HIGHWAY NO. 36 AS DESCRIBED IN BOOK 878 AT PAGE 263 OF THE RECORDS OF BOULDER COUNTY, COLORADO; THENCE S63°11'25"E, ALONG THE SOUTHWESTERLY LINE OF U.S. HIGHWAY NO. 36, AS DESCRIBED IN SAID BOOK 878 AT PAGE 263, A DISTANCE OF 847.75 FEET TO THE SOUTH LINE OF THAT TRACT OF LAND DESCRIBED IN BOOK 424 AT PAGE 247 OF THE RECORDS OF BOULDER COUNTY, COLORADO; THENCE N89°05'04"E, ALONG THE SOUTH LINE OF THAT TRACT OF LAND DESCRIBED IN SAID BOOK 424 AT PAGE 247, A DISTANCE OF 1.06 FEET TO THE SOUTHWESTERLY LINE OF U.S. HIGHWAY NO. 36 AS DESCRIBED IN BOOK 878 AT PAGE 267 OF THE RECORDS OF BOULDER COUNTY, COLORADO; THENCE, ALONG THE SOUTHWESTERLY LINE OF U.S. HIGHWAY NO. 36 AS DESCRIBED IN SAID BOOK 878 AT PAGE 267, THE FOLLOWING COURSES AND DISTANCES;

S63°09'10"E A DISTANCE OF 837.67 FEET; THENCE N26°50'50"E, A DISTANCE OF 10.00 FEET; THENCE S63°09'10"E A DISTANCE OF 350.00 FEET; THENCE S32°36'31"E A DISTANCE OF 367.91 FEET TO THE NORTH LINE OF SAID N1/2, NE1/4;

THENCE, DEPARTING FROM THE SOUTHWESTERLY LINE OF SAID U.S. HIGHWAY NO. 36, N89°08'40"E, ALONG THE NORTH LINE OF SAID N1/2, NE1/4, A DISTANCE OF 0.07 FEET TO THE TRUE POINT OF BEGINNING, COUNTY OF BOULDER, STATE OF COLORADO, CONTAINING 94.320 ACRES MORE OR LESS.

NOTES:

BEARINGS ARE BASED UPON THE NORTH LINE OF THE NE1/4, SECTION 24, T1S, R70W HAVING A BEARING OF S89°08'40"W (TRUE MERIDIAN).

BOUNDARY DIMENSIONS ARE TAKEN FROM SURVEY BY DREXEL BARRELL ENGINEERS/SURVEYORS DATED 12/5/94, JOB NO. 4632-25.

AMENDED PD BOUNDARY

SUPERIOR MARKETPLACE, FILING 5, LOT 6:

COMMENCING AT THE NORTHEAST CORNER SECTION 24; THENCE S89°08'48"W A DISTANCE OF 517.28 FEET TO A POINT ON THE WESTERLY RIGHT-OF-WAY LINE OF THE BOULDER-DENVER TURNPIKE, U.S. HIGHWAY NO. 36, BOOK 878, PAGES 267 AND 263; STATE OF COLORADO. THENCE S07°07'51"E ALONG SAID WESTERLY RIGHT-OF-WAY A DISTANCE OF 128.37 FEET, TO A POINT ON SAID WESTERLY RIGHT-OF-WAY SAID POINT BEING THE POINT OF BEGINNING; THENCE ALONG SAID WESTERLY RIGHT-OF-WAY THE FOLLOWING 4 COURSES:

1. S07°07'51"E A DISTANCE OF 17.44 FEET;
2. S24°49'24"E A DISTANCE OF 114.32 FEET;
3. S42°30'57"E A DISTANCE OF 142.79 FEET;
4. S73°20'49"E A DISTANCE OF 121.38 FEET;

THENCE LEAVING SAID WESTERLY RIGHT-OF-WAY ALONG THE WESTERLY LINE TRACT M S00°09'56"W A DISTANCE OF 421.95 FEET TO A POINT ON THE NORTHERLY RIGHT-OF-WAY OF MARSHALL ROAD; THENCE ALONG SAID RIGHT-OF-WAY THE FOLLOWING 2 COURSES.

1. S89°48'20"W A DISTANCE OF 485.17 FEET TO A POINT OF CURVATURE TO THE RIGHT;
2. ALONG SAID CURVE WHOSE RADIUS IS 398.00 FEET AND AN INCLUDED ANGLE OF 34°46'00", A DISTANCE OF 241.50 FEET TO A POINT ON SAID RIGHT-OF-WAY AND A POINT ON THE EASTERLY BOUNDARY OF TRACT L;

THENCE LEAVING SAID RIGHT-OF-WAY ALONG SAID EASTERLY BOUNDARY THE FOLLOWING 2 COURSES.

1. N04°04'38"W A DISTANCE OF 70.98 FEET; TO A POINT OF CURVATURE TO THE RIGHT, AND A POINT ON THE EASTERLY BOUNDARY OF LOT 4;
2. ALONG SAID CURVE TO THE RIGHT WHOSE RADIUS IS 261.23 FEET WITH AN INCLUDED ANGLE OF 19°05'05", A DISTANCE OF 87.01 FEET;

TO A POINT ON THE NORTHERLY BOUNDARY TRACT L; THENCE LEAVING SAID EASTERLY BOUNDARY ALONG SAID NORTHERLY LINE N67°29'52"W A DISTANCE OF 38.26 FEET THENCE ALONG AN ARC OF A CURVE TO THE LEFT WHOSE RADIUS IS 205.50 FEET WITH AN INCLUDED ANGLE OF 22°23'31", A DISTANCE OF 80.31 FEET TO A POINT ON THE EASTERLY BOUNDARY LOT 4; THENCE ALONG SAID EASTERLY BOUNDARIES OF LOT 3 AND SAID LOT 4 N00°00'00"E A DISTANCE OF 347.68 FEET TO A POINT ON SAID EASTERLY BOUNDARY OF LOT 3, AND A POINT ON THE SOUTHERLY BOUNDARY OF LOT 5; THENCE ALONG SAID SOUTHERLY BOUNDARY THE FOLLOWING 2 COURSES.

1. S90°00'00"E A DISTANCE OF 363.83 FEET;
2. N65°10'36"E A DISTANCE OF 71.62 FEET; TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS 411,216 SQ. FT. (9.43 ACRES) MORE OR LESS.

Memo of Record recorded on April 16, 2003 At Boulder County Clerks office Recording # 2426256

TOWN BOARD OF TRUSTEES' CERTIFICATE

Approved this 13th day of January A.D., 2003 by the Board of Trustees, Superior, Colorado. This approval is with the understanding that all expenses involving necessary improvements for all utility services, paving, grading, landscaping, curbs, gutters, street lights, street signs, and sidewalks, shall be financed by others and not the Town of Superior.

Phyllis A. Hardin
Town Clerk

Mayor

THE TOWN OF SUPERIOR SEAL COLORADO

PLANNING COMMISSION CERTIFICATE

Approved this 6th day of November A.D., 2002

Joseph F. Civelli
Chairman Superior Planning Commission

TOWN CLERK'S CERTIFICATE

I hereby certify that this instrument was filed in my office at 6:30 O'clock P.M. this 13th day of March A.D., 2003 and is duly recorded.

Phyllis A. Hardin
Town Clerk

CERTIFICATE OF OWNERSHIP

I Certify that NEW PLAN EXCEL REALTY TRUST, INC. is the owner of portions of the property, and has the right to immediate possession of the remainder of the property ~~under eminent domain actions filed by the Superior Urban Renewal Authority~~, and I consent to the above P.D. (KLB)

In witness whereof I hereunto set my hand this 12th day of March '03 by Thomas L. Mulkey as manager. New Plan Excel Realty Trust, Inc. by Thomas L. Mulkey as president.

The foregoing instrument was acknowledged before me this 12th day of March A.D. 2003 by Thomas L. Mulkey as manager of New Plan Excel Realty Trust, Inc. corporation and as president of my commission expires 9.26.04

Notary Public

KAREN A. PITZER NOTARY PUBLIC

DEVELOPER

NEW PLAN EXCEL
REALTY TRUST, INC.

563 W. 500 South
Suite #440
Bountiful, UT 84010

Tom Mulkey
(801) 296-6033

ARCHITECT/PLANNER

The Mulhern Group, Ltd.

1730 BLAKE STREET SUITE 435
DENVER, COLORADO 80202
303.297.3334
FAX : 303.292.2601
MICHAEL MULHERN
DWAYNE DALE

CIVIL ENGINEER

Hydro-Triad/V3, Colorado

200 UNION BLVD. SUITE 200
LAKEWOOD, COLORADO 80228
303.989.8588
FAX : 303.989.9932

MARK CEVALL

LANDSCAPE ARCHITECT

Norris/Dullea

710 WEST COLFAX
DENVER, COLORADO 80204
303.892.1166
FAX : 303.892.1186
DOUG CRAIG
JOHN BIRKEY

The information, drawings, intent, and concepts contained in this package are the property of the Ellman Companies and their use by any other party is strictly prohibited without the permission of the Ellman Companies.

REVISED JANUARY 14, 2000
REVISED MARCH 1, 2000
REVISED FEBRUARY 1, 2001
REVISED MARCH 20, 2001
REVISED APRIL 5, 2001
REVISED NOVEMBER 14, 2001
REVISED JUNE 28, 2002
REV SEPT 19, 2002

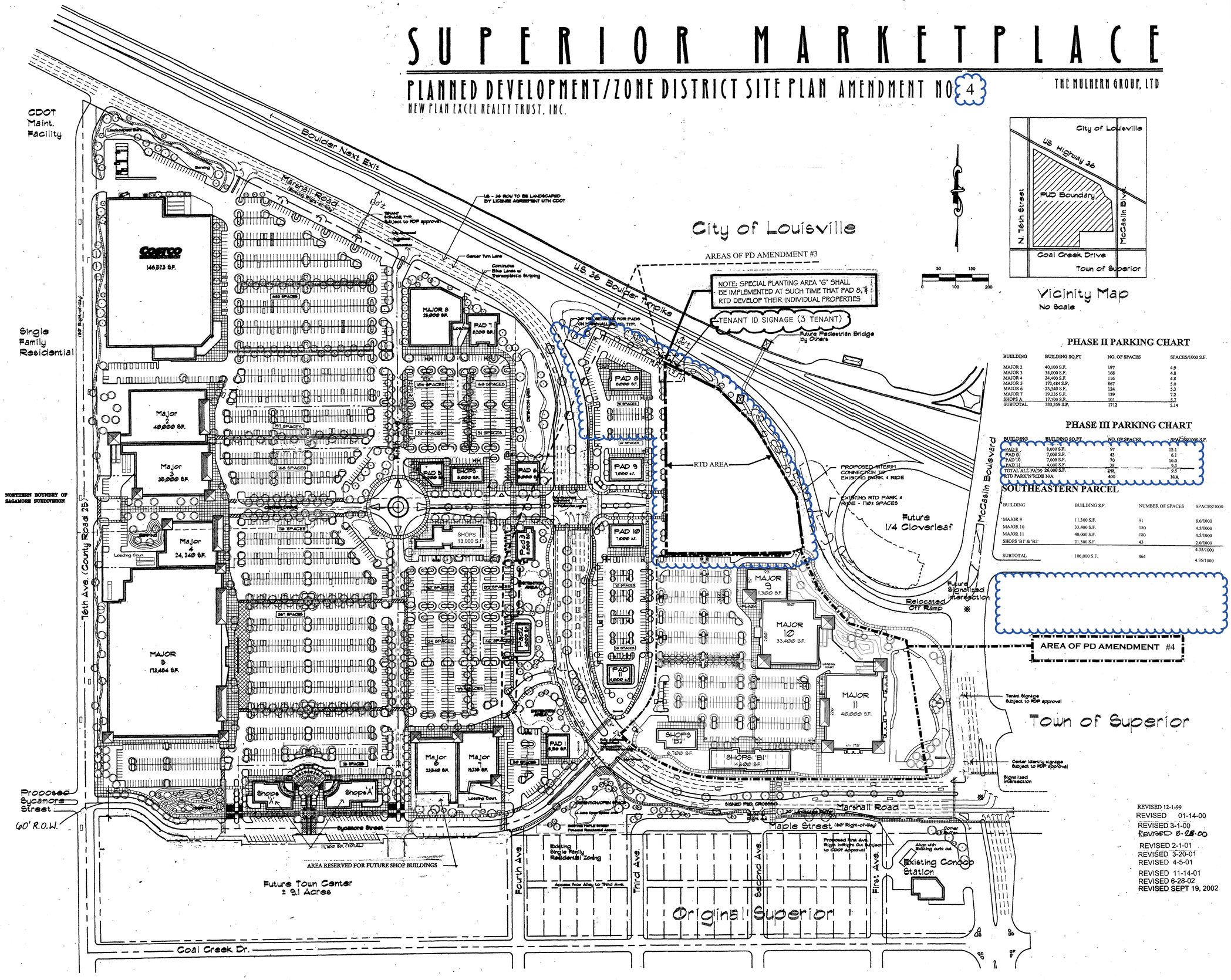
COVER SHEET : 1 OF 16

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT/ZONE DISTRICT SITE PLAN AMENDMENT NO 4

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD



Vicinity Map
No Scale

PHASE II PARKING CHART

BUILDING	BUILDING SQ.FT	NO. OF SPACES	SPACES/1000 S.F.
MAJOR 2	40,000 S.F.	197	4.9
MAJOR 3	35,000 S.F.	168	4.8
MAJOR 4	24,400 S.F.	116	4.8
MAJOR 5	173,484 S.F.	867	5.0
MAJOR 6	23,540 S.F.	124	5.3
MAJOR 7	19,235 S.F.	139	7.2
SHOPS A	17,200 S.F.	101	5.7
SUBTOTAL	333,359 S.F.	1712	5.14

PHASE III PARKING CHART

BUILDING	BUILDING SQ.FT	NO. OF SPACES	SPACES/1000 S.F.
PAD 8	8,000 S.F.	97	12.1
PAD 9	7,000 S.F.	43	6.1
PAD 10	7,000 S.F.	70	10.0
PAD 11	4,000 S.F.	38	9.5
TOTAL ALL PADS	26,000 S.F.	248	9.5
RTD PARK'N'RIDE	N/A	400	N/A

SOUTHEASTERN PARCEL

BUILDING	BUILDING S.F.	NUMBER OF SPACES	SPACES/1000
MAJOR 9	11,300 S.F.	91	8.0/1000
MAJOR 10	33,400 S.F.	150	4.5/1000
MAJOR 11	40,000 S.F.	180	4.5/1000
SHOPS 'B1' & 'B2'	21,300 S.F.	43	2.0/1000
SUBTOTAL	106,000 S.F.	464	4.35/1000

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 8-28-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED SEPT 19, 2002

THE MULHERN GROUP LTD.
ARCHITECTURE • PLANNING • INTERIORS

1730 BLAKE STREET SUITE 435
DENVER COLORADO 80202
303-297-3334 FAX 303-292-2601

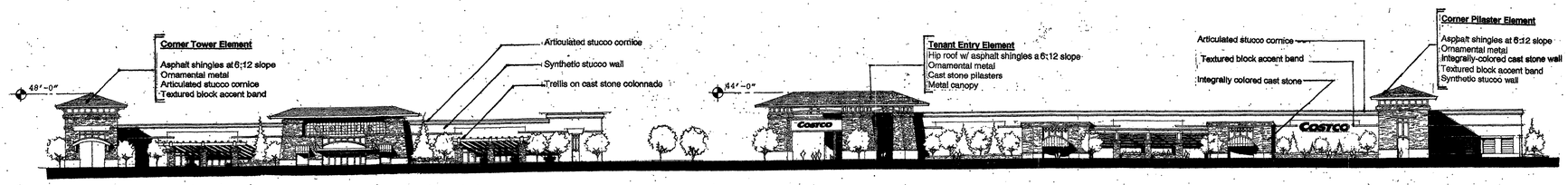
SUPERIOR MARKETPLACE
SUPERIOR, COLORADO

The information contained in this drawing file is intended for use only on this project. Unauthorized reproduction or use in other projects is not permitted. The Mulhern Group,ltd. assumes no liability for unauthorized reproduction, changes to or use of the information contained herein. The information contained herein is provided on an "as-is" basis. The Mulhern Group,ltd disclaims all warranties with regard to the data contained in this drawing file and to the performance of the delivery media, including all implied warranties of fitness. The Mulhern Group,ltd assumes no obligations or liabilities for damages, including, but not limited to, consequential damages arising out of or in connection with the use or performance of this drawing file and its delivery media.

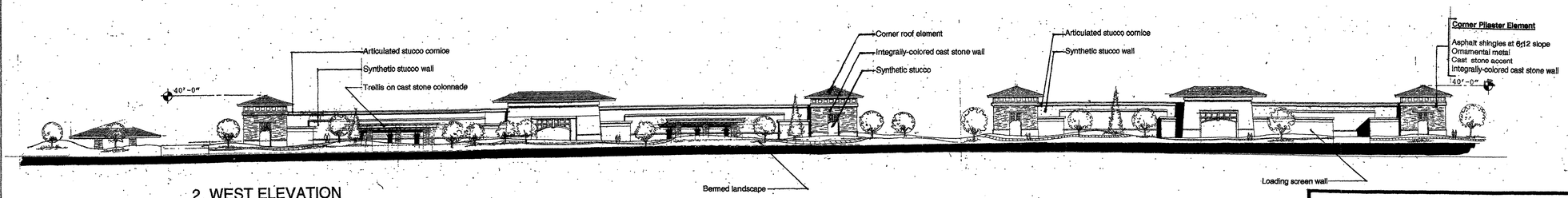
DATE	REVISION
2.20.98	PD SUBMISSION
3.9.98	PLAN REVISION
3.25.98	PLAN REVISION
4.14.98	PLAN REVISION
4.28.98	PLAN REVISION
5.14.98	PLAN REVISION
6.1.98	PLAN REVISION
1.25.99	PLAN REVISION
5.21.99	PLAN REVISION
REVISED	01-14-00

PROJECT NUMBER:	97046
DRAWN BY:	GD/DD/RW
CHECKED BY:	DD/MGM
DESCRIPTION:	SITE PLAN

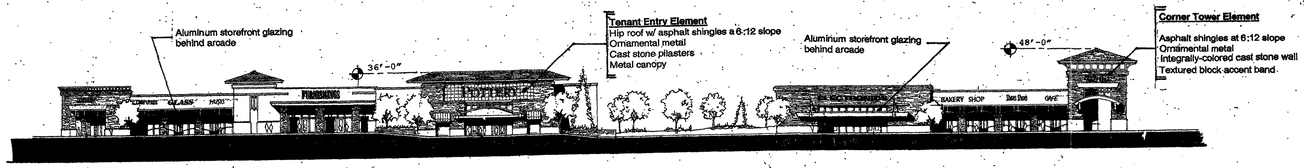
REFERENCE NORTH



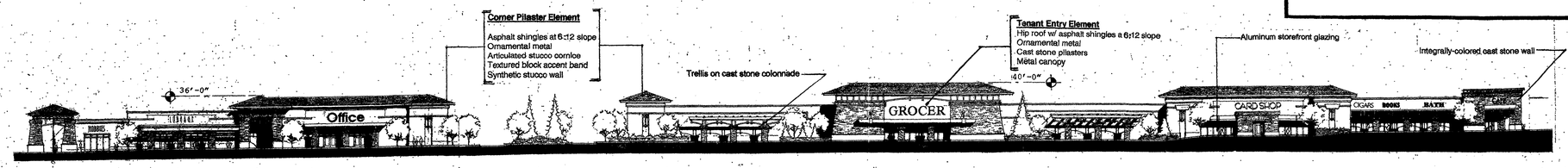
1. EAST ELEVATION
FRONT OF MAJORS 1 & 2
SCALE : 1/32" = 1'-0"



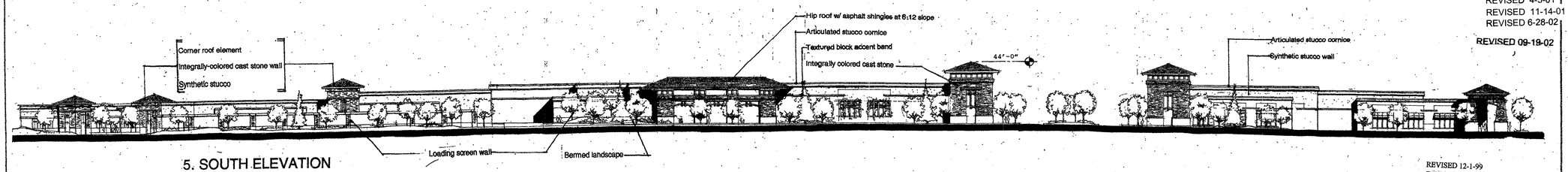
2. WEST ELEVATION
REAR OF MAJORS 1 & 2 FACING 76TH ST.
SCALE : 1/32" = 1'-0"



3. EAST ELEVATION
FRONT OF RETAILERS
SCALE : 1/32" = 1'-0"

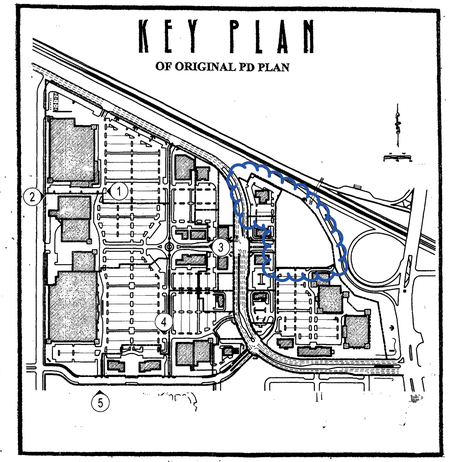


4. NORTH ELEVATION
FRONT OF MAJORS
SCALE : 1/32" = 1'-0"



5. SOUTH ELEVATION
REAR OF MAJORS FACING SYCAMORE ST.
SCALE : 1/32" = 1'-0"

NOTE: KEY PLAN "UNCHANGED" TO COORDINATE WITH REPRESENTATIVE ARCHITECTURE AS SUBMITTED WITH PREVIOUSLY APPROVED PD.



REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02

REVISED 09-19-02

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00

THE MULHERN GROUP LTD.
ARCHITECTURE • PLANNING • INTERIORS

1730 BLAKE STREET SUITE 435
DENVER COLORADO 80202
303·297·3334 FAX 303·292·2601

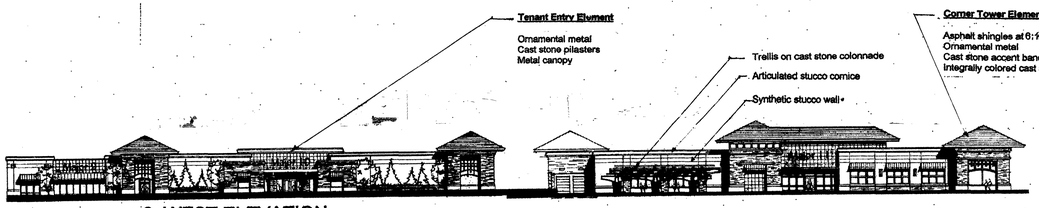
SUPERIOR MARKETPLACE
PD AMENDMENT #4
SUPERIOR, COLORADO

The information contained in this drawing file is intended for use only on this project. Unauthorized reproduction or use in other projects is not permitted. The Mulhern Group,ltd. assumes no liability for unauthorized reproduction, changes to or use of the information contained herein. The information contained herein is provided on an "as-is" basis. The Mulhern Group,ltd disclaims all warranties with regard to the data contained in this drawing file and to the performance of the delivery media, including all implied warranties of fitness. The Mulhern Group,ltd assumes no obligations or liabilities for damages, including, but not limited to, consequential damages arising out of or in connection with the use or performance of this drawing file and its delivery media.

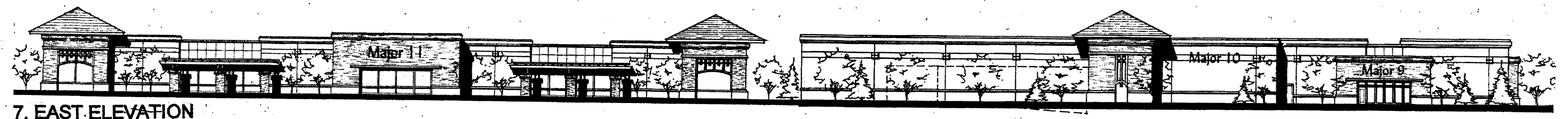
DATE	REVISION
2.20.98	PD SUBMISSION
3.9.98	PLAN REVISION
3.25.98	PLAN REVISION
4.14.98	PLAN REVISION
4.28.98	PLAN REVISION
5.14.98	PLAN REVISION
6.1 .98	PLAN REVISION
1.25.99	PLAN REVISION
5.21.99	PLAN REVISION
REVISED	01-14-00
PROJECT NUMBER:	97046
DRAWN BY:	DD/GD
CHECKED BY:	DD
DESCRIPTION:	ELEVATIONS

REFERENCE

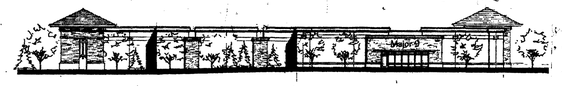
3



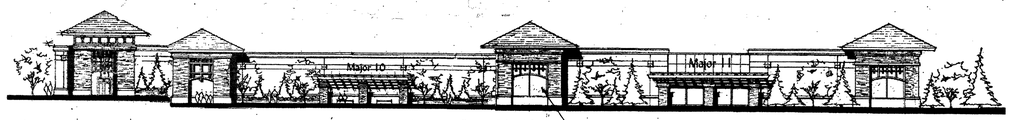
6. WEST ELEVATION
MAJORS 9, 10 & 11
SCALE : 1/32" = 1'-0"



7. EAST ELEVATION
MAJORS 9, 10 & 11
SCALE : 1/32" = 1'-0"

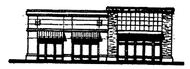


8. NORTH ELEVATION
MAJOR 9
SCALE : 1/32" = 1'-0"



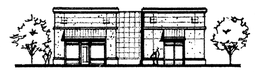
9. SOUTH ELEVATION
MAJORS 9, 10 & 11
SCALE : 1/32" = 1'-0"

10. NORTH ELEVATION
MARSHALL ROAD SHOPS
SCALE : 1/32" = 1'-0"

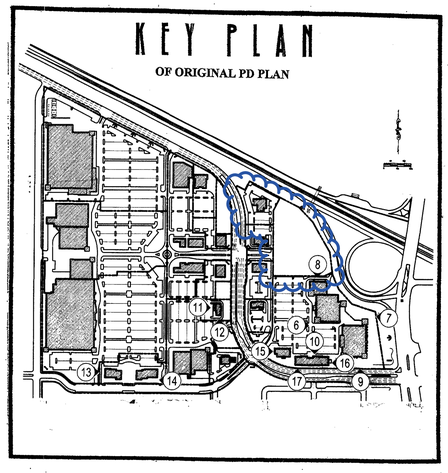


15. WEST/EAST ELEVATIONS
MARSHALL ROAD SHOPS B2
SCALE: 1/32" = 1'-0"

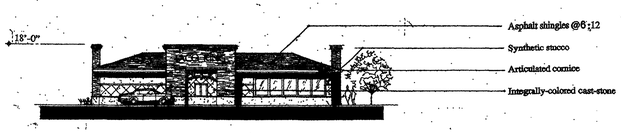
17. SOUTH ELEVATION
MARSHALL ROAD SHOPS
SCALE : 1/32" = 1'-0"



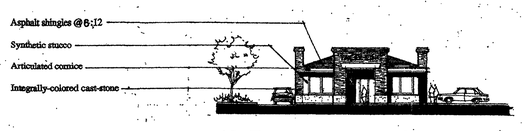
16. WEST/EAST ELEVATIONS
MARSHALL ROAD SHOPS B1
SCALE: 1/32" = 1'-0"



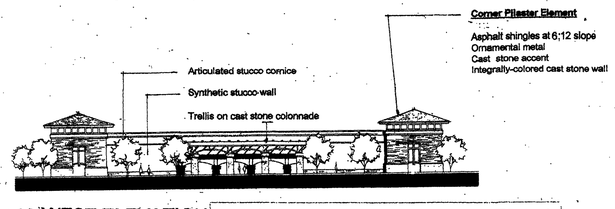
NOTE: KEY PLAN "UNCHANGED" TO COORDINATE WITH REPRESENTATIVE ARCHITECTURE AS SUBMITTED WITH PREVIOUSLY APPROVED PD.



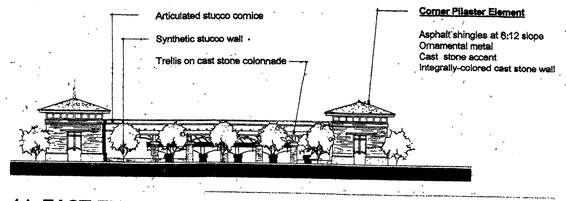
11. SOUTH ELEVATION
TYPICAL PAD BUILDING
SCALE : 1/16" = 1'-0"



12. EAST ELEVATION
TYPICAL PAD BUILDING
SCALE : 1/16" = 1'-0"



13. WEST ELEVATION (Final façade elevations subject to Town approval at FDP stage)
FIFTH AVENUE PROMENADE
SCALE : 1/32" = 1'-0"



14. EAST ELEVATION (Final façade elevations subject to Town approval at FDP stage)
FIFTH AVENUE PROMENADE
SCALE : 1/32" = 1'-0"

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

THE MULHERN GROUP LTD.
ARCHITECTURE + PLANNING + INTERIORS

1730 BLAKE STREET SUITE 435
DENVER COLORADO 80202
303·297·3334 FAX 303·292·2801

SUPERIOR MARKETPLACE
PD AMENDMENT # 4
SUPERIOR, COLORADO

The information contained in this drawing file is intended for use only on this project. Unauthorized reproduction or use in other projects is not permitted. The Mulhern Group,ltd. assumes no liability for unauthorized reproduction, changes to or use of the information contained herein.
The information contained herein is provided on an "as-is" basis. The Mulhern Group,ltd disclaims all warranties with regard to the data contained in this drawing file and to the performance of the delivery media, including all implied warranties of fitness. The Mulhern Group,ltd assumes no obligations or liabilities for damages, including, but not limited to, consequential damages arising out of or in connection with the use or performance of this drawing file and its delivery media.

DATE	REVISION
5.14.98	PD SUBMITTAL
6.1 .98	REVISION
1.25.99	REVISION
5.21.99	REVISION
8.23.99	PLAN REVISION
10.01.99	PLAN REVISION
11.4.99	REVISION
REVISED 2-1-01	
REVISED 01-14-00	

PROJECT NUMBER:	97046
DRAWN BY:	DD
CHECKED BY:	DD
DESCRIPTION:	ELEVATIONS

REFERENCE NORTH

4

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT/ZONE DISTRICT SITE PLAN SUBMITTAL

NEW PLAN EXCEL REALTY TRUST, INC.

A PORTION OF THE SE 1/4 OF SECTION 13 AND THE N 1/2 OF THE NE 1/4 OF SECTION 24, T1S,R70W OF THE 6TH P.M.

AMENDMENT #4

THE MULHERN GROUP, LTD.

SUBMITTAL DESIGN GUIDELINES

A. NARRATIVE

The proposed Superior Marketplace seeks to create a major commercial development for the Town of Superior. Elcor, LLC, intends to capitalize on the site's unique frontage on U.S. 36 and McCaslin Road, good access, adjacency to Original Superior, strong regional demographics and existing demand. While it is the intent of the center to provide a focal point for the community it is also the intent that this center will provide a synergy which will attract shoppers from up to seven miles away. Thereby bringing in substantial tax revenue for the Town.

The proposed site, while offering great opportunities, also poses substantial challenges. The final design must tie in well with Original Superior, with respect to both planning and architecture, while at the same time creating buffers which protect the single family core. The new circulation system must provide for good access to the proposed Towne Center mixed use development while also providing connectivity to Original Superior and newly proposed developments. At the same time, we must relocate a state highway, meet spacing requirements for signals along McCaslin and provide for an expanded interchange and Park 'n Ride facility.

We have sought to do this in the following manner:

B. CIRCULATION ELEMENTS

Circulation elements have become major factors in the determination of the final site plan. Key factors are the following:

1. Relocation of Marshall Road. Connecting McCaslin (near Maple) to the existing Marshall Road ROW west of what would be Fourth Avenue.

2. Location of Marshall Road just north of existing Maple. Alternatively to No. 1 above, allows existing Maple to act as a frontage road for existing residential lots facing north on Maple.

3. Provision of Sycamore Street from Third to 76th. Allows for direct access to Marshall Road and ultimately, McCaslin, for SURA's southern 9.1+/- acres of the mixed use development and the proposed Sagamore development. This access further protects Original Superior by providing quick, efficient travel to McCaslin thereby discouraging use of existing roadways.

4. Connection of future Fifth Avenue directly into the proposed commercial development. Provides direct connection into the heart of the center for existing development to the east and future developments to the south of the SURA District while not encouraging use by those not living in Original Superior.

C. BUFFERS

Three major buffers have been incorporated in the proposed plan:

1. Maple Street. Per the original Advisory Committee's recommendation, the proposal has incorporated a 30' landscaped buffer paralleling Maple Street and the relocated Marshall Road. Just north of the two existing residences on Maple, this landscaped buffer increases to 42' at the east and 57' at the western edge. This buffer will be bermed and well landscaped to protect the residential character of Maple Street as it develops. It will be pierced at strategic locations to provide pedestrian and bicycle connections from Original Superior to the commercial development.

2. 9.1+/- acres from Coal Creek to Maple, 4th to 76th. This area is planned as a transitional zoning buffer between the residential planned south of Coal Creek (per the comp plan) and the larger commercial district. It is proposed as a commercial or government center in accord with current zoning. It will tie to the major commercial development via the 5th Avenue Promenade. To minimize traffic impacts on Coal Creek curb cuts for the development should be predominantly located on Sycamore Street thereby discouraging use of Original Superior street system.

3. Rear of commercial development. To minimize adverse impacts by the rear of the commercial development we have sought to create service courts versus the typical "wraparound" service drives. In most cases, backs of buildings parallel the street being separated by a landscaped area with a minimum depth of 25' from the property line combining with an additional setback from the curb of 18' to create a total setback of 40-43'. Acting with the streets, a strong buffer is created for existing and future residential developments. Contrasting this, retailers (pads) along Marshall shall generally be within 20' of the ROW to reinforce the "urban" nature of the plan.

D. PLANNING OF THE COMMERICAL DEVELOPMENT

The commercial development has been broken into two major components.

West of Marshall Road will be a commercial development of approximately 56 acres. The size of this development is such that it should provide for an interesting mix of tenants, including general merchandise, soft goods, electronics, party goods, groceries, office supplies and restaurants.

The Marketplace provides for a large mix of tenants oriented east and north with various outbuildings articulating entries at Marshall Road.

The Master Plan features two major tree-lined drives which meet at a landscaped roundabout at the center of the development. Deep landscaped setbacks have also been provided along Marshall Road to allow for gracious landscaped detention areas along the major thoroughfare. The southern portion of the major north-south drive has been widened and landscaped to create a major promenade in order to link with future development to the south.

Major buildings step in and out to create visual interest and break up large masses while drives and pedestrian walks meander to address this stepping. This meandering slows traffic while creating interesting walks similar to the development at 92nd and Sheridan.

Parking is presently provided at a minimum of 4.8 sp/1000 s.f. In most cases we are shooting for ratios of 5 sp/1000 s.f. of retail and 10 sp./1000 s.f. of restaurants to assure adequate parking for all. Landscaped islands are provided every 20 spaces per Superior guidelines and linear landscaped medians are provided at strategic rows to further break up larger parking areas.

E. EASTERN COMMERCIAL DEVELOPMENT/TRANSPORTATION HUB

The eastern area is comprised of approximately 21.77 acres. It has been planned to provide an entertainment complex in concert with restaurants and an expanded RTD Park'n Ride.

Circulation is simple with a major tree-lined north-south drive at the west end of the parking area accessed at the Sycamore intersection. This drive is designed to provide connections to parking for the Park 'n Ride. A second east-west boulevard off the center's major entrance provides direct access to some shops, a drop-off for the Park 'n Ride and the Southeastern retail complex.

Majors with adjacent shops are planned for the eastern edge with the Park 'n Ride located at the northeast portion of this area. Restaurants and shop spaces are located at major entries along Marshall Road. Also incorporated are two specialty shop buildings which front on Marshall Road. The buildings have been designed to provide interest along Marshall Road while providing a buffer from the lights and activity of the major parking lot for Original Superior.

F. ARCHITECTURAL THEME

The major buildings and shops buildings will be of an architecturally consistent theme incorporating similar materials. All other buildings shall be controlled per the proposed architectural guidelines and the CC& R's as submitted to the town.

In development of the theme it shall be our effort to create a look which is unique to and compatible with the town of Superior. The magnitude of the Marketplace and the fact that it is the only major commercial development in the town will help to assure that the image of the town is conveyed through the Marketplace. This may be furthered by the introduction of this design vocabulary to other commercial and residential developments proposed within the town in the future.

ARCHITECTURAL GUIDELINES

A. INTENT

The Superior Marketplace is intended to be a comprehensively designed retail, entertainment and commercial development. When completed, it will bring together a wide array of tenants offering an extensive range of goods, entertainment opportunities and a smaller scale commerce or government development to the Town of Superior. This is to be in an architecturally unified, well-landscaped complex which provides for a safe, pleasant, and interesting shopping environment for the citizens and guests who visit this exciting mixed use development.

To that end, plans and conceptual elevations have been developed and are attached to this PD . Should there be necessary future design deviations of the major buildings or as one seeks to determine the appropriate design of the planned pad buildings, the following guidelines are set forth.

The architectural "theme" for the Superior Marketplace is best described as a "Craftsman Image," with a distinctive combination of materials and forms to create the theme. Throughout Superior, one is struck by the use of Colorado native sandstone on bridges and on public buildings, as well as generous use in the Rock Creek subdivision. This abundance legitimizes this material as "indigenous" to Superior. Because of this, the proposed architecture has been provided with a generous amount of cast stone to augment and perpetuate this material as the image presented by Superior.

The use of integrally-colored cast stone, stucco and ornamental metal combine in Craftsman-style forms: towers with hipped roofs, battered walls and pilasters to support ornamental metal and colonnades with arching metal accents to create arcades that support metal canopies. Roofs and canopies provide generous overhangs to emphasize their horizontal nature - a Craftsman aesthetic. Ornamental iron accents this and creates another layer of design unifying the different forms of the composition. Towers combined with hip roofs break up the parapet lines of the retailers, helping to create an intriguing roofscape. The arrangement of towers, colonnades and major tenant entries creates a composition of elements that establish a hierarchy for the center, while reducing the mass of the development to a more human scale. The arrangement of elements seeks to differentiate tenants and will be employed in such a fashion so as to accentuate this. Freestanding towers, pilaster towers, and parapet towers articulate building corners and different tenants. Arcades define entries, retailer storefronts and help to break up long building facades.

Although there is not a set "formula" for which users employ which specific elements, the elevations convey an overall sense of variety in the sequencing and relative spacing of the elements. Parapet lines between users may stagger to convey a difference in floor levels; however, this stagger should be distanced by use of a tower, roof, or pilaster element.

B. THE MAJOR BUILDING ENVELOPE

The Major Building envelope shall be composed of accented stucco with details and color to establish a base, middle and top. It shall be enhanced by cast stone at the entries, tower elements and trellis elements, if included in the composition, and at sidewalk planters. The building design has been varied to incorporate variations of the craftsman theme to provide additional interest and richness in the overall composition. Said design shall be complementary to the overall theme. Attention to sequencing of massing elements to reinforce an overall hierarchy of elements will be maintained. A 360° architecture will be employed by pulling towers and trellises with stucco patterning, ground face block banding, articulated cornices and accent detailing around to the sides and rears of the buildings.

Materials incorporated shall be as follows:

1. Fronts:
   a. Cast Flagstone: Stone to cover not less than 30% of the overall area of all users combined. The front face of columns faced in stone shall be considered a part of the facade, as would attached stone-faced planters. Stone may be intermittent between users, so long as an average of 30% is maintained on each major massing (i.e., Major 1 and Major 2, south of Major 2 to the southwest pedestrian plaza, from the southwest pedestrian plaza to 5th Avenue and from 5th east), unless approved otherwise by the Town.

   b. CMU: Maximum wall area allowed shall not exceed 25%. CMU shall only be used to create bases or accent banding with split or ground face units (integrally colored or stained). Banding shall be utilized to differentiate between a frontage's base, middle and top. Differentiation shall occur on 75% of the buildings, minimum. Bands shall not exceed 16" in height, typical. Bases shall not exceed ¼ of building height, maximum.

   c. Stucco: Approved colors and textures only. Stucco shall not exceed 75% of area averaged over entire center's frontages.

   d. Glazing: All users shall incorporate not less than 25% of linear frontage as glazed doors or windows. All window and door frames to be uniform in color and finish throughout center. (Color shall be bronze duranodic or a compatible "kynar" color). Users are encouraged to increase amount of glazing in building frontages.

Exception. Major 1, being 136,565 s.f., (a discount warehouse operation), and a major grocer of 55,000-75,000 s.f. shall be exempt from the "glazing" portion (1.d) of this provision although efforts by these users to meet these requirements is encouraged.

2. Sides:
   a. Cast flagstone: To cover no less than 15% of overall wall area (including columns and attached planters) unless otherwise approved by Town.
   b. CMU: Maximum wall area shall not exceed 25%. Banding to occur at specifically designated portions. Banding shall be utilized to differentiate between a frontage's base, middle or top and shall not exceed 16" in height, typical. Differentiation shall occur on 75% of the buildings, minimum.
   c. Stucco: Approved colors and textures only.
   d. Glazing: Users shall be encouraged to incorporate glazing wherever appropriate.
3. Rears:
   a. Cast flagstone: To cover no less than 15% of over all wall area exposed to public view (including columns and attached planters) unless otherwise approved by Town. See special notes for Sycamore Street elevations.
   b. CMU: Maximum wall area shall not exceed 25%. Banding to occur at specifically designated portions. Banding shall be utilized to differentiate between a frontage's base, middle or top and shall not exceed 16" in height, typical. Differentiation shall occur on 75% of the buildings, minimum.
   c. Stucco: Approved colors and textures only.
4. Roofs:
   All sloped roofs to conform to a 6:12 slope, typical and be covered with center standard roofing material (as determined by town planning review process). The use of hips, sheds and towers are encouraged to provide a variated roofscape. No more than 70% of any visually unbroken façade (may include multiple tenants)shall be flat (straight) parapet unless interrupted by sloping (shed or hipped 6:12 slope) residential roof elements. When flat parapets do occur, they shall be capped by either an articulated cornice (center standard) or pre-finished metal coping cap of complimenting color. Roofing matls. to be approved by Town at FDP stage.
5. Screening of rooftop units:
   All HVAC units throughout the SURA District shall be screened from view within Superior by a building parapet of equal height, or a screen wall of stucco to match design, detailing and the materials of the building or other appropriate screening. Determination of the appropriateness of the design as to its location shall be the sole discretion of the Town staff.

6. Wall Composition:
   In an effort to alleviate long uninterrupted facades, any wall face shall conform to the following restrictions.

   Main Building Frontage (incorporating primary entry doors).

   a. No wall expanse shall extend over 75 lineal feet without incorporating at least one architectural feature(s)of at least 24' in length total and at least one-third the building height. Architectural features shall include either towers, entry elements, flagstone colonnades with trellis', pilaster towers, vision glass, or display windows. Attached planters at buildings shall not be designated as an architectural feature, however, the use of cast stone at the planter face may apply to a frontage's minimum cast stone requirements as it is in essence a projection of the building base. Attached planter boxes of cast stone shall be provided at a minimum of 25% of building frontage on at least one-half the users, averaged over the entire center.

   Note: Glazing is included as an architectural feature to encourage tenants to incorporate glass. Windows, whether looking into the store or presenting display add substantially to a building's interest both during the day or night.

   b. Building Sides and Rears. Architectural features as listed above shall occur in no less than 20% of the outer lineal wall length while also meeting the 75' rule. Said articulation need not occur within a loading court area. However, wall area above the elevation of screen wall must display cornice details and roof details as in accord with previously noted requirements.

   c. Diagonal Screen Walls Adjacent to Intersection of 76th and Sycamore. Since these walls may shield a majority of the shop's rear facades, as the outer wall face, they shall be distinguished by architectural elements that may include:
      - Metal trellis attachments
      - Cast stone pilasters
      - CMU accent band coping cap

   Said elements shall encompass not less than 20% of the screen wall area applied to and the amount of cast stone shall meet the Sycamore Street Design Guidelines.

C. BUILDING ENTRIES

The entry to each major user shall be highlighted and protected by a well-designed arcade vestibule, awning, or canopy. These elements shall be composed of not less than 50% cast flagstone, with the remaining being ornamental metalwork, canopy awning elements, stucco sign band or flagstone tiles. Said tenant entry should employ the integrally-colored cast stone and/or ornamental metal to contrast from the Major Building envelope. The scale or mass of any tenant entry should be proportional to the square footage of said user. Said determination of proportionality shall be at sole discretion of Town staff at FDP stage. No entry element shall exceed beyond 1/3 the building height over parapet line. Signage should work in proportion to the entry element to create a pleasing architectural composition.

D. ORNAMENTAL IRONWORK

Where appropriate, ornamental ironwork, complimentary to that illustrated in the PD shall be introduced into the overall composition. A variety of designs will provide for additional architectural interest, as well as continuity, throughout the center. All styles of ironwork are shown on, or shall be compatible with the styles indicated on the building elevation sheets. No less than half (50%) of the primary building entries shall display ornamental ironwork. Said ironwork to envelope a minimum of 5% of these entry elements. (Tracking of percentage rules shall be by Architectural Review Committee established by Master Developer).

E. PEDESTRIAN WALKS

The Superior Marketplace has been designed to provide a pedestrian-friendly environment. Therefore, special attention shall be given to all walking surfaces especially those in front of each retail space. Walks at major public areas, i.e., Plaza, Pedestrian Plaza at 2nd and Marshall, major entry drive shops, the 5th Avenue promenade, the Southwest Shops Plaza and any other special plazas, shall feature additional scoring and a minimum of 20% colored concrete. Also incorporated shall be an area of integrally colored concrete pavers, brick pavers or stamped concrete. Said area shall equate to a minimum of 5% of that area designated as special paving area. Street trees shall be placed adjoining a facade and planters shall be placed between building entries where grade changes occur and unbroken walk areas exceed a width of 20 feet. These trees shall be placed in tree grates or shrub beds. Tree locations may be adjusted, however, the number of trees shown on the PD at the sidewalks, shall not be reduced. Architectural paving shall be introduced at handicapped ramp areas. Pedestrian pole, wall-mounted lights, freestanding sidewalk benches and colonnades with trellises will work to finish the pedestrian nature of the building fronts. Lights and street furnishing are further described below.

1. Restrictions:
   a. Minimum depth from curb to building at pads is 12'. Minimum depth from curb to building at major users and outlying shop buildings is 15', however, average depth at major users shall not be less than 20' including planters.

   b. Minimum number of trees at front facades. All building entry frontages shall include a minimum of one street tree per 40' of frontage on the average. Said trees may be located in tree grates, shrub beds, grass lawns or attached or detached planters.

   c. Attached planter boxes of cast stone shall be provided at a minimum of 25% of building frontage on at least one-half the users, averaged over the entire center.

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 5

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT/ZONE DISTRICT SITE PLAN SUBMITTAL

NEW PLAN EXCEL REALTY TRUST, INC.

A PORTION OF THE SE 1/4 OF SECTION 13 AND THE N 1/2 OF THE NE 1/4 OF SECTION 24, T1S,R70W OF THE 6TH P.M.

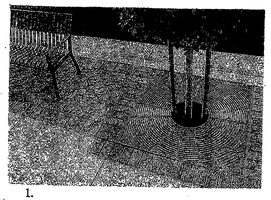
THE MULHERN GROUP, LTD.

AMENDMENT # 4

F. SITE FURNISHINGS

Major site furnishings include benches, waste receptacles, bicycle racks, and tree grates. In general, visual continuity of these elements is desired throughout the project. The color, in addition to design, will create continuity on the site. All components of outdoor site furniture should be low maintenance and durable. Said fixtures shall be located at all major pedestrian plazas and other areas deemed appropriate in the F.D.P. phase.

1. Tree Grate: Ironsmith Olympian or approved equal
2. Trash Receptacle: Victor Stanley The T Series or 32 gallon steel receptacle with standard spun steel tapered lid or approved equal
3. Radius Bench with Back: Gametime The Ultrum Collection or approved equal
4. Backless Bench: Gametime The Ultrum Collection or approved equal
5. Bicycle Racks: Cycloops Super 2175 or approved equal.

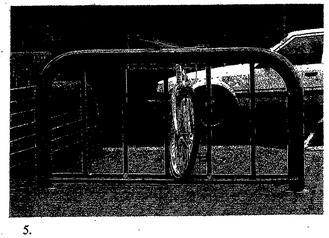


1.

2.

3.

4.



5.

G. PAD BUILDINGS

These buildings, by their nature, are in high visibility locations. Given this, 360 degree architectural treatments shall be embraced and great sensitivity must be given to the screening of service areas and utility entries. The architecture of these buildings shall be compatible to that of the center in mass, material, color and details. All facades of these pad buildings shall be a minimum of 20% integrally-colored cast stone. CMU (groundfaced or splitfaced), may be used as a base or accent band only. Bands shall not exceed 16" in height, typical. Bases shall not exceed ¼ of building height, maximum. Roofing materials must be compatible with the overall design and color intent of the center. These shall be determined by planning staff. Entry areas shall be highlighted by unique architectural treatments where appropriate. The introduction of display windows for users backing up to Marshall Road and McCaslin Boulevard shall be encouraged, and 20% of lineal frontage on these roads shall be vision or display windows to at least 10' above finished floor. Spandrel glazing shall not be utilized in these calculations. (Note: Spandrel glass may only be used to expand a field of vision glass. It shall be limited to 25% of that field, maximum).

Ornamental ironwork shall be worked into arcades, vestibules and/or canopies. Canvas awnings may be incorporated, however, they shall not be backlit. The sidewalk treatment shall be restricted as previously noted in "E. Pedestrian Walks" and landscaping of pad sites shall meet the intent of the original quality of the design with respect to size and spacing of materials including ground cover and mulch. For purposes of these guidelines, the proposed theatre (and attached) buildings shall be designated as "pads."

Pad buildings may incorporate a drive-thru with the exception of those included in the entry restaurant/shop complex in the conceptual plan. (Pads 3-6 and the adjoining shops buildings.)

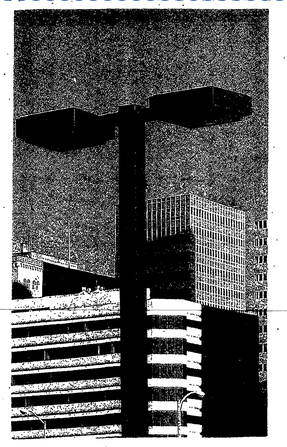
H. LIGHT STANDARDS

All light standards, be they parking, pedestrian pole or wall-mounted fixtures, shall be those shown in these documents.

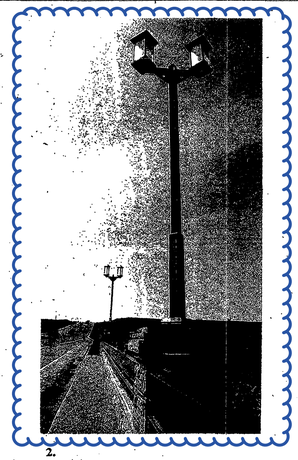
Lighting Fixtures.

Lighting fixtures incorporated within the SURA District shall be as follows:

1. Street Lighting: Street lighting fixtures shall be similar, as shown in illustration "#1" or an approved equal. Said fixtures shall be green to match McCaslin standards and shall not exceed District standards for height. Fixtures shall exhibit cut-off capabilities to minimize off-site spillage.
2. Parking Lot Lighting: Parking lot lights shall be the same as the street lights shown in illustration #1. Said lights shall not exceed a height of 35' including the concrete base. Fixtures shall exhibit cut-off capabilities to minimize off-site illumination spillage.
3. Ornamental Lights at Sidewalks and Pedestrian Plazas: Ornamental lights at sidewalks and pedestrian plazas shall include double-pole mounted; single-pole mounted and wall-mounted fixtures designed to match those ornamental fixtures at the bridge on McCaslin. See illustration #2.
4. Security Lighting: Security lighting may be wall packs and of colors noted in the color section. Said lighting shall be allowed at loading areas only. Said lights shall not project above dock screen wall.



1.



2.

I. 5th AVENUE PROMENADE

NO LONGER VALID

J. COLOR SCHEME

As all buildings are to be architecturally compatible, variations in sympathetic colors will afford interest to the overall center and help provide a human scale for the center. The range of colors shall be as follows:

1. Integrally-colored cast stone: Although a range of hues is anticipated, all units to be in the red/brown/buff range to be sympathetic to stone utilized. Applied in a "mountain ledge" pattern across composition, colors should not be segregated in order to create a uniformity across the site.
2. Stucco: Smooth to medium textures will be utilized in a range of light tan to medium browns to contrast yet compliment the rough texture and deep colors of the cast flagstone.
3. CMU: (split face or ground face) Will be stained or integrally colored at new buildings to avoid a "painted" look. This stain shall be complimentary to the colors of the stone and stucco.
4. Ornamental Ironwork: These colors shall bring life to the color compositions. They should give a clean, crisp feeling. Colors may be bright white, off white, or hunter/forest green, and deemed appropriate (at Town staff's discretion) to the architectural composition of the building and pavilions overall.
5. Glazing: Glazing shall be clear only.
6. Glazing System: The Glazing System shall be medium bronze anodized aluminum, or green (center standard) "Kynar " finished or bronze duranodic.
7. Architectural Roofing: Shall be uniform across site, to be determined by planning staff resolution.
8. Light Standards: Lights and light standards in parking areas, major drives and pedestrian walkways shall be green to match those fixtures at McCaslin. Lights and light standards at loading bays may be bronze anodized or of a color to match the adjacent wall surface so that they disappear.
9. Pre-cast concrete: Pre-cast concrete shall be light tan/buff.
10. Awnings: Awning color may vary as long as it is appropriate to the building composition. However, awnings may not be orange or black.
11. Accent tiles: Accent tiles of green, black, tan or white may be introduced if successfully integrated into the architectural design of the building and shopping center.
12. Corporate Colors: Corporate colors may be exemplified in signage, awning and logo, however awning may not be orange or black.

K. ELEVATIONS OF COMMERCIAL STRUCTURES FACING SOUTH ONTO SYCAMORE STREET.

In any major retail development there exists a rear of buildings where loading service and storage occur. Sycamore Street will be an important entry conduit for the Sagamore development and the SURA District community parcel. Fifth Street will provide an important access point to the commercial development from Original Superior, thus additional care must be taken in the design of this frontage.

These guidelines shall apply to either the rear of majors without "community shops" planned in front of them.

1. Cast flagstone shall cover no less than 15% of overall wall area in public view (areas within loading courts are exempt).
2. The architecture at the corners of buildings adjacent to 5th Street shall make an "entry statement" through the use of pilaster tower elements.
3. The intersection of 5th and Sycamore shall be made pedestrian friendly through the use of concrete crosswalks and small plazas at the northern corners.
4. Loading areas shall be clustered as loading courts wherever possible. 13'-6" (minimum) screen walls shall be provided at all dock areas directly adjacent to the ROW.
5. The rear of these buildings shall incorporate sloped roof elements which comprise a minimum of 20% of the length of the Sycamore facades.
6. The architecture detailing of these buildings shall be in keeping with the fronts of the buildings however at a limited scale. Therefore wrapping the building architecture.
7. Landscaping. Landscaping shall be taken to the building wherever possible. Said landscaping shall include a variety of meandering berms planted with a combination of deciduous and coniferous trees.

   In addition, two quiet pedestrian seating areas shall be incorporated just off the sidewalk area on the north side of Sycamore.
8. Glass. Although glazing is typically not appropriate to the rear of a building its use is encouraged. To that end, if a tenant introduces glass along this frontage in the form of a vision window, or display window said tenant shall be allowed sensitively applied signage at this frontage. Said sign area shall equal one square foot per square foot of glass area. However, said sign shall not exceed 18" in height nor 50 s.f. total. All signage shall be individually pan channel letters. However, they may not be illuminated.
9. Sycamore Street Location. The preliminary PD shows a location of Sycamore Street which the Authority, the Town and Redeveloper agree may need to be relocated to accommodate the desire of the Town and the Authority to permit construction of retail shops on the Property on the north side of, and facing, Sycamore Street. If the buildings or other improvements shown on the preliminary PD have been relocated up to ten (10) feet north to accommodate such retail shops, and if requested by Elcor, the Town and the Authority agree to relocate the street up to an equivalent of ten (10) feet south of the original planned location so as to accommodate the possibility of future construction of commercial buildings facing Sycamore Street. Redeveloper shall design and locate buildings to be constructed by Redeveloper on the Property so as to permit possible future construction by Redeveloper of commercial buildings facing Sycamore Street; provided, however, Redeveloper shall have no obligation to construct such buildings at any time; and provided further, that no event shall Redeveloper be required to locate any building more than ten (10) feet north of the location depicted.
10. SMALL SCALE RETAIL SHOPS

    Since this revised PD incorporates retail shop buildings that are conceptually different from the rears of Major tenants concieved in the initial submittal, the following will apply to said retail buildings:

    A. All elevations shall employ a minimum of 20% cast stone, primarily used in entry elements, sign areas and corner pilasters, typ.

    B. Sloped roofing elements shall be restricted, to create a smaller sense of scale.

    C. Maximum shop building height = 28' A.F.F.

    D. Glazing shall cover no less than 50% of the north and south facades.

L. LOADING DOCKS.

Loading dock areas must be sensitively handled throughout the project. To that end, the following shall apply:

1. Dock areas where exposed to public view, shall be screened with a masonry wall that is a minimum of 13'-6" above the grade of dock and a minimum length of 55' to effectively screen a tractor trailer. Said wall shall meet architectural requirements listed in this document.
2. If loading docks are within 150' of residentially zoned property and loading occurs between the hours of 10 p.m. and 6 a.m., said dock areas shall be also enclosed by a roof structure.
3. Lights incorporated at dock areas and at the rear of buildings shall be "cut off" fixtures not allowing casting of light onto the ground plane beyond the property line at adjacent ROWs.
4. Noise at loading docks shall not exceed the following decibels at property lines adjacent to a residentially zoned property:

   Sycamore. 50 dba both day and night.*

   76th Avenue. 50 dba from 7p.m. to 7a.m.
   60 dba from 7a.m. to 7p.m.

These levels are to be enforced as per the Colorado Revised Statutes Volume 11A, 1989 Replacement Volume, Government IIA, Article 12, Noise Abatement.

*55 dba allowed both day and night if no residential located south of Sycamore St.

M. SPECIAL COVENANTS.

1. Special covenants shall be introduced into the development's C.C.&R's to control the following:
   a. At auto uses special covenants requiring provision and maintenance of trash receptacles and steam cleaning of parking areas on a regular basis.
   b. Restrictions limiting storage of vehicles to 36 hours.

N. PROJECT TITLE.

Upon completion of the approval process the developer may change the name of project. The original name Superior Towne Center shall be reserved for future town projects.

Currently, the name of the center is Superior Marketplace.

The developer shall endeavor to have RTD identify the Park 'n Ride area as the Superior Park 'n Ride deleting the reference to Louisville as no portion of the Park 'n Ride is in Louisville.

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 6

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT/ZONE DISTRICT SITE PLAN SUBMITTAL

NEW PLAN EXCEL REALTY TRUST, INC.

A PORTION OF THE SE 1/4 OF SECTION 13 AND THE N 1/2 OF THE NE 1/4 OF SECTION 24, T1S,R70W OF THE 6TH P.M.

AMENDMENT #4

THE MULHERN GROUP, LTD.

O. BICYCLE CIRCULATION.

Bicycle circulation is an important part of the SURA District. The following restrictions shall apply:

1. Bikes lanes at Marshall Road: Seven-foot wide bike lanes shall be incorporated at Marshall Road from the sycamore intersection to the 76th Street intersection. In order to assure a more permanent marking of these lanes they shall be striped and identified utilizing thermo plastic material versus paint.
2. Combination bike/pedestrian paths at Marshall Road: Eight-foot wide (off-street) paths shall be located on both sides of Marshall Road from McCaslin to the major entry of the commercial development. Said walks shall be striped and noted with 4' for bicycles and 4' for pedestrians.
3. Bicycle racks: Racks shall be incorporated throughout the development. Said racks shall be introduced in all FDP submittals at locations deemed appropriate by staff.

P. UNOBSTRUCTED OPEN SPACE.

North of a line equating to the southern ROW line of Sycamore Street, within the SURA District, unobstructed open space shall equate to a minimum of 25% of the total site area. This shall include ROWs within the area defined.

Unobstructed open space shall be composed of the following:

1. Islands, medians, etc., when located within a parking area when equating to 400 s.f. or more.
2. Landscaped areas at the site perimeter, within the site, within ROWs and within walks areas.
3. Walks when within a landscaped area.
4. Pedestrian plazas when greater than 5,000 s.f.

Q. LANDSCAPED AREAS WITHIN PARKING LOTS.

Landscaped areas within a rectangle formed by the perimeter of a parking area shall constitute a minimum of 5% of the parking area.

R. OTHER OPEN SPACE.

In determining overall site coverage there shall be a category noted as other open space. Said space shall be that area not classified as building footprint, paved areas (road, drives, loading areas, parking lots), or unobstructed open space. Said space will include walks when not within landscaped areas, plazas less than 5,000 s.f., parking lot islands less than 400 s.f. and other such spaces.

The landscaped berm at the COSTCO fueling station shall be bermed and landscaped in such a manner so that the solid portions of the fueling pumps are screened from view from Marshall Road and US 36.

S. LANDSCAPING SUBSTITUTIONS / COMPONENTS

1. Shrubs/sod substitution at islands.

The restriction requiring one tree and three shrubs for each 20 parking spaces shall be amended as follows. In lieu of shrubs a grassed, irrigated berm may be provided at islands and medians.

2. Tree/Shrub Substitutions.

In determination of the number of trees and shrubs required, one tree may be substituted for ten shrubs required or vice versa.

3. Final landscaping design shall include components to provide a liberal use of wildflowers and boulders to create a quality landscape effect.

T. PEDESTRIAN CIRCULATION WITHIN PARKING AREAS.

Pedestrian walkways shall be incorporated at key locations within parking areas. Said walks shall continue across drives as concrete, thereby, providing a change in color and texture to alert drivers of the pedestrian crossing. These will serve as traffic calming devices.

U. ARCHITECTURAL REVIEW COMMITTEE (ARC) BY MASTER DEVELOPER.

The Master Developer shall staff and maintain an ARC for the duration of the physical development of the center. The ARC shall be established for purposes of reviewing all FDP applications and any FDP amendment applications for compliance with these Design Guidelines. The ARC shall review all FDP applications prior to the applicant submitting such applications to the Town. The ARC shall forward a letter of compliance to the Town regarding each application. The Town reserves the right to determine final compliance with these Design Guidelines.

V. VIEWS TO AND FROM THE DEVELOPMENT.

Views west to the foothills. The SURA District development, being predominantly one-story retail, will help to maintain the present views to the Flatirons. This will be enhanced by the grading plan which will step down at 76th and then provide a gentle grade of approximately 3% to McCaslin.

One will continue to see the Flatirons from many locations within the district, however, these views will diminish as one approaches buildings from east to west.

1. Heights: To further assure views to the Flatirons will be preserved, heights of the buildings shall be limited as follows:

	Base parapet	Accessory tower & entry elements
Retail buildings	35'	45'
Office/Government buildings	35'	50'
Major towers		50'

2. Views north along McCaslin: There will be some views to the eastern edge of the SURA District development as one proceeds north on McCaslin.

The parapet of this roof shall be equal to the height of all HVAC units and these units shall be laid out in a neat linear fashion. The success of this requirement is seen in the view to the existing Mann Theater building where all units are screened with a parapet versus Eagle Hardware where units are screened individually and Home Depot where units project above the parapet heights.

3. HVAC units will also be required to be screened in such a manner so as not to be viewed from U.S. 36 at Davidson Mesa.

W. BUILDING SETBACKS.

	Setback
1. Adjacent to Marshall Road, McCaslin at U.S. 36 ROW	20' from ROW
2. Adjacent to 76th Street, Sycamore Street, 4th, 5th Aves.	25' from ROW
3. North, east and south of outparcel along 76th Street	30' from prop. line.
4. Internal lot lines.	-0-

DESIGN AND PLANNING CRITERIA FOR SUPERIOR MARKETPLACE

A. PERMITTED USES

1. Retail Commercial as defined herein: Those retail and service businesses which provide a full range of merchandise and services. Such businesses shall consist of the following:
   a. Discount stores, membership merchandising stores, catalogue stores and specialty warehouse stores.
   b. Entertainment facilities, including, but not limited to movie theaters, bowling alleys and skating rinks.
   c. Recreation facilities, including, but not limited to swimming, golf, tennis, health and court sports facilities.
   d. Supermarkets and specialty food stores.
   e. Specialty retail and personal service businesses, including, but not limited to, health spas, specialty clothing and clothing accessory shops, sporting good stores, card and gift shops, art and art supply stores, culinary supply stores, toy stores, pet stores, bookstores, hardware stores, electronic equipment stores, furniture, appliance and home furnishing stores, printing shops, banks with drive-up teller, savings and loans and finance companies.
   f. Free standing, sit-down restaurants. Such restaurants shall be encouraged to have screened, outdoor dining areas. Restaurants may have drive-thru facilities, if said buildings are not part of the entry restaurant/shop complex. In the conceptual plan this area includes pads 3-6 and the two adjoining shops buildings.
   g. Cell phone relays such that they are inconspicuously placed from the public view, or incorporated as an integral design feature.
   h. Or any other use deemed appropriate by the Town.
2. Administrative and professional offices as defined herein:
   a. General Offices, for example:
      1. Administrative and executive offices.
      2. Consulting service offices (business and professional).
      3. Design professions (architect, planner, etc.)
      4. Financial institutions (including drive-through facilities, freestanding ATMs).
      5. Medical, dental and veterinary offices.
      6. Insurance and investment offices, etc.
   b. Public or private meeting hall.
   c. Nursery school, day care center.
   d. Appurtenant retail uses including restaurants, sandwich shops and cafeterias shall be permitted within principal use buildings, provided that the entrance to any such restaurant, sandwich shop or cafeteria shall be from inside the principal use building, and provided that no more than fifteen (15%) percent of said principal use building shall be devoted to such usage. Parking structures shall be permitted as accessory uses.
   e. Government centers.
3. Other:
   a. Parking associated with all uses (to be provided per ADA standards).
   b. Preschool nurseries and child care centers.
   c. Parks and recreational open space.
   d. Accessory buildings and uses.
   e. Other uses not specifically listed herein require a use permit.
   f. Public facilities and utilities.
   g. Commercial mobile radio service facilities - building-mounted antennas only; equipment shelters must be fully screened.
4. Ancillary uses:
   a. Ancillary uses for Major 1 to include fuel pumps and tire center shall be an allowed use.
5. Use by Special Review:
   a. Auto specialty stores (i.e., tire, muffler, parts, glass).
   b. Lofts or other residential units above commercial shops not to exceed 12 units per gross acre.
6. Use by Administrative Permit:
   a. Portable kiosks and push cart vendors.
   b. Street entertainers.

B. EXCLUDED USES

1. Those uses and activities which are specifically prohibited are as follows:
   a. Adult bookstores, adult entertainment and other adult-related activities.
   b. Outdoor storage, except for garden and nursery supplies and other, similar seasonal merchandise.
   c. Rental agencies for heavy equipment.
   d. Mini-storage facilities.
   e. Warehousing and light industrial uses.
   f. Car wash facilities of any kind.
   g. Outdoor (non-screened) storage of vehicles (for service) for a period exceeding 36 hours.
   h. Auto body repair shops.
   i. Multi-family residential other than that described in section A.5.b. - Use by special review.
   j. Pawn and second hand shop.

SURA DISTRICT MAINTENANCE OUTLINE

A. DEVELOPER RESPONSIBILITES

The developer of each parcel within in the SURA District or 'district' shall be responsible for all the upkeep and maintenance of all the improvements on said property with the exception of water lines, sanitary sewer mains, and storm sewer lines which are part of the Superior/McCaslin Interchange District (SMID) . In addition, the developer shall also be responsible for landscaping, maintaining, and irrigating additional open space to an adjacent curb should there be an adjacent ROW.

1. Detention Facilities:
   The developer shall also be responsible for all maintenance and upkeep of all landscaping within detention pond areas (see note B.3 below) and any underground detention facilities should they be required. If required, the developer must provide for and execute a schedule of maintenance acceptable to the Town which may also be enforced by the Town. The Town and the SMID will also be granted access to these facilities via easements. Should parking lot detention be utilized, the depth of such detention shall be as deemed appropriate by Town staff during the FDP stage.
2. The developer shall attempt to obtain a license permit from CDOT to sod and irrigate the R.O.W. and open space margin between Marshall Rd. and U.S. Highway 36.

B. SUPERIOR/MCCASLIN INTERCHANGE DISTRICT RESPONSIBILITIES

1. Public Roadways:
   a. Marshall Road. CDOT shall maintain the paving and concrete work at Marshall Road should the roadway remain a State highway. The SMID shall maintain any and all sidewalks, landscaped medians along the road and the landscaped buffer on the south side of Marshall Road. Should the roadway become part of the Town or SMID it shall be maintained by the SMID.
   b. District roads. The District shall be responsible for the maintenance and upkeep of the following roadways, and associated sidewalks proposed to be improved or constructed as part of Superior Marketplace.
      1. Sycamore Street (from relocated Marshall Road to 76th).
      2. 76th Street (the eastern half from Coal Creek to Marshall Road).
      3. 5th Street (from Coal Creek north to Sycamore Street).
      4. Coal Creek (the northern half, from 4th Street to 76th Street).
2. Utilities:
   a. The District shall maintain all public water and sanitary sewer mains which are planned within the SURA District.
   b. The District shall maintain all 'regional' storm water conveyances, defined as: storm sewer pipes that are outlets from stormwater detention ponds, and storm sewer pipes that convey runoff from offsite areas through the property.
3. Detention:
   a. The District will perform routine maintenance necessary for the ponds to function as stormwater detention facilities (e.g. sediment removal, debris removal, and mow native grasses. The District shall not maintain or repair retaining walls, mow irrigated turf, or maintain landscaping.
4. Landscaped Areas:
   The District shall maintain and irrigate the following landscaped areas.
   a. Marshall Road medians.
   b. Open space buffer south of Marshall Road and Sycamore Street (to 4th Avenue).
   c. Sycamore street medians.

PROPOSED SURA DISTRICT SIGNAGE GUIDELINES

The following standards have been developed to supersede the SURA Sign Guidelines. They shall amend the Superior Sign Code Section as noted, providing some additional sign area. However, in most cases it adopts further restrictions to better control the many types of signage a tenant will propose (i.e., store within a store, sign composition, national logos, blade, window and awning signs, etc.).

Should a particular issue arise not addressed in this guideline the Superior Sign Code as enforced on May 5, 1998, shall govern.

A. LEASING SIGNS (To be approved only at FDP stage)

1. Number: Three (2 at U.S. 36 frontage, 1 at McCaslin frontage).
2. Size allowed: Must be less than 8'x16' = 128 s.f. maximum sign face.
3. Materials: Paint or vinyl lettering on wood, typical.
4. Lighting: Signs may be externally illuminated with outdoor floods.
5. Tenure: Signs may remain in location selected for a period not to exceed two years from date of installation. After this time period leasing signs shall be allowed pursuant to the Superior Sign Code for temporary signs in force at that time.
6. Height: Top of sign face not to exceed 12' above finish grade.

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 7

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT/ZONE DISTRICT SITE PLAN SUBMITTAL

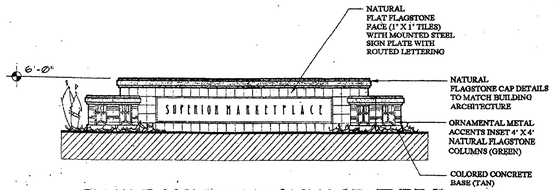
NEW PLAN EXCEL REALTY TRUST, INC.

A PORTION OF THE SE 1/4 OF SECTION 13 AND THE N 1/2 OF THE NE 1/4 OF SECTION 24, T1S,R70W OF THE 6TH P.M

THE MULHERN GROUP, LTD.

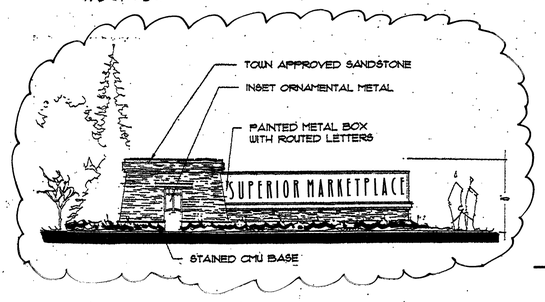
AMENDMENT #4

B. CENTER ID MONUMENT SIGNS



CENTER MONUMENT SIGNAGE (TYPE 2)

1/8" = 1'-0"

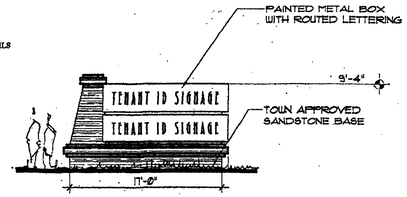


CENTER MONUMENT SIGNAGE (TYPE 1)

1/8" = 1'-0"

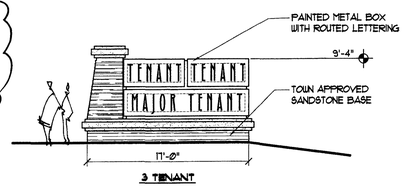
1. Number: Up to two at each entry to each access to and within the SURA District.
2. Size allowed: 60 s.f. maximum sign face.
3. Height: Not to exceed 6'. (Architecture may exceed this by up to 2').
4. Lighting: Internal or indirect external illumination. Brightness limit on any fixture related to signage to be 60 watt maximum.
5. Maximum letter size: 24"
6. Materials: To be Town-approved natural sandstone, with cut metal boxes similar to tenant ID signage. A CMU base of up to 18" may be introduced.
7. Nomenclature: Signs shall identify development projects only. No tenant signage shall appear on Center ID signs.

C. TENANT ID MONUMENT SIGNS



TENANT I.D. SIGNAGE

1/8" = 1'-0"

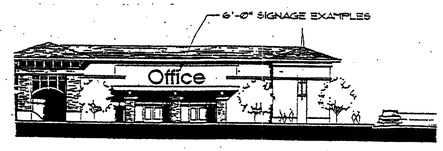


TENANT ID SIGNAGE

1/8" = 1'-0"

1. Number: Four at U.S. 36 frontage.
   One at McCaslin frontage.
2. Box Size allowed: (2) 3 -0"x14' boxes per sign
   or
   (1) 3'-0" x 14'-0" and (2) 3'-0" x 7'-0" boxes per sign.
3. Number of tenants allowed: 2/sign for 3 at U.S. 36
   2/sign for 1 at McCaslin
   3/sign for 1 at U.S. 36
4. Sign Area: 2'-6" x 13'-4" = 34 s.f. per box for each 2 box sign. (May be double-faced).
   (1) 2'-6" x 13'-4" = 34 s.f. plus (2) 2'-6" x 6'-4" = 32 s.f. per each 3 box sign. (May be double-faced)
5. Height: Sign shall not exceed height of 9'-4" above adjacent grade at high side of sign. (Architecture may exceed this by 1'-8"). A flat grade of a minimum of 3' beyond the sign must be provided on the low side. It shall be created by use of a natural sandstone retaining wall and shall include a continuous row of foundation plantings. Note: Berming to elevate sign at high side shall not be allowed.
6. Miscellaneous: Signage elements to be consistent. Cut metal boxes of like color shall be set on Town-approved sandstone. A CMU base of up to 18" shall be allowed. All tenant "boxes" will have a uniform color background, shall be internally lit and may have the tenant's name/identification/logo in the type, design, style or color desired by a particular tenant.
7. Marshall Road Setbacks: Architecture of said signs may be located at the property line with any signage setback a minimum of three feet. Final distance from Marshall Road shall be dependent on CDOT alignment. In any case, landscaping elements will define and accentuate the separation of the signs from Marshall Road.
9. McCaslin Road Setbacks: Said signs shall be setback a minimum of 25' from the roadway curb and gutter.

D. WALL SIGNS



1. Number: One per frontage on street, drive, parking area or landscape element. Not to exceed a total of three. Signage on walls adjoining adjacent tenants shall be allowed only if user is within one space of ROW.

   *Exception: Due to the length of the building and its entry location at the far end of the structure, Major 1 may utilize two signs on the east-facing facade, however, the maximum area of all signs on this facade shall not exceed the maximums listed below.

2. Exclusion: Shall not be allowed facing Sycamore Street or 76th Street without tenant entry door or glazing located on said street. Signage on these streets, if allowed, shall not be illuminated.

3. Allowable area calculation: 1.5 s.f. per lineal foot of building frontage for first 100 lineal feet, one s.f. per lineal foot thereafter. No signage on a facade shall exceed that area allowed for a particular frontage.

Total sign area per frontage shall not exceed the following:

Area maximum: 200 s.f./frontage for tenant less than 30,000 s.f.
300 s.f./frontage for tenants equal to or greater than 30,001 and less than 100,000 s.f.
350 s.f./frontage for tenants equal to or greater than 100,001 s.f.

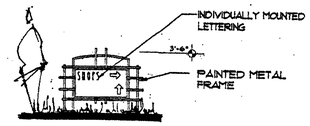
In addition, no one tenant shall have an aggregate sign area of more than 600 s.f.

Maximum allowable letter height: 3'-0" for users up to 14,999 s.f.
4'-0" for users 15,000 s.f. to *39,999* s.f.
5'-0" for users 40,000 s.f. to 79,999 s.f.
6'-0" for users 80,000 s.f. or greater

Note: Letter height is often further reduced by allowed sign area. Limitations of letter height typically come into play when a tenant has a very short name.

4. Composition: Signage may be of more than one line, however, said signage composition shall not exceed *two* times the allowed letter height and be appropriate to its architectural location.
5. Logo: National logos are acceptable and may be up to 1.5 times the allowed letter height. All logos are considered a part of the allowable sign area and shall not exceed 50% of allowable sign area. Logos shall be subordinate to the overall architectural design scheme of the building or monument sign which they are placed. Said logo may be a box sign. A logo may be a portion of an individual tenant's name, but cannot be the entire name.
6. Store within a store: In this case one additional sign only shall be allowed on the major building elevation. Said sign shall be limited to 66% of the allowed letter height and shall not exceed 50 s.f. Said sign area shall fall under the allowed area maximum for the major tenant.
7. Blade Signs: In addition to fascia signage each tenant shall be allowed one ornamental blade sign. This sign shall be double-faced and shall not exceed 16 s.f. per side and shall fit within a 4'x4' square. Said sign area shall fall under total allowed sign area. The sign shall be hung via ornamental ironwork, shall be located on a column adjacent to the tenants main entry and the top of the sign shall not be mounted more than 14' above adjacent grade.
8. Descriptors: Descriptors are allowed and may be located separately from main body of signage. Descriptors shall not exceed ½ the allowed letter height. However, no descriptors shall exceed a height of 2'. Said signage shall fall under area limitations previously listed and shall not exceed 35% of overall maximum sign area allowance. All descriptor locations outside of designated sign band area shall be placed in an appropriate architectural location and are therefore subject to Developer approval.
9. Fabric awning signage: Awnings, other than backlit, are allowed. Should signage be displayed on more than one canopy it shall be repetitive. Said signage shall fall under area limitations previously listed. All awnings material shall be fabric, metal, or other approved materials. No plastic awnings shall be allowed. Awning colors shall be repetitive, and compatible or complimentary to a building's color palette.
10. Window signs: One window sign per window is permitted on any face of a building. Individual letters shall be allowed and shall be "white," applied to the inside face of the window. The typestyle shall be limited to that of the primary fascia sign. All signage shall be mounted at the same elevation above finished floor. No such sign letter or composition shall exceed 8" in height and its width shall not be greater than 80% of the exposed window. The area of any single window *sign* shall not exceed 5% of window area on which it is mounted. The area of said signage shall combine and shall fall under area limitations previously listed and shall not exceed 20% of overall maximum sign area allowance.
11. Sign area calculation: All signage areas shall be defined as that area created by enclosing the signage in question by a multisided polygon composed only of 90° corners. No side of said polygon may be less than one-fourth the proposed letter height.
12. Area summation: The sum of the areas of all signage types (main body, descriptor, canopy, blade, etc.) shall not exceed the allowable area calculation or area maximum for any individual user, or given frontage.

E. DIRECTIONAL SIGNAGE



DIRECTIONAL TENANT SIGNAGE

1/8" = 1'-0"

The Superior Marketplace is composed of six major parcels with a multitude of uses and users (i.e., theater, RTD park 'n ride, major users and Town Hall). To make one's experience of this exciting project as enjoyable as possible a directional sign program shall be introduced. The program shall incorporate ornamental signs designed in a manner compatible to the architecture of the center and appropriately placed to facilitate one's movement. Major tenant names may be incorporated on the signs, however, letter height shall not exceed 8" and one typestyle shall be utilized throughout.

F. GENERAL

1. Signage shall be located in the designated sign band, as indicated on the FDP.
2. Signs shall generally be individual pan channel letters. The letters shall not be less than four (4) inches nor more than five-and-one-half (5 ½) inches in depth. National logos, or descriptors 1' or less in height, may be a box sign with similar trim details to the typical pan channel letter. All such signs shall be internally illuminated.
3. Temporary window banners ("Now Open," "Sale," etc.) shall be allowed on a basis of one sign per frontage for a single period of one month in any given calendar year. Sign shall not exceed 50% of window area in which it is mounted, and shall be located entirely within tenant space.
4. Other sign media shall be acceptable at Superior Marketplace as long as such sign material is deemed to be of an equal or higher standard.

PUBLICLY DEDICATED LAND DESCRIPTIONS

The following lands (or portions thereof) shall be dedicated as a part of the Superior Marketplace development:

1. The area designated as Marshall Road (+/- 100' wide R.O.W.) that crosses the proposed site. This area encompasses +/- 5.4 acres.
2. The area designated as Extended Maple Street (to be renamed Sycamore, with a 60' R.O.W.) that crosses the proposed site. This area encompasses +/- 2.2 acres.
3. The eastern 50% of the 76th Street R.O.W. This area encompasses *+/- 1.9 acres.*
4. The northern 50% of Coal Creek from 4th Avenue to 76th. This area encompasses *+/- 0.8 acres.*
5. Primary detention areas – exact sizes to be determined in the final PD and platting processes. These shall include:
   a) Two detention areas west of roundabout.
   b) *Three* large detention areas west of Marshall Road.
   c) Detention area south and east of theatre buildings.

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 8

SUPERIOR MARKETPLACE

Superior, Colorado

Preliminary Landscape Plan

Planned Development Zone District Plan

Amendment #4

May 14, 1998

Revised May 21, 1999
~~Revised November 30, 1999~~
~~Revised January 10, 2000~~

REVISED 3-1-00

Special Planting Area Densities

Area	Trees	Shrubs
A(Area Behind Costco)	1 / 1,400 s.f.	1 / 30 s.f.
B(Roundabout Planting)	1 / 1,500 s.f.	1 / 30 s.f.
D(Planting Along Marshall Road)	1 / 1,000 s.f.	1 / 30 s.f.
E(Detention along Marshall Road and McCaslin Road).	1 / 1,400 s.f.	1 / 30 s.f.
A1(Area Behind Majors 2,3 &4)	1 / 800 s.f.	1 / 30 s.f.
C1(N.E. Corner of 76th & Sycamore)	1 / 575 s.f.	1 / 30 s.f.
F(Area Behind Majors 6 & 7)	1 / 825 s.f.	1 / 30 s.f.
G(Area Along Transportation Hub)	1 / 1,400 s.f.	1 / 30 s.f.

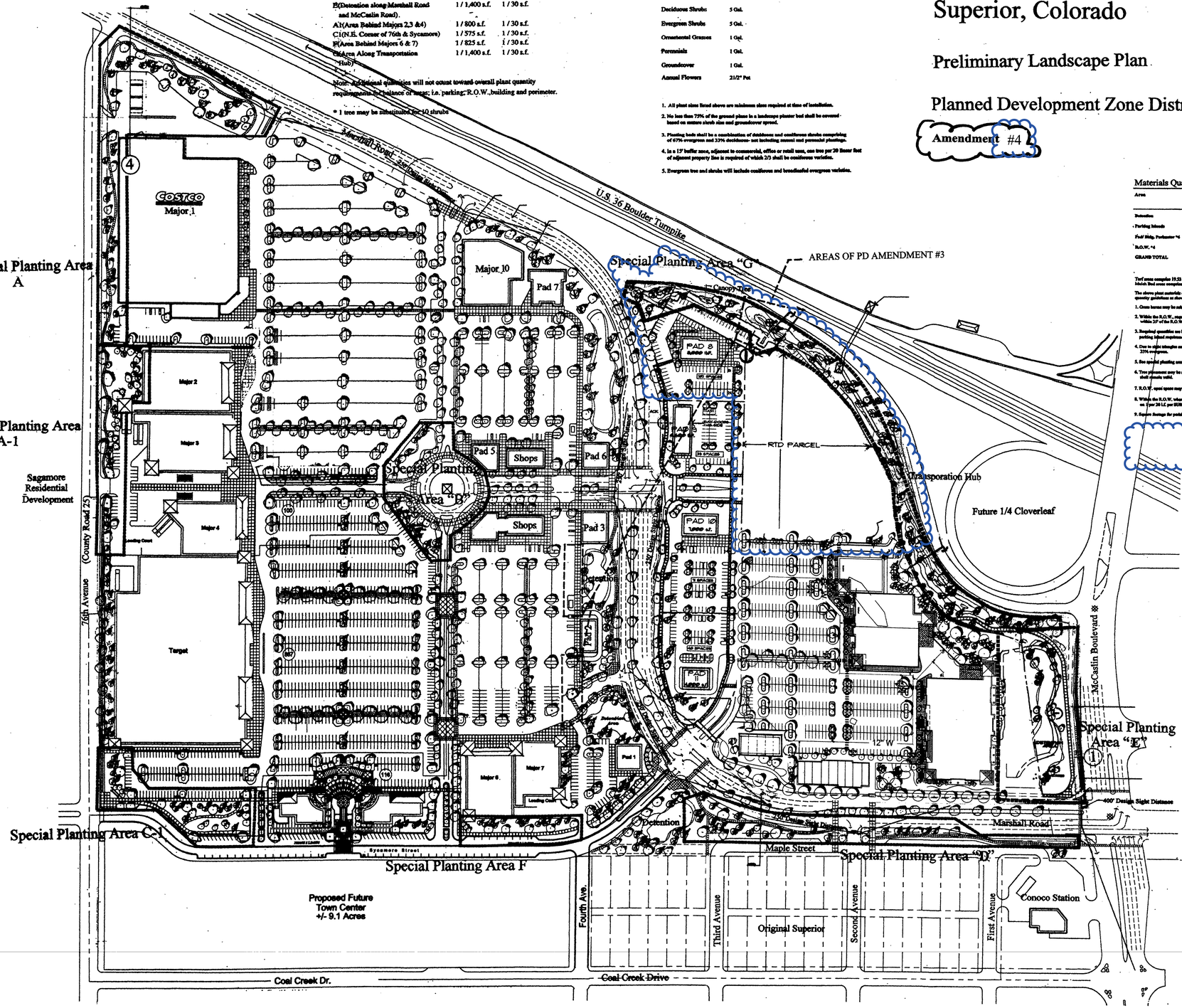
Note: Additional quantities will not count toward overall plant quantity requirements for balance of area; i.e. parking, R.O.W., building and perimeter.

* 1 tree may be substituted for 10 shrubs

Plant Material Size Criteria

Deciduous Trees	3" Cal. or greater	10%
	2 1/4"-2 3/4"	70%
	1 1/2"- 2"	20%
Evergreen Trees	8' or greater	10%
	6'- 8'	70%
	4'- 6'	20%
Deciduous Shrubs	5 Gal.	
Evergreen Shrubs	5 Gal.	
Ornamental Grasses	1 Gal.	
Perennials	1 Gal.	
Groundcover	1 Gal.	
Annual Flowers	21/2" Pot	

1. All plant sizes listed above are minimum sizes required at time of installation.
2. No less than 75% of the ground plane in a landscape planter bed shall be covered based on mature shrub size and groundcover spread.
3. Planting beds shall be a combination of deciduous and coniferous shrubs comprising of 67% evergreen and 33% deciduous; not including seasonal and perennial plantings.
4. In a 15' buffer zone, adjacent to commercial, office or retail uses, one tree per 20 linear feet of adjacent property line is required of which 2/3 shall be coniferous varieties.
5. Evergreen tree and shrubs will include coniferous and broadleafed evergreen varieties.



Materials Quantity Chart

Area	Total Tree Quantity Ratio *5	Tree Percentages	Deciduous Trees Required / Proposed	Evergreen Trees Required / Proposed	Shrubs Required / Proposed	Total Open Space Acreage/ s.f.	Percentage of Project Open Space
Detention	1/3,353 s.f.	33% dec., 67% ever.	84/34	48/ 51	3477/3477		
Parking Islands	1/2,500 s.f.	33% dec., 67% ever.	35/ 259 *3	21/ 0	1,317/ 1,317 *1		
Roof Slab, Perimeter *4	1/ 1,722 s.f.	33% dec., 67% ever.	170/ 199	84/ 91	8719/ 8719		
R.O.W. *4	1/ 40 LF	67% dec., 33% ever.	170/ 171 *2	84/ 91 *2	539/ 589		
GRAND TOTAL			[illegible]	[illegible]	11,686/ 11,686		

Turf areas comprise 19.53 Acres (85%)
Mulch Bed areas comprise 2.47 Acres (11%)

The above plant materials quantities for each type and Open Space area are to meet or exceed the minimum open space quantity guidelines as shown in the Land Use Code and the SURA Planning and Design Standards.

1. Ornamental trees may be substituted for shrubbed islands throughout the development.
2. Within the R.O.W., required and proposed quantities are based on 1 per 40 LF per SURA code. Trees may be planted within 25' of the R.O.W. and groupings not further than 60' apart.
3. Required quantities are based on open space requirements per SURA code. Proposed quantity is based on parking island requirements per SURA code.
4. Due to slope triangles and view corridor requirements, trees within the R.O.W. shall be 67% deciduous and 33% evergreen.
5. See special planting areas and density chart for any specific requirements.
6. Tree placement may be modified in plan to allow for display windows/ entrances, etc. Overall densities shall remain valid.
7. R.O.W. open space may change due to road widening or reduction per CDOT standards.
8. Within the R.O.W. where landscape buffer separation exceeds 100 feet, shrub, required and proposed quantities are based on 1 per 20 LF per SURA code. Trees may be planted within 25' of the R.O.W. and groupings not further than 60' apart.
9. Square footage for parking islands includes those only over 400 s.f.

PLANT LEGEND

COMMON NAME	BOTANICAL NAME	LOCATION
DECIDUOUS CANOPY TREES		
GREEN SPIRE LINDEN	TILIA CORDATA 'GREEN SPIRE'	ROW, PARKING, MULTI-FAMILY
AUTUMN PURPLE ASH	FRAXINUS PENNSYLVANICA 'TRANSHALL'	DETENTION, PARKING, MULTI-FAMILY
PATMORE ASH	FRAXINUS PENNSYLVANICA 'PATMORE'	ROW, DETENTION, PARKING, MULTI-FAMILY
LANCELEAF COTTONWOOD	POPULUS ACUMINATA	DETENTION, MULTI-FAMILY
COMMON HACKBERRY	CELTIS OCCIDENTALIS	PARKING, BLDG. PERIMETER, MULTI-FAMILY
RED OAK	QUERCUS RUBRA	ROW, BLDG. PERIMETER
EVERGREEN TREES		
AUSTRIAN PINE	PINUS NIGRA	ROW, BLDG. PERIMETER, MULTI-FAMILY
PONDEROSA PINE	PINUS PONDEROSA	ROW, BLDG. PERIMETER, MULTI-FAMILY
COLORADO BLUE SPRUCE	PICEA PUNGENS	RWY, DETENTION, BLDG. PERIMETER, MULTI-FAMILY
DECIDUOUS ORNAMENTAL TREES		
CANADA RED CHERRY	P. VIRGINIANA 'MELANOCARPA 'SCHUBERT'	ROW, PARKING, BLDG. PERIMETER, MULTI-FAMILY
FLOWERING HAWTHORN	CRATAEGUS PHAENOPYRUM	PARKING, BLDG. PERIMETER, MULTI-FAMILY
SPRING SNOW CRAB	MALUS 'SPRING SNOW'	ROW, PARKING, BLDG. PERIMETER, MULTI-FAMILY
EVERGREEN SHRUBS		
BLUE CHIP JUNIPER	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	
BUFFALO JUNIPER	JUNIPERUS SABINA 'BUFFALO'	
SARGENT JUNIPER	JUNIPERUS SABINA 'SARGENT'	
TORY JUNIPER	JUNIPERUS SABINA 'TAMARISCIFOLIA'	
DECIDUOUS SHRUBS		
ANTHONY WATERER SPIREA	SPIRAEA BUMALDA 'ANTHONY WATERER'	
ALPINE CURRANT	RIBES ALPINUM	
BLUE MIST SPIREA	CARYOPTERIS INCANA	
CRISPY BURNING BUSH	EUONYMUS ALATA 'COMPACTUS'	
COMPACT CRANBERRY	VIBURNUM TRILOBUM 'COMPACTUM'	
CHEYENNA PRIVET	PRIVET HEDERIFOLIA	
DWARF KOREAN LILAC	SYRINGA 'PALIBIN'	
JAPANESE PIERIS/FLA	PIERIS JAPONICA 'VARIEGATA'	
MOUNT FUJI PEERIS	PIERIS JAPONICA 'MOUNT FUJI'	
PANDA GRASS	MISCANTHUS SINENSIS 'GRACILLIMUS'	
PURPLE FOUNTAIN	PENNISETUM ALOPECUROIDES	
ROZY GOTHEIMER	COTONEASTER HORIZONTALIS	
SARGENT TAMARIX	TAMARIX CHINENSIS 'SARGENT'	
SHASTA DAISY	CHRYSANTHEMUM MAXIMUM	
VARIEGATED WEIGELA	WEIGELA FLORIDA 'VARIEGATA'	
VIRGIL BRUNNER	COTONEASTER DAMMERI 'VIRGIL BRUNNER'	
GROUND COVERS, VINES & PERENNIAL PLANTINGS		
TALL CREEPING YARROW	ACHILLEA FILIPENDULINA	
CRAMP ARTER	ARTEMISIA NOVA 'SILVER MT.'	
CLAYTONIA	CLAYTONIA	
CRAMP DOUBLE COREOPSIS	COREOPSIS GRANDIFLORA 'SUNBURST'	
SUNBURST PLANT FLOWER	GAILLARDIA GRANDIFLORA 'SUNBURST'	
CREEPING PHLOX	PHLOX SUBULATA 'EMERALD BLUE'	
SIBERIAN IRIS	IRIS SIBERICA	
STELLA D'ORO DAYLILLY	HEMEROCALLIS	
GLORIOSA DAISY	COREOPSIS LANCEOLATA 'GOLDFINCH'	
ROCKY MOUNTAIN PENSTEMON	PENSTEMON STRICTUS	
GARDEN PHLOX	PHLOX PANICULATA 'DARWIN'	

REVISED 09-19-02

REVISED 07/05/02
REVISED 6-28-02
REVISED 11-14-01
REVISED 4-5-01
REVISED 3-20-01
REVISED 2-1-01

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MACERICH GROUP, LTD.

SHEET 9 Page 9 of 18

SUPERIOR MARKETPLACE

SUPERIOR, COLORADO

SPECIAL PLANTING AREA 'G'

PLANNED DEVELOPMENT ZONE DISTRICT PLAN

TYPICAL AREA ENLARGEMENT

AMENDMENT #4

REVISED 3-20-01 MAY 21,1999
REVISED 4-5-01 REVISED JANUARY 14, 2000
REVISED 11-14-01 REVISED 3-1-00
REVISED 6-28-02 REVISED 2-1-01
REVISED 09-19-02

NORTH

SCALE 1"=50'

The NORRIS DULLEA Company
Planning
Landscape Architecture
710 West Colfax
Denver, Colorado 80204
Fax: 303 892 1186
Phone: 303 892 1166

Area G

	Area	Ratio
Total Area	121404 s.f.	
Bed Area* **	24,280 s.f.	
Trees*		1 / 1400 s.f.
Shrubs**		1 / 30 s.f.

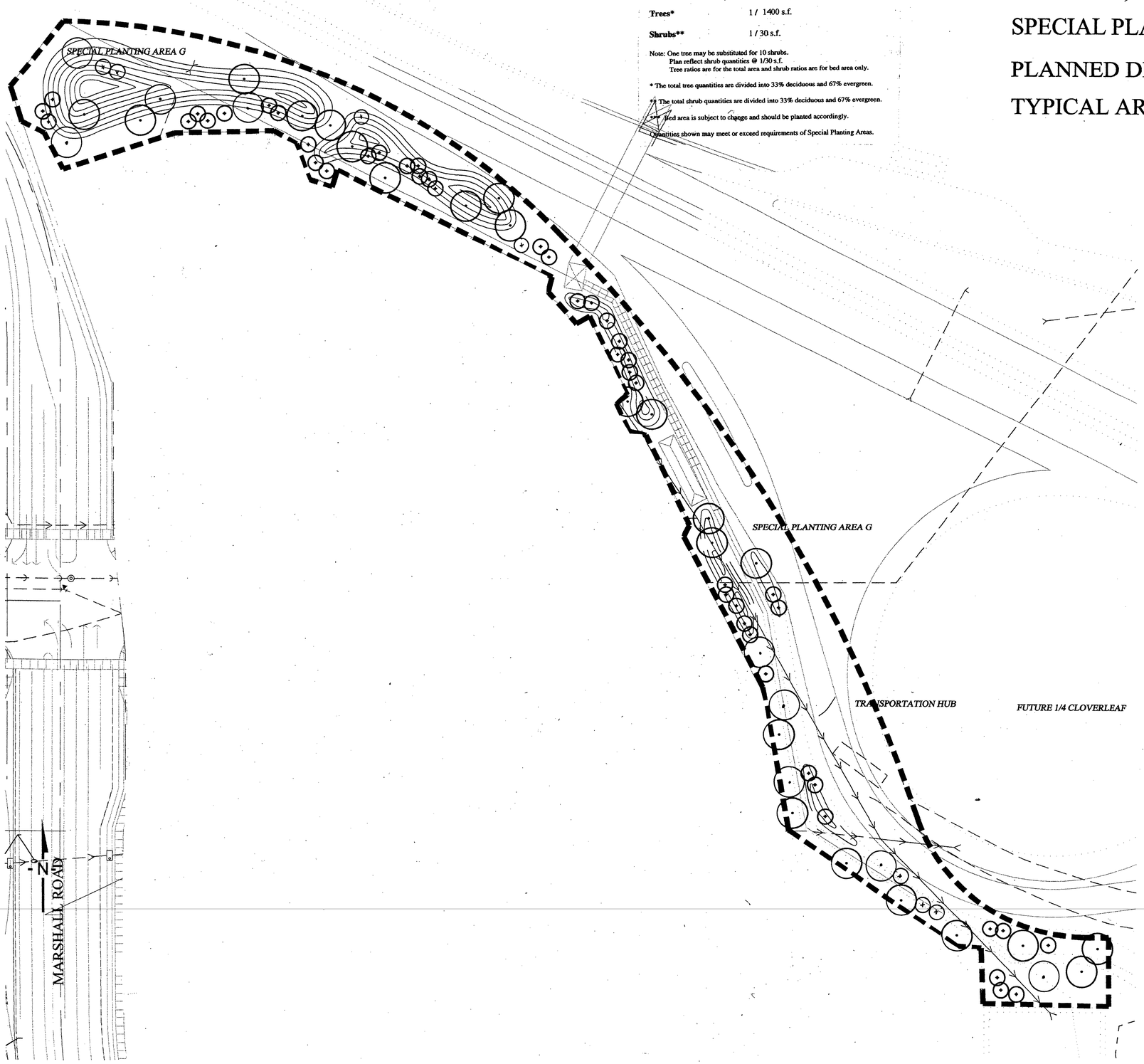
Note: One tree may be substituted for 10 shrubs.
Plan reflect shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Areas.



SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

SHEET 9.1 Page 10 of 18

SUPERIOR MARKETPLACE

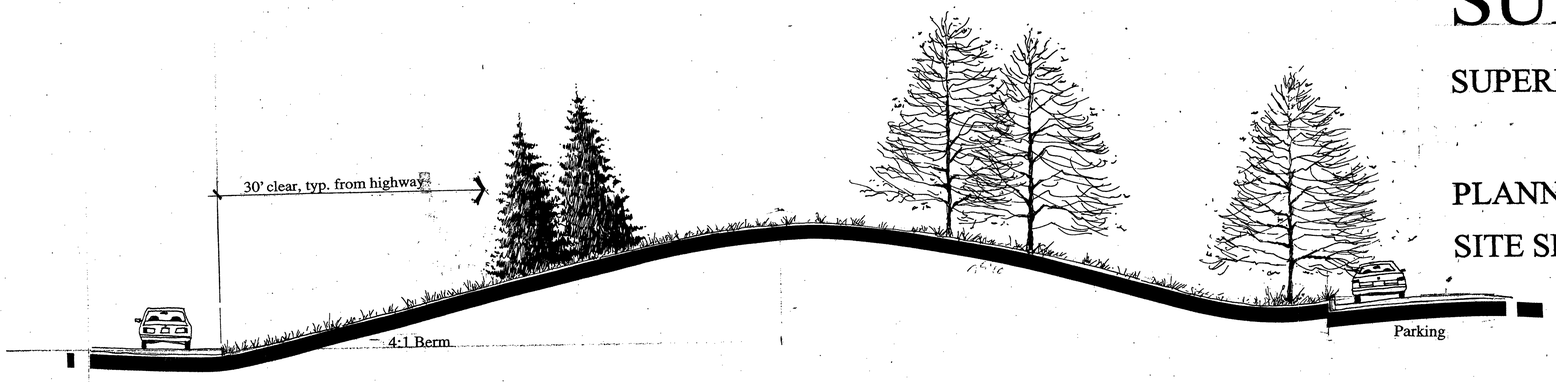
SUPERIOR, COLORADO

PLANNED DEVELOPMENT ZONE DISTRICT PLAN

SITE SECTIONS

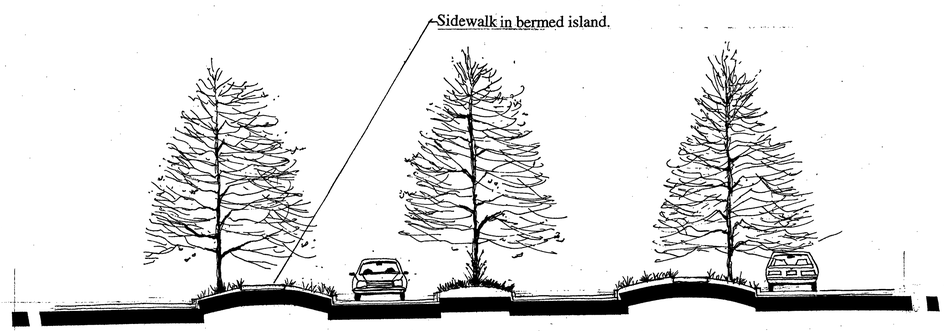
AMENDMENT #4

REVISED JANUARY 14, 2000
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02



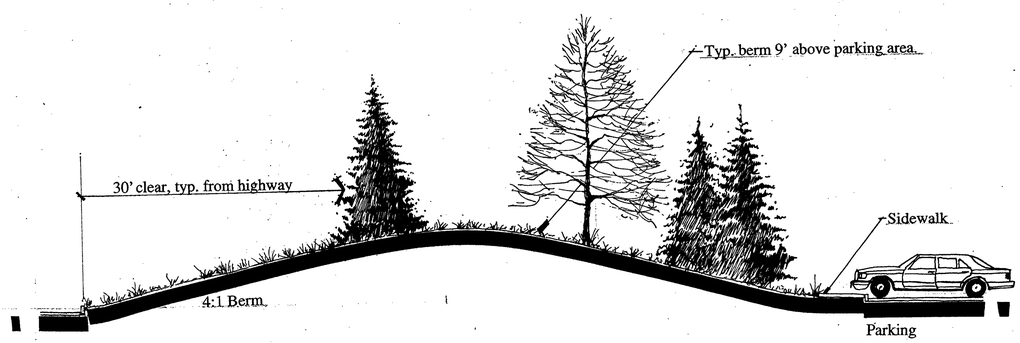
Section 1

Scale 1/8"=1'-0"



Section 2

Scale 1/8"=1'-0"



Section 3

Scale 1/8"=1'-0"

SUPERIOR MARKETPLACE

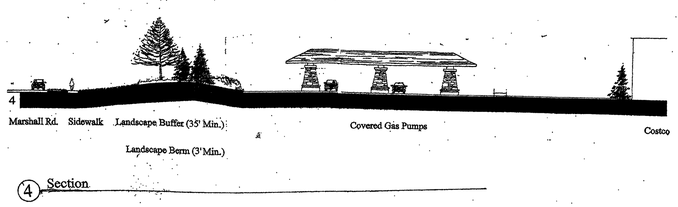
NEW PLAN EXCEL REALTY TRUST, INC.

THE HALKIN GROUP, LTD.

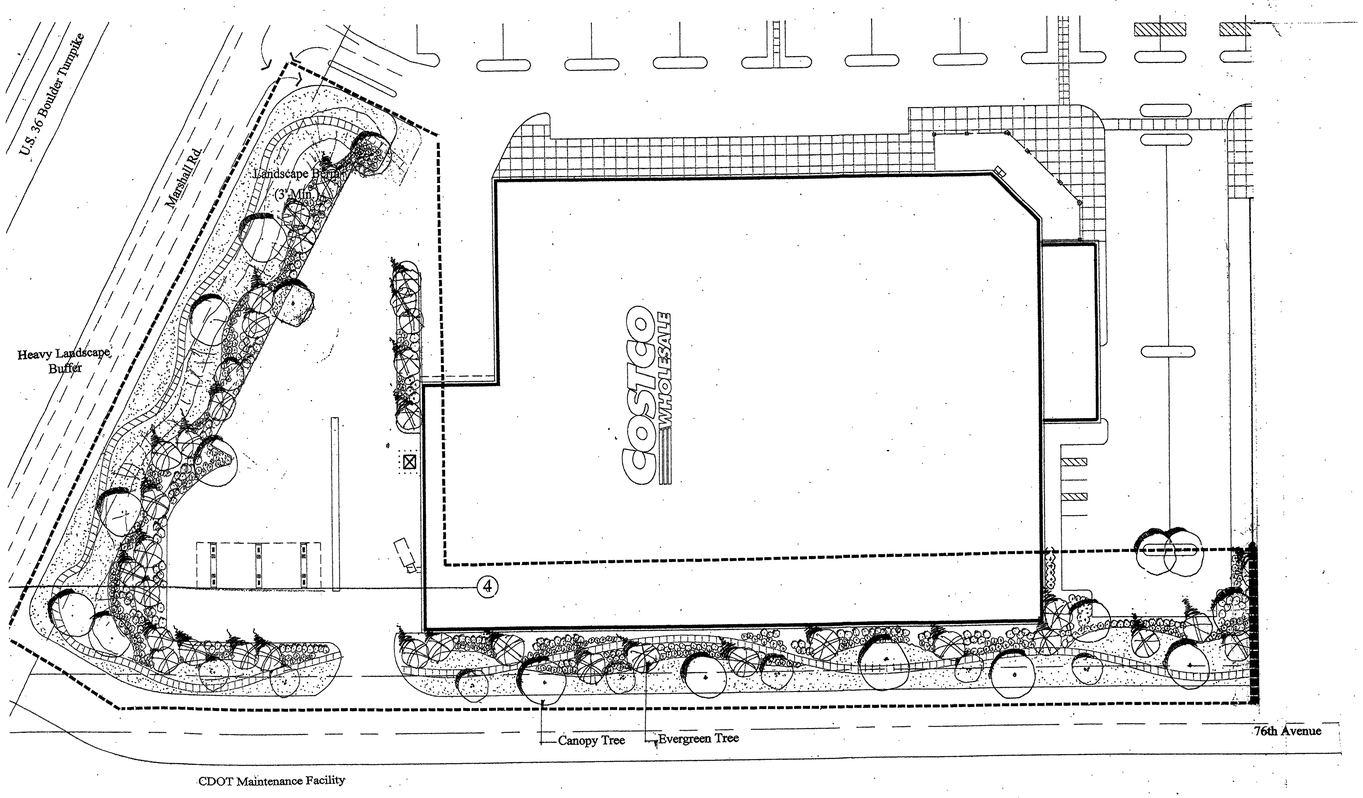
SHEET

Special Planting Area "G"

9.2 Page 11 of 18



4 Section



Area A

	Area	Ratio
Total Area	97,370 s.f.	
Bed Area***	28,231 s.f.	
Trees*		1/ 1,400 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/50 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may exceed requirements of Special Planting Area densities.

SUPERIOR MARKETPLACE

PD AMENDMENT #4

Superior, Colorado

May 14, 1998

North Scale: 1"=30'-0"

Special Planting Area "A"

REVISED 09-19-02

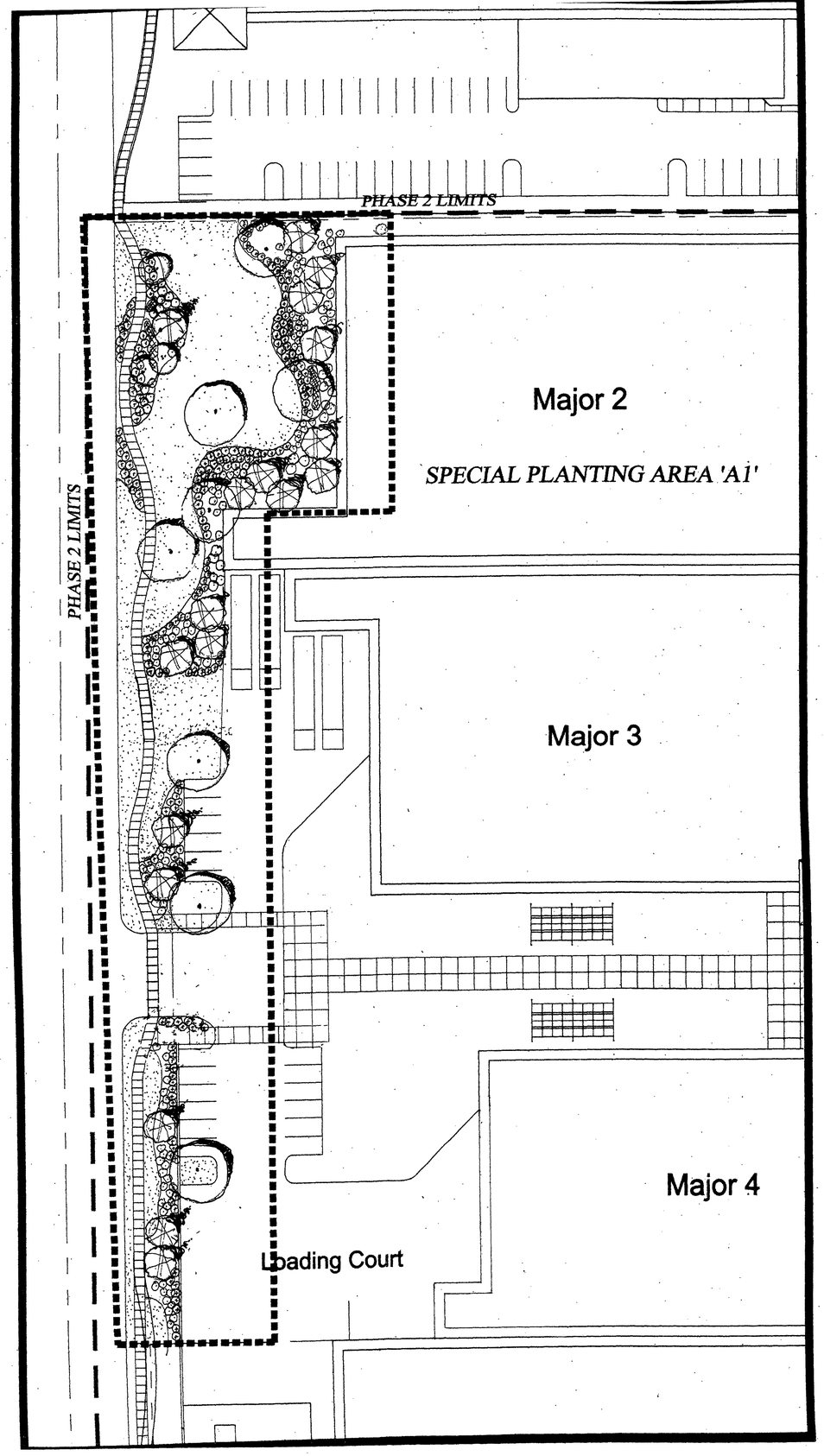
REVISED 11-14-01
REVISED 6-28-02
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 10 Page 12 of 18



SUPERIOR MARKETPLACE

SUPERIOR, COLORADO

MAY 21,1999

NORTH

0 15 30 60

SCALE 1"=30'

The NORRIS/DULLEA Company
Planning
Landscape Architecture
710 West Colfax
Denver, Colorado 80204
Fax: 303 892 1186
Phone: 303 892 1166

SPECIAL PLANTING AREA 'A1'

PLANNED DEVELOPMENT ZONE DISTRICT PLAN

TYPICAL AREA ENLARGEMENT

PD AMENDMENT #4

Area A1

	Area	Ratio
Total Area	25075 s.f.	
Bed Area* **	12675 s.f.	
Trees*		1/ 800 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.

For Final Crosswalk Plan, see Sheet 2

11.4.99 REVISION

10/1/99 PLAN REVISION

8.23.99 PLAN REVISION

REVISED 11-30-99

REVISED 12-1-99

REVISED 01-14-00

REVISED 3-1-00

REVISED 2-1-01

REVISED 3-20-01

REVISED 4-5-01

REVISED 11-14-01

REVISED 6-28-02

REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAM EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 11

Superior Marketplace

Superior, Colorado

May 14, 1998

Typical Area Enlargement

North

15' 30' 60'

Scale: 1"=30'-0"

Planned Development Zone District Plan AMENDMENT #4

Special Planting Area "B"

Area B

	Area	Ratio
Total Area	38,487 s.f.	
Bed Area* **	8,300 s.f.	
Trees*		1/ 1,500 s.f.
Shrubs**		1/ 30 s.f.

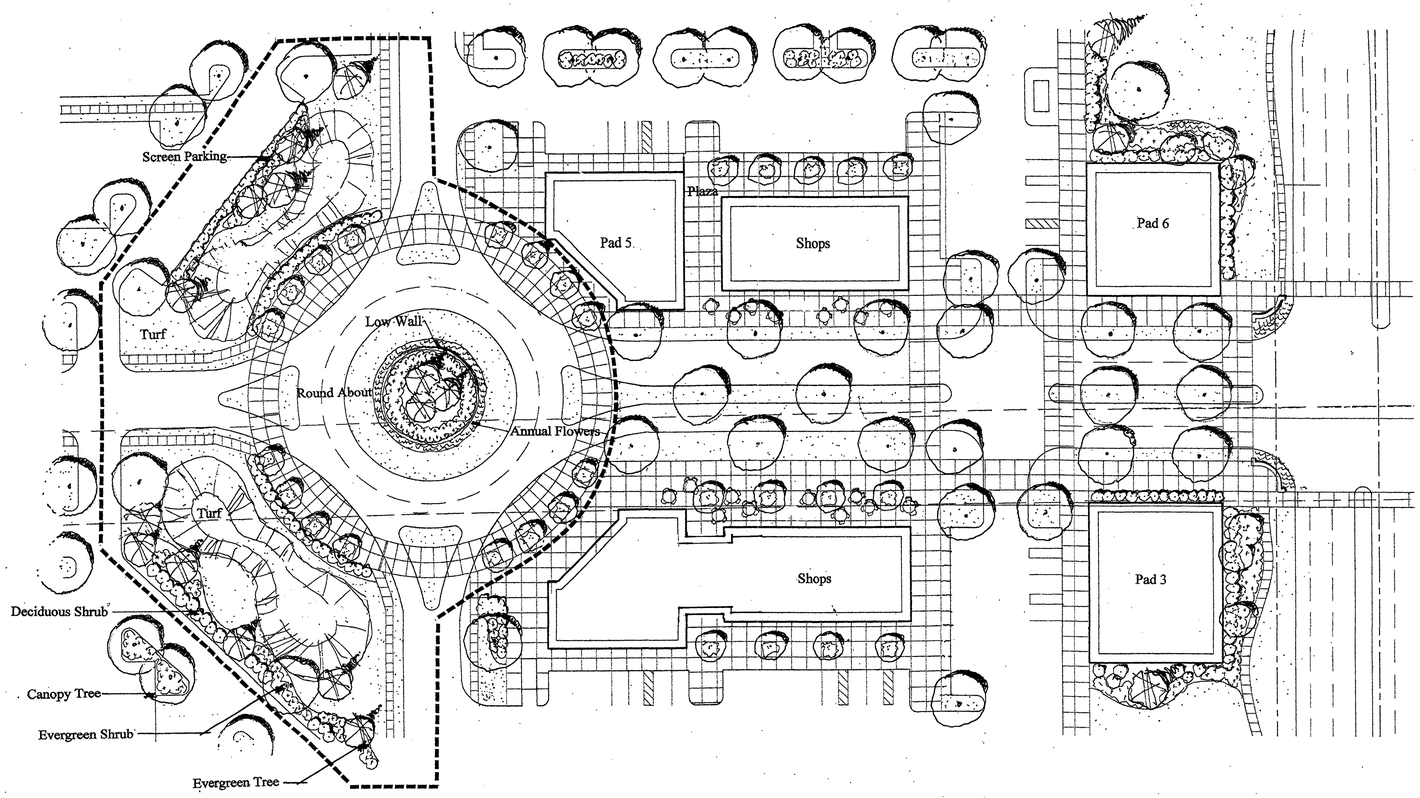
Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 46% deciduous and 54% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.



Round About Plantings

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01

REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 12

Page 14 of 18

SUPERIOR MARKETPLACE

SUPERIOR, COLORADO

REVISED 2-1-01 MAY 21,1999
REVISED 3-20-01 REVISED JANUARY 14, 2000
REVISED 4-5-01 REVISED 3-1-00
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

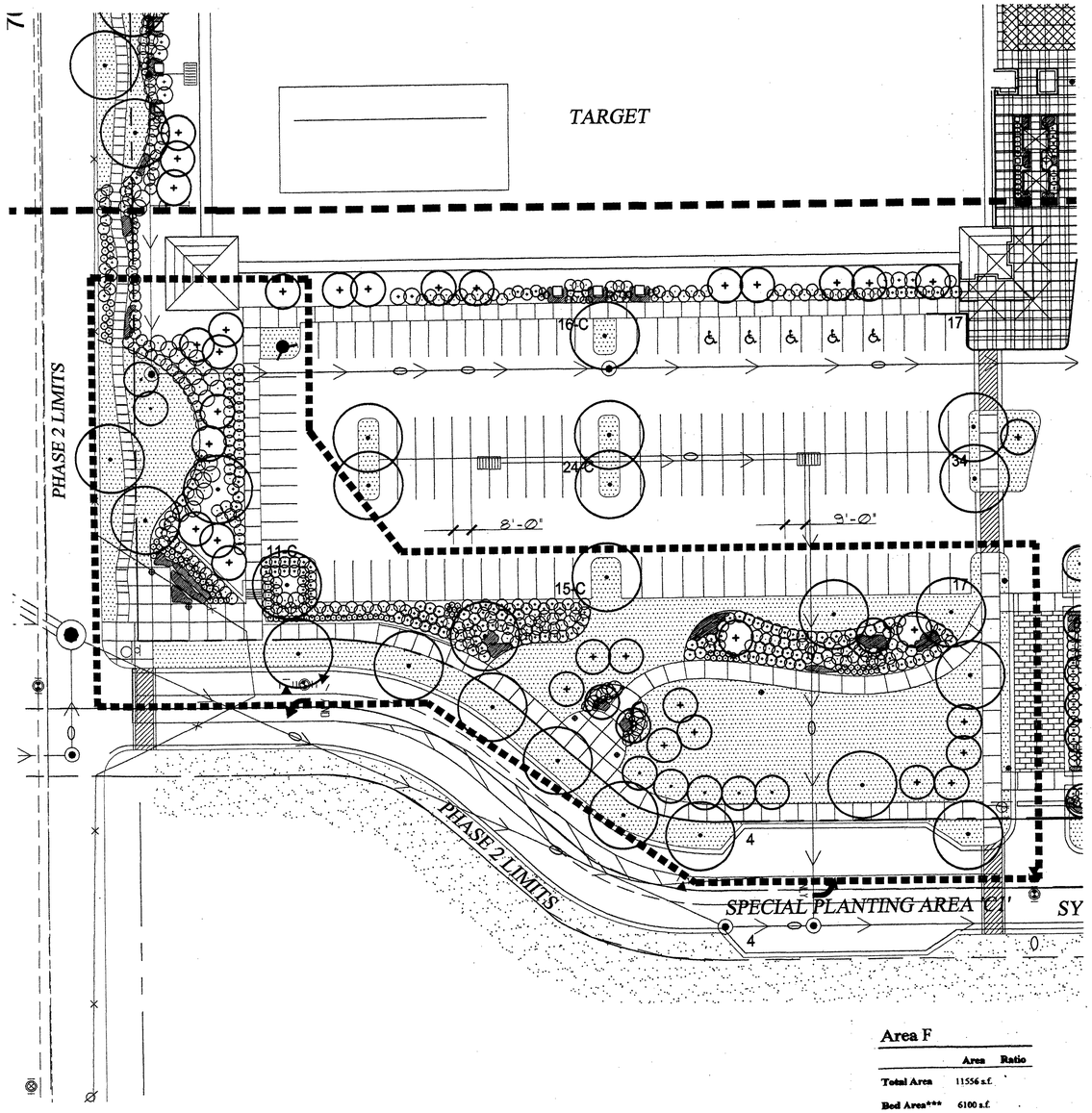
NORTH

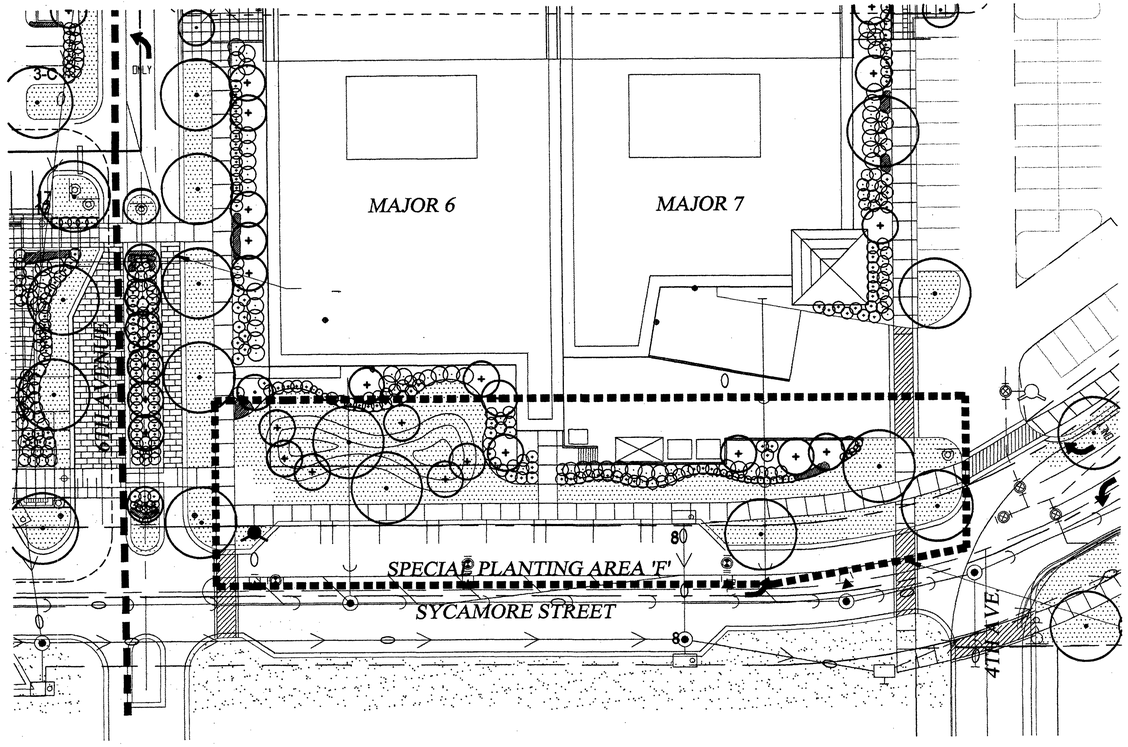
0 15 30 60
1"=30'

The NORRIS DULLEA Company
Planning Landscape Architecture
710 West Colfax
Denver, Colorado 80204
Fax: 303 892 1186
Phone: 303 892 1166

SPECIAL PLANTING AREA 'C1' & 'F'
PLANNED DEVELOPMENT ZONE DISTRICT PLAN
TYPICAL AREA ENLARGEMENT

AMENDMENT #4





Area F

	Area	Ratio
Total Area	11556 s.f.	
Bed Area* **	6100 s.f.	
Trees*		1/825 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.

Area C-1

	Area	Ratio
Total Area	17369 s.f.	
Bed Area* **	7370 s.f.	
Trees*		1/ 575 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* Th : total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE NORRIS GROUP, MD.

SHEET 13

Superior Marketplace

Superior, Colorado

May 14, 1998

Typical Area Enlargement

North

Scale: 1"=30'-0"

15' 30' 60'

Planned Development Zone District Plan AMENDMENT #4

Area D

	Area	Ratio
Total Area	28,723 s.f.	
Bed Area* **	13,740 s.f.	
Trees*		1/ 1,000 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.

Area E

	Area	Ratio
Total Area	27,000 s.f.	
Bed Area* **	5,500 s.f.	
Trees*		1/ 1,000 s.f.
Shrubs**		1/ 30 s.f.

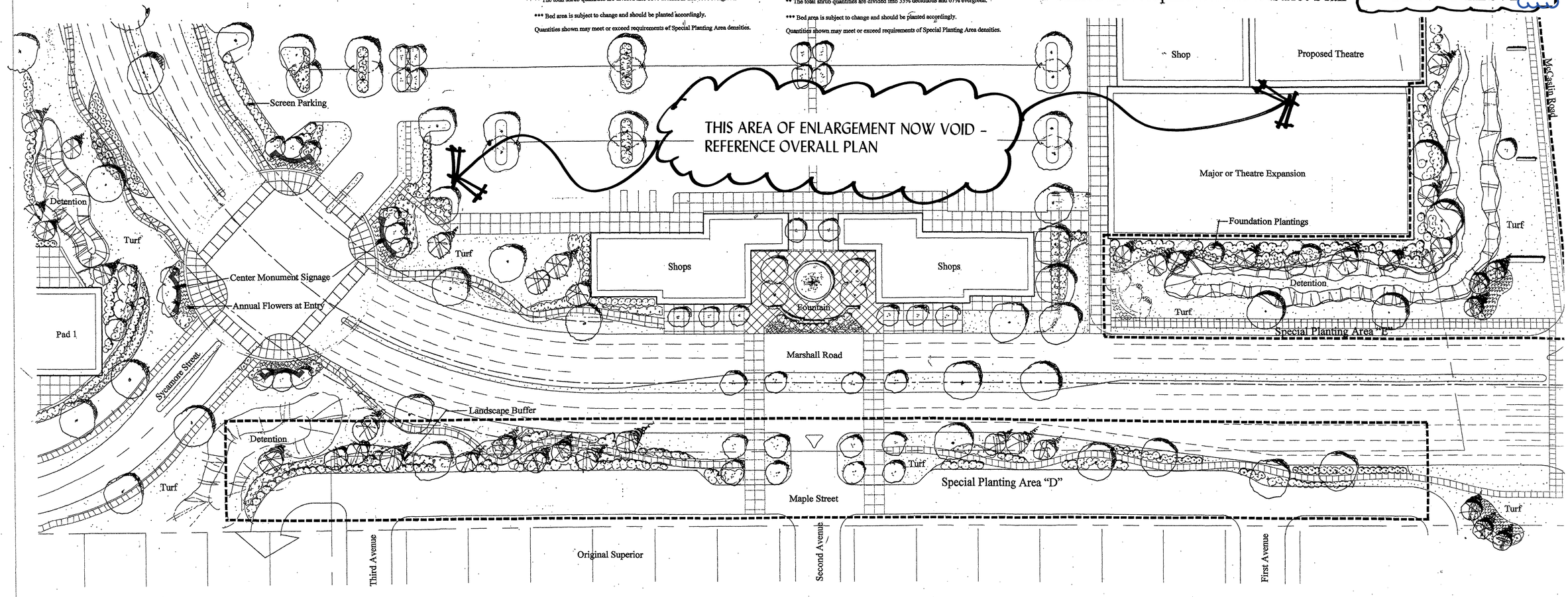
Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.



Marshall Road Streetscape

Special Planting Area "D" and Partial "E"

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 14

Page 16 of 18

Superior Marketplace

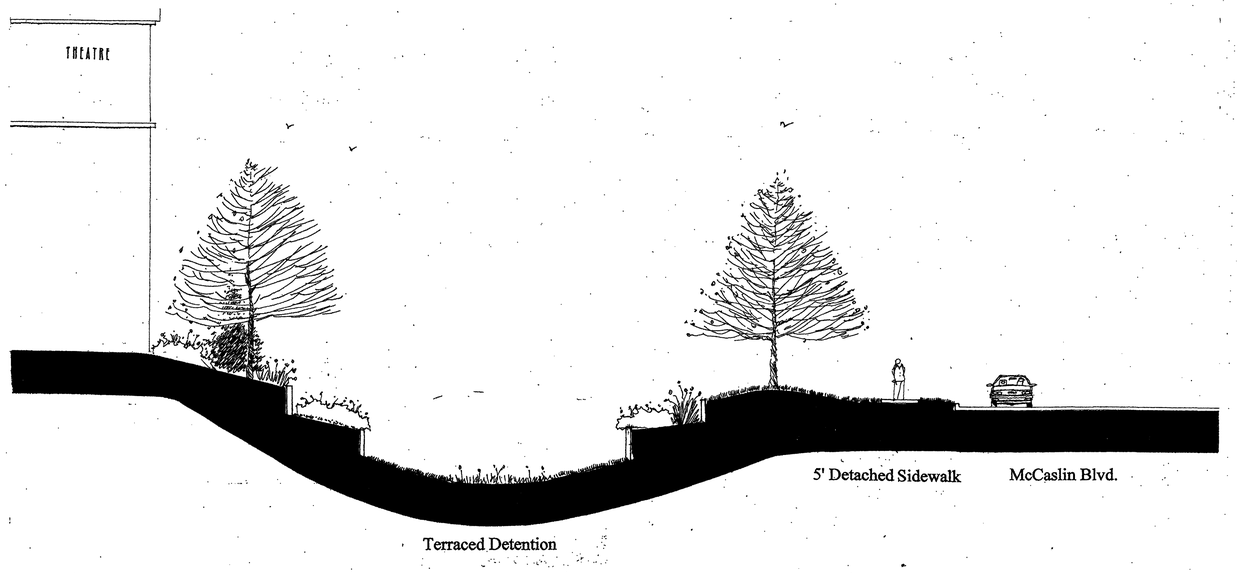
Superior, Colorado

PD AMENDMENT #4

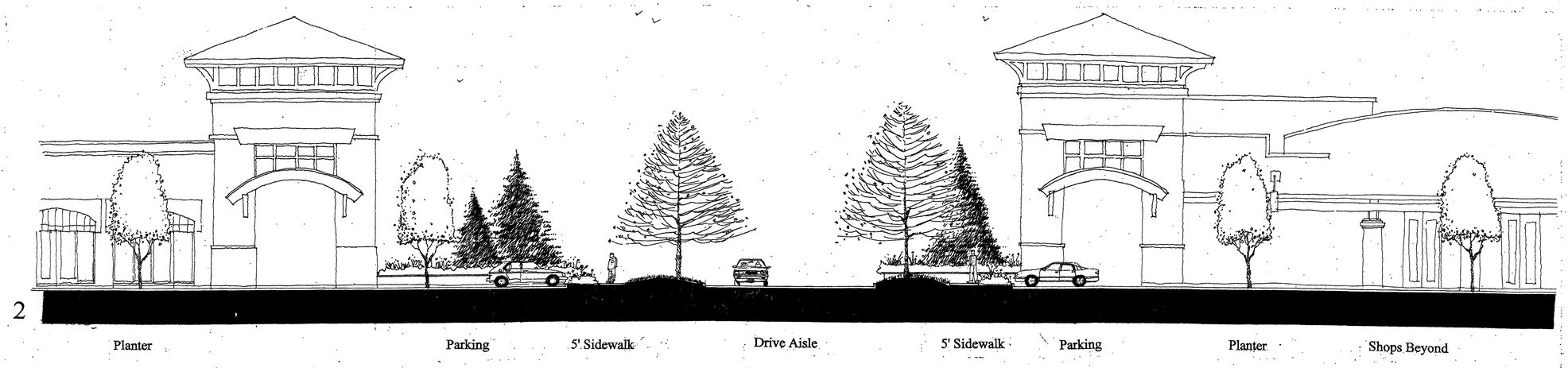
Typical Sections

May 14, 1998

1/8"=1'-0"



• Section Looking North at McCaslin Blvd.

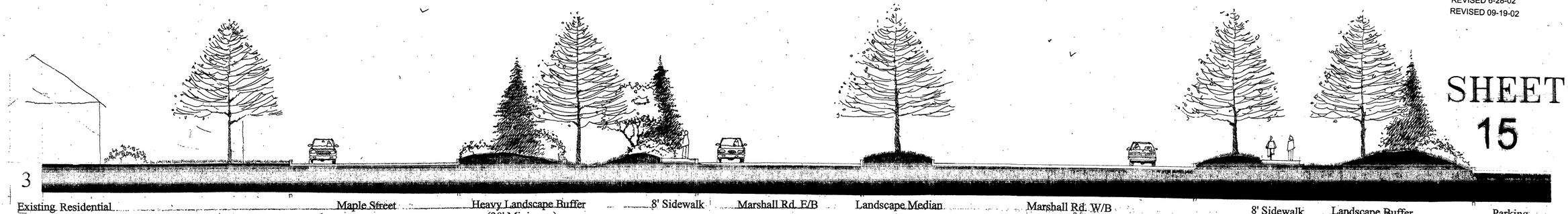


•Section Looking West Thru Main Drive Aisle/ Typical Pedestrian Way

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01

REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

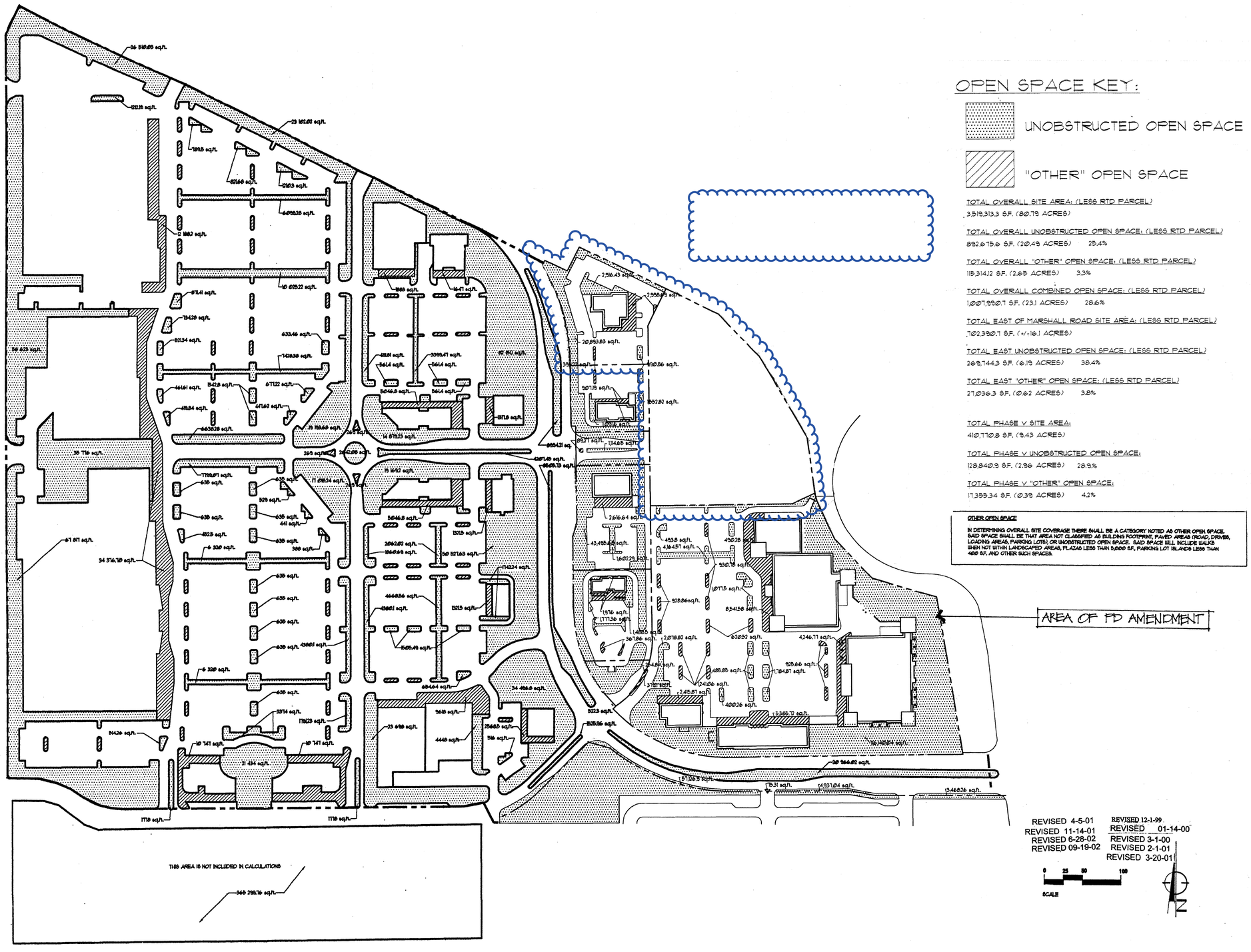
SHEET 15



• Section Looking West Thru Marshall Rd./ Maple St. Buffer

SUPERIOR MARKETPLACE

OPEN SPACE CALCULATIONS AMENDMENT #4



OPEN SPACE KEY:

UNOBSTRUCTED OPEN SPACE

"OTHER" OPEN SPACE

TOTAL OVERALL SITE AREA: (LESS RTD PARCEL)
3,519,313.3 S.F. (80.79 ACRES)

TOTAL OVERALL UNOBSTRUCTED OPEN SPACE: (LESS RTD PARCEL)
892,675.6 S.F. (20.49 ACRES) 25.4%

TOTAL OVERALL "OTHER" OPEN SPACE: (LESS RTD PARCEL)
115,314.12 S.F. (2.65 ACRES) 3.3%

TOTAL OVERALL COMBINED OPEN SPACE: (LESS RTD PARCEL)
1,007,990.1 S.F. (23.1 ACRES) 28.6%

TOTAL EAST OF MARSHALL ROAD SITE AREA: (LESS RTD PARCEL)
702,390.1 S.F. (+/-16.1 ACRES)

TOTAL EAST UNOBSTRUCTED OPEN SPACE: (LESS RTD PARCEL)
269,744.3 S.F. (6.19 ACRES) 38.4%

TOTAL EAST "OTHER" OPEN SPACE: (LESS RTD PARCEL)
27,036.3 S.F. (0.62 ACRES) 3.8%

TOTAL PHASE V SITE AREA:
410,770.8 S.F. (9.43 ACRES)

TOTAL PHASE V UNOBSTRUCTED OPEN SPACE:
128,840.9 S.F. (2.96 ACRES) 28.9%

TOTAL PHASE V "OTHER" OPEN SPACE:
17,355.34 S.F. (0.39 ACRES) 4.2%

OTHER OPEN SPACE

IN DETERMINING OVERALL SITE COVERAGE THERE SHALL BE A CATEGORY NOTED AS OTHER OPEN SPACE. SAID SPACE SHALL BE THAT AREA NOT CLASSIFIED AS BUILDING FOOTPRINT, PAVED AREAS (ROAD, DRIVES, LOADING AREAS, PARKING LOTS), OR UNOBSTRUCTED OPEN SPACE. SAID SPACE WILL INCLUDE WALKS WHEN NOT WITHIN LANDSCAPED AREAS, PLAZAS LESS THAN 5,000 S.F., PARKING LOT ISLANDS LESS THAN 400 S.F. AND OTHER SUCH SPACES.

REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01

SCALE 0 25 50 100

N

THE MULHERN GROUP LTD.
ARCHITECTURE • PLANNING • INTERIORS

1730 BLAKE STREET SUITE 435
DENVER COLORADO 80202
303-297-3334 FAX 303-292-2601

SUPERIOR MARKETPLACE
SUPERIOR, COLORADO

The information contained in this drawing file is intended for use only on this project. Unauthorized reproduction or use in other projects is not permitted. The Mulhern Group,ltd. assumes no liability for unauthorized reproduction, changes to or use of the information contained herein.
The information contained herein is provided on an "as-is" basis. The Mulhern Group,ltd disclaims all warranties with regard to the data contained in this drawing file and to the performance of the delivery media, including all implied warranties of fitness. The Mulhern Group,ltd assumes no obligations or liabilities for damages, including, but not limited to, consequential damages arising out of or in connection with the use or performance of this drawing file and its delivery media.

DATE	REVISION
6.4.99	FDP SUBMITTAL II
8.10.99	REVISION
8.23.99	REVISION
12.01.99	REVISION

SUPERIOR MARKETPLACE	
PROJECT NUMBER:	99010
DRAWN BY:	RAW
CHECKED BY:	DD/MGM
DESCRIPTION:	SITE PLAN

REFERENCE NORTH

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT / ZONE DISTRICT PLAN AMENDMENT #6

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

A PORTION OF THE SE 1/4 OF SECTION 13 AND THE N 1/2 OF THE NE 1/4 OF SECTION 24, T1S,R70W OF THE 6TH P.M.

SITE DEVELOPMENT CRITERIA

Maximum Building Height :
- Retail: 35' (flat parapet height) 50' (entry elements, towers, or sloped roofs)
- Theater building: 55'
- Residential Mixed Use building: 55' / 4 stories (above existing grade)

Retail Building Setbacks
- From Public R.O.W.* : 20' min.
- From Internal Property Lines : 0'

Min. Separation Between Freestanding Buildings : 0'

Parking Setbacks
- From all Public R.O.W.: 20' min.
- From Internal Arteries : 10' min.

Typical Parking Stall : 9' x 18'

Typical Handicap Space : 14' x 18' (includes aisle)

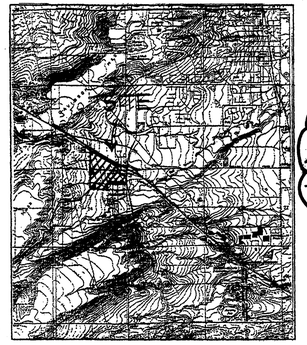
Typical Parking Aisle : 24' wide

Internal Arteries : 25' min. flowline to flowline

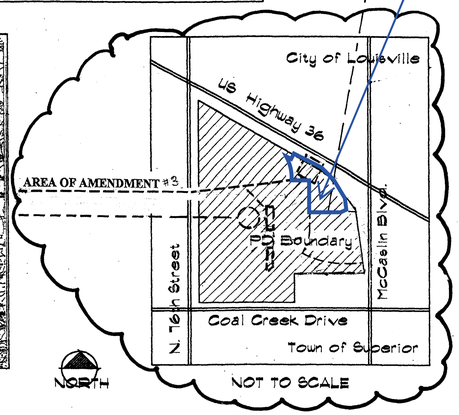
* Rear of in-line buildings facing a R.O.W. shall be setback a minimum of 20' from R.O.W.

* Rears of buildings at 70th Street shall be setback a minimum of 20' from R.O.W.

VICINITY MAPS



1 : 48000



LAND USE TABLE

SURA Site Area :	97.5 Acres	100%
Future Development Parcel :	9.1 Acres	9.3%
Gross Development Area :	88.7 Acres	90.7%

Gross Development Area includes R.O.W. areas as well as Retail Development.

Density : Commercial : 7,568 s.f./acre (F.A.R. Of .17)

Breakdown:

Building Area Subtotal :	672,476 S.F. (15.5 Ac)	17.4%
Unobstructed Open Space:	22.8 Acres	25.7%
Other Open Space:	3.3 Acres	3.8%
Walks in front of buildings Plazas less than 5,000 s.f. Islands less than 400 s.f.		
Paving Area Subtotal :	47.1 Acres	53.1%
Roadways, drives, loading areas, and parking lots		
Total:	88.7 Acres	100% of gross

Parking Data/Requirements :
- Provided: Total site spaces: 4,261 Spaces
- Retail Development: 3,561 Spaces 5.7/1000 s.f.
- RTD Park-n-Ride 400 Spaces

Required Ratios:
- Retail : 4.8 spaces/1000 s.f. (min.)
- Freestanding Restaurants : 8 spaces/1000 s.f. (min.)

Net Right-of-Way Area :	11.6 Acres	12.0%

Right-of-Ways

Marshall Rd.	5.64 Acres	5.8%
Extended Sycamore St.	2.38 Acres	2.4%
Extended Fifth Ave.	0.40 Acres	0.4%
East Side of 70th St.	2.34 Acres	2.4%
North Side of Coal Cr.	0.80 Acres	0.8%

Estimated Water Usage
TBD Gallons daily use

Estimated Sewer Usage
TBD cfs daily use

ENTIRE PD BOUNDARY

A TRACT OF LAND IN THE N1/2, NE1/4, SECTION 24 AND IN THE S1/2, SE1/4, SECTION 13, ALL IN TOWNSHIP 1 SOUTH, RANGE 70 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF BOULDER, STATE OF COLORADO, DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SECTION 24, T1S, R70 W; THENCE S89°08'40"W, ALONG THE NORTH LINE OF THE NE1/4 OF SAID SECTION 24, A DISTANCE OF 621.20 FEET TO THE NORTHEAST CORNER OF THAT TRACT OF LAND DESCRIBED ON FILM 626 AS RECEPTION NO. 869600 OF THE RECORDS OF BOULDER COUNTY, COLORADO, WHICH CORNER IS THE TRUE POINT OF BEGINNING;

THENCE S32°34'10"E, ALONG THE EASTERLY LINE OF THAT TRACT OF LAND DESCRIBED ON SAID FILM 626 AS RECEPTION NO. 869600, A DISTANCE OF 240.50 FEET; THENCE S56°47'24"E, CONTINUING ALONG THE EASTERLY LINE OF THAT TRACT OF LAND DESCRIBED ON SAID FILM 626 AS RECEPTION NO. 869600, A DISTANCE OF 364.72 FEET; THENCE S8°01'22"E, CONTINUING ALONG THE EASTERLY LINE OF THAT TRACT OF LAND DESCRIBED ON SAID FILM 626 AS RECEPTION NO. 869600, A DISTANCE OF 530.65 FEET TO THE SOUTHEAST CORNER OF THAT TRACT OF LAND DESCRIBED ON SAID FILM 626 AS RECEPTION NO. 869600, WHICH CORNER IS ON THE NORTH LINE OF MAPLE STREET IN MINK'S ADDITION TO THE TOWN OF SUPERIOR, RECORDED IN PLAT BOOK 3 AT PAGE 36 OF THE RECORDS OF BOULDER COUNTY, COLORADO; THENCE S89°48'20"W, ALONG THE NORTH LINE OF SAID MAPLE STREET, A DISTANCE OF 1273.53 FEET TO THE WEST LINE OF FOURTH AVENUE IN SAID MINK'S ADDITION TO THE TOWN OF SUPERIOR; THENCE S0°11'40"E, ALONG THE WEST LINE OF SAID FOURTH AVENUE, A DISTANCE OF 396.60 FEET TO THE SOUTH LINE OF THE N1/2, NE1/4, OF SAID SECTION 24; THENCE S89°44'22"W, ALONG THE SOUTH LINE OF SAID N1/2, NE1/4, A DISTANCE OF 1262.71 FEET TO THE SOUTHWEST CORNER OF SAID N1/2, NE1/4; THENCE N0°11'17"W, ALONG THE WEST LINE OF SAID N1/2, NE1/4, A DISTANCE OF 1292.99 FEET TO THE NORTHWEST CORNER OF SAID N1/2, NE1/4; THENCE N0°00'56"E, ALONG THE WEST LINE OF THE S1/2, SE1/4, SECTION 13, T1S, R70W, A DISTANCE OF 1249.98 FEET TO THE SOUTHWESTERLY LINE OF U.S. HIGHWAY NO. 36 AS DESCRIBED IN BOOK 878 AT PAGE 263 OF THE RECORDS OF BOULDER COUNTY, COLORADO; THENCE S63°11'12"E, ALONG THE SOUTHWESTERLY LINE OF U.S. HIGHWAY NO. 36, AS DESCRIBED IN SAID BOOK 878 AT PAGE 263, A DISTANCE OF 847.75 FEET TO THE SOUTH LINE OF THAT TRACT OF LAND DESCRIBED IN BOOK 424 AT PAGE 247 OF THE RECORDS OF BOULDER COUNTY, COLORADO; THENCE N89°05'04"E, ALONG THE SOUTH LINE OF THAT TRACT OF LAND DESCRIBED IN SAID BOOK 424 AT PAGE 247, A DISTANCE OF 1.06 FEET TO THE SOUTHWESTERLY LINE OF U.S. HIGHWAY NO. 36 AS DESCRIBED IN BOOK 878 AT PAGE 267 OF THE RECORDS OF BOULDER COUNTY, COLORADO; THENCE, ALONG THE SOUTHWESTERLY LINE OF U.S. HIGHWAY NO. 36 AS DESCRIBED IN SAID BOOK 878 AT PAGE 267, THE FOLLOWING COURSES AND DISTANCES;

S63°09'10"E A DISTANCE OF 837.67 FEET; THENCE N26°50'50"E, A DISTANCE OF 10.00 FEET; THENCE S63°09'10"E A DISTANCE OF 350.00 FEET; THENCE S32°36'31"E A DISTANCE OF 367.91 FEET TO THE NORTH LINE OF SAID N1/2, NE1/4;

THENCE, DEPARTING FROM THE SOUTHWESTERLY LINE OF SAID U.S. HIGHWAY NO. 36, N89°08'40"E, ALONG THE NORTH LINE OF SAID N1/2, NE1/4, A DISTANCE OF 0.07 FEET TO THE TRUE POINT OF BEGINNING, COUNTY OF BOULDER, STATE OF COLORADO, CONTAINING 94.320 ACRES MORE OR LESS.

NOTES:

BEARINGS ARE BASED UPON THE NORTH LINE OF THE NE1/4, SECTION 24, T1S, R70W HAVING A BEARING OF S89°08'40"W (TRUE MERIDIAN).

BOUNDARY DIMENSIONS ARE TAKEN FROM SURVEY BY DREXEL BARRELL ENGINEERS/SURVEYORS DATED 12/5/94, JOB NO. 4832-25.

AMENDED PD BOUNDARY

SUPERIOR MARKETPLACE, FILING 5, LOT 6:

COMMENCING AT THE NORTHEAST CORNER SECTION 24; THENCE S89°08'48"W A DISTANCE OF 517.28 FEET TO A POINT ON THE WESTERLY RIGHT-OF-WAY LINE OF THE BOULDER-DENVER TURNPIKE, U.S. HIGHWAY NO. 36, BOOK 878, PAGES 267 AND 263; STATE OF COLORADO. THENCE S07°07'51"E ALONG SAID WESTERLY RIGHT-OF-WAY A DISTANCE OF 128.37 FEET, TO A POINT ON SAID WESTERLY RIGHT-OF-WAY SAID POINT BEING THE POINT OF BEGINNING; THENCE ALONG SAID WESTERLY RIGHT-OF-WAY THE FOLLOWING 4 COURSES:

1. S07°07'51"E A DISTANCE OF 17.44 FEET;
2. S24°49'24"E A DISTANCE OF 114.32 FEET;
3. S42°30'57"E A DISTANCE OF 142.79 FEET;
4. S73°20'49"E A DISTANCE OF 121.38 FEET;

THENCE LEAVING SAID WESTERLY RIGHT-OF-WAY ALONG THE WESTERLY LINE TRACT M S00°09'56"W A DISTANCE OF 421.95 FEET TO A POINT ON THE NORTHERLY RIGHT-OF-WAY OF MARSHALL ROAD; THENCE ALONG SAID RIGHT-OF-WAY THE FOLLOWING 2 COURSES.

1. S89°48'20"W A DISTANCE OF 485.17 FEET TO A POINT OF CURVATURE TO THE RIGHT;
2. ALONG SAID CURVE WHOSE RADIUS IS 398.00 FEET AND AN INCLUDED ANGLE OF 34°46'00", A DISTANCE OF 241.50 FEET TO A POINT ON SAID RIGHT-OF-WAY AND A POINT ON THE EASTERLY BOUNDARY OF TRACT L;

THENCE LEAVING SAID RIGHT-OF-WAY ALONG SAID EASTERLY BOUNDARY THE FOLLOWING 2 COURSES.

1. N04°04'38"W A DISTANCE OF 70.98 FEET; TO A POINT OF CURVATURE TO THE RIGHT, AND A POINT ON THE EASTERLY BOUNDARY OF LOT 4;
2. ALONG SAID CURVE TO THE RIGHT WHOSE RADIUS IS 261.23 FEET WITH AN INCLUDED ANGLE OF 19°05'05", A DISTANCE OF 87.01 FEET;

TO A POINT ON THE NORTHERLY BOUNDARY TRACT L; THENCE LEAVING SAID EASTERLY BOUNDARY ALONG SAID NORTHERLY LINE N67°29'52"W A DISTANCE OF 38.26 FEET THENCE ALONG AN ARC OF A CURVE TO THE LEFT WHOSE RADIUS IS 205.50 FEET WITH AN INCLUDED ANGLE OF 22°23'31", A DISTANCE OF 80.31 FEET TO A POINT ON THE EASTERLY BOUNDARY LOT 4; THENCE ALONG SAID EASTERLY BOUNDARIES OF LOT 3 AND SAID LOT 4 N00°00'00"E A DISTANCE OF 347.68 FEET TO A POINT ON SAID EASTERLY BOUNDARY OF LOT 3, AND A POINT ON THE SOUTHERLY BOUNDARY OF LOT 5; THENCE ALONG SAID SOUTHERLY BOUNDARY THE FOLLOWING 2 COURSES.

1. S90°00'00"E A DISTANCE OF 363.83 FEET;
2. N65°10'36"E A DISTANCE OF 71.62 FEET; TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS 411,216 SQ. FT. (9.43 ACRES) MORE OR LESS.

Gross Development Area for Amendment #6: 5.384 Acres

Residential Mixed Use Density for Amendment #6:

Residential and parking structure uses:
50 dwelling units / acre (= max. 269 Dwelling Units)
80,000 s.f. / acre (F.A.R. of 1.84 = max. 430,720 s.f.)
Community-driven and/or non-profit commercial use:
2,000 s.f. / acre (= max. 10,768 s.f.)

Parking Data/Requirements for Amendment #6:

Provided:
RTD Park-n-Ride: 294 Existing Spaces to be retained/restored
Total Site Spaces: TBD Spaces (per required ratios)

Minimum Required Ratios:
Community-driven or non-profit Commercial: 1 space / 1,000 s.f. (min.)
100% Affordable Multifamily Residential: 0.30 spaces / dwelling unit

CERTIFICATE OF OWNERSHIP

I hereby certify that BRIXMOR PROPERTY GROUP is the owner of the entire property consisting of Pad 8, and as EVP, I consent to the above P.D.

By: _____
[Bill Brown, EVP, Development/Redevelopment]

Approved as to legal form for BRIXMOR PROPERTY GROUP

By: _____
[Bill Brown, EVP, Development/Redevelopment]

This instrument was acknowledged before me on _____ by Bill Brown as EVP of BRIXMOR PROPERTY GROUP, a Colorado political subdivision.

_____
Notary Public

My commission expires _____.

TOWN BOARD OF TRUSTEES' CERTIFICATE

Approved this _____ day of _____, A.D., 20____, by the Board of Trustees, Superior, Colorado. This approval is with the understanding that all expenses involving necessary improvements for all utility services, paving, grading, landscaping, curbs, gutters, street lights, street signs, and sidewalk, shall be financed by others and not the town of Superior.

_____ _____
Town Clerk Mayor

PLANNING COMMISSION CERTIFICATE

Approved this _____ day of _____, A.D., 20____.

_____
Chairman - Superior Planning Commission

TOWN CLERK'S CERTIFICATE

I hereby certify that this instrument was filed in my office at _____ o'clock ____ this _____ day of _____ A.D., 20____, and is duly recorded.

_____
Town Clerk

CERTIFICATE OF OWNERSHIP

I certify that the REGIONAL TRANSPORTATION DISTRICT (RTD) is the owner of the entire property consisting of pad 12 and pad 13, and as RTD General Manager and CEO, I consent to the above P.D.

By: _____
Debra A. Johnson, General Manager and CEO

APPROVED AS TO LEGAL FORM FOR RTD

By: _____

This instrument was acknowledged before me on _____ by Debra A. Johnson, as General Manager and CEO of the REGIONAL TRANSPORTATION DISTRICT, a Colorado political subdivision.

_____
Notary Public

My commission expires _____.

DEVELOPER

BOULDER COUNTY HOUSING AUTHORITY
3400 BROADWAY
BOULDER, CO 80304
LAUREN CELY
303.229.2568

ARCHITECT/PLANNER

COBURN ARCHITECTURE
2718 PINE STREET #100
BOULDER, CO 80302
PETER WEBER, AIA
303.442.3351

CIVIL ENGINEER

JVA, INC.
1319 SPRUCE STREET
BOULDER, CO 80302
CODY GRATNY
303.441.1951

LANDSCAPE ARCHITECT

Norris/Dullea
710 WEST COLFAX
DENVER, COLORADO 80204
303.892.1166
FAX : 303.892.1186
DOUG CRAIG
JOHN BIRKEY

The information, drawings, intent, and concepts contained in this package are the property of the Ellman Companies and their use by any other party is strictly prohibited without the permission of the Ellman Companies.

REVISED JANUARY 14, 2000
REVISED MARCH 1, 2000
REVISED FEBRUARY 1, 2001
REVISED MARCH 20, 2001
REVISED APRIL 5, 2001
REVISED NOVEMBER 14, 2001
REVISED JUNE 28, 2002
REV SEPT 19, 2002

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT/ZONE DISTRICT SITE PLAN AMENDMENT NO. 6

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD

CDOT Maint. Facility

Single Family Residential

NORTHERN BOUNDRY OF SAGAMORE SUBDIVISION

Boulder Next Exit

Marshall Road (Boulder Right-of-Way)

US 36 Boulder Turnpike

US - 36 ROW TO BE LANDSCAPED BY LICENSE AGREEMENT WITH CDOT

Center Turn Lane

Continuous Bike Lanes w/ Thermoplastic Striping

TENANT SIGNAGE, TYP. Subject to PDP approval

City of Louisville

AREAS OF PD AMENDMENT #3

NOTE: SPECIAL PLANTING AREA 'G' SHALL BE IMPLEMENTED AT SUCH TIME THAT PAD 8, & RTD DEVELOP THEIR INDIVIDUAL PROPERTIES

TENANT ID SIGNAGE (3 TENANT)

Future Pedestrian Bridge by Others

AREA OF PD AMENDMENT #6

PAD 8

PAD 12

PAD 13

PROPOSED INTERIM CONNECTION TO EXISTING PARK & RIDE

EXISTING RTD PARK & RIDE - 1101 SPACES

Future 1/4 Cloverleaf

McCaslin Boulevard

Future Signalized Intersection

Relocated Off Ramp

AREA OF PD AMENDMENT #4

Tenant Signage Subject to PDP approval

Center Identity signage Subject to PDP approval

Signalized Intersection

Town of Superior

Vicinity Map

No Scale

City of Louisville

US Highway 36

PUD Boundary

N. Tenth Street

McCaslin Blvd.

Coal Creek Drive

Town of Superior

50 0 100 150 200

COSTCO 146,323 S.F.

663 SPACES

MAJOR 8 25,000 S.F.

PAD 7 8,200 S.F.

104 SPACES

60 SPACES

Major 2 40,000 S.F.

151 SPACES

51 SPACES

Major 3 35,000 S.F.

156 SPACES

PAD 6 5,000 S.F.

PAD 5 5,000 S.F.

SHOPS 5,000 S.F.

PAD 9 7,000 s.f.

67 SPACES

76th Ave. (County Road 25)

(60' Right-of-Way)

Major 4 24,240 S.F.

Loading Court

78 SPACES

SHOPS 13,000 S.F.

PAD 3 5,200 S.F.

PAD 4 5,000 S.F.

MAJOR 5 113,484 S.F.

187 SPACES

174 SPACES

PAD 2 5,000 S.F.

PAD 10 7,000 s.f.

30 SPACES

PAD 11 7,000 s.f.

MAJOR 9 11,300 S.F.

MAJOR 10 33,400 S.F.

MAJOR 11 40,000 S.F.

SHOPS 'B2' 6,100 S.F.

SHOPS 'B1' 14,600 S.F.

Loading Court

PAD 1 8,200 S.F.

Major 6 23,240 S.F.

Major 7 18,238 S.F.

Shops 'A'

Shops 'A'

Loading Court

Proposed Sycamore Street 60' R.O.W.

Sycamore Street

11,100 SF (TOTAL)

AREA RESERVED FOR FUTURE SHOP BUILDINGS

Future Town Center ± 9.1 Acres

DETENTION/OPEN SPACE (3 Acre Open Water Area)

SIGNED PED. CROSSING

30" Vertical Curb

Maple Street (60' Right-of-Way)

Proposed First Ave. Right in/Right out Subject to CDOT Approval

Corner Bumpout

Align with Existing curb cut

Existing Condo Station

Existing Single Family Residential Zoning

Access from Alley to Third Ave.

Fourth Ave.

Third Ave.

Second Ave.

First Ave.

Original Superior

Coal Creek Dr.

PHASE II PARKING CHART

BUILDING	BUILDING SQ.FT	NO. OF SPACES	SPACES/1000 S.F.
MAJOR 2	40,000 S.F.	197	4.9
MAJOR 3	35,000 S.F.	168	4.8
MAJOR 4	24,400 S.F.	116	4.8
MAJOR 5	173,484 S.F.	867	5.0
MAJOR 6	23,540 S.F.	124	5.3
MAJOR 7	19,235 S.F.	139	7.2
SHOPS A	17,000 S.F.	101	5.7
SUBTOTAL	333,359 S.F.	1712	5.14

PHASE III PARKING CHART

BUILDING	BUILDING SQ.FT	NO. OF SPACES	SPACES/1000 S.F.
PAD 9	7,000 S.F.	43	6.1
PAD 10	7,000 S.F.	70	10.0
PAD 11	4,000 S.F.	38	9.5
TOTAL ALL PADS	18,000 S.F.	151	8.3

SOUTHEASTERN PARCEL

BUILDING	BUILDING S.F.	NUMBER OF SPACES	SPACES/1000
MAJOR 9	11,300 S.F.	91	8.0/1000
MAJOR 10	33,400 S.F.	150	4.5/1000
MAJOR 11	40,000 S.F.	180	4.5/1000
SHOPS 'B1' & 'B2'	21,300 S.F.	43	2.0/1000
SUBTOTAL	106,000 S.F.	464	4.35/1000 4.35/1000

NORTHEASTERN PARCEL PARKING CHART (PADS 8, 12, 13)

USE	MAXIMUM BUILDING AREA	MAXIMUM # OF DWELLING UNITS	MINIMUM NUMBER OF SPACES	SPACES/ 1000SF	SPACES/DU
RESIDENTIAL	430,720 S.F.	269	N/A	N/A	0.30/DU
COMMERCIAL	10,768 S.F.	N/A	11	1/1000	N/A
RTD	N/A	N/A	294	N/A	N/A
SUBTOTAL	441,488 S.F.	269	386	1/1000	0.30/DU

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 8-28-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED SEPT 19, 2002

THE MULHERN GROUP LTD.
ARCHITECTURE • PLANNING • INTERIORS

AMENDMENT #6

COBURN ARCHITECTURE

SUPERIOR MARKETPLACE

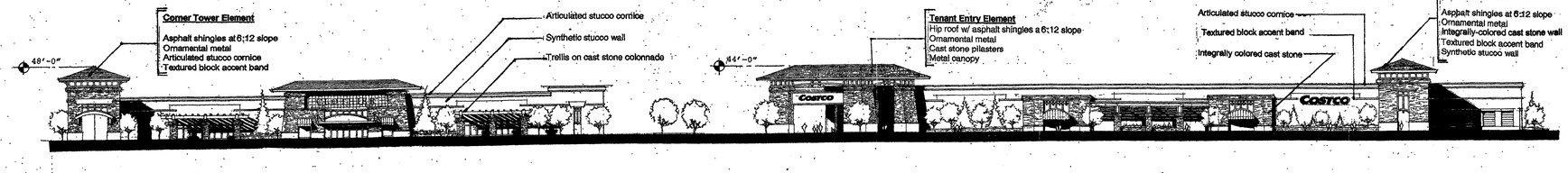
SUPERIOR, COLORADO

The information contained in this drawing file is intended for use only on this project. Unauthorized reproduction or use in other projects is not permitted. The Mulhern Group,ltd. assumes no liability for unauthorized reproduction, changes to or use of the information contained herein. The information contained herein is provided on an "as-is" basis. The Mulhern Group,ltd disclaims all warranties with regard to the data contained in this drawing file and to the performance of the delivery media, including all implied warranties of fitness. The Mulhern Group,ltd assumes no obligations or liabilities for damages, including, but not limited to, consequential damages arising out of or in connection with the use or performance of this drawing file and its delivery media.

DATE	REVISION
2.20.98	PD SUBMISSION
3.9.98	PLAN REVISION
3.25.98	PLAN REVISION
4.14.98	PLAN REVISION
4.28.98	PLAN REVISION
5.14.98	PLAN REVISION
6.1.98	PLAN REVISION
1.25.99	PLAN REVISION
5.21.99	PLAN REVISION
REVISED	01-14-00

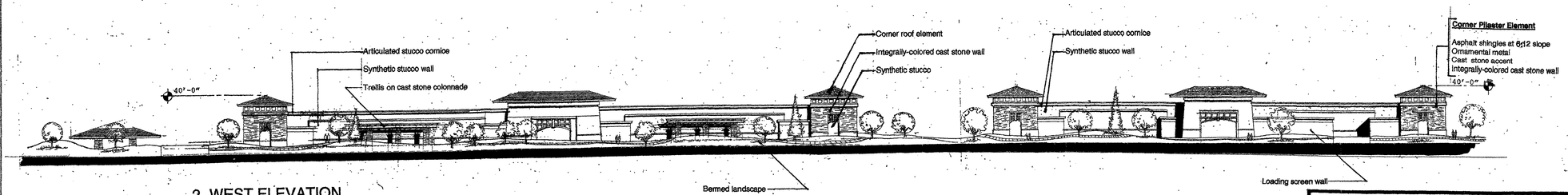
PROJECT NUMBER:	97046
DRAWN BY:	GD/DD/RW
CHECKED BY:	DD/MGM
DESCRIPTION:	SITE PLAN

REFERENCE NORTH



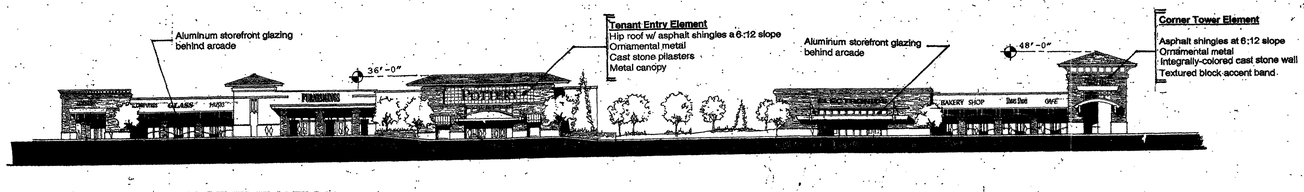
1. EAST ELEVATION

FRONT OF MAJORS 1 & 2
SCALE : 1/32" = 1'-0"



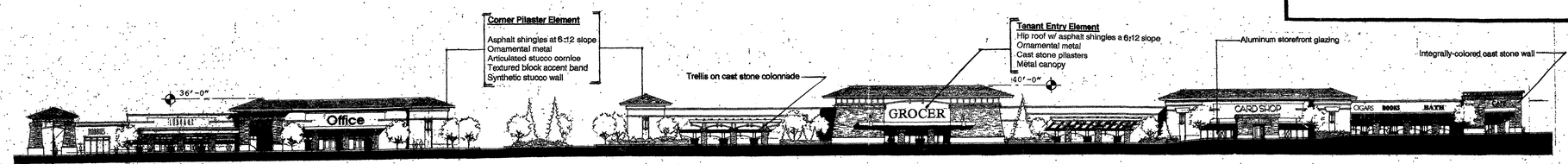
2. WEST ELEVATION

REAR OF MAJORS 1 & 2 FACING 76TH ST.
SCALE : 1/32" = 1'-0"



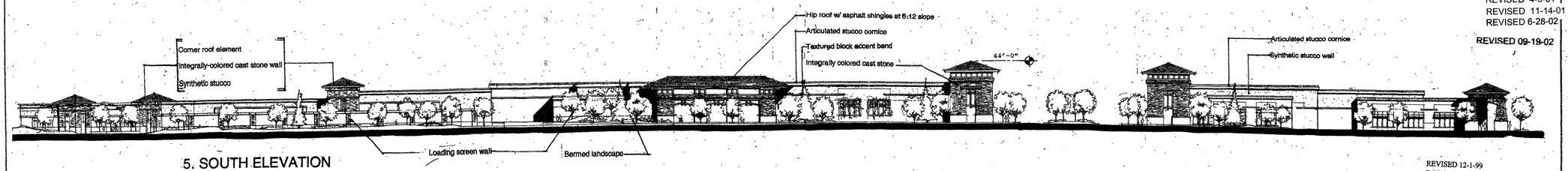
3. EAST ELEVATION

FRONT OF RETAILERS
SCALE : 1/32" = 1'-0"



4. NORTH ELEVATION

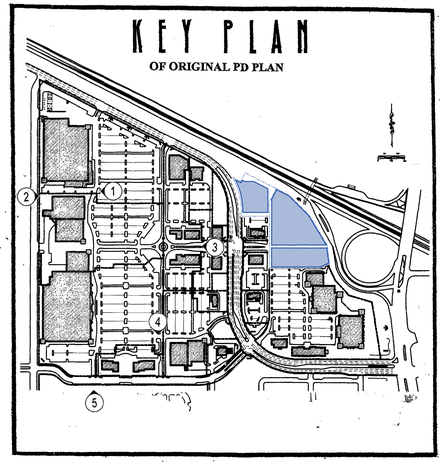
FRONT OF MAJORS
SCALE : 1/32" = 1'-0"



5. SOUTH ELEVATION

REAR OF MAJORS FACING SYCAMORE ST.
SCALE : 1/32" = 1'-0"

NOTE: KEY PLAN "UNCHANGED" TO COORDINATE WITH REPRESENTATIVE ARCHITECTURE AS SUBMITTED WITH PREVIOUSLY APPROVED PD.



REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02

REVISED 09-19-02

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00

THE MULHERN GROUP LTD.
ARCHITECTURE • PLANNING • INTERIORS

AMENDMENT #6

COBURN ARCHITECTURE

SUPERIOR MARKETPLACE

PD AMENDMENT #4
SUPERIOR, COLORADO

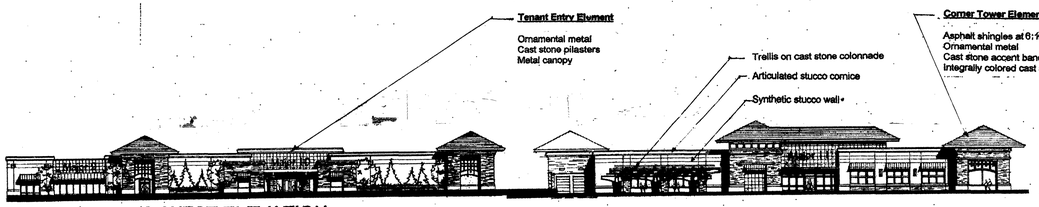
The information contained in this drawing file is intended for use only on this project. Unauthorized reproduction or use in other projects is not permitted. The Mulhern Group,ltd. assumes no liability for unauthorized reproduction, changes to or use of the information contained herein. The information contained herein is provided on an "as-is" basis. The Mulhern Group,ltd disclaims all warranties with regard to the data contained in this drawing file and to the performance of the delivery media, including all implied warranties of fitness. The Mulhern Group,ltd assumes no obligations or liabilities for damages, including, but not limited to, consequential damages arising out of or in connection with the use or performance of this drawing file and its delivery media.

DATE	REVISION
2.20.98	PD SUBMISSION
3.9.98	PLAN REVISION
3.25.98	PLAN REVISION
4.14.98	PLAN REVISION
4.28.98	PLAN REVISION
5.14.98	PLAN REVISION
6.1 .98	PLAN REVISION
1.25.99	PLAN REVISION
5.21.99	PLAN REVISION
REVISED	01-14-00

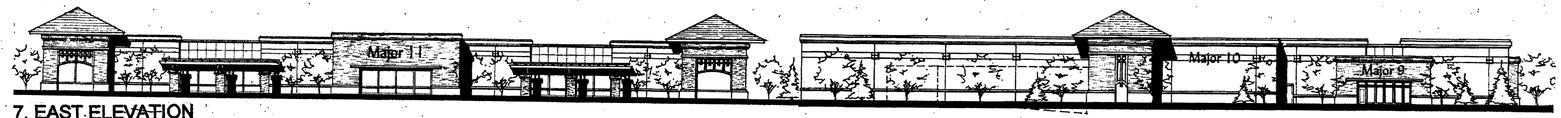
PROJECT NUMBER:	97046
DRAWN BY:	DD/GD
CHECKED BY:	DD
DESCRIPTION:	ELEVATIONS

REFERENCE

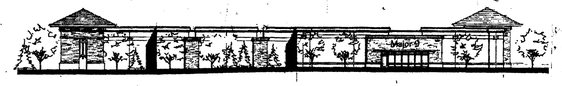
3



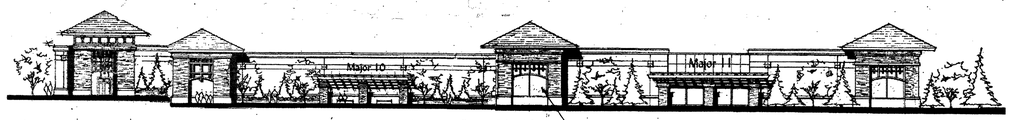
6. WEST ELEVATION
MAJORS 9, 10 & 11
SCALE : 1/32" = 1'-0"



7. EAST ELEVATION
MAJORS 9, 10 & 11
SCALE : 1/32" = 1'-0"



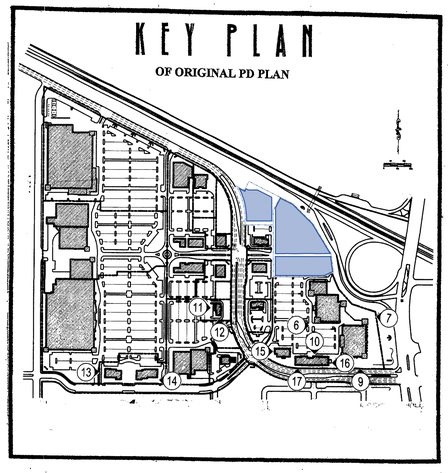
8. NORTH ELEVATION
MAJOR 9
SCALE : 1/32" = 1'-0"

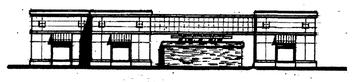


9. SOUTH ELEVATION
MAJORS 9, 10 & 11
SCALE : 1/32" = 1'-0"

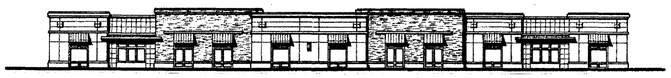
10. NORTH ELEVATION
MARSHALL ROAD SHOPS
SCALE : 1/32" = 1'-0"

15. WEST/EAST ELEVATIONS
MARSHALL ROAD SHOPS B2
SCALE: 1/32" = 1'-0"



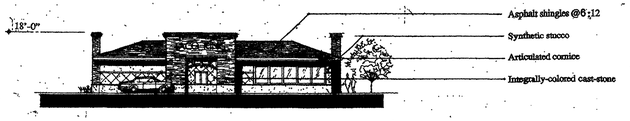


17. SOUTH ELEVATION
MARSHALL ROAD SHOPS
SCALE : 1/32" = 1'-0"

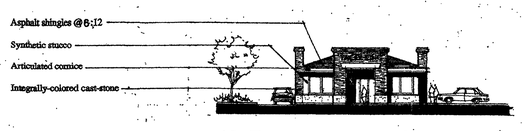


16. WEST/EAST ELEVATIONS
MARSHALL ROAD SHOPS B1
SCALE: 1/32" = 1'-0"

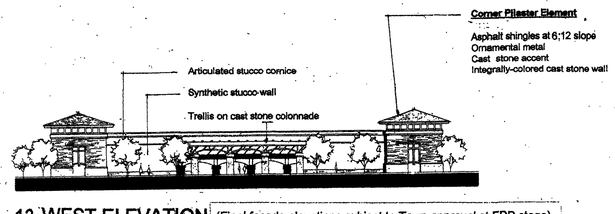
NOTE: KEY PLAN "UNCHANGED" TO COORDINATE WITH REPRESENTATIVE ARCHITECTURE AS SUBMITTED WITH PREVIOUSLY APPROVED PD.



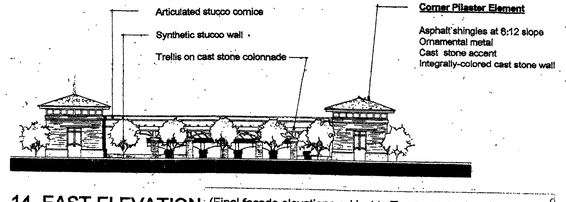
11. SOUTH ELEVATION
TYPICAL PAD BUILDING
SCALE : 1/16" = 1'-0"



12. EAST ELEVATION
TYPICAL PAD BUILDING
SCALE : 1/16" = 1'-0"



13. WEST ELEVATION (Final façade elevations subject to Town approval at FDP stage)
FIFTH AVENUE PROMENADE
SCALE : 1/32" = 1'-0"



14. EAST ELEVATION (Final façade elevations subject to Town approval at FDP stage)
FIFTH AVENUE PROMENADE
SCALE : 1/32" = 1'-0"

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

THE MULHERN GROUP LTD.
ARCHITECTURE • PLANNING • INTERIORS

AMENDMENT #6

COBURN ARCHITECTURE

SUPERIOR MARKETPLACE
PD AMENDMENT # 4
SUPERIOR, COLORADO

The information contained in this drawing file is intended for use only on this project. Unauthorized reproduction or use in other projects is not permitted. The Mulhern Group,ltd. assumes no liability for unauthorized reproduction, changes to or use of the information contained herein. The information contained herein is provided on an "as-is" basis. The Mulhern Group,ltd disclaims all warranties with regard to the data contained in this drawing file and to the performance of the delivery media, including all implied warranties of fitness. The Mulhern Group,ltd assumes no obligations or liabilities for damages, including, but not limited to, consequential damages arising out of or in connection with the use or performance of this drawing file and its delivery media.

DATE	REVISION
5.14.98	PD SUBMITTAL
6.1 .98	REVISION
1.25.99	REVISION
5.21.99	REVISION
8.23.99	PLAN REVISION
10.01.99	PLAN REVISION
11.4.99	REVISION

PROJECT NUMBER:	97046
DRAWN BY:	DD
CHECKED BY:	DD
DESCRIPTION:	ELEVATIONS

REFERENCE NORTH

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT/ZONE DISTRICT SITE PLAN SUBMITTAL

NEW PLAN EXCEL REALTY TRUST, INC.

A PORTION OF THE SE 1/4 OF SECTION 13 AND THE N 1/2 OF THE NE 1/4 OF SECTION 24, T1S,R70W OF THE 6TH P.M.

AMENDMENT #6

THE MULHERN GROUP, LTD.

SUBMITTAL DESIGN GUIDELINES

A. NARRATIVE

The proposed Superior Marketplace seeks to create a major commercial development for the Town of Superior. Elcor, LLC, intends to capitalize on the site's unique frontage on U.S. 36 and McCaslin Road, good access, adjacency to Original Superior, strong regional demographics and existing demand. While it is the intent of the center to provide a focal point for the community it is also the intent that this center will provide a synergy which will attract shoppers from up to seven miles away. Thereby bringing in substantial tax revenue for the Town.

The 6th Amendment to the PUD adds residential mixed use to the permitted uses for the Amendment #6 area (pads 8, 12 & 13) illustrated on page 2. Policy 4.2.a of the Town's Comprehensive Plan makes it a long-term goal of the Town to "provide for a mix of attached and detached residential housing types at varied densities and price ranges to accommodate residents of all ages."

The proposed site, while offering great opportunities, also poses substantial challenges. The final design must tie in well with Original Superior, with respect to both planning and architecture, while at the same time creating buffers which protect the single family core. The new circulation system must provide for good access to the proposed Towne Center mixed use development while also providing connectivity to Original Superior and newly proposed developments. At the same time, we must relocate a state highway, meet spacing requirements for signals along McCaslin and provide for an expanded interchange and Park 'n Ride facility.

We have sought to do this in the following manner:

B. CIRCULATION ELEMENTS

Circulation elements have become major factors in the determination of the final site plan. Key factors are the following:

1. Relocation of Marshall Road. Connecting McCaslin (near Maple) to the existing Marshall Road ROW west of what would be Fourth Avenue.

2. Location of Marshall Road just north of existing Maple. Alternatively to No. 1 above, allows existing Maple to act as a frontage road for existing residential lots facing north on Maple.

3. Provision of Sycamore Street from Third to 76th. Allows for direct access to Marshall Road and ultimately, McCaslin, for SURA's southern 9.1+/- acres of the mixed use development and the proposed Sagamore development. This access further protects Original Superior by providing quick, efficient travel to McCaslin thereby discouraging use of existing roadways.

4. Connection of future Fifth Avenue directly into the proposed commercial development. Provides direct connection into the heart of the center for existing development to the east and future developments to the south of the SURA District while not encouraging use by those not living in Original Superior.

C. BUFFERS

Three major buffers have been incorporated in the proposed plan:

1. Maple Street. Per the original Advisory Committee's recommendation, the proposal has incorporated a 30' landscaped buffer paralleling Maple Street and the relocated Marshall Road. Just north of the two existing residences on Maple, this landscaped buffer increases to 42' at the east and 57' at the western edge. This buffer will be bermed and well landscaped to protect the residential character of Maple Street as it develops. It will be pierced at strategic locations to provide pedestrian and bicycle connections from Original Superior to the commercial development.

2. 9.1+/- acres from Coal Creek to Maple, 4th to 76th. This area is planned as a transitional zoning buffer between the residential planned south of Coal Creek (per the comp plan) and the larger commercial district. It is proposed as a commercial or government center in accord with current zoning. It will tie to the major commercial development via the 5th Avenue Promenade. To minimize traffic impacts on Coal Creek curb cuts for the development should be predominantly located on Sycamore Street thereby discouraging use of Original Superior street system.

3. Rear of commercial development. To minimize adverse impacts by the rear of the commercial development we have sought to create service courts versus the typical "wraparound" service drives. In most cases, backs of buildings parallel the street being separated by a landscaped area with a minimum depth of 25' from the property line combining with an additional setback from the curb of 18' to create a total setback of 40-43'. Acting with the streets, a strong buffer is created for existing and future residential developments. Contrasting this, retailers (pads) along Marshall shall generally be within 20' of the ROW to reinforce the "urban" nature of the plan.

D. PLANNING OF THE COMMERICAL DEVELOPMENT

The commercial development has been broken into two major components.

West of Marshall Road will be a commercial development of approximately 56 acres. The size of this development is such that it should provide for an interesting mix of tenants, including general merchandise, soft goods, electronics, party goods, groceries, office supplies and restaurants.

The Marketplace provides for a large mix of tenants oriented east and north with various outbuildings articulating entries at Marshall Road.

The Master Plan features two major tree-lined drives which meet at a landscaped roundabout at the center of the development. Deep landscaped setbacks have also been provided along Marshall Road to allow for gracious landscaped detention areas along the major thoroughfare. The southern portion of the major north-south drive has been widened and landscaped to create a major promenade in order to link with future development to the south.

Major buildings step in and out to create visual interest and break up large masses while drives and pedestrian walks meander to address this stepping. This meandering slows traffic while creating interesting walks similar to the development at 92nd and Sheridan.

Parking is presently provided at a minimum of 4.8 sp/1000 s.f. In most cases we are shooting for ratios of 5 sp/1000 s.f. of retail and 10 sp./1000 s.f. of restaurants to assure adequate parking for all. Landscaped islands are provided every 20 spaces per Superior guidelines and linear landscaped medians are provided at strategic rows to further break up larger parking areas.

E. EASTERN MIXED USE DEVELOPMENT AND TRANSPORTATION HUB

The eastern area is comprised of approximately 21.77 acres. It has been planned to provide an entertainment complex in concert with restaurants and an expanded RTD Park'n Ride, as well as, through Amendment #6, a residential mixed use development with 100% affordable multifamily housing, associated structured parking, supporting uses including, but not limited to, leasing office, amenity areas, fitness centers, co-working spaces, and community-driven and/or non-profit commercial uses.

Circulation is simple with a major tree-lined north-south drive at the west end of the parking area accessed at the Sycamore intersection. This drive is designed to provide connections to parking for the Park'n Ride and residential mixed use development. A second east-west boulevard off the center's major entrance provides direct access to some shops, a drop-off for the Park 'n Ride, the Southeastern retail complex, and the residential mixed use development.

Majors with adjacent shops are planned for the eastern edge with the Park 'n Ride and proposed residential mixed use development located at the northeast portion of this area. Restaurants and shop spaces are located at major entries along Marshall Road. Also incorporated are two specialty shop buildings which front on Marshall Road. The buildings have been designed to provide interest along Marshall Road while providing a buffer from the lights and activity of the major parking lot for Original Superior.

F. ARCHITECTURAL THEME

The major buildings and shops buildings will be of an architecturally consistent theme incorporating similar materials. All other buildings shall be controlled per the proposed architectural guidelines and the CC& R's as submitted to the town.

In development of the theme it shall be our effort to create a look which is unique to and compatible with the town of Superior. The magnitude of the Marketplace and the fact that it is the only major commercial development in the town will help to assure that the image of the town is conveyed through the Marketplace. This may be furthered by the introduction of this design vocabulary to other commercial and residential developments proposed within the town in the future.

ARCHITECTURAL GUIDELINES

A. INTENT

The Superior Marketplace is intended to be a comprehensively designed mixed-use development. The new residential mixed use component will complement the Superior Marketplace's wide array of tenants offering an extensive range of goods, entertainment opportunities and smaller scale commerce and government development. This is to be in an architecturally unified, well-landscaped complex which provides for a safe, pleasant, and interesting shopping environment for the citizens and guests who visit and the residents who live in this mixed use development.

To that end, plans and conceptual elevations have been developed and are attached to this PD . Should there be necessary future design deviations of the major buildings or as one seeks to determine the appropriate design of the planned pad buildings, the following guidelines are set forth.

The architectural "theme" for the Superior Marketplace is best described as a "Craftsman Image," with a distinctive combination of materials and forms to create the theme. Throughout Superior, one is struck by the use of Colorado native sandstone on bridges and on public buildings, as well as generous use in the Rock Creek subdivision. This abundance legitimizes this material as "indigenous" to Superior. Because of this, the proposed architecture has been provided with a generous amount of cast stone to augment and perpetuate this material as the image presented by Superior.

The use of integrally-colored cast stone, stucco and ornamental metal combine in Craftsman-style forms: towers with hipped roofs, battered walls and pilasters to support ornamental metal and colonades with arching metal accents to create arcades that support metal canopies. Roofs and canopies provide generous overhangs to emphasize their horizontal nature - a Craftsman aesthetic. Ornamental iron accents this and creates another layer of design unifying the different forms of the composition. Towers combined with hip roofs break up the parapet lines of the retailers, helping to create an intriguing roofscape. The arrangement of towers, colonnades and major tenant entries creates a composition of elements that establish a hierarchy for the center, while reducing the mass of the development to a more human scale. The arrangement of elements seeks to differentiate tenants and will be employed in such a fashion so as to accentuate this. Freestanding towers, pilaster towers, and parapet towers articulate building corners and different tenants. Arcades define entries, retailer storefronts and help to break up long building facades.

Although there is not a set "formula" for which users employ which specific elements, the elevations convey an overall sense of variety in the sequencing and relative spacing of the elements. Parapet lines between users may stagger to convey a difference in floor levels; however, this stagger should be distanced by use of a tower, roof, or pilaster element.

B. THE MAJOR BUILDING ENVELOPE

The Major Building envelope shall be composed of accented stucco with details and color to establish a base, middle and top. It shall be enhanced by cast stone at the entries, tower elements and trellis elements, if included in the composition, and at sidewalk planters. The building design has been varied to incorporate variations of the craftsman theme to provide additional interest and richness in the overall composition. Said design shall be complementary to the overall theme. Attention to sequencing of massing elements to reinforce an overall hierarchy of elements will be maintained. A 360° architecture will be employed by pulling towers and trellises with stucco patterning, ground face block banding, articulated cornices and accent detailing around to the sides and rears of the buildings.

Materials incorporated shall be as follows:

1. Fronts:
   a. Cast Flagstone: Stone to cover not less than 30% of the overall area of all users combined. The front face of columns faced in stone shall be considered a part of the facade, as would attached stone-faced planters. Stone may be intermittent between users, so long as an average of 30% is maintained on each major massing (i.e., Major 1 and Major 2, south of Major 2 to the southwest pedestrian plaza, from the southwest pedestrian plaza to 5th Avenue and from 5th east), unless approved otherwise by the Town.

   b. CMU: Maximum wall area allowed shall not exceed 25%. CMU shall only be used to create bases or accent banding with split or ground face units (integrally colored or stained). Banding shall be utilized to differentiate between a frontage's base, middle and top. Differentiation shall occur on 75% of the buildings, minimum. Bands shall not exceed 16" in height, typical. Bases shall not exceed ¼ of building height, maximum.

   c. Stucco: Approved colors and textures only. Stucco shall not exceed 75% of area averaged over entire center's frontages.

   d. Glazing: All users shall incorporate not less than 25% of linear frontage as glazed doors or windows. All window and door frames to be uniform in color and finish throughout center. (Color shall be bronze duranodic or a compatible "kynar" color). Users are encouraged to increase amount of glazing in building frontages.

Exception. Major 1, being 136,565 s.f., (a discount warehouse operation), and a major grocer of 55,000-75,000 s.f. shall be exempt from the "glazing" portion (1.d) of this provision although efforts by these users to meet these requirements is encouraged.

2. Sides:
   a. Cast flagstone: To cover no less than 15% of overall wall area (including columns and attached planters) unless otherwise approved by Town.
   b. CMU: Maximum wall area shall not exceed 25%. Banding to occur at specifically designated portions. Banding shall be utilized to differentiate between a frontage's base, middle or top and shall not exceed 16" in height, typical. Differentiation shall occur on 75% of the buildings, minimum.
   c. Stucco: Approved colors and textures only.
   d. Glazing: Users shall be encouraged to incorporate glazing wherever appropriate.

3. Rears:
   a. Cast flagstone: To cover no less than 15% of over all wall area exposed to public view (including columns and attached planters) unless otherwise approved by Town. See special notes for Sycamore Street elevations.
   b. CMU: Maximum wall area shall not exceed 25%. Banding to occur at specifically designated portions. Banding shall be utilized to differentiate between a frontage's base, middle or top and shall not exceed 16" in height, typical. Differentiation shall occur on 75% of the buildings, minimum.
   c. Stucco: Approved colors and textures only.

4. Roofs:
   All sloped roofs to conform to a 6:12 slope, typical and be covered with center standard roofing material (as determined by town planning review process). The use of hips, sheds and towers are encouraged to provide a variated roofscape. No more than 70% of any visually unbroken façade (may include multiple tenants)shall be flat (straight) parapet unless interrupted by sloping (shed or hipped 6:12 slope) residential roof elements. When flat parapets do occur, they shall be capped by either an articulated cornice (center standard) or pre-finished metal coping cap of complimenting color. Roofing matls. to be approved by Town at FDP stage.

5. Screening of rooftop units:
   All HVAC units throughout the SURA District shall be screened from view within Superior by a building parapet of equal height, or a screen wall of stucco to match design, detailing and the materials of the building or other appropriate screening. Determination of the appropriateness of the design as to its location shall be the sole discretion of the Town staff.

6. Wall Composition:
   In an effort to alleviate long uninterrupted facades, any wall face shall conform to the following restrictions.

   Main Building Frontage (incorporating primary entry doors).

   a. No wall expanse shall extend over 75 lineal feet without incorporating at least one architectural feature(s)of at least 24' in length total and at least one-third the building height. Architectural features shall include either towers, entry elements, flagstone colonnades with trellis', pilaster towers, vision glass, or display windows. Attached planters at buildings shall not be designated as an architectural feature, however, the use of cast stone at the planter face may apply to a frontage's minimum cast stone requirements as it is in essence a projection of the building base. Attached planter boxes of cast stone shall be provided at a minimum of 25% of building frontage on at least one-half the users, averaged over the entire center.

   Note: Glazing is included as an architectural feature to encourage tenants to incorporate glass. Windows, whether looking into the store or presenting display add substantially to a building's interest both during the day or night.

   b. Building Sides and Rears. Architectural features as listed above shall occur in no less than 20% of the outer lineal wall length while also meeting the 75' rule. Said articulation need not occur within a loading court area. However, wall area above the elevation of screen wall must display cornice details and roof details as in accord with previously noted requirements.

   c. Diagonal Screen Walls Adjacent to Intersection of 76th and Sycamore. Since these walls may shield a majority of the shop's rear facades, as the outer wall face, they shall be distinguished by architectural elements that may include:
      - Metal trellis attachments
      - Cast stone pilasters
      - CMU accent band coping cap

   Said elements shall encompass not less than 20% of the screen wall area applied to and the amount of cast stone shall meet the Sycamore Street Design Guidelines.

C. BUILDING ENTRIES

The entry to each major user shall be highlighted and protected by a well-designed arcade vestibule, awning, or canopy. These elements shall be composed of not less than 50% cast flagstone, with the remaining being ornamental metalwork, canopy awning elements, stucco sign band or flagstone tiles. Said tenant entry should employ the integrally-colored cast stone and/or ornamental metal to contrast from the Major Building envelope. The scale or mass of any tenant entry should be proportional to the square footage of said user. Said determination of proportionality shall be at sole discretion of Town staff at FDP stage. No entry element shall exceed beyond 1/3 the building height over parapet line. Signage should work in proportion to the entry element to create a pleasing architectural composition.

D. ORNAMENTAL IRONWORK

Where appropriate, ornamental ironwork, complimentary to that illustrated in the PD shall be introduced into the overall composition. A variety of designs will provide for additional architectural interest, as well as continuity, throughout the center. All styles of ironwork are shown on, or shall be compatible with the styles indicated on the building elevation sheets. No less than half (50%) of the primary building entries shall display ornamental ironwork. Said ironwork to envelope a minimum of 5% of these entry elements. (Tracking of percentage rules shall be by Architectural Review Committee established by Master Developer).

E. PEDESTRIAN WALKS

The Superior Marketplace has been designed to provide a pedestrian-friendly environment. Therefore, special attention shall be given to all walking surfaces especially those in front of each retail space. Walks at major public areas, i.e., Plaza, Pedestrian Plaza at 2nd and Marshall, major entry drive shops, the 5th Avenue promenade, the Southwest Shops Plaza and any other special plazas, shall feature additional scoring and a minimum of 20% colored concrete. Also incorporated shall be an area of integrally colored concrete pavers, brick pavers or stamped concrete. Said area shall equate to a minimum of 5% of that area designated as special paving area. Street trees shall be placed adjoining a facade and planters shall be placed between building entries where grade changes occur and unbroken walk areas exceed a width of 20 feet. These trees shall be placed in tree grates or shrub beds. Tree locations may be adjusted, however, the number of trees shown on the PD at the sidewalks, shall not be reduced. Architectural paving shall be introduced at handicapped ramp areas. Pedestrian pole, wall-mounted lights, freestanding sidewalk benches and colonnades with trellises will work to finish the pedestrian nature of the building fronts. Lights and street furnishing are further described below.

1. Restrictions:
   a. Minimum depth from curb to building at pads is 12'. Minimum depth from curb to building at major users and outlying shop buildings is 15', however, average depth at major users shall not be less than 20' including planters.

   b. Minimum number of trees at front facades. All building entry frontages shall include a minimum of one street tree per 40' of frontage on the average. Said trees may be located in tree grates, shrub beds, grass lawns or attached or detached planters.

   c. Attached planter boxes of cast stone shall be provided at a minimum of 25% of building frontage on at least one-half the users, averaged over the entire center.

AMENDMENT #6

COBURN ARCHITECTURE

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

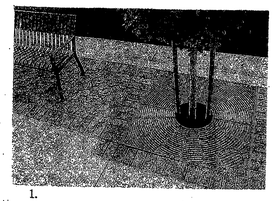
THE MULHERN GROUP, LTD.

SHEET 5

F. SITE FURNISHINGS

Major site furnishings include benches, waste receptacles, bicycle racks, and tree grates. In general, visual continuity of these elements is desired throughout the project. The color, in addition to design, will create continuity on the site. All components of outdoor site furniture should be low maintenance and durable. Said fixtures shall be located at all major pedestrian plazas and other areas deemed appropriate in the F.D.P. phase.

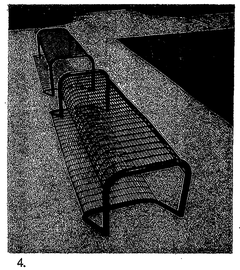
1. Tree Grate: Ironsmith Olympian or approved equal
2. Trash Receptacle: Victor Stanley The T Series or 32 gallon steel receptacle with standard spun steel tapered lid or approved equal
3. Radius Bench with Back: Gametime The Ultrum Collection or approved equal
4. Backless Bench: Gametime The Ultrum Collection or approved equal
5. Bicycle Racks: Cycloops Super 2175 or approved equal.



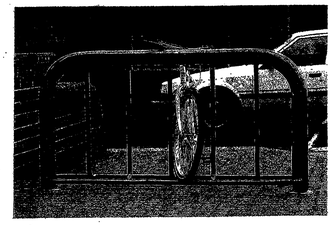
1.

2.

3.



4.



5.

G. PAD BUILDINGS

These buildings, by their nature, are in high visibility locations. Given this, 360 degree architectural treatments shall be embraced and great sensitivity must be given to the screening of service areas and utility entries. The architecture of these buildings shall be compatible to that of the center in mass, material, color and details. All facades of these pad buildings shall be a minimum of 20% integrally-colored cast stone. CMU (groundfaced or splitfaced), may be used as a base or accent band only. Bands shall not exceed 16" in height, typical. Bases shall not exceed ¼ of building height, maximum. Roofing materials must be compatible with the overall design and color intent of the center. These shall be determined by planning staff. Entry areas shall be highlighted by unique architectural treatments where appropriate. The introduction of display windows for users backing up to Marshall Road and McCaslin Boulevard shall be encouraged, and 20% of lineal frontage on these roads shall be vision or display windows to at least 10' above finished floor. Spandrel glazing shall not be utilized in these calculations. (Note: Spandrel glass may only be used to expand a field of vision glass. It shall be limited to 25% of that field, maximum).

Ornamental ironwork shall be worked into arcades, vestibules and/or canopies. Canvas awnings may be incorporated, however, they shall not be backlit. The sidewalk treatment shall be restricted as previously noted in "E. Pedestrian Walks" and landscaping of pad sites shall meet the intent of the original quality of the design with respect to size and spacing of materials including ground cover and mulch. For purposes of these guidelines, the proposed theatre (and attached) buildings shall be designated as "pads."

Pad buildings may incorporate a drive-thru with the exception of those included in the entry restaurant/shop complex in the conceptual plan. (Pads 3-6 and the adjoining shops buildings.)

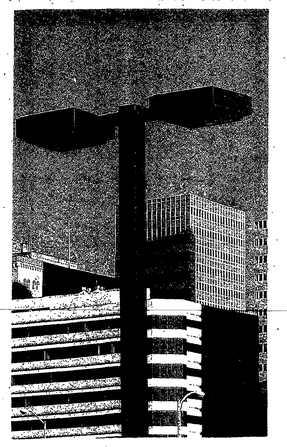
H. LIGHT STANDARDS

All light standards, be they parking, pedestrian pole or wall-mounted fixtures, shall be those shown in these documents.

Lighting Fixtures.

Lighting fixtures incorporated within the SURA District shall be as follows:

1. Street Lighting: Street lighting fixtures shall be similar, as shown in illustration "#1" or an approved equal. Said fixtures shall be green to match McCaslin standards and shall not exceed District standards for height. Fixtures shall exhibit cut-off capabilities to minimize off-site spillage.
2. Parking Lot Lighting: Parking lot lights shall be the same as the street lights shown in illustration #1. Said lights shall not exceed a height of 35' including the concrete base. Fixtures shall exhibit cut-off capabilities to minimize off-site illumination spillage.
3. Ornamental Lights at Sidewalks and Pedestrian Plazas: Ornamental lights at sidewalks and pedestrian plazas shall include double-pole mounted; single-pole mounted and wall-mounted fixtures designed to match those ornamental fixtures at the bridge on McCaslin. See illustration #2 · Fixtures shall be full cut-off LED.
4. Security Lighting: Security lighting may be wall packs and of colors noted in the color section. Said lighting shall be allowed at loading areas only. Said lights shall not project above dock screen wall. Security lighting is also permitted at parking structures and public transportation facilities.



1.

2.

I. 5th AVENUE PROMENADE

NO LONGER VALID

J. COLOR SCHEME

As all buildings are to be architecturally compatible, variations in sympathetic colors will afford interest to the overall center and help provide a human scale for the center. The range of colors shall be as follows:

1. Integrally-colored cast stone: Although a range of hues is anticipated, all units to be in the red/brown/buff range to be sympathetic to stone utilized. Applied in a "mountain ledge" pattern across composition, colors should not be segregated in order to create a uniformity across the site.
2. Stucco: Smooth to medium textures will be utilized in a range of light tan to medium browns to contrast yet compliment the rough texture and deep colors of the cast flagstone.
3. CMU: (split face or ground face) Will be stained or integrally colored at new buildings to avoid a "painted" look. This stain shall be complimentary to the colors of the stone and stucco.
4. Ornamental Ironwork: These colors shall bring life to the color compositions. They should give a clean, crisp feeling. Colors may be bright white, off white, or hunter/forest green, and deemed appropriate (at Town staff's discretion) to the architectural composition of the building and pavilions overall.
5. Glazing: Glazing shall be clear only.
6. Glazing System: The Glazing System shall be medium bronze anodized aluminum, or green (center standard) "Kynar " finished or bronze duranodic.
7. Architectural Roofing: Shall be uniform across site, to be determined by planning staff resolution.
8. Light Standards: Lights and light standards in parking areas, major drives and pedestrian walkways shall be green to match those fixtures at McCaslin. Lights and light standards at loading bays may be bronze anodized or of a color to match the adjacent wall surface so that they disappear.
9. Pre-cast concrete: Pre-cast concrete shall be light tan/buff.
10. Awnings: Awning color may vary as long as it is appropriate to the building composition. However, awnings may not be orange or black.
11. Accent tiles: Accent tiles of green, black, tan or white may be introduced if successfully integrated into the architectural design of the building and shopping center.
12. Corporate Colors: Corporate colors may be exemplified in signage, awning and logo, however awning may not be orange or black.

K. ELEVATIONS OF COMMERCIAL STRUCTURES FACING SOUTH ONTO SYCAMORE STREET.

In any major retail development there exists a rear of buildings where loading service and storage occur. Sycamore Street will be an important entry conduit for the Sagamore development and the SURA District community parcel. Fifth Street will provide an important access point to the commercial development from Original Superior, thus additional care must be taken in the design of this frontage.

These guidelines shall apply to either the rear of majors without "community shops" planned in front of them.

1. Cast flagstone shall cover no less than 15% of overall wall area in public view (areas within loading courts are exempt).
2. The architecture at the corners of buildings adjacent to 5th Street shall make an "entry statement" through the use of pilaster tower elements.
3. The intersection of 5th and Sycamore shall be made pedestrian friendly through the use of concrete crosswalks and small plazas at the northern corners.
4. Loading areas shall be clustered as loading courts wherever possible. 13'-6" (minimum) screen walls shall be provided at all dock areas directly adjacent to the ROW.
5. The rear of these buildings shall incorporate sloped roof elements which comprise a minimum of 20% of the length of the Sycamore facades.
6. The architecture detailing of these buildings shall be in keeping with the fronts of the buildings however at a limited scale. Therefore wrapping the building architecture.
7. Landscaping. Landscaping shall be taken to the building wherever possible. Said landscaping shall include a variety of meandering berms planted with a combination of deciduous and coniferous trees.

   In addition, two quiet pedestrian seating areas shall be incorporated just off the sidewalk area on the north side of Sycamore.
8. Glass. Although glazing is typically not appropriate to the rear of a building its use is encouraged. To that end, if a tenant introduces glass along this frontage in the form of a vision window, or display window said tenant shall be allowed sensitively applied signage at this frontage. Said sign area shall equal one square foot per square foot of glass area. However, said sign shall not exceed 18" in height nor 50 s.f. total. All signage shall be individually pan channel letters. However, they may not be illuminated.
9. Sycamore Street Location. The preliminary PD shows a location of Sycamore Street which the Authority, the Town and Redeveloper agree may need to be relocated to accommodate the desire of the Town and the Authority to permit construction of retail shops on the Property on the north side of, and facing, Sycamore Street. If the buildings or other improvements shown on the preliminary PD have been relocated up to ten (10) feet north to accommodate such retail shops, and if requested by Elcor, the Town and the Authority agree to relocate the street up to an equivalent of ten (10) feet south of the original planned location so as to accommodate the possibility of future construction of commercial buildings facing Sycamore Street. Redeveloper shall design and locate buildings to be constructed by Redeveloper on the Property so as to permit possible future construction by Redeveloper of commercial buildings facing Sycamore Street; provided, however, Redeveloper shall have no obligation to construct such buildings at any time; and provided further, that no event shall Redeveloper be required to locate any building more than ten (10) feet north of the location depicted.
10. SMALL SCALE RETAIL SHOPS

    Since this revised PD incorporates retail shop buildings that are conceptually different from the rears of Major tenants concieved in the initial submittal, the following will apply to said retail buildings:

    A. All elevations shall employ a minimum of 20% cast stone, primarily used in entry elements, sign areas and corner pilasters, typ.

    B. Sloped roofing elements shall be restricted, to create a smaller sense of scale.

    C. Maximum shop building height = 28' A.F.F.

    D. Glazing shall cover no less than 50% of the north and south facades.

L. LOADING DOCKS.

Loading dock areas must be sensitively handled throughout the project. To that end, the following shall apply:

1. Dock areas where exposed to public view, shall be screened with a masonry wall that is a minimum of 13'-6" above the grade of dock and a minimum length of 55' to effectively screen a tractor trailer. Said wall shall meet architectural requirements listed in this document.
2. If loading docks are within 150' of residentially zoned property and loading occurs between the hours of 10 p.m. and 6 a.m., said dock areas shall be also enclosed by a roof structure.
3. Lights incorporated at dock areas and at the rear of buildings shall be "cut off" fixtures not allowing casting of light onto the ground plane beyond the property line at adjacent ROWs.
4. Noise at loading docks shall not exceed the following decibels at property lines adjacent to a residentially zoned property:

   Sycamore. 50 dba both day and night.*

   76th Avenue. 50 dba from 7p.m. to 7a.m.
   60 dba from 7a.m. to 7p.m.

These levels are to be enforced as per the Colorado Revised Statutes Volume 11A, 1989 Replacement Volume, Government IIA, Article 12, Noise Abatement.

*55 dba allowed both day and night if no residential located south of Sycamore St.

M. SPECIAL COVENANTS.

1. Special covenants shall be introduced into the development's C.C.&R's to control the following:
   a. At auto uses special covenants requiring provision and maintenance of trash receptacles and steam cleaning of parking areas on a regular basis.
   b. Restrictions limiting storage of vehicles to 36 hours.

N. PROJECT TITLE.

Upon completion of the approval process the developer may change the name of project. The original name Superior Towne Center shall be reserved for future town projects.

Currently, the name of the center is Superior Marketplace.

The developer shall endeavor to have RTD identify the Park 'n Ride area as the Superior Park 'n Ride deleting the reference to Louisville as no portion of the Park 'n Ride is in Louisville.

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

AMENDMENT #6
COBURN ARCHITECTURE

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 6

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT/ZONE DISTRICT SITE PLAN SUBMITTAL

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

A PORTION OF THE SE 1/4 OF SECTION 13 AND THE N 1/2 OF THE NE 1/4 OF SECTION 24, T1S,R70W OF THE 6TH P.M.

AMENDMENT #6

O. BICYCLE CIRCULATION.

Bicycle circulation is an important part of the SURA District. The following restrictions shall apply:

1. Bikes lanes at Marshall Road: Seven-foot wide bike lanes shall be incorporated at Marshall Road from the sycamore intersection to the 76th Street intersection. In order to assure a more permanent marking of these lanes they shall be striped and identified utilizing thermo plastic material versus paint.
2. Combination bike/pedestrian paths at Marshall Road: Eight-foot wide (off-street) paths shall be located on both sides of Marshall Road from McCaslin to the major entry of the commercial development. Said walks shall be striped and noted with 4' for bicycles and 4' for pedestrians.
3. Bicycle racks: Racks shall be incorporated throughout the development. Said racks shall be introduced in all FDP submittals at locations deemed appropriate by staff.

P. UNOBSTRUCTED OPEN SPACE.

North of a line equating to the southern ROW line of Sycamore Street, within the SURA District, unobstructed open space shall equate to a minimum of 25% of the total site area. This shall include ROWs within the area defined.

Unobstructed open space shall be composed of the following:

1. Islands, medians, etc., when located within a parking area when equating to 400 s.f. or more.
2. Landscaped areas at the site perimeter, within the site, within ROWs and within walks areas.
3. Walks when within a landscaped area.
4. Pedestrian plazas when greater than 5,000 s.f.

Within the Amendment #6 residential mixed use development, unobstructed open space shall equate to a minimum of 15% of the total site area. This shall include ROWs within the area defined.

Unobstructed open space shall be composed of the following:

1. Islands, medians, etc., when located within a parking area when equating to 150 s.f. or more.
2. Landscaped areas at the site perimeter, within the site, within ROWs and within walks areas.
3. Walks when within a landscaped area.
4. Pedestrian plazas of any size.
5. Roof decks accessible to residents or building occupants as amenity space.
6. Decks and Patios accessible to the public at grade or elevated, including but not limited to outdoor seating areas associated with community-driven or non-profit commercial uses.

Q. LANDSCAPED AREAS WITHIN PARKING LOTS.

Landscaped areas within a rectangle formed by the perimeter of a parking area shall constitute a minimum of 5% of the parking area. Not applicable to parking structures.

R. OTHER OPEN SPACE.

In determining overall site coverage there shall be a category noted as other open space. Said space shall be that area not classified as building footprint, paved areas (road, drives, loading areas, parking lots), or unobstructed open space. Said space will include walks when not within landscaped areas, plazas less than 5,000 s.f., parking lot islands less than 400 s.f. and other such spaces.

The landscaped berm at the COSTCO fueling station shall be bermed and landscaped in such a manner so that the solid portions of the fueling pumps are screened from view from Marshall Road and US 36.

S. LANDSCAPING SUBSTITUTIONS / COMPONENTS

1. Shrubs/sod substitution at islands.

The restriction requiring one tree and three shrubs for each 20 parking spaces shall be amended as follows. In lieu of shrubs a grassed, irrigated berm may be provided at islands and medians.

2. Tree/Shrub Substitutions.

In determination of the number of trees and shrubs required, one tree may be substituted for ten shrubs required or vice versa.

3. Final landscaping design shall include components to provide a liberal use of wildflowers and boulders to create a quality landscape effect.

T. PEDESTRIAN CIRCULATION WITHIN PARKING AREAS.

Pedestrian walkways shall be incorporated at key locations within parking areas. Said walks shall continue across drives as concrete, thereby, providing a change in color and texture to alert drivers of the pedestrian crossing. These will serve as traffic calming devices. Not applicable to parking areas within parking structures.

U. ARCHITECTURAL REVIEW COMMITTEE (ARC) BY MASTER DEVELOPER.

No longer valid.

V. VIEWS TO AND FROM THE DEVELOPMENT.

Views west to the foothills. The SURA District development, being predominantly one-story retail, will help to maintain the present views to the Flatirons. This will be enhanced by the grading plan which will step down at 76th and then provide a gentle grade of approximately 3% to McCaslin.

One will continue to see the Flatirons from many locations within the district, however, these views will diminish as one approaches buildings from east to west.

1. Heights: To further assure views to the Flatirons will be preserved, heights of the buildings shall be limited as follows:

	Base parapet	Accessory tower & entry elements
Retail buildings	35'	45'
Office/Government buildings	35'	50'
Major towers		50'
	Base parapet	Appurtenances & screens
Residential Mixed Use buildings*	50'	55'

* within Area of Amendment #6; above existing grade

2. Views north along McCaslin: There will be some views to the eastern edge of the SURA District development as one proceeds north on McCaslin.

   ~~The parapet of this roof shall be equal to the height of all HVAC units and~~ these units shall be laid out in a neat linear fashion. The success of this requirement is seen in the view to the existing Mann Theater building where all units are screened with a parapet versus Eagle Hardware where units are screened individually and Home Depot where units project above the parapet heights.

3. HVAC units will also be required to be screened in such a manner so as not to be viewed from U.S. 36 at Davidson Mesa.

W. BUILDING SETBACKS.

	Setback
1. Adjacent to Marshall Road, McCaslin at U.S. 36 ROW	20' from ROW
2. Adjacent to 76th Street, Sycamore Street, 4th, 5th Aves.	25' from ROW
3. North, east and south of outparcel along 76th Street	30' from prop. line.
4. Internal lot lines.	-0-

DESIGN AND PLANNING CRITERIA FOR SUPERIOR MARKETPLACE

A. PERMITTED USES

1. Retail Commercial as defined herein: Those retail and service businesses which provide a full range of merchandise and services. Such businesses shall consist of the following:
   a. Discount stores, membership merchandising stores, catalogue stores and specialty warehouse stores.
   b. Entertainment facilities, including, but not limited to movie theaters, bowling alleys and skating rinks.
   c. Recreation facilities, including, but not limited to swimming, golf, tennis, health and court sports facilities.
   d. Supermarkets and specialty food stores.
   e. Specialty retail and personal service businesses, including, but not limited to, health spas, specialty clothing and clothing accessory shops, sporting good stores, card and gift shops, art and art supply stores, culinary supply stores, toy stores, pet stores, bookstores, hardware stores, electronic equipment stores, furniture, appliance and home furnishing stores, printing shops, banks with drive-up teller, savings and loans and finance companies.
   f. Free standing, sit-down restaurants. Such restaurants shall be encouraged to have screened, outdoor dining areas. Restaurants may have drive-thru facilities, if said buildings are not part of the entry restaurant/shop complex. In the concepual plan this area includes pads 3-6 and the two adjoining shops buildings.
   g. Cell phone relays such that they are inconspicuously placed from the public view, or incorporated as an integral design feature.
   h. Or any other use deemed appropriate by the Town.
2. Administrative and professional offices as defined herein:
   a. General Offices, for example:
      1. Administrative and executive offices.
      2. Consulting service offices (business and professional).
      3. Design professions (architect, planner, etc.)
      4. Financial institutions (including drive-through facilities, freestanding ATMs).
      5. Medical, dental and veterinary offices.
      6. Insurance and investment offices, etc.
   b. Public or private meeting hall.
   c. Nursery school, day care center.
   d. Appurtenant retail uses including restaurants, sandwich shops and cafeterias shall be permitted within principal use buildings, provided that the entrance to any such restaurant, sandwich shop or cafeteria shall be from inside the principal use building, and provided that no more than fifteen (15%) percent of said principal use building shall be devoted to such usage. Parking structures shall be permitted as accessory uses.
   e. Government centers.
3. Mixed Use Residential (within Area of Amendment #6)
   a. 100% affordable multifamily residential and associated supporting uses including but not limited to:
      1. Leasing offices
      2. Amenity areas
      3. Fitness centers
      4. Business centers & co-working spaces
   b. Community-driven and/or non-profit commercial uses including but not limited to:
      1. Coffee shops
      2. Daycare centers
      3. Bike shops
   c. Parking structures
4. Other:
   a. Parking associated with all uses (to be provided per ADA standards).
   b. Preschool nurseries and child care centers.
   c. Parks and recreational open space.
   d. Accessory buildings and uses.
   e. Other uses not specifically listed herein require a use permit.
   f. Public facilities and utilities.
   g. Commercial mobile radio service facilities - building-mounted antennas only; equipment shelters must be fully screened.
5. Ancillary uses:
   a. Ancillary uses for Major 1 to include fuel pumps and tire center shall be an allowed use.
6. ~~Use by Special Review:~~
   a. Auto specialty stores (i.e., tire, muffler, parts, glass).
   b. Lofts or other residential units above commercial shops not to exceed 12 units per gross acre outside of Area of Amendment #6.
7. Use by Administrative Permit:
   a. Portable kiosks and push cart vendors.
   b. Street entertainers.

B. EXCLUDED USES

1. Those uses and activities which are specifically prohibited are as follows:
   a. Adult bookstores, adult entertainment and other adult-related activities.
   b. Outdoor storage, except for garden and nursery supplies and other, similar seasonal merchandise.
   c. Rental agencies for heavy equipment.
   d. Mini-storage facilities.
   e. Warehousing and light industrial uses.
   f. Car wash facilities of any kind.
   g. Outdoor (non-screened) storage of vehicles (for service) for a period exceeding 36 hours.
   h. Auto body repair stores.
   i. Multi-family residential outside of Area of Amendment #6 other than that described in section A.6.b. - Use by special review.
   j. Pawn and second hand shop.

SURA DISTRICT MAINTENANCE OUTLINE

A. DEVELOPER RESPONSIBILITES

The developer of each parcel within in the SURA District or 'district' shall be responsible for all the upkeep and maintenance of all the improvements on said property with the exception of water lines, sanitary sewer mains, and storm sewer lines which are part of the Superior/McCaslin Interchange District (SMID) . In addition, the developer shall also be responsible for landscaping, maintaining, and irrigating additional open space to an adjacent curb should there be an adjacent ROW.

1. Detention Facilities:
   The developer shall also be responsible for all maintenance and upkeep of all landscaping within detention pond areas (see note B.3 below) and any underground detention facilities should they be required. If required, the developer must provide for and execute a schedule of maintenance acceptable to the Town which may also be enforced by the Town. The Town and the SMID will also be granted access to these facilities via easements. Should parking lot detention be utilized, the depth of such detention shall be as deemed appropriate by Town staff during the FDP stage.
2. The developer shall attempt to obtain a license permit from CDOT to sod and irrigate the R.O.W. and open space margin between Marshall Rd. and U.S. Highway 36.

B. SUPERIOR/MCCASLIN INTERCHANGE DISTRICT RESPONSIBILITIES

1. Public Roadways:
   a. Marshall Road. CDOT shall maintain the paving and concrete work at Marshall Road should the roadway remain a State highway. The SMID shall maintain any and all sidewalks, landscaped medians along the road and the landscaped buffer on the south side of Marshall Road. Should the roadway become part of the Town or SMID it shall be maintained by the SMID.
   b. District roads. The District shall be responsible for the maintenance and upkeep of the following roadways, and associated sidewalks proposed to be improved or constructed as part of Superior Marketplace.
      1. Sycamore Street (from relocated Marshall Road to 76th).
      2. 76th Street (the eastern half from Coal Creek to Marshall Road).
      3. 5th Street (from Coal Creek north to Sycamore Street).
      4. Coal Creek (the northern half, from 4th Street to 76th Street).
2. Utilities:
   a. The District shall maintain all public water and sanitary sewer mains which are planned within the SURA District.
   b. The District shall maintain all 'regional' storm water conveyances, defined as: storm sewer pipes that are outlets from stormwater detention ponds, and storm sewer pipes that convey runoff from offsite areas through the property.
3. Detention:
   a. The District will perform routine maintenance necessary for the ponds to function as stormwater detention facilities (e.g. sediment removal, debris removal, and mow native grasses. The District shall not maintain or repair retaining walls, mow irrigated turf, or maintain landscaping.
4. Landscaped Areas:

   The District shall maintain and irrigate the following landscaped areas.

   a. Marshall Road medians.
   b. Open space buffer south of Marshall Road and Sycamore Street (to 4th Avenue).
   c. Sycamore street medians.

PROPOSED SURA DISTRICT SIGNAGE GUIDELINES

The following standards have been developed to supersede the SURA Sign Guidelines. They shall amend the Superior Sign Code Section as noted, providing some additional sign area. However, in most cases it adopts further restrictions to better control the many types of signage a tenant will propose (i.e., store within a store, sign composition, national logos, blade, window and awning signs, etc.).

Should a particular issue arise not addressed in this guideline the Superior Sign Code as enforced on May 5, 1998, shall govern.

A. LEASING SIGNS (To be approved only at FDP stage)

1. Number: Three (2 at U.S. 36 frontage, 1 at McCaslin frontage).
2. Size allowed: Must be less than 8'x16' = 128 s.f. maximum sign face.
3. Materials: Paint or vinyl lettering on wood, typical.
4. Lighting: Signs may be externally illuminated with outdoor floods.
5. Tenure: Signs may remain in location selected for a period not to exceed two years from date of installation. After this time period leasing signs shall be allowed pursuant to the Superior Sign Code for temporary signs in force at that time.
6. Height: Top of sign face not to exceed 12' above finish grade.

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

AMENDMENT #6

COBURN ARCHITECTURE

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 7

SUPERIOR MARKETPLACE

PLANNED DEVELOPMENT/ZONE DISTRICT SITE PLAN SUBMITTAL

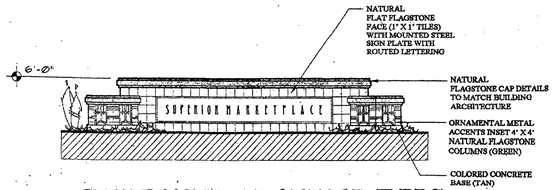
NEW PLAN EXCEL REALTY TRUST, INC.

A PORTION OF THE SE 1/4 OF SECTION 13 AND THE N 1/2 OF THE NE 1/4 OF SECTION 24, T1S,R70W OF THE 6TH P.M

THE MULHERN GROUP, LTD.

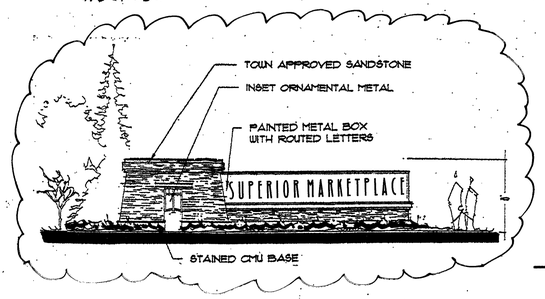
AMENDMENT #6

B. CENTER ID MONUMENT SIGNS



CENTER MONUMENT SIGNAGE (TYPE 2)

1/8" = 1'-0"

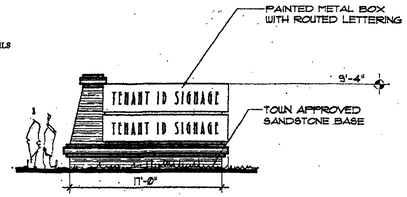


CENTER MONUMENT SIGNAGE (TYPE 1)

1/8" = 1'-0"

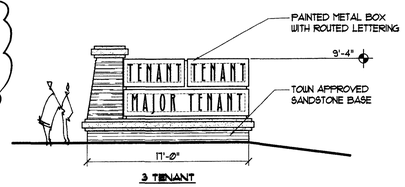
1. Number: Up to two at each entry to each access to and within the SURA District.
2. Size allowed: 60 s.f. maximum sign face.
3. Height: Not to exceed 6'. (Architecture may exceed this by up to 2').
4. Lighting: Internal or indirect external illumination. Brightness limit on any fixture related to signage to be 60 watt maximum.
5. Maximum letter size: 24"
6. Materials: To be Town-approved natural sandstone, with cut metal boxes similar to tenant ID signage. A CMU base of up to 18" may be introduced.
7. Nomenclature: Signs shall identify development projects only. No tenant signage shall appear on Center ID signs.

C. TENANT ID MONUMENT SIGNS



TENANT I.D. SIGNAGE

1/8" = 1'-0"

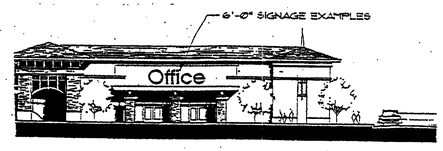


TENANT ID SIGNAGE

1/8" = 1'-0"

1. Number: Four at U.S. 36 frontage.
   One at McCaslin frontage.
2. Box Size allowed: (2) 3 -0"x14' boxes per sign
   or
   (1) 3'-0" x 14'-0" and (2) 3'-0" x 7'-0" boxes per sign.
3. Number of tenants allowed: 2/sign for 3 at U.S. 36
   2/sign for 1 at McCaslin
   3/sign for 1 at U.S. 36
4. Sign Area: 2'-6" x 13'-4" = 34 s.f. per box for each 2 box sign. (May be double-faced).
   (1) 2'-6" x 13'-4" = 34 s.f. plus (2) 2'-6" x 6'-4" = 32 s.f. per each 3 box sign. (May be double-faced)
5. Height: Sign shall not exceed height of 9'-4" above adjacent grade at high side of sign. (Architecture may exceed this by 1'-8"). A flat grade of a minimum of 3' beyond the sign must be provided on the low side. It shall be created by use of a natural sandstone retaining wall and shall include a continuous row of foundation plantings. Note: Berming to elevate sign at high side shall not be allowed.
6. Miscellaneous: Signage elements to be consistent. Cut metal boxes of like color shall be set on Town-approved sandstone. A CMU base of up to 18" shall be allowed. All tenant "boxes" will have a uniform color background, shall be internally lit and may have the tenant's name/identification/logo in the type, design, style or color desired by a particular tenant.
7. Marshall Road Setbacks: Architecture of said signs may be located at the property line with any signage setback a minimum of three feet. Final distance from Marshall Road shall be dependent on CDOT alignment. In any case, landscaping elements will define and accentuate the separation of the signs from Marshall Road.
9. McCaslin Road Setbacks: Said signs shall be setback a minimum of 25' from the roadway curb and gutter.

D. WALL SIGNS



1. Number: One per frontage on street, drive, parking area or landscape element. Not to exceed a total of three. Signage on walls adjoining adjacent tenants shall be allowed only if user is within one space of ROW.

   *Exception: Due to the length of the building and its entry location at the far end of the structure, Major 1 may utilize two signs on the east-facing facade, however, the maximum area of all signs on this facade shall not exceed the maximums listed below.

2. Exclusion: Shall not be allowed facing Sycamore Street or 76th Street without tenant entry door or glazing located on said street. Signage on these streets, if allowed, shall not be illuminated.

3. Allowable area calculation: 1.5 s.f. per lineal foot of building frontage for first 100 lineal feet, one s.f. per lineal foot thereafter. No signage on a facade shall exceed that area allowed for a particular frontage.

Total sign area per frontage shall not exceed the following:

Area maximum: 200 s.f./frontage for tenant less than 30,000 s.f.
300 s.f./frontage for tenants equal to or greater than 30,001 and less than 100,000 s.f.
350 s.f./frontage for tenants equal to or greater than 100,001 s.f.

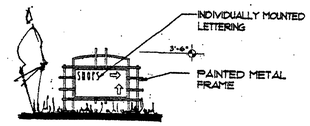
In addition, no one tenant shall have an aggregate sign area of more than 600 s.f.

Maximum allowable letter height: 3'-0" for users up to 14,999 s.f.
4'-0" for users 15,000 s.f. to *39,999* s.f.
5'-0" for users 40,000 s.f. to 79,999 s.f.
6'-0" for users 80,000 s.f. or greater

Note: Letter height is often further reduced by allowed sign area. Limitations of letter height typically come into play when a tenant has a very short name.

4. Composition: Signage may be of more than one line, however, said signage composition shall not exceed *two* times the allowed letter height and be appropriate to its architectural location.
5. Logo: National logos are acceptable and may be up to 1.5 times the allowed letter height. All logos are considered a part of the allowable sign area and shall not exceed 50% of allowable sign area. Logos shall be subordinate to the overall architectural design scheme of the building or monument sign which they are placed. Said logo may be a box sign. A logo may be a portion of an individual tenant's name, but cannot be the entire name.
6. Store within a store: In this case one additional sign only shall be allowed on the major building elevation. Said sign shall be limited to 66% of the allowed letter height and shall not exceed 50 s.f. Said sign area shall fall under the allowed area maximum for the major tenant.
7. Blade Signs: In addition to fascia signage each tenant shall be allowed one ornamental blade sign. This sign shall be double-faced and shall not exceed 16 s.f. per side and shall fit within a 4'x4' square. Said sign area shall fall under total allowed sign area. The sign shall be hung via ornamental ironwork, shall be located on a column adjacent to the tenants main entry and the top of the sign shall not be mounted more than 14' above adjacent grade.
8. Descriptors: Descriptors are allowed and may be located separately from main body of signage. Descriptors shall not exceed ½ the allowed letter height. However, no descriptors shall exceed a height of 2'. Said signage shall fall under area limitations previously listed and shall not exceed 35% of overall maximum sign area allowance. All descriptor locations outside of designated sign band area shall be placed in an appropriate architectural location and are therefore subject to Developer approval.
9. Fabric awning signage: Awnings, other than backlit, are allowed. Should signage be displayed on more than one canopy it shall be repetitive. Said signage shall fall under area limitations previously listed. All awnings material shall be fabric, metal, or other approved materials. No plastic awnings shall be allowed. Awning colors shall be repetitive, and compatible or complimentary to a building's color palette.
10. Window signs: One window sign per window is permitted on any face of a building. Individual letters shall be allowed and shall be "white," applied to the inside face of the window. The typestyle shall be limited to that of the primary fascia sign. All signage shall be mounted at the same elevation above finished floor. No such sign letter or composition shall exceed 8" in height and its width shall not be greater than 80% of the exposed window. The area of any single window *sign* shall not exceed 5% of window area on which it is mounted. The area of said signage shall combine and shall fall under area limitations previously listed and shall not exceed 20% of overall maximum sign area allowance.
11. Sign area calculation: All signage areas shall be defined as that area created by enclosing the signage in question by a multisided polygon composed only of 90° corners. No side of said polygon may be less than one-fourth the proposed letter height.
12. Area summation: The sum of the areas of all signage types (main body, descriptor, canopy, blade, etc.) shall not exceed the allowable area calculation or area maximum for any individual user, or given frontage.

E. DIRECTIONAL SIGNAGE



DIRECTIONAL TENANT SIGNAGE

1/8" = 1'-0"

The Superior Marketplace is composed of six major parcels with a multitude of uses and users (i.e., theater, RTD park 'n ride, major users and Town Hall). To make one's experience of this exciting project as enjoyable as possible a directional sign program shall be introduced. The program shall incorporate ornamental signs designed in a manner compatible to the architecture of the center and appropriately placed to facilitate one's movement. Major tenant names may be incorporated on the signs, however, letter height shall not exceed 8" and one typestyle shall be utilized throughout.

F. GENERAL

1. Signage shall be located in the designated sign band, as indicated on the FDP.
2. Signs shall generally be individual pan channel letters. The letters shall not be less than four (4) inches nor more than five-and-one-half (5 ½) inches in depth. National logos, or descriptors 1' or less in height, may be a box sign with similar trim details to the typical pan channel letter. All such signs shall be internally illuminated.
3. Temporary window banners ("Now Open," "Sale," etc.) shall be allowed on a basis of one sign per frontage for a single period of one month in any given calendar year. Sign shall not exceed 50% of window area in which it is mounted, and shall be located entirely within tenant space.
4. Other sign media shall be acceptable at Superior Marketplace as long as such sign material is deemed to be of an equal or higher standard.

PUBLICLY DEDICATED LAND DESCRIPTIONS

The following lands (or portions thereof) shall be dedicated as a part of the Superior Marketplace development:

1. The area designated as Marshall Road (+/- 100' wide R.O.W.) that crosses the proposed site. This area encompasses +/- 5.4 acres.
2. The area designated as Extended Maple Street (to be renamed Sycamore, with a 60' R.O.W.) that crosses the proposed site. This area encompasses +/- 2.2 acres.
3. The eastern 50% of the 76th Street R.O.W. This area encompasses *+/- 1.9 acres.*
4. The northern 50% of Coal Creek from 4th Avenue to 76th. This area encompasses *+/- 0.8 acres.*
5. Primary detention areas – exact sizes to be determined in the final PD and platting processes. These shall include:
   a) Two detention areas west of roundabout.
   b) *Three* large detention areas west of Marshall Road.
   c) Detention area south and east of theatre buildings.

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

AMENDMENT #6

COBURN ARCHITECTURE

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 8

SUPERIOR MARKETPLACE

Superior, Colorado

Preliminary Landscape Plan

Planned Development Zone District Plan

Amendment #6

May 14, 1998

Revised May 21, 1999
~~Revised November 30, 1999~~
~~Revised January 10, 2000~~

REVISED 3-1-00

Special Planting Area Densities

Area	Trees	Shrubs
A(Area Behind Costco)	1 / 1,400 s.f.	1 / 30 s.f.
B(Roundabout Planting)	1 / 1,500 s.f.	1 / 30 s.f.
D(Planting Along Marshall Road)	1 / 1,000 s.f.	1 / 30 s.f.
E(Detention along Marshall Road and McCaslin Road)	1 / 1,400 s.f.	1 / 30 s.f.
A1(Area Behind Majors 2,3 &4)	1 / 800 s.f.	1 / 30 s.f.
C1(N.E. Corner of 76th & Sycamore)	1 / 575 s.f.	1 / 30 s.f.
F(Area Behind Majors 6 & 7)	1 / 825 s.f.	1 / 30 s.f.
G(Area Along Transportation Hub)	1 / 1,400 s.f.	1 / 30 s.f.

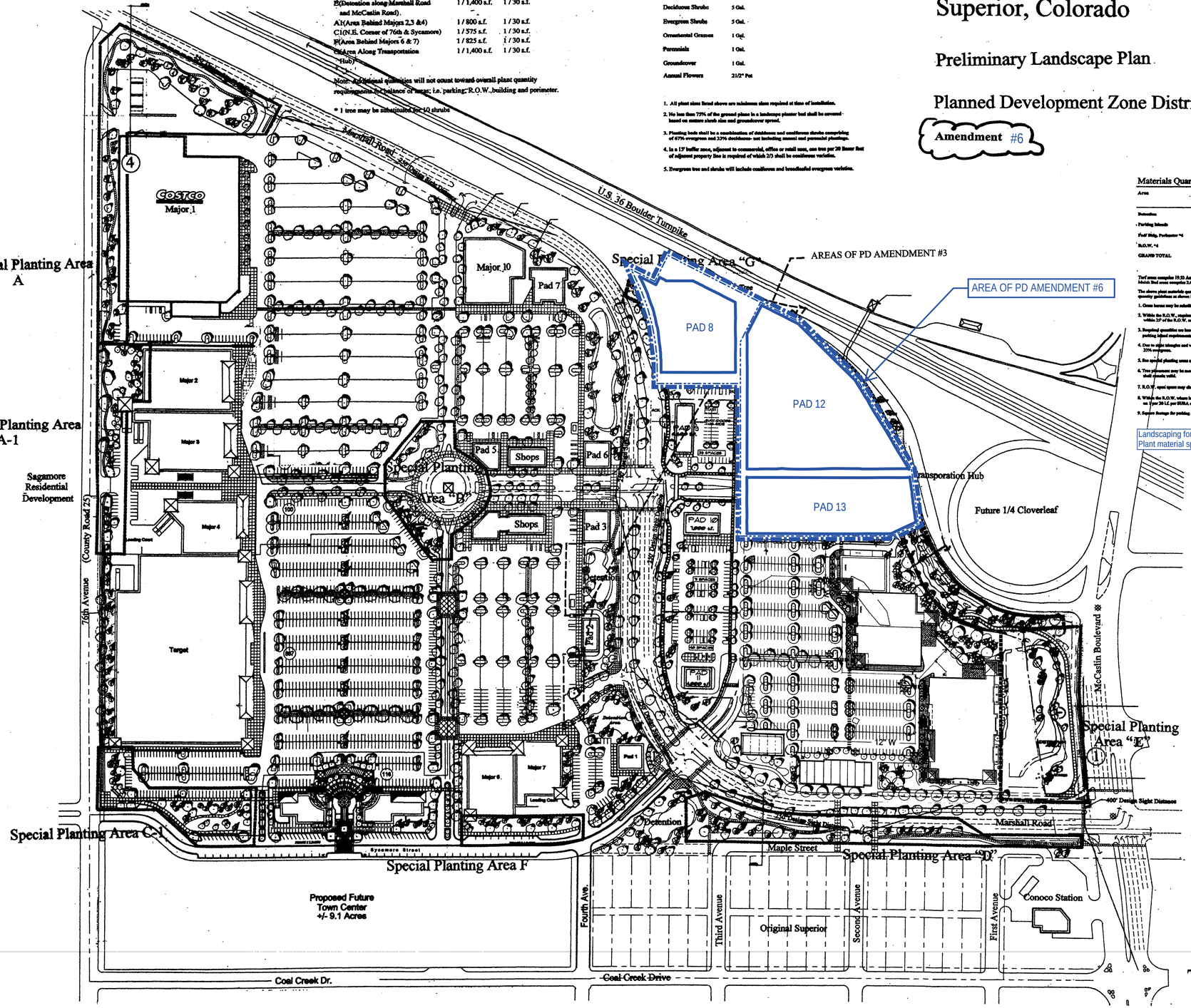
Note: Additional quantities will not count toward overall plant quantity requirements for balance of areas; i.e. parking, R.O.W., building and perimeter.

* 1 tree may be substituted for 10 shrubs

Plant Material Size Criteria

Deciduous Trees	2" Cal. or greater	10%
	2 1/4"-2 3/4"	70%
	1 1/2"- 2"	20%
Evergreen Trees	8' or greater	10%
	6'- 8'	70%
	4'- 6'	20%
Deciduous Shrubs	5 Gal.	
Evergreen Shrubs	5 Gal.	
Ornamental Grasses	1 Gal.	
Perennials	1 Gal.	
Groundcover	1 Gal.	
Annual Flowers	21/2" Pot	

1. All plant sizes listed above are minimum sizes required at time of installation.
2. No less than 75% of the ground plane in a landscape planter bed shall be covered based on mature shrub size and groundcover spread.
3. Planting beds shall be a combination of deciduous and coniferous shrubs comprising of 67% evergreen and 33% deciduous- not including seasonal and perennial plantings.
4. In a 15' buffer zone, adjacent to commercial, office or retail uses, one tree per 20 linear feet of adjacent property line is required of which 2/3 shall be coniferous varieties.
5. Evergreen tree and shrubs will include coniferous and broadleafed evergreen varieties.



Materials Quantity Chart

REVISED 3-1-00

Area	Total Tree Quantity Ratio *5	Tree Percentages	Deciduous Trees Required / Proposed	Evergreen Trees Required / Proposed	Shrubs Required / Proposed	Total Open Space Acreage/ s.f.	Percentage of Project Open Space
Detention	1/3,333 s.f.	33% dec., 67% ever.	84/34	48/51	3477/347		
Parking Islands	1/2,500 s.f.	33% dec., 67% ever.	35/259 *3	21/0	1,317/1,317 *1		
Roof Slab, Perimeter *4	1/ 1,722 s.f.	33% dec., 67% ever.	170/ 199	84/ 95	8719/ 8719		
R.O.W. *4	1/40 LF	67% dec., 33% ever.	170/ 171 *2	84/ 85 *2	559/ 559		
GRAND TOTAL			[illegible]	[illegible]	11,886/ 11,886		

Turf areas comprise 19.53 Acres (85%)
Mulch Bed areas comprise 2.67 Acres (12%)

The above plant materials quantities for each type and Open Space area are to meet or exceed the minimum open space quantity guidelines as shown in the Land Use Code and the SURA Planning and Design Standards.

1. Ornamental trees may be substituted for shrubbed islands throughout the development.
2. Within the R.O.W., required and proposed quantities are based on 1 per 40 LF per SURA code. Trees may be planted within 25' of the R.O.W. and groupings not further than 60' apart.
3. Required quantities are based on open space requirements per SURA code. Proposed quantity is based on parking island requirements per SURA code.
4. Due to sight triangles and view corridor requirements, trees within the R.O.W. shall be 67% deciduous and 33% evergreen.
5. See typical planting areas and density chart for any specific requirements.
6. Tree placement may be modified in plan to allow for display windows/ entrances, etc. Overall densities shall remain valid.
7. R.O.W. open space may change due to road widening or reduction per CDOT standards.
8. Within the R.O.W. where landscape buffer separation exceeds 100 feet, the total required and proposed quantities are based on 1 per 20 LF per SURA code. Trees may be planted within 25' of the R.O.W. and groupings not further than 60' apart.
9. Square footage for parking islands includes those only over 400 s.f.

Landscaping for PD Amendment #6 will be native, drought tolerant, and xeriscaping. Plant material specifications and quantities to be determined at Final Development Plan.

PLANT LEGEND

COMMON NAME	BOTANICAL NAME	LOCATION
DECIDUOUS CANOPY TREES		
GREEN SPIRE LINDEN	TILIA CORDATA 'GREEN SPIRE'	ROW, PARKING, MULTI-FAMILY
AUTUMN PURPLE ASH	FRAXINUS PENNSYLVANICA 'MARSHALL'S'	DETENTION, PARKING, MULTI-FAMILY
PATMORE ASH	FRAXINUS PENNSYLVANICA 'PATMORE'	ROW, DETENTION, PARKING, MULTI-FAMILY
LANCELEAF COTTONWOOD	POPULUS ACUMINATA	DETENTION, MULTI-FAMILY
COMMON HACKBERRY	CELTIS OCCIDENTALIS	PARKING, BLDG. PERIMETER, MULTI-FAMILY
RED OAK	QUERCUS RUBRA	ROW, BLDG. PERIMETER
EVERGREEN TREES		
AUSTRIAN PINE	PINUS NIGRA	ROW, BLDG. PERIMETER, MULTI-FAMILY
PONDEROSA PINE	PINUS PONDEROSA	ROW, BLDG. PERIMETER, MULTI-FAMILY
COLORADO BLUE SPRUCE	PICEA PUNGENS	ROW, DETENTION, BLDG. PERIMETER, MULTI-FAMILY
DECIDUOUS ORNAMENTAL TREES		
CANADA RED CHERRY	P. VIRGINIANA 'MELANOCARPA 'SCHUBERT'	ROW, PARKING, BLDG. PERIMETER, MULTI-FAMILY
HAWTHORNE HAWTHORN	CRATAEGUS PHAENOPYRUM	PARKING, BLDG. PERIMETER, MULTI-FAMILY
SPRING SNOW CRAB	MALUS 'SPRING SNOW'	ROW, PARKING, BLDG. PERIMETER, MULTI-FAMILY
EVERGREEN SHRUBS		
BLUE CHIP JUNIPER	JUNIPERUS HORIZONTALIS 'BLUE CHIP'	
BUFFALO JUNIPER	JUNIPERUS SABINA 'BUFFALO'	
SARGENT JUNIPER	JUNIPERUS SABINA 'SARGENT'	
TORY JUNIPER	JUNIPERUS SABINA 'TAMARISCIFOLIA'	
DECIDUOUS SHRUBS		
ANTHONY WATERER SPIREA	SPIRAEA BUMALDA 'ANTHONY WATERER'	
ALPINE CURRANT	RIBES ALPINUM	
BLUE MIST SPIREA	CARYOPTERIS INCANA	
CRISPY BURNING BUSH	EUONYMUS ALATA 'COMPACTUS'	
DOROTHY CAMERON	EUONYMUS FORTUNEI 'DOROTHY CAMERON'	
CHEYENNA PLUM	PRUNUS VIRGINIA	
DWARF KOREAN LILAC	SYRINGA 'PATULA'	
JAPANESE PIERIS/FLA	PIERIS FLORIBUNDA 'MOUNTAIN'	
MUGO PEKING POTENTILLA	POTENTILLA FRUTICOSA 'MEDICINAM'	
PANDA GRASS	MISCANTHUS SINENSIS 'GRACILLIMUS'	
PARSON GREENY	PRUNUS TOMENTOSA	
ROCK COTONEASTER	COTONEASTER HORIZONTALIS	
RUSSIAN SAGE	PEROVSKIA ATRIPLICIFOLIA	
RUSSIANT GIANT SPIRAE	SPIR ARGUTATA 'GRAUF'	
SAPPHIRE VIOLA	VIOLA GLABRA	
SPIRAL BEAUTY	CATOCEASTER SUPERIS 'SPIRAL BEAUTY'	
COTONEASTER		
THREE LEAF SPIRAE	SPIR TRILOBATA	
VANHOUTTE SPIREA	SPIRAEA VANHOUTTE	
WESTERN SAND CHERRY	PRUNUS BESSEYI	
GROUND COVERS, VINES & PERENNIAL PLANTINGS		
TALL CRIPPEN YARROW	ACHILLEA FILIPENDULINA	
CRAMP ARTER	ARTEM NOVI-BELAE 'EP'	
GAYFEATHER	LIATRIS	
DWARF DOUBLE COREOPSIS	COREOPSIS GRANDIFLORA 'BABUN'	
BARNSLEY PLANET FLOWER	GAILLARDIA GRANDIFLORA 'BARNSLEY'	
CREEPING PHLOX	PHLOX SUBULATA 'EMERALD BLUE'	
SIBERIAN IRIS	IRIS SIBERICA	
STELLA D'ORO DAYLILLY	HEMEROCALLIS	
ULTIMATE COREOPSIS	COREOPSIS LANCEOLATA 'ULTIMATE'	
ROCKY MOUNTAIN PENSTEMON	PENSTEMON STRICTUS	
GARDEN PHLOX	PHLOX PANICULATA 'DARDEN'	

REVISED 09-19-02

REVISED 07/05/02
REVISED 6-28-02
REVISED 11-14-01
REVISED 4-5-01
REVISED 3-20-01
REVISED 2-1-01

SUPERIOR MARKETPLACE

AMENDMENT #6

COBURN ARCHITECTURE

NEW PLAN EXCEL REALTY TRUST, INC.

THE HALKIN GROUP, LTD.

SHEET 9

SUPERIOR MARKETPLACE

SUPERIOR, COLORADO

SPECIAL PLANTING AREA 'G'

PLANNED DEVELOPMENT ZONE DISTRICT PLAN

TYPICAL AREA ENLARGEMENT

AMENDMENT #6

REVISED 3-20-01 MAY 21,1999
REVISED 4-5-01 REVISED JANUARY 14, 2000
REVISED 11-14-01 REVISED 3-1-00
REVISED 6-28-02 REVISED 2-1-01
REVISED 09-19-02

NORTH

SCALE 1"=50'

The NORRIS DULLEA Company
Planning
Landscape Architecture
710 West Colfax
Denver, Colorado 80204
Fax: 303 892 1186
Phone: 303 892 1166

Area G

	Area	Ratio
Total Area	121404 s.f.	
Bed Area* **	24,280 s.f.	
Trees*		1 / 1400 s.f.
Shrubs**		1 / 30 s.f.

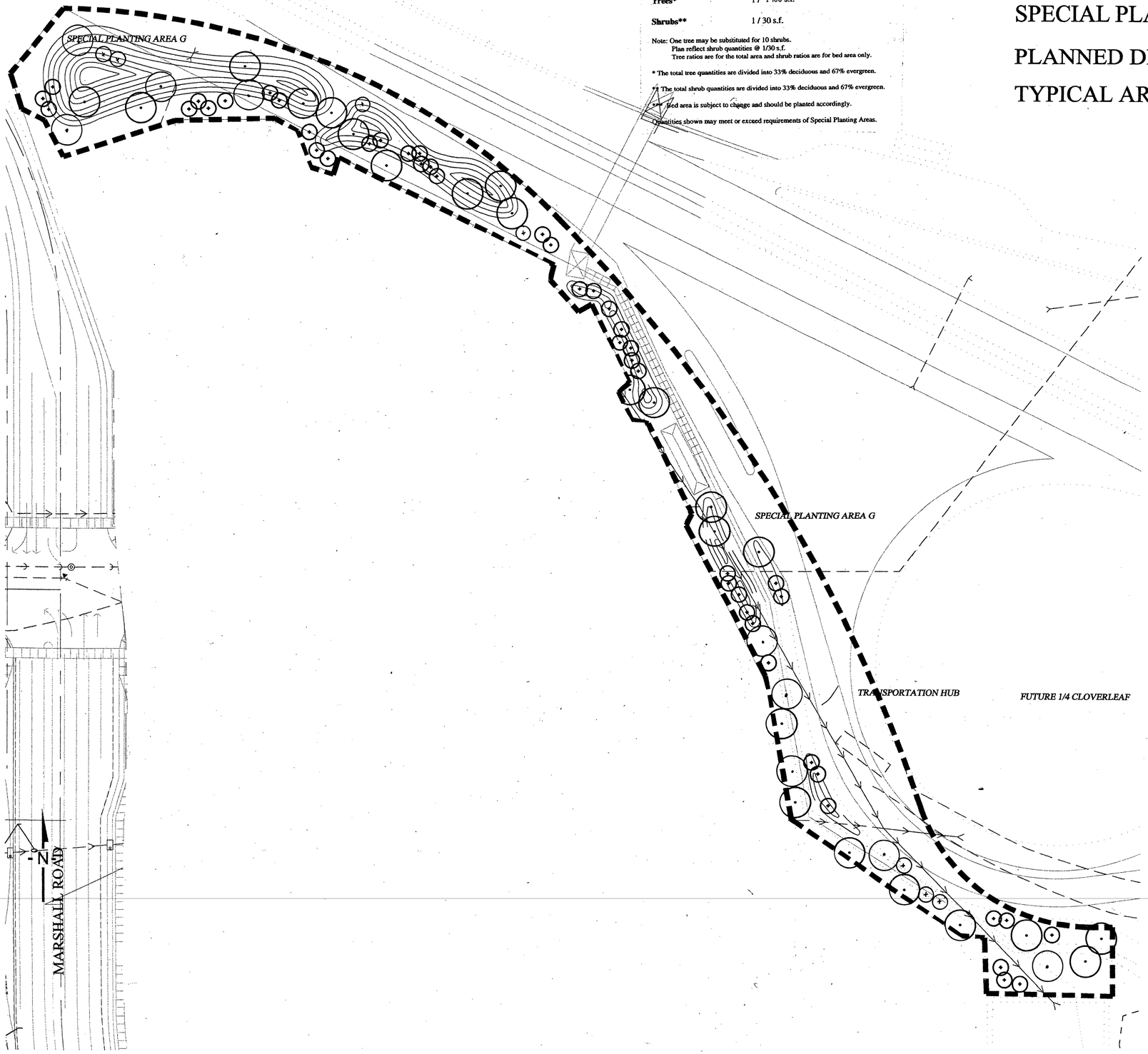
Note: One tree may be substituted for 10 shrubs.
Plan reflect shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Areas.



SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

SHEET 9.1 Page 10 of 18

SUPERIOR MARKETPLACE

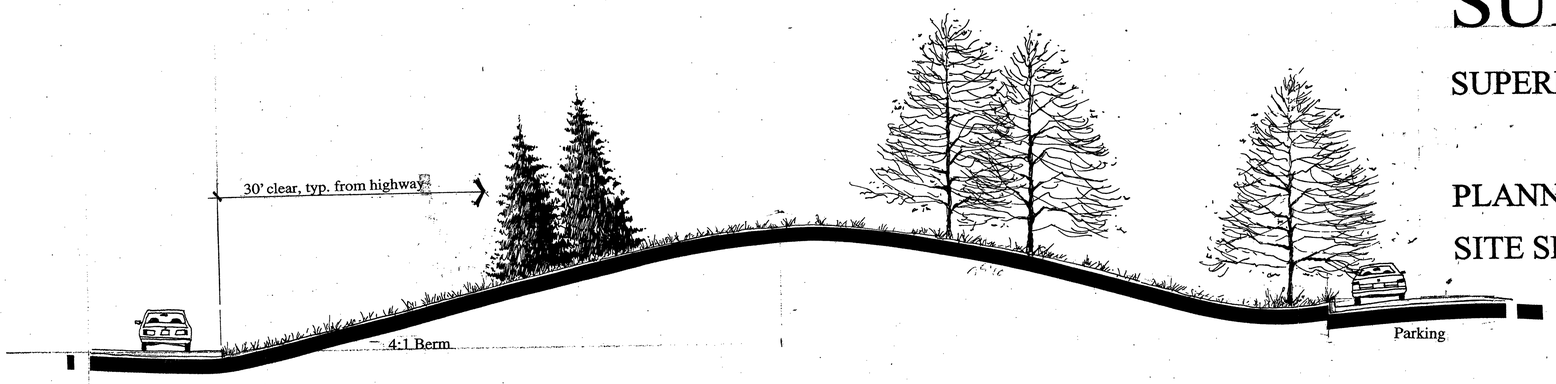
SUPERIOR, COLORADO

PLANNED DEVELOPMENT ZONE DISTRICT PLAN

SITE SECTIONS

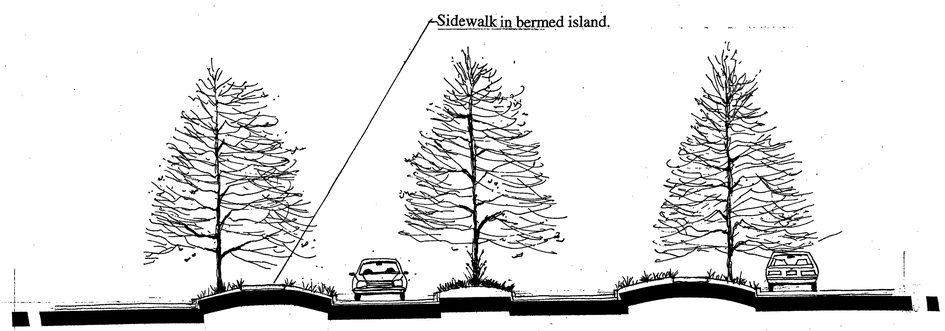
AMENDMENT #6

REVISED JANUARY 14, 2000
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02



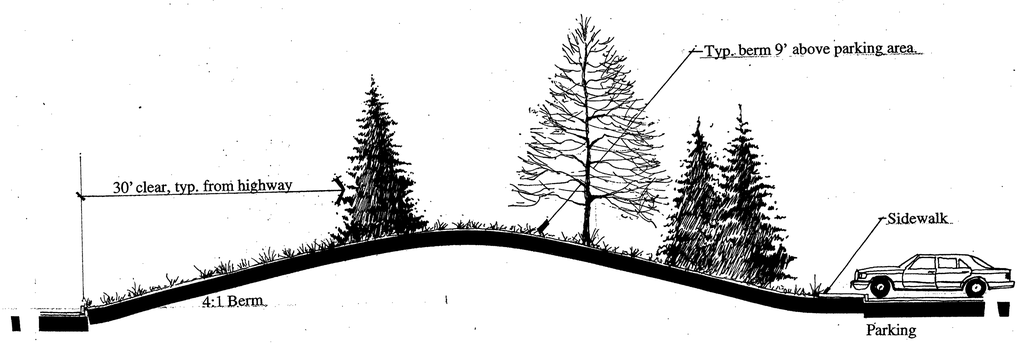
Section 1

Scale 1/8"=1'-0"



Section 2

Scale 1/8"=1'-0"



Section 3

Scale 1/8"=1'-0"

SUPERIOR MARKETPLACE

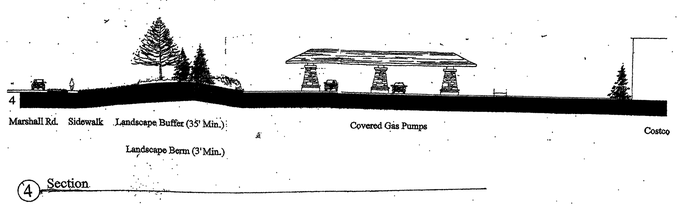
NEW PLAN EXCEL REALTY TRUST, INC.

THE HOUSTON GROUP, LTD.

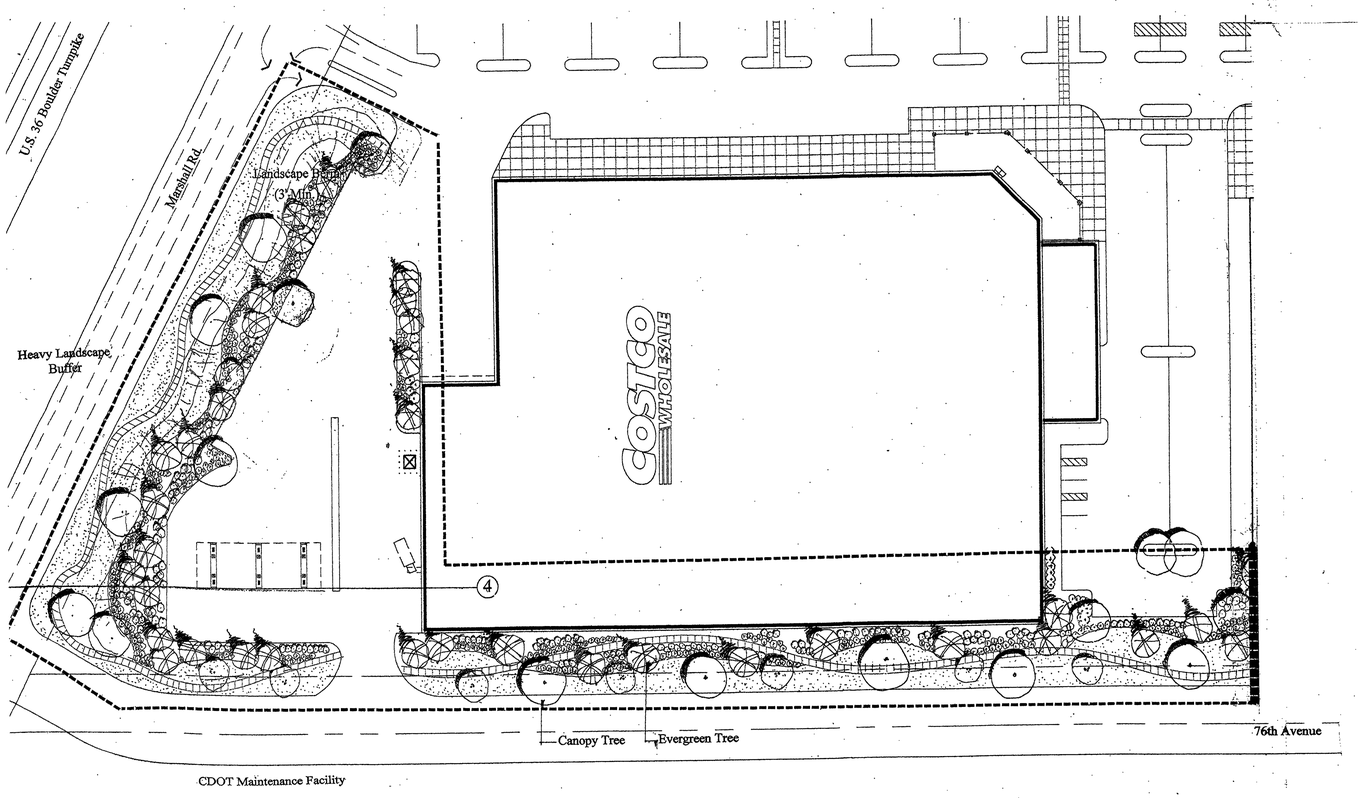
SHEET

Special Planting Area "G"

9.2 Page 11 of 18



4 Section



Area A

	Area	Ratio
Total Area	97,370 s.f.	
Bed Area***	28,231 s.f.	
Trees*		1/ 1,400 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/50 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may exceed requirements of Special Planting Area densities.

SUPERIOR MARKETPLACE

PD AMENDMENT #6

Superior, Colorado

May 14, 1998

North Scale: 1"=30'-0"

Special Planting Area "A"

REVISED 09-19-02

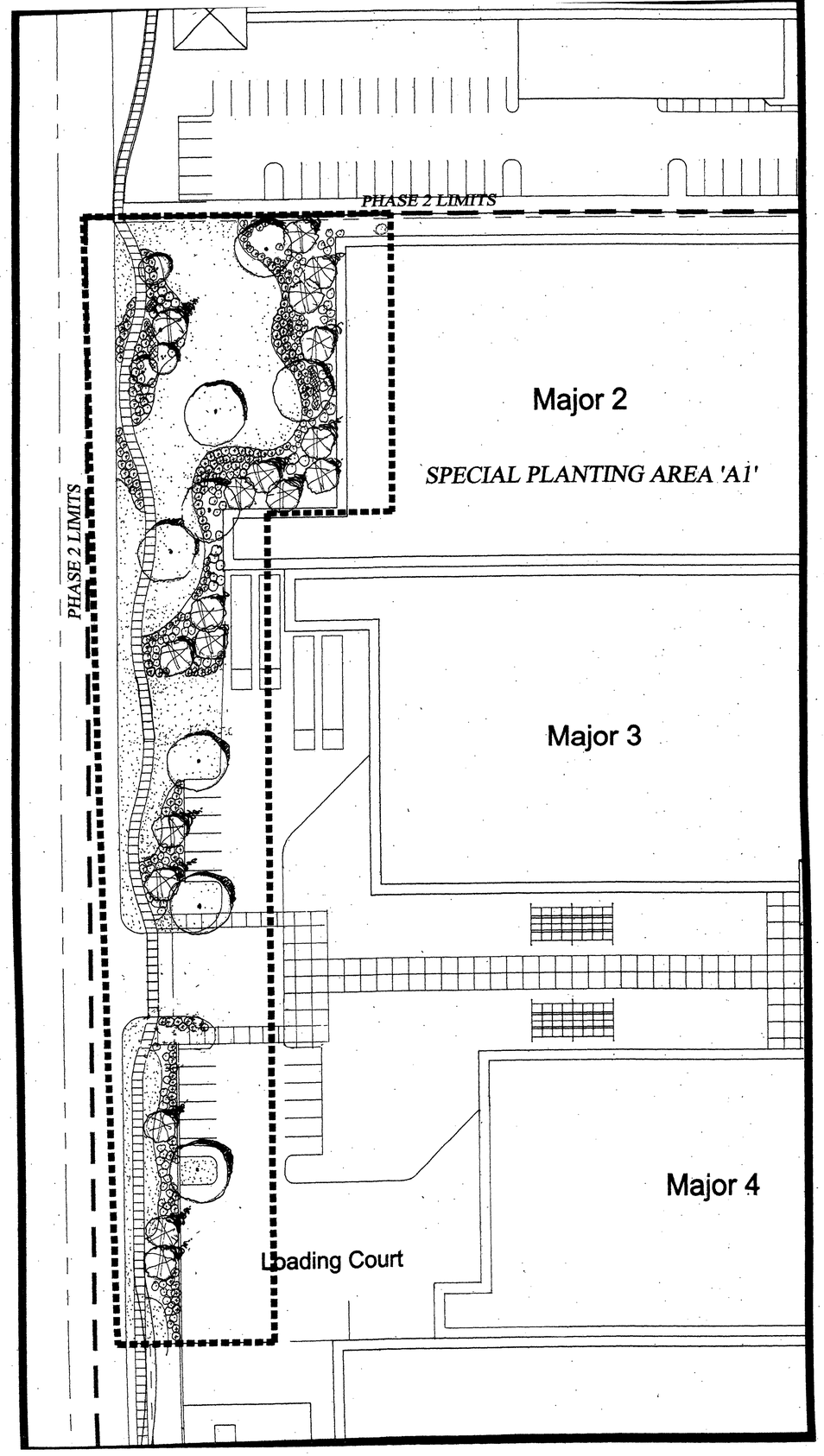
REVISED 11-14-01
REVISED 6-28-02
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 10 Page 12 of 18



SUPERIOR MARKETPLACE

SUPERIOR, COLORADO

MAY 21,1999

NORTH

SCALE 1"=30'

The NORRIS|DULLEA Company
Planning
Landscape Architecture
710 West Colfax
Denver, Colorado 80204
Fax: 303 892 1186
Phone: 303 892 1166

SPECIAL PLANTING AREA 'A1'

PLANNED DEVELOPMENT ZONE DISTRICT PLAN

TYPICAL AREA ENLARGEMENT

PD AMENDMENT #6

Area A1

	Area	Ratio
Total Area	25075 s.f.	
Bed Area* **	12675 s.f.	
Trees*		1/ 800 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.

For Final Crosswalk Plan, see Sheet 2

11.4.99 REVISION

10/1/99 PLAN REVISION

8.23.99 PLAN REVISION

REVISED 11-30-99

REVISED 12-1-99

REVISED 01-14-00

REVISED 3-1-00

REVISED 2-1-01

REVISED 3-20-01

REVISED 4-5-01

REVISED 11-14-01

REVISED 6-28-02

REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAM EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 11

Superior Marketplace

Superior, Colorado

May 14, 1998

Typical Area Enlargement

North

15' 30' 60'

Scale: 1"=30'-0"

Planned Development Zone District Plan AMENDMENT #6

Special Planting Area "B"

Area B

	Area	Ratio
Total Area	38,487 s.f.	
Bed Area* **	8,300 s.f.	
Trees*		1/ 1,500 s.f.
Shrubs**		1/ 30 s.f.

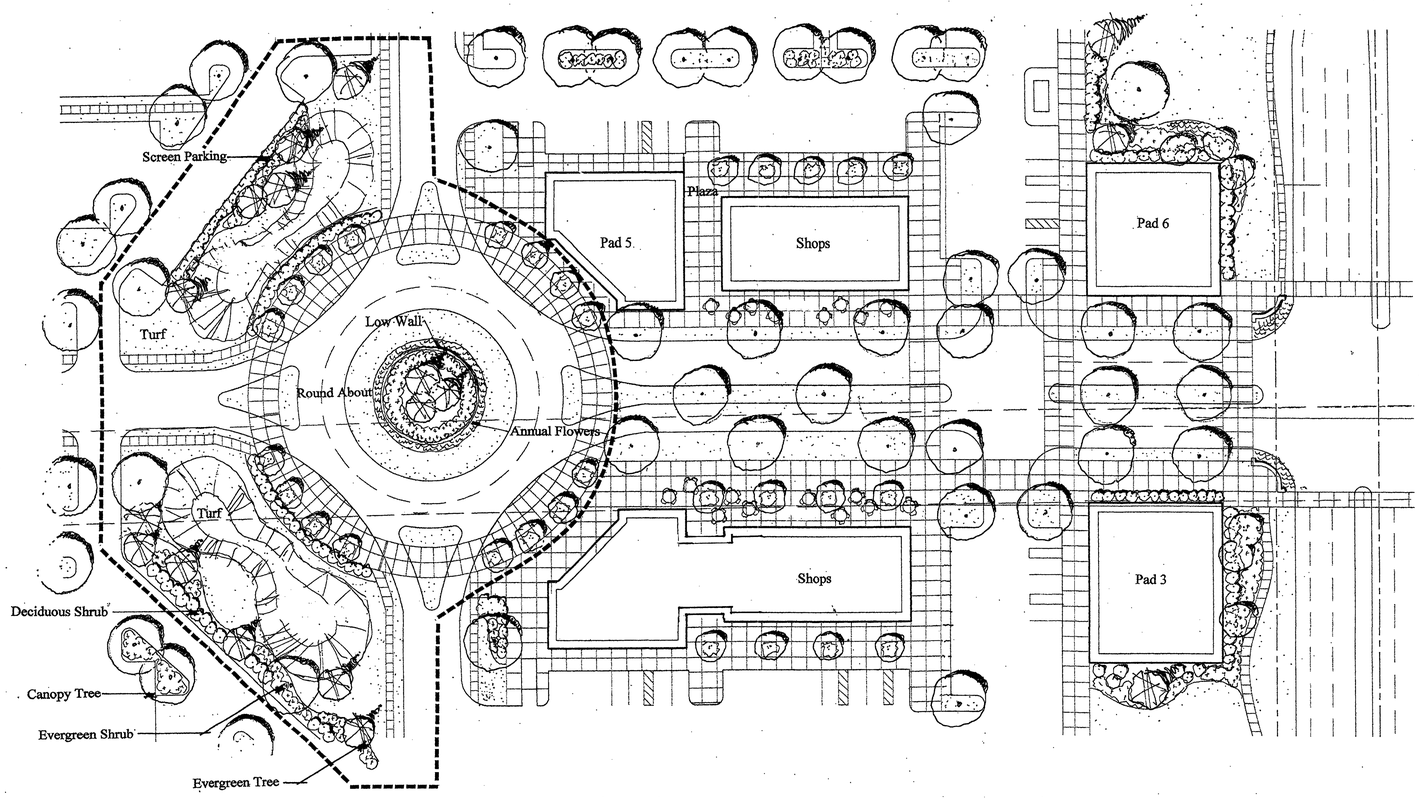
Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 46% deciduous and 54% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.



Round About Plantings

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01

REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 12

Page 14 of 18

SUPERIOR MARKETPLACE

SUPERIOR, COLORADO

REVISED 2-1-01 MAY 21,1999
REVISED 3-20-01 REVISED JANUARY 14, 2000
REVISED 4-5-01 REVISED 3-1-00
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

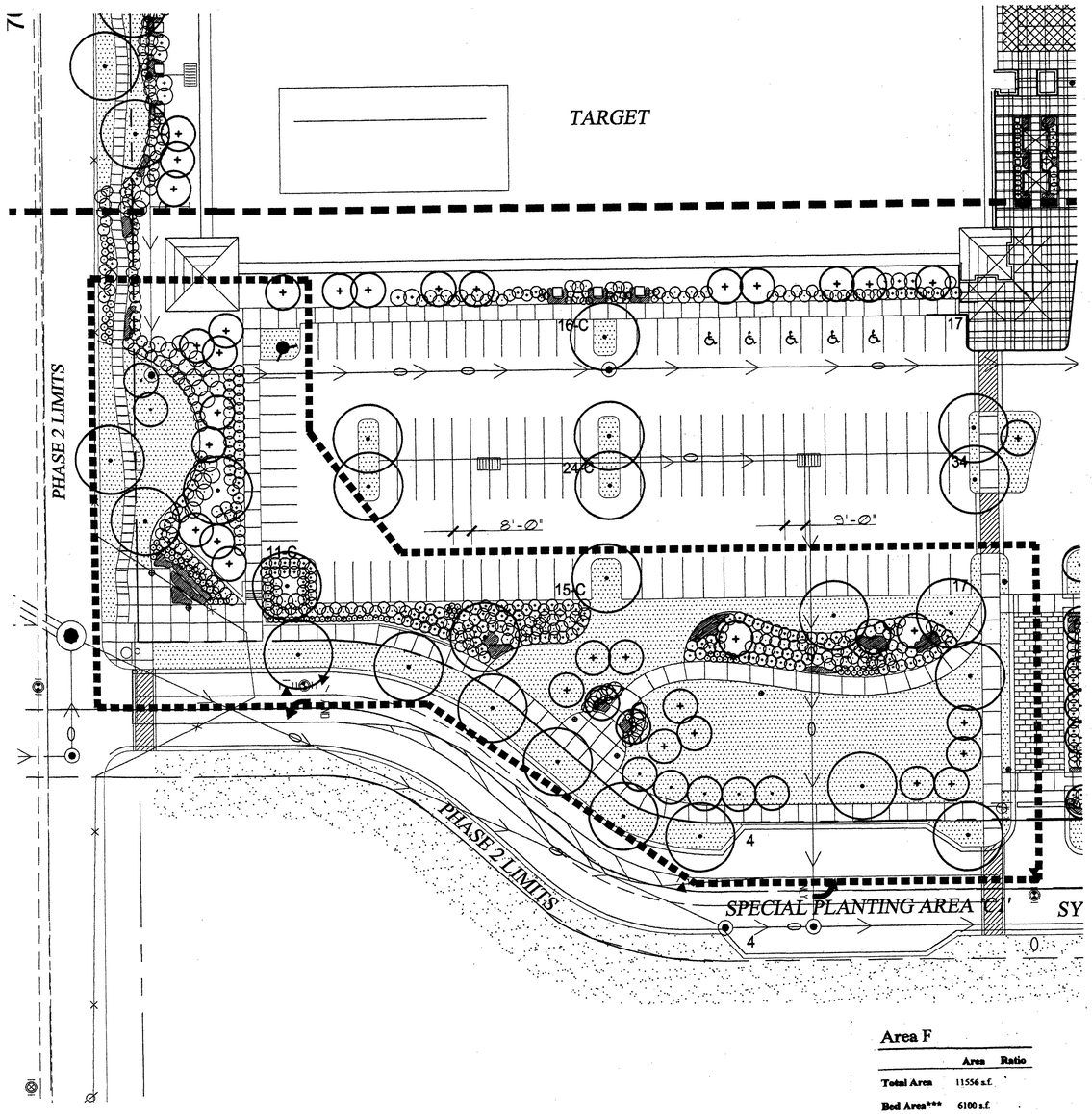
NORTH

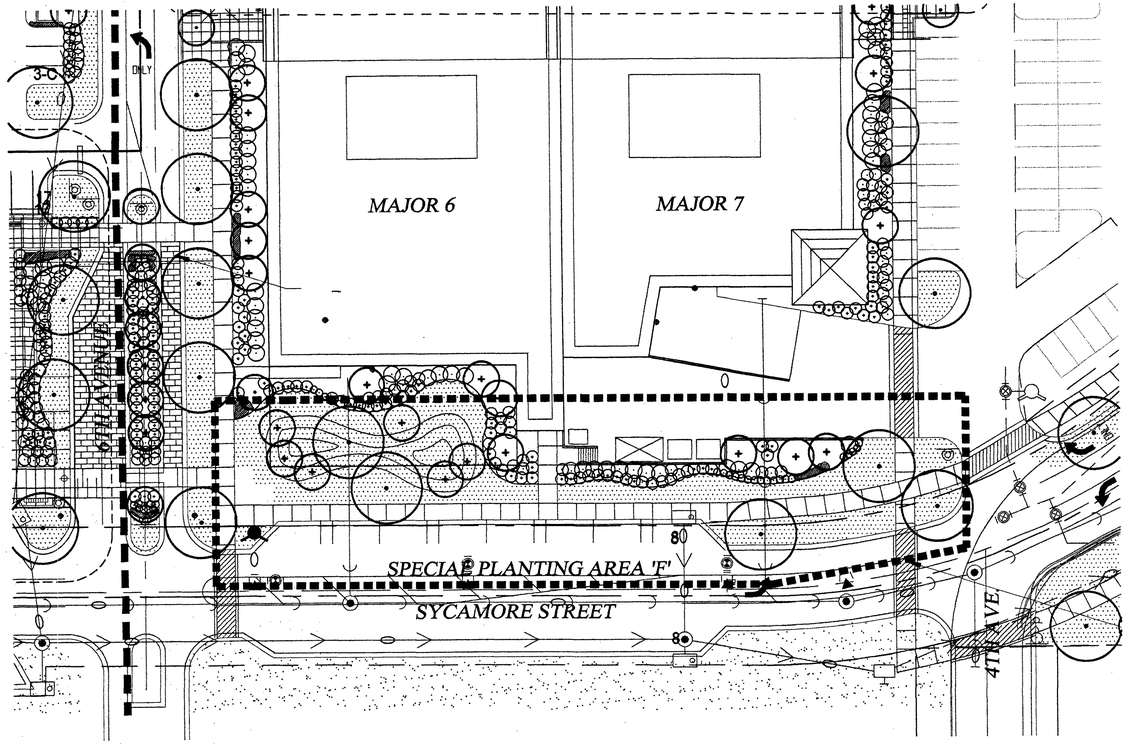
0 15 30 60
1"=30'

The NORRIS DULLEA Company
Planning
Landscape Architecture
710 West Colfax
Denver, Colorado 80204
Fax: 303 892 1186
Phone: 303 892 1166

SPECIAL PLANTING AREA 'C1' & 'F'
PLANNED DEVELOPMENT ZONE DISTRICT PLAN
TYPICAL AREA ENLARGEMENT

AMENDMENT #6





Area F

	Area	Ratio
Total Area	11556 s.f.	
Bed Area* **	6100 s.f.	
Trees*		1/825 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.

Area C-1

	Area	Ratio
Total Area	17369 s.f.	
Bed Area* **	7370 s.f.	
Trees*		1/ 575 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* Th : total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE NORRIS GROUP, MD.

SHEET 13

Superior Marketplace

Superior, Colorado

May 14, 1998

Typical Area Enlargement

North

Scale: 1"=30'-0"

Planned Development Zone District Plan AMENDMENT #6

Area D

	Area	Ratio
Total Area	28,723 s.f.	
Bed Area* **	13,740 s.f.	
Trees*		1/ 1,000 s.f.
Shrubs**		1/ 30 s.f.

Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.

Area E

	Area	Ratio
Total Area	27,000 s.f.	
Bed Area* **	5,500 s.f.	
Trees*		1/ 1,000 s.f.
Shrubs**		1/ 30 s.f.

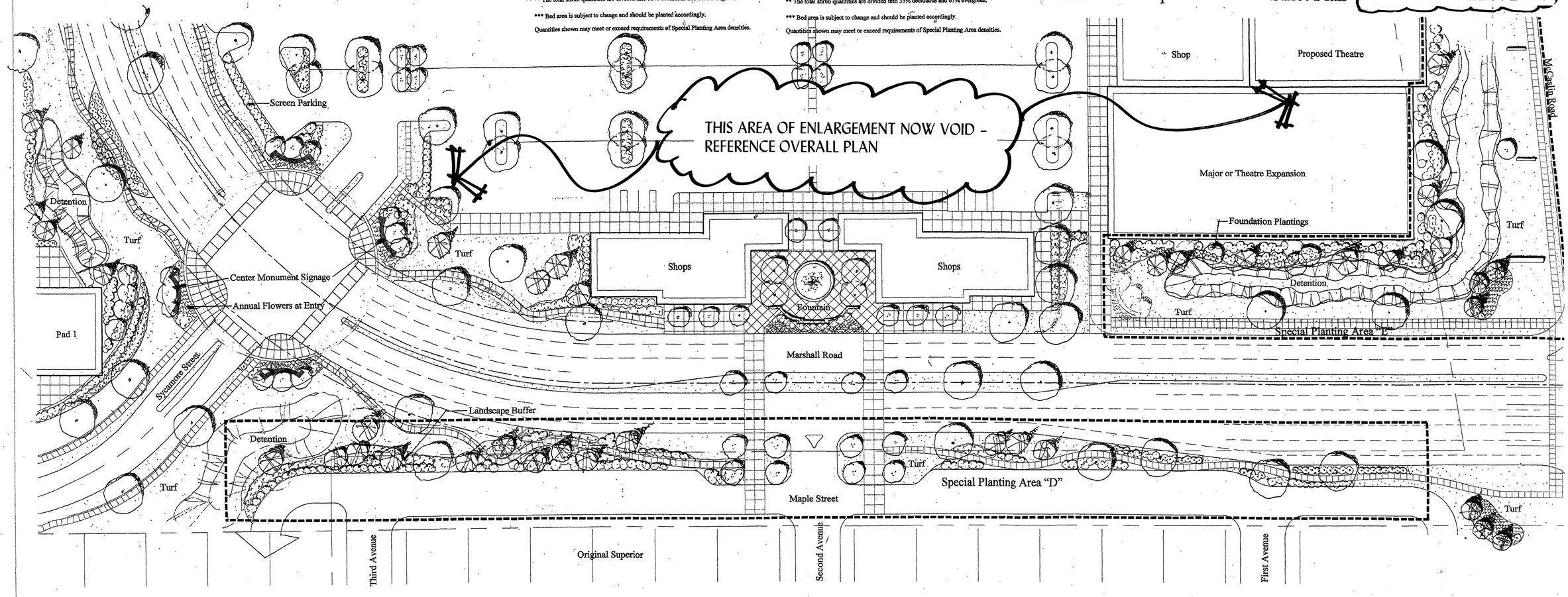
Note: One tree may be substituted for 10 shrubs.
Plan reflects shrub quantities @ 1/30 s.f.
Tree ratios are for the total area and shrub ratios are for the bed area only.

* The total tree quantities are divided into 33% deciduous and 67% evergreen.

** The total shrub quantities are divided into 33% deciduous and 67% evergreen.

*** Bed area is subject to change and should be planted accordingly.

Quantities shown may meet or exceed requirements of Special Planting Area densities.



Marshall Road Streetscape

Special Planting Area "D" and Partial "E"

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

SUPERIOR MARKETPLACE

NEW PLAN EXCEL REALTY TRUST, INC.

THE MULHERN GROUP, LTD.

SHEET 14

Page 16 of 18

Superior Marketplace

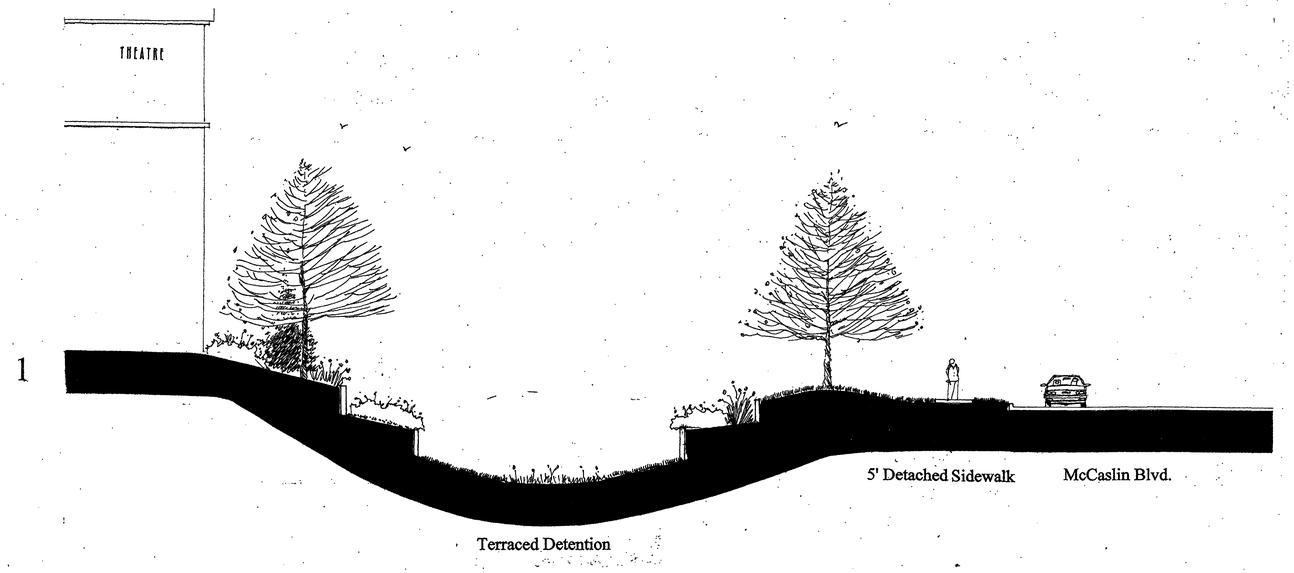
PD AMENDMENT #6

Superior, Colorado

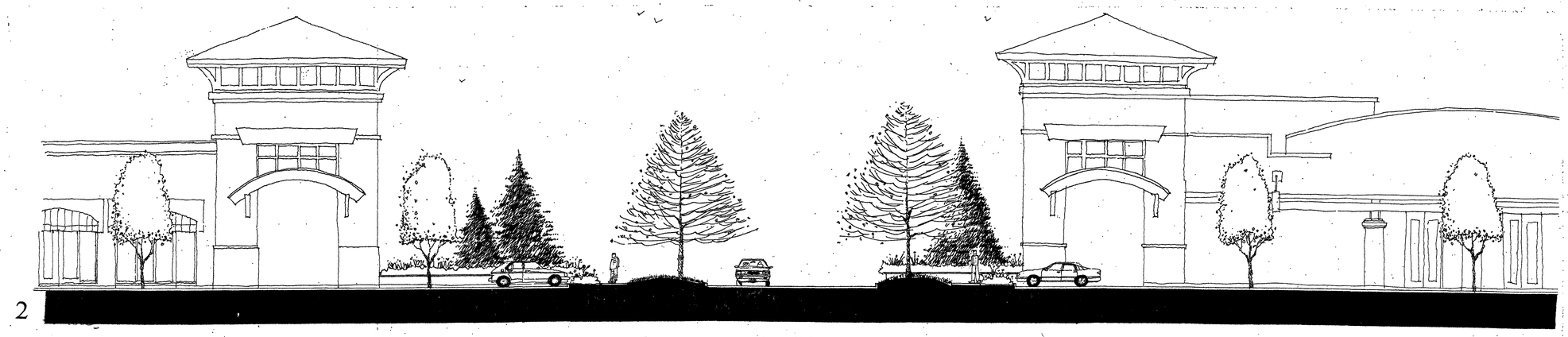
Typical Sections

May 14, 1998

1/8"=1'-0"



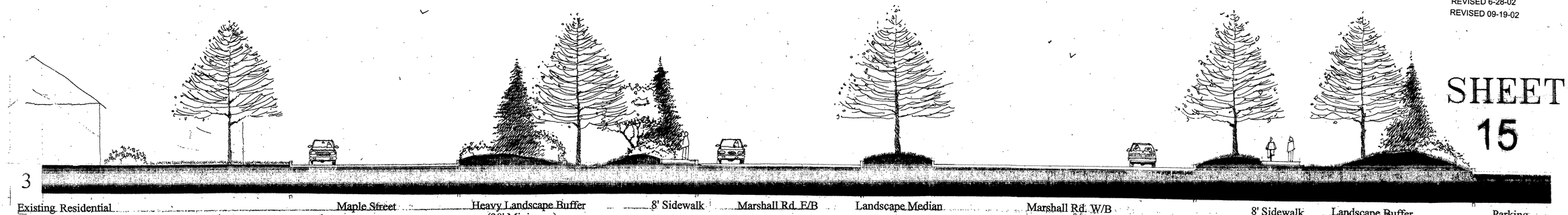
• Section Looking North at McCaslin Blvd.



•Section Looking West Thru Main Drive Aisle/ Typical Pedestrian Way

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01
REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

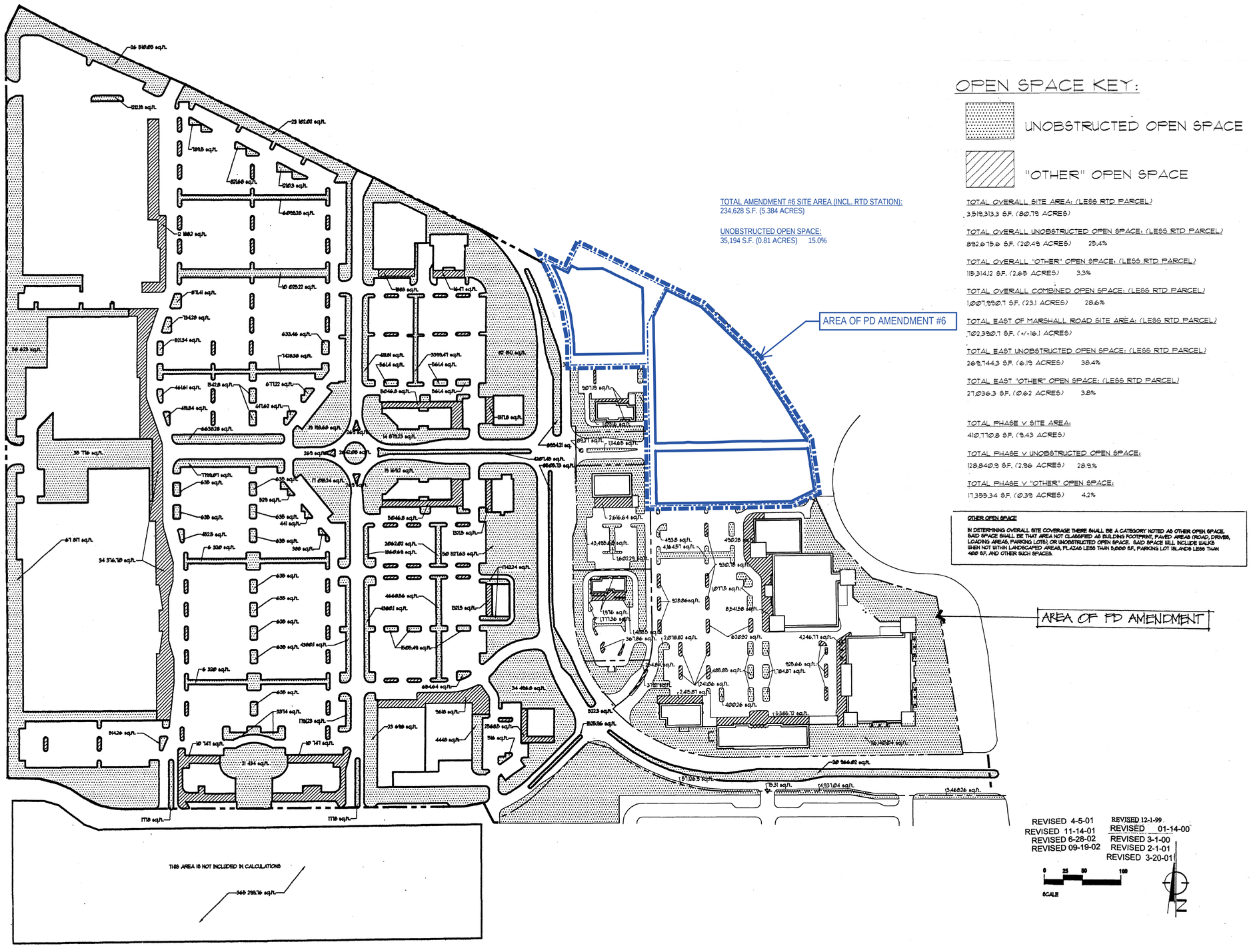
SHEET 15



• Section Looking West Thru Marshall Rd./ Maple St. Buffer

SUPERIOR MARKETPLACE

OPEN SPACE CALCULATIONS AMENDMENT #6



TOTAL AMENDMENT #6 SITE AREA (INCL. RTD STATION):
234,628 S.F. (5.384 ACRES)

UNOBSTRUCTED OPEN SPACE:
35,194 S.F. (0.81 ACRES) 15.0%

OPEN SPACE KEY:

UNOBSTRUCTED OPEN SPACE

"OTHER" OPEN SPACE

TOTAL OVERALL SITE AREA: (LESS RTD PARCEL)
3,519,313.3 S.F. (80.79 ACRES)

TOTAL OVERALL UNOBSTRUCTED OPEN SPACE: (LESS RTD PARCEL)
892,675.6 S.F. (20.49 ACRES) 25.4%

TOTAL OVERALL "OTHER" OPEN SPACE: (LESS RTD PARCEL)
115,314.12 S.F. (2.65 ACRES) 3.3%

TOTAL OVERALL COMBINED OPEN SPACE: (LESS RTD PARCEL)
1,007,990.1 S.F. (23.1 ACRES) 28.6%

TOTAL EAST OF MARSHALL ROAD SITE AREA: (LESS RTD PARCEL)
702,390.1 S.F. (+/-16.1 ACRES)

TOTAL EAST UNOBSTRUCTED OPEN SPACE: (LESS RTD PARCEL)
269,744.3 S.F. (6.19 ACRES) 38.4%

TOTAL EAST "OTHER" OPEN SPACE: (LESS RTD PARCEL)
27,036.3 S.F. (0.62 ACRES) 3.8%

TOTAL PHASE V SITE AREA:
410,770.8 S.F. (9.43 ACRES)

TOTAL PHASE V UNOBSTRUCTED OPEN SPACE:
128,840.9 S.F. (2.96 ACRES) 28.9%

TOTAL PHASE V "OTHER" OPEN SPACE:
17,355.34 S.F. (0.39 ACRES) 4.2%

OTHER OPEN SPACE

IN DETERMINING OVERALL SITE COVERAGE THERE SHALL BE A CATEGORY NOTED AS OTHER OPEN SPACE. SAID SPACE SHALL BE THAT AREA NOT CLASSIFIED AS BUILDING FOOTPRINT, PAVED AREAS (ROAD, DRIVES, LOADING AREAS, PARKING LOTS), OR UNOBSTRUCTED OPEN SPACE. SAID SPACE WILL INCLUDE WALKS WHEN NOT WITHIN LANDSCAPED AREAS, PLAZAS LESS THAN 5,000 S.F., PARKING LOT ISLANDS LESS THAN 400 S.F. AND OTHER SUCH SPACES.

REVISED 4-5-01
REVISED 11-14-01
REVISED 6-28-02
REVISED 09-19-02

REVISED 12-1-99
REVISED 01-14-00
REVISED 3-1-00
REVISED 2-1-01
REVISED 3-20-01

0 25 50 100
SCALE

REFERENCE NORTH

16

Page 18 of 18

THE MULHERN GROUP LTD.
ARCHITECTURE • PLANNING • INTERIORS

AMENDMENT #6

COBURN ARCHITECTURE

SUPERIOR MARKETPLACE
SUPERIOR, COLORADO

The information contained in this drawing file is intended for use only on this project. Unauthorized reproduction or use in other projects is not permitted. The Mulhern Group,ltd. assumes no liability for unauthorized reproduction, changes to or use of the information contained herein.
The information contained herein is provided on an "as-is" basis. The Mulhern Group,ltd disclaims all warranties with regard to the data contained in this drawing file and to the performance of the delivery media, including all implied warranties of fitness. The Mulhern Group,ltd assumes no obligations or liabilities for damages, including, but not limited to, consequential damages arising out of or in connection with the use or performance of this drawing file and its delivery media.

DATE	REVISION
6.4.99	FDP SUBMITTAL II
8.10.99	REVISION
8.23.99	REVISION
12.01.99	REVISION

SUPERIOR MARKETPLACE	
PROJECT NUMBER:	99010
DRAWN BY:	RAW
CHECKED BY:	DD/MGM
DESCRIPTION:	SITE PLAN

Boulder County Housing Authority TOD Site

Traffic Impact Study

Town of Superior, Colorado

Date: *August 18, 2022*

Submitted To:
Boulder County Housing Authority
3400 Broadway
Boulder, CO 80304

Submitted By:
Fox Tuttle Transportation Group, LLC
1624 Market Street, Suite 202
Denver, CO 80202
FT# 20011

FOX TUTTLE

TABLE OF CONTENTS

1.0 INTRODUCTION 4

2.0 PROJECT DESCRIPTION 4

3.0 EXISTING TRAFFIC CONDTIONS 7

3.1 Study Area and Circulation Network 7
3.2 Existing Transit and Multimodal Network 8
3.3 Existing Traffic Volumes 8
3.4 Existing Intersection Capacity Analysis 8

4.0 FUTURE TRAFFIC CONDITIONS WITHOUT PROJECT 13

4.1 Annual Growth Factor and Future Volume Methodology 13
4.2 Future Year Background (without Project) Capacity Analysis 13

5.0 PROPOSED DEVELOPMENT TRAFFIC 17

5.1 Trip Generation 17
5.2 Trip Distribution and Assignment 18

6.0 FUTURE TRAFFIC CONDITIONS WITH PROJECT 21

6.1 Intersection Capacity Analysis for Short-Term + Project Scenario 21
6.2 Intersection Capacity Analysis for Long-Term + Project Scenario 21
6.3 Site Access and Circulation 24
6.4 BCHA Site Parking 24

7.0 CONCLUSIONS 25

LIST OF TABLES

Table 1 – Peak Hour Intersection Level of Service Summary..... 11
Table 2 – Peak Hour 95th-Percentile Queue Summary 12
Table 3 – Trip Generation Summary..... 19

LIST OF FIGURES

Figure 1 – Vicinity Map..... 5
Figure 2 – Site Plan..... 6
Figure 3 – Existing Traffic Volumes..... 10
Figure 4 – Year 2025 Background Traffic Volumes 15
Figure 5 – Year 2041 Background Traffic Volumes 16
Figure 6 – Site-Generated Traffic Volumes..... 20
Figure 7 – Year 2025 Total Traffic Volumes..... 22
Figure 8 – Year 2041 Total Traffic Volumes..... 23

APPENDIX

Affordable Housing Trip Rates (COLA)
Level of Service Definitions
Intersection Capacity Worksheets

BCHA TOD SITE TRAFFIC IMPACT STUDY – SUPERIOR, COLORADO

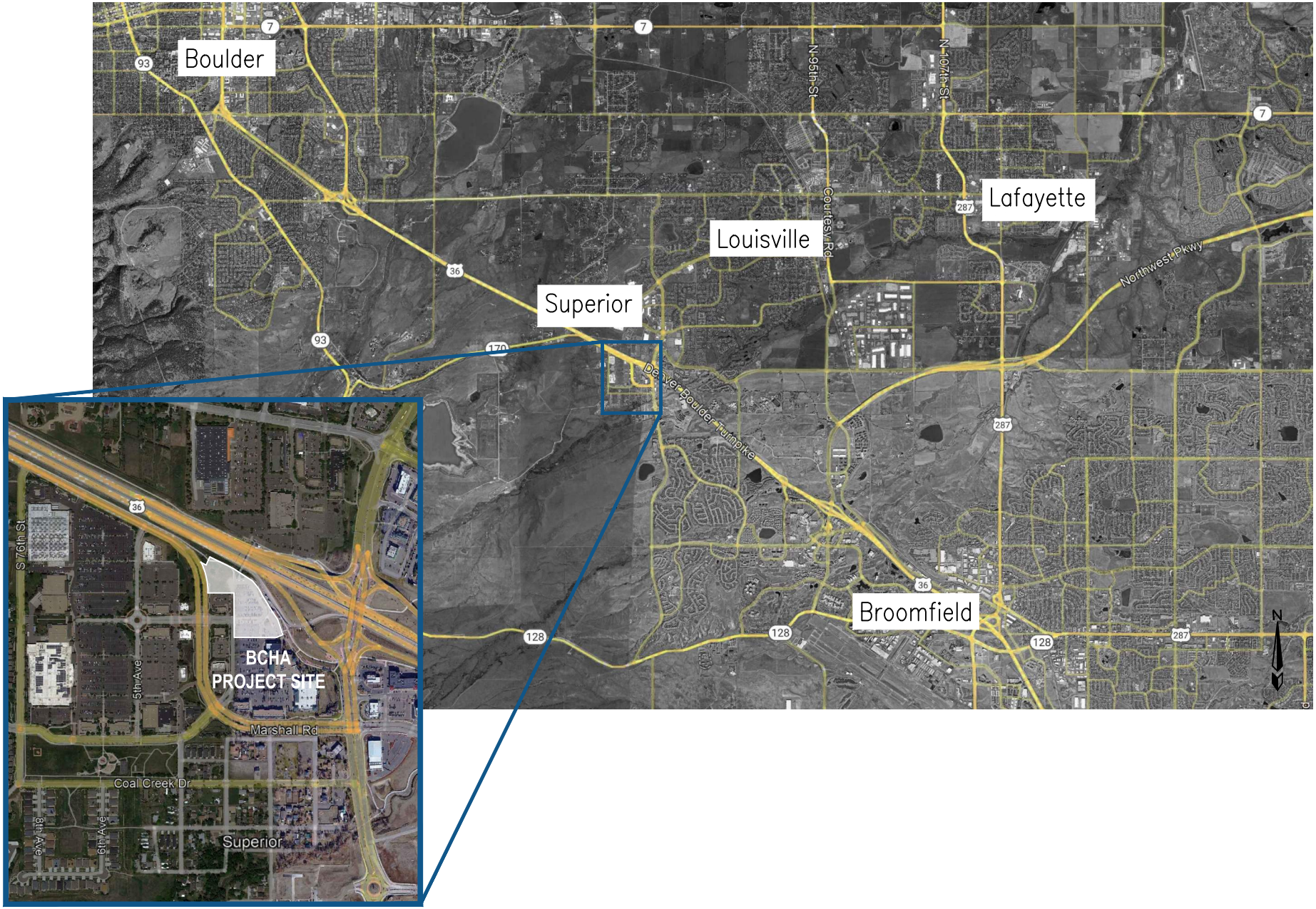
1.0 INTRODUCTION

This traffic impact study has been prepared by the Fox Tuttle Transportation Group for the Boulder County Housing Authority (BCHA) Transit Oriented Development (TOD) project within the Superior Marketplace located in the Town of Superior. The project proposes to develop 269 multifamily, affordable housing units with a 10,768 square foot community-driven and/or non-profit commercial use adjacent to the existing US 36 & McCaslin RTD Station and Park and Ride.

The purpose of this study is to assist in identifying potential traffic impacts within the study area with buildout of this project in the short and long-term scenarios. The traffic study addresses morning and evening peak hour intersection conditions in the study area without and with the project added traffic. The information contained in this study is anticipated to be used by the Town of Superior in identifying any intersection or roadway deficiencies and potential improvements for both the near term (2025) and long-term (2041) future scenarios necessary to service project-added traffic volumes.

2.0 PROJECT DESCRIPTION

The BCHA project proposes to develop 269 multifamily affordable housing units adjacent to the existing US 36 & McCaslin RTD Station and Park and Ride. Access to the BCHA site is proposed via Sycamore Street and Center Drive. A vicinity map is shown on **Figure 1**. The concept site footprint relative to the surrounding uses is shown on **Figure 2**. Existing adjacent land uses include commercial retail, restaurant, and service uses.

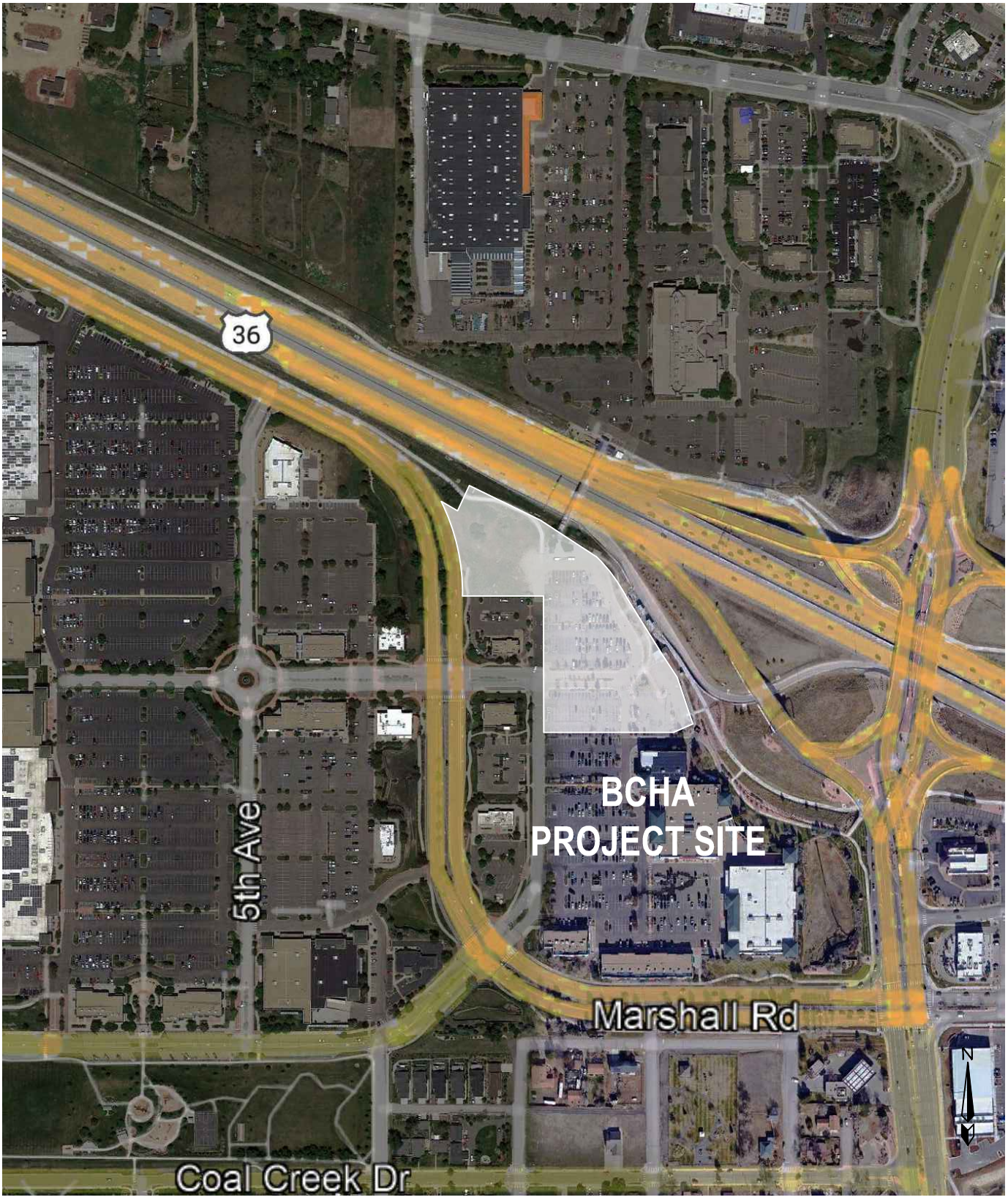


FOX TUTTLE
TRANSPORTATION GROUP

BOULDER COUNTY HOUSING AUTHORITY TOD SITE TRAFFIC IMPACT STUDY - SUPERIOR, CO

VICINITY MAP

FT Project #	21066	Original Scale	NTS	Date	8/12/22	Drawn by	MAR	Figure #	1



FOX TUTTLE
TRANSPORTATION GROUP

BOULDER COUNTY HOUSING AUTHORITY TOD SITE TRAFFIC IMPACT STUDY - SUPERIOR, CO

SITE PLAN

FT #	21066	Original Scale	NTS	Date	8/12/22	Drawn by	AWD	Figure #	2

3.0 EXISTING TRAFFIC CONDTIONS

3.1 Study Area and Circulation Network

The study area boundaries took into consideration the amount of traffic to be generated by the project and potential impact to the existing and proposed roadway network.

The existing study area street network consists of arterial, collector and local streets. The primary public roadways that serve the project site are discussed in the following text. Roadway classifications discussed are consistent with the Transportation Plan 2014 Update[1]. The existing study area roadway network is illustrated on **Figure 1**.

McCaslin Blvd is a four-lane major arterial roadway that provides north-south travel through the study area, linking the communities of Louisville (to the north) and Superior to the south. McCaslin Blvd. provides access to US 36 and Denver-Boulder. Per CDOT TDMS data (for both post-COVID, 2021 and pre-COVID, 2019 conditions), McCaslin Blvd. services approximately 26,000 to 32,000 vehicles per day (vpd) at just north of Marshall Road. The posted speed limit is 35 miles per hour (mph).

Marshall Road is a four-lane minor arterial roadway that provides east-west access from State Highway 93 to the west to just east of McCaslin Blvd where it extends into downtown Superior. Per Northwest Planning Project data (2018) provided by the Town of Superior, Marshall Road services approximately 23,000 vpd just west of McCaslin Blvd. The posted speed limit is 35 mph within the project vicinity. The intersection of Marshall Road with McCaslin Blvd. is controlled with a traffic signal.

Sycamore Street is a two-lane major collector roadway that provides east-west access between Center Street and S. 76th Street. Sycamore Street forms the southern border of the Superior Marketplace commercial district and terminates on the northeast end at the US 36 & McCaslin RTD Bus Rapid Transit (BRT) Station and Park and Ride. The posted speed limit is 30 mph. The intersection of Sycamore Street with Marshall Road is controlled with a traffic signal.

Center Street is a two-lane local roadway that provides access to commercial uses within the Superior Marketplace on both sides of Marshall Road. The posted speed limit is 25 mph. The intersection of Center Street with Marshall Road is controlled with a traffic signal. The intersection of Center Street with Sycamore Street is controlled with an all-way stop.

[1] Transportation Plan 2014 Update. Town of Superior. February 2014.

3.2 Existing Transit and Multimodal Network

There are on-street bike lanes on McCaslin Blvd. and Marshall Road within the study area, with the exception of Marshall Road between Sycamore Street and McCaslin Blvd. The north portion of Sycamore Street, where the US 36 Bikeway routes through this area, is designated with sharrows (shared lane use with autos). Sidewalk connections are generally complete throughout the study area, including segments of attached and detached sidewalks varying from 6' to 10' in width, with the exception of the east side of Sycamore Street north of Marshall Road and adjacent to the RTD Station and parking. The US 36 Bikeway traverses the BCHA site and provides regional bike connectivity from the BRT station to Boulder (to the north) and other US 36 communities (so the south).

Bus routes serves by the US 36 and McCaslin BRT Station include the Flatiron Flyer (Bus Rapid Transit service between Denver, Westminster, Broomfield Louisville, Superior and Boulder) and the Route AB1 bus that provides transit service between Boulder and Denver International Airport. Route 222 provides local transit service on McCaslin Blvd. with bus stops on the McCaslin/US 36 bridge.

3.3 Existing Traffic Volumes

Weekday AM and PM peak period turning-movement was collected by the Town in 2018 for the Northwest Planning Project and utilized for this project. These volumes represent pre-COVID conditions and thus provide a higher/more conservative basis for potential site traffic impacts. These volumes are illustrated on **Figure 3**. The existing intersection geometry and traffic control are also shown on **Figure 3**.

3.4 Existing Intersection Capacity Analysis

In determining the operational characteristics of an intersection, "Levels of Service" (LOS) A through F are applied, with LOS A indicating very good operations and LOS F indicating congested operations. The intersection LOS is represented as a delay in seconds per vehicle for the intersection as a whole and for each turning movement. A more detailed discussion of LOS methodology is contained in the Appendix for reference. Criteria contained in the Highway Capacity Manual (HCM)[2] was applied for these analyses in order to determine existing levels of service and 95th-percentile queues during peak hour periods. Existing signal timing and phasing parameters were obtained from the Town of Superior and incorporated into the Synchro models.

[2] Highway Capacity Manual, Sixth Edition, Transportation Research Board, National Research Council, 2016. Synchro v10 software utilized.

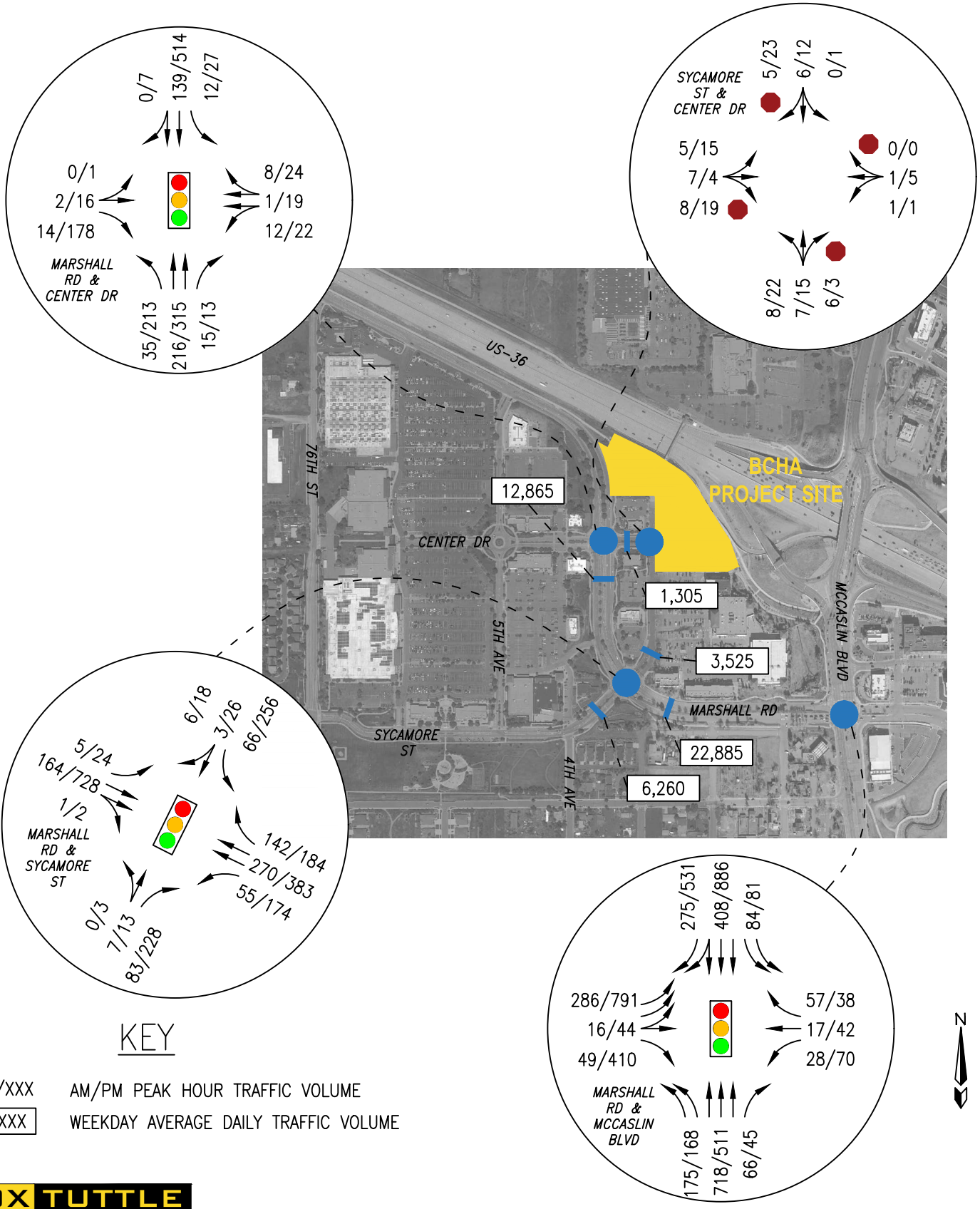
The results of the LOS and queue calculations for the intersections are summarized on **Table 1** and **Table 2**, respectively. The intersection level of service and queue worksheets are attached in the Appendix. The LOS data shows that all study intersections are operating acceptably overall, but with some approaches/movements operating at LOS E or LOS F in at least one peak hour, as follows:

Marshall Road & McCaslin Blvd.

- The eastbound and westbound approaches are operating at LOS E, primarily due to the high volume of eastbound left-turns which are accommodated by a triple left-turn lane which is implemented with a "split phase" operation. Elimination of the split phase could improve the operation of the signal but will require physical widening to eliminate the shared eastbound left-through lane condition. Additionally, the heavy eastbound right-turn movement and poor LOS (LOS F in PM peak) would require widening to implement a "free" right-turn movement to increase capacity.
- The northbound left-turn is operating at LOS E in both peak hours. This is due to the protected-only operation of this left turn that has been implemented to improve safety (particularly with the dual left-turn lane configuration) and this LOS is common where protected-only left-turns phasing is used. The left-turn queues are shown to be contained in the available storage length and mitigation is thus not proposed for this condition.

Marshall Road & Sycamore Street.

- The eastbound right turn movement operates at LOS E during the AM peak and LOS F during the PM peak for existing conditions. The intersection operates at a good LOS and the operations for this one movement can be mitigated by a change in signal timing and phasing to include a right-turn "overlap" signal that would allow the eastbound right-turn movements to occur currently with the northbound left turn phase. This is assumed as a background improvement to be in place for future-year scenarios.



KEY

XXX/XXX — AM/PM PEAK HOUR TRAFFIC VOLUME

XX,XXX — WEEKDAY AVERAGE DAILY TRAFFIC VOLUME

FOX TUTTLE TRANSPORTATION GROUP

BOULDER COUNTY HOUSING AUTHORITY TOD SITE TRAFFIC IMPACT STUDY - SUPERIOR, CO

EXISTING TRAFFIC VOLUMES

FT #	21066	Original Scale	NTS	Date	8/12/22	Drawn by	MAR	Figure #	3

Table 1 - Peak Hour Intersection Level of Service Summary

Intersection and Lanes Groups	2021 Existing				2025 Background				2025 Background + Project				2041 Background				2041 Bkgrd + Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
SIGNAL CONTROL																				
1. Marshall Rd at Center Dr	**6**	**A**	**11**	**B**	**6**	**A**	**11**	**B**	**6**	**A**	**11**	**B**	**9**	**A**	**12**	**B**	**9**	**A**	**12**	**B**
Eastbound Left+Through	52	D	38	D	52	D	38	D	52	D	38	D	51	D	38	D	51	D	38	D
Eastbound Right	53	D	52	D	53	D	52	D	53	D	52	D	52	D	53	D	52	D	53	D
Westbound Left+Through	53	D	39	D	53	D	39	D	52	D	39	D	53	D	41	D	53	D	41	D
Westbound Through+Right	53	D	39	D	53	D	39	D	53	D	39	D	52	D	40	D	52	D	40	D
Northbound Left	3	A	3	A	3	A	3	A	3	A	2	A	3	A	3	A	3	A	3	A
Northbound Through	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A
Northbound Right	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A
Southbound Left	3	A	2	A	3	A	2	A	3	A	2	A	3	A	2	A	3	A	2	A
Southbound Through+Right	4	A	4	A	4	A	4	A	4	A	4	A	4	A	4	A	4	A	4	A
2. Marshall Rd at Sycamore St	**19**	**B**	**32**	**C**	**22**	**C**	**27**	**C**	**23**	**C**	**23**	**C**	**24**	**C**	**25**	**C**	**24**	**C**	**27**	**C**
Eastbound Left+Through	52	D	44	D	45	D	40	D	45	D	40	D	44	D	40	D	43	D	41	D
Eastbound Right	63	E	>120	F	50	D	46	D	50	D	46	D	50	D	48	D	48	D	46	D
Westbound Left	47	D	35	C	40	D	31	C	39	D	31	C	38	D	31	C	40	D	34	C
Westbound Through+Right	42	D	27	C	36	D	24	C	34	C	23	C	33	C	22	C	33	C	22	C
Northbound Left	5	A	16	B	9	A	33	C	10	A	29	C	10	B	47	D	10	B	44	D
Northbound Through	6	A	17	B	10	A	20	C	11	B	22	C	12	B	24	C	12	B	24	C
Northbound Right	7	A	18	B	10	A	21	C	12	B	24	C	11	B	24	C	12	B	25	C
Southbound Left	7	A	16	B	10	A	19	B	11	B	20	B	11	B	19	B	12	B	21	C
Southbound Through+Right	18	B	17	B	22	C	22	C	23	C	12	B	25	C	12	B	25	C	16	B
3. Marshall Rd at McCaslin Blvd	**31**	**C**	**54**	**D**	**36**	**D**	**61**	**E**	**36**	**D**	**62**	**E**	**36**	**D**	**45**	**D**	**36**	**D**	**46**	**D**
Eastbound Left	56	E	51	D	59	E	51	D	57	E	52	D	58	E	52	D	55	E	52	D
Eastbound Through	56	E	51	D	59	E	51	D	57	E	52	D	46	D	52	D	55	D	45	D
Eastbound Right	51	D	>120	F	44	D	>120	F	42	D	>120	F	0	A	0	A	0	A	0	A
Westbound Left	71	E	69	E	79	E	68	E	77	E	68	E	48	D	34	C	39	D	39	D
Westbound Through	56	E	52	D	51	D	53	D	50	D	54	D	47	D	48	D	47	D	48	D
Westbound Right	53	D	30	C	28	C	32	C	30	C	33	C	14	B	17	B	15	B	17	B
Northbound Left	58	E	59	E	63	E	59	E	61	E	59	E	59	E	68	E	59	E	68	E
Northbound Through	21	C	26	C	25	C	26	C	24	C	26	C	33	C	45	D	32	C	45	D
Northbound Right	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A
Southbound Left	39	D	47	D	48	D	48	D	50	D	48	D	44	D	61	E	47	D	64	E
Southbound Through	10	B	23	C	17	B	24	C	18	B	24	C	23	C	38	D	25	C	39	D
Southbound Right	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A
STOP SIGN CONTROL																				
4. Center Dr at Sycamore St	**7**	**A**	**7**	**A**	**7**	**A**	**7**	**A**	**7**	**A**	**8**	**A**	**7**	**A**	**8**	**A**	**7**	**A**	**8**	**A**
Eastbound Left+Through+Right	7	A	7	A	7	A	7	A	7	A	7	A	7	A	8	A	7	A	8	A
Westbound Left+Through+Right	7	A	7	A	7	A	7	A	8	A	8	A	7	A	8	A	8	A	8	A
Northbound Left+Through+Right	7	A	7	A	7	A	8	A	7	A	8	A	7	A	8	A	7	A	8	A
Southbound Left+Through+Right	7	A	7	A	7	A	7	A	7	A	7	A	7	A	7	A	7	A	8	A

Note: Delay represented in average seconds per vehicle.

Table 2 - Peak Hour 95th-Percentile Queue Summary

Intersection and Lanes Groups	Existing Storage Length	2021 Existing		2025 Background		2025 Background + Project		2041 Background		2041 Bkgrd + Project	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
SIGNAL CONTROL											
1. Marshall Rd at Center Dr											
Eastbound Left+Through	-	9'	32'	9'	36'	13'	39'	15'	41'	19'	44'
Eastbound Right	100'	0'	62'	0'	65'	0'	65'	0'	66'	0'	66'
Westbound Left+Through	-	16'	14'	17'	37'	19'	39'	36'	56'	38'	57'
Westbound Through+Right	-	16'	14'	17'	37'	19'	39'	36'	56'	38'	57'
Northbound Left	425'	32'	28'	9'	113'	9'	113'	7'	173'	6'	172'
Northbound Through	-	67'	26'	25'	25'	25'	26'	20'	5'	15'	5'
Northbound Right	175'	4'	0'	0'	0'	0'	0'	0'	0'	0'	0'
Southbound Left	165'	8'	6'	9'	16'	10'	16'	12'	22'	13'	23'
Southbound Through+Right	-	38'	103'	42'	150'	42'	150'	51'	180'	51'	180'
2. Marshall Rd at Sycamore St											
Eastbound Left+Through	-	21'	34'	36'	32'	38'	34'	38'	38'	38'	42'
Eastbound Right	160'	34'	76'	54'	163'	54'	179'	56'	185'	52'	201'
Westbound Left	100'	82'	231'	82'	231'	134'	273'	118'	269'	159'	326'
Westbound Through+Right	-	16'	39'	17'	39'	18'	39'	20'	40'	20'	42'
Northbound Left	400'	19'	146'	55'	323'	55'	322'	38'	397'	42'	367'
Northbound Through	-	48'	170'	97'	203'	97'	204'	81'	201'	89'	207'
Northbound Right	-	2'	70'	35'	82'	39'	92'	6'	16'	0'	17'
Southbound Left	120'	3'	17'	4'	21'	4'	21'	6'	22'	7'	21'
Southbound Through+Right	-	20'	311'	29'	384'	29'	384'	47'	458'	53'	458'
3. Marshall Rd at McCaslin Blvd											
Eastbound Left	385'	138'	336'	182'	393'	196'	420'	186'	352'	201'	363'
Eastbound Through	-	161'	416'	209'	481'	234'	489'	40'	44'	39'	44'
Eastbound Right	265'	1'	131'	0'	185'	0'	184'	12'	450'	13'	413'
Westbound Left	120'	54'	108'	63'	116'	62'	116'	38'	85'	38'	85'
Westbound Through	-	36'	72'	41'	77'	41'	77'	46'	88'	46'	88'
Westbound Right	120'	0'	0'	0'	0'	0'	0'	23'	58'	24'	58'
Northbound Left	180'	109'	106'	126'	115'	126'	118'	140'	155'	142'	155'
Northbound Through	-	167'	138'	213'	152'	204'	152'	347'	464'	342'	464'
Northbound Right	125'	0'	0'	6'	0'	0'	0'	0'	0'	0'	0'
Southbound Left	220'	61'	39'	71'	64'	70'	64'	126'	173'	131'	173'
Southbound Through	-	102'	260'	130'	294'	125'	294'	334'	453'	349'	455'
Southbound Right	200'	0'	0'	0'	0'	0'	0'	0'	0'	0'	0'
STOP SIGN CONTROL											
4. Center Dr at Sycamore St											
Eastbound Left+Through+Right	-	3'	5'	3'	5'	3'	5'	3'	8'	5'	10'
Westbound Left+Through+Right	-	0'	0'	0'	0'	3'	3'	3'	3'	3'	3'
Northbound Left+Through+Right	-	0'	5'	3'	5'	5'	10'	3'	10'	8'	15'
Southbound Left+Through+Right	-	3'	5'	3'	5'	5'	8'	3'	8'	5'	10'

4.0 FUTURE TRAFFIC CONDITIONS WITHOUT PROJECT

4.1 Annual Growth Factor and Future Volume Methodology

Future traffic growth was based on previous analysis performed by the Town of Superior and LSC Consultants for the Northwest Planning Project. This analysis includes a review of DRCOG regional long-term traffic forecasts and potential build out of the Superior Marketplace and adjacent developments over the short-term and long-term planning horizons. Additionally, 350 new multifamily units were assumed (not related to the BCHA project) within the study area to provide a conservative estimate for potential future background growth.

The BCHA project is anticipated to be fully built and occupied within the next few years. Thus, the Year 2025 planning horizon was assumed for the build-out or "opening day" scenario, with Year 2041 as the long-term planning scenario. Using the above growth assumptions, the projected Year 2025 background traffic volumes are provided on **Figure 4** with the projected Year 2041 background traffic volumes on **Figure 5**.

4.2 Future Year Background (without Project) Capacity Analysis

The level of service criteria discussed Section 3.4 was applied to the study area intersections to determine baseline operations for the Year 2025 and Year 2041 background traffic scenarios. The results of the LOS calculations are summarized on **Table 1** on the previous page. The intersection level of service and queue worksheets are attached in the Appendix. The eastbound right-turn overlap phase at the Marshall Road & Sycamore Street intersection was assumed to be in place for future background scenarios.

The data on **Table 1** shows that all study intersections are projected to operate acceptably overall and for individual movements (LOS D or better) in both peak hours in the Year 2025 background scenario, with the following exceptions:

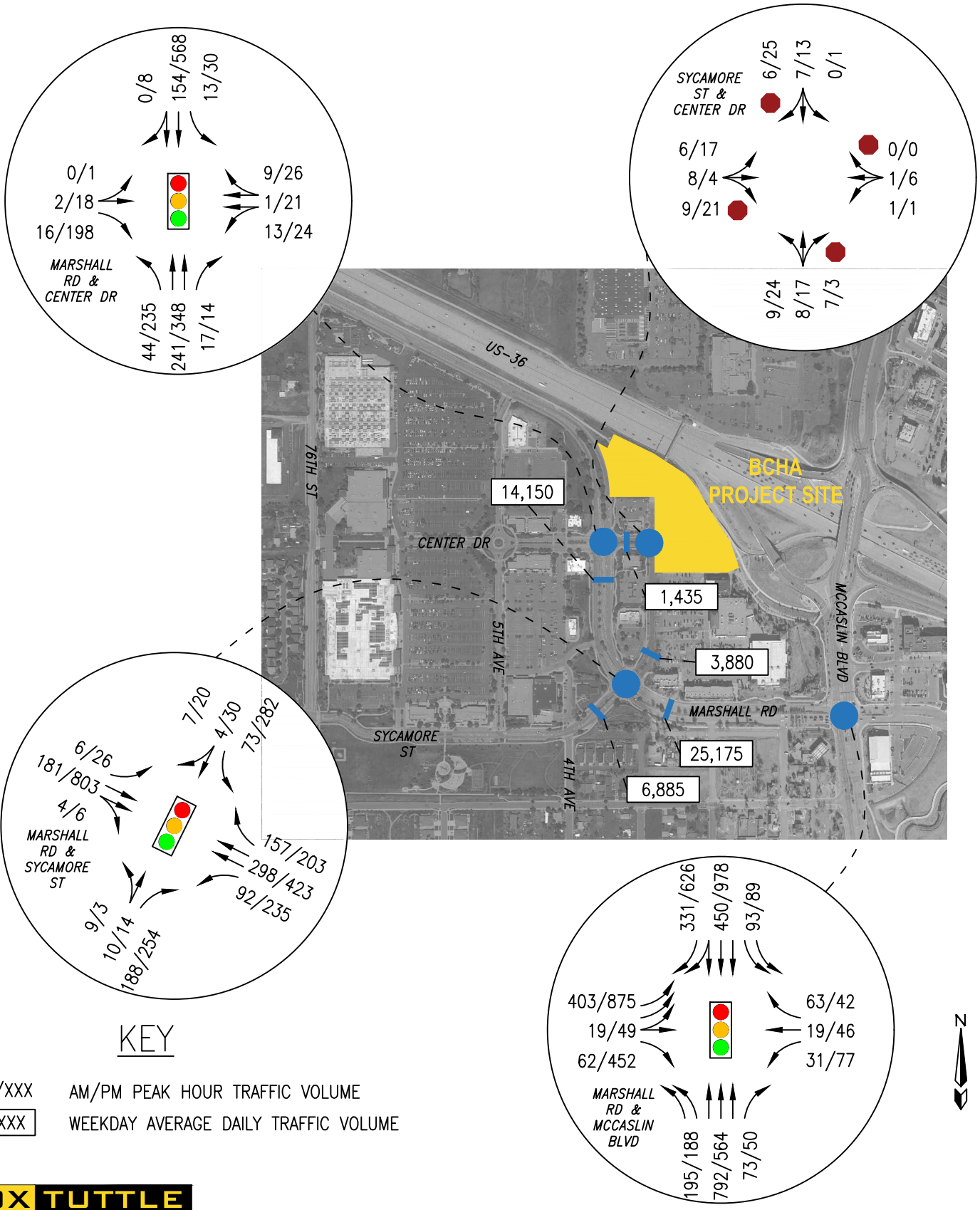
Marshall Road & McCaslin Blvd.

- The intersection is anticipated to operate at LOS E in the PM peak hour, and with the same approaches and movements operating at LOS E as noted for the existing conditions in Section 3.4.
- As noted in Section 3.4, the eastbound and westbound approaches are operating at LOS E, primarily due to the high volume of eastbound left-turns which are accommodated by a triple left-turn lane which is implemented with a "split phase" operation. Elimination of the split phase could improve the operation of the signal but will require physical widening to eliminate the shared eastbound left-through lane condition. Additionally, the heavy eastbound right-turn movement and poor

LOS (LOS F in PM peak) would require widening to implement a "free" right-turn movement to increase capacity.

- The northbound left-turn is projected to continue to operate at LOS E in both peak hours. This is due to the protected-only operation of this left turn that has been implemented to improve safety (particularly with the dual left-turn lane configuration) and this LOS is common where protected-only left-turns phasing is used. The left-turn queues are shown to be contained in the available storage length and mitigation is thus not needed for this condition.

For the Year 2041 background scenario, improvements to the Marshall Road & McCaslin Blvd. intersection to mitigate the existing capacity limitations were assumed to be in place. The data on **Table 1** shows that all study intersections are projected to operate acceptably overall with these improvements in place. No other mitigation measures have been identified to adequately service projected traffic volumes in the background growth scenarios.



KEY

XXX/XXX — AM/PM PEAK HOUR TRAFFIC VOLUME

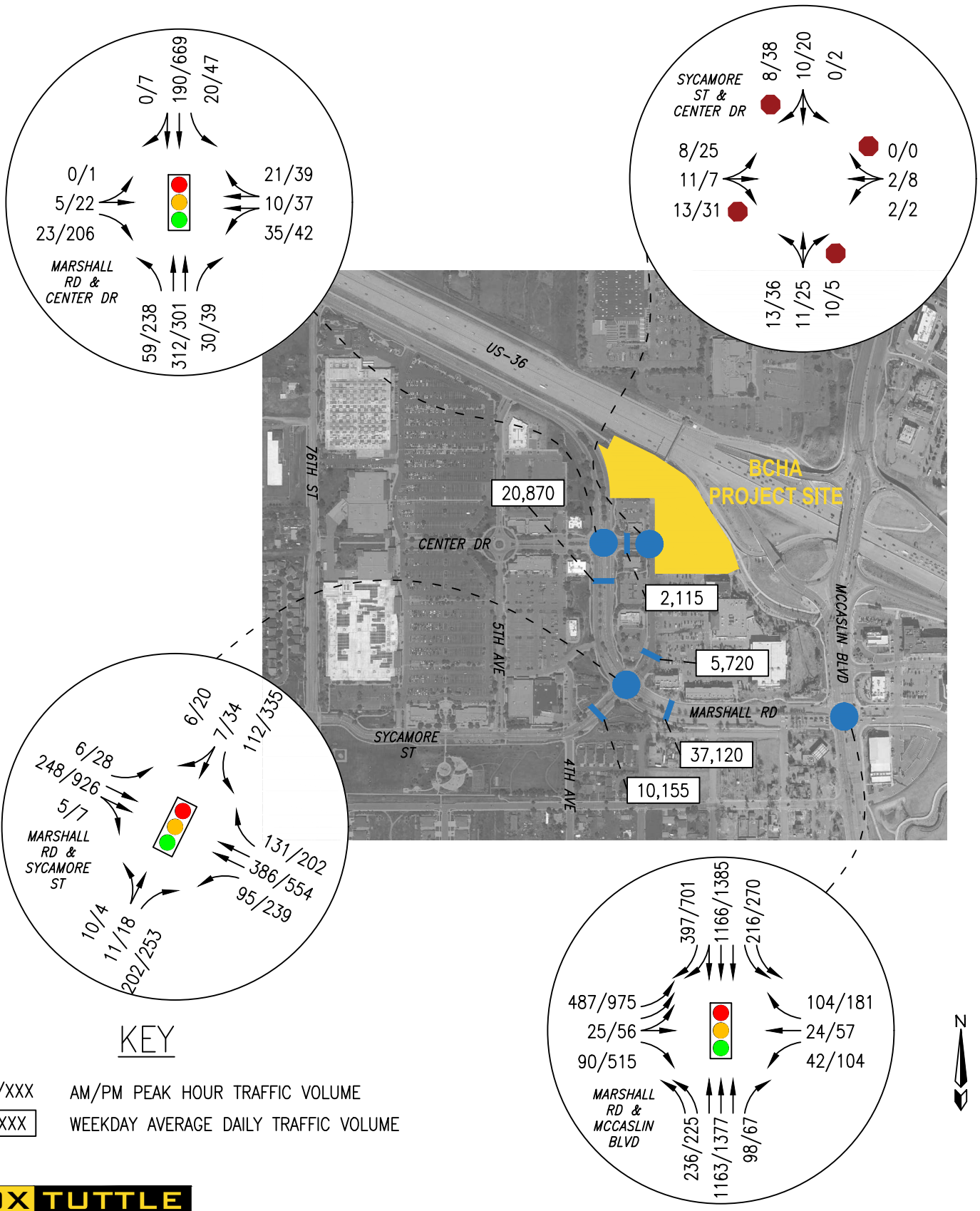
XX,XXX — WEEKDAY AVERAGE DAILY TRAFFIC VOLUME

FOX TUTTLE TRANSPORTATION GROUP

BOULDER COUNTY HOUSING AUTHORITY TOD SITE TRAFFIC IMPACT STUDY - SUPERIOR, CO

YEAR 2025 BACKGROUND TRAFFIC VOLUMES

FT #	21066	Original Scale	NTS	Date	8/12/22	Drawn by	MAR	Figure #	4



KEY

XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME

XX,XXX WEEKDAY AVERAGE DAILY TRAFFIC VOLUME

FOX TUTTLE TRANSPORTATION GROUP

BOULDER COUNTY HOUSING AUTHORITY TOD SITE TRAFFIC IMPACT STUDY - SUPERIOR, CO

YEAR 2041 BACKGROUND TRAFFIC VOLUMES

FT #	21066	Original Scale	NTS	Date	8/12/22	Drawn by	MAR	Figure #	5

5.0 PROPOSED DEVELOPMENT TRAFFIC

5.1 Trip Generation

The BCHA site proposes to develop three buildings on the site with a total of 269 residential units, with partial below grade parking. The development will also include up to 10,768 square feet of community-driven and/or non-profit commercial use. This commercial space is anticipated as an ancillary use to service residents and potentially transit customers using the RTD station, but not as a unique destination that is anticipated generate unique vehicular trips (as a traditional retail/commercial space might). However, to provide a conservatively high estimate of potential site traffic impacts, this commercial use was included in the trip generation estimates.

The BCHA site proposes affordable housing units, which have been shown to generate less automobile trips than typical residential sites. In order to estimate the anticipated volume of residential vehicle trips generated by the development by the project, trip rates contained in Table 5 of the Los Angeles Department of Transportation (LADOT) Impact Study Guidelines were applied. The LADOT developed these rates based on field studies of affordable housing sites through the city. This information is also attached in the Appendix, for reference. For the commercial space, trip rates contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual[3] were utilized.

The BCHA Transit Oriented Development (TOD) site will benefit from the proximity to the US 36 and McCaslin RTD Station, access to the US 36 Bikeway, and close access to retail, restaurants, and other uses within the Superior Marketplace. As such, reductions were applied to the vehicular trip generation estimates to account for transit, biking and walking trips. A 30% non-auto use reduction was applied for the BCHA site for transit and multimodal trip usage given the proximity to the RTD station, US 36 bikeway and adjacent retail/commercial uses within walking and biking distance.

The resulting vehicular trip estimates for the project are summarized on **Table 2** on the following page. As shown, the project is anticipated to generate the following vehicular trips at buildout and full occupancy:

- 1,180 daily trips, 112 AM peak hour trips, 114 PM peak hour trips

[3] Trip Generation 11th Edition, Institute of Transportation Engineers, 2021.

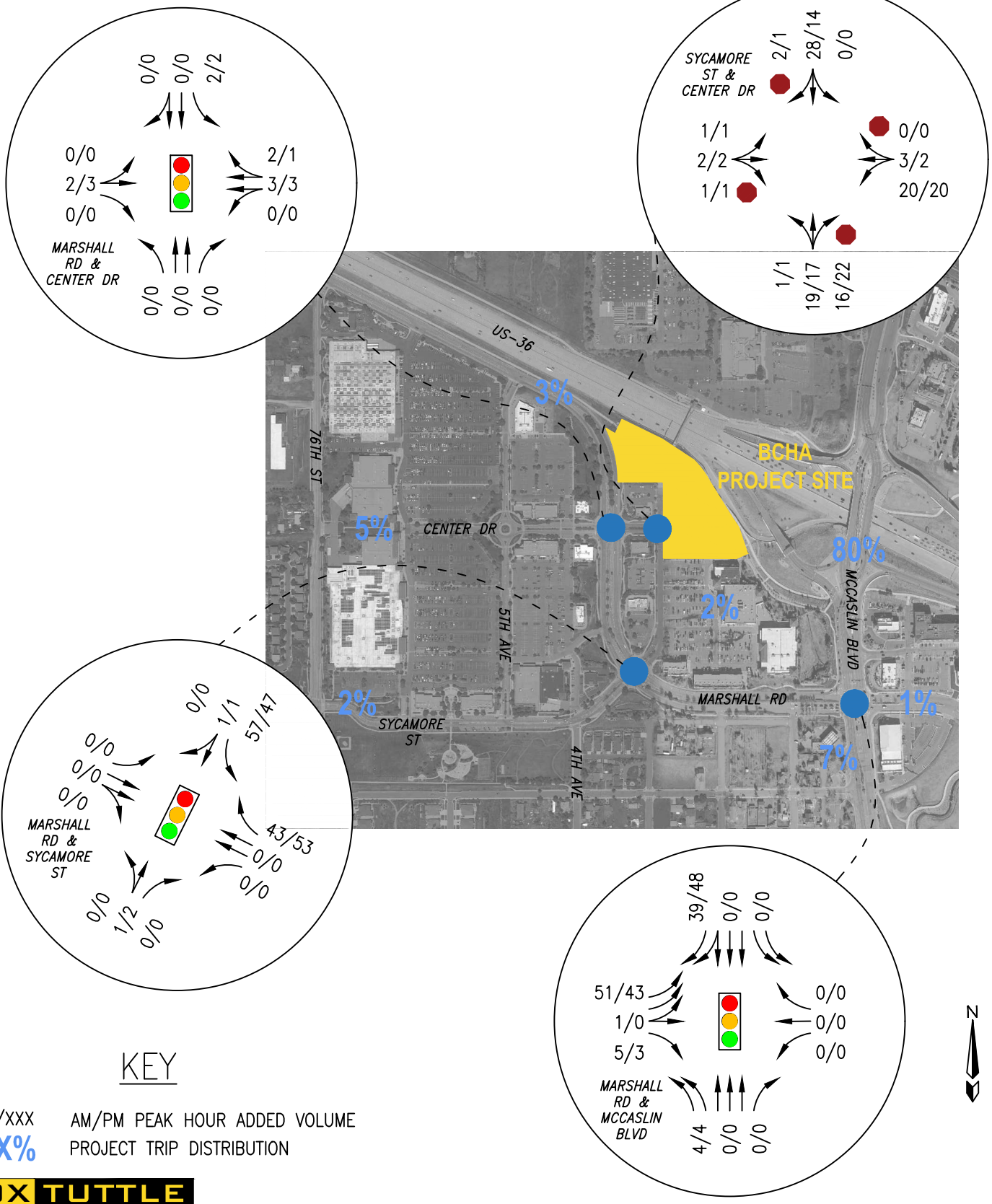
5.2 Trip Distribution and Assignment

The estimated project build-out vehicle trips were distributed onto the surrounding roadway and intersection based on existing traffic patterns in the study area determined with the existing count data, as well as based on regional origins and destinations for residential trips (i.e.: employment centers, population centers, etc.). Using this data, it is estimated that roughly 80% of the project traffic will be oriented to/from US 36 via McCaslin Road.

The anticipated project-added volumes at build-out, along with the trip distribution assumptions, is provided on **Figure 6**.

Table 2 - Trip Generation Summary

	Land Use	Size	Unit	Non-Auto Factor [1]	Average Daily Trips		AM Peak Hour Trips				PM Peak Hour Trips			
					Rate	Total	Rate	Total	In	Out	Rate	Total	In	Out
BCHA Site														
1	COLA - Affordable Housing - Family	269	DU	0.70	4.08	768	0.50	94	38	56	0.34	64	35	29
2	Commercial (ITE #822, Retail <40k)	10.8	TSF	0.70	54.45	412	2.36	18	11	7	6.59	50	25	25
	BHCA Site - Total New Trips:					*1,180*		*112*	*49*	*63*		*114*	*60*	*54*



KEY

XXX/XXX AM/PM PEAK HOUR ADDED VOLUME

XX% PROJECT TRIP DISTRIBUTION

FOX TUTTLE TRANSPORTATION GROUP

BOULDER COUNTY HOUSING AUTHORITY TOD SITE TRAFFIC IMPACT STUDY - SUPERIOR, CO

BCHA SITE-GENERATED TRAFFIC VOLUMES

FT #	21066	Original Scale	NTS	Date	8/12/22	Drawn by	MAR	Figure #	6

6.0 FUTURE TRAFFIC CONDITIONS WITH PROJECT

This analysis has been conducted in order to determine impacts associated with full development and occupancy of the project in the short-term (build-out) and long-term scenarios.

6.1 Intersection Capacity Analysis for Short-Term + Project Scenario

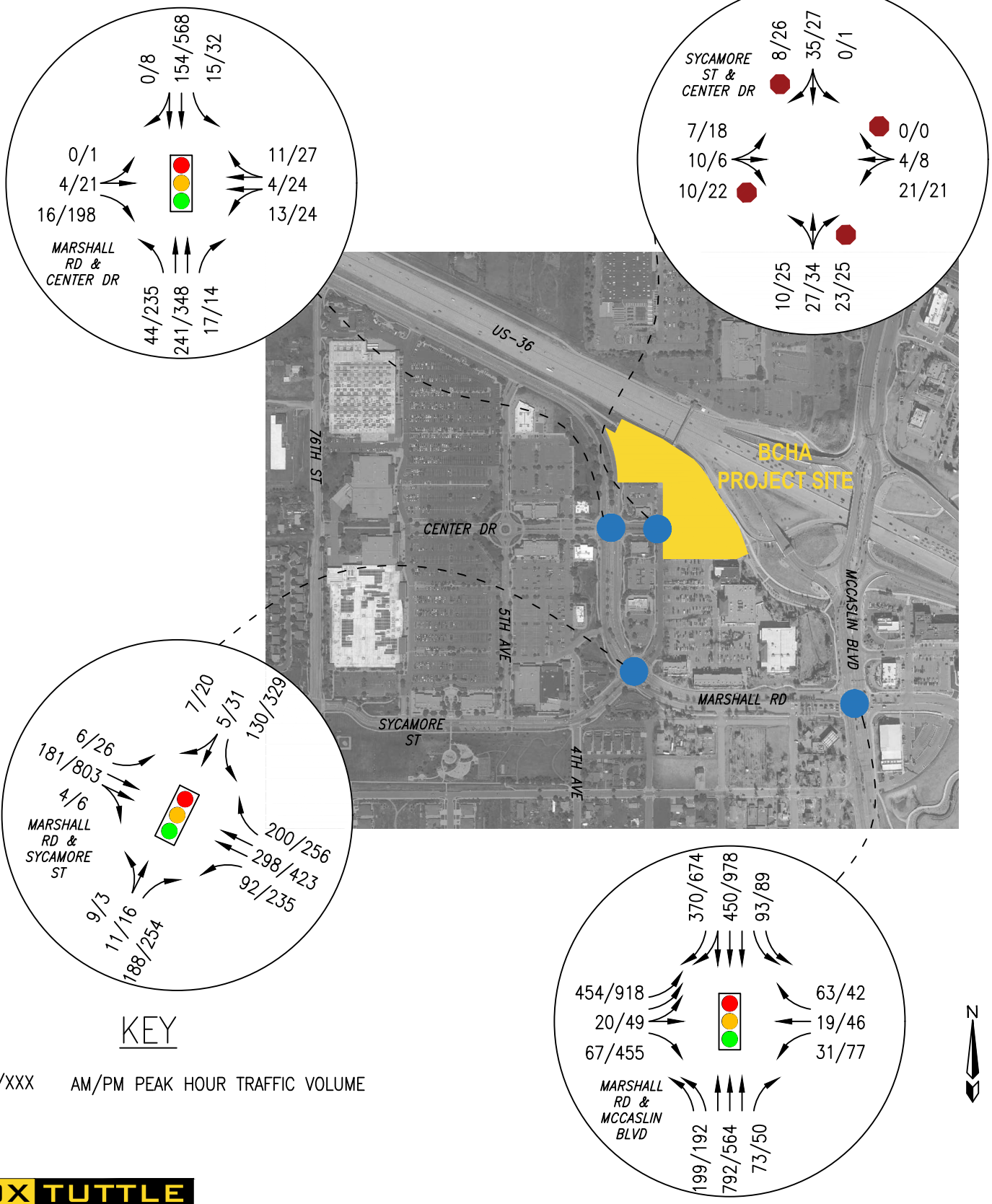
The site-generated traffic volumes were added to the Year 2025 background traffic volumes to analyze potential site impacts in the short-term, build-out scenario. The Year 2025 total traffic volumes are illustrated on **Figure 7**. The level of service criteria discussed in prior sections was applied to the study area intersections to determine impacts with the addition of project build-out traffic volumes in the short-term. The results of the LOS calculations for the intersections are summarized for each scenario in **Table 1** and the queue calculations in **Table 2**. The intersection level of service and queue worksheets are attached in the Appendix.

The data contained in **Table 1** illustrates that the study area intersections and proposed accesses will operate similarly to the Year 2025 background conditions, with only marginal increases in delay values and no changes in LOS letter grades for any intersections or movements.

6.2 Intersection Capacity Analysis for Long-Term + Project Scenario

The site-generated traffic volumes were added to the Year 2041 background traffic volumes to analyze potential site impacts in the long-term, build-out scenario. The Year 2041 total traffic volumes are illustrated on **Figure 8**. The level of service criteria discussed in prior sections was applied to the study area intersections to determine impacts with the addition of project build-out traffic volumes in the long-term. The results of the LOS calculations for the intersections are summarized for each scenario in **Table 1** and the queue calculations in **Table 2**. The intersection level of service and queue worksheets are attached in the Appendix.

As discussed in Section 4.2, for the Year 2041 scenario, improvements to the Marshall Road & McCaslin Blvd. intersection to mitigate the existing capacity limitations were assumed to be in place as a background traffic need (independent of the project). The data on **Table 1** shows that with these improvements, all study intersections are projected to operate acceptably overall through the Year 2041 scenario with full buildout of both residential sites.



KEY

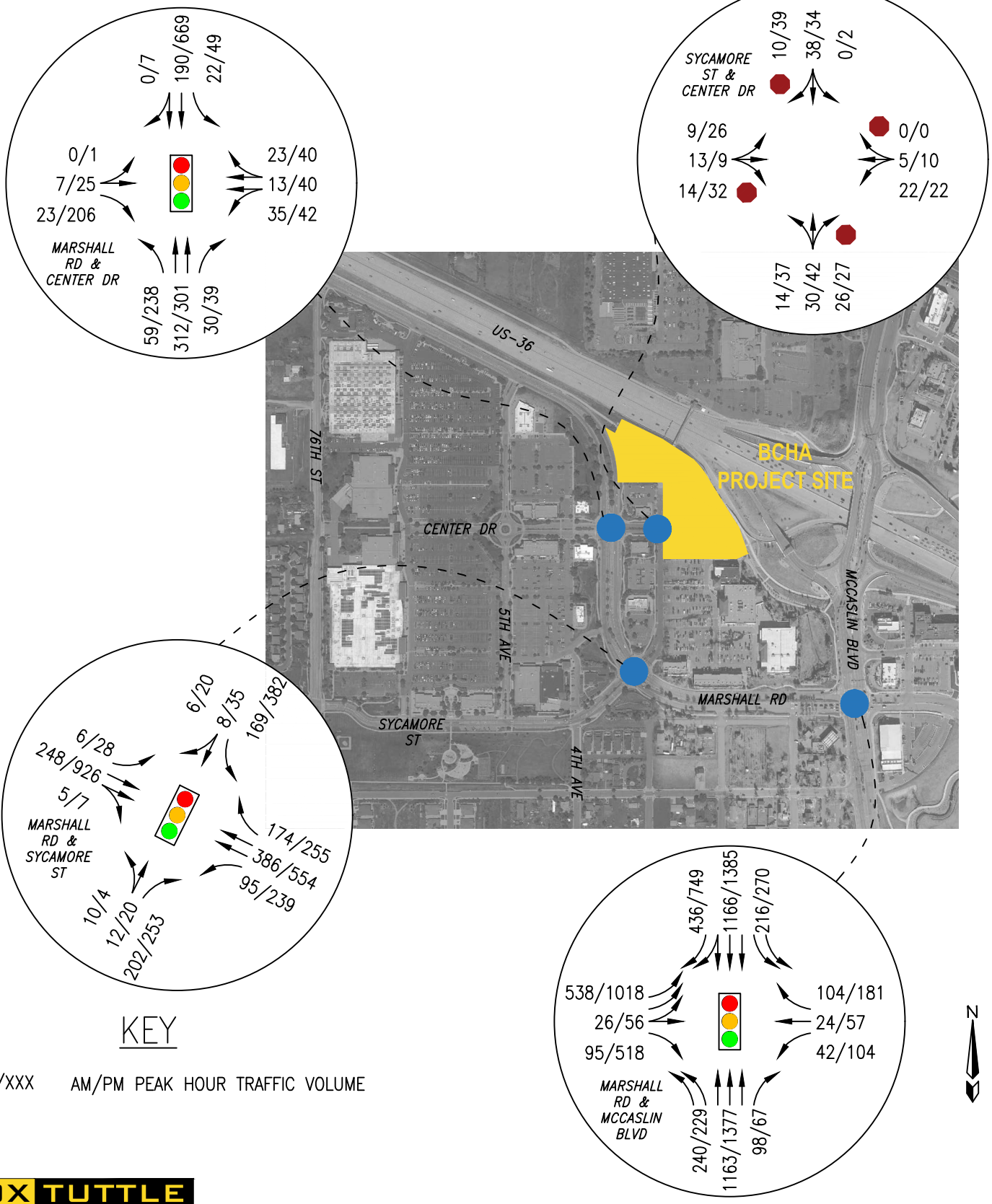
XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME

FOX TUTTLE TRANSPORTATION GROUP

BOULDER COUNTY HOUSING AUTHORITY TOD SITE TRAFFIC IMPACT STUDY - SUPERIOR, CO

YEAR 2025 + PROJECT TRAFFIC VOLUMES

FT #	21066	Original Scale	NTS	Date	8/12/22	Drawn by	MAR	Figure #	7



KEY

XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME

FOX TUTTLE TRANSPORTATION GROUP

BOULDER COUNTY HOUSING AUTHORITY TOD SITE TRAFFIC IMPACT STUDY - SUPERIOR, CO

YEAR 2041 + PROJECT TRAFFIC VOLUMES

FT #	21066	Original Scale	NTS	Date	8/12/22	Drawn by	MAR	Figure #	8

6.3 Site Access and Circulation

The project proposes the following access points:

- Access to under-structure parking for the north buildings along the north side of the RTD station loop driveway and via Sycamore Street.
- Access to the south building under-structure parking along both the RTD station loop driveway and along Sycamore Street just south of Center Street

The proposed access plan provides sufficient distribution of trips to and from the site and ease of access onto the adjacent roadway and intersection network. No new auxiliary turn lanes are needed at either site access intersections or study area intersections to support the project-added traffic volumes. As site plans are refined for each site, multimodal access details should be provided, showing sidewalk connections to adjacent/existing multimodal facilities.

6.4 Site Parking

The BCHA site proposes to maintain 294 RTD parking spaces (matching existing). A 0.3 parking space per unit ratio is proposed for the residential uses and 1.0 parking spaces per 1,000 SF of commercial gross floor area. The residential parking provision of 0.3 spaces per unit represents a variance from Town standards on the basis of studies which have shown a reduction in parking demand for affordable housing units and near transit. Potential parking strategies to provide any additional parking could utilize mixed-use shared parking agreements with adjacent commercial uses, as peak residential and commercial parking demand often varies by time of day (peak parking demand for residential during nights and peak parking demand for commercial during the day).

7.0 CONCLUSIONS

The Boulder County Housing Authority (BCHA) proposes to develop 269 multifamily affordable housing units and up to 10,768 SF of community-driven and/or non-profit commercial use adjacent to the existing US 36 & McCaslin RTD Station and Park and Ride. Access to the BCHA site is proposed via Sycamore Street and Center Drive. The purpose of this study is to assist in identifying potential traffic impacts within the study area with buildout of this project in the short and long-term scenarios. The traffic study addresses weekday morning and evening peak hour intersection conditions in the study area without and with the project added traffic.

The project is anticipated to generate a total of approximately 1,180 daily, 112 AM peak hour and 114 PM peak hour trips at full build-out and occupancy. It was determined that the project-added traffic can be accommodated on the existing and future roadway and intersection network with minimal impacts. It is anticipated that improvements to the Marshall Road & McCaslin Blvd. to remove the existing split-phase operational of the traffic signal will be implemented by the Town by the long-term planning horizon. No deficiencies or improvements were identified as necessary to support these residential projects, as proposed.

The analysis shows that the residential use will generate primarily outbound trips in the AM peak hour, while many adjacent commercials uses in the area are not open or generating significant traffic. In the PM peak hour, the residential trips will largely be inbound. The addition of residential use in the Superior Marketplace is anticipated to increase use of transit via the US 36 and McCaslin RTD station as well as help to create a mixed-use environment that will encourage short, non-auto trips between the residential and adjacent commercial uses.

APPENDIX

Affordable Housing Trip Rates (COLA)
Level of Service Definitions
Intersection Capacity Worksheets

Affordable Housing Trip Rates (COLA)

  - » Provide continuous paved sidewalks / walkways with adequate lighting from all buildings in the Project to nearby transit services and stops. This may include mid-block paseos.
  - » Implement transit shelter enhancements.
- If the Development Project is not within ¼-mile walking distance of a transit station or a RapidBus stop, the Project may still qualify for up to 10% trip generation adjustment. To be eligible for this adjustment, the Project should include design features that promote alternative travel modes and provide certain amenities to tenants and employees. Features and amenities that may qualify a Project for this adjustment include the following:
  - » An on-site transit information kiosk and/or on-site transit pass sales;
  - » On-site facilities such as ATM machines, cafeteria, convenience shopping, showers, and changing rooms;
  - » Pricing for single-occupancy auto parking;
  - » Publicly accessible car share or bike share station, contingent on LADOT approval;
  - » Bicycle racks or amenities for people traveling by bicycle;
  - » Provision of on-site concierge service to facilitate use of transit, taxis, or private shuttles by employees/ residents;
  - » Provision of shuttle service for employees and/or customers.

  Transit trip adjustment will not be automatically granted to Development Projects located in an area with infrequent transit service. However, all reasonable efforts by the developer to promote the use of public transit or walking will be considered for transit adjustments on a case-by-case basis.

  NOTE: Refer to ***Section 4.2*** of these TIS Guidelines for transit-related impact mitigation measures.

- Affordable Housing Projects

  Residential or mixed-use developments that include Affordable Housing Units [as defined in LAMC 12.22-A.25 (b)] are eligible to use the trip generation rates presented in **Table 5**, which are based on the total number and type of dwelling units reserved as affordable. These trip generation rates are based on vehicle trip count data collected at affordable housing sites in the City of Los Angeles in 2016. These trip generation rates for Affordable Housing units are not subject to any of the aforementioned adjustments in this Section.

Table 5: Trip Generation Rates for Affordable Housing Projects

Affordable Housing Type	***Daily Rate*** *(Trips per DU)*	***Average AM Peak Hr Rate*** *(Trips per DU)*	***% AM Trips In***	***% AM Trips Out***	***Average PM Peak Hr Rate*** *(Trips per DU)*	***% PM Trips In***	***% PM Trips Out***
Family	4.08	0.50	40%	60%	0.34	55%	45%
Seniors	1.72	0.12	38%	62%	0.15	52%	48%
Permanent Supportive Housing / Special Needs	1.27	0.12	44%	56%	0.12	59%	41%

Family affordable housing offers affordable dwelling units designed for households with children. Senior affordable

housing provides affordable dwelling units designed for mature residents. Permanent supportive housing provides long-term housing with supportive services designed to enable homeless persons and individuals/families at risk of homelessness to ensure that they remain housed and live as independently as possible.

3.3C TRAFFIC COUNTS

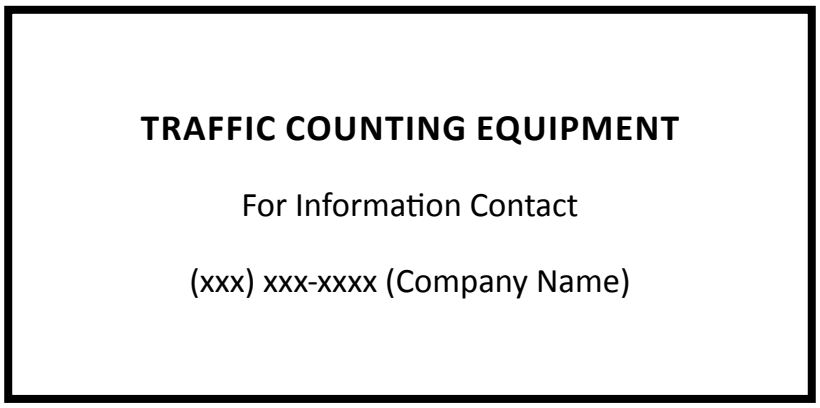
The LADOT traffic count database should be searched for any recent traffic counts at the Study intersections. The TIS should not use any traffic counts that are more than two years old. If recent LADOT traffic counts are not available, then new traffic counts shall be collected by a qualified data collection firm. Turning movement data at the study intersections should be collected in 15-minute intervals during the hours of 7:00 a.m. to 10:00 a.m. and 3:00 p.m. to 6:00 p.m., unless LADOT specifies other hours (e.g., for a signal warrant determination or weekend analysis). Unless otherwise required, all traffic counts should generally be conducted when local schools or colleges are in session, on days of good weather, on Tuesdays through Thursdays during non-Summer months, and should avoid being taken on weeks with a holiday. Relative to the proposed Project description, the TIS may be required to collect traffic data on and evaluate special circumstances, such as:

- Summer weekend activity in recreational areas
- Holidays or special events
- Alternative Project scenarios if required by another City Department or adjacent jurisdiction

Traffic counts should include vehicle classifications, pedestrian volume counts, and bicycle counts. If traffic count data is collected utilizing video technology equipment that is left unattended in the public right-of-way, the video equipment should be clearly labeled as traffic counting equipment and should include the name and contact information of the company conducting the count, as shown in **Figure 2**. All traffic data collected should be summarized and presented in the standard LADOT format depicting turning movement volumes for all required modes as shown in **Attachments G and H**, and submitted in digital and hard copy formats.

The TIS should include map(s) showing the "existing" (specify base year) traffic volumes for both the a.m. and p.m. peak hours at the study intersections and the average daily traffic (ADT) on any analyzed street segments. Additionally, the TIS should include map(s) showing future traffic volumes with ambient growth without Project at the Study intersections and street segments. This map should specify the future year used in the impact analysis and should be based on the expected date of project buildout. The future year identified in this step shall remain consistent for all other analyses and maps used to illustrate future traffic projections.

Figure 2: Sample Label for Traffic Counting Equipment



Level of Service Definitions

LEVEL OF SERVICE DEFINITIONS

In rating roadway and intersection operating conditions with existing or future traffic volumes, "Levels of Service" (LOS) A through F are used, with LOS A indicating very good operation and LOS F indicating poor operation. Levels of service at signalized and unsignalized intersections are closely associated with vehicle delays experienced in seconds per vehicle. More complete level of service definitions and delay data for signal and stop sign controlled intersections are contained in the following table for reference.

Level of Service Rating	Delay in seconds per vehicle *(a)*		Definition
	Signalized	Unsignalized	
A	0.0 to 10.0	0.0 to 10.0	Low vehicular traffic volumes; primarily free flow operations. Density is low and vehicles can freely maneuver within the traffic stream. Drivers are able to maintain their desired speeds with little or no delay.
B	10.1 to 20.0	10.1 to 15.0	Stable vehicular traffic volume flow with potential for some restriction of operating speeds due to traffic conditions. Vehicle maneuvering is only slightly restricted. The stopped delays are not bothersome and drivers are not subject to appreciable tension.
C	20.1 to 35.0	15.1 to 25.0	Stable traffic operations, however the ability for vehicles to maneuver is more restricted by the increase in traffic volumes. Relatively satisfactory operating speeds prevail, but adverse signal coordination or longer vehicle queues cause delays along the corridor.
D	35.1 to 55.0	25.1 to 35.0	Approaching unstable vehicular traffic flow where small increases in volume could cause substantial delays. Most drivers are restricted in ability to maneuver and selection of travel speeds due to congestion. Driver comfort and convenience are low, but tolerable.
E	55.1 to 80.0	35.1 to 50.0	Traffic operations characterized by significant approach delays and average travel speeds of one-half to one-third the free flow speed. Vehicular flow is unstable and there is potential for stoppages of brief duration. High signal density, extensive vehicle queuing, or corridor signal progression/timing are the typical causes of vehicle delays at signalized corridors.
F	> 80.0	> 50.0	Forced vehicular traffic flow and operations with high approach delays at critical intersections. Vehicle speeds are reduced substantially, and stoppages may occur for short or long periods of time because of downstream congestion.

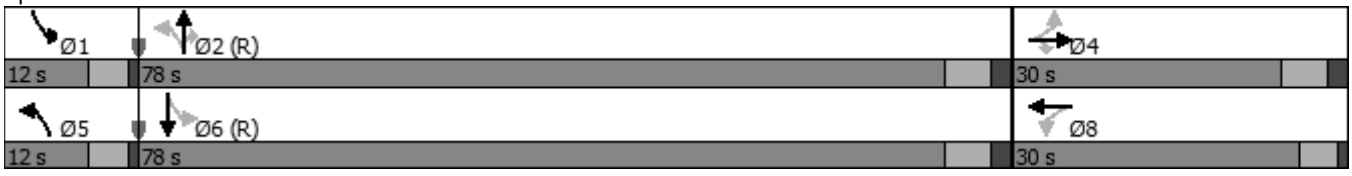
(a) Delay ranges based on Highway Capacity Manual (6th Edition, 2016) criteria.

Intersection Capacity Worksheets

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	14	12	1	35	216	15	12	139
Future Volume (vph)	2	14	12	1	35	216	15	12	139
Turn Type	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	4			8	5	2		1	6
Permitted Phases		4	8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	Ped	Ped	Ped	Ped	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	24.0	24.0		25.5	84.0	79.8	79.8	82.4	77.3
Actuated g/C Ratio	0.20	0.20		0.21	0.70	0.66	0.66	0.69	0.64
v/c Ratio	0.01	0.04		0.04	0.04	0.10	0.02	0.02	0.07
Control Delay	38.5	0.2		27.0	10.2	13.8	3.0	5.2	8.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	0.2		27.0	10.2	13.8	3.0	5.2	8.9
LOS	D	A		C	B	B	A	A	A
Approach Delay	4.7			27.0		12.7			8.6
Approach LOS	A			C		B			A

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.10	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	2	15	23	38	235	16	13	151
v/c Ratio	0.01	0.04	0.04	0.04	0.10	0.02	0.02	0.07
Control Delay	38.5	0.2	27.0	10.2	13.8	3.0	5.2	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	0.2	27.0	10.2	13.8	3.0	5.2	8.9
Queue Length 50th (ft)	1	0	4	15	48	0	3	23
Queue Length 95th (ft)	9	0	16	32	67	4	8	38
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	372	367	623	875	2352	1045	818	2280
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.04	0.04	0.04	0.10	0.02	0.02	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	14	12	1	8	35	216	15	12	139	0
Future Volume (veh/h)	0	2	14	12	1	8	35	216	15	12	139	0
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	0	2	15	13	1	9	38	235	16	13	151	0
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	0	124	105	143	9	95	1047	2777	1235	949	2723	0
Arrive On Green	0.00	0.07	0.07	0.07	0.07	0.07	0.06	1.00	1.00	0.01	0.77	0.00
Sat Flow, veh/h	0	1870	1579	1289	135	1437	1781	3554	1581	1781	3647	0
Grp Volume(v), veh/h	0	2	15	14	0	9	38	235	16	13	151	0
Grp Sat Flow(s),veh/h/ln	0	1870	1579	1425	0	1437	1781	1777	1581	1781	1777	0
Q Serve(g_s), s	0.0	0.1	1.1	0.9	0.0	0.7	0.5	0.0	0.0	0.2	1.2	0.0
Cycle Q Clear(g_c), s	0.0	0.1	1.1	1.1	0.0	0.7	0.5	0.0	0.0	0.2	1.2	0.0
Prop In Lane	0.00		1.00	0.93		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	124	105	152	0	95	1047	2777	1235	949	2723	0
V/C Ratio(X)	0.00	0.02	0.14	0.09	0.00	0.09	0.04	0.08	0.01	0.01	0.06	0.00
Avail Cap(c_a), veh/h	0	374	316	359	0	305	1105	2777	1235	1034	2723	0
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)	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	52.4	52.8	52.8	0.0	52.6	2.5	0.0	0.0	2.9	3.4	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.6	0.3	0.0	0.4	0.0	0.1	0.0	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(50%),veh/ln	0.0	0.1	0.4	0.4	0.0	0.3	0.1	0.0	0.0	0.1	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	52.4	53.4	53.0	0.0	53.0	2.5	0.1	0.0	2.9	3.5	0.0
LnGrp LOS	A	D	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		17			23			289			164	
Approach Delay, s/veh		53.3			53.0			0.4			3.4	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	99.8		14.0	8.1	97.9		14.0				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.2	2.0		3.1	2.5	3.2		3.1				
Green Ext Time (p_c), s	0.0	1.6		0.0	0.0	1.0		0.1				

Intersection Summary		
HCM 6th Ctrl Delay		5.7
HCM 6th LOS		A

Notes

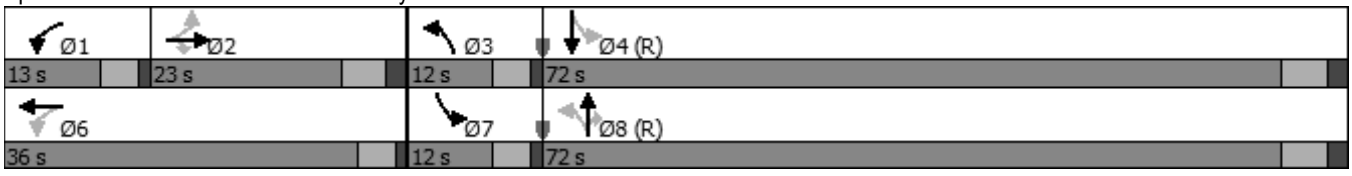
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	83	66	3	55	270	142	5	164
Future Volume (vph)	7	83	66	3	55	270	142	5	164
Turn Type	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	2		1	6	3	8		7	4
Permitted Phases		2	6		8		8	4	
Detector Phase	2	2	1	6	3	8	8	7	4
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	22.5	9.5	24.0	24.0	9.5	24.0
Total Split (s)	23.0	23.0	13.0	36.0	12.0	72.0	72.0	12.0	72.0
Total Split (%)	19.2%	19.2%	10.8%	30.0%	10.0%	60.0%	60.0%	10.0%	60.0%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	8.1	8.1	20.0	20.0	90.5	87.5	87.5	86.5	80.5
Actuated g/C Ratio	0.07	0.07	0.17	0.17	0.75	0.73	0.73	0.72	0.67
v/c Ratio	0.06	0.44	0.34	0.04	0.07	0.11	0.13	0.01	0.08
Control Delay	50.1	12.4	44.8	23.6	3.4	4.3	0.5	3.6	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	12.4	44.8	23.6	3.4	4.3	0.5	3.6	4.8
LOS	D	B	D	C	A	A	A	A	A
Approach Delay	15.5			42.2		3.1			4.8
Approach LOS	B			D		A			A

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 50.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	8	90	72	10	60	293	154	5	179
v/c Ratio	0.06	0.44	0.34	0.04	0.07	0.11	0.13	0.01	0.08
Control Delay	50.1	12.4	44.8	23.6	3.4	4.3	0.5	3.6	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	12.4	44.8	23.6	3.4	4.3	0.5	3.6	4.8
Queue Length 50th (ft)	6	0	49	2	6	17	0	0	11
Queue Length 95th (ft)	21	34	82	16	19	48	2	3	20
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	263	314	218	442	891	2579	1167	824	2372
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.29	0.33	0.02	0.07	0.11	0.13	0.01	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	7	83	66	3	6	55	270	142	5	164	1
Future Volume (veh/h)	0	7	83	66	3	6	55	270	142	5	164	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	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	0	8	90	72	3	7	60	293	154	5	178	1
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	0	143	120	240	81	188	877	2466	1098	697	2407	14
Arrive On Green	0.00	0.08	0.08	0.05	0.16	0.16	0.04	0.69	0.69	0.00	0.22	0.22
Sat Flow, veh/h	0	1870	1573	1781	497	1160	1781	3554	1583	1781	3623	20
Grp Volume(v), veh/h	0	8	90	72	0	10	60	293	154	5	87	92
Grp Sat Flow(s),veh/h/ln	0	1870	1573	1781	0	1657	1781	1777	1583	1781	1777	1867
Q Serve(g_s), s	0.0	0.5	6.7	4.3	0.0	0.6	1.2	3.3	4.0	0.1	4.7	4.7
Cycle Q Clear(g_c), s	0.0	0.5	6.7	4.3	0.0	0.6	1.2	3.3	4.0	0.1	4.7	4.7
Prop In Lane	0.00		1.00	1.00		0.70	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	0	143	120	240	0	269	877	2466	1098	697	1180	1240
V/C Ratio(X)	0.00	0.06	0.75	0.30	0.00	0.04	0.07	0.12	0.14	0.01	0.07	0.07
Avail Cap(c_a), veh/h	0	265	223	280	0	435	924	2466	1098	797	1180	1240
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.00	1.00	1.00	1.00	0.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	51.4	54.3	46.1	0.0	42.4	5.4	6.1	6.2	6.6	17.6	17.6
Incr Delay (d2), s/veh	0.0	0.2	8.9	0.7	0.0	0.1	0.0	0.1	0.3	0.0	0.1	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(50%),veh/ln	0.0	0.2	2.9	2.0	0.0	0.3	0.4	1.2	1.3	0.0	1.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	51.6	63.2	46.8	0.0	42.4	5.4	6.2	6.5	6.6	17.7	17.7
LnGrp LOS	A	D	E	D	A	D	A	A	A	A	B	B
Approach Vol, veh/h		98			82			507			184	
Approach Delay, s/veh		62.2			46.3			6.2			17.4	
Approach LOS		E			D			A			B	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	10.3	15.2	8.8	85.7		25.5	5.3	89.3				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	8.5	17.0	7.5	66.0		* 32	7.5	66.0				
Max Q Clear Time (g_c+I1), s	6.3	8.7	3.2	6.7		2.6	2.1	6.0				
Green Ext Time (p_c), s	0.0	0.1	0.0	1.0		0.0	0.0	2.5				

Intersection Summary	
HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

Notes

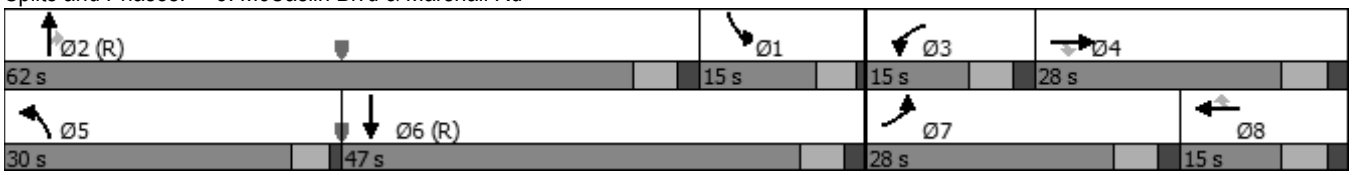
User approved pedestrian interval to be less than phase max green.

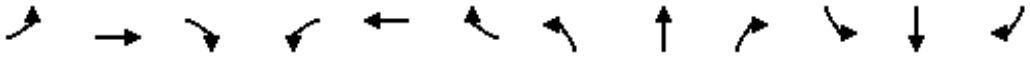
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	16	49	28	17	57	175	718	66	84	408	275
Future Volume (vph)	286	16	49	28	17	57	175	718	66	84	408	275
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	9.5	11.0	11.0	9.5	11.0	
Total Split (s)	28.0	28.0	28.0	15.0	15.0	15.0	30.0	62.0	62.0	15.0	47.0	
Total Split (%)	23.3%	23.3%	23.3%	12.5%	12.5%	12.5%	25.0%	51.7%	51.7%	12.5%	39.2%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	18.9	18.9	28.4	7.4	14.4	14.4	12.0	56.0	56.0	10.5	54.5	120.0
Actuated g/C Ratio	0.16	0.16	0.24	0.06	0.12	0.12	0.10	0.47	0.47	0.09	0.45	1.00
v/c Ratio	0.43	0.43	0.10	0.28	0.08	0.16	0.56	0.33	0.09	0.30	0.19	0.19
Control Delay	54.3	58.1	0.8	59.7	47.2	0.9	57.4	20.6	0.2	54.2	20.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	58.1	0.8	59.7	47.2	0.9	57.4	20.6	0.2	54.2	20.2	0.3
LOS	D	E	A	E	D	A	E	C	A	D	C	A
Approach Delay		48.0			24.5			25.9			16.8	
Approach LOS		D			C			C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 64 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 26.2	Intersection LOS: C
Intersection Capacity Utilization 59.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: McCaslin Blvd & Marshall Rd





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	218	110	53	30	18	62	190	780	72	91	443	299
v/c Ratio	0.43	0.43	0.10	0.28	0.08	0.16	0.56	0.33	0.09	0.30	0.19	0.19
Control Delay	54.3	58.1	0.8	59.7	47.2	0.9	57.4	20.6	0.2	54.2	20.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	58.1	0.8	59.7	47.2	0.9	57.4	20.6	0.2	54.2	20.2	0.3
Queue Length 50th (ft)	96	96	0	23	12	0	73	135	0	34	73	0
Queue Length 95th (ft)	138	161	1	54	36	0	109	167	0	61	102	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	671	256	505	132	234	399	729	2373	831	300	2310	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.43	0.10	0.23	0.08	0.16	0.26	0.33	0.09	0.30	0.19	0.19

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	16	49	28	17	57	175	718	66	84	408	275
Future Volume (veh/h)	286	16	49	28	17	57	175	718	66	84	408	275
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	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	323	0	53	30	18	62	190	780	0	91	443	0
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	447	0	164	47	88	73	259	2383		701	3100	
Arrive On Green	0.08	0.00	0.10	0.03	0.05	0.05	0.07	0.47	0.00	0.20	0.61	0.00
Sat Flow, veh/h	5344	0	1571	1781	1870	1555	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	323	0	53	30	18	62	190	780	0	91	443	0
Grp Sat Flow(s),veh/h/ln	1781	0	1571	1781	1870	1555	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	7.1	0.0	3.8	2.0	1.1	3.2	6.5	11.5	0.0	2.6	4.5	0.0
Cycle Q Clear(g_c), s	7.1	0.0	3.8	2.0	1.1	3.2	6.5	11.5	0.0	2.6	4.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	0	164	47	88	73	259	2383		701	3100	
V/C Ratio(X)	0.72	0.00	0.32	0.64	0.20	0.85	0.73	0.33		0.13	0.14	
Avail Cap(c_a), veh/h	980	0	288	134	140	117	734	2383		701	3100	
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)	0.98	0.00	0.98	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	53.6	0.0	49.8	57.9	55.0	26.4	54.3	20.1	0.0	39.2	10.1	0.0
Incr Delay (d2), s/veh	2.2	0.0	1.1	13.6	1.1	26.5	4.0	0.4	0.0	0.1	0.1	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(50%),veh/ln	3.2	0.0	1.5	1.1	0.5	2.4	3.0	4.6	0.0	1.1	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	0.0	50.9	71.4	56.2	52.9	58.3	20.5	0.0	39.2	10.2	0.0
LnGrp LOS	E	A	D	E	E	D	E	C		D	B	
Approach Vol, veh/h		376			110			970	A		534	A
Approach Delay, s/veh		55.1			58.5			27.9			15.2	
Approach LOS		E			E			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.3	62.0	9.2	18.5	13.5	78.8	16.0	11.6
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.5	* 56	9.0	22.0	25.5	41.0	22.0	9.0
Max Q Clear Time (g_c+I1), s	4.6	13.5	4.0	5.8	8.5	6.5	9.1	5.2
Green Ext Time (p_c), s	0.1	6.5	0.0	0.1	0.5	3.3	1.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

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

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	7	8	1	1	0	8	7	6	0	6	5
Future Vol, veh/h	5	7	8	1	1	0	8	7	6	0	6	5
Peak Hour Factor	0.83	0.83	0.83	0.25	0.25	0.25	0.88	0.88	0.88	0.69	0.69	0.69
Heavy Vehicles, %	10	10	10	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	8	10	4	4	0	9	8	7	0	9	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

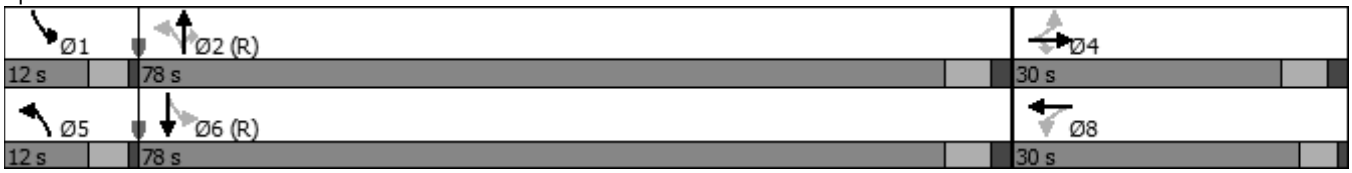
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.1	7.1	7	6.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	38%	25%	50%	0%
Vol Thru, %	33%	35%	50%	55%
Vol Right, %	29%	40%	0%	45%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	21	20	2	11
LT Vol	8	5	1	0
Through Vol	7	7	1	6
RT Vol	6	8	0	5
Lane Flow Rate	24	24	8	16
Geometry Grp	1	1	1	1
Degree of Util (X)	0.026	0.026	0.009	0.016
Departure Headway (Hd)	3.871	3.954	4.086	3.7
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	927	907	877	968
Service Time	1.887	1.97	2.104	1.718
HCM Lane V/C Ratio	0.026	0.026	0.009	0.017
HCM Control Delay	7	7.1	7.1	6.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	16	178	22	19	213	315	13	27	514
Future Volume (vph)	1	16	178	22	19	213	315	13	27	514
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Detector Phase	4	4	4	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Ped	Ped	Ped	Ped	Ped	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		24.0	24.0		25.5	83.5	77.5	77.5	79.6	72.0
Actuated g/C Ratio		0.20	0.20		0.21	0.70	0.65	0.65	0.66	0.60
v/c Ratio		0.05	0.41		0.11	0.40	0.15	0.01	0.04	0.27
Control Delay		39.4	8.5		26.1	8.5	5.0	0.0	5.3	11.8
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		39.4	8.5		26.1	8.5	5.0	0.0	5.3	11.8
LOS		D	A		C	A	A	A	A	B
Approach Delay		11.1			26.1		6.3			11.5
Approach LOS		B			C		A			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 81.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	193	71	232	342	14	29	567
v/c Ratio	0.05	0.41	0.11	0.40	0.15	0.01	0.04	0.27
Control Delay	39.4	8.5	26.1	8.5	5.0	0.0	5.3	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	8.5	26.1	8.5	5.0	0.0	5.3	11.8
Queue Length 50th (ft)	11	0	14	28	26	0	6	103
Queue Length 95th (ft)	32	62	35	86	32	0	14	134
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	369	471	642	578	2285	1011	728	2119
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.41	0.11	0.40	0.15	0.01	0.04	0.27

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	16	178	22	19	24	213	315	13	27	514	7
Future Volume (veh/h)	1	16	178	22	19	24	213	315	13	27	514	7
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		0.99	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	1	17	193	24	21	26	232	342	14	29	559	8
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	35	264	226	161	130	171	670	2463	1093	779	2361	34
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.12	1.00	1.00	0.03	0.66	0.66
Sat Flow, veh/h	24	1838	1578	785	903	1192	1781	3554	1577	1781	3586	51
Grp Volume(v), veh/h	18	0	193	39	0	32	232	342	14	29	277	290
Grp Sat Flow(s),veh/h/ln	1861	0	1578	1398	0	1482	1781	1777	1577	1781	1777	1861
Q Serve(g_s), s	0.0	0.0	14.3	1.3	0.0	2.3	5.3	0.0	0.0	0.6	7.6	7.6
Cycle Q Clear(g_c), s	1.0	0.0	14.3	2.5	0.0	2.3	5.3	0.0	0.0	0.6	7.6	7.6
Prop In Lane	0.06		1.00	0.62		0.80	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	299	0	226	249	0	213	670	2463	1093	779	1170	1225
V/C Ratio(X)	0.06	0.00	0.85	0.16	0.00	0.15	0.35	0.14	0.01	0.04	0.24	0.24
Avail Cap(c_a), veh/h	402	0	316	343	0	315	673	2463	1093	844	1170	1225
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	0.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	0.0	50.2	45.0	0.0	45.0	5.1	0.0	0.0	6.1	8.3	8.3
Incr Delay (d2), s/veh	0.1	0.0	14.7	0.3	0.0	0.3	0.3	0.1	0.0	0.0	0.5	0.5
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(50%),veh/ln	0.5	0.0	6.6	1.0	0.0	0.9	1.5	0.0	0.0	0.2	2.9	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.5	0.0	64.8	45.3	0.0	45.3	5.4	0.1	0.0	6.1	8.8	8.8
LnGrp LOS	D	A	E	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		211			71			588			596	
Approach Delay, s/veh		63.1			45.3			2.2			8.6	
Approach LOS		E			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	89.2		23.2	11.8	85.0		23.2				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.6	2.0		16.3	7.3	9.6		4.5				
Green Ext Time (p_c), s	0.0	2.4		0.4	0.0	3.7		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		15.7	
HCM 6th LOS		B	

Notes

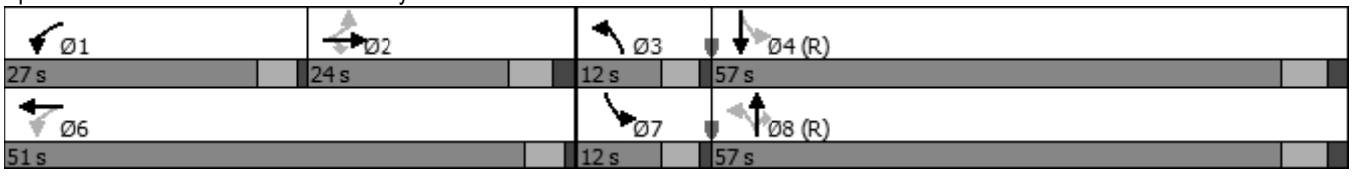
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	3	13	228	256	26	174	383	184	24	728
Future Volume (vph)	3	13	228	256	26	174	383	184	24	728
Turn Type	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2		1	6	3	8		7	4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	2	2	2	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	11.0	9.5	9.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	24.0	24.0	24.0	27.0	51.0	12.0	57.0	57.0	12.0	57.0
Total Split (%)	20.0%	20.0%	20.0%	22.5%	42.5%	10.0%	47.5%	47.5%	10.0%	47.5%
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		9.1	9.1	35.3	35.3	74.8	67.5	67.5	68.1	60.3
Actuated g/C Ratio		0.08	0.08	0.29	0.29	0.62	0.56	0.56	0.57	0.50
v/c Ratio		0.13	0.72	0.66	0.09	0.47	0.21	0.21	0.05	0.45
Control Delay		50.9	18.3	42.4	18.3	21.3	22.0	9.5	9.2	15.9
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		50.9	18.3	42.4	18.3	21.3	22.0	9.5	9.2	15.9
LOS		D	B	D	B	C	C	A	A	B
Approach Delay		20.4			38.8		18.7			15.7
Approach LOS		C			D		B			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 67.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	17	248	278	48	189	416	200	26	793
v/c Ratio	0.13	0.72	0.66	0.09	0.47	0.21	0.21	0.05	0.45
Control Delay	50.9	18.3	42.4	18.3	21.3	22.0	9.5	9.2	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	18.3	42.4	18.3	21.3	22.0	9.5	9.2	15.9
Queue Length 50th (ft)	13	1	182	16	78	105	1	5	108
Queue Length 95th (ft)	34	76	231	39	146	170	70	m17	311
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	262	443	435	684	404	1989	952	595	1777
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.56	0.64	0.07	0.47	0.21	0.21	0.04	0.45

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	13	228	256	26	18	174	383	184	24	728	2
Future Volume (veh/h)	3	13	228	256	26	18	174	383	184	24	728	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		1.00	1.00		0.99	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	3	14	248	278	28	20	189	416	200	26	791	2
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	62	244	235	480	339	242	410	1791	794	456	1693	4
Arrive On Green	0.15	0.15	0.15	0.15	0.33	0.33	0.06	0.50	0.50	0.03	0.62	0.62
Sat Flow, veh/h	177	1625	1569	1781	1013	723	1781	3554	1576	1781	3636	9
Grp Volume(v), veh/h	17	0	248	278	0	48	189	416	200	26	387	406
Grp Sat Flow(s),veh/h/ln	1801	0	1569	1781	0	1736	1781	1777	1576	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	18.0	15.2	0.0	2.3	6.5	7.9	8.7	0.9	14.0	14.0
Cycle Q Clear(g_c), s	0.9	0.0	18.0	15.2	0.0	2.3	6.5	7.9	8.7	0.9	14.0	14.0
Prop In Lane	0.18		1.00	1.00		0.42	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	305	0	235	480	0	581	410	1791	794	456	827	870
V/C Ratio(X)	0.06	0.00	1.05	0.58	0.00	0.08	0.46	0.23	0.25	0.06	0.47	0.47
Avail Cap(c_a), veh/h	305	0	235	552	0	673	410	1791	794	524	827	870
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.92	0.92	0.92	0.96	0.96	0.96
Uniform Delay (d), s/veh	43.7	0.0	51.0	33.6	0.0	27.3	15.4	16.7	16.9	15.8	14.9	14.9
Incr Delay (d2), s/veh	0.1	0.0	73.5	1.1	0.0	0.1	0.7	0.3	0.7	0.0	1.8	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(50%),veh/ln	0.4	0.0	11.8	6.7	0.0	1.0	2.6	3.2	3.2	0.4	5.2	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.8	0.0	124.5	34.7	0.0	27.4	16.1	17.0	17.6	15.8	16.7	16.6
LnGrp LOS	D	A	F	C	A	C	B	B	B	B	B	B
Approach Vol, veh/h		265			326			805			819	
Approach Delay, s/veh		119.3			33.6			16.9			16.6	
Approach LOS		F			C			B			B	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	22.1	24.0	12.0	61.9		46.1	7.4	66.5				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	22.5	18.0	7.5	51.0		* 47	7.5	51.0				
Max Q Clear Time (g_c+I1), s	17.2	20.0	8.5	16.0		4.3	2.9	10.7				
Green Ext Time (p_c), s	0.4	0.0	0.0	5.4		0.2	0.0	3.6				

Intersection Summary		
HCM 6th Ctrl Delay		31.5
HCM 6th LOS		C

Notes

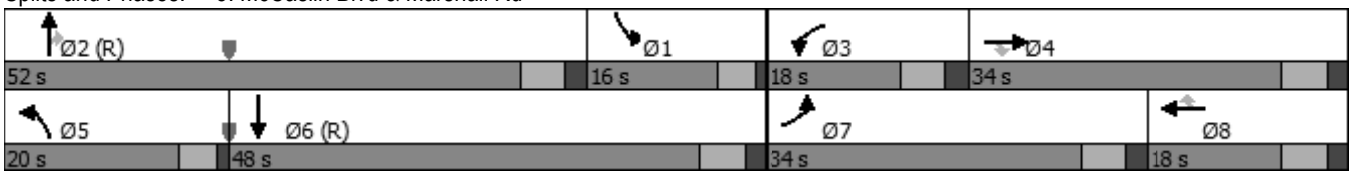
User approved pedestrian interval to be less than phase max green.

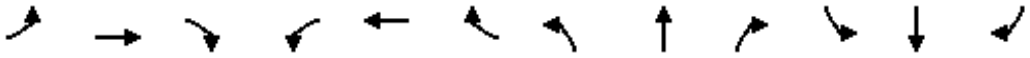
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	791	44	410	70	42	38	168	511	45	81	886	531
Future Volume (vph)	791	44	410	70	42	38	168	511	45	81	886	531
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	9.5	11.0	11.0	9.5	11.0	
Total Split (s)	34.0	34.0	34.0	18.0	18.0	18.0	20.0	52.0	52.0	16.0	48.0	
Total Split (%)	28.3%	28.3%	28.3%	15.0%	15.0%	15.0%	16.7%	43.3%	43.3%	13.3%	40.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	30.9	30.9	32.5	9.9	11.4	11.4	11.7	46.0	46.0	11.5	45.8	120.0
Actuated g/C Ratio	0.26	0.26	0.27	0.08	0.10	0.10	0.10	0.38	0.38	0.10	0.38	1.00
v/c Ratio	0.73	0.73	0.65	0.52	0.26	0.11	0.55	0.28	0.07	0.27	0.50	0.36
Control Delay	57.9	63.7	11.8	65.0	53.7	0.7	57.5	26.1	0.2	52.7	29.7	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	63.7	11.8	65.0	53.7	0.7	57.5	26.1	0.2	52.7	29.7	0.7
LOS	E	E	B	E	D	A	E	C	A	D	C	A
Approach Delay		44.0			45.6			31.8			20.7	
Approach LOS		D			D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 64 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 69.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: McCaslin Blvd & Marshall Rd





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	602	306	446	76	46	41	183	555	49	88	963	577
v/c Ratio	0.73	0.73	0.65	0.52	0.26	0.11	0.55	0.28	0.07	0.27	0.50	0.36
Control Delay	57.9	63.7	11.8	65.0	53.7	0.7	57.5	26.1	0.2	52.7	29.7	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	63.7	11.8	65.0	53.7	0.7	57.5	26.1	0.2	52.7	29.7	0.7
Queue Length 50th (ft)	235	239	28	57	33	0	70	107	0	32	206	0
Queue Length 95th (ft)	336	#416	131	108	72	0	106	138	0	59	260	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	848	419	683	177	196	371	443	1949	716	328	1940	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.73	0.65	0.43	0.23	0.11	0.41	0.28	0.07	0.27	0.50	0.36

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	791	44	410	70	42	38	168	511	45	81	886	531
Future Volume (veh/h)	791	44	410	70	42	38	168	511	45	81	886	531
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	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	894	0	446	76	46	41	183	555	0	88	963	0
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	1047	0	367	97	172	143	246	1957		445	2316	
Arrive On Green	0.20	0.00	0.23	0.05	0.09	0.09	0.07	0.38	0.00	0.13	0.45	0.00
Sat Flow, veh/h	5344	0	1575	1781	1870	1559	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	894	0	446	76	46	41	183	555	0	88	963	0
Grp Sat Flow(s),veh/h/ln	1781	0	1575	1781	1870	1559	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	19.4	0.0	28.0	5.1	2.7	2.2	6.2	9.0	0.0	2.7	15.2	0.0
Cycle Q Clear(g_c), s	19.4	0.0	28.0	5.1	2.7	2.2	6.2	9.0	0.0	2.7	15.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1047	0	367	97	172	143	246	1957		445	2316	
V/C Ratio(X)	0.85	0.00	1.21	0.78	0.27	0.29	0.74	0.28		0.20	0.42	
Avail Cap(c_a), veh/h	1247	0	367	178	187	156	446	1957		445	2316	
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)	0.82	0.00	0.82	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.6	0.0	46.0	56.0	50.7	28.4	54.7	25.6	0.0	46.7	22.1	0.0
Incr Delay (d2), s/veh	4.3	0.0	115.2	12.7	0.8	1.1	4.4	0.4	0.0	0.2	0.6	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(50%),veh/ln	8.9	0.0	22.5	2.6	1.3	1.2	2.9	3.7	0.0	1.2	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.9	0.0	161.2	68.7	51.5	29.5	59.1	26.0	0.0	46.9	22.6	0.0
LnGrp LOS	D	A	F	E	D	C	E	C		D	C	
Approach Vol, veh/h		1340			163			738	A		1051	A
Approach Delay, s/veh		87.6			54.0			34.2			24.7	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.5	52.0	12.5	34.0	13.0	60.4	29.5	17.0
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	11.5	* 46	12.0	28.0	15.5	42.0	28.0	12.0
Max Q Clear Time (g_c+I1), s	4.7	11.0	7.1	30.0	8.2	17.2	21.4	4.7
Green Ext Time (p_c), s	0.1	4.3	0.1	0.0	0.3	7.5	2.1	0.1

Intersection Summary	
HCM 6th Ctrl Delay	53.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

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

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	4	19	1	5	0	22	15	3	1	12	23
Future Vol, veh/h	15	4	19	1	5	0	22	15	3	1	12	23
Peak Hour Factor	0.73	0.73	0.73	0.50	0.50	0.50	0.67	0.67	0.67	0.75	0.75	0.75
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	21	5	26	2	10	0	33	22	4	1	16	31
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

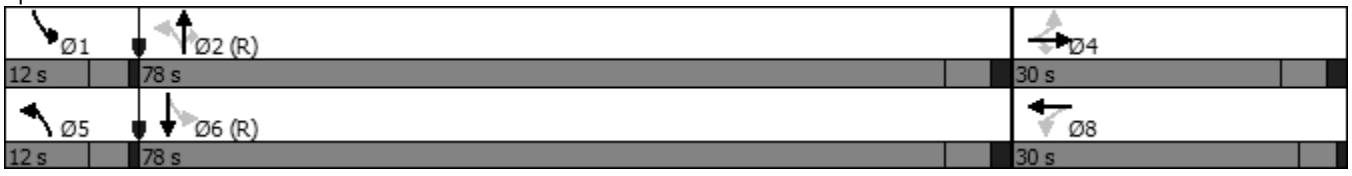
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.3	7.4	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	55%	39%	17%	3%
Vol Thru, %	38%	11%	83%	33%
Vol Right, %	7%	50%	0%	64%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	38	6	36
LT Vol	22	15	1	1
Through Vol	15	4	5	12
RT Vol	3	19	0	23
Lane Flow Rate	60	52	12	48
Geometry Grp	1	1	1	1
Degree of Util (X)	0.068	0.056	0.014	0.049
Departure Headway (Hd)	4.113	3.875	4.16	3.678
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	870	920	855	969
Service Time	2.144	1.918	2.21	1.717
HCM Lane V/C Ratio	0.069	0.057	0.014	0.05
HCM Control Delay	7.4	7.2	7.3	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0	0.2

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	16	13	1	44	241	17	13	154
Future Volume (vph)	2	16	13	1	44	241	17	13	154
Turn Type	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	4			8	5	2		1	6
Permitted Phases		4	8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	Ped	Ped	Ped	Ped	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	24.0	24.0		25.5	84.1	79.8	79.8	81.2	75.1
Actuated g/C Ratio	0.20	0.20		0.21	0.70	0.66	0.66	0.68	0.63
v/c Ratio	0.01	0.05		0.04	0.06	0.11	0.02	0.02	0.08
Control Delay	38.5	0.2		26.7	3.3	5.0	0.1	5.2	9.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	0.2		26.7	3.3	5.0	0.1	5.2	9.6
LOS	D	A		C	A	A	A	A	A
Approach Delay	4.3			26.7		4.5			9.2
Approach LOS	A			C		A			A

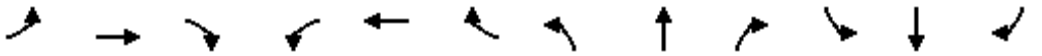
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.11	
Intersection Signal Delay: 7.0	Intersection LOS: A
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	2	17	25	48	262	18	14	167
v/c Ratio	0.01	0.05	0.04	0.06	0.11	0.02	0.02	0.08
Control Delay	38.5	0.2	26.7	3.3	5.0	0.1	5.2	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	0.2	26.7	3.3	5.0	0.1	5.2	9.6
Queue Length 50th (ft)	1	0	4	4	14	0	3	26
Queue Length 95th (ft)	9	0	17	9	25	0	9	42
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	372	367	622	850	2352	1045	794	2213
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.04	0.06	0.11	0.02	0.02	0.08

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	16	13	1	9	44	241	17	13	154	0
Future Volume (veh/h)	0	2	16	13	1	9	44	241	17	13	154	0
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	0	2	17	14	1	10	48	262	18	14	167	0
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	0	129	109	147	9	99	1030	2764	1230	922	2701	0
Arrive On Green	0.00	0.07	0.07	0.07	0.07	0.07	0.07	1.00	1.00	0.02	0.76	0.00
Sat Flow, veh/h	0	1870	1579	1295	125	1437	1781	3554	1581	1781	3647	0
Grp Volume(v), veh/h	0	2	17	15	0	10	48	262	18	14	167	0
Grp Sat Flow(s),veh/h/ln	0	1870	1579	1420	0	1437	1781	1777	1581	1781	1777	0
Q Serve(g_s), s	0.0	0.1	1.2	1.0	0.0	0.8	0.7	0.0	0.0	0.2	1.4	0.0
Cycle Q Clear(g_c), s	0.0	0.1	1.2	1.2	0.0	0.8	0.7	0.0	0.0	0.2	1.4	0.0
Prop In Lane	0.00		1.00	0.93		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	129	109	156	0	99	1030	2764	1230	922	2701	0
V/C Ratio(X)	0.00	0.02	0.16	0.10	0.00	0.10	0.05	0.09	0.01	0.02	0.06	0.00
Avail Cap(c_a), veh/h	0	374	316	359	0	305	1082	2764	1230	1005	2701	0
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)	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	52.1	52.6	52.5	0.0	52.4	2.5	0.0	0.0	3.0	3.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.7	0.3	0.0	0.4	0.0	0.1	0.0	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(50%),veh/ln	0.0	0.1	0.5	0.4	0.0	0.3	0.2	0.0	0.0	0.1	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	52.1	53.2	52.8	0.0	52.8	2.6	0.1	0.0	3.0	3.7	0.0
LnGrp LOS	A	D	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		19			25			328			181	
Approach Delay, s/veh		53.1			52.8			0.4			3.6	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	99.3		14.3	8.5	97.2		14.3				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.2	2.0		3.2	2.7	3.4		3.2				
Green Ext Time (p_c), s	0.0	1.9		0.0	0.0	1.1		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	5.7
HCM 6th LOS	A

Notes

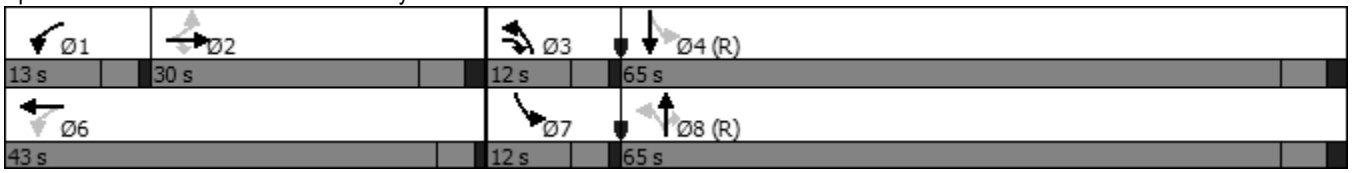
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	9	10	188	73	4	92	298	157	6	181
Future Volume (vph)	9	10	188	73	4	92	298	157	6	181
Turn Type	Perm	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	3	1	6	3	8		7	4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	2	2	3	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	9.5	22.5	9.5	24.0	24.0	9.5	24.0
Total Split (s)	30.0	30.0	12.0	13.0	43.0	12.0	65.0	65.0	12.0	65.0
Total Split (%)	25.0%	25.0%	10.0%	10.8%	35.8%	10.0%	54.2%	54.2%	10.0%	54.2%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	4.5	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.0	15.5	19.5	19.2	93.1	91.3	91.3	88.1	80.9
Actuated g/C Ratio		0.08	0.13	0.16	0.16	0.78	0.76	0.76	0.73	0.67
v/c Ratio		0.16	0.54	0.38	0.04	0.11	0.12	0.14	0.01	0.08
Control Delay		50.0	10.0	45.2	21.3	5.9	7.2	2.2	5.2	6.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		50.0	10.0	45.2	21.3	5.9	7.2	2.2	5.2	6.4
LOS		D	B	D	C	A	A	A	A	A
Approach Delay		13.8			42.0		5.5			6.4
Approach LOS		B			D		A			A

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 50.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	21	204	79	12	100	324	171	7	201
v/c Ratio	0.16	0.54	0.38	0.04	0.11	0.12	0.14	0.01	0.08
Control Delay	50.0	10.0	45.2	21.3	5.9	7.2	2.2	5.2	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	10.0	45.2	21.3	5.9	7.2	2.2	5.2	6.4
Queue Length 50th (ft)	16	0	53	3	18	33	0	1	16
Queue Length 95th (ft)	36	54	82	17	55	97	35	4	29
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	313	388	213	543	896	2693	1216	819	2378
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.53	0.37	0.02	0.11	0.12	0.14	0.01	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	10	188	73	4	7	92	298	157	6	181	4
Future Volume (veh/h)	9	10	188	73	4	7	92	298	157	6	181	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	10	11	204	79	4	8	100	324	171	7	197	4
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	142	141	293	306	129	258	775	2209	984	602	2102	43
Arrive On Green	0.15	0.15	0.15	0.05	0.23	0.23	0.04	0.62	0.62	0.00	0.19	0.19
Sat Flow, veh/h	670	973	1578	1781	556	1111	1781	3554	1583	1781	3562	72
Grp Volume(v), veh/h	21	0	204	79	0	12	100	324	171	7	98	103
Grp Sat Flow(s),veh/h/ln	1643	0	1578	1781	0	1667	1781	1777	1583	1781	1777	1857
Q Serve(g_s), s	0.0	0.0	14.5	4.4	0.0	0.7	2.6	4.6	5.5	0.2	5.4	5.5
Cycle Q Clear(g_c), s	1.2	0.0	14.5	4.4	0.0	0.7	2.6	4.6	5.5	0.2	5.4	5.5
Prop In Lane	0.48		1.00	1.00		0.67	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	283	0	293	306	0	387	775	2209	984	602	1048	1096
V/C Ratio(X)	0.07	0.00	0.70	0.26	0.00	0.03	0.13	0.15	0.17	0.01	0.09	0.09
Avail Cap(c_a), veh/h	371	0	379	344	0	535	814	2209	984	697	1048	1096
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	0.0	45.7	39.1	0.0	35.6	8.4	9.5	9.6	9.8	22.0	22.0
Incr Delay (d2), s/veh	0.1	0.0	3.8	0.4	0.0	0.0	0.1	0.1	0.4	0.0	0.2	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(50%),veh/ln	0.6	0.0	5.9	2.0	0.0	0.3	0.9	1.7	1.9	0.1	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.5	0.0	49.5	39.5	0.0	35.7	8.5	9.6	10.0	9.8	22.2	22.2
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	C	C
Approach Vol, veh/h		225			91			595			208	
Approach Delay, s/veh		49.1			39.0			9.5			21.8	
Approach LOS		D			D			A			C	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	10.5	23.4	9.3	76.8		33.9	5.5	80.6				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	8.5	24.0	7.5	59.0		* 39	7.5	59.0				
Max Q Clear Time (g_c+I1), s	6.4	16.5	4.6	7.5		2.7	2.2	7.5				
Green Ext Time (p_c), s	0.0	0.4	0.1	1.2		0.0	0.0	2.8				

Intersection Summary	
HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C

Notes

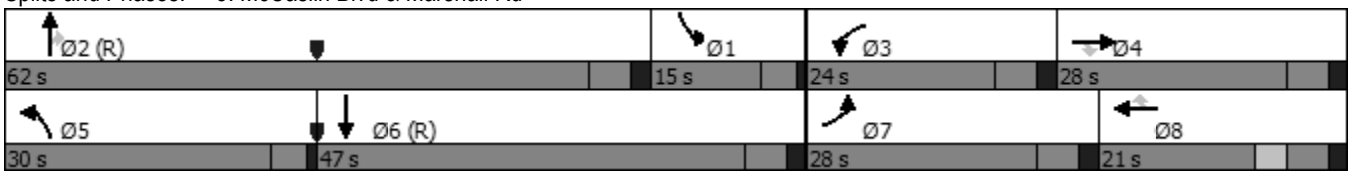
User approved pedestrian interval to be less than phase max green.

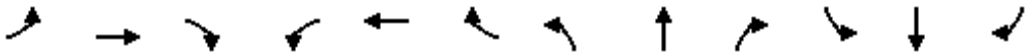
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	403	19	62	31	19	63	195	792	73	93	450	331
Future Volume (vph)	403	19	62	31	19	63	195	792	73	93	450	331
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	24.0	21.0	21.0	24.0	21.0	21.0	9.5	11.0	11.0	9.5	11.0	
Total Split (s)	28.0	28.0	28.0	24.0	21.0	21.0	30.0	62.0	62.0	15.0	47.0	
Total Split (%)	21.7%	21.7%	21.7%	18.6%	16.3%	16.3%	23.3%	48.1%	48.1%	11.6%	36.4%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	17.5	17.5	36.9	8.0	22.5	22.5	13.3	56.0	56.0	10.5	53.2	129.0
Actuated g/C Ratio	0.14	0.14	0.29	0.06	0.17	0.17	0.10	0.43	0.43	0.08	0.41	1.00
v/c Ratio	0.71	0.69	0.12	0.31	0.06	0.17	0.60	0.39	0.11	0.36	0.23	0.23
Control Delay	62.1	69.3	0.4	64.6	47.4	0.9	62.2	25.5	0.9	60.0	25.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.1	69.3	0.4	64.6	47.4	0.9	62.2	25.5	0.9	60.0	25.4	0.3
LOS	E	E	A	E	D	A	E	C	A	E	C	A
Approach Delay		56.3			26.4			30.6			19.6	
Approach LOS		E			C			C			B	

Intersection Summary	
Cycle Length: 129	
Actuated Cycle Length: 129	
Offset: 64 (50%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 31.5	Intersection LOS: C
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

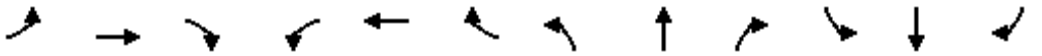
Splits and Phases: 3: McCaslin Blvd & Marshall Rd





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	307	152	67	34	21	68	212	861	79	101	489	360
v/c Ratio	0.71	0.69	0.12	0.31	0.06	0.17	0.60	0.39	0.11	0.36	0.23	0.23
Control Delay	62.1	69.3	0.4	64.6	47.4	0.9	62.2	25.5	0.9	60.0	25.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.1	69.3	0.4	64.6	47.4	0.9	62.2	25.5	0.9	60.0	25.4	0.3
Queue Length 50th (ft)	136	135	0	28	15	0	88	176	0	41	95	0
Queue Length 95th (ft)	182	209	0	63	41	0	126	213	6	71	130	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	549	220	564	246	325	408	678	2207	750	279	2097	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.69	0.12	0.14	0.06	0.17	0.31	0.39	0.11	0.36	0.23	0.23

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	403	19	62	31	19	63	195	792	73	93	450	331
Future Volume (veh/h)	403	19	62	31	19	63	195	792	73	93	450	331
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		0.99	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	453	0	67	34	21	68	212	861	0	101	489	0
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	575	0	310	49	217	183	277	2217		539	2663	
Arrive On Green	0.11	0.00	0.20	0.03	0.12	0.12	0.08	0.43	0.00	0.16	0.52	0.00
Sat Flow, veh/h	5344	0	1578	1781	1870	1573	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	453	0	67	34	21	68	212	861	0	101	489	0
Grp Sat Flow(s),veh/h/ln	1781	0	1578	1781	1870	1573	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	10.7	0.0	4.6	2.4	1.3	3.7	7.8	14.8	0.0	3.3	6.5	0.0
Cycle Q Clear(g_c), s	10.7	0.0	4.6	2.4	1.3	3.7	7.8	14.8	0.0	3.3	6.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	575	0	310	49	217	183	277	2217		539	2663	
V/C Ratio(X)	0.79	0.00	0.22	0.70	0.10	0.37	0.76	0.39		0.19	0.18	
Avail Cap(c_a), veh/h	911	0	310	249	217	183	683	2217		539	2663	
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)	0.96	0.00	0.96	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.1	0.0	43.5	62.2	51.0	27.2	58.1	24.8	0.0	47.3	16.3	0.0
Incr Delay (d2), s/veh	2.4	0.0	0.3	16.6	0.2	1.3	4.4	0.5	0.0	0.2	0.2	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(50%),veh/ln	4.9	0.0	1.8	1.3	0.6	2.1	3.6	6.1	0.0	1.4	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.5	0.0	43.8	78.8	51.1	28.4	62.5	25.4	0.0	47.5	16.5	0.0
LnGrp LOS	E	A	D	E	D	C	E	C		D	B	
Approach Vol, veh/h		520			123			1073			590	
Approach Delay, s/veh		56.6			46.2			32.7			21.8	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.1	62.0	9.5	31.3	14.9	73.3	19.9	21.0
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.5	* 56	18.0	22.0	25.5	41.0	22.0	15.0
Max Q Clear Time (g_c+I1), s	5.3	16.8	4.4	6.6	9.8	8.5	12.7	5.7
Green Ext Time (p_c), s	0.1	7.3	0.0	0.1	0.6	3.7	1.2	0.1

Intersection Summary	
HCM 6th Ctrl Delay	36.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

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

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	8	9	1	1	0	9	8	7	0	7	6
Future Vol, veh/h	6	8	9	1	1	0	9	8	7	0	7	6
Peak Hour Factor	0.83	0.83	0.83	0.25	0.25	0.25	0.88	0.88	0.88	0.69	0.69	0.69
Heavy Vehicles, %	10	10	10	0	0	0	0	0	0	0	0	0
Mvmt Flow	7	10	11	4	4	0	10	9	8	0	10	9
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

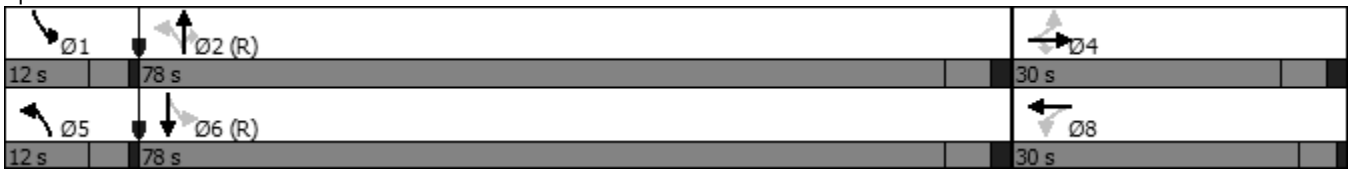
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.1	7.2	7	6.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	38%	26%	50%	0%
Vol Thru, %	33%	35%	50%	54%
Vol Right, %	29%	39%	0%	46%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	23	2	13
LT Vol	9	6	1	0
Through Vol	8	8	1	7
RT Vol	7	9	0	6
Lane Flow Rate	27	28	8	19
Geometry Grp	1	1	1	1
Degree of Util (X)	0.029	0.031	0.009	0.019
Departure Headway (Hd)	3.877	3.973	4.101	3.706
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	925	903	874	967
Service Time	1.894	1.989	2.12	1.726
HCM Lane V/C Ratio	0.029	0.031	0.009	0.02
HCM Control Delay	7	7.1	7.2	6.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	18	198	24	21	235	348	14	30	568
Future Volume (vph)	1	18	198	24	21	235	348	14	30	568
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Detector Phase	4	4	4	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		24.0	24.0		25.5	83.4	77.4	77.4	79.7	72.0
Actuated g/C Ratio		0.20	0.20		0.21	0.70	0.64	0.64	0.66	0.60
v/c Ratio		0.06	0.44		0.12	0.47	0.17	0.01	0.05	0.30
Control Delay		39.5	8.4		26.0	11.1	3.6	0.0	5.4	12.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		39.5	8.4		26.0	11.1	3.6	0.0	5.4	12.1
LOS		D	A		C	B	A	A	A	B
Approach Delay		11.2			26.0		6.5			11.7
Approach LOS		B			C		A			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 82.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr

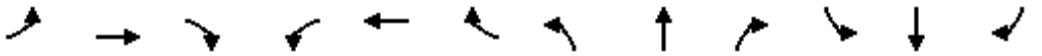


Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	21	215	77	255	378	15	33	626
v/c Ratio	0.06	0.44	0.12	0.47	0.17	0.01	0.05	0.30
Control Delay	39.5	8.4	26.0	11.1	3.6	0.0	5.4	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	8.4	26.0	11.1	3.6	0.0	5.4	12.1
Queue Length 50th (ft)	13	0	16	44	18	0	7	116
Queue Length 95th (ft)	36	65	37	113	25	0	16	150
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	369	488	641	545	2282	1011	707	2119
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.44	0.12	0.47	0.17	0.01	0.05	0.30

Intersection Summary

HCM 6th Signalized Intersection Summary
1: Marshall Rd & Center Dr

08/15/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	18	198	24	21	26	235	348	14	30	568	8
Future Volume (veh/h)	1	18	198	24	21	26	235	348	14	30	568	8
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	1	20	215	26	23	28	255	378	15	33	617	9
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	37	390	336	220	187	247	732	2840	1261	877	2785	41
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.10	1.00	1.00	0.03	0.78	0.78
Sat Flow, veh/h	24	1837	1581	804	880	1163	1781	3554	1578	1781	3585	52
Grp Volume(v), veh/h	21	0	215	41	0	36	255	378	15	33	306	320
Grp Sat Flow(s),veh/h/ln	1861	0	1581	1359	0	1489	1781	1777	1578	1781	1777	1861
Q Serve(g_s), s	0.0	0.0	14.9	1.4	0.0	2.3	3.9	0.0	0.0	0.4	5.6	5.6
Cycle Q Clear(g_c), s	1.1	0.0	14.9	2.5	0.0	2.3	3.9	0.0	0.0	0.4	5.6	5.6
Prop In Lane	0.05		1.00	0.63		0.78	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	427	0	336	338	0	316	732	2840	1261	877	1380	1445
V/C Ratio(X)	0.05	0.00	0.64	0.12	0.00	0.11	0.35	0.13	0.01	0.04	0.22	0.22
Avail Cap(c_a), veh/h	427	0	336	338	0	316	754	2840	1261	939	1380	1445
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	0.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	0.0	43.1	38.1	0.0	38.1	2.2	0.0	0.0	2.3	3.6	3.6
Incr Delay (d2), s/veh	0.2	0.0	9.0	0.7	0.0	0.7	0.3	0.1	0.0	0.0	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(50%),veh/ln	0.5	0.0	6.7	1.1	0.0	0.9	0.8	0.0	0.0	0.1	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	0.0	52.1	38.9	0.0	38.9	2.5	0.1	0.0	2.4	4.0	4.0
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		236			77			648			659	
Approach Delay, s/veh		50.8			38.9			1.0			3.9	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	101.9		31.5	10.5	99.2		31.5				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.4	2.0		16.9	5.9	7.6		4.5				
Green Ext Time (p_c), s	0.0	2.7		0.5	0.1	4.1		0.4				

Intersection Summary		
HCM 6th Ctrl Delay		11.2
HCM 6th LOS		B

Notes

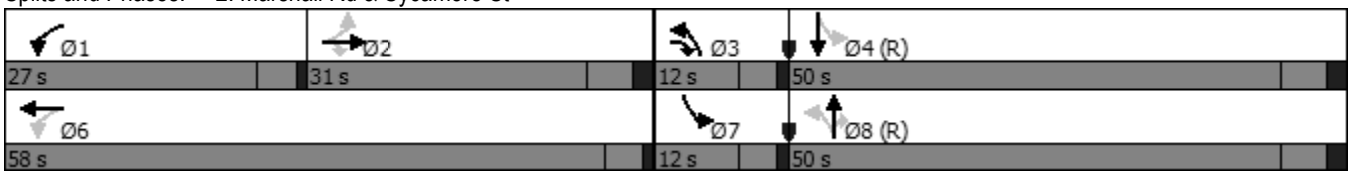
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	3	14	254	282	30	235	423	203	26	803
Future Volume (vph)	3	14	254	282	30	235	423	203	26	803
Turn Type	Perm	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	3	1	6	3	8		7	4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	2	2	3	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	9.5	9.5	9.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	31.0	31.0	12.0	27.0	58.0	12.0	50.0	50.0	12.0	50.0
Total Split (%)	25.8%	25.8%	10.0%	22.5%	48.3%	10.0%	41.7%	41.7%	10.0%	41.7%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	4.5	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.1	25.7	33.0	33.0	77.1	69.8	69.8	62.9	55.1
Actuated g/C Ratio		0.08	0.21	0.28	0.28	0.64	0.58	0.58	0.52	0.46
v/c Ratio		0.12	0.62	0.76	0.11	0.59	0.22	0.22	0.05	0.54
Control Delay		48.5	25.6	48.6	17.8	25.8	22.0	9.1	10.7	20.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		48.5	25.6	48.6	17.8	25.8	22.0	9.1	10.7	20.6
LOS		D	C	D	B	C	C	A	B	C
Approach Delay		27.0			43.9		20.0			20.3
Approach LOS		C			D		B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

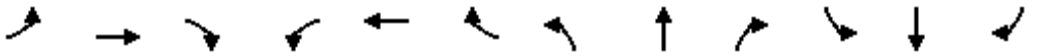
Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	276	307	55	255	460	221	28	880
v/c Ratio	0.12	0.62	0.76	0.11	0.59	0.22	0.22	0.05	0.54
Control Delay	48.5	25.6	48.6	17.8	25.8	22.0	9.1	10.7	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	25.6	48.6	17.8	25.8	22.0	9.1	10.7	20.6
Queue Length 50th (ft)	14	91	204	18	120	128	9	7	146
Queue Length 95th (ft)	32	163	231	39	#323	203	82	m21	384
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	361	443	420	788	435	2057	986	536	1622
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.62	0.73	0.07	0.59	0.22	0.22	0.05	0.54

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	14	254	282	30	20	235	423	203	26	803	6
Future Volume (veh/h)	3	14	254	282	30	20	235	423	203	26	803	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		1.00	1.00		0.99	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	3	15	276	307	33	22	255	460	221	28	873	7
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	68	299	389	526	393	262	341	1638	726	394	1531	12
Arrive On Green	0.18	0.18	0.18	0.15	0.38	0.38	0.06	0.46	0.46	0.03	0.56	0.56
Sat Flow, veh/h	178	1622	1572	1781	1045	697	1781	3554	1575	1781	3613	29
Grp Volume(v), veh/h	18	0	276	307	0	55	255	460	221	28	429	451
Grp Sat Flow(s),veh/h/ln	1800	0	1572	1781	0	1742	1781	1777	1575	1781	1777	1865
Q Serve(g_s), s	0.0	0.0	19.2	16.1	0.0	2.4	7.5	9.6	10.6	1.1	18.6	18.6
Cycle Q Clear(g_c), s	1.0	0.0	19.2	16.1	0.0	2.4	7.5	9.6	10.6	1.1	18.6	18.6
Prop In Lane	0.17		1.00	1.00		0.40	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	367	0	389	526	0	655	341	1638	726	394	753	790
V/C Ratio(X)	0.05	0.00	0.71	0.58	0.00	0.08	0.75	0.28	0.30	0.07	0.57	0.57
Avail Cap(c_a), veh/h	409	0	427	585	0	776	341	1638	726	460	753	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.89	0.89	0.89	0.95	0.95	0.95
Uniform Delay (d), s/veh	40.3	0.0	41.3	30.2	0.0	24.1	25.0	20.0	20.3	18.5	19.2	19.2
Incr Delay (d2), s/veh	0.1	0.0	4.9	1.2	0.0	0.1	7.9	0.4	1.0	0.1	3.0	2.8
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(50%),veh/ln	0.4	0.0	7.9	7.1	0.0	1.0	3.6	4.0	4.0	0.4	7.2	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	0.0	46.1	31.4	0.0	24.2	33.0	20.4	21.2	18.5	22.1	22.0
LnGrp LOS	D	A	D	C	A	C	C	C	C	B	C	C
Approach Vol, veh/h		294			362			936			908	
Approach Delay, s/veh		45.8			30.3			24.0			21.9	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	23.0	28.1	12.0	56.9		51.1	7.5	61.3				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	22.5	25.0	7.5	44.0		* 54	7.5	44.0				
Max Q Clear Time (g_c+I1), s	18.1	21.2	9.5	20.6		4.4	3.1	12.6				
Green Ext Time (p_c), s	0.4	0.4	0.0	5.7		0.3	0.0	4.0				

Intersection Summary	
HCM 6th Ctrl Delay	26.7
HCM 6th LOS	C

Notes

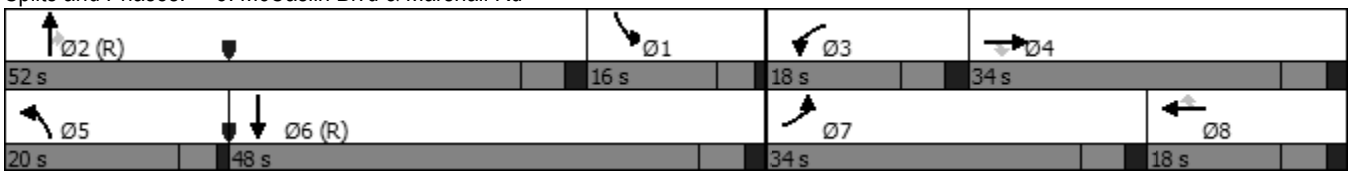
User approved pedestrian interval to be less than phase max green.

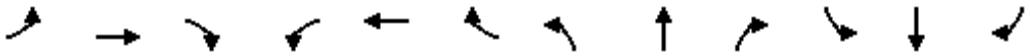
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	875	49	452	77	46	42	188	564	50	89	978	626
Future Volume (vph)	875	49	452	77	46	42	188	564	50	89	978	626
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	9.5	11.0	11.0	9.5	11.0	
Total Split (s)	34.0	34.0	34.0	18.0	18.0	18.0	20.0	52.0	52.0	16.0	48.0	
Total Split (%)	28.3%	28.3%	28.3%	15.0%	15.0%	15.0%	16.7%	43.3%	43.3%	13.3%	40.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	31.6	31.6	32.3	10.2	10.7	10.7	12.3	46.0	46.0	11.5	45.2	120.0
Actuated g/C Ratio	0.26	0.26	0.27	0.08	0.09	0.09	0.10	0.38	0.38	0.10	0.38	1.00
v/c Ratio	0.79	0.79	0.73	0.56	0.30	0.13	0.58	0.31	0.08	0.30	0.56	0.43
Control Delay	58.0	64.5	16.1	66.6	55.2	0.8	57.7	26.5	0.2	53.1	31.2	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	64.5	16.1	66.6	55.2	0.8	57.7	26.5	0.2	53.1	31.2	0.9
LOS	E	E	B	E	E	A	E	C	A	D	C	A
Approach Delay		45.7			46.6			32.2			21.2	
Approach LOS		D			D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 64 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 32.8	Intersection LOS: C
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: McCaslin Blvd & Marshall Rd

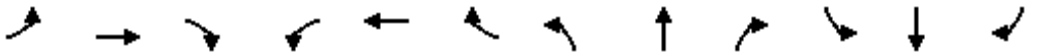




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	666	338	491	84	50	46	204	613	54	97	1063	680
v/c Ratio	0.79	0.79	0.73	0.56	0.30	0.13	0.58	0.31	0.08	0.30	0.56	0.43
Control Delay	58.0	64.5	16.1	66.6	55.2	0.8	57.7	26.5	0.2	53.1	31.2	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	64.5	16.1	66.6	55.2	0.8	57.7	26.5	0.2	53.1	31.2	0.9
Queue Length 50th (ft)	271	275	30	63	36	0	78	120	0	36	235	0
Queue Length 95th (ft)	#393	#481	185	116	77	0	115	152	0	64	294	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	848	428	672	177	186	364	443	1949	716	328	1913	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.79	0.73	0.47	0.27	0.13	0.46	0.31	0.08	0.30	0.56	0.43

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	875	49	452	77	46	42	188	564	50	89	978	626
Future Volume (veh/h)	875	49	452	77	46	42	188	564	50	89	978	626
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	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	989	0	491	84	50	46	204	613	0	97	1063	0
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	1127	0	367	107	154	128	267	1957		427	2257	
Arrive On Green	0.21	0.00	0.23	0.06	0.08	0.08	0.08	0.38	0.00	0.12	0.44	0.00
Sat Flow, veh/h	5344	0	1575	1781	1870	1556	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	989	0	491	84	50	46	204	613	0	97	1063	0
Grp Sat Flow(s),veh/h/ln	1781	0	1575	1781	1870	1556	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	21.5	0.0	28.0	5.6	3.0	2.5	6.9	10.1	0.0	3.0	17.6	0.0
Cycle Q Clear(g_c), s	21.5	0.0	28.0	5.6	3.0	2.5	6.9	10.1	0.0	3.0	17.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1127	0	367	107	154	128	267	1957		427	2257	
V/C Ratio(X)	0.88	0.00	1.34	0.79	0.32	0.36	0.76	0.31		0.23	0.47	
Avail Cap(c_a), veh/h	1247	0	367	178	187	156	446	1957		427	2257	
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)	0.77	0.00	0.77	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.9	0.0	46.0	55.7	51.9	29.8	54.3	25.9	0.0	47.4	23.6	0.0
Incr Delay (d2), s/veh	5.4	0.0	165.0	12.1	1.2	1.7	4.5	0.4	0.0	0.3	0.7	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(50%),veh/ln	9.9	0.0	27.6	2.8	1.5	1.4	3.2	4.2	0.0	1.3	7.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.3	0.0	211.0	67.7	53.1	31.5	58.8	26.3	0.0	47.7	24.3	0.0
LnGrp LOS	D	A	F	E	D	C	E	C		D	C	
Approach Vol, veh/h		1480			180			817			1160	
Approach Delay, s/veh		104.3			54.4			34.4			26.3	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.8	52.0	13.2	34.0	13.8	59.0	31.3	15.9
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	11.5	* 46	12.0	28.0	15.5	42.0	28.0	12.0
Max Q Clear Time (g_c+I1), s	5.0	12.1	7.6	30.0	8.9	19.6	23.5	5.0
Green Ext Time (p_c), s	0.1	4.8	0.1	0.0	0.3	8.1	1.8	0.2

Intersection Summary	
HCM 6th Ctrl Delay	61.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

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

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	4	21	1	6	0	24	17	3	1	13	25
Future Vol, veh/h	17	4	21	1	6	0	24	17	3	1	13	25
Peak Hour Factor	0.73	0.73	0.73	0.50	0.50	0.50	0.67	0.67	0.67	0.75	0.75	0.75
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	23	5	29	2	12	0	36	25	4	1	17	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

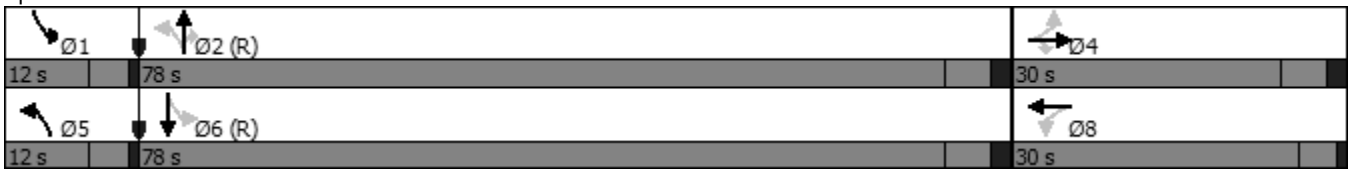
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.3	7.5	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	55%	40%	14%	3%
Vol Thru, %	39%	10%	86%	33%
Vol Right, %	7%	50%	0%	64%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	44	42	7	39
LT Vol	24	17	1	1
Through Vol	17	4	6	13
RT Vol	3	21	0	25
Lane Flow Rate	66	58	14	52
Geometry Grp	1	1	1	1
Degree of Util (X)	0.075	0.062	0.016	0.053
Departure Headway (Hd)	4.131	3.893	4.176	3.693
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	865	914	851	964
Service Time	2.166	1.943	2.232	1.737
HCM Lane V/C Ratio	0.076	0.063	0.016	0.054
HCM Control Delay	7.5	7.2	7.3	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0	0.2

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	16	13	4	44	241	17	15	154
Future Volume (vph)	4	16	13	4	44	241	17	15	154
Turn Type	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	4			8	5	2		1	6
Permitted Phases		4	8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	Ped	Ped	Ped	Ped	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	24.0	24.0		25.5	84.1	79.7	79.7	81.3	75.1
Actuated g/C Ratio	0.20	0.20		0.21	0.70	0.66	0.66	0.68	0.63
v/c Ratio	0.01	0.05		0.05	0.06	0.11	0.02	0.02	0.08
Control Delay	38.8	0.2		26.4	3.3	4.8	0.1	5.2	9.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	0.2		26.4	3.3	4.8	0.1	5.2	9.6
LOS	D	A		C	A	A	A	A	A
Approach Delay	7.6			26.4		4.3			9.2
Approach LOS	A			C		A			A

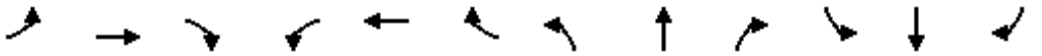
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.11	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	4	17	30	48	262	18	16	167
v/c Ratio	0.01	0.05	0.05	0.06	0.11	0.02	0.02	0.08
Control Delay	38.8	0.2	26.4	3.3	4.8	0.1	5.2	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	0.2	26.4	3.3	4.8	0.1	5.2	9.6
Queue Length 50th (ft)	3	0	5	4	14	0	3	26
Queue Length 95th (ft)	13	0	19	9	25	0	10	42
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	372	367	631	851	2351	1045	794	2213
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.06	0.11	0.02	0.02	0.08

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	4	16	13	4	11	44	241	17	15	154	0
Future Volume (veh/h)	0	4	16	13	4	11	44	241	17	15	154	0
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	0	4	17	14	4	12	48	262	18	16	167	0
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	0	136	115	131	31	105	1025	2745	1221	921	2688	0
Arrive On Green	0.00	0.07	0.07	0.07	0.07	0.07	0.07	1.00	1.00	0.02	0.76	0.00
Sat Flow, veh/h	0	1870	1579	1069	427	1437	1781	3554	1581	1781	3647	0
Grp Volume(v), veh/h	0	4	17	18	0	12	48	262	18	16	167	0
Grp Sat Flow(s),veh/h/ln	0	1870	1579	1496	0	1437	1781	1777	1581	1781	1777	0
Q Serve(g_s), s	0.0	0.2	1.2	0.7	0.0	0.9	0.7	0.0	0.0	0.2	1.4	0.0
Cycle Q Clear(g_c), s	0.0	0.2	1.2	1.2	0.0	0.9	0.7	0.0	0.0	0.2	1.4	0.0
Prop In Lane	0.00		1.00	0.78		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	136	115	162	0	105	1025	2745	1221	921	2688	0
V/C Ratio(X)	0.00	0.03	0.15	0.11	0.00	0.11	0.05	0.10	0.01	0.02	0.06	0.00
Avail Cap(c_a), veh/h	0	374	316	368	0	305	1077	2745	1221	1001	2688	0
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)	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	51.7	52.1	52.1	0.0	52.0	2.6	0.0	0.0	3.1	3.7	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.6	0.3	0.0	0.5	0.0	0.1	0.0	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(50%),veh/ln	0.0	0.1	0.5	0.5	0.0	0.4	0.2	0.0	0.0	0.1	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	51.8	52.7	52.4	0.0	52.5	2.7	0.1	0.0	3.1	3.8	0.0
LnGrp LOS	A	D	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		21			30			328			183	
Approach Delay, s/veh		52.5			52.4			0.4			3.7	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	98.7		14.8	8.5	96.8		14.8				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.2	2.0		3.2	2.7	3.4		3.2				
Green Ext Time (p_c), s	0.0	1.9		0.0	0.0	1.1		0.1				

Intersection Summary		
HCM 6th Ctrl Delay		6.2
HCM 6th LOS		A

Notes

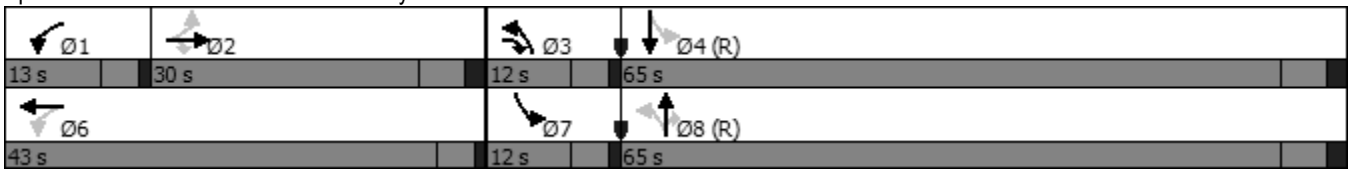
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	9	11	188	130	5	92	298	200	6	181
Future Volume (vph)	9	11	188	130	5	92	298	200	6	181
Turn Type	Perm	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	3	1	6	3	8		7	4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	2	2	3	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	9.5	22.5	9.5	24.0	24.0	9.5	24.0
Total Split (s)	30.0	30.0	12.0	13.0	43.0	12.0	65.0	65.0	12.0	65.0
Total Split (%)	25.0%	25.0%	10.0%	10.8%	35.8%	10.0%	54.2%	54.2%	10.0%	54.2%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	4.5	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.1	15.6	19.9	19.9	90.5	87.5	87.5	85.4	78.2
Actuated g/C Ratio		0.08	0.13	0.17	0.17	0.75	0.73	0.73	0.71	0.65
v/c Ratio		0.17	0.53	0.66	0.05	0.12	0.13	0.18	0.01	0.09
Control Delay		50.0	10.0	57.7	21.7	6.0	7.4	2.0	5.3	6.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		50.0	10.0	57.7	21.7	6.0	7.4	2.0	5.3	6.6
LOS		D	A	E	C	A	A	A	A	A
Approach Delay		13.9			54.6		5.4			6.6
Approach LOS		B			D		A			A

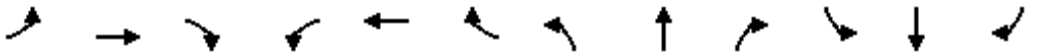
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 53.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	22	204	141	13	100	324	217	7	201
v/c Ratio	0.17	0.53	0.66	0.05	0.12	0.13	0.18	0.01	0.09
Control Delay	50.0	10.0	57.7	21.7	6.0	7.4	2.0	5.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	10.0	57.7	21.7	6.0	7.4	2.0	5.3	6.6
Queue Length 50th (ft)	17	0	99	3	18	33	0	1	16
Queue Length 95th (ft)	38	54	134	18	55	97	39	4	29
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	316	389	213	547	870	2579	1184	796	2299
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.52	0.66	0.02	0.11	0.13	0.18	0.01	0.09

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	11	188	130	5	7	92	298	200	6	181	4
Future Volume (veh/h)	9	11	188	130	5	7	92	298	200	6	181	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	10	12	204	141	5	8	100	324	217	7	197	4
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	136	148	293	343	164	262	749	2134	950	560	2026	41
Arrive On Green	0.15	0.15	0.15	0.07	0.25	0.25	0.04	0.60	0.60	0.00	0.19	0.19
Sat Flow, veh/h	635	1019	1578	1781	647	1035	1781	3554	1582	1781	3562	72
Grp Volume(v), veh/h	22	0	204	141	0	13	100	324	217	7	98	103
Grp Sat Flow(s),veh/h/ln	1654	0	1578	1781	0	1681	1781	1777	1582	1781	1777	1857
Q Serve(g_s), s	0.0	0.0	14.5	7.9	0.0	0.7	2.7	4.8	7.6	0.2	5.5	5.5
Cycle Q Clear(g_c), s	1.2	0.0	14.5	7.9	0.0	0.7	2.7	4.8	7.6	0.2	5.5	5.5
Prop In Lane	0.45		1.00	1.00		0.62	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	284	0	293	343	0	426	749	2134	950	560	1011	1057
V/C Ratio(X)	0.08	0.00	0.70	0.41	0.00	0.03	0.13	0.15	0.23	0.01	0.10	0.10
Avail Cap(c_a), veh/h	373	0	379	343	0	539	789	2134	950	655	1011	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	0.0	45.7	38.4	0.0	33.7	9.4	10.5	11.1	10.8	23.2	23.2
Incr Delay (d2), s/veh	0.1	0.0	3.8	0.8	0.0	0.0	0.1	0.1	0.5	0.0	0.2	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(50%),veh/ln	0.6	0.0	5.9	3.5	0.0	0.3	1.0	1.9	2.7	0.1	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.5	0.0	49.5	39.2	0.0	33.7	9.5	10.7	11.6	10.8	23.4	23.4
LnGrp LOS	D	A	D	D	A	C	A	B	B	B	C	C
Approach Vol, veh/h		226			154			641			208	
Approach Delay, s/veh		49.0			38.7			10.8			23.0	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.0	23.4	9.3	74.3		36.4	5.5	78.0				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	8.5	24.0	7.5	59.0		* 39	7.5	59.0				
Max Q Clear Time (g_c+I1), s	9.9	16.5	4.7	7.5		2.7	2.2	9.6				
Green Ext Time (p_c), s	0.0	0.4	0.0	1.2		0.0	0.0	3.0				

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Notes

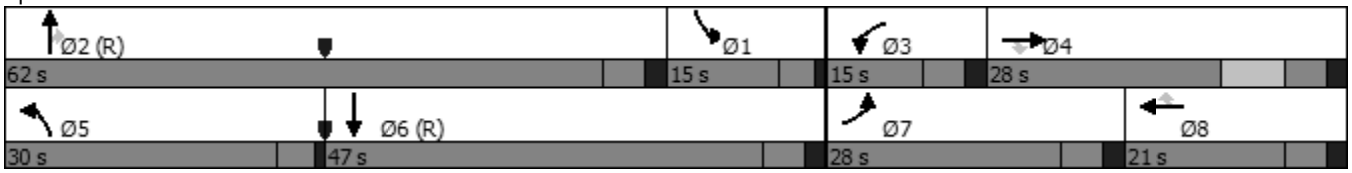
User approved pedestrian interval to be less than phase max green.

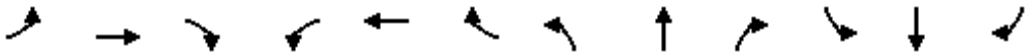
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	454	20	67	31	19	63	199	792	73	93	450	370
Future Volume (vph)	454	20	67	31	19	63	199	792	73	93	450	370
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	15.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	21.0	21.0	11.0	21.0	21.0	9.5	11.0	11.0	9.5	11.0	
Total Split (s)	28.0	28.0	28.0	15.0	21.0	21.0	30.0	62.0	62.0	15.0	47.0	
Total Split (%)	22.2%	22.2%	22.2%	11.9%	16.7%	16.7%	23.8%	49.2%	49.2%	11.9%	37.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	18.2	18.2	34.3	7.6	18.8	18.8	13.2	56.0	56.0	10.5	53.3	126.0
Actuated g/C Ratio	0.14	0.14	0.27	0.06	0.15	0.15	0.10	0.44	0.44	0.08	0.42	1.00
v/c Ratio	0.73	0.74	0.13	0.32	0.08	0.16	0.60	0.38	0.10	0.35	0.23	0.25
Control Delay	60.8	70.7	0.5	64.3	49.2	0.8	60.6	24.0	0.2	58.3	24.0	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.8	70.7	0.5	64.3	49.2	0.8	60.6	24.0	0.2	58.3	24.0	0.4
LOS	E	E	A	E	D	A	E	C	A	E	C	A
Approach Delay		56.3			26.6			29.2			17.9	
Approach LOS		E			C			C			B	

Intersection Summary	
Cycle Length: 126	
Actuated Cycle Length: 126	
Offset: 64 (51%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 30.8	Intersection LOS: C
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

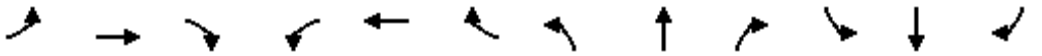
Splits and Phases: 3: McCaslin Blvd & Marshall Rd





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	340	175	73	34	21	68	216	861	79	101	489	402
v/c Ratio	0.73	0.74	0.13	0.32	0.08	0.16	0.60	0.38	0.10	0.35	0.23	0.25
Control Delay	60.8	70.7	0.5	64.3	49.2	0.8	60.6	24.0	0.2	58.3	24.0	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.8	70.7	0.5	64.3	49.2	0.8	60.6	24.0	0.2	58.3	24.0	0.4
Queue Length 50th (ft)	147	151	0	27	15	0	88	168	0	40	91	0
Queue Length 95th (ft)	196	234	0	62	41	0	126	204	0	70	125	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	562	235	547	126	277	420	694	2260	795	286	2149	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.74	0.13	0.27	0.08	0.16	0.31	0.38	0.10	0.35	0.23	0.25

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	454	20	67	31	19	63	199	792	73	93	450	370
Future Volume (veh/h)	454	20	67	31	19	63	199	792	73	93	450	370
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		0.99	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	509	0	73	34	21	68	216	861	0	101	489	0
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	636	0	332	49	222	187	283	2269		439	2561	
Arrive On Green	0.12	0.00	0.21	0.03	0.12	0.12	0.08	0.44	0.00	0.13	0.50	0.00
Sat Flow, veh/h	5344	0	1578	1781	1870	1573	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	509	0	73	34	21	68	216	861	0	101	489	0
Grp Sat Flow(s),veh/h/ln	1781	0	1578	1781	1870	1573	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	11.7	0.0	4.8	2.4	1.3	3.7	7.7	14.2	0.0	3.3	6.7	0.0
Cycle Q Clear(g_c), s	11.7	0.0	4.8	2.4	1.3	3.7	7.7	14.2	0.0	3.3	6.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	636	0	332	49	222	187	283	2269		439	2561	
V/C Ratio(X)	0.80	0.00	0.22	0.69	0.09	0.36	0.76	0.38		0.23	0.19	
Avail Cap(c_a), veh/h	933	0	332	127	223	187	699	2269		439	2561	
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)	0.92	0.00	0.92	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.0	0.0	41.2	60.7	49.5	28.6	56.6	23.4	0.0	49.4	17.3	0.0
Incr Delay (d2), s/veh	2.9	0.0	0.3	15.9	0.2	1.2	4.2	0.5	0.0	0.3	0.2	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(50%),veh/ln	5.4	0.0	1.9	1.3	0.6	2.0	3.5	5.8	0.0	1.5	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.0	0.0	41.5	76.6	49.6	29.7	60.9	23.9	0.0	49.7	17.5	0.0
LnGrp LOS	E	A	D	E	D	C	E	C		D	B	
Approach Vol, veh/h		582			123			1077			590	
Approach Delay, s/veh		55.0			46.1			31.3			23.0	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	62.0	9.5	32.5	14.8	69.2	21.0	21.0
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.5	* 56	9.0	22.0	25.5	41.0	22.0	15.0
Max Q Clear Time (g_c+I1), s	5.3	16.2	4.4	6.8	9.7	8.7	13.7	5.7
Green Ext Time (p_c), s	0.1	7.3	0.0	0.1	0.6	3.7	1.3	0.1

Intersection Summary	
HCM 6th Ctrl Delay	35.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

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

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	10	10	21	4	0	10	27	23	0	35	8
Future Vol, veh/h	7	10	10	21	4	0	10	27	23	0	35	8
Peak Hour Factor	0.83	0.92	0.83	0.92	0.92	0.92	0.88	0.88	0.92	0.92	0.69	0.69
Heavy Vehicles, %	10	2	10	2	2	2	0	0	2	2	0	0
Mvmt Flow	8	11	12	23	4	0	11	31	25	0	51	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

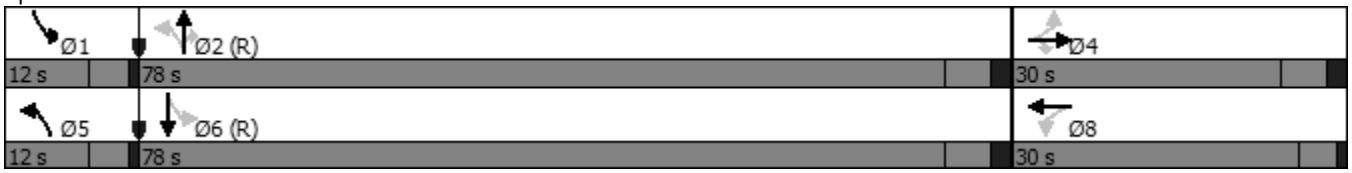
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.6	7.2	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	17%	26%	84%	0%
Vol Thru, %	45%	37%	16%	81%
Vol Right, %	38%	37%	0%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	27	25	43
LT Vol	10	7	21	0
Through Vol	27	10	4	35
RT Vol	23	10	0	8
Lane Flow Rate	67	31	27	62
Geometry Grp	1	1	1	1
Degree of Util (X)	0.072	0.036	0.033	0.068
Departure Headway (Hd)	3.852	4.144	4.35	3.941
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	925	857	817	904
Service Time	1.896	2.2	2.406	1.985
HCM Lane V/C Ratio	0.072	0.036	0.033	0.069
HCM Control Delay	7.2	7.4	7.6	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.1	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	21	198	24	24	235	348	14	32	568
Future Volume (vph)	1	21	198	24	24	235	348	14	32	568
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Detector Phase	4	4	4	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		24.0	24.0		25.5	83.4	77.4	77.4	79.7	72.0
Actuated g/C Ratio		0.20	0.20		0.21	0.70	0.64	0.64	0.66	0.60
v/c Ratio		0.06	0.44		0.13	0.47	0.17	0.01	0.05	0.30
Control Delay		39.6	8.4		26.0	11.0	3.5	0.0	5.4	12.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		39.6	8.4		26.0	11.0	3.5	0.0	5.4	12.1
LOS		D	A		C	B	A	A	A	B
Approach Delay		11.5			26.0		6.4			11.7
Approach LOS		B			C		A			B

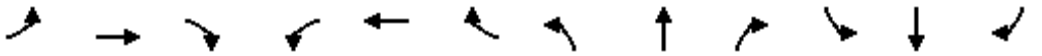
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 82.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	24	215	81	255	378	15	35	626
v/c Ratio	0.06	0.44	0.13	0.47	0.17	0.01	0.05	0.30
Control Delay	39.6	8.4	26.0	11.0	3.5	0.0	5.4	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	8.4	26.0	11.0	3.5	0.0	5.4	12.1
Queue Length 50th (ft)	15	0	17	43	18	0	7	116
Queue Length 95th (ft)	39	65	39	113	26	0	16	150
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	370	488	644	545	2282	1010	707	2119
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.44	0.13	0.47	0.17	0.01	0.05	0.30

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	21	198	24	24	27	235	348	14	32	568	8
Future Volume (veh/h)	1	21	198	24	24	27	235	348	14	32	568	8
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	1	23	215	26	26	29	255	378	15	35	617	9
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	35	392	336	212	203	243	733	2840	1261	879	2788	41
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.10	1.00	1.00	0.03	0.78	0.78
Sat Flow, veh/h	19	1844	1581	770	954	1145	1781	3554	1578	1781	3585	52
Grp Volume(v), veh/h	24	0	215	43	0	38	255	378	15	35	306	320
Grp Sat Flow(s),veh/h/ln	1863	0	1581	1377	0	1492	1781	1777	1578	1781	1777	1861
Q Serve(g_s), s	0.0	0.0	14.9	1.3	0.0	2.5	3.9	0.0	0.0	0.5	5.5	5.6
Cycle Q Clear(g_c), s	1.2	0.0	14.9	2.6	0.0	2.5	3.9	0.0	0.0	0.5	5.5	5.6
Prop In Lane	0.04		1.00	0.60		0.77	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	427	0	336	341	0	317	733	2840	1261	879	1382	1447
V/C Ratio(X)	0.06	0.00	0.64	0.13	0.00	0.12	0.35	0.13	0.01	0.04	0.22	0.22
Avail Cap(c_a), veh/h	427	0	336	341	0	317	755	2840	1261	940	1382	1447
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	0.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	0.0	43.1	38.1	0.0	38.2	2.2	0.0	0.0	2.3	3.6	3.6
Incr Delay (d2), s/veh	0.3	0.0	9.0	0.8	0.0	0.8	0.3	0.1	0.0	0.0	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(50%),veh/ln	0.6	0.0	6.7	1.1	0.0	1.0	0.8	0.0	0.0	0.1	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	0.0	52.1	38.9	0.0	38.9	2.4	0.1	0.0	2.3	4.0	3.9
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		239			81			648			661	
Approach Delay, s/veh		50.7			38.9			1.0			3.9	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	101.9		31.5	10.5	99.3		31.5				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.5	2.0		16.9	5.9	7.6		4.6				
Green Ext Time (p_c), s	0.0	2.7		0.5	0.1	4.1		0.4				

Intersection Summary		
HCM 6th Ctrl Delay		11.3
HCM 6th LOS		B

Notes

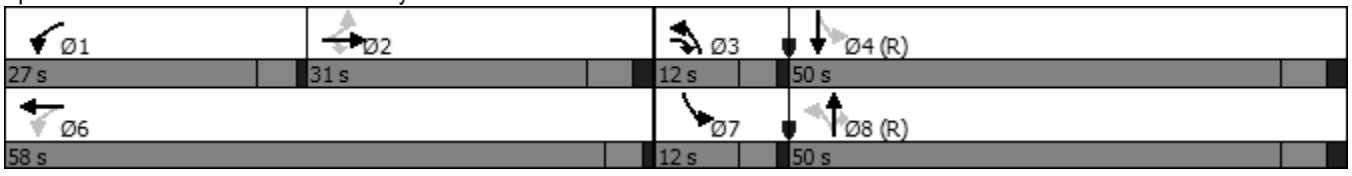
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	3	16	254	329	31	235	423	256	26	803
Future Volume (vph)	3	16	254	329	31	235	423	256	26	803
Turn Type	Perm	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	3	1	6	3	8		7	4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	2	2	3	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	9.5	9.5	9.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	31.0	31.0	12.0	27.0	58.0	12.0	50.0	50.0	12.0	50.0
Total Split (%)	25.8%	25.8%	10.0%	22.5%	48.3%	10.0%	41.7%	41.7%	10.0%	41.7%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	4.5	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.1	25.9	33.6	33.6	76.5	69.1	69.1	62.1	54.3
Actuated g/C Ratio		0.08	0.22	0.28	0.28	0.64	0.58	0.58	0.52	0.45
v/c Ratio		0.14	0.64	0.86	0.11	0.59	0.23	0.28	0.05	0.55
Control Delay		48.8	29.6	57.9	17.9	25.8	21.9	8.8	10.7	20.9
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		48.8	29.6	57.9	17.9	25.8	21.9	8.8	10.7	20.9
LOS		D	C	E	B	C	C	A	B	C
Approach Delay		30.9			52.5		19.2			20.6
Approach LOS		C			D		B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 26.3	Intersection LOS: C
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

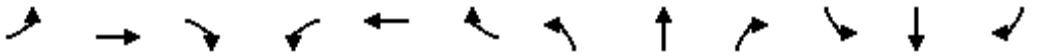
Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	276	358	56	255	460	278	28	880
v/c Ratio	0.14	0.64	0.86	0.11	0.59	0.23	0.28	0.05	0.55
Control Delay	48.8	29.6	57.9	17.9	25.8	21.9	8.8	10.7	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	29.6	57.9	17.9	25.8	21.9	8.8	10.7	20.9
Queue Length 50th (ft)	15	107	246	19	118	127	16	7	146
Queue Length 95th (ft)	34	179	273	39	#322	204	92	m21	384
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	364	429	420	789	433	2038	1004	530	1599
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.64	0.85	0.07	0.59	0.23	0.28	0.05	0.55

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	16	254	329	31	20	235	423	256	26	803	6
Future Volume (veh/h)	3	16	254	329	31	20	235	423	256	26	803	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		1.00	1.00		0.99	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	3	17	276	358	34	22	255	460	278	28	873	7
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	62	306	389	562	421	272	368	1563	692	361	1455	12
Arrive On Green	0.18	0.18	0.18	0.18	0.40	0.40	0.06	0.44	0.44	0.05	0.81	0.81
Sat Flow, veh/h	152	1658	1572	1781	1059	685	1781	3554	1574	1781	3613	29
Grp Volume(v), veh/h	20	0	276	358	0	56	255	460	278	28	429	451
Grp Sat Flow(s),veh/h/ln	1810	0	1572	1781	0	1744	1781	1777	1574	1781	1777	1865
Q Serve(g_s), s	0.0	0.0	19.2	18.8	0.0	2.4	7.5	10.0	14.4	1.1	10.9	10.9
Cycle Q Clear(g_c), s	1.1	0.0	19.2	18.8	0.0	2.4	7.5	10.0	14.4	1.1	10.9	10.9
Prop In Lane	0.15		1.00	1.00		0.39	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	369	0	389	562	0	693	368	1563	692	361	715	751
V/C Ratio(X)	0.05	0.00	0.71	0.64	0.00	0.08	0.69	0.29	0.40	0.08	0.60	0.60
Avail Cap(c_a), veh/h	410	0	427	584	0	778	368	1563	692	428	715	751
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	0.87	0.87	0.87	0.95	0.95	0.95
Uniform Delay (d), s/veh	40.3	0.0	41.3	29.2	0.0	22.5	23.8	21.6	22.9	19.6	8.0	8.0
Incr Delay (d2), s/veh	0.1	0.0	4.9	2.2	0.0	0.0	4.8	0.4	1.5	0.1	3.5	3.4
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(50%),veh/ln	0.5	0.0	7.9	8.3	0.0	1.0	2.8	4.2	5.5	0.4	3.2	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.4	0.0	46.1	31.4	0.0	22.6	28.6	22.0	24.4	19.6	11.6	11.4
LnGrp LOS	D	A	D	C	A	C	C	C	C	B	B	B
Approach Vol, veh/h		296			414			993			908	
Approach Delay, s/veh		45.7			30.2			24.4			11.7	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	25.5	28.1	12.0	54.3		53.7	7.5	58.8				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	22.5	25.0	7.5	44.0		* 54	7.5	44.0				
Max Q Clear Time (g_c+I1), s	20.8	21.2	9.5	12.9		4.4	3.1	16.4				
Green Ext Time (p_c), s	0.2	0.4	0.0	6.1		0.3	0.0	4.2				

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Notes

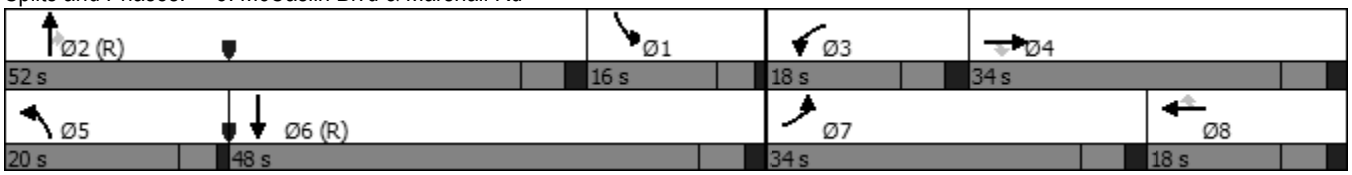
User approved pedestrian interval to be less than phase max green.

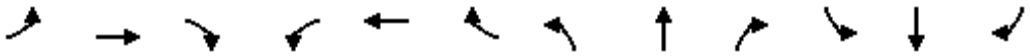
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	918	49	455	77	46	42	192	564	50	89	978	674
Future Volume (vph)	918	49	455	77	46	42	192	564	50	89	978	674
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	9.5	11.0	11.0	9.5	11.0	
Total Split (s)	34.0	34.0	34.0	18.0	18.0	18.0	20.0	52.0	52.0	16.0	48.0	
Total Split (%)	28.3%	28.3%	28.3%	15.0%	15.0%	15.0%	16.7%	43.3%	43.3%	13.3%	40.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	31.6	31.6	32.3	10.2	10.7	10.7	12.5	46.0	46.0	11.5	45.0	120.0
Actuated g/C Ratio	0.26	0.26	0.27	0.08	0.09	0.09	0.10	0.38	0.38	0.10	0.38	1.00
v/c Ratio	0.82	0.82	0.74	0.56	0.30	0.13	0.59	0.31	0.08	0.30	0.56	0.46
Control Delay	58.4	65.1	16.5	66.6	55.2	0.8	57.8	26.5	0.2	53.1	31.3	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	65.1	16.5	66.6	55.2	0.8	57.8	26.5	0.2	53.1	31.3	1.0
LOS	E	E	B	E	E	A	E	C	A	D	C	A
Approach Delay		46.5			46.6			32.4			20.7	
Approach LOS		D			D			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 64 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 32.9	Intersection LOS: C
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: McCaslin Blvd & Marshall Rd



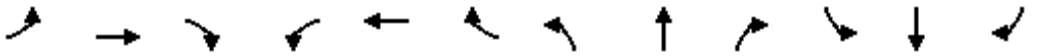


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	699	352	495	84	50	46	209	613	54	97	1063	733
v/c Ratio	0.82	0.82	0.74	0.56	0.30	0.13	0.59	0.31	0.08	0.30	0.56	0.46
Control Delay	58.4	65.1	16.5	66.6	55.2	0.8	57.8	26.5	0.2	53.1	31.3	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	65.1	16.5	66.6	55.2	0.8	57.8	26.5	0.2	53.1	31.3	1.0
Queue Length 50th (ft)	288	290	35	63	36	0	80	120	0	36	236	0
Queue Length 95th (ft)	m#420	m#489	m184	116	77	0	118	152	0	64	294	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	848	428	672	177	186	364	443	1949	716	328	1907	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.82	0.74	0.47	0.27	0.13	0.47	0.31	0.08	0.30	0.56	0.46

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	918	49	455	77	46	42	192	564	50	89	978	674
Future Volume (veh/h)	918	49	455	77	46	42	192	564	50	89	978	674
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	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	1036	0	495	84	50	46	209	613	0	97	1063	0
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	1162	0	367	107	141	118	272	1957		427	2250	
Arrive On Green	0.22	0.00	0.23	0.06	0.08	0.08	0.08	0.38	0.00	0.12	0.44	0.00
Sat Flow, veh/h	5344	0	1575	1781	1870	1554	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	1036	0	495	84	50	46	209	613	0	97	1063	0
Grp Sat Flow(s),veh/h/ln	1781	0	1575	1781	1870	1554	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	22.6	0.0	28.0	5.6	3.0	2.6	7.1	10.1	0.0	3.0	17.7	0.0
Cycle Q Clear(g_c), s	22.6	0.0	28.0	5.6	3.0	2.6	7.1	10.1	0.0	3.0	17.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1162	0	367	107	141	118	272	1957		427	2250	
V/C Ratio(X)	0.89	0.00	1.35	0.79	0.35	0.39	0.77	0.31		0.23	0.47	
Avail Cap(c_a), veh/h	1247	0	367	178	187	155	446	1957		427	2250	
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)	0.72	0.00	0.72	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.6	0.0	46.0	55.7	52.7	30.4	54.2	25.9	0.0	47.4	23.7	0.0
Incr Delay (d2), s/veh	6.0	0.0	168.8	12.1	1.5	2.1	4.5	0.4	0.0	0.3	0.7	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(50%),veh/ln	10.5	0.0	28.0	2.8	1.5	1.4	3.3	4.2	0.0	1.3	7.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.6	0.0	214.8	67.7	54.2	32.5	58.7	26.3	0.0	47.7	24.4	0.0
LnGrp LOS	D	A	F	E	D	C	E	C		D	C	
Approach Vol, veh/h		1531			180			822			1160	
Approach Delay, s/veh		104.4			55.0			34.6			26.4	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.8	52.0	13.2	34.0	14.0	58.9	32.1	15.1
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	11.5	* 46	12.0	28.0	15.5	42.0	28.0	12.0
Max Q Clear Time (g_c+I1), s	5.0	12.1	7.6	30.0	9.1	19.7	24.6	5.0
Green Ext Time (p_c), s	0.1	4.8	0.1	0.0	0.3	8.1	1.5	0.1

Intersection Summary	
HCM 6th Ctrl Delay	61.9
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

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

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	6	22	21	8	0	25	34	25	1	27	26
Future Vol, veh/h	18	6	22	21	8	0	25	34	25	1	27	26
Peak Hour Factor	0.73	0.92	0.73	0.92	0.92	0.92	0.67	0.67	0.92	0.92	0.75	0.75
Heavy Vehicles, %	0	2	0	2	2	2	0	0	2	2	0	0
Mvmt Flow	25	7	30	23	9	0	37	51	27	1	36	35
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

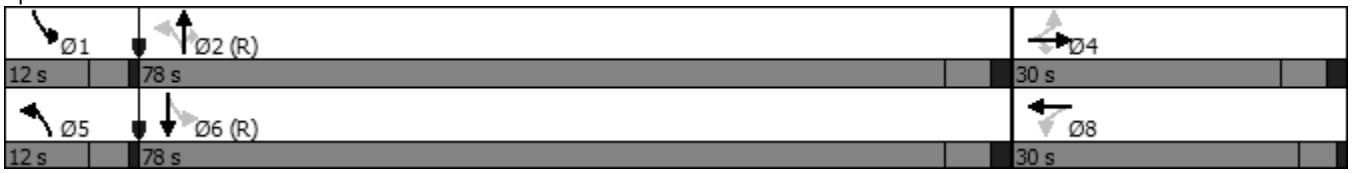
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.7	7.7	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	39%	72%	2%
Vol Thru, %	40%	13%	28%	50%
Vol Right, %	30%	48%	0%	48%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	84	46	29	54
LT Vol	25	18	21	1
Through Vol	34	6	8	27
RT Vol	25	22	0	26
Lane Flow Rate	115	61	32	72
Geometry Grp	1	1	1	1
Degree of Util (X)	0.128	0.069	0.039	0.078
Departure Headway (Hd)	3.998	4.037	4.45	3.899
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	888	874	793	908
Service Time	2.059	2.124	2.541	1.971
HCM Lane V/C Ratio	0.13	0.07	0.04	0.079
HCM Control Delay	7.7	7.4	7.7	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.2	0.1	0.3

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	5	23	35	10	59	312	30	20	190
Future Volume (vph)	5	23	35	10	59	312	30	20	190
Turn Type	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	4			8	5	2		1	6
Permitted Phases		4	8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	Ped	Ped	Ped	Ped	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	24.0	24.0		25.5	83.4	77.6	77.6	81.2	74.9
Actuated g/C Ratio	0.20	0.20		0.21	0.70	0.65	0.65	0.68	0.62
v/c Ratio	0.01	0.07		0.12	0.08	0.15	0.03	0.03	0.09
Control Delay	38.8	0.3		27.6	2.2	3.4	0.1	5.3	9.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	0.3		27.6	2.2	3.4	0.1	5.3	9.7
LOS	D	A		C	A	A	A	A	A
Approach Delay	6.8			27.6		2.9			9.3
Approach LOS	A			C		A			A

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.15	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	25	72	64	339	33	22	207
v/c Ratio	0.01	0.07	0.12	0.08	0.15	0.03	0.03	0.09
Control Delay	38.8	0.3	27.6	2.2	3.4	0.1	5.3	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	0.3	27.6	2.2	3.4	0.1	5.3	9.7
Queue Length 50th (ft)	3	0	16	4	15	0	4	33
Queue Length 95th (ft)	15	0	36	7	20	0	12	51
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	372	367	615	826	2287	1018	744	2207
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.07	0.12	0.08	0.15	0.03	0.03	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	5	23	35	10	21	59	312	30	20	190	0
Future Volume (veh/h)	0	5	23	35	10	21	59	312	30	20	190	0
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	0	5	25	38	11	23	64	339	33	22	207	0
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	0	159	134	162	44	98	976	2686	1195	846	2633	0
Arrive On Green	0.00	0.08	0.08	0.08	0.08	0.08	0.07	1.00	1.00	0.02	0.74	0.00
Sat Flow, veh/h	0	1870	1579	1232	517	1155	1781	3554	1581	1781	3647	0
Grp Volume(v), veh/h	0	5	25	42	0	30	64	339	33	22	207	0
Grp Sat Flow(s),veh/h/ln	0	1870	1579	1415	0	1489	1781	1777	1581	1781	1777	0
Q Serve(g_s), s	0.0	0.3	1.8	3.1	0.0	2.2	1.0	0.0	0.0	0.4	1.9	0.0
Cycle Q Clear(g_c), s	0.0	0.3	1.8	3.4	0.0	2.2	1.0	0.0	0.0	0.4	1.9	0.0
Prop In Lane	0.00		1.00	0.90		0.78	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	159	134	177	0	127	976	2686	1195	846	2633	0
V/C Ratio(X)	0.00	0.03	0.19	0.24	0.00	0.23	0.07	0.13	0.03	0.03	0.08	0.00
Avail Cap(c_a), veh/h	0	374	316	357	0	316	1022	2686	1195	919	2633	0
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)	0.00	1.00	1.00	1.00	0.00	1.00	0.99	0.99	0.99	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	50.4	51.0	51.8	0.0	51.3	3.0	0.0	0.0	3.4	4.3	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.7	0.7	0.0	0.9	0.0	0.1	0.0	0.0	0.1	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(50%),veh/ln	0.0	0.1	0.7	1.2	0.0	0.9	0.3	0.0	0.0	0.1	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	50.5	51.7	52.5	0.0	52.2	3.0	0.1	0.0	3.4	4.3	0.0
LnGrp LOS	A	D	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		30			72			436			229	
Approach Delay, s/veh		51.5			52.4			0.5			4.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	96.7		16.2	8.9	94.9		16.2				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.4	2.0		3.8	3.0	3.9		5.4				
Green Ext Time (p_c), s	0.0	2.5		0.1	0.0	1.4		0.3				

Intersection Summary		
HCM 6th Ctrl Delay		8.5
HCM 6th LOS		A

Notes

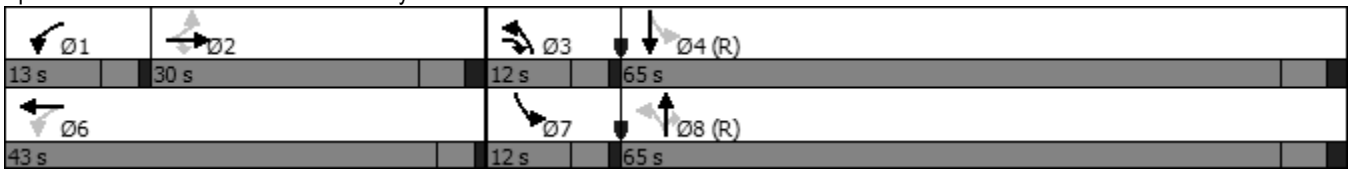
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	10	11	202	112	7	95	386	131	6	248
Future Volume (vph)	10	11	202	112	7	95	386	131	6	248
Turn Type	Perm	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	3	1	6	3	8		7	4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	2	2	3	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	9.5	22.5	9.5	24.0	24.0	9.5	24.0
Total Split (s)	30.0	30.0	12.0	13.0	43.0	12.0	65.0	65.0	12.0	65.0
Total Split (%)	25.0%	25.0%	10.0%	10.8%	35.8%	10.0%	54.2%	54.2%	10.0%	54.2%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	4.5	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.1	15.7	19.9	19.9	90.5	87.5	87.5	85.4	78.2
Actuated g/C Ratio		0.08	0.13	0.17	0.17	0.75	0.73	0.73	0.71	0.65
v/c Ratio		0.17	0.56	0.57	0.05	0.13	0.16	0.12	0.01	0.12
Control Delay		50.3	10.1	52.6	24.1	3.8	4.7	0.4	6.2	7.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		50.3	10.1	52.6	24.1	3.8	4.7	0.4	6.2	7.6
LOS		D	B	D	C	A	A	A	A	A
Approach Delay		13.9			49.5		3.6			7.6
Approach LOS		B			D		A			A

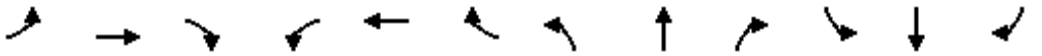
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	23	220	122	15	103	420	142	7	275
v/c Ratio	0.17	0.56	0.57	0.05	0.13	0.16	0.12	0.01	0.12
Control Delay	50.3	10.1	52.6	24.1	3.8	4.7	0.4	6.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	10.1	52.6	24.1	3.8	4.7	0.4	6.2	7.6
Queue Length 50th (ft)	17	0	84	5	11	26	0	1	28
Queue Length 95th (ft)	38	56	118	20	38	81	6	6	47
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	313	404	213	560	819	2579	1164	734	2298
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.54	0.57	0.03	0.13	0.16	0.12	0.01	0.12

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	11	202	112	7	6	95	386	131	6	248	5
Future Volume (veh/h)	10	11	202	112	7	6	95	386	131	6	248	5
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	11	12	220	122	8	7	103	420	142	7	270	5
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	149	148	307	351	241	211	680	2102	936	530	1998	37
Arrive On Green	0.15	0.15	0.15	0.07	0.26	0.26	0.04	0.59	0.59	0.00	0.18	0.18
Sat Flow, veh/h	678	960	1579	1781	919	804	1781	3554	1582	1781	3569	66
Grp Volume(v), veh/h	23	0	220	122	0	15	103	420	142	7	134	141
Grp Sat Flow(s),veh/h/ln	1638	0	1579	1781	0	1723	1781	1777	1582	1781	1777	1858
Q Serve(g_s), s	0.0	0.0	15.7	6.7	0.0	0.8	2.9	6.6	4.8	0.2	7.6	7.6
Cycle Q Clear(g_c), s	1.3	0.0	15.7	6.7	0.0	0.8	2.9	6.6	4.8	0.2	7.6	7.6
Prop In Lane	0.48		1.00	1.00		0.47	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	297	0	307	351	0	452	680	2102	936	530	995	1040
V/C Ratio(X)	0.08	0.00	0.72	0.35	0.00	0.03	0.15	0.20	0.15	0.01	0.13	0.14
Avail Cap(c_a), veh/h	371	0	380	351	0	553	719	2102	936	626	995	1040
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	0.0	45.3	37.1	0.0	32.9	10.0	11.4	11.0	11.3	24.6	24.6
Incr Delay (d2), s/veh	0.1	0.0	4.9	0.6	0.0	0.0	0.1	0.2	0.3	0.0	0.3	0.3
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(50%),veh/ln	0.6	0.0	6.5	3.0	0.0	0.3	1.1	2.6	1.7	0.1	3.4	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	0.0	50.1	37.7	0.0	33.0	10.1	11.5	11.3	11.3	24.9	24.9
LnGrp LOS	D	A	D	D	A	C	B	B	B	B	C	C
Approach Vol, veh/h		243			137			665			282	
Approach Delay, s/veh		49.5			37.2			11.3			24.6	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.0	24.5	9.3	73.2		37.5	5.5	77.0				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	8.5	24.0	7.5	59.0		* 39	7.5	59.0				
Max Q Clear Time (g_c+I1), s	8.7	17.7	4.9	9.6		2.8	2.2	8.6				
Green Ext Time (p_c), s	0.0	0.4	0.0	1.6		0.0	0.0	3.5				

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Notes

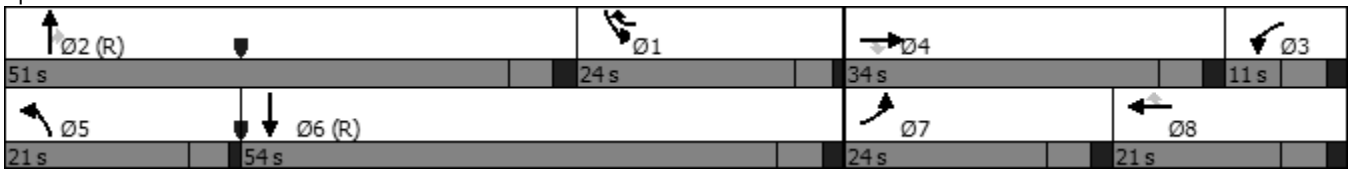
User approved pedestrian interval to be less than phase max green.

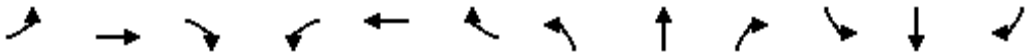
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	487	25	90	42	24	104	236	1163	98	216	1166	397
Future Volume (vph)	487	25	90	42	24	104	236	1163	98	216	1166	397
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	1	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	5.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	21.0	21.0	11.0	21.0	22.0	9.5	11.0	11.0	22.0	11.0	
Total Split (s)	24.0	34.0	34.0	11.0	21.0	24.0	21.0	51.0	51.0	24.0	54.0	
Total Split (%)	20.0%	28.3%	28.3%	9.2%	17.5%	20.0%	17.5%	42.5%	42.5%	20.0%	45.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	C-Max	C-Max	Ped	C-Max	
Act Effct Green (s)	16.9	30.2	30.2	5.0	16.1	37.1	13.9	45.0	45.0	19.5	50.6	120.0
Actuated g/C Ratio	0.14	0.25	0.25	0.04	0.13	0.31	0.12	0.38	0.38	0.16	0.42	1.00
v/c Ratio	0.75	0.06	0.19	0.32	0.10	0.20	0.65	0.66	0.15	0.42	0.59	0.27
Control Delay	59.7	41.6	4.6	62.1	47.8	3.3	58.3	33.3	0.5	47.8	28.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	41.6	4.6	62.1	47.8	3.3	58.3	33.3	0.5	47.8	28.5	0.4
LOS	E	D	A	E	D	A	E	C	A	D	C	A
Approach Delay		50.7			24.2			35.1			24.6	
Approach LOS		D			C			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 32.3	Intersection LOS: C
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: McCaslin Blvd & Marshall Rd

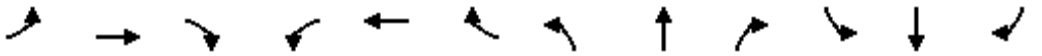




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	529	27	98	46	26	113	257	1264	107	235	1267	432
v/c Ratio	0.75	0.06	0.19	0.32	0.10	0.20	0.65	0.66	0.15	0.42	0.59	0.27
Control Delay	59.7	41.6	4.6	62.1	47.8	3.3	58.3	33.3	0.5	47.8	28.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	41.6	4.6	62.1	47.8	3.3	58.3	33.3	0.5	47.8	28.5	0.4
Queue Length 50th (ft)	144	18	1	18	18	0	99	295	0	85	273	0
Queue Length 95th (ft)	186	m40	12	38	46	23	140	347	0	126	334	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	748	468	525	143	250	570	472	1906	705	557	2143	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.06	0.19	0.32	0.10	0.20	0.54	0.66	0.15	0.42	0.59	0.27

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	487	25	90	42	24	104	236	1163	98	216	1166	397
Future Volume (veh/h)	487	25	90	42	24	104	236	1163	98	216	1166	397
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		0.99	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	529	27	0	46	26	113	257	1264	0	235	1267	0
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	633	253		399	234	472	322	1915		602	2392	
Arrive On Green	0.13	0.14	0.00	0.12	0.12	0.12	0.09	0.38	0.00	0.17	0.47	0.00
Sat Flow, veh/h	5023	1870	1585	3456	1870	1574	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	529	27	0	46	26	113	257	1264	0	235	1267	0
Grp Sat Flow(s),veh/h/ln	1674	1870	1585	1728	1870	1574	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	12.3	1.5	0.0	1.4	1.5	1.6	8.7	24.7	0.0	7.2	21.0	0.0
Cycle Q Clear(g_c), s	12.3	1.5	0.0	1.4	1.5	1.6	8.7	24.7	0.0	7.2	21.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	633	253		399	234	472	322	1915		602	2392	
V/C Ratio(X)	0.84	0.11		0.12	0.11	0.24	0.80	0.66		0.39	0.53	
Avail Cap(c_a), veh/h	753	436		399	234	473	475	1915		602	2392	
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)	0.94	0.94	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.2	45.5	0.0	47.6	46.6	13.7	53.3	31.1	0.0	43.9	22.5	0.0
Incr Delay (d2), s/veh	6.6	0.2	0.0	0.1	0.2	0.3	5.9	1.8	0.0	0.4	0.8	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(50%),veh/ln	5.5	0.7	0.0	0.6	0.7	1.4	4.1	10.4	0.0	3.1	8.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.9	45.7	0.0	47.7	46.8	13.9	59.2	33.0	0.0	44.3	23.4	0.0
LnGrp LOS	E	D		D	D	B	E	C		D	C	
Approach Vol, veh/h		556			185			1521			1502	
Approach Delay, s/veh		57.3			26.9			37.4			26.7	
Approach LOS		E			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.9	51.0	19.8	22.3	15.7	62.2	21.1	21.0
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	19.5	* 45	5.0	28.0	16.5	48.0	18.0	15.0
Max Q Clear Time (g_c+I1), s	9.2	26.7	3.4	3.5	10.7	23.0	14.3	3.6
Green Ext Time (p_c), s	0.6	8.9	0.0	0.1	0.4	10.4	0.8	0.3

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

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

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	11	13	2	2	0	13	11	10	0	10	8
Future Vol, veh/h	8	11	13	2	2	0	13	11	10	0	10	8
Peak Hour Factor	0.83	0.83	0.83	0.25	0.25	0.25	0.88	0.88	0.88	0.69	0.69	0.69
Heavy Vehicles, %	10	10	10	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	13	16	8	8	0	15	13	11	0	14	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

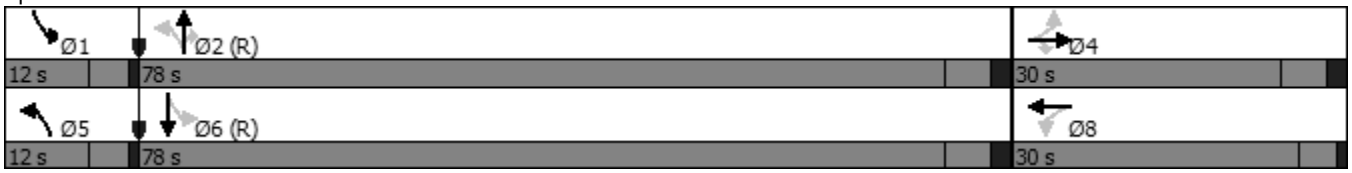
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.2	7.1	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	38%	25%	50%	0%
Vol Thru, %	32%	34%	50%	56%
Vol Right, %	29%	41%	0%	44%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	34	32	4	18
LT Vol	13	8	2	0
Through Vol	11	11	2	10
RT Vol	10	13	0	8
Lane Flow Rate	39	39	16	26
Geometry Grp	1	1	1	1
Degree of Util (X)	0.042	0.043	0.018	0.027
Departure Headway (Hd)	3.913	3.999	4.14	3.756
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	914	895	863	951
Service Time	1.942	2.026	2.172	1.788
HCM Lane V/C Ratio	0.043	0.044	0.019	0.027
HCM Control Delay	7.1	7.2	7.2	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	22	206	42	37	238	301	39	47	669
Future Volume (vph)	1	22	206	42	37	238	301	39	47	669
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Detector Phase	4	4	4	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		24.0	24.0		25.5	82.5	75.0	75.0	80.0	72.0
Actuated g/C Ratio		0.20	0.20		0.21	0.69	0.62	0.62	0.67	0.60
v/c Ratio		0.07	0.45		0.20	0.53	0.15	0.04	0.07	0.35
Control Delay		39.7	8.4		26.8	16.4	1.7	0.2	5.5	12.6
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		39.7	8.4		26.8	16.4	1.7	0.2	5.5	12.6
LOS		D	A		C	B	A	A	A	B
Approach Delay		11.5			26.8		7.7			12.2
Approach LOS		B			C		A			B

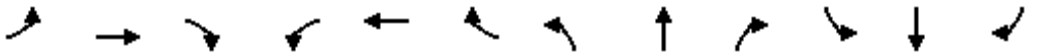
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 83.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	224	128	259	327	42	51	735
v/c Ratio	0.07	0.45	0.20	0.53	0.15	0.04	0.07	0.35
Control Delay	39.7	8.4	26.8	16.4	1.7	0.2	5.5	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	8.4	26.8	16.4	1.7	0.2	5.5	12.6
Queue Length 50th (ft)	16	0	28	36	4	0	10	142
Queue Length 95th (ft)	41	66	56	173	5	0	22	180
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	369	495	638	490	2212	982	737	2120
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.45	0.20	0.53	0.15	0.04	0.07	0.35

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	22	206	42	37	39	238	301	39	47	669	7
Future Volume (veh/h)	1	22	206	42	37	39	238	301	39	47	669	7
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	1	24	224	46	40	42	259	327	42	51	727	8
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	35	392	336	228	196	222	675	2840	1261	912	2819	31
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.10	1.00	1.00	0.03	0.78	0.78
Sat Flow, veh/h	17	1846	1581	837	921	1047	1781	3554	1578	1781	3600	40
Grp Volume(v), veh/h	25	0	224	67	0	61	259	327	42	51	359	376
Grp Sat Flow(s),veh/h/ln	1863	0	1581	1296	0	1510	1781	1777	1578	1781	1777	1863
Q Serve(g_s), s	0.0	0.0	15.6	3.9	0.0	3.9	3.9	0.0	0.0	0.6	6.6	6.6
Cycle Q Clear(g_c), s	1.3	0.0	15.6	5.1	0.0	3.9	3.9	0.0	0.0	0.6	6.6	6.6
Prop In Lane	0.04		1.00	0.68		0.69	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	427	0	336	326	0	321	675	2840	1261	912	1391	1459
V/C Ratio(X)	0.06	0.00	0.67	0.21	0.00	0.19	0.38	0.12	0.03	0.06	0.26	0.26
Avail Cap(c_a), veh/h	427	0	336	326	0	321	696	2840	1261	962	1391	1459
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	0.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	0.0	43.4	39.2	0.0	38.8	2.2	0.0	0.0	2.1	3.5	3.5
Incr Delay (d2), s/veh	0.3	0.0	10.1	1.4	0.0	1.3	0.3	0.1	0.0	0.0	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(50%),veh/ln	0.6	0.0	7.1	1.8	0.0	1.6	0.7	0.0	0.0	0.2	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	0.0	53.4	40.6	0.0	40.1	2.5	0.1	0.0	2.1	4.0	4.0
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		249			128			628			786	
Approach Delay, s/veh		51.9			40.4			1.1			3.9	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	101.9		31.5	10.5	100.0		31.5				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.6	2.0		17.6	5.9	8.6		7.1				
Green Ext Time (p_c), s	0.0	2.4		0.5	0.1	5.1		0.7				

Intersection Summary			
HCM 6th Ctrl Delay		12.2	
HCM 6th LOS		B	

Notes

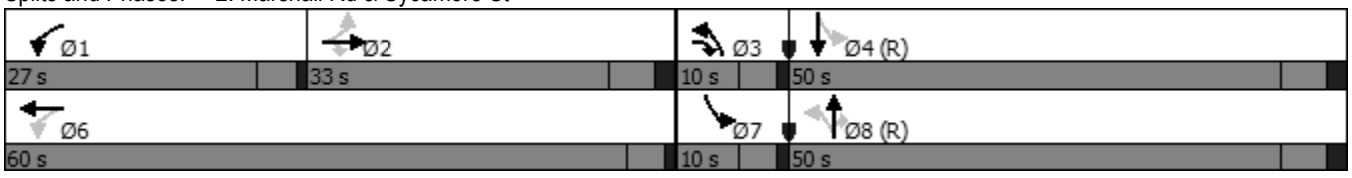
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	18	253	335	34	239	554	202	28	926
Future Volume (vph)	4	18	253	335	34	239	554	202	28	926
Turn Type	Perm	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	3	1	6	3	8		7	4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	2	2	3	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	9.5	9.5	9.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	33.0	33.0	10.0	27.0	60.0	10.0	50.0	50.0	10.0	50.0
Total Split (%)	27.5%	27.5%	8.3%	22.5%	50.0%	8.3%	41.7%	41.7%	8.3%	41.7%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	4.5	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.7	33.8	34.2	34.2	75.9	68.9	68.9	53.7	46.3
Actuated g/C Ratio		0.09	0.28	0.28	0.28	0.63	0.57	0.57	0.45	0.39
v/c Ratio		0.16	0.53	0.86	0.12	0.59	0.30	0.23	0.07	0.74
Control Delay		48.5	24.9	57.3	18.0	33.0	12.3	0.9	11.4	28.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		48.5	24.9	57.3	18.0	33.0	12.3	0.9	11.4	28.4
LOS		D	C	E	B	C	B	A	B	C
Approach Delay		26.8			51.8		15.0			27.9
Approach LOS		C			D		B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 26.4	Intersection LOS: C
Intersection Capacity Utilization 77.2%	ICU Level of Service D
Analysis Period (min) 15	

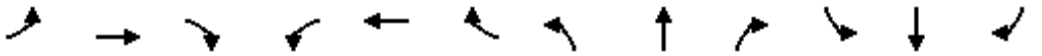
Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	24	275	364	59	260	602	220	30	1015
v/c Ratio	0.16	0.53	0.86	0.12	0.59	0.30	0.23	0.07	0.74
Control Delay	48.5	24.9	57.3	18.0	33.0	12.3	0.9	11.4	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	24.9	57.3	18.0	33.0	12.3	0.9	11.4	28.4
Queue Length 50th (ft)	18	103	250	21	101	91	0	7	364
Queue Length 95th (ft)	38	185	269	40	m#397	201	m16	m22	458
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	390	519	426	820	444	2032	976	401	1365
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.53	0.85	0.07	0.59	0.30	0.23	0.07	0.74

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	18	253	335	34	20	239	554	202	28	926	7
Future Volume (veh/h)	4	18	253	335	34	20	239	554	202	28	926	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		1.00	1.00		0.99	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	20	275	364	37	22	260	602	220	30	1007	8
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	69	307	371	568	443	264	310	1536	680	317	1491	12
Arrive On Green	0.19	0.19	0.19	0.18	0.40	0.40	0.05	0.43	0.43	0.05	0.83	0.83
Sat Flow, veh/h	180	1618	1573	1781	1097	653	1781	3554	1574	1781	3613	29
Grp Volume(v), veh/h	24	0	275	364	0	59	260	602	220	30	495	520
Grp Sat Flow(s),veh/h/ln	1798	0	1573	1781	0	1750	1781	1777	1574	1781	1777	1865
Q Serve(g_s), s	0.0	0.0	19.4	19.0	0.0	2.5	5.5	13.9	11.1	1.1	13.2	13.2
Cycle Q Clear(g_c), s	1.3	0.0	19.4	19.0	0.0	2.5	5.5	13.9	11.1	1.1	13.2	13.2
Prop In Lane	0.17		1.00	1.00		0.37	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	376	0	371	568	0	707	310	1536	680	317	733	770
V/C Ratio(X)	0.06	0.00	0.74	0.64	0.00	0.08	0.84	0.39	0.32	0.09	0.68	0.68
Avail Cap(c_a), veh/h	438	0	426	587	0	809	310	1536	680	352	733	770
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	0.83	0.83	0.83	0.94	0.94	0.94
Uniform Delay (d), s/veh	39.9	0.0	42.5	28.8	0.0	22.1	31.8	23.3	22.5	19.2	7.3	7.3
Incr Delay (d2), s/veh	0.1	0.0	5.9	2.2	0.0	0.1	15.5	0.6	1.0	0.1	4.6	4.4
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(50%),veh/ln	0.6	0.0	8.1	8.4	0.0	1.0	6.1	5.9	4.2	0.5	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	0.0	48.4	31.0	0.0	22.1	47.3	23.9	23.5	19.4	11.9	11.7
LnGrp LOS	D	A	D	C	A	C	D	C	C	B	B	B
Approach Vol, veh/h		299			423			1082			1045	
Approach Delay, s/veh		47.7			29.8			29.5			12.1	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	25.7	28.8	10.0	55.5		54.5	7.7	57.9				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	22.5	27.0	5.5	44.0		* 56	5.5	44.0				
Max Q Clear Time (g_c+I1), s	21.0	21.4	7.5	15.2		4.5	3.1	15.9				
Green Ext Time (p_c), s	0.2	0.5	0.0	7.3		0.3	0.0	5.1				

Intersection Summary												
HCM 6th Ctrl Delay			25.0									
HCM 6th LOS			C									

Notes

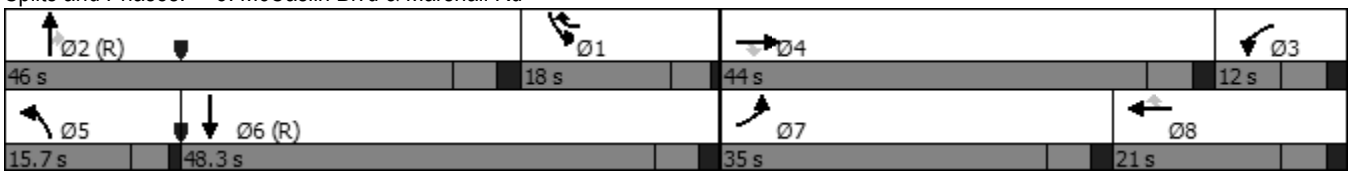
User approved pedestrian interval to be less than phase max green.

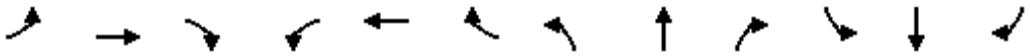
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	975	56	515	104	57	181	225	1377	67	270	1385	701
Future Volume (vph)	975	56	515	104	57	181	225	1377	67	270	1385	701
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	1	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	15.0	5.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	21.0	9.5	9.5	11.0	11.0	9.5	11.0	
Total Split (s)	35.0	44.0	44.0	12.0	21.0	18.0	15.7	46.0	46.0	18.0	48.3	
Total Split (%)	29.2%	36.7%	36.7%	10.0%	17.5%	15.0%	13.1%	38.3%	38.3%	15.0%	40.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	30.1	33.0	33.0	7.8	15.0	26.7	11.0	43.1	43.1	13.5	45.6	120.0
Actuated g/C Ratio	0.25	0.28	0.28	0.06	0.12	0.22	0.09	0.36	0.36	0.11	0.38	1.00
v/c Ratio	0.85	0.12	0.93	0.50	0.27	0.44	0.78	0.82	0.11	0.76	0.78	0.48
Control Delay	43.7	25.5	38.2	63.0	50.9	10.7	70.6	40.3	0.3	65.2	37.2	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.7	25.5	38.2	63.0	50.9	10.7	70.6	40.3	0.3	65.2	37.2	1.0
LOS	D	C	D	E	D	B	E	D	A	E	D	A
Approach Delay		41.2			33.3			42.8			29.6	
Approach LOS		D			C			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 36.6	Intersection LOS: D
Intersection Capacity Utilization 78.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: McCaslin Blvd & Marshall Rd



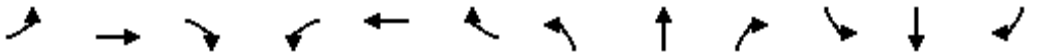


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1060	61	560	113	62	197	245	1497	73	293	1505	762
v/c Ratio	0.85	0.12	0.93	0.50	0.27	0.44	0.78	0.82	0.11	0.76	0.78	0.48
Control Delay	43.7	25.5	38.2	63.0	50.9	10.7	70.6	40.3	0.3	65.2	37.2	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.7	25.5	38.2	63.0	50.9	10.7	70.6	40.3	0.3	65.2	37.2	1.0
Queue Length 50th (ft)	298	33	274	44	44	24	96	399	0	115	390	0
Queue Length 95th (ft)	#352	m44	m#450	#85	88	58	#155	464	0	#173	453	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	1249	589	654	224	232	445	320	1828	684	386	1932	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.10	0.86	0.50	0.27	0.44	0.77	0.82	0.11	0.76	0.78	0.48

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	975	56	515	104	57	181	225	1377	67	270	1385	701
Future Volume (veh/h)	975	56	515	104	57	181	225	1377	67	270	1385	701
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		0.99	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	1060	61	0	113	62	197	245	1497	0	293	1505	0
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	1163	171		917	234	370	300	1702		380	1884	
Arrive On Green	0.23	0.09	0.00	0.27	0.12	0.12	0.09	0.33	0.00	0.11	0.37	0.00
Sat Flow, veh/h	5023	1870	1585	3456	1870	1566	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	1060	61	0	113	62	197	245	1497	0	293	1505	0
Grp Sat Flow(s),veh/h/ln	1674	1870	1585	1728	1870	1566	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	24.7	3.7	0.0	3.0	3.6	4.9	8.4	33.2	0.0	9.9	31.6	0.0
Cycle Q Clear(g_c), s	24.7	3.7	0.0	3.0	3.6	4.9	8.4	33.2	0.0	9.9	31.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1163	171		917	234	370	300	1702		380	1884	
V/C Ratio(X)	0.91	0.36		0.12	0.27	0.53	0.82	0.88		0.77	0.80	
Avail Cap(c_a), veh/h	1214	592		917	234	370	323	1702		389	1884	
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)	0.60	0.60	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.9	51.2	0.0	33.5	47.5	15.5	53.8	37.7	0.0	51.9	33.9	0.0
Incr Delay (d2), s/veh	6.6	0.8	0.0	0.1	0.6	1.5	14.1	6.9	0.0	9.0	3.6	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(50%),veh/ln	10.8	1.8	0.0	1.3	1.7	2.3	4.2	14.7	0.0	4.8	13.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.5	52.0	0.0	33.5	48.1	17.0	67.9	44.6	0.0	60.9	37.5	0.0
LnGrp LOS	D	D		C	D	B	E	D		E	D	
Approach Vol, veh/h		1121			372			1742			1798	
Approach Delay, s/veh		51.5			27.2			47.9			41.3	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.2	46.0	37.8	17.0	14.9	50.3	33.8	21.0
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	13.5	* 40	6.0	38.0	11.2	42.3	29.0	15.0
Max Q Clear Time (g_c+I1), s	11.9	35.2	5.0	5.7	10.4	33.6	26.7	6.9
Green Ext Time (p_c), s	0.2	3.7	0.0	0.3	0.1	6.1	1.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	44.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

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

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	6	31	2	8	0	36	25	5	2	20	38
Future Vol, veh/h	25	6	31	2	8	0	36	25	5	2	20	38
Peak Hour Factor	0.73	0.73	0.73	0.50	0.50	0.50	0.67	0.67	0.67	0.75	0.75	0.75
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	34	8	42	4	16	0	54	37	7	3	27	51
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

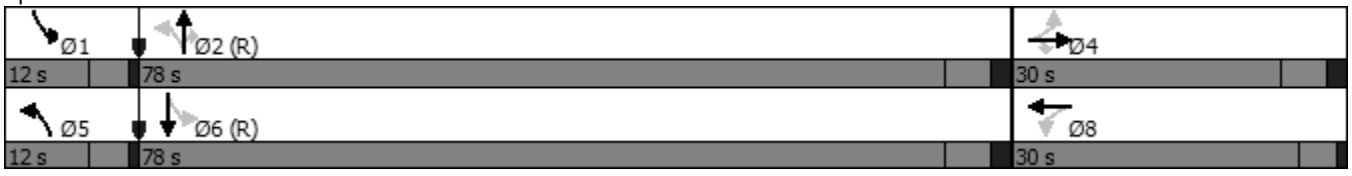
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.5	7.8	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	55%	40%	20%	3%
Vol Thru, %	38%	10%	80%	33%
Vol Right, %	8%	50%	0%	63%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	66	62	10	60
LT Vol	36	25	2	2
Through Vol	25	6	8	20
RT Vol	5	31	0	38
Lane Flow Rate	99	85	20	80
Geometry Grp	1	1	1	1
Degree of Util (X)	0.115	0.094	0.024	0.084
Departure Headway (Hd)	4.207	4.004	4.316	3.784
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	845	882	816	934
Service Time	2.268	2.085	2.411	1.857
HCM Lane V/C Ratio	0.117	0.096	0.025	0.086
HCM Control Delay	7.8	7.5	7.5	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.1	0.3

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	23	35	13	59	312	30	22	190
Future Volume (vph)	7	23	35	13	59	312	30	22	190
Turn Type	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	4			8	5	2		1	6
Permitted Phases		4	8		2		2	6	
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	Ped	Ped	Ped	Ped	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	24.0	24.0		25.5	83.3	77.6	77.6	81.2	74.9
Actuated g/C Ratio	0.20	0.20		0.21	0.69	0.65	0.65	0.68	0.62
v/c Ratio	0.02	0.07		0.12	0.08	0.15	0.03	0.03	0.09
Control Delay	39.0	0.3		27.3	2.0	3.3	0.3	5.3	9.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	0.3		27.3	2.0	3.3	0.3	5.3	9.7
LOS	D	A		C	A	A	A	A	A
Approach Delay	9.7			27.3		2.9			9.3
Approach LOS	A			C		A			A

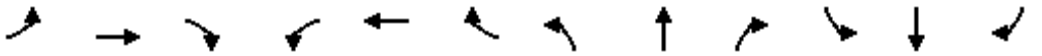
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.15	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	8	25	77	64	339	33	24	207
v/c Ratio	0.02	0.07	0.12	0.08	0.15	0.03	0.03	0.09
Control Delay	39.0	0.3	27.3	2.0	3.3	0.3	5.3	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	0.3	27.3	2.0	3.3	0.3	5.3	9.7
Queue Length 50th (ft)	5	0	17	4	25	0	5	33
Queue Length 95th (ft)	19	0	38	6	15	0	13	51
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	372	367	618	826	2287	1018	744	2207
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.07	0.12	0.08	0.15	0.03	0.03	0.09

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	7	23	35	13	23	59	312	30	22	190	0
Future Volume (veh/h)	0	7	23	35	13	23	59	312	30	22	190	0
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	0	8	25	38	14	25	64	339	33	24	207	0
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	0	160	135	154	52	99	975	2679	1192	848	2630	0
Arrive On Green	0.00	0.09	0.09	0.09	0.09	0.09	0.07	1.00	1.00	0.02	0.74	0.00
Sat Flow, veh/h	0	1870	1579	1156	605	1157	1781	3554	1581	1781	3647	0
Grp Volume(v), veh/h	0	8	25	45	0	32	64	339	33	24	207	0
Grp Sat Flow(s),veh/h/ln	0	1870	1579	1429	0	1489	1781	1777	1581	1781	1777	0
Q Serve(g_s), s	0.0	0.5	1.8	3.1	0.0	2.4	1.0	0.0	0.0	0.4	1.9	0.0
Cycle Q Clear(g_c), s	0.0	0.5	1.8	3.6	0.0	2.4	1.0	0.0	0.0	0.4	1.9	0.0
Prop In Lane	0.00		1.00	0.85		0.78	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	160	135	178	0	127	975	2679	1192	848	2630	0
V/C Ratio(X)	0.00	0.05	0.18	0.25	0.00	0.25	0.07	0.13	0.03	0.03	0.08	0.00
Avail Cap(c_a), veh/h	0	374	316	359	0	316	1021	2679	1192	918	2630	0
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)	0.00	1.00	1.00	1.00	0.00	1.00	0.99	0.99	0.99	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	50.4	51.0	51.8	0.0	51.3	3.0	0.0	0.0	3.4	4.3	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.7	0.7	0.0	1.0	0.0	0.1	0.0	0.0	0.1	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(50%),veh/ln	0.0	0.2	0.7	1.3	0.0	1.0	0.3	0.0	0.0	0.1	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	50.5	51.6	52.5	0.0	52.3	3.0	0.1	0.0	3.4	4.4	0.0
LnGrp LOS	A	D	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		33			77			436			231	
Approach Delay, s/veh		51.4			52.4			0.5			4.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	96.5		16.3	8.9	94.8		16.3				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.4	2.0		3.8	3.0	3.9		5.6				
Green Ext Time (p_c), s	0.0	2.5		0.1	0.0	1.4		0.3				

Intersection Summary		
HCM 6th Ctrl Delay		8.9
HCM 6th LOS		A

Notes

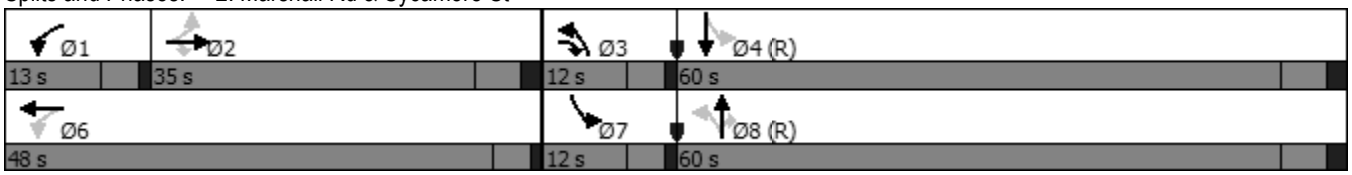
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	10	12	202	169	8	95	386	174	6	248
Future Volume (vph)	10	12	202	169	8	95	386	174	6	248
Turn Type	Perm	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	3	1	6	3	8		7	4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	2	2	3	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	9.5	22.5	9.5	24.0	24.0	9.5	24.0
Total Split (s)	35.0	35.0	12.0	13.0	48.0	12.0	60.0	60.0	12.0	60.0
Total Split (%)	29.2%	29.2%	10.0%	10.8%	40.0%	10.0%	50.0%	50.0%	10.0%	50.0%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	4.5	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		11.2	16.7	20.9	20.9	89.4	86.4	86.4	84.3	77.1
Actuated g/C Ratio		0.09	0.14	0.17	0.17	0.74	0.72	0.72	0.70	0.64
v/c Ratio		0.16	0.54	0.82	0.05	0.13	0.16	0.16	0.01	0.12
Control Delay		48.1	9.2	70.7	23.4	4.4	5.4	0.4	7.2	8.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		48.1	9.2	70.7	23.4	4.4	5.4	0.4	7.2	8.6
LOS		D	A	E	C	A	A	A	A	A
Approach Delay		13.1			66.9		3.9			8.6
Approach LOS		B			E		A			A

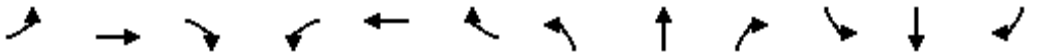
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 56.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	24	220	184	16	103	420	189	7	275
v/c Ratio	0.16	0.54	0.82	0.05	0.13	0.16	0.16	0.01	0.12
Control Delay	48.1	9.2	70.7	23.4	4.4	5.4	0.4	7.2	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	9.2	70.7	23.4	4.4	5.4	0.4	7.2	8.6
Queue Length 50th (ft)	18	0	132	6	11	26	0	1	32
Queue Length 95th (ft)	38	52	159	20	42	89	0	7	53
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	380	415	225	635	810	2548	1165	726	2267
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.53	0.82	0.03	0.13	0.16	0.16	0.01	0.12

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	12	202	169	8	6	95	386	174	6	248	5
Future Volume (veh/h)	10	12	202	169	8	6	95	386	174	6	248	5
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	11	13	220	184	9	7	103	420	189	7	270	5
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	146	158	313	354	259	202	676	2089	930	508	1985	37
Arrive On Green	0.16	0.16	0.16	0.07	0.27	0.27	0.04	0.59	0.59	0.00	0.18	0.18
Sat Flow, veh/h	648	999	1579	1781	974	758	1781	3554	1582	1781	3569	66
Grp Volume(v), veh/h	24	0	220	184	0	16	103	420	189	7	134	141
Grp Sat Flow(s),veh/h/ln	1648	0	1579	1781	0	1732	1781	1777	1582	1781	1777	1858
Q Serve(g_s), s	0.0	0.0	15.6	8.5	0.0	0.8	2.9	6.6	6.7	0.2	7.6	7.6
Cycle Q Clear(g_c), s	1.3	0.0	15.6	8.5	0.0	0.8	2.9	6.6	6.7	0.2	7.6	7.6
Prop In Lane	0.46		1.00	1.00		0.44	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	304	0	313	354	0	461	676	2089	930	508	988	1034
V/C Ratio(X)	0.08	0.00	0.70	0.52	0.00	0.03	0.15	0.20	0.20	0.01	0.14	0.14
Avail Cap(c_a), veh/h	439	0	446	354	0	628	715	2089	930	603	988	1034
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	0.0	44.8	38.8	0.0	32.6	10.2	11.6	11.6	11.5	24.8	24.9
Incr Delay (d2), s/veh	0.1	0.0	2.9	1.3	0.0	0.0	0.1	0.2	0.4	0.0	0.3	0.3
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(50%),veh/ln	0.6	0.0	6.3	0.1	0.0	0.4	1.1	2.6	2.4	0.1	3.4	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	0.0	47.7	40.2	0.0	32.7	10.3	11.8	12.0	11.5	25.1	25.1
LnGrp LOS	D	A	D	D	A	C	B	B	B	B	C	C
Approach Vol, veh/h		244			200			712			282	
Approach Delay, s/veh		47.3			39.6			11.6			24.8	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	13.0	24.9	9.3	72.7		37.9	5.5	76.5				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	8.5	29.0	7.5	54.0		* 44	7.5	54.0				
Max Q Clear Time (g_c+I1), s	10.5	17.6	4.9	9.6		2.8	2.2	8.7				
Green Ext Time (p_c), s	0.0	0.6	0.0	1.6		0.1	0.0	3.6				

Intersection Summary		
HCM 6th Ctrl Delay		24.1
HCM 6th LOS		C

Notes

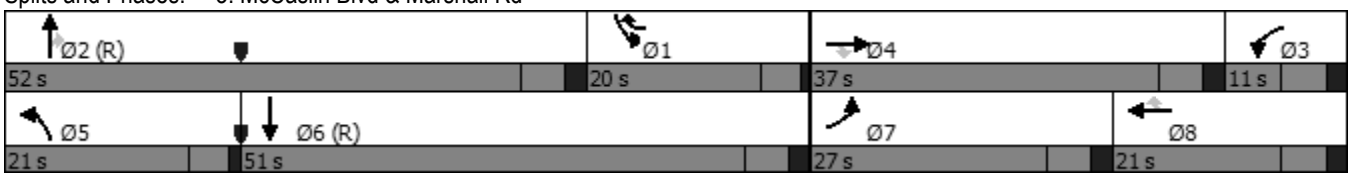
User approved pedestrian interval to be less than phase max green.

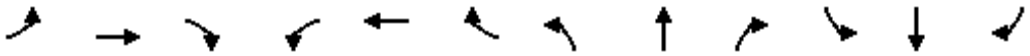
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	538	26	95	42	24	104	240	1163	98	216	1166	436
Future Volume (vph)	538	26	95	42	24	104	240	1163	98	216	1166	436
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	1	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	15.0	5.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	21.0	9.5	9.5	11.0	11.0	9.5	11.0	
Total Split (s)	27.0	37.0	37.0	11.0	21.0	20.0	21.0	52.0	52.0	20.0	51.0	
Total Split (%)	22.5%	30.8%	30.8%	9.2%	17.5%	16.7%	17.5%	43.3%	43.3%	16.7%	42.5%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	19.0	13.6	13.6	14.3	15.0	25.4	14.0	56.4	56.4	15.5	57.9	120.0
Actuated g/C Ratio	0.16	0.11	0.11	0.12	0.12	0.21	0.12	0.47	0.47	0.13	0.48	1.00
v/c Ratio	0.74	0.13	0.31	0.11	0.11	0.26	0.65	0.53	0.13	0.53	0.52	0.30
Control Delay	60.1	52.3	6.7	47.1	48.0	4.2	58.4	25.5	0.3	53.7	24.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	52.3	6.7	47.1	48.0	4.2	58.4	25.5	0.3	53.7	24.9	0.5
LOS	E	D	A	D	D	A	E	C	A	D	C	A
Approach Delay		52.1			21.1			29.1			22.5	
Approach LOS		D			C			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 29.5	Intersection LOS: C
Intersection Capacity Utilization 65.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: McCaslin Blvd & Marshall Rd

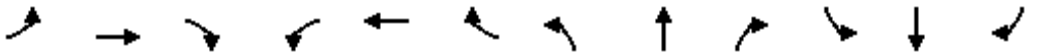




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	585	28	103	46	26	113	261	1264	107	235	1267	474
v/c Ratio	0.74	0.13	0.31	0.11	0.11	0.26	0.65	0.53	0.13	0.53	0.52	0.30
Control Delay	60.1	52.3	6.7	47.1	48.0	4.2	58.4	25.5	0.3	53.7	24.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	52.3	6.7	47.1	48.0	4.2	58.4	25.5	0.3	53.7	24.9	0.5
Queue Length 50th (ft)	160	22	7	14	18	0	100	283	0	89	279	0
Queue Length 95th (ft)	m201	m39	m13	38	46	24	142	342	0	131	349	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	873	481	534	408	232	430	472	2391	836	443	2454	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.06	0.19	0.11	0.11	0.26	0.55	0.53	0.13	0.53	0.52	0.30

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	538	26	95	42	24	104	240	1163	98	216	1166	436
Future Volume (veh/h)	538	26	95	42	24	104	240	1163	98	216	1166	436
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		0.99	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	585	28	0	46	26	113	261	1264	0	235	1267	0
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	702	117		698	234	437	326	1957		525	2316	
Arrive On Green	0.14	0.06	0.00	0.20	0.12	0.12	0.09	0.38	0.00	0.15	0.45	0.00
Sat Flow, veh/h	5023	1870	1585	3456	1870	1574	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	585	28	0	46	26	113	261	1264	0	235	1267	0
Grp Sat Flow(s),veh/h/ln	1674	1870	1585	1728	1870	1574	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	13.6	1.7	0.0	1.3	1.5	1.8	8.9	24.3	0.0	7.4	21.6	0.0
Cycle Q Clear(g_c), s	13.6	1.7	0.0	1.3	1.5	1.8	8.9	24.3	0.0	7.4	21.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	702	117		698	234	437	326	1957		525	2316	
V/C Ratio(X)	0.83	0.24		0.07	0.11	0.26	0.80	0.65		0.45	0.55	
Avail Cap(c_a), veh/h	879	483		698	234	438	475	1957		525	2316	
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)	0.90	0.90	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.3	53.5	0.0	38.7	46.6	14.5	53.2	30.3	0.0	46.3	23.8	0.0
Incr Delay (d2), s/veh	5.1	0.9	0.0	0.0	0.2	0.3	6.1	1.7	0.0	0.6	0.9	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(50%),veh/ln	6.0	0.8	0.0	0.6	0.7	1.4	4.1	10.2	0.0	3.2	8.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.4	54.5	0.0	38.8	46.8	14.8	59.4	32.0	0.0	46.9	24.8	0.0
LnGrp LOS	E	D		D	D	B	E	C		D	C	
Approach Vol, veh/h		613			185			1525			1502	
Approach Delay, s/veh		55.3			25.2			36.7			28.2	
Approach LOS		E			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.2	52.0	30.2	13.5	15.8	60.4	22.8	21.0
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	15.5	* 46	5.0	31.0	16.5	45.0	21.0	15.0
Max Q Clear Time (g_c+I1), s	9.4	26.3	3.3	3.7	10.9	23.6	15.6	3.8
Green Ext Time (p_c), s	0.4	9.2	0.0	0.1	0.4	9.7	1.2	0.3

Intersection Summary	
HCM 6th Ctrl Delay	35.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

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

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	13	14	22	5	0	14	30	26	0	38	10
Future Vol, veh/h	9	13	14	22	5	0	14	30	26	0	38	10
Peak Hour Factor	0.83	0.92	0.83	0.92	0.92	0.92	0.88	0.88	0.92	0.92	0.69	0.69
Heavy Vehicles, %	10	2	10	2	2	2	0	0	2	2	0	0
Mvmt Flow	11	14	17	24	5	0	16	34	28	0	55	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

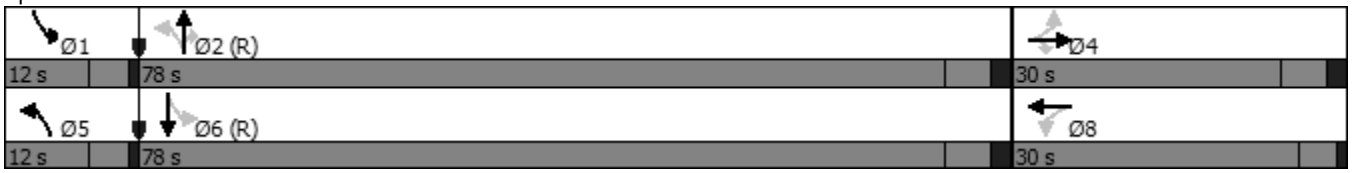
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.6	7.3	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	25%	81%	0%
Vol Thru, %	43%	36%	19%	79%
Vol Right, %	37%	39%	0%	21%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	36	27	48
LT Vol	14	9	22	0
Through Vol	30	13	5	38
RT Vol	26	14	0	10
Lane Flow Rate	78	42	29	70
Geometry Grp	1	1	1	1
Degree of Util (X)	0.085	0.048	0.036	0.076
Departure Headway (Hd)	3.893	4.166	4.386	3.958
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	913	852	809	898
Service Time	1.946	2.23	2.452	2.012
HCM Lane V/C Ratio	0.085	0.049	0.036	0.078
HCM Control Delay	7.3	7.4	7.6	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.1	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	1	25	206	42	40	238	301	39	49	669
Future Volume (vph)	1	25	206	42	40	238	301	39	49	669
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Detector Phase	4	4	4	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	16.0	16.0	14.5	14.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	12.0	78.0	78.0	12.0	78.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	10.0%	65.0%	65.0%	10.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	6.0		4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		24.0	24.0		25.5	82.5	75.0	75.0	80.0	72.0
Actuated g/C Ratio		0.20	0.20		0.21	0.69	0.62	0.62	0.67	0.60
v/c Ratio		0.08	0.45		0.21	0.53	0.15	0.04	0.07	0.35
Control Delay		39.8	8.4		27.0	16.4	1.7	0.2	5.5	12.6
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		39.8	8.4		27.0	16.4	1.7	0.2	5.5	12.6
LOS		D	A		C	B	A	A	A	B
Approach Delay		11.9			27.0		7.7			12.2
Approach LOS		B			C		A			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 83.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Marshall Rd & Center Dr



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	224	132	259	327	42	53	735
v/c Ratio	0.08	0.45	0.21	0.53	0.15	0.04	0.07	0.35
Control Delay	39.8	8.4	27.0	16.4	1.7	0.2	5.5	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	8.4	27.0	16.4	1.7	0.2	5.5	12.6
Queue Length 50th (ft)	18	0	29	36	4	0	11	142
Queue Length 95th (ft)	44	66	57	172	5	0	23	180
Internal Link Dist (ft)	493		184		692			330
Turn Bay Length (ft)		100		425		175	165	
Base Capacity (vph)	370	495	641	489	2211	981	737	2120
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.45	0.21	0.53	0.15	0.04	0.07	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	25	206	42	40	40	238	301	39	49	669	7
Future Volume (veh/h)	1	25	206	42	40	40	238	301	39	49	669	7
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	1	27	224	46	43	43	259	327	42	53	727	8
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	34	393	336	223	204	221	675	2838	1260	912	2819	31
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.10	1.00	1.00	0.03	0.78	0.78
Sat Flow, veh/h	14	1850	1581	814	962	1038	1781	3554	1578	1781	3600	40
Grp Volume(v), veh/h	28	0	224	69	0	63	259	327	42	53	359	376
Grp Sat Flow(s),veh/h/ln	1864	0	1581	1302	0	1512	1781	1777	1578	1781	1777	1863
Q Serve(g_s), s	0.0	0.0	15.6	3.9	0.0	4.1	3.9	0.0	0.0	0.7	6.6	6.6
Cycle Q Clear(g_c), s	1.4	0.0	15.6	5.3	0.0	4.1	3.9	0.0	0.0	0.7	6.6	6.6
Prop In Lane	0.04		1.00	0.66		0.69	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	427	0	336	327	0	321	675	2838	1260	912	1391	1459
V/C Ratio(X)	0.07	0.00	0.67	0.21	0.00	0.20	0.38	0.12	0.03	0.06	0.26	0.26
Avail Cap(c_a), veh/h	427	0	336	327	0	321	696	2838	1260	962	1391	1459
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	0.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	0.0	43.4	39.2	0.0	38.8	2.2	0.0	0.0	2.1	3.5	3.5
Incr Delay (d2), s/veh	0.3	0.0	10.1	1.5	0.0	1.4	0.3	0.1	0.0	0.0	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(50%),veh/ln	0.7	0.0	7.1	1.9	0.0	1.7	0.7	0.0	0.0	0.2	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.1	0.0	53.4	40.7	0.0	40.2	2.5	0.1	0.0	2.1	4.0	4.0
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		252			132			628			788	
Approach Delay, s/veh		51.7			40.5			1.1			3.9	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	101.9		31.5	10.5	100.0		31.5				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		* 6				
Max Green Setting (Gmax), s	7.5	72.0		24.0	7.5	72.0		* 26				
Max Q Clear Time (g_c+I1), s	2.7	2.0		17.6	5.9	8.6		7.3				
Green Ext Time (p_c), s	0.0	2.4		0.5	0.1	5.1		0.7				

Intersection Summary		
HCM 6th Ctrl Delay		12.3
HCM 6th LOS		B

Notes

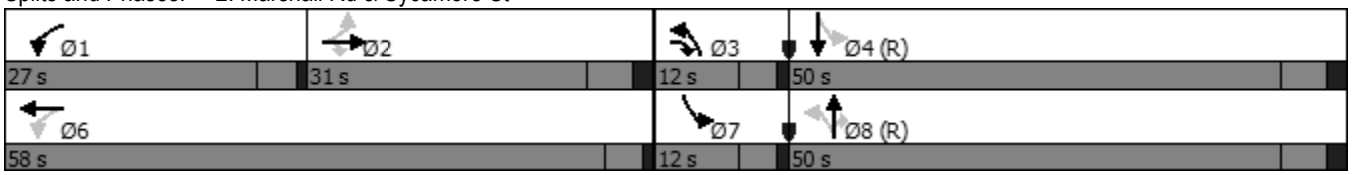
User approved pedestrian interval to be less than phase max green.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	20	253	382	35	239	554	255	28	926
Future Volume (vph)	4	20	253	382	35	239	554	255	28	926
Turn Type	Perm	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		2	3	1	6	3	8		7	4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	2	2	3	1	6	3	8	8	7	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	11.0	9.5	9.5	9.5	9.5	11.0	11.0	9.5	11.0
Total Split (s)	31.0	31.0	12.0	27.0	58.0	12.0	50.0	50.0	12.0	50.0
Total Split (%)	25.8%	25.8%	10.0%	22.5%	48.3%	10.0%	41.7%	41.7%	10.0%	41.7%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0	4.5	4.5	4.5	4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lag	Lag	Lead	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.4	32.4	34.1	34.1	76.0	68.6	68.6	55.2	47.4
Actuated g/C Ratio		0.09	0.27	0.28	0.28	0.63	0.57	0.57	0.46	0.40
v/c Ratio		0.17	0.56	0.98	0.12	0.60	0.30	0.28	0.07	0.73
Control Delay		49.7	29.2	79.4	18.4	32.2	12.5	0.9	11.0	27.5
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		49.7	29.2	79.4	18.4	32.2	12.5	0.9	11.0	27.5
LOS		D	C	E	B	C	B	A	B	C
Approach Delay		31.0			71.7		14.2			27.0
Approach LOS		C			E		B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 29.6	Intersection LOS: C
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Marshall Rd & Sycamore St



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	26	275	415	60	260	602	277	30	1015
v/c Ratio	0.17	0.56	0.98	0.12	0.60	0.30	0.28	0.07	0.73
Control Delay	49.7	29.2	79.4	18.4	32.2	12.5	0.9	11.0	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	29.2	79.4	18.4	32.2	12.5	0.9	11.0	27.5
Queue Length 50th (ft)	20	119	295	21	99	92	0	7	358
Queue Length 95th (ft)	42	201	326	42	m#367	207	m17	m21	458
Internal Link Dist (ft)	356			327		1089			692
Turn Bay Length (ft)		160	100		400			120	
Base Capacity (vph)	362	487	422	792	435	2022	997	431	1396
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.56	0.98	0.08	0.60	0.30	0.28	0.07	0.73

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	20	253	382	35	20	239	554	255	28	926	7
Future Volume (veh/h)	4	20	253	382	35	20	239	554	255	28	926	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		1.00	1.00		0.99	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	22	275	415	38	22	260	602	277	30	1007	8
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	64	304	389	580	454	263	312	1517	672	302	1412	11
Arrive On Green	0.18	0.18	0.18	0.19	0.41	0.41	0.06	0.43	0.43	0.05	0.78	0.78
Sat Flow, veh/h	157	1649	1572	1781	1110	642	1781	3554	1574	1781	3613	29
Grp Volume(v), veh/h	26	0	275	415	0	60	260	602	277	30	495	520
Grp Sat Flow(s),veh/h/ln	1807	0	1572	1781	0	1752	1781	1777	1574	1781	1777	1865
Q Serve(g_s), s	0.0	0.0	19.2	22.3	0.0	2.5	7.5	14.0	14.7	1.2	16.5	16.5
Cycle Q Clear(g_c), s	1.4	0.0	19.2	22.3	0.0	2.5	7.5	14.0	14.7	1.2	16.5	16.5
Prop In Lane	0.15		1.00	1.00		0.37	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	367	0	389	580	0	717	312	1517	672	302	694	729
V/C Ratio(X)	0.07	0.00	0.71	0.72	0.00	0.08	0.83	0.40	0.41	0.10	0.71	0.71
Avail Cap(c_a), veh/h	410	0	427	580	0	781	312	1517	672	367	694	729
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	0.81	0.81	0.81	0.94	0.94	0.94
Uniform Delay (d), s/veh	40.5	0.0	41.3	29.3	0.0	21.7	29.3	23.7	23.9	20.6	9.8	9.8
Incr Delay (d2), s/veh	0.1	0.0	4.8	4.2	0.0	0.0	14.5	0.6	1.5	0.1	5.8	5.5
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(50%),veh/ln	0.6	0.0	7.8	10.1	0.0	1.1	4.9	5.9	5.7	0.5	4.5	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	0.0	46.1	33.5	0.0	21.7	43.8	24.3	25.4	20.7	15.6	15.3
LnGrp LOS	D	A	D	C	A	C	D	C	C	C	B	B
Approach Vol, veh/h		301			475			1139			1045	
Approach Delay, s/veh		45.6			32.0			29.0			15.6	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	27.0	28.1	12.0	52.9		55.1	7.7	57.2				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0		* 6	4.5	6.0				
Max Green Setting (Gmax), s	22.5	25.0	7.5	44.0		* 54	7.5	44.0				
Max Q Clear Time (g_c+I1), s	24.3	21.2	9.5	18.5		4.5	3.2	16.7				
Green Ext Time (p_c), s	0.0	0.4	0.0	7.0		0.3	0.0	5.3				

Intersection Summary			
HCM 6th Ctrl Delay		26.5	
HCM 6th LOS		C	

Notes

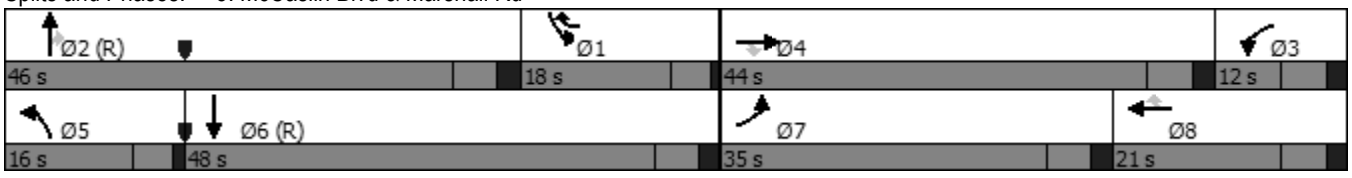
User approved pedestrian interval to be less than phase max green.

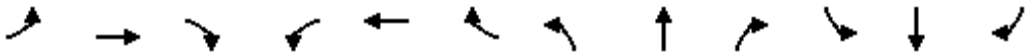
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1018	56	518	104	57	181	229	1377	67	270	1385	749
Future Volume (vph)	1018	56	518	104	57	181	229	1377	67	270	1385	749
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Free
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			Free
Detector Phase	7	4	4	3	8	1	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	15.0	15.0	5.0	15.0	5.0	4.5	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	21.0	21.0	11.0	21.0	9.5	9.5	11.0	11.0	9.5	11.0	
Total Split (s)	35.0	44.0	44.0	12.0	21.0	18.0	16.0	46.0	46.0	18.0	48.0	
Total Split (%)	29.2%	36.7%	36.7%	10.0%	17.5%	15.0%	13.3%	38.3%	38.3%	15.0%	40.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	30.0	32.9	32.9	7.9	15.0	26.7	11.3	43.2	43.2	13.5	45.4	120.0
Actuated g/C Ratio	0.25	0.27	0.27	0.07	0.12	0.22	0.09	0.36	0.36	0.11	0.38	1.00
v/c Ratio	0.89	0.12	0.94	0.50	0.27	0.44	0.77	0.82	0.11	0.76	0.78	0.51
Control Delay	47.7	27.0	38.9	62.8	50.9	10.7	69.8	40.2	0.3	65.2	37.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	27.0	38.9	62.8	50.9	10.7	69.8	40.2	0.3	65.2	37.4	1.2
LOS	D	C	D	E	D	B	E	D	A	E	D	A
Approach Delay		44.1			33.2			42.7			29.2	
Approach LOS		D			C			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 37.1	Intersection LOS: D
Intersection Capacity Utilization 78.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: McCaslin Blvd & Marshall Rd



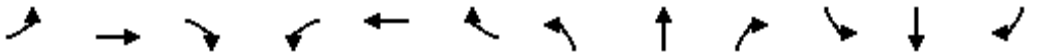


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1107	61	563	113	62	197	249	1497	73	293	1505	814
v/c Ratio	0.89	0.12	0.94	0.50	0.27	0.44	0.77	0.82	0.11	0.76	0.78	0.51
Control Delay	47.7	27.0	38.9	62.8	50.9	10.7	69.8	40.2	0.3	65.2	37.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	27.0	38.9	62.8	50.9	10.7	69.8	40.2	0.3	65.2	37.4	1.2
Queue Length 50th (ft)	314	35	278	44	44	24	98	399	0	115	391	0
Queue Length 95th (ft)	m#363	m44	m#413	#85	88	58	#155	464	0	#173	455	0
Internal Link Dist (ft)		1089			358			498			562	
Turn Bay Length (ft)	385		265	120		120	180		125	220		200
Base Capacity (vph)	1247	589	658	225	232	445	328	1831	685	386	1924	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.10	0.86	0.50	0.27	0.44	0.76	0.82	0.11	0.76	0.78	0.51

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1018	56	518	104	57	181	229	1377	67	270	1385	749
Future Volume (veh/h)	1018	56	518	104	57	181	229	1377	67	270	1385	749
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		0.99	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	1107	61	0	113	62	197	249	1497	0	293	1505	0
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	1192	290		716	234	361	305	1702		361	1848	
Arrive On Green	0.24	0.15	0.00	0.21	0.12	0.12	0.09	0.33	0.00	0.10	0.36	0.00
Sat Flow, veh/h	5023	1870	1585	3456	1870	1566	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	1107	61	0	113	62	197	249	1497	0	293	1505	0
Grp Sat Flow(s),veh/h/ln	1674	1870	1585	1728	1870	1566	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	25.9	3.4	0.0	3.2	3.6	5.0	8.5	33.2	0.0	10.0	32.0	0.0
Cycle Q Clear(g_c), s	25.9	3.4	0.0	3.2	3.6	5.0	8.5	33.2	0.0	10.0	32.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1192	290		716	234	361	305	1702		361	1848	
V/C Ratio(X)	0.93	0.21		0.16	0.27	0.55	0.82	0.88		0.81	0.81	
Avail Cap(c_a), veh/h	1214	592		716	234	361	331	1702		389	1848	
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)	0.56	0.56	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.8	44.3	0.0	39.0	47.5	15.7	53.8	37.7	0.0	52.6	34.6	0.0
Incr Delay (d2), s/veh	7.7	0.2	0.0	0.1	0.6	1.7	13.8	6.9	0.0	11.7	4.1	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(50%),veh/ln	11.4	1.6	0.0	1.4	1.7	2.3	4.3	14.7	0.0	4.9	13.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.4	44.5	0.0	39.1	48.1	17.4	67.5	44.6	0.0	64.2	38.7	0.0
LnGrp LOS	D	D		D	D	B	E	D		E	D	
Approach Vol, veh/h		1168			372			1746			1798	
Approach Delay, s/veh		52.0			29.1			47.9			42.9	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.5	46.0	30.9	24.6	15.1	49.4	34.5	21.0
Change Period (Y+Rc), s	6.0	* 6	6.0	6.0	4.5	6.0	6.0	6.0
Max Green Setting (Gmax), s	13.5	* 40	6.0	38.0	11.5	42.0	29.0	15.0
Max Q Clear Time (g_c+I1), s	12.0	35.2	5.2	5.4	10.5	34.0	27.9	7.0
Green Ext Time (p_c), s	0.2	3.7	0.0	0.3	0.1	5.7	0.6	0.6

Intersection Summary	
HCM 6th Ctrl Delay	45.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

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

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	26	9	32	22	10	0	37	42	27	2	34	39
Future Vol, veh/h	26	9	32	22	10	0	37	42	27	2	34	39
Peak Hour Factor	0.73	0.92	0.73	0.92	0.92	0.92	0.67	0.67	0.92	0.92	0.75	0.75
Heavy Vehicles, %	0	2	0	2	2	2	0	0	2	2	0	0
Mvmt Flow	36	10	44	24	11	0	55	63	29	2	45	52
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	7.9	8.1	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	35%	39%	69%	3%
Vol Thru, %	40%	13%	31%	45%
Vol Right, %	25%	48%	0%	52%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	106	67	32	75
LT Vol	37	26	22	2
Through Vol	42	9	10	34
RT Vol	27	32	0	39
Lane Flow Rate	147	89	35	100
Geometry Grp	1	1	1	1
Degree of Util (X)	0.172	0.106	0.045	0.112
Departure Headway (Hd)	4.21	4.263	4.703	4.063
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	857	843	763	886
Service Time	2.21	2.277	2.719	2.074
HCM Lane V/C Ratio	0.172	0.106	0.046	0.113
HCM Control Delay	8.1	7.8	7.9	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.4	0.1	0.4

JVA, Incorporated
1319 Spruce Street
Boulder, CO 80302
303.444.1951
info@jvajva.com

www.jvajva.com

July 21, 2022

BCHA SUPERIOR TOD

Water Utilities

Description

1. Water line installation shall conform to all state and local requirements and includes the following: Installation of approved PVC, ductile iron, or copper pipe with a minimum of 4.5-ft of cover from final grade; connection to existing the existing water main within the Town of Superior; and chlorination and flushing of finished water line per Town's standards. All new water lines shall meet required test standards.
2. It is anticipated two or more new hydrants will be needed for the proposed buildings; there are two existing fire hydrants within the parking lot but may not be sufficient to service the two buildings. There is an existing 6-in water main along Center drive and the west drive of the parking lot. It is anticipated that the 6-in water main may have to be looped around the exterior drive of the north parking lot to provide additional fire hydrants along the east side of the building.
3. Each building is expected to have a 3-in domestic water meter and 6-in fire service line. Irrigation will have a separate meter that can be connected to the existing 8-in reclaimed water line located along the west drive of the buildings. Final domestic and fire service tap sizes and locations will be coordinated with the project mechanical engineer. Irrigation facilities, as designed by the landscape architect

Sanitary Sewer

Description

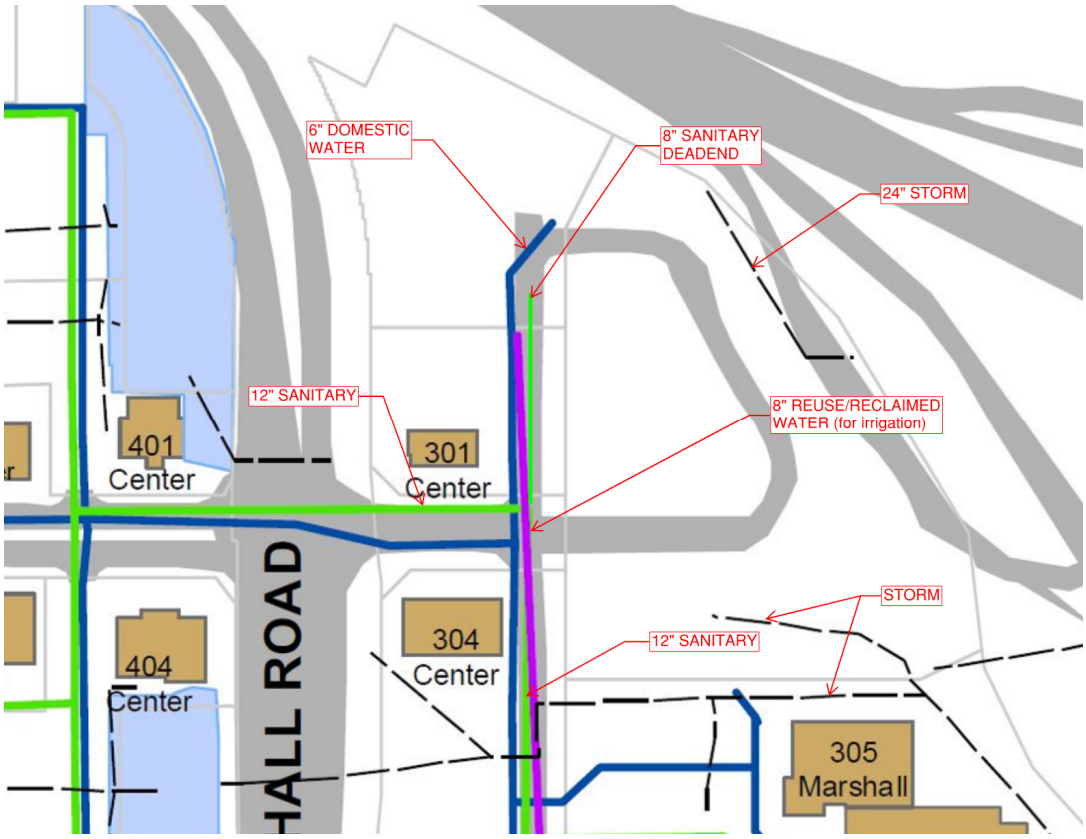
1. Sanitary sewer installation shall conform to all state and local requirements. There is a 12-in sanitary main that runs parallel to the water main along Center Drive and becomes 8-in along the west drive of the parking lot. The 8-in sanitary line dead ends at the pedestrian bridge over US-36.
2. It is anticipated that each building will require a 6-in sanitary service line and will connect to the existing 8-in along the west drive. The sanitary connection for the proposed building will be coordinated with The Town of Superior Sanitation District. Service sizing for the proposed building will be coordinated with the project mechanical. Cleanouts will be provided as needed and spaced every 100 feet and at every bend of the service line. The location of the proposed building's sanitary sewer service connection will be coordinated with the design team. The project's grease interceptor, if needed, will be designed by the mechanical engineer.

Storm Drainage

Description

1. The existing site generally slopes from the west to the east with the majority of storm water runoff being captured by an existing storm sewer system that conveys runoff to the existing water quality detention ponds to the east of the site. The existing site consists of asphalt parking lots, and concrete drives and sidewalk.

2. A new storm sewer system will be constructed to serve the proposed developed site and tie into the existing system. The proposed building roof drains will connect to the proposed onsite storm infrastructure. It is not anticipated that the proposed building and surrounding development will increase the overall site imperviousness; therefore, there shouldn't be an increase in developed flows either. It is assumed that, since an increase in imperviousness is not anticipated, the existing water quality and detention ponds will be able to continue to provide water quality and detention to the site.



GIS Map of existing utilities from Town of Superior

From: Bill Brown
To: Steven Williams
Cc: Martin Toth; Renae Stavros; Geoffrey Weathers; Jill Mendoza; Tony DeSimone; Dan Craine; John Lato; Matthew Berger
Subject: Brixmor application @ Superior Marketplace
Date: Friday, May 13, 2022 10:01:08 AM
Attachments: image003.png
image004.png
image005.png
image001.png

Steven,

Thank you for the message and we remain very supportive of the BCHA rezone application. In order to better understand your request and the impact to the Marketplace property and future application, would you be available for a call early next week to discuss? We have completed our agreement with Confluence Group for the future redevelopment of the multi-family residential project and have commence our effort to initiate tenant discussions to allow such development. Therefore, our clock has started, and we are excited to expedite the effort.

If you could forward a convenient time / day for a call next week, I will confirm accordingly.

Thank you in advance of your time.

With appreciation.

Bill

Bill Brown
EVP, Development/Redevelopment
> Direct 646.344.8631 > Cell 949.359.1908
BRIXMOR Property Group Our center is you

From: Steven Williams <stevenw@superiorcolorado.gov>
Sent: Friday, May 13, 2022 9:24 AM
To: Bill Brown <Bill.Brown@brixmor.com>; Matthew Berger <matthew.berger@brixmor.com>; John Lato <John.Lato@brixmor.com>
Cc: Martin Toth <MartinT@superiorcolorado.gov>; Renae Stavros <renaes@superiorcolorado.gov>; Geoffrey Weathers <geoffreyw@superiorcolorado.gov>; Jill Mendoza <jillm@superiorcolorado.gov>
Subject: BCHA application - request for referral

WARNING EXTERNAL EMAIL: Please be cautious.

Good morning Bill,

I hope you are doing well. As you are aware, the rezoning proposal from BCHA for the RTD property within the Superior Marketplace is going to Planning Commission for consideration this month and the Town Board in June.

Staff has requested the application materials be updated slightly for better clarity and consistency with the existing Planned Development. Recent additions include distinguishing that this use allowance will not impact the existing development allowances of the broader Marketplace PD. That is, this is a net new request for additional development allowances that will not impact the existing development potential of the other areas. In short, the PD identified pad sites for development. The RTD was not noted as a pad site. This rezoning would designate it as one with specific development parameters outlined through this PD amendment.

BCHA is also still working their way through the RTD application process. RTD has provided a referral letter in support of the BCHA proposal. We are seeking comparable referral letters from other stakeholders in the area, if possible. The RTD letter is required as they are the property owner. A referral from Brixmor, however, would also be helpful for our Planning Commission and elected officials as they consider this proposal.

The links to the updates plan sheet are available through our Recent Development Application webpage. https://www.superiorcolorado.gov/departments/planning/recent-development-projects

I have also include a screen shot to direct you to these documents, which also includes the RTD letter. Please let me know if the Town can expect a referral letter from Brixmor a well.

Rezoning request for Superior Marketplace Planned Development/Zone District Plan Amendment, located on the current Regional Transportation District parcel in the northeast corner of the Superior Marketplace shopping center (Boulder County Housing Authority).
****This proposal will be considered by Planning Commission Tuesday 5/17 @ 7pm****

- Project Narrative
- RTD Rezone Support Letter
- Revised Planned Development Sheets

Let me know if you have any questions.

Thanks,

STEVEN WILLIAMS

Planning and Building Director
Town of Superior
124 E. Coal Creek Drive, Superior, CO 80027
303.499.3675 x.131
Facebook | Twitter | Instagram

We make lives better
through connections.

April 25, 2022

Board of Trustees
Town of Superior
Superior Town Hall
124 E. Coal Creek Drive
Superior, CO 80027

Subject: Superior TOD Rezoning Application

Dear Town of Superior Board of Trustees,

Please accept this letter of support for the proposed rezoning of the RTD Park-n-ride site at U.S. 36 and McCaslin Boulevard. Increasing maximum densities and residential use that accommodate parking for transit customers are consistent with RTD policy as well as best practices for Transit-Oriented Development. As the property owner, RTD expects to sign the Amended PD once approved by the Board.

RTD follows an unsolicited proposal procedure for joint development on its properties. This is a competitive process for the selection of a developer and proposal for the redevelopment of any RTD properties. Currently, Boulder County Housing Authority (BCHA) has completed the second step in the procedure, which is a technical review to determine if there are any fatal flaws in the proposal. Further discussions will be required before BCHA is ready to initiate the third step in the process and submit the unsolicited proposal (U.P.) to RTD.

At this time, RTD has not selected BCHA as the site's developer and has not approved the project BCHA designed. If the Superior Board approves the rezoning, and if BCHA submits an U.P., RTD will then determine whether the U.P. meets RTD's operational and policy goals. If RTD determines that the U.P. has merit, RTD will issue a request for alternate proposals in order to ensure a competitive process and secure the best project for the site. More details on RTD's unsolicited proposal procedure can be found here: https://www.rtd-denver.com/unsolicited-proposal-procedure-real-property

Sincerely,

Chessy Brady
Transit-Oriented Development Manager