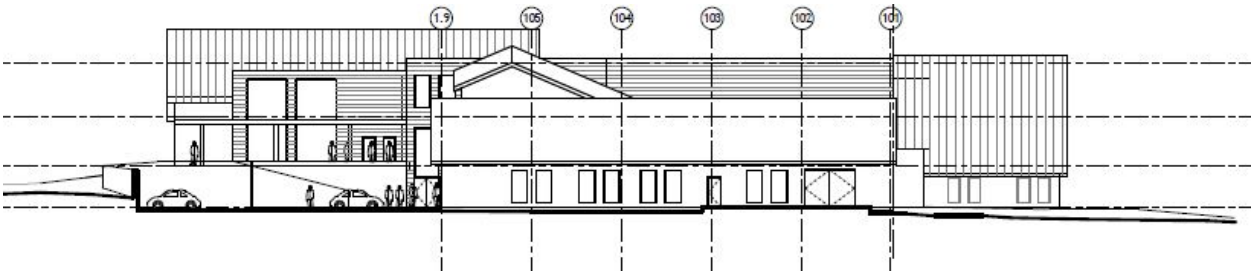
Auxiliary Turn Lane Assessment
Transportation Impact Study and Parking Plan

for

Crested Butte Center for the Arts
Crested Butte, Colorado



June 16, 2016

PREPARED FOR:
Crested Butte Center for the Arts
PO Box 636
Crested Butte, CO 81224
Contact: Crockett Farnell

PREPARED BY:
McDowell Engineering, LLC
PO Box 4259
Eagle, CO 81631
970.623.0788
Contact: Kari J. McDowell Schroeder, PE, PTOE
Project Number: M1202

Statement of Engineering Qualifications

Kari J. McDowell Schroeder, PE, PTOE is a Transportation and Traffic Engineer for McDowell Engineering, LLC. Ms. McDowell Schroeder has over nineteen years of extensive traffic and transportation engineering experience. She has completed numerous transportation studies and roadway design projects throughout the State of Colorado. Ms. McDowell Schroeder is a licensed Professional Engineer in the State of Colorado and has her certification as a Professional Traffic Operations Engineer from the Institute of Transportation Engineers.

Traffic Impact Analysis for the Crested Butte Center for the Arts

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1.0 Project Description

McDowell Engineering has prepared this Level Two Auxiliary Turn Lane Assessment for the proposed expansion to the existing Crested Butte Center for the Arts facility located in Crested Butte, Colorado. The purpose of this transportation impact analysis is to forecast and analyze the impacts of the additional traffic volumes associated with this project on the surrounding roadway network. Recommendations to mitigate any traffic impacts are also included. The analysis complies with Colorado Department of Transportation standards.

The Crested Butte Center for the Arts is the premier visual and performing arts venue in the region, hosting a wide variety of indoor and outdoor events throughout the year. For more than 20 years, the Center for the Arts has hosted live music, dance and theater performances, art exhibits, and speakers.

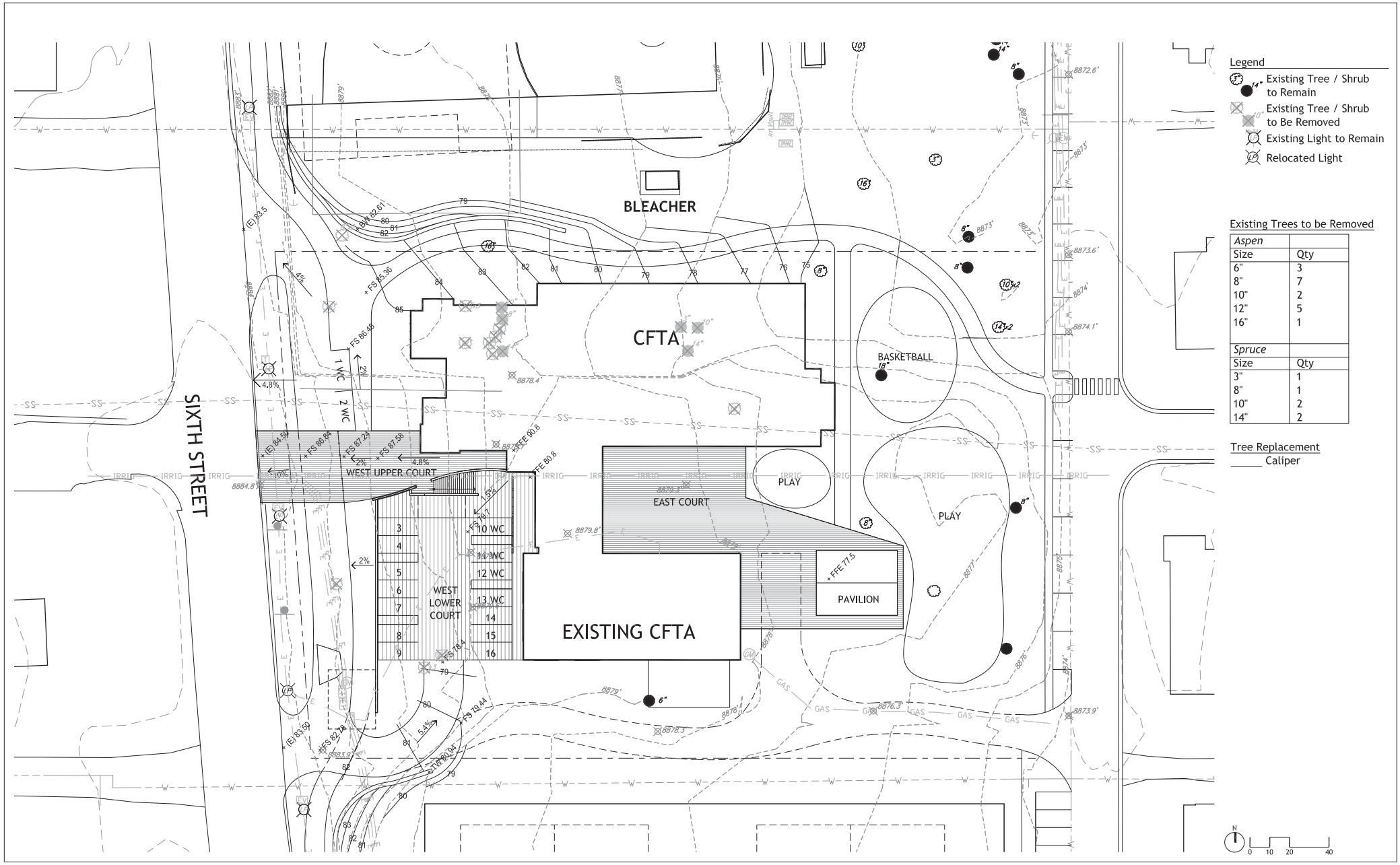
Programing needs over the past decade have outgrown the capacity of the existing facility and demand continues to increase. In order to meet demand and increase programming, the Center is proposing to expand the existing facility with a new addition, creating a 40,863 square-foot facility.

The project is located at 606 6th Street (SH 135) in Crested Butte, Colorado. Refer to the Area Map in **Figure 1.**

There is an existing site access to the Center's parking lot. This entrance and the existing parking lot will be demolished as part of the proposed expansion project.

The proposed primary vehicle access to the site is a one-way, northbound, driveway with an entrance approximately 160-feet south of White Rock Avenue and an exit approximately 100-feet north of White Rock Avenue as shown on Site Plan in **Figure 2**.

Figure 1: Area Map



Aspen	
Size	Qty
6"	3
8"	7
10"	2
12"	5
16"	1

Spruce	
Size	Qty
3"	1
8"	1
10"	2
14"	2

HOLZMAN MOSS BOTTINO ARCHITECTURE

CENTER FOR THE ARTS Crested Butte

Crested Butte Center for the Arts

Crested Butte Center for the Arts
606 6th Street, Crested Butte, CO 81224

MUNDUS BISHOP

Site Plan

June 16, 2016

2.0 Existing Conditions

2.1 Description of Existing Transportation System

State Highway 135 (SH 135) is a 27.48-mile-long two-lane highway connecting Crested Butte to Gunnison. It is the only paved road leading to Crested Butte. State Highway 135 extends to the intersection with White Rock Avenue in the Town of Crested Butte where it becomes a local street known as 6th Street. In the vicinity of the proposed project, 6th Street has a two-lane section with a posted speed limit of 25mph. It is classified by the Colorado Department of Transportation (CDOT) as an access category NR-B, non-rural arterial.

2.2 Proposed Site Access Description & Access Control Plan

The primary vehicle access to the site is a one-way driveway with connections north and south of White Rock Avenue as shown on Site Plan in **Figure 2**. Traffic will circulate from the south to north, entering the access point located approximately 160-feet south of White Rock Avenue and exiting approximately 100-feet north of White Rock Avenue.

2.3 Traffic Data Collection

CDOT's SH 135 traffic count per their *Online Transportation Information System* (*OTIS*)[2] was 6,700 vehicles per day (vpd) in Year 2014.

The peak hour directional split from Tuesday, July 26, 2011 was used for the existing traffic condition. This date is anticipated to be within the highway's seasonal peak based on a comparison with a CDOT continuous counter located on SH 135, at White Rock Avenue (Station 104575). CDOT's traffic data is included in the **Appendix** of the report.

The Center for the Arts performed a travel survey at two sold-out ski movies in October 2015. The 239 attendees for each show were polled at the door to determine their method of travel for the event. The multimodal rates for the Center were determined by averaging the volumes for the two events. An email with the details is included in the **Appendix**. The results can be summarized by the following:

- 30% Pedestrians
- 10% Bicycles
- 1% Transit
- 59% Vehicles

An additional poll in June 2016 resulted in a similar mode split. The Trevor Hall concert attracted 190 patrons. The mode split was:

- 48% Pedestrians/Bicycles
- 8% Transit
- 44% Vehicles

The resulting October 2015 rates were applied to the proposed facility in an effort to maintain a conservative traffic evaluation.

3.0 Future Traffic Projections

3.1 Background Infrastructure Assumptions

There are no known proposed development projects that would impact the SH 135 traffic projections significantly in the area of the proposed site access.

The Town is considering the construction of a roundabout at the intersection of SH 135 and Red Lady Avenue. This project is still in the planning stages. The Center for the Arts project shall be incorporated into the Town's planning process for the roundabout.

3.2 Background Traffic Growth

Year 2017 Background Traffic:

CDOT uses their published growth rate to forecast traffic volumes on their highways. Per CDOT, the SH 135 corridor at Milepost 27.4 is anticipated to have a 20-year growth factor of 1.24, which equates to a 1.08% annual growth rate. CDOT's 2011 morning and evening peak hour traffic volumes for SH 135 were forecasted to Year 2017 traffic volumes by applying the 1.08% growth rate.[1] No seasonal adjustment factor was utilized for CDOT's data on SH 135 as the data was collected in July 2011.

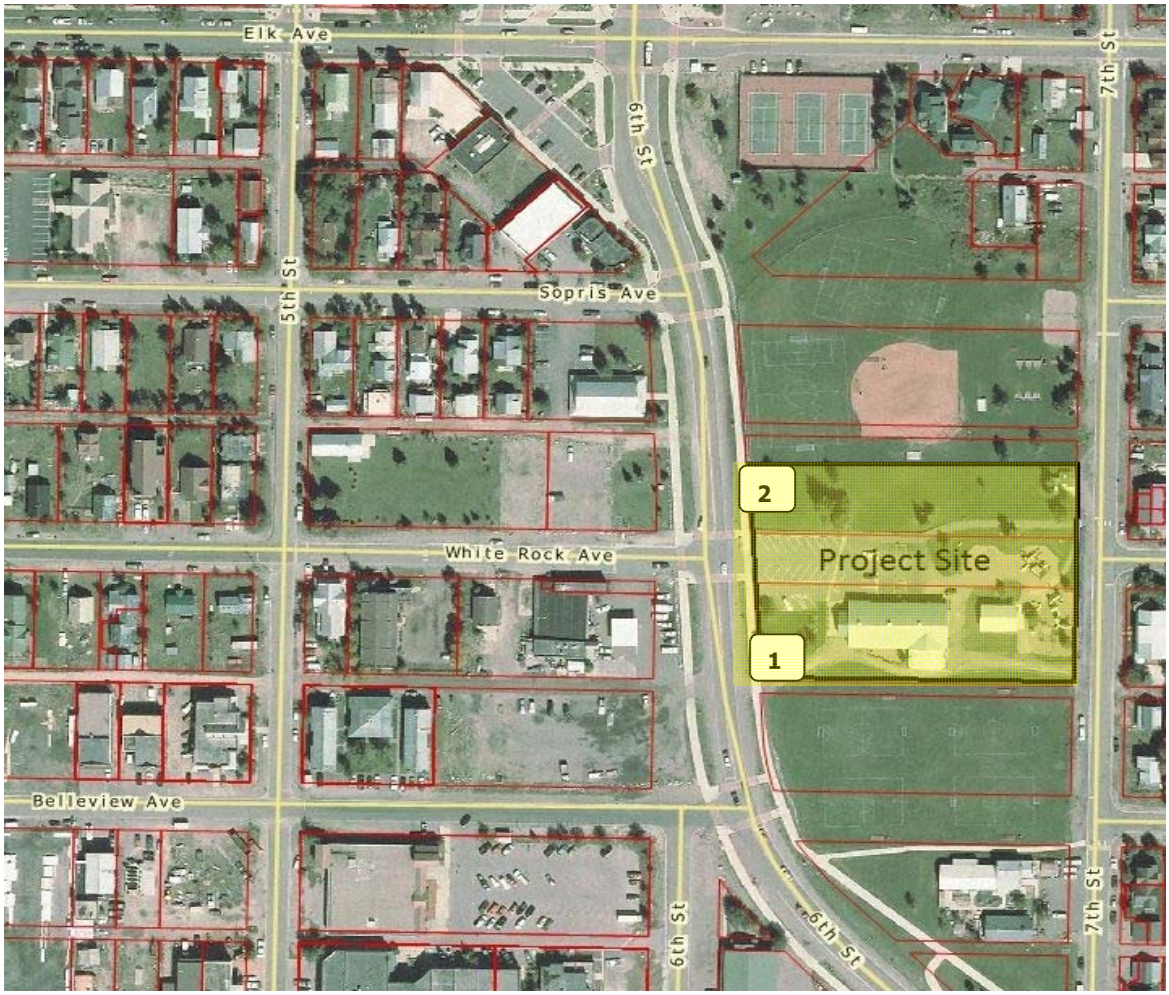
The resulting Year 2017 background traffic volumes can be found in **Figure 3.**

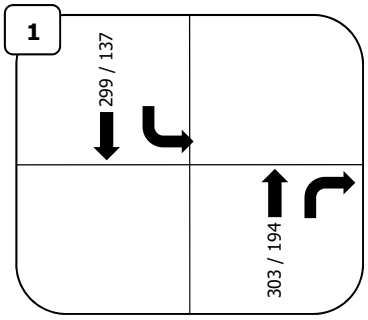
Year 2040 Background Traffic:

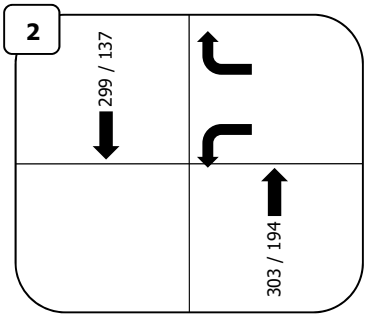
CDOT's 2011 peak hour traffic volumes for SH 135 were forecasted to Year 2040 traffic volumes by applying the 1.08% growth rate.[1]

The resulting Year 2040 background traffic volumes can be found in **Figure 4.**

Figure 3: Year 2017 Background Traffic







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Transportation Engineering Consultants

Project Number: M1202
Prepared by: BBG
Date: 5/10/2016
Crested Butte Center for the Arts
Crested Butte, Colorado

LEGEND :

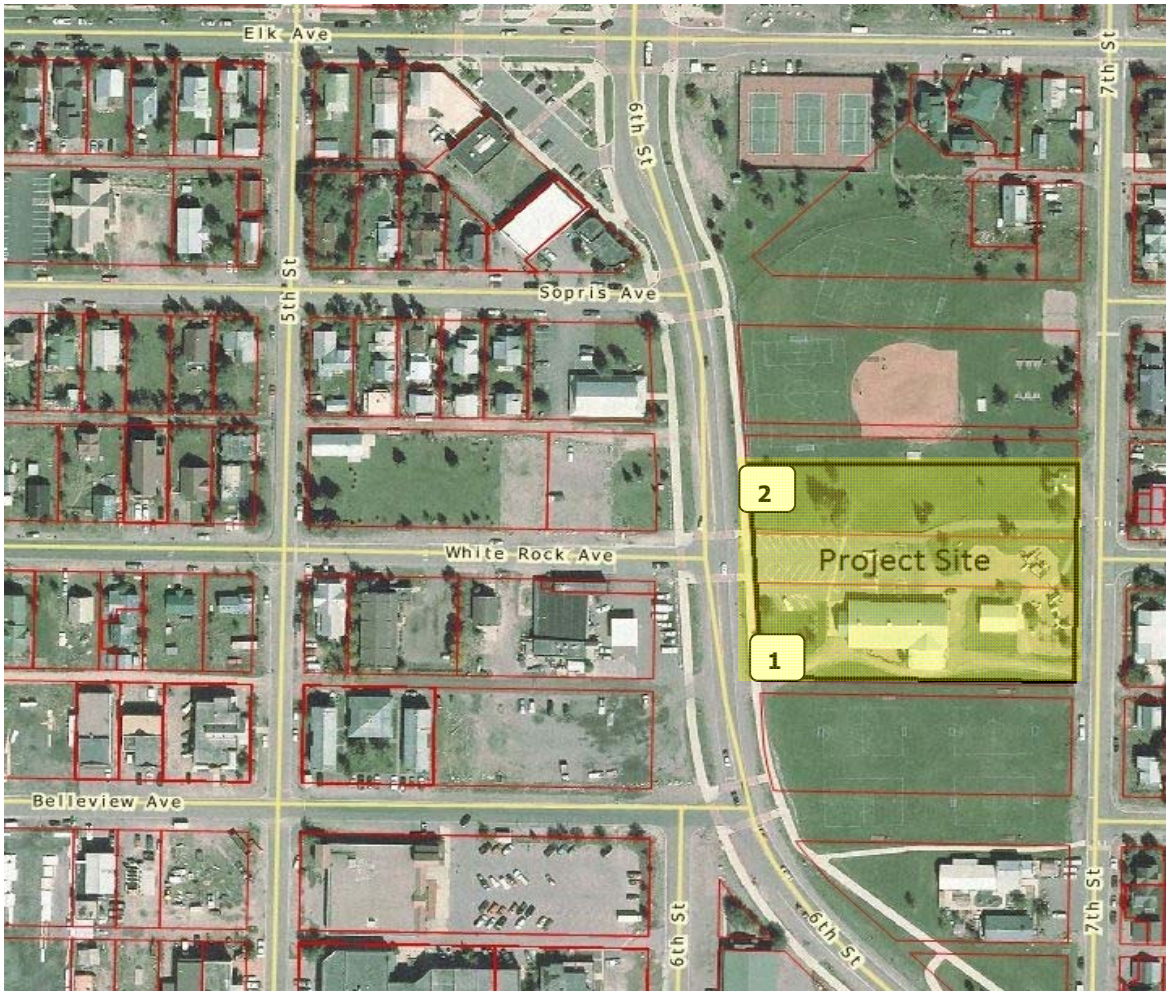
AM / PM Volumes XX / XX

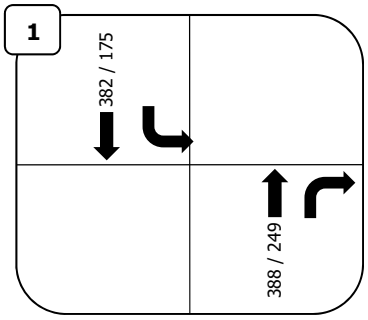
Turning Movements

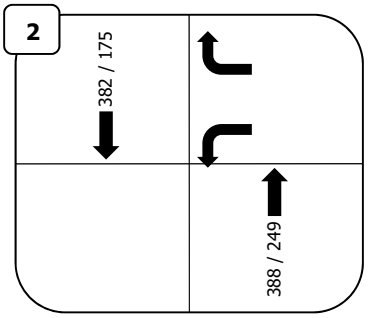
N

(NTS)

Figure 4: Year 2040 Background Traffic







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Turning Movements

N

(NTS)

4.0 Project Traffic

4.1 Trip Generation for Proposed Land Use

The proposed Center for the Arts facility does not fit into an established trip generation land use within the Institute of Transportation Engineers' *9th Edition of the Trip Generation Manual.* Therefore, a custom trip generation analysis is necessary. A detailed Custom Trip Generation Worksheet can be found in **Table 1.** The worksheet is the applicant's best estimation of the anticipated operations and associated traffic volumes, arrival hours, departure hours, and deliveries.

Anticipated Operations:

- Administrative Staff: It is anticipated that 7 full time administrative staff will access the site on weekdays.
- Shared Space: The facility will have shared space for artists to work if they don't have space in their home or elsewhere. The space will have a full ceramics studio but is open to artist working in all mediums. It is anticipated that there would be 3 artists in residence.
- Art Classes: It is anticipated that the facility would host four art classes each weekday. These classes are assumed to include an instructor and 5-20 students each.
- Private Parties: The facility includes space that can be reserved for private parties.
- Dance Classes: It is anticipated that the facility would host five dance classes each weekday. These classes are assumed to include an instructor and 30-40 students each.
- Theater: The facility will include a 260 seat theater that will host a range of performances. The Center for the Arts hosts approximately 40 shows per year.
- Alpenglow Summer Concerts: The Town hosts a series of nine Monday evening concerts in the summer. These concerts are held on the lawn south of the event center. Attendance ranges from 100 – 1,000 attendees.
- Maintenance Staff: One part-time staff member would access the site each day.
- Deliveries: The facility is anticipating two deliveries per day. This may include items such as trash pickup, supplies, etc.

Multimodal Traffic: The Center for the Arts performed a travel survey at two sold-out shows in October 2015. The 239 attendees for each show were polled at the door to determine their method of travel for the event. As described in **Section 2.3**, the resulting travel mode rates were applied to the proposed facility.

Special Events: The Custom Trip Generation Worksheet calculates the anticipated peak traffic hours for the event center based upon the operations described above. Per Section 1.5(31) of the *Access Code*, the design hourly volume refers to the 30th highest hour vehicular volume experienced in a one-year period. Therefore, the Alpenglow Summer Concerts are not included in the design hourly volume calculation. These larger events occur less than 30 times per year, therefore, it is appropriate to use a more typical weekday/theater event for peak hour traffic evaluation.

If traffic generated by the events exceeded 25 vph for the southbound left turn into the site or 50 vph for the northbound right turn into the site, temporary traffic control would be required. See **Section 5.3** for temporary traffic control requirements.

Custom Trip Generation Worksheet: **Table 1** summarizes the number of people anticipated to access the site for each activity and distributes these trips according to this modal split. To calculate vehicle trips, the number of people using a vehicle to access the site was divided by the likely number of people per car to calculate a total number of vehicles per day. This number was doubled to determine the total number of total (inbound + outbound) trips accessing the site. Administrative and maintenance staffs were assumed to enter and leave the site more than once throughout the day.

Based upon the above operations, the applicant's facility can expect 358 vehicle trips per day and 239 multimodal trips per day. The morning peak traffic hour will occur at 10:00am for morning classes. The site access can anticipate 8 incoming vehicles during the morning peak hour.

The evening peak hour is anticipated at 7:00pm during arrival of patrons to Theater events. The site access can anticipate 47 incoming and 11 outgoing vehicles during the evening peak hour.

A secondary evening peak hour occurs around 9:00pm as patrons are leaving theater events. The site access can anticipate 11 incoming and 47 outgoing vehicles during the evening peak hour.

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Table 1 - Trip Generation Analysis
Crested Butte Center for the Arts
Crested Butte, Colorado
Estimated Project-Generated Traffic[1]

PROJECT NUMBER: M1202
PREPARED BY: BBG
DATE: 5/18/2016
REVISED:

	People	Pedestrian	Bicycle	Bus	Vehicle				Vehicle Trips per Hour																	Comments
	Total per day	Total per day	Total per day	Total per day	Total per day	People per veh	Total veh trips per day		7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm		
Administrative Staff	7	2	1	0	4	1	8	inbound		4																
								outbound											4							
Art Shared Space	3	1	1	0	1	1	2	inbound				1														
								outbound										1								
Classes	44	13	4	1	26	1.5	18	inbound			2	7														
								outbound					7	2												
Private Parties	10	3	1	0	6	2	6	inbound										3								
								outbound												3						
Dance Classes	155	46	16	2	92	2	92	inbound									5	41								5 classes w/ 30 students & 1 instructor each
								outbound											41	5						
Theater	260	78	26	2	154	2.5	146	inbound												15	47		11			
								outbound													11		47	15		
Gallery	101	30	10	2	59	1.5	80	inbound			1		4	6	6	6	6	6	5							
								outbound						4	7	6	6	6	6	5						
Maintenance Staff	1	0	0	0	1	1	2	inbound	1																	
								outbound						1												
Deliveries/Trash	2	0	0	0	2	1	4	inbound						1		1										
								outbound						1		1										
Total		173	59	7			358	inbound	1	4	2	8	0	1	0	1	5	44	0	15	47	0	11	0		
								outbound	0	0	0	0	7	4	0	1	0	1	45	8	11	0	47	15		
									1	4	2	8	7	5	0	2	5	45	45	23	58	0	58	15		
												AM									PM		PM 2			

Custom Trip Generation calculations are based upon anticipated project operations. Exact event times may vary.
Distribution of pedestrians (30%), bicycles (10%), transit (1%), and vehicles (59%) are based on 2015 event surveys.
vpd = vehicles per day
vph = vehicles per hour

4.2 Directional Distribution

The distribution of project-generated vehicular traffic on 6th Street is influenced by several factors including the following:

- The location of the site relative to other facilities and the roadway network
- The configuration of the existing and proposed adjacent roadway network
- Relative location of neighboring population centers

Therefore, it is conservatively anticipated that 70% of the site traffic will be originating from the north. The remaining 30% of traffic would be arriving from and returning to the south. Because the southbound left turn has the lowest threshold for turn lane requirements this distribution represents a conservative analysis. The anticipated directional distribution of project-generated traffic is depicted in **Figure 5**. Distribution is not anticipated to change from Year 2017 to Year 2040.

The project will include 16 parking spaces accessed from 6th Street. An additional 38 project parking spaces will be provided on the east side of the project site along 7th Street. Therefore, not all site-generated traffic will access the site from 6th Street. It is assumed that these spaces will be used by traffic from the north and/or east and these trips would not impact 6th Street at the access location.

The Center for the Arts' website and promotional material advertises public transportation and alternate off-site parking alternatives:

Additional parking can be found:

1. Along the rock wall in the CB True Value parking lot across the street.
2. An empty lot on the northwest corner of 6th and Whiterock, also across from the Center.
3. Along 7th Street to the east and behind the Center.
4. Along the surrounding side streets (Whiterock Ave., Sopris Ave., Belleview Ave.)
5. CB Community School (Red Lady Ave, two blocks south of site)
6. Public Parking Lot at intersection of 6th Street and Elk Ave.

Therefore, a number of trips would be attributed to vehicles dropping off and picking up patrons and parking off site in on-street spaces or public parking lots. This study assumes that 50% of trips not parking in on-site parking spaces would use the access to drop off / pick up lane. For the peak event this will result in 11 trips using the access to drop off / pick up lane.

Additional information describing the proposed parking operations can be found in **Section 5**.

Sensitivity Analysis:

CDOT staff has requested several additional directional distribution scenarios as a sensitivity analysis. The alternate distribution analysis is included in **Table 2** detail the vehicle trips that are anticipated from the proposed land use.

Table 2: Directional Distribution – Project Traffic Assignment Sensitivity Analysis

2040 Total Traffic Volumes (vph)	Crested Butte Center for the Arts Directional Distribution at Site Access				
(AM/PM/PM 2**)	90% north/ 10% south (6th Site Accesses: 45% north / 5% south)	80% north/ 20% south (6th Site Accesses: 40% north / 10% south)	70% north/ 30% south (6th Site Accesses: 35% north / 15% south)	60% north/ 40% south (6th Site Accesses: 30% north / 20% south)	CDOT Turn Lane Threshold
North Access	WBL 0/1/2 WBR 0/5/21	WBL 0/1/5 WBR 0/4/19	WBL 0/2/7 WBR 0/4/16	WBL 0/2/9 WBR 0/3/14	* *
South Access	NBR 0/2/1 SBL 4/21/5	NBR 1/5/1 SBL 3/19/4	NBR 1/7/2 SBL 3/16/4	NBR 2/9/2 SBL 2/14/3	>50 vph >25 vph

The traffic study's assumptions are based upon a 70%/30% split, as highlighted above.
Values are stated in PCEs (Passenger Car Equivalents) and vehicles per hour.
Check mark (✓) indicates that an auxiliary turn lane is required per the *Access Code*.
*Based upon assessment of safety and operation of an intersection.
**The PM 2 rates refer to the 9pm peak when patrons are leaving a theater event.

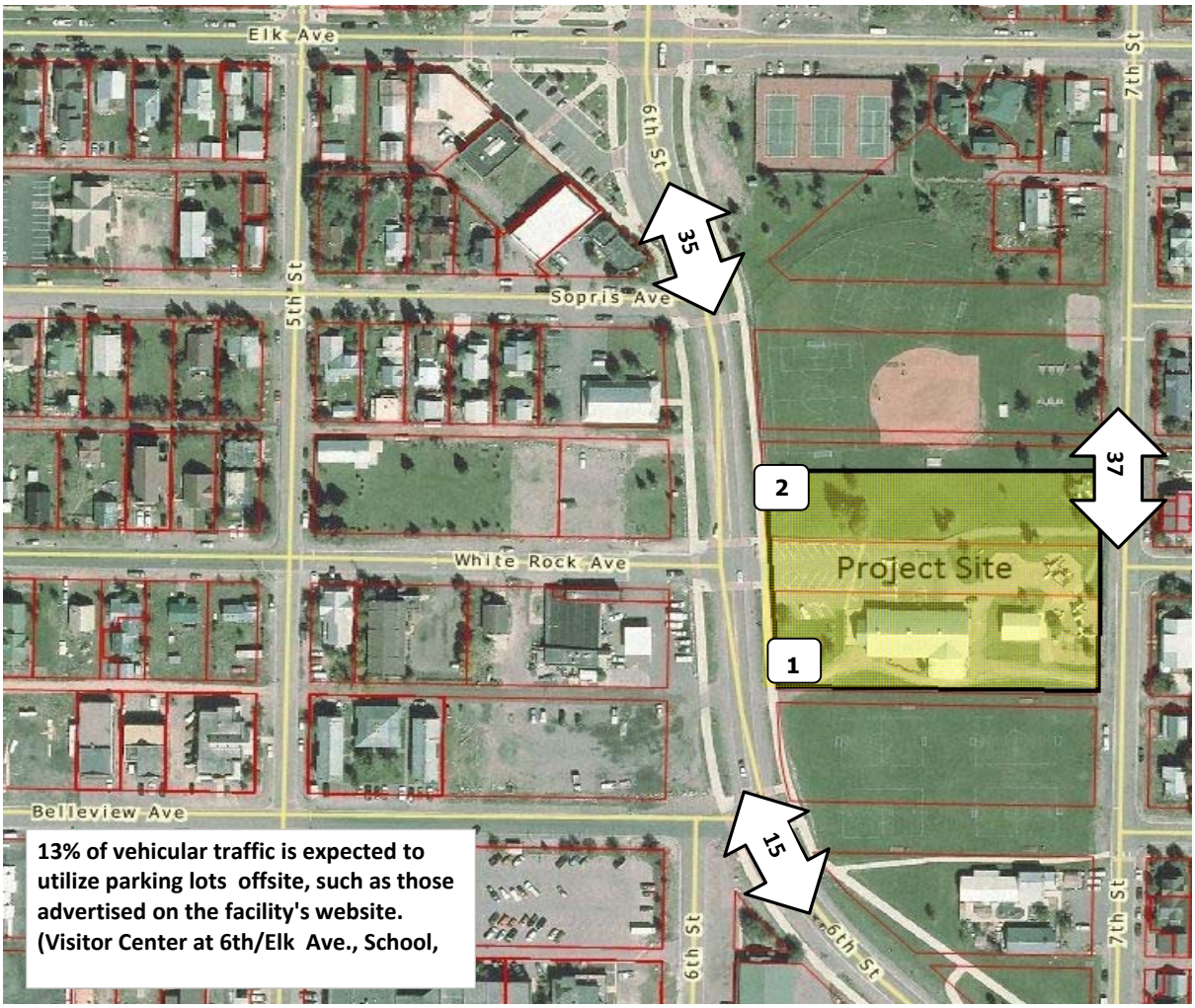
4.3 Traffic Assignment and Total Traffic

When the trip generation expected for this site is applied to the estimated trip distribution, the result is the anticipated assignment of trips on the roadway system. **Figure 6** depicts the new vehicle trips that are anticipated from the proposed development. Note that the traffic assignment is given for the anticipated morning (AM) peak, as well as both the ingressing (PM) and egressing (PM 2) evening peak hour traffic for the site.

The Year 2017 total traffic is the sum of Year 2017 background **(Figure 3)** traffic with **Figure 6** and can be seen in **Figure 7.**

Similarly, Year 2040 total traffic is the sum of **Figure 4** with **Figure 6** and can be seen in **Figure 8.**

Figure 5: Distribution of Project Generated Traffic



Distribution Assumptions:

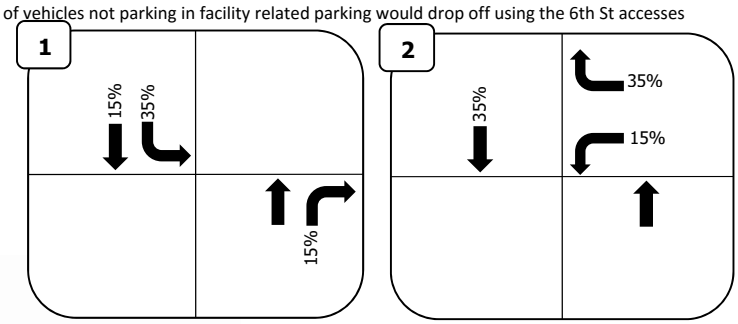
1 Project Distribution is generally 70% from/to the North & 30% from/to the South

2 During larger events, including those using the Theater, 50% of all vehicles will access the 6th Street accesses

a) 23 parking spaces are provided for the facility on 7th Street. These spaces will be occupied by vehicles from the North or East

b) 18 parking spaces are provided at the 6th Street access

c) 50% of vehicles not parking in facility related parking would drop off using the 6th St accesses



LEGEND :

Directional Distribution XX%

Turning Movements

N

(NTS)

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Crested Butte Center for the Arts
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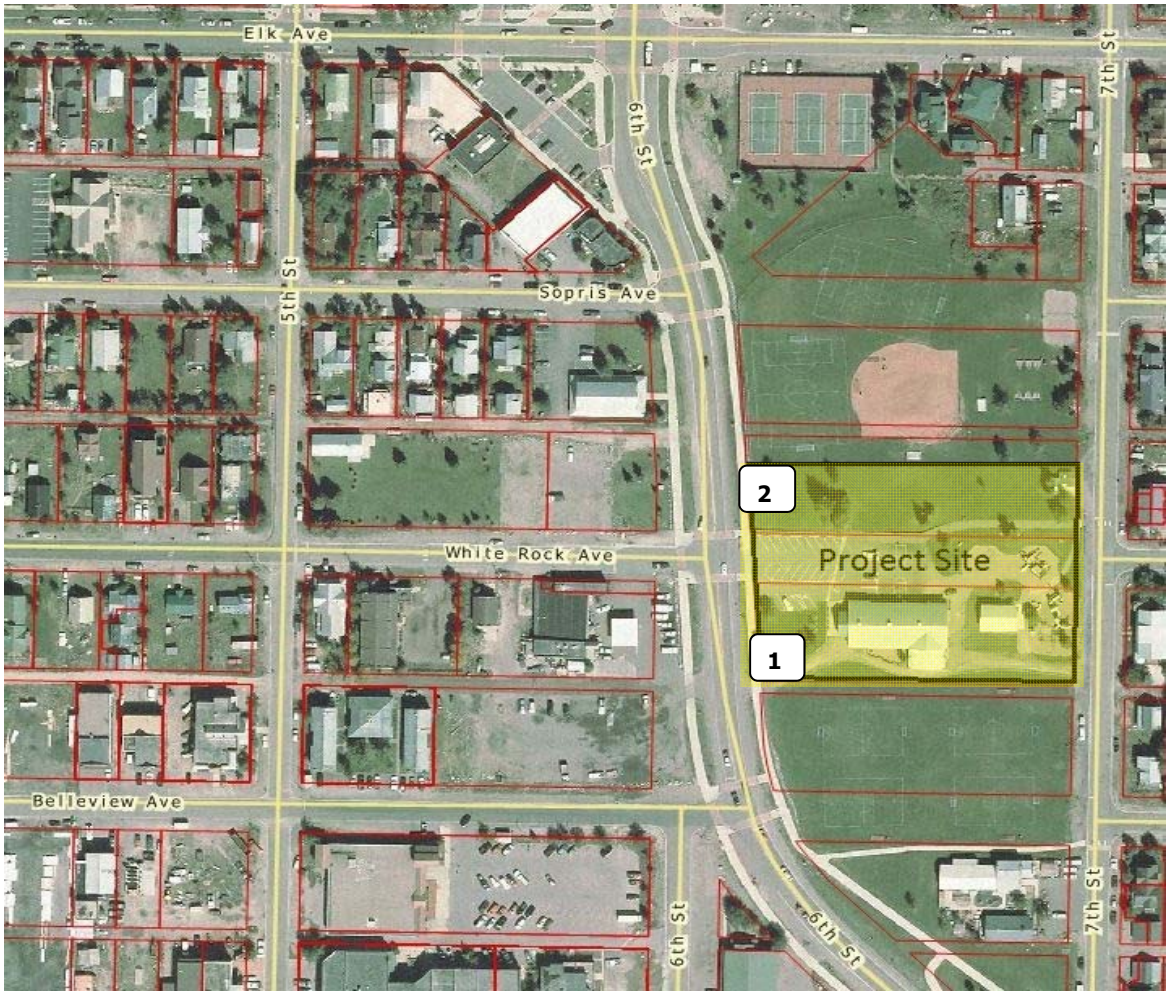
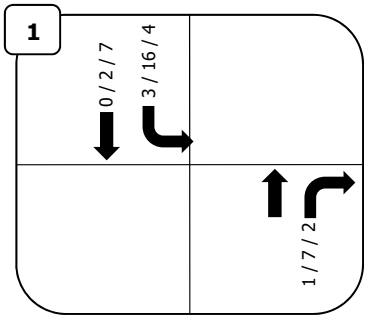
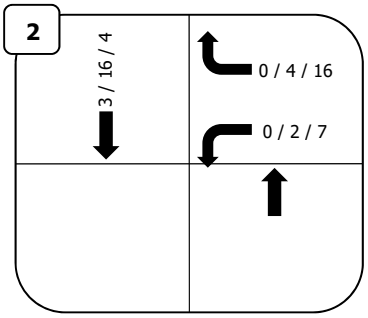
Figure 6: Assignment of Project Generated Traffic







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TRANSPORTATION ENGINEERING CONSULTANTS

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Crested Butte Center for the Arts
Crested Butte, Colorado

LEGEND :

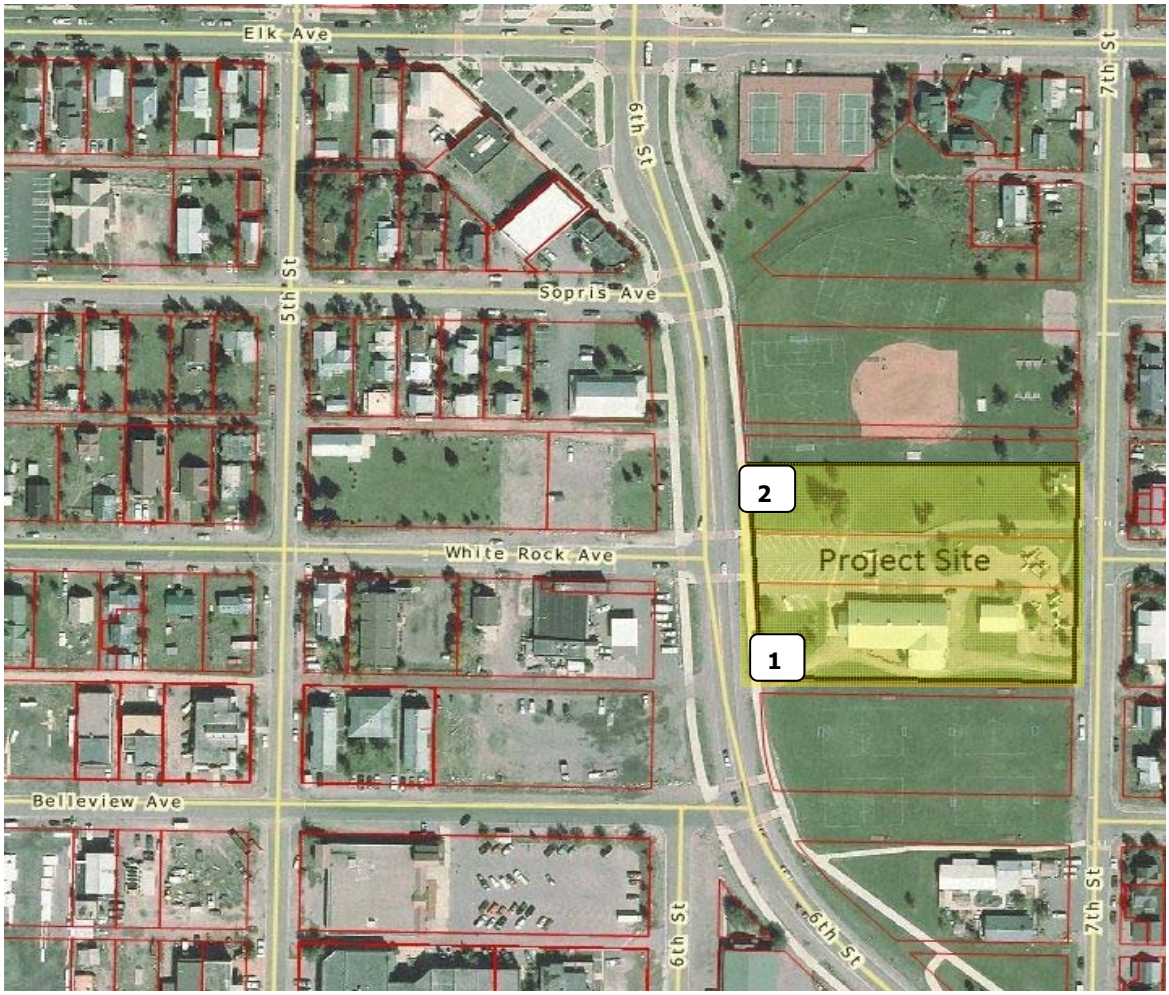
AM / PM / PM 2 Volumes XX / XX/ XX

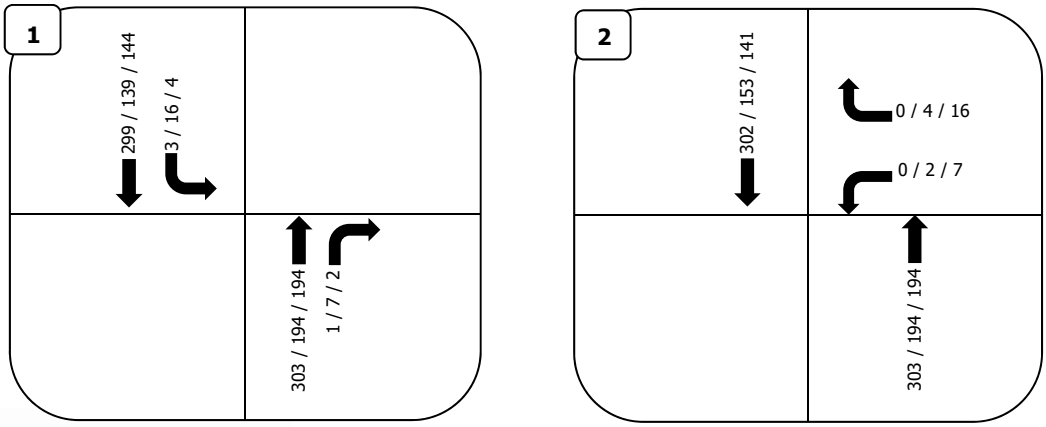
Turning Movements

N

(NTS)

Figure 7: Year 2017 Total Traffic





LEGEND :

AM / PM / PM 2 Volumes XX / XX/ XX

Turning Movements

N

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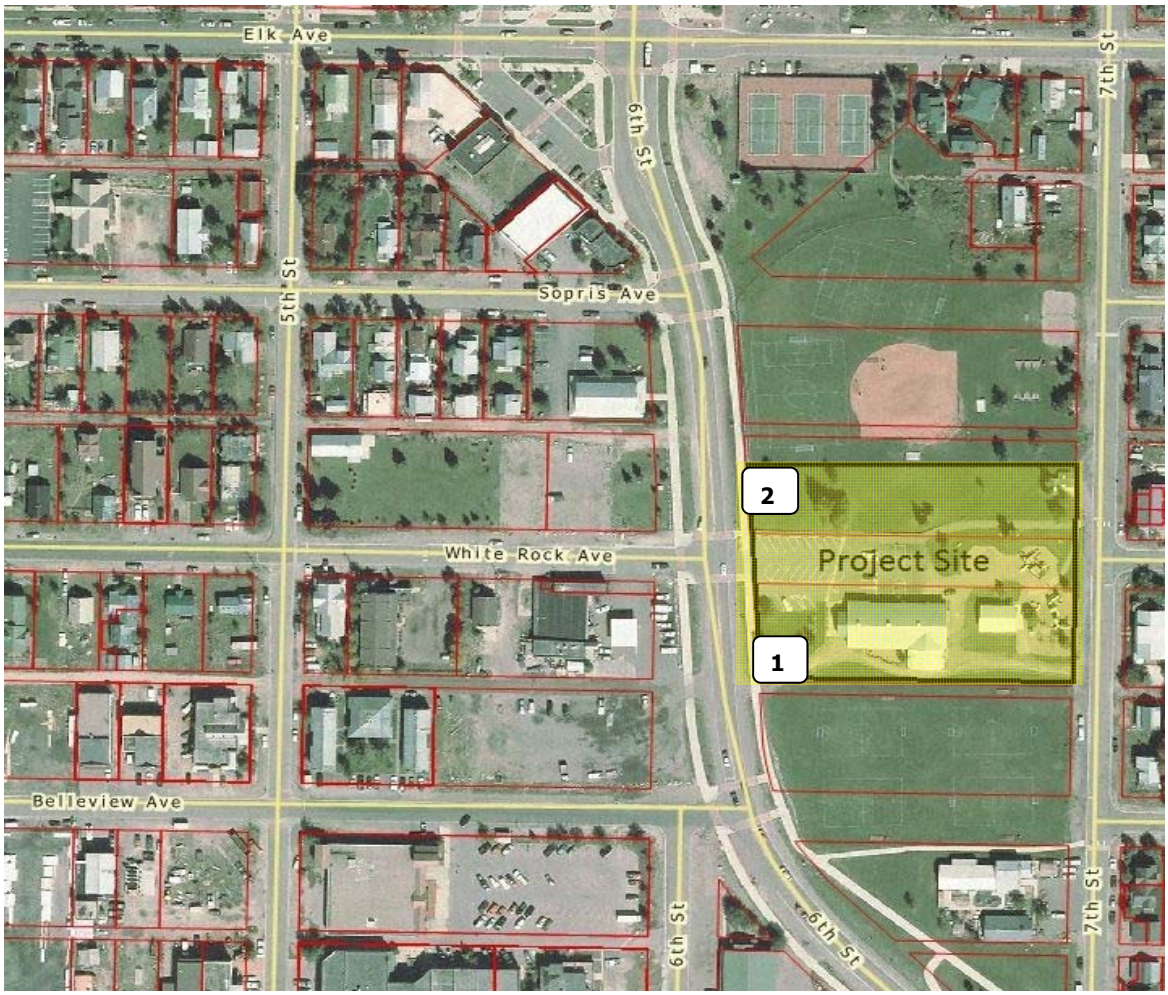
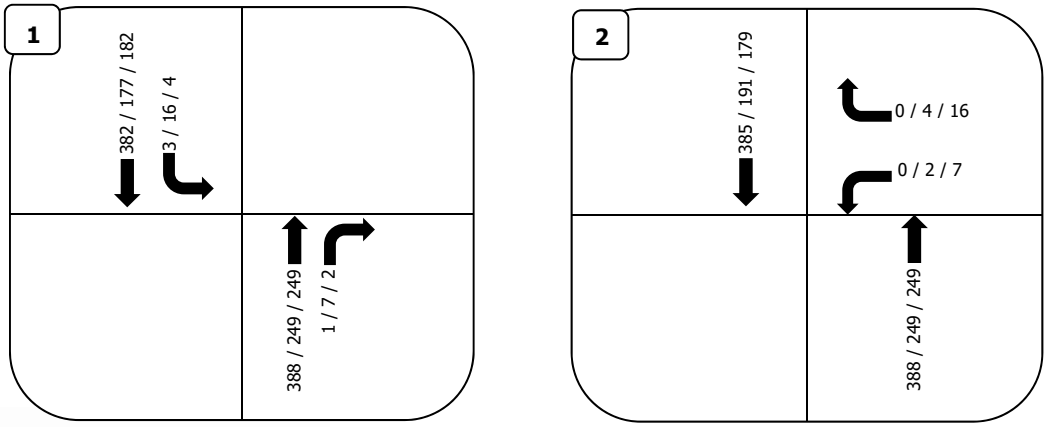
Figure 8: Year 2040 Total Traffic





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5.0 Parking Plan

5.1 Required Parking for the Project

The existing Center for the Arts requires 62 spaces per Section 16-16-20 of the Town Code. 27 spaces are available on site. Therefore, the existing site accommodates 43.5% of the parking on site.

The proposed expansion will require 104 total parking spaces. Detailed calculations from the Building Department are included in the **Appendix** of this report.

5.2 Available On-Site / 7th Street Parking

The current site plan removes the existing parking lot and replaces 14 spaces on-site on the south and west sides of the building. The on-site lots will accommodate 13.5% of the required parking.

In addition, this project will be adding 38 perpendicular on-street parking spaces on 7th Street. Refer to the Parking Diagram in **Figure 9**. In total the on-site lots and 7th Street parking will accommodate 50.0% of the required parking.

5.3 Satellite Parking / Pilot Parking Program

As mentioned in **Section 4.2**, the Center for the Arts' website and promotional material advertises public transportation and off-site parking alternatives:

Additional parking can be found:

1. Along the rock wall in the CB True Value parking lot across the street.
2. An empty lot on the northwest corner of 6th and Whiterock, also across from the Center.
3. Along 7th Street to the east and behind the Center.
4. Along the surrounding side streets (Whiterock Ave., Sopris Ave., Belleview Ave.)
5. CB Community School (Red Lady Ave, two blocks south of site)
6. Public Parking Lot at intersection of 6th Street and Elk Ave.

In the Summer of 2016, the Center for the Arts is going to implement a pilot program for satellite parking. This would include directing traffic to park in the following locations:

1. Community School – 70 +/- spaces available (1,250 feet walk)
2. 6th Avenue Lot – 35 +/- spaces available (275 feet walk)
3. 4-Way Lot – 90 +/- spaces available (820 feet walk)

Refer to **Figure 9** for a map of these locations. Refer to **Figure 10** for the Town Park Circulation Plan. These satellite locations provide an additional 195 spaces for public

use. The remaining 52 required parking spaces per the Town Code could be accommodated by these additional public spaces. Fifty-two spaces would utilize 27% of the available public parking spaces. All of the satellite lots are located within ¼ mile walking distance from the main entrance of the Center. National planning studies indicate that a one-quarter mile (five minute) walk is the average distance that a pedestrian is willing to walk before opting to drive.

The satellite parking lots shall be advertised by the Center for the Arts. Advertised methods may include:

4. Website
5. Tickets/Event details
6. Event flyers
7. Posted signage
8. Sandwich boards
9. Email newsletter

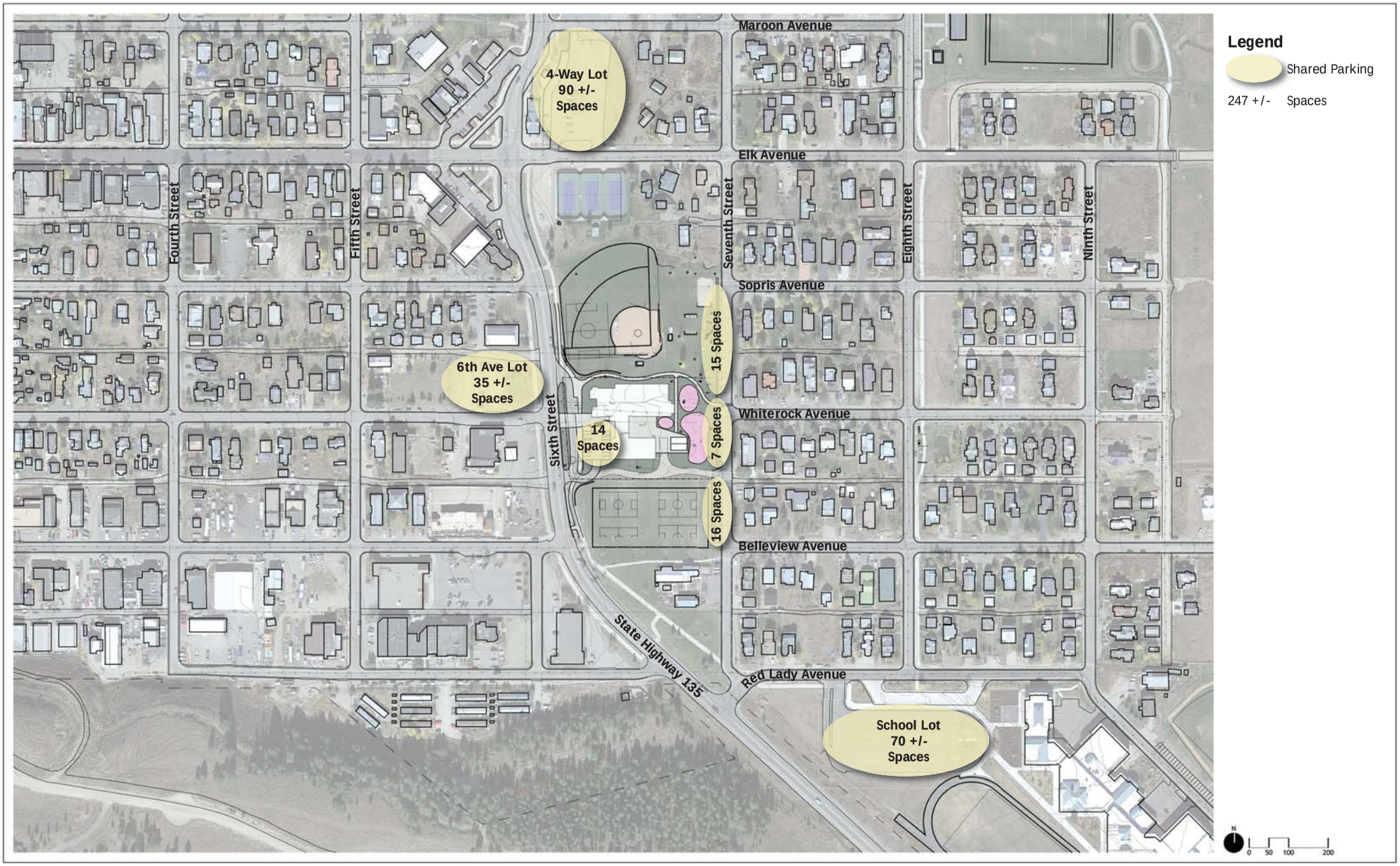
The Center for the Arts shall review the Summer 2016 Satellite Parking Pilot Program with Town staff for effectiveness and future implementation.

5.4 Multimodal Impact on Parking

The Town Code does not have a provision for multi-modal reduction in required parking calculations. The Center for the Arts has conducted two surveys of large theater events finding the following mode split among attendees to be:

- 40-50% walk or bike
- 1-8% transit
- 44-59% vehicle

These surveys indicate that the number of parking spaces required by the Town Code may overestimate the actual need of the Center for the Arts. Therefore, the parking analysis and requirements shall be considered a conservative estimation.



HOLZMAN MOSS BOTTINO ARCHITECTURE

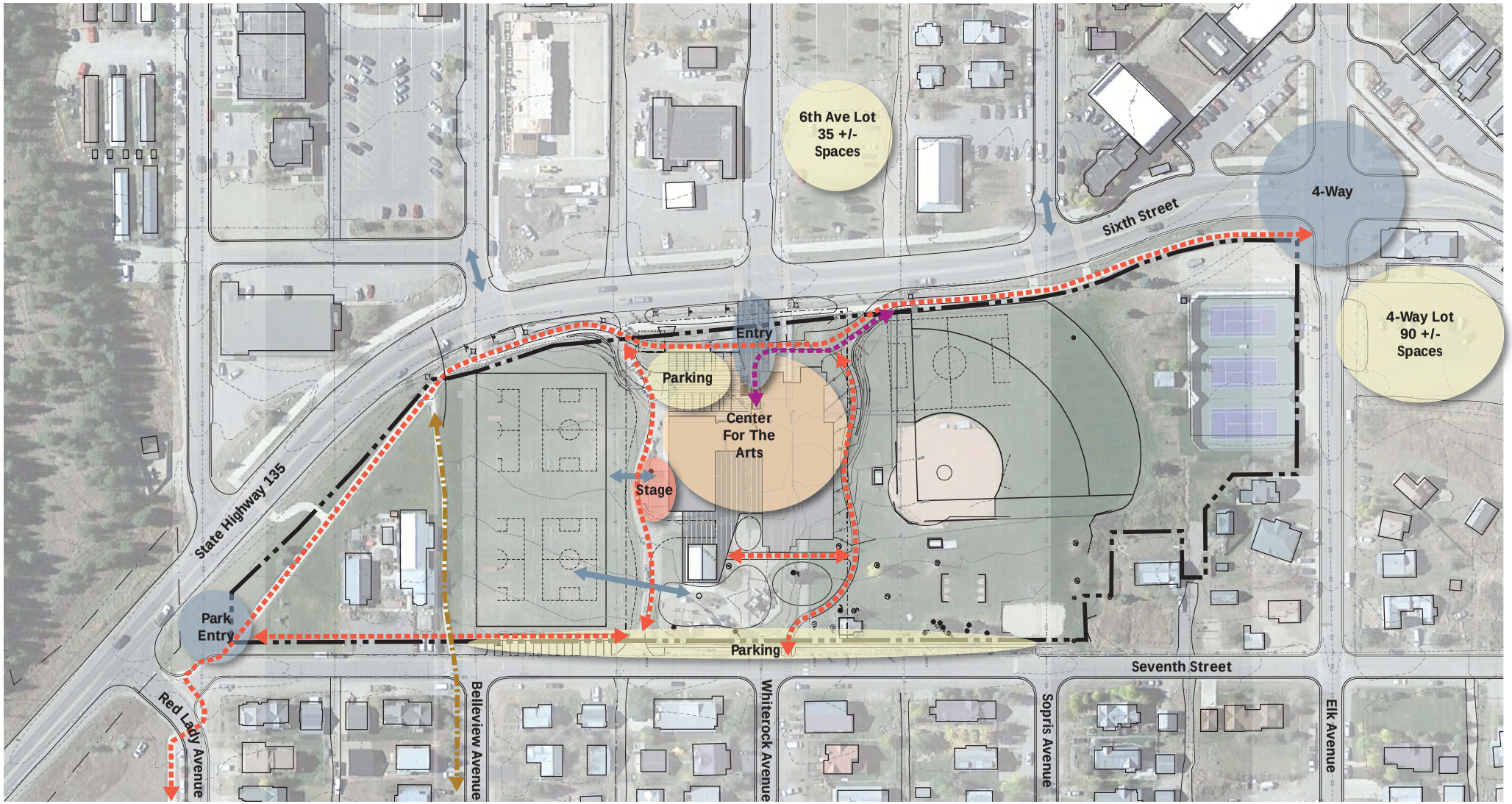
AHA

CENTER FOR THE ARTS Crested Butte

Crested Butte Center for the Arts
Crested Butte Center for the Arts
606 6th Street, Crested Butte, CO 81224

MUNDUS BISHOP

Parking Diagram
June 16, 2016



Legend

- Key Connections
- Pedestrian Routes
- ADA Route
- School Route
- Entry
- Parking
- Building Space
- Park Boundary

N 0 25 50 100

HOLZMAN MOSS BOTTINO ARCHITECTURE

AHA

CENTER FOR THE ARTS Crested Butte

Crested Butte Center for the Arts

Crested Butte Center for the Arts
606 6th Street, Crested Butte, CO 81224

MUNDUS BISHOP

Town Park Circulation

June 16, 2016

6.0 Transportation Impact Analysis

6.1 State Highway Access Permits

The site does not currently have State Highway Access Permit. Section 2.6(3) of the *State Highway Access Code*[3] (*Access Code*) requires a new access permit when there is a land use change and/or the driveway volume is anticipated to increase by more than twenty percent. Therefore, a new State Highway Access Permit will be required for the proposed southern access to this property.

The site's existing access to SH 135 will be closed as part of this expansion project. Refer to the site plan in **Figure 2**.

6.2 State Highway Turn Lane Analysis

The *State Highway Access Code* establishes the need for auxiliary turn lanes. Several criteria apply when determining the traffic volume thresholds. 6th Street is a two-lane highway with a posted speed limit of 25mph in the vicinity of the proposed project site. North of White Rock Rd 6th Street is a local street. South of White Rock Rd 6th Street (SH 135) is classified by the Colorado Department of Transportation (CDOT) as an access category NR-B, non-rural arterial.

Per Section 3.11(4) of the *Access Code*, auxiliary turn lanes are required for more than 25vph making a left ingress turn movement and 50vph making a right ingress turn movement.

Based upon the Year 2040 total traffic volumes at the site access, no auxiliary deceleration or acceleration lanes will be required for the site. Details for this analysis are shown in **Table 2**.

A cursory queue analysis was performed to check queue lengths at the south site access. The 95th percentile queue lengths are anticipated to be less than one car length.

6.3 Temporary Traffic Control

As described in **Section 4.1**, the Town hosts a series of nine Alpenglow Summer Concerts on Monday evenings in the summer. These concerts are held on the lawn south of the event center. Attendance ranges from 100 – 1,000 attendees.

The *State Highway Access Code* requirements for auxiliary turn lanes are based on the Peak Hour Volume which for the purposes of the *Access Code* are equivalent to the Design Hourly Volume (DHV). The *Access Code* defines the DHV as the 30th highest vehicular volume experienced in a one-year period. The applicant anticipates that events will be held on weekends during the summer months and that there would be

fewer than 30 events. For this reason, the Peak Hour Volume used to evaluate the need for auxiliary turn lanes did not include weekend event traffic.

Should the event traffic exceed 25vph for southbound left turns or 50vph for southbound right turns, the applicant will coordinate with CDOT to provide temporary traffic control for these occasional events. The same is true if there are operational concerns during these events.

6.4 Parking Lot Notification

When parking at the access is full event staff should use sandwich boards or similar signage to notify drivers that there is no parking available and to use alternate parking.

6.5 Sight Distance

This section of SH 135 is on a tangent alignment with relatively level grades. The proposed access point has adequate sight distance in both directions that exceeds the 250-feet requirement in Table 4-2 of the *Access Code*. This sight distance is measured from a point 10 feet back from the edge of the roadway. There are no horizontal or vertical deflections in SH 135 that would prevent this sight distance from the Crested Butte Center for the Arts access.

6.6 Access Design Criteria

The proposed access will operate as a northbound one-way with the entrance south of White Rock Avenue and the exit north of White Rock Avenue. Section 4.5 of the *Access Code* limits the width of one-way access to 18-feet.

Circulation between the one-way entrance and parking area will need to be evaluated to prohibit two-way traffic at the south access.

The Town of Crested Butte's regulations will also apply.

7.0 Recommendations and Conclusions

The proposed Crested Butte Center for the Arts facility is anticipated to be successfully accommodated into the greater roadway system.

Trip Generation:

The Center for the Arts facility can expect 358 passenger car equivalent vehicle trips per day. The morning peak traffic hour is anticipated to occur at 10:00am for morning classes. The site access can anticipate 8 incoming vehicles during the morning peak hour.

The evening peak hour is anticipated at 7:00pm as Theater patrons arrive for performances. The site access can anticipate 47 incoming and 11 outgoing vehicles during the evening peak hour.

A secondary evening peak hour will occur as patrons leave theater events. At this time, the site can anticipate 11 incoming and 47 outgoing vehicles per hour.

State Highway Access Permits:

A new State Highway Access Permit will be required for the proposed south site access to SH 135. The site's existing access to SH 135 will be closed as part of the expansion project.

Auxiliary Turn Lanes:

The traffic volumes generated by this development are not anticipated to require the construction of auxiliary turn lanes on SH 135.

Based upon review of the proposed operations, SH 135 characteristics, and traffic forecasts; there are not any foreseen safety or operational reasons to recommend auxiliary lanes or other highway improvements.

A cursory queue analysis was performed to check queue lengths at the south site access. The 95th percentile queue lengths are anticipated to be less than one car length.

There is the potential that left-turns entering the south access could queue and impede exiting left-turning vehicles during events that exceed the anticipated design hour volume. Event staff should monitor operations for this potential and restrict left turns at the exit if necessary.

Sight Distance:

The site access has adequate sight distance in both directions that exceeds the 250-feet requirement in Table 4-2 of the *Access Code*.

Access Construction:

The proposed access will operate as a northbound one-way with the entrance south of White Rock Avenue and the exit north of White Rock Avenue. Section 4.5 of the *Access Code* limits the width of one-way access to 18-feet.

Circulation between the one-way entrance and parking area will need to be evaluated to prohibit two-way traffic at the south access.

The Town of Crested Butte's regulations will also apply.

8.0 Appendix

Reference Documents

1. OTIS Traffic Data. Colorado Department of Transportation.
2. *Highway Capacity Manual.* Transportation Research Board, 2010.
3. *State Highway Access Code.* State of Colorado, 2002.
4. *Trip Generation Handbook.* Institute of Transportation Engineers, 2012.

Included Documents

1. Scoping correspondence with CDOT, April 2016.
2. CDOT OTIS Traffic Data
3. Modal Survey Results Email, November 2015.
4. CFTA Trip Generation Email, May 2016.
5. Town of Crested Butte Building Department Parking Requirements Email, June 2016

Ben Gerdes <ben@mcdowelleng.com>

Fwd: Crested Butte Center for the Arts

1 message

Kari McDowell Schroeder <kari@mcdowelleng.com> Tue, May 17, 2016 at 12:48 PM
To: Ben Gerdes <ben@mcdowelleng.com>

------ Forwarded message ------
From: **Roussin - CDOT, Daniel** <daniel.roussin@state.co.us>
Date: Saturday, December 5, 2015
Subject: Crested Butte Center for the Arts
To: Kari McDowell Schroeder <kari@mcdowelleng.com>

I think it would could work. I would make the lane only 18' instead of 30 feet.

Thanks

Dan Roussin
Permit Unit Manager
Traffic and Safety

COLORADO
Department of Transportation
Region 3

P 970.683.6284 | F 970.683.6290
222 South 6th Street, Room 100, Grand Junction, CO 81501
daniel.roussin@state.co.us | www.codot.gov/ | www.cotrip.org

On Fri, Dec 4, 2015 at 10:32 AM, Kari McDowell Schroeder <kari@mcdowelleng.com> wrote:

> Dan,
>
> Have you had a chance to take a quick look for fatal flaws at this proposed drop-off lane sketch yet?
>
> Kari
>
> ---
>
> **From:** Kari McDowell Schroeder [mailto:kari@mcdowelleng.com]
> **Sent:** Monday, November 23, 2015 2:41 PM
> **To:** Dan Roussin (daniel.roussin@state.co.us)

Subject: Crested Butte Center for the Arts

Dan,

Attached is a conceptual sketch of the drop-off lane for Crested Butte's proposed Center for the Arts. I am thinking that the drop-off lane would be a one-way northbound movement. I still need to figure out the left turn feasibility. I would appreciate any feedback, as the planners are wanting to finalize the site layout.

I'll try to run some preliminary traffic volumes early next week.

Thanks!

Kari

Kari J. McDowell Schroeder, PE, PTOE

Transportation / Traffic Engineer

McDowell Engineering, LLC
Transportation Engineering Consultants

Eagle • Broomfield • Grand Junction

970.623.0788 • 303.949.4748 • 303.845.9541 fax

kari@mcdowelleng.com

www.mcdowelleng.com

ON SH 135, 6TH ST N/O WHITEROCK AVE, CRESTED BUTTE (Station Id: 104575)

Daily | Monthly Summaries | Annual

07/26/2011

View Entire Month

Export to Excel

Dir	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
P	4	5	3	2	2	15	77	179	292	271	284	292	342	317	300	278	369	332	316	182	137	71	40	13
S	9	2	3	3	4	12	64	133	258	278	280	365	327	301	361	311	357	349	234	128	121	100	56	25
C	13	7	6	5	6	27	141	312	550	549	564	657	669	618	661	589	726	681	550	310	258	171	96	38

P = Primary direction S = Secondary direction C = Combined traffic counts

Kari McDowell Schroeder

From: Crockett Farnell
Sent: Thursday, November 05, 2015 3:18 PM
To: Kari McDowell Schroeder
Subject: Fwd: Survey Data from Matchstick Show

Kari - CFTA attendance survey attached for your use.

---------- Forwarded message ----------
From: **Jenny Birnie** <jenny@crestedbuttearts.org>
Date: Fri, Oct 30, 2015 at 10:35 AM
Subject: RE: Survey Data from Matchstick Show
To: Crockett Farnell <cfarnell@blackdragonllc.com>

Here you go!

7 pm Matchstick show:

37 people walked

42 people rode their bike

3 people rode the bus

157 people drove their car

9 am Matchstick show

116 people walked!

13 people rode their bike

4 people rode the bus

106 people drove their car

From: Crockett Farnell [mailto:cfarnell@blackdragonllc.com]
Sent: Friday, October 30, 2015 9:33 AM
To: Jenny Birnie
Subject: Survey Data from Matchstick Show

Can you send me the results please? I need to get the traffic consultant up to speed asap.

Gracias

--

J. Crockett Farnell

Black Dragon Development LLC

720.485.1111

www.blackdragonllc.com

--
J. Crockett Farnell
Black Dragon Development LLC
720.485.1111
www.blackdragonllc.com

Kari McDowell Schroeder

From: Jenny Birnie
Sent: Monday, June 13, 2016 10:37 AM
To: Kari McDowell Schroeder
Cc: Crockett Farnell
Subject: Re: Traffic and parking analysis

Follow Up Flag: Follow up
Flag Status: Flagged

Door survey last Thursday
Performance: Trevor Hall
190 total patrons

92 walked or rode their bike
15 rode the bus
83 drove to the venue

Let me know if you need anything else! jenny

On Thu, Jun 9, 2016 at 10:10 AM, Kari McDowell Schroeder <kari@mcdowelleng.com> wrote:

> Yes. I would love another door survey regarding modal split (bikes, peds, cars) at a summer event that may have more tourists.
>
> Kari
>
> On Thu, Jun 9, 2016 at 10:04 AM, Crockett Farnell <cfarnell@blackdragonllc.com> wrote:
>
> > Kari -
> >
> > Please see below. Any further data needed from Jennie at this point?
> >
> > She's off to Yosemite next week.
> >
> > Thanks
> >
> > CF
> >
> > ---------- Forwarded message ----------
> > From: **Jenny Birnie** <jenny@crestedbuttearts.org>
> > Date: Thu, Jun 9, 2016 at 9:33 AM
> > Subject: Traffic and parking analysis
> > To: Crockett Farnell <cfarnell@blackdragonllc.com>, Nestor Bottino <nbottino@holzmanmossbottino.com>, Andrew Hadley <andrew@andrewhadleyarchitect.com>, Ed Schmidt <Ed.Schmidt@nordanglia.com>, August Hasz <hasz@reginc.com>
> >
> > Hey guys, When we met last week we talked about putting together narratives related to traffic flow and parking. I am heading out of town tomorrow afternoon but I believe some input was needed from me. So

please let me know how I can help--notes I can put together based on the working of the center and now and into the future. I can easily do this while my husband is taking the brunt of driving, so let me know! Jenny

--

J. Crockett Farnell
Black Dragon Development LLC
720.485.1111
www.blackdragonllc.com

Kari McDowell Schroeder

From: Jenny Birnie
Sent: Tuesday, May 17, 2016 11:57 AM
To: Crockett Farnell
Cc: Ben Gerdes; Kari McDowell Schroeder
Subject: Re: FW: FW: CFTA Program Square Footage

HI Ben, I am sorry that I am so late in getting back to you on this!

- Administrative Staff - number of staff (full and part time) **7 full time admin staff in the new building**
- • Maintenance Staff - number of staff (full and part time) **One part time maintenance staff**
-
- Resident artists - total number and estimate of how many might use facility at one time **3 artist in residence at one time**
- • Art Classes - how many classes might occur at the same time, number of students per class, number of instructors per class **4 classes at one time 5-20 students per class. One instructor per class**
- • Dance Classes - how many classes might occur at the same time, number of students per class, number of instructors per class **5 classes consecutively at one time. 30-40 students per class. 1-2 instructors per class**
- • Theater - will the theater be in use at the same time as classes? **Yes**
- • Gallery - is there full time staff? any estimate of the number of visitors per day? **One part time staff 100 visitors/day average**
- • Alpenglow - website indicates 9 concerts and mentions 8,000 attendees. I assume this is for the entire series? Are there vendors at these events? If so, how many? **Yes entire series, yes we have one food vendor at each event and we also provide a full bar with 5 bartenders**

On Tue, May 10, 2016 at 11:29 AM, Crockett Farnell <cfarnell@blackdragonllc.com> wrote:
Ben -

Regarding ballfields, they are not part of our site or program responsibility and should not be considered part of our scope of work at this time unless you see need otherwise.

I am copying Jennie Birnie on this email as she is the one who would need to answer your prior email questions regarding facility programming. Her cell number is 970.901.0479 should you need to reach her directly.

I am concerned that we're getting to these questions this late in the process. How much time will you need to complete your calculations?

JB - could you please respond to the questions above regarding use of the CFTA?

Thanks for your help.

Crockett

On Tue, May 10, 2016 at 11:16 AM, Ben Gerdes <ben@mcdowelleng.com> wrote:
Crockett,

Another question, are sporting events held here as well? From the aerial it looks like there are fields on either side of the existing building. If so, are they used only on weekends? How many people would be using the fields at a given time (participants, coaches, and spectators combined).

Thanks, Ben

Ben Gerdes, PE
Traffic / Transportation Engineer

Eagle ● Broomfield ● Grand Junction

Phone: 970.366.9502
email: ben@mcdowelleng.com
www.mcdowelleng.com

On Tue, May 10, 2016 at 10:22 AM, Ben Gerdes <ben@mcdowelleng.com> wrote:
Crockett,

I am trying to understand the programming for the new facility in order to develop a realistic trip generation number. Could you provide some information on the following:

- Administrative Staff - number of staff (full and part time)
- Maintenance Staff - number of staff (full and part time)
- Resident artists - total number and estimate of how many might use facility at one time
- Art Classes - how many classes might occur at the same time, number of students per class, number of instructors per class
- Dance Classes - how many classes might occur at the same time, number of students per class, number of instructors per class
- Theater - will the theater be in use at the same time as classes?
- Gallery - is there full time staff? any estimate of the number of visitors per day?
- Alpenglow - website indicates 9 concerts and mentions 8,000 attendees. I assume this is for the entire series? Are there vendors at these events? If so, how many?

Thanks for your help, just trying to understand how the facility is envisioned to operate as to get an accurate prediction of trips.

Regards, Ben

Ben Gerdes, PE
Traffic / Transportation Engineer

Eagle ● Broomfield ● Grand Junction

Phone: 970.366.9502
email: ben@mcdowelleng.com
www.mcdowelleng.com

On Mon, May 9, 2016 at 4:34 PM, Kari McDowell Schroeder <kari@mcdowelleng.com> wrote:

From: Crockett Farnell [mailto:cfarnell@blackdragonllc.com]
Sent: Monday, May 09, 2016 4:24 PM
To: Kari McDowell Schroeder
Subject: Re: FW: CFTA Program Square Footage

This is latest and of course subject to change.

On Mon, May 9, 2016 at 2:21 PM, Kari McDowell Schroeder <kari@mcdowelleng.com> wrote:

Crockett,

Can you please send me the latest site plan for this project? Ben Gerdes (from my office) will be finalizing the trip generation calculations and asking for your input.

Kari

From: Crockett Farnell [mailto:cfarnell@blackdragonllc.com]
Sent: Tuesday, April 26, 2016 6:40 PM
To: Kari McDowell Schroeder
Subject: Fwd: FW: CFTA Program Square Footage

Kari -

Here are the official square footages for the current design of the CB CFTA. Can you please review and get back to me with a timeline for your report. Town Staff is pushing for it as soon as possible. Not really sure why as they will be dictating the parking requirements but my job is just to deliver.

Please call with any questions.

Thanks

Crockett

---------- Forwarded message ----------
From: **Nestor Bottino** <nbottino@holzmanmossbottino.com>
Date: Wed, Apr 20, 2016 at 1:03 PM
Subject: FW: CFTA Program Square Footage
To: Crockett Farnell <cfarnell@blackdragonllc.com>

Crockett

Below are area calculations you requested. They include mechanical spaces that take up floor area (First Level and Third Level) but not mechanical mezzanines above the ceilings in the existing building or above the theater support.

Nestor

Nestor Bottino, FAIA
Partner

HOLZMAN MOSS BOTTINO ARCHITECTURE
90 Broad Street, Suite 1803
New York, New York 10004
T: 212.465.0808 x203
F: 212.465.2226
nbottino@holzmanmossbottino.com

Find us at: holzmanmossbottino.com | Facebook | Twitter

From: Rafael Ayala
Sent: Wednesday, April 20, 2016 2:45 PM
To: Nestor Bottino <nbottino@holzmanmossbottino.com>
Subject: RE: CFTA Program Square Footage

Hello Nestor,

Here are the CFTA Program SF:

First Floor = 22,217 sf

Second Floor = 10,812 sf

Third Floor = 7,834 sf

Total = 40,863 sf

Building Footprint on Site = 25,932 sf

Rafael Ayala, Assoc. AIA

HOLZMAN MOSS BOTTINO ARCHITECTURE
90 Broad Street, Suite 1803
New York, New York 10004
T: 212.465.0808 x254
rayala@holzmanmossbottino.com

Find us at: HolzmanMossBottino.com | Facebook | Twitter | YouTube

From: Crockett Farnell [mailto:cfarnell@blackdragonllc.com]
Sent: Tuesday, April 19, 2016 4:06 PM
To: Nestor Bottino <nbottino@holzmanmossbottino.com>
Subject: CFTA Program Square Footage

Nestor -

Could you please provide a summary of building program square footage based on the latest BOZAR submittal package? I need to forward the latest "official" square footage to McDowell so they can finish up traffic study data. Hope to get that done as support material for formal submittal package next month.

Thanks.

--

J. Crockett Farnell

Black Dragon Development LLC

720.485.1111

www.blackdragonllc.com

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J. Crockett Farnell

Black Dragon Development LLC

720.485.1111

www.blackdragonllc.com

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www.blackdragonllc.com

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J. Crockett Farnell

Black Dragon Development LLC

720.485.1111

www.blackdragonllc.com

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J. Crockett Farnell
Black Dragon Development LLC
720.485.1111
www.blackdragonllc.com

Following is the Building Departments analysis of the parking requirement for the Center for the Arts based on the Town's requirements in section 16-16-20 of the Town Code. Circulation and common spaces in the building are not calculated as needing parking.

Existing Center for the Arts

Theatre	-239 fixed seats/4	= 60 spaces
Office/Gallery	- 632 sq. ft./ 500	= 2 spaces
Total		62 spaces
Off Street parking on-site		27 spaces
% of parking on site		43.5%

Proposed Center for the Arts

Theatre	- 321 fixed seats/4	= 81 spaces
Offices/Gallery/performance	- 11,466 sq. ft./ 500	= 23 spaces
Total		104 spaces
Off Street parking on site		16 spaces
% of parking on site		15.5 %

Net Analysis

Theatre	321 seats proposed minus 239 seats existing	= 20.5 additional spaces
Office/Gallery/Performance	11,466 sq. ft. minus 632 sq. ft.	= 33 additional spaces

Total additional parking spaces needed for expansion	– 54 spaces
On site spaces lost in remodel	- 11 spaces
Total additional spaces	- 65 spaces