

Council Special Meeting

Obey Creek Development Agreement Process



October 30, 2014

Town of Chapel Hill | 405 Martin Luther King Jr. Blvd. | www.townofchapelhill.org

Agenda for the Work Session

1.	Public Comment (Approximately 10 minutes)
2.	Presentation: Connectivity, Transportation, and Transit
3.	Presentation: Response to questions about southern Chapel Hill
4.	Council Discussion
5.	Public Comment (Approximately 10 minutes)

Connectivity

Team Member:

David Bonk, Long Range and Transportation Manager

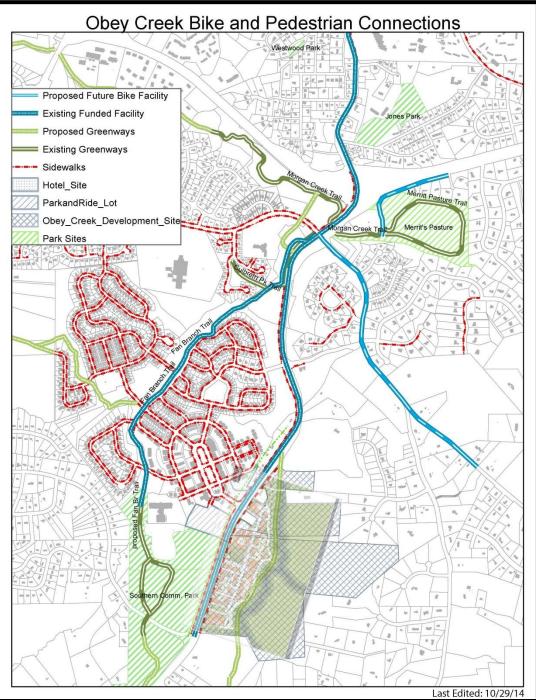
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Connectivity

- Response from NCDOT: US 15-501
- Meeting with BACH (Bicycle Alliance Chapel Hill)

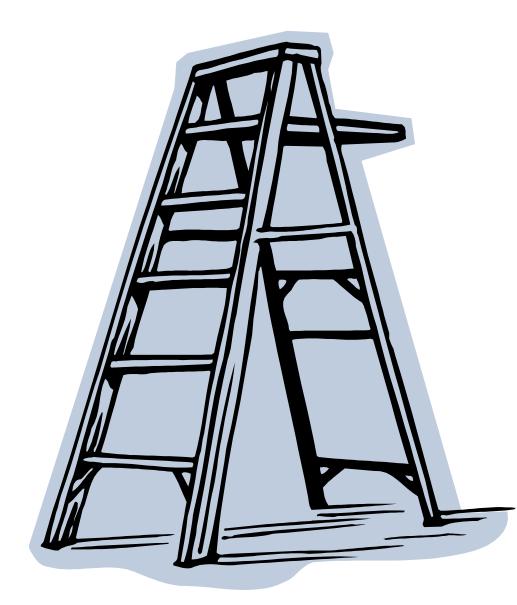


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Existing and Proposed Bike and Pedestrian Connections in southern Chapel Hill

ww.townofchapelhill.org



How does this information inform the next steps in the process?

Roadway Improvements

Team Member: Craig Scheffler, HNTB Kumar Neppalli, Traffic Engineering

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Today's Presentation

HNI

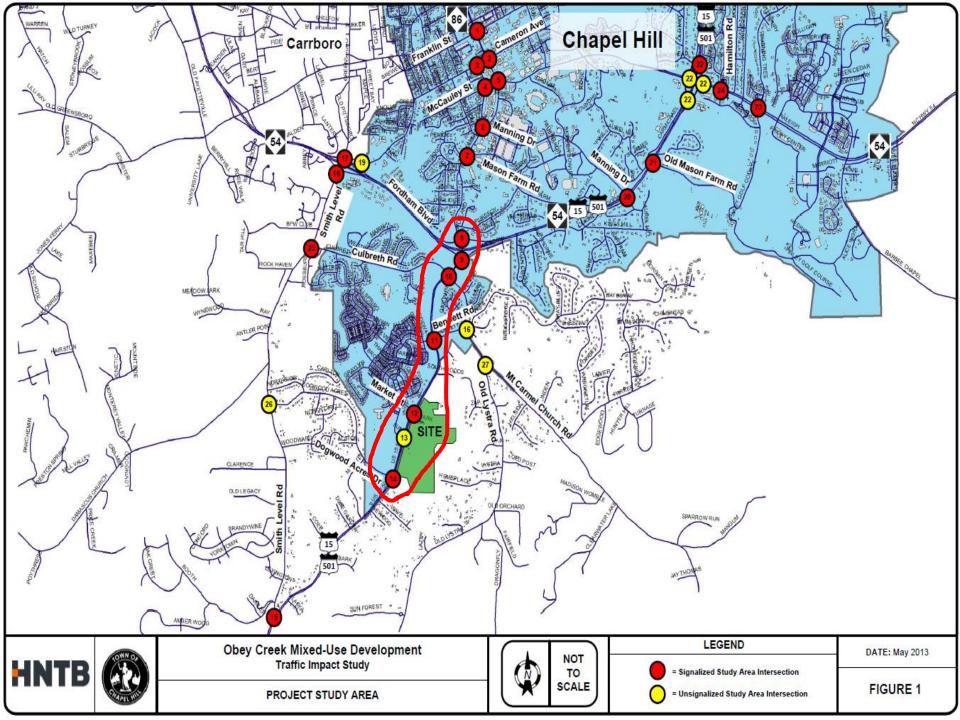
- Provide Updates to Original TIS Capacity Analysis
- New Traffic Network Assumptions
- Discussion of Level-of-Service and Queueing Results

Updated Traffic Analysis

Basic Details

HIN T B

- US 15-501 Corridor from NC 54 Bypass Interchange to Dogwood Acres Drive
- 2022 PM Peak Hour Worst Case
- Accounts for NCDOT Modified Recommendations
- Accounts for Recommended Loop Ramp and Mt. Carmel Church Road Improvements

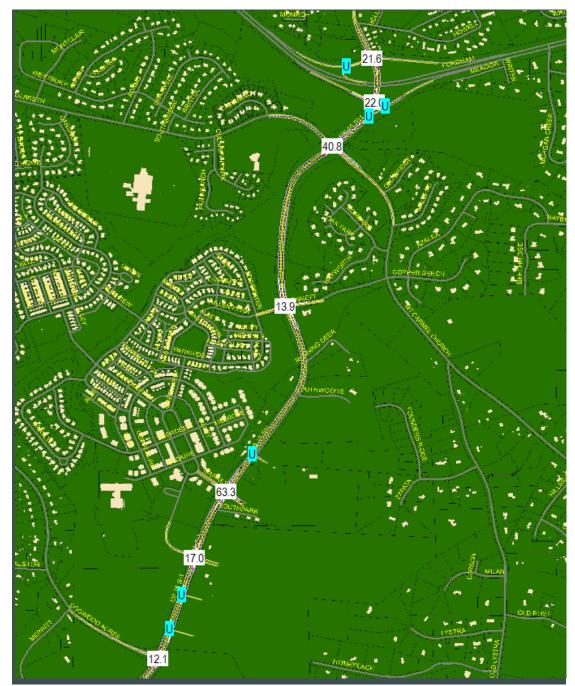




Updated Traffic Analysis Synchro Network

> 2022 PM Peak Hour Overall Intersection LOS



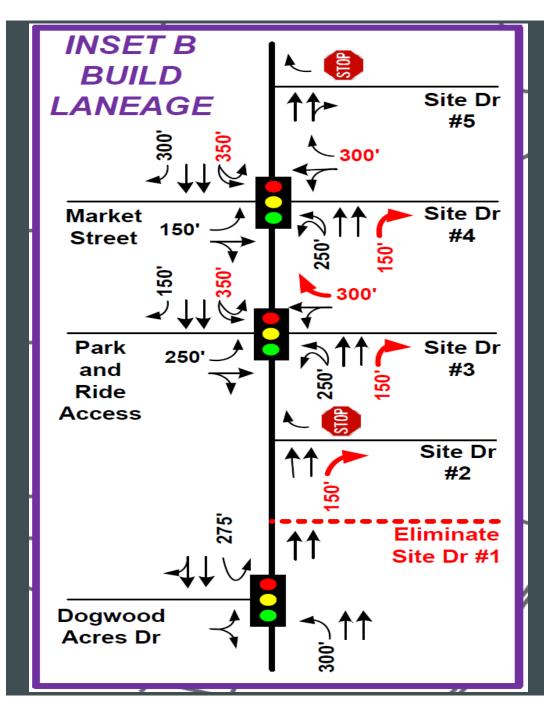


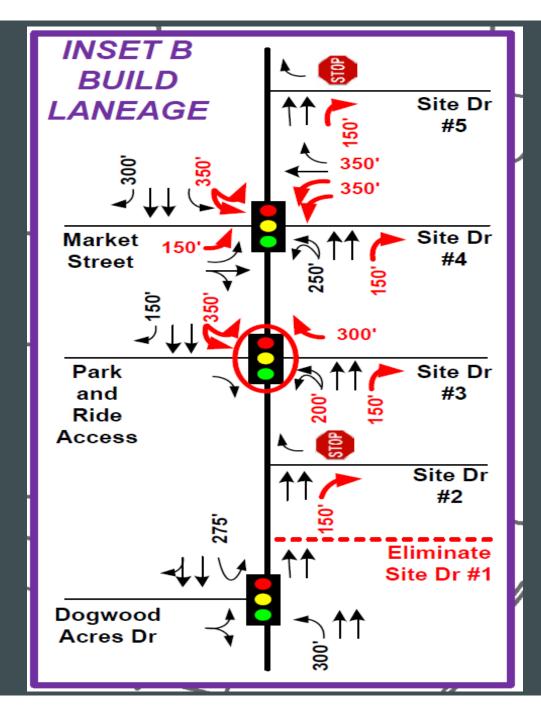
Updated Traffic Analysis Methodology

- Revise Road Network in Vicinity of Obey Creek
- Adjust Traffic Volumes for Sumac Road (Park & Ride Exit / Site Driveway #3) Access Restrictions
- Reoptimize Network Traffic Signals
- Assume Loop Ramp Design and Mt. Carmel Church Road Improvements in Place

Updated Traffic Analysis

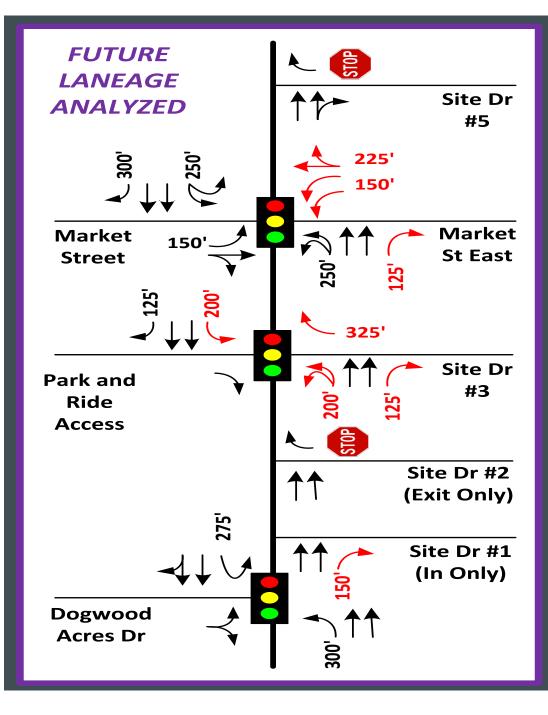
Original HNTB Laneage Recommendations for Obey Creek





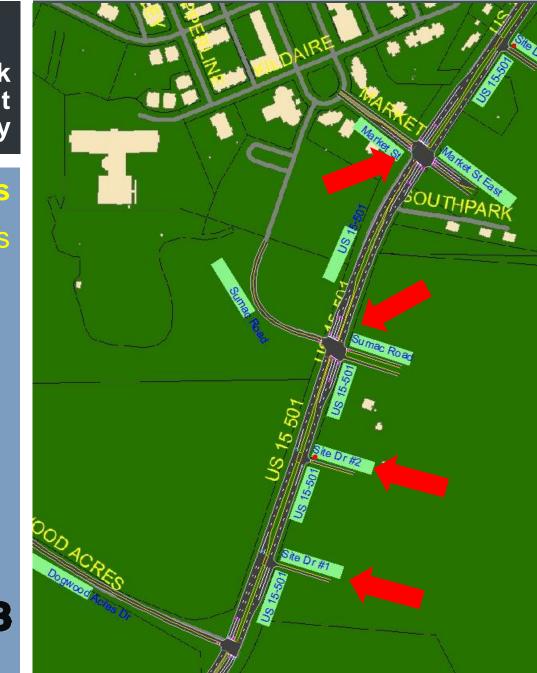
Updated Traffic Analysis

NCDOT Original Recommended Laneage for Obey Creek



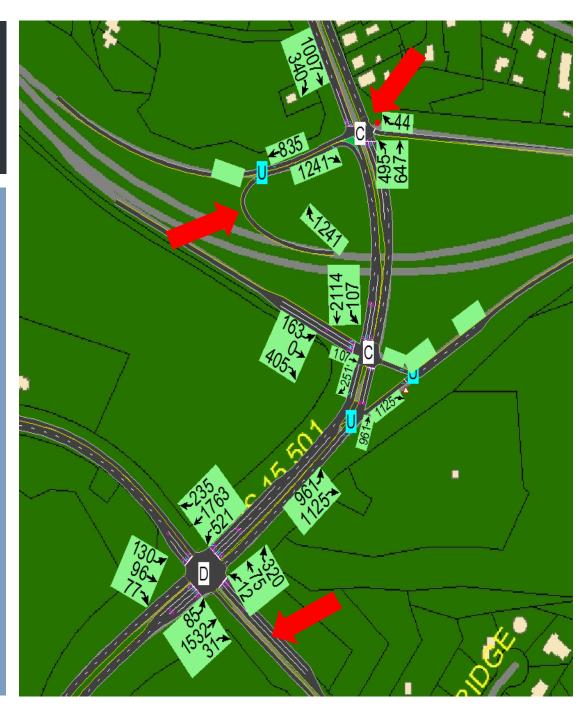
Updated Traffic Analysis

Current Laneage Assumptions for Obey Creek



Updated Traffic Analysis Network Changes



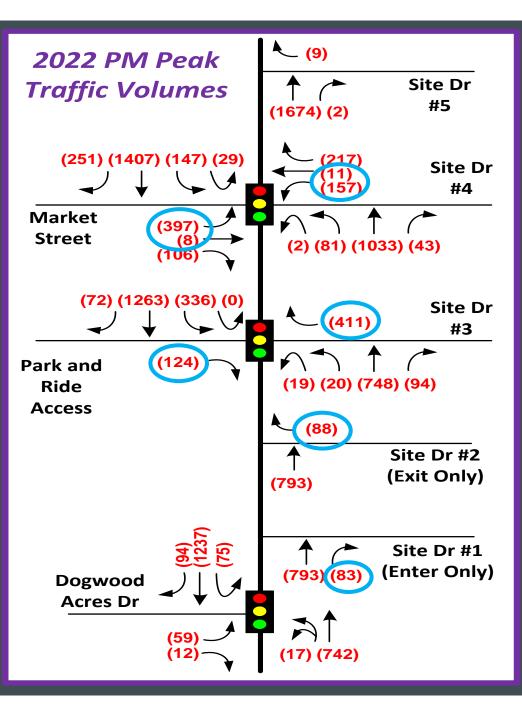


Updated Traffic Analysis Network Changes



Updated Traffic Analysis

Traffic Volume Redistribution



Updated Traffic Analysis

2022 PM Peak Hour Weekday LOS Results & Maximum Queue Estimates

Several Individual Movements Exceed LOS D

Several Movements Exceed Queue Storage



Table 1. 2022 PM Peak Hour Intersection	Capacity and Queue	Analysis Results
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D	T	LOS	Average Victorian Datase	95 th %	Queue
#	Intersections / Movements	LUS	Vehicular Delay (sec/vehicle)	Queue Length (ft)	Storage (ft)
8	NC 86 (S. Columbia Street) & NC 54 Bypass (Fordham Blvd) WB Ramps	С	21.6		
	EB RT*	Α	5.0	0	600
	WB RT**	A	8.9	25	1350
	NBLT	E	70.9	475	200
	NB TH	A	0.4	0	725
	SB TH	C	34.2	1175	-
	SB RT	B	13.3	225	350
9	US 15-501 & NC 54 Bypass (Fordham Blvd) EB Ramps	С	22.0		
		-	67.0	225	250
	EB LT	E	57.9	225	250
	EB LTTH	E	79.3	325	900
	EB RT	E	78.9	325	250
	NB TH	A	4.7	150	800
	SB LT SB TH	B	10.3	50	150
10		В	16.0	575	625
10	US 15-501 & Culbreth Road / Mt. Carmel Church Road	D	40.9		
	EB LT	F	97.2	200	900
	EB TH	E	56.1	150	-
	EBRT	E	56.6	125	75
	WB LTTH	F	113.8	200	-
	WB RT	С	32.8	200	350
	NB LT	F	101.8	200	125
	NB TH	D	54.0	975	-
	NB RT	В	10.9	50	75
	SB LT	F	83.4	675	525
	SB TH	В	11.6	650	800
	SB RT	Α	2.0	50	250
11	US 15-501 & Arlen Park Drive / Bennett Road	В	13.9		
	EB LT	E	70.4	175	75
	EB THRT	D	52.2	100	400
	WBLT	E	60.7	125	200
	WB THRT	D	49.2	50	-
	NB LT	E	63.5	50	275
	NB TH	A	9.6	650	-
	NB RT	Α	5.5	50	300
	SB LT	E	59.9	50	275
	SB TH	A	9.6	375	-
	SB RT	A	6.1	75	325

RED LOS/DELAY VALUES – Movement or Overall Intersection is over capacity per Town of Chapel Hill TIS Guidelines RED QUEUE LENGTH/STORAGE VALUES – Synchro Estimated Queue Length Potentially Exceeds Existing/Future Storage "" = Queue Storage Calculation Not Relevant for Specified Movement

* - Free Flow Movement ** - Unsignalized (Stop-Controlled) Movement

Updated Traffic Analysis

2022 PM Peak Hour Weekday LOS Results & Maximum Queue Estimates

US 15-501 & Market Street / Market Street East Exceeds Overall Intersection LOS D

Several Movements Exceed Queue Storage



D #	Intersections / Movements	LOS	Average Vehicular Delay (sec/vehicle)	95 th % Queue Length (ft)	Queue Storage (ft)
2	US 15-501 & Market Street / Market Street East	E	63.4		
	EB LT	F	103.8	650	150
	EB THRT	E	71.2	175	350
	WB LT	D	41.3	100	150
	WB THRT	F	116.7	425	225
	NB LT/U-TURN	F	109.9	200	250
	NB TH	D	44.4	600	925
	NB RT	Α	5.8	25	150
	SB LT/U-TURN	F	108.1	325	250
	SB TH	E	61.9	925	-
	SB RT	Α	6.5	25	300
3	US 15-501 & Sumac Road (SV Park & Ride Driveway / Site Driveway #3)	В	17.0		
	EBRT	E	68.1	175	-
	WBRT	С	26.2	400	325
	NB LT/U-TURN	E	68.0	100	200
	NB TH	С	26.4	250	1400
	NBRT	C	22.1	75	125
	SBLT	B	11.4	175	200
	SB TH	A	2.5	100	925
	SB RT	Α	2.1	25	125
4	US 15-501 & Dogwood Acres Drive	B	12.1		
	EBLTRT	E	75.5	125	-
	NB LT	A	9.6	25	300
	NB TH	A	9.6	225	-
	SB U-TURN	E	55.7	150	275
	SB THRT	A	7.2	275	1400
)	US 15-501 & Site Driveway #2 (Exit Only)	N/A	N/A		
	WB RT	B	10.8	25	-
0	US 15-501 & Site Driveway #5 (RIRO)	N/A	N/A		
	WB RT	В	10.0	25	

"-" = Queue Storage Calculation Not Relevant for Specified Movement

** - Unsignalized Movement

N/A - Not Applicable, Overall Intersection LOS for Unsignalized Intersection Not Calculated by HCM Methodologies

Updated Traffic Analysis

US 15-501 & Market Street Improvement

Change Westbound Approach from Obey Creek to lefttrun/through/right-turn lanes

> Overall Intersection LOS improves to LOS D

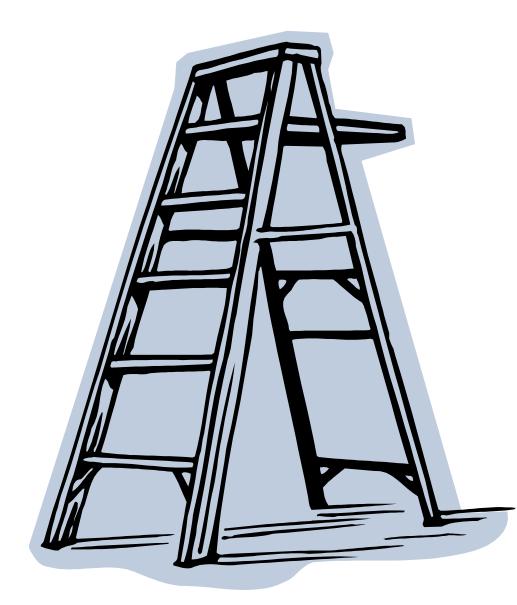
> > HNTB

Table 2. US 15-501 and Market Street Potential Improvements

D #	Intersections / Movements	LOS	Average Vehicular Delay (sec/vehicle)	95 th % Queue Length (ft)	Queue Storage (ft)
12	US 15-501 & Market Street / Market Street East	D	37.3		
	EB LT	Ε	71.7	575	150
	EB THRT	E	67.3	175	350
	WB LT	E	71.4	250	150
	WB TH	E	63.8	50	225
	WB RT	E	65.8	300	225
	NB LT/U-TURN	F	109.8	200	250
	NB TH	С	32.3	575	925
	NB RT	В	12.3	50	150
	SB LT/U-TURN	E	67.8	250	250
	SB TH	В	18.5	725	-
01	SB RT	A	2.2	100	300

Blue = Improved Movement Allowing Overall Delay to Drop from 63 to 37 seconds





How does this information inform the next steps in the process?

Transit

Team Member: Craig Scheffler, HNTB Brian Litchfield, Chapel Hill Transit

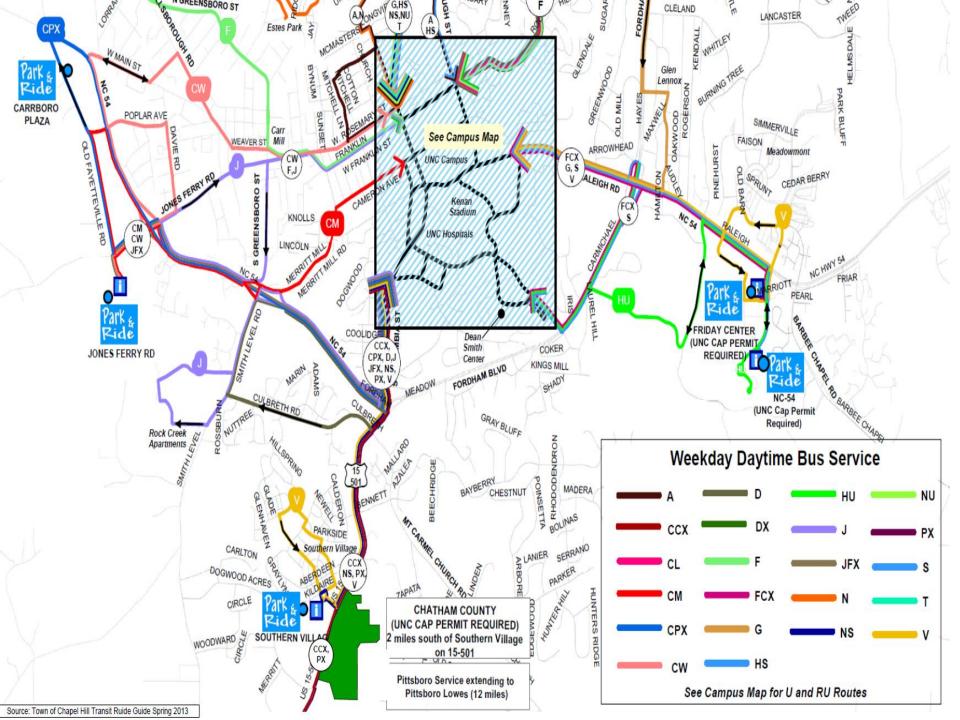
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Today's Presentation



 Determine Existing & Future CHT Service Patterns and Capacity

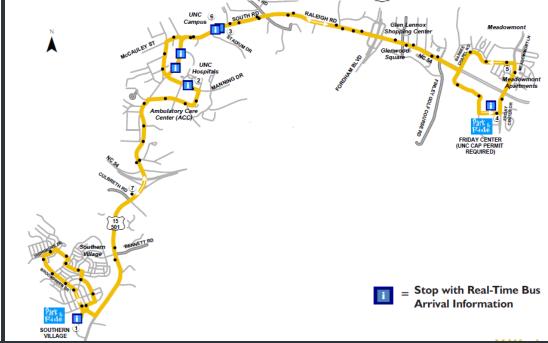
- Proportion Obey Creek Projected Transit Trips Onto Existing Routes
- Estimate Future Build "Stop" and Route Load/Capacity





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Current CHT Fixed Routes NS and V provide service to Southern Village Park and Ride & are only current routes directly serving Obey Creek



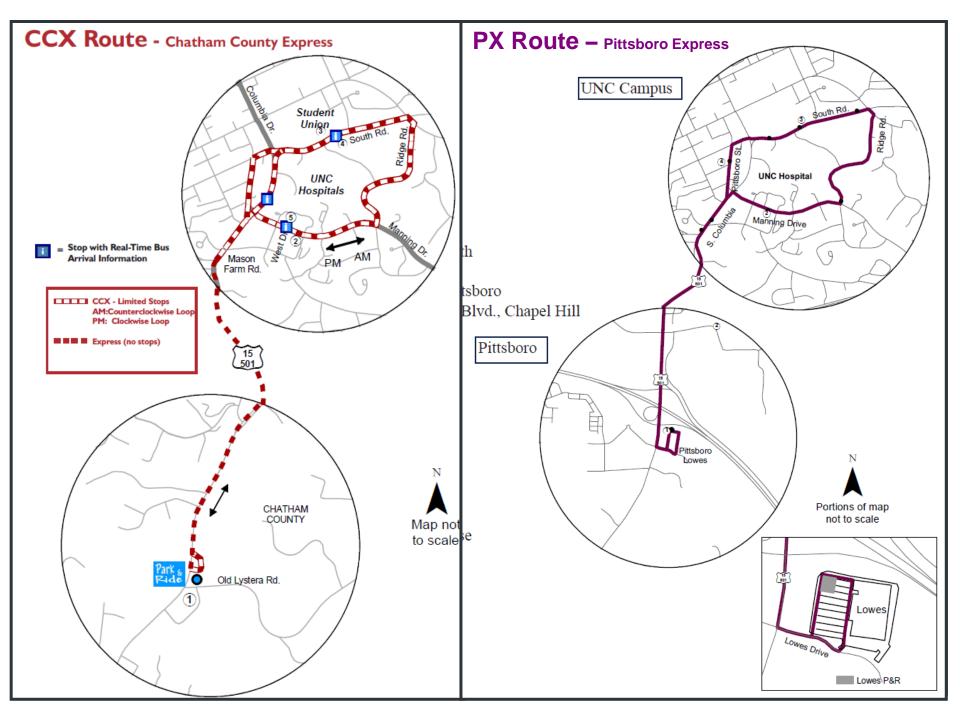


Table 2. Existing CHT Service Capacity and Details

Direction	Obey Creek Trip Type	Daily Buses	Daily Cap.	AM Peak Hour Range	Buses	Raw Seat Cap.	Noon Peak Hour Range	Buses	Raw Seat Cap.	PM Peak Hour Range	Buses	Raw Seat Cap.	
	NS Route												
Southbound	Alighting	51	3,060	7:30 – 8:20	6	360	11:55- 12:25	2	120	4:40- 5:30	6	360	
Northbound	Boarding	51	3,060	7:30- 8:20	6	360	12:10- 12:30	2	120	4:40- 5:40	6	360	
					V Rou	te							
Southbound	Alighting	18	1,080	7:36- 8:18	2	120	12:46	1	60	4:51- 5:42	2	360	
Northbound	Boarding	16	960	7:40- 8:15	2	120	12:10	1	60	5:03- 5:30	2	360	
				(CCX Ro	oute							
Southbound	Alighting	18	1,080	7:30-	4	240	12:20 -	2	120	4:45-	4	240	
Northbound	Boarding	18	1,080	8:15	4	240	1:00	2	120	5:30	4	240	
					PX Rot	ute							
Southbound	Alighting	8	480	7:48	1	60	N/A	N/A	N/A	5:08	1	60	
Northbound	Boarding	6	360	7:10	1	00	N/A	N/A	N/A	4:28	1	00	

Detailed Transit Analysis

Site Trip Generation Details



- Calculated Trips Using ITE Methodology and Adjusted by Field Collected Information/Research
- Adjusted Raw Trips For Internal Capture, Transit: Pedestrian/Bicycle, Pass-by Trips & Diverted Linked Trips
- Distribute Vehicle Trips By Existing Trip Patterns & Proposed Spatial Access
- Assign Trips

Trip Generation Step	24 H	our Volu	mes	AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
1. ITE Raw Trip Generation Calculations	12,836	12,836	25,672	719	450	1,169	814	772	1,585	1,098	1,295	2,393
2. Internal Capture	-1,284	-1,284	-2,568	-46	-46	-92	-144	-144	-288	-241	-241	-482
EXTERNAL TRIP GENERATION BEFORE MODAL REDUCTION	11,552	11,552	23,104	673	404	1,077	670	628	1,297	857	1,054	1,911
3. Transit Trip Reductions	-1,282	-1,282	-2,565	-98	-63	-161	-60	-57	-116	-131	-155	-286
4. Ped/Bike Trip Reductions	-130	- <mark>1</mark> 30	-259	-10	-6	- <mark>1</mark> 6	-6	-6	-12	-13	-15	-29
TOTAL EXTERNAL VEHICLE TRIPS (DRIVEWAY VOLUMES)	10,140	10,140	20,280	565	335	900	604	565	1,169	712	884	1,596
5. Pass-By Trips	-1,213	-1,213	2, <mark>4</mark> 25	-0	-0	-0	-119	-119	-237	-176	-176	-352
6. Diverted Linked Trips	-999	-999	1,997	-0	-0	-0	-98	-98	-195	-145	-145	-290
TOTAL EXTERNAL VEHICLE TRIPS (NEW TRIPS)	7,928	7,928	15,858	565	335	900	387	348	736	391	563	954

Detailed Transit Analysis

2022 Obey Creek Demand

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Table 1. Estimated Obey Creek Transit Trips

Тгір Туре	Daily	AM Peak Hour	Noon Peak Hour	PM Peak Hour
Boarding (Exit)	1,282	63	57	155
Alighting (Enter)	1,282	98	60	131
Totals	2,564	161	117	286

- Peak Hour Demand = Adjacent Traffic Peak Hour
- Peak Hour Demand Divided Over Existing Route Service (# of buses)
- No estimate of distribution of daily trips over "off-peak" hours for this analysis

 Table 3. Existing Average Transit Ridership (Boardings) for Routes Serving Obey Creek

		AM Peak	Noon Peak	PM Peak
Route	Daily	Hour	Hour	Hour
NS	3,643.36	476.98	147.1	409.93
V	603.17	112.35	45.08	79.19
CCX	412.61	87.77	7.33	33.6
РХ	98.47	21.82	0	33.1
Totals	4,757.61	698.92	199.51	555.82

- Ridership estimates used to proportion Obey Creek demand for each potential route
- Assume CCX and PX Routes could be used for Obey Creek service

Obey Creek Mixed-Use Development Traffic Impact Study

Detailed Transit Analysis Existing Route Ridership



Table 4. Estimated Proportion of Obey Creek Trips Using Existing Routes

Obey Creek Mixed-Use Development Traffic Impact Study

Detailed Transit Analysis Obey Creek Trips By Route

Route	Daily		AM Peak Hour		Noon Pe	eak Hour	PM Peak Hour		
Koute	Boarding	Alighting	Boarding	Alighting	Boarding	Alighting	Boarding	Alighting	
NS	982	982	43	67	42	44	114	97	
V	163	163	10	16	13	14	22	19	
CCX	111	111	8	12	2	2	9	8	
РХ	27	27	2	3	0	0	9	8	
Totals	1,282	1,282	63	98	57	60	155	131	

- Assume no transfers to other routes
- No PX Route Noon Peak service
- Use data to add to projected 2022 No-Build loadings to determine "stop" and route available capacity

Detailed Transit Analysis

"Stop" Capacity Analysis Results

Scenario 2014 Existing 2022 No-Build 2022 W/ Obey Co									
	Scenario	2014 E	xisting	2022 N	o-Build	2022 W/ C	Obey Creek		
Time Period	Route	% Available Boarding Capacity	% Available Alighting Capacity	% Available Boarding Capacity	% Available Alighting Capacity	% Available Boarding Capacity	% Available Alighting Capacity		
	NS	85%	85%	82%	82%	50%	50%		
	V	90%	95%	88%	94%	71%	79%		
Daily	CCX	90%	89%	88%	86%	83%	81%		
	PX	80%	95%	76%	94%	61%	91%		
	Totals	87%	89 %	<mark>85</mark> %	87%	65 %	69%		
	NS	64%	88%	57%	85%	45%	67%		
	V	73%	92%	<mark>67%</mark>	90%	59%	77%		
AM Peak Hour	CCX	73%	95%	<mark>67%</mark>	93%	64%	88%		
noui	PX	64%	96%	57%	96%	53%	91%		
	Totals	6 8%	9 1%	62 %	<mark>89</mark> %	54%	77%		
	NS	92%	84%	91%	80%	56%	44%		
Noon	V	90%	97%	88%	96%	67%	73%		
Peak	CCX	97%	92%	96%	91%	94%	89%		
Hour	PX	0%	0%	0%	0%	0%	0%		
	Totals	94 %	90%	92 %	<mark>88%</mark>	73%	68%		
	NS	97%	81%	96%	78%	65%	51%		
PM Peak	V	98%	95%	98%	94%	80%	78%		
Hour	CCX	97%	58%	96%	50%	92%	46%		
nour	PX	98%	72%	98%	<mark>6</mark> 6%	83%	54%		
	Totals	97%	76%	97%	71%	77%	54%		

- Is there enough load capacity for Obey Creek riders to get on/off?
- Does not account for impacts along the routes

Detailed Transit Analysis

Route Capacity Analysis Results

- <u>Does Obey Creek ridership impact</u> other areas along each route where existing/future service may be near/at capacity?</u>
- Assume Obey Creek riders board/alight at same proportions as existing route boardings/alightings
- Compute load capacity for each stop along route – No-Build/Build
- Assume no transfers & stops can be made for Express Routes at Obey Creek
- No Daily Estimates made for this analysis

EXHIBIT 3. 2022 CCX Route No-Build/Build Available Load Capacity Results

Obey Creek Mixed-Use Development Traffic Impact Study

Detailed Transit Analysis

Route Capacity Analysis Results

CCX Route

HNTB

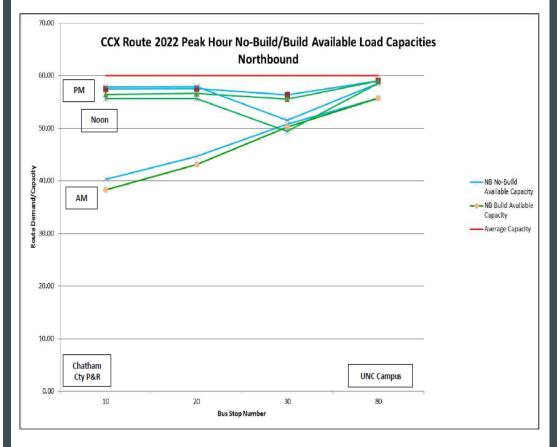


Table 6. 2022 Southbound Route CCX Load Capacity Analysis – Passing Obey Creek Site

Peak Hour	Max Capacity	2014 Existing Available Capacity	2022 No-Build Available Capacity	Obey Creek Portion (Alighting at Obey Creek)	2022 Build Available Capacity
AM	60	58.37	58.01	3.00	55.01
Noon	60	56.10	55.32	1.00	54.32
PM	60	49.44	47.33	2.00	45.33

EXHIBIT 4. 2022 PX Route No-Build/Build Available Load Capacity Results

PX Route 2022 Peak Hour No-Build/Build Available Load Capacities

Northbound

Obey Creek Mixed-Use Development Traffic Impact Study

Detailed Transit Analysis

Route Capacity Analysis Results

PX Route

HNTB

70.00

60.00

PM

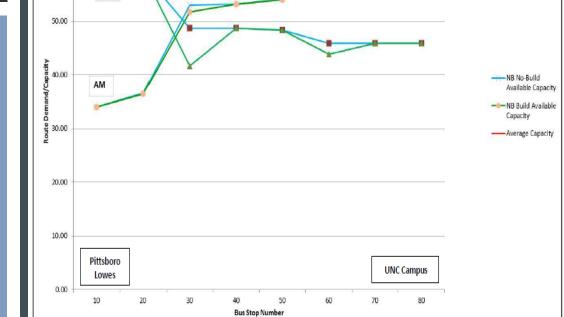
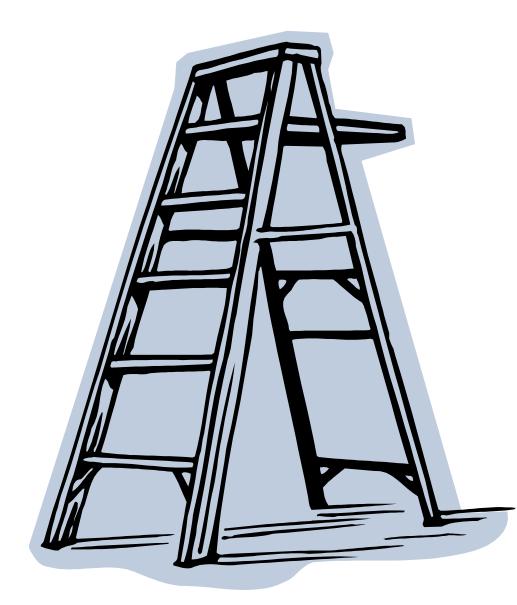


Table 7. 2022 Southbound Route PX Load Capacity Analysis – Passing Obey Creek Site

Peak Hour	Max Capacity	2014 Existing Available Capacity	2022 No-Build Available Capacity	Obey Creek Portion (Alighting at Obey Creek)	2022 Build Available Capacity
AM	60	58.00	57.60	3.00	54.60
PM	60	42.93	39.51	8.00	31.51



How does this information inform the next steps in the process?

Responses to questions about southern Chapel Hill

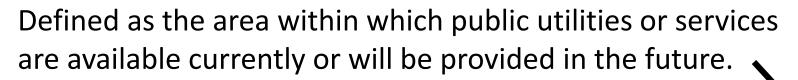
Team Member:

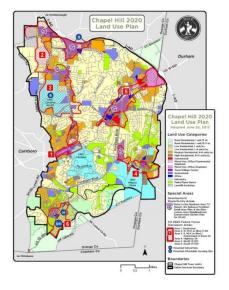
Megan Wooley, Community Sustainability Planner

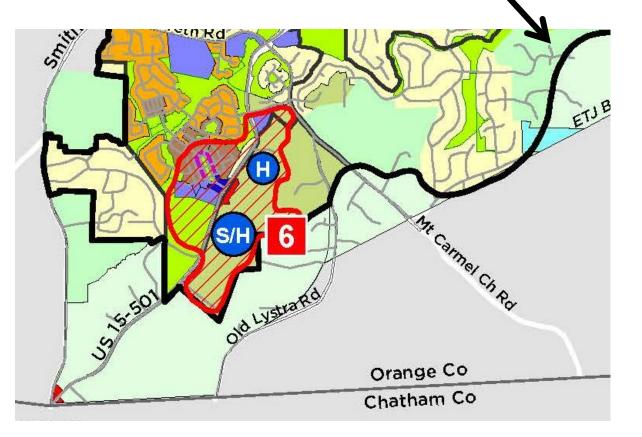
Guidance from existing plans and reports for growth in southern Chapel Hill

Urban Services Boundary Chapel Hill 2020 comprehensive plan Obey Creek Compass Committee Report

Urban Services Boundary (Established 1986)







Urban Services Boundary

Chapel Hill 2020 Land Use Plan

Uses in the west:

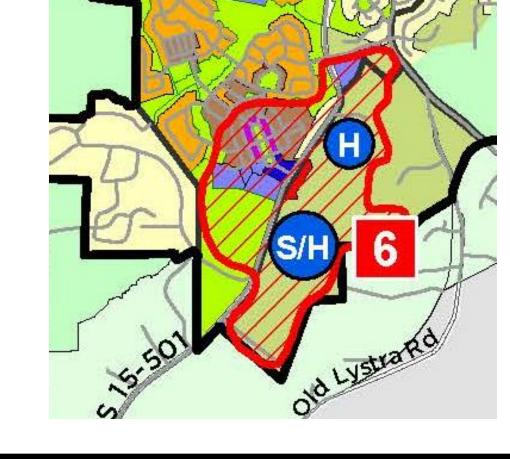
- Parks and Open Space
- Institutional

Uses in the east:

• Low residential

Suggested Uses:

- H: Affordable Housing
- S: School



Urban Services Boundary Chapel Hill 2020 Comprehensive plan Committee Report

Urban Services Boundary Chapel Hill 2020 Comprehensive plan Committee Report

South 15-501 Discussion Group – General Principles



A Place for Everyone

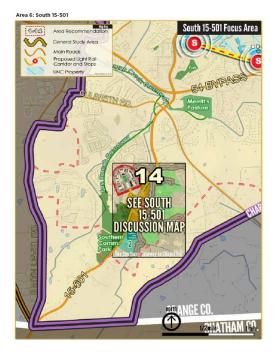
 Respond to demonstrated needs of the greater Chapel Hill community

Facilitate Getting Around

- Minimize traffic impact on neighborhoods surrounding the study area and along 15-501
- Plan collaboratively for the 15-501 corridor with Orange County and Chatham County (including transit planning)
- Improve bicycle and pedestrian connectivity among neighborhoods, schools, community facilities, parks, and across 15-501
- Plan for increased use of transit



South 15-501 Discussion Group – General Principles



Develop Good Places, New Spaces

- Recognize and honor the spirit of the Southern Small Area Plan from the early 1990s
- Ensure that there is significant community process and community benefit in all future development plans
- Minimize the impact of development on schools

Nurture Our Community

- Preserve and enhance natural resources (make public), including water quality and stormwater quality
- Preserve and enhance the "Green Gateway"

South 15-501 Discussion Group – Area Specific Principles

Area-Specific Principles



Area 1

- Meet community needs with new development (mixed-use) focused on commercial rather than residential
- Promote architectural diversity and quality with design guidelines
- Emulate design principles of market area of Southern Village, including building height restrictions
- And County Line: Encourage clustered retail development including any new development toward the county line



South 15-501 Discussion Group – Area Specific Principles

Area-Specific Principles



Areas 1 and 2

• Utilize clustered, compact development to maximize open space preservation

Areas 1, 2, and 3

 Promote greenways, particularly along and near creeks

Areas 2 and 3

 Maximize permanent preservation of open space

South 15-501 Discussion Group – Area Specific Principles

Area-Specific Principles



Areas 4 and 5

 Promote possibility of workforce housing or accommodations for other identified community needs, such as senior citizen housing

Area 5

 Evaluate increased transit use at park-andride lot

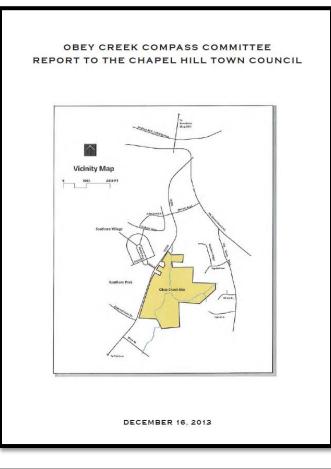
All Areas

 Provide corridor buffer along 15-501, allowing for visibility and access to retail or commercial development

Obey Creek Compass Committee Report (December 2013)



Provides area-wide and site-specific recommendations



Area-wide recommendations regarding:

- Uses and Impacts
- Design
- Connectivity and Mobility
- Traffic
- Environmental Considerations

Guidance from existing plans and reports for growth in southern Chapel Hill

Urban Services Boundary Chapel Hill 2020 comprehensive plan Obey Creek Compass Committee Report

Cost Estimates for a Small Area Plan

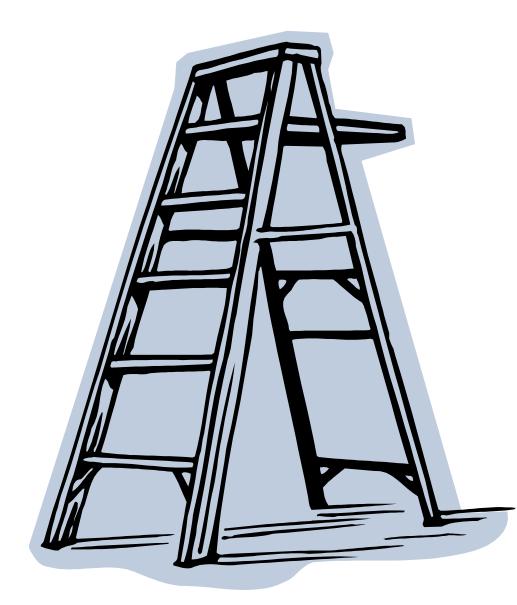
Option 1: Visioning Workshop - \$80,000-\$95,000

- Review Base Information
- Vision Workshop (3-4 day visioning and design effort)
- Final work product (plan for area)

Option 2: Charrette - \$180,000-\$250,000

- Review Base Information
- Pre-Charrette Analysis
- Charrette (5-7 day visioning and design effort)
- Final work product (plan for area)
- Final presentations

Note: These estimates do not include staff time.



How does this information inform the next steps in the process?

Council Discussion

Team Member:

Mary Jane Nirdlinger, Planning and Sustainability

Conclusion and Next Steps

Team Member:

Mary Jane Nirdlinger, Planning and Sustainability

Upcoming Meetings

- Monday, November 3rd
- Thursday, November 13th
- Monday, December 8th