

# Appendix B: Survey and Results

## Results Summary

The Consultant conducted a three-day event in order to survey travelers at the Mall from December 17<sup>th</sup> to December 19<sup>th</sup> 2009 and a similar, post-holiday event on Saturday, January 16<sup>th</sup>. A kiosk was set up in the Food Court area of the Mall, and brief paper surveys were offered to those that wanted to complete them. In all, 243 survey responses were received; a summary of the major findings are shown below, along with specific reference points in the main document to learn more about each issue.

**What kind of people were the respondents?** With the exception of the Mall Walker event attended largely by seniors (40 out of 47 respondents were over the age of 65), the respondents differed on the aspects measured. Forty-two percent (42%) of respondents were between the age of 25 and 49, with 9% being under the age of 18 and 5% being over the age of 65 (again, excluding the Mall Walker respondents). Nine percent (9%) of all respondents said that they walk to shopping, dining, or work at least once per week; 3% - 5% said that they ride a bicycle or take transit at least once each week.

**Where are people coming from?** Generally, respondents traveled the greatest distance on the weekend, after the major holiday season was over. The spread of respondents even include a couple of out-of-state participants, although the great majority of responses were from people within a few miles of the Mall.

**How are people traveling through Crabtree Valley?** The great majority of people (95%) surveyed said that they drove themselves or otherwise rode in a car to arrive at the Mall on their trip. Less than 13% of those that got to Crabtree Valley by car did so with more than one person in the car.

**How long does it take to get to the Valley?** The majority of respondents (68%) to the survey stated that their trip took between six and thirty minutes. However, 10% of respondents said that their trip took longer than one hour.

**What kinds of issues did people cite concerning their trip to Crabtree Valley?** A large variety of concerns were identified, as well as possible solutions. A large number of these responses concerned getting onto, parking in, and getting out of the Mall property. A smaller number cited specific intersections and the amount of time or difficulty (safety, potential for accidents) of getting through these intersections. Capacity, signage, and traffic light delays (stop delays) were principal concerns of the respondents. Additional transit services, roadway capacity improvements, and safety/intersection improvements were common solutions proposed by the respondents.

**What questions did the survey have on it, and how was it conducted?** The survey is shown in its entirety at the end of Appendix B, and a description of the methodology begins on the following page.

## Methodology and Survey Design

As stated earlier, the Consultant conducted a three-day event at the Crabtree Valley Mall (the “Mall”) in December and January to gather holiday and post-holiday opinions from travelers through and into the study area. The purpose of the events was to gather surveys and input to describe the travel conditions to and from the Mall property. No attempt was made to obtain statistical significance for this exercise, although survey effects such as halo and grammatical phrasing were valued in the survey design. Coordination occurred prior to the events with the Mall authorities to determine the survey station locations, setup, and to review the survey content. The first day of the survey process was considered somewhat of a pilot endeavor to finalize the survey content and survey gathering process; the following describes the survey framework for each of the event days.

- Day 1 (Thursday, December 17, 2009): The survey audience was a group of “mall walkers” that meet monthly with the support from the Mall, and are provided food donated by a restaurant in the Food Court. A table was set up in the Food Court area, as well as two 6’ standing banners and a table wrap-around banner. Fifty-six (56) surveys were completed. This audience was significantly older than the general Friday and Saturday event participants, rendering the results incompatible for combining with the remainder of the survey responses. However, one respondent identified that their mode of travel was by bicycle and another by bus. Interviews were conducted with two participants that agreed to sign permission waivers.

- Day 2 (Friday, December 18, 2009): This was the first day of the general survey, with responses being accepted between 12PM and 5PM. Nearly identical survey stations were set up in the Food Court area at the same location as the Thursday event; the second station, which only lacked a TV screen, was set up downstairs near

the information station and escalators. Survey responses were much higher in the upstairs, Food Court location due to the action taken by the surveyors of handing out blank surveys on empty dining tables throughout the Food Court. This prompted relocating staff from the downstairs station to upstairs on the second day (Saturday), although a table and surveys remained downstairs. The upstairs station was equipped with standing and table banners as well as a TV screen that showed a video summary of the project and invited passersby to take the survey; showed preliminary results; and noted how many winners of gift certificates (four, \$100 gift certificates were awarded randomly to those persons that completed a survey). Additionally interviews were conducted with participants, including signed permission waivers. Fifty-one (51) surveys were completed on Friday.

- Day 3 (Saturday, December 19, 2009): The station setups were identical to that of Friday, with the previously noted exception of not manning the downstairs station due to a lack of response. Seventy-six (76) surveys were completed on Saturday. This additional day of the survey was conducted due to the thought that travel patterns were markedly different for weekend Christmas shopping as opposed to more localized weekday shopping patrons, which turned out to be true to a limited extent.
- Day 4 (Saturday, January 16, 2010): This last event was chosen to compare non-holiday situations with those that occurred on the previous three event days. As before, two people manned a 6’ table/kiosk with a stand-up banner, wrap-around table banner, and a number of surveys to hand out to those that walked up or to be placed on empty tables at the Mall’s food court seating area. Sixty (60) surveys were completed and returned during this event.

It should be noted that, in all cases, staff were not allowed to approach Mall patrons to ask them to complete the survey instrument, per the instructions of the Mall operations authorities. Additional surveys could have been completed if this rule had been relaxed.



**Figure B-1. Mall Event Kiosk, showing stand-up banner, TV presentation, and video camera (right)**

## Response Summary

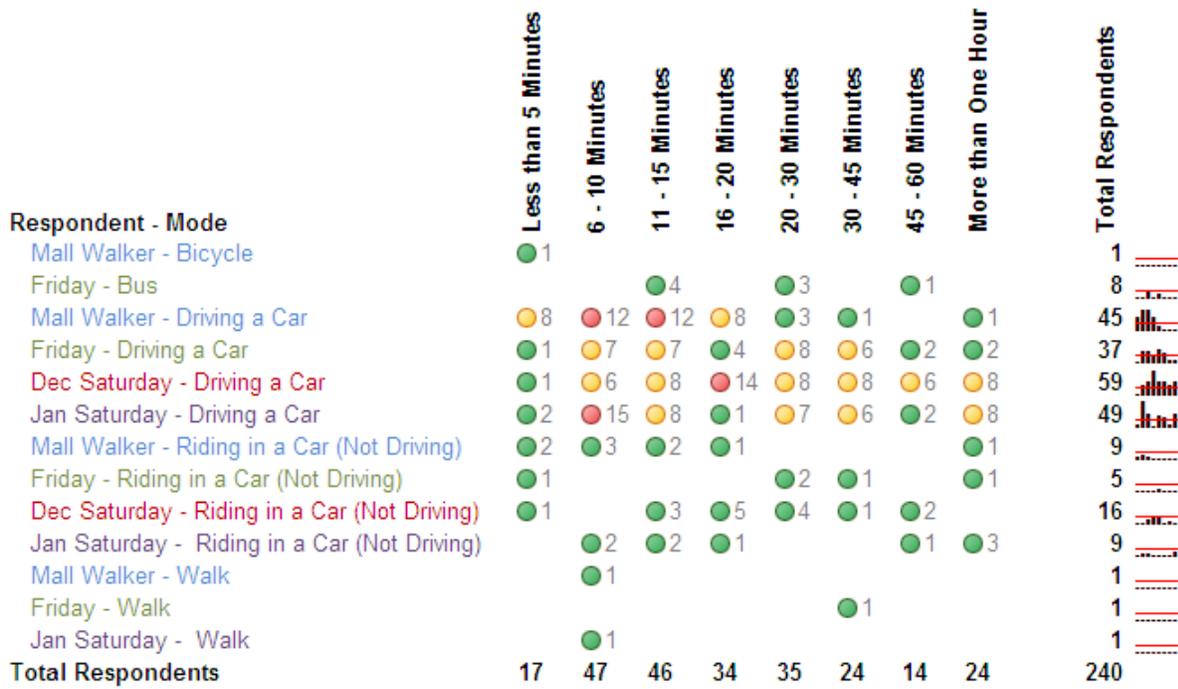
In total, 243 survey responses were entered ( $n=243$ ) for the three days, with the most (76) being gathered on Saturday, December 19<sup>th</sup>. The graphics on the following pages help to summarize key responses from the survey; the complete survey is shown at the end of this Appendix.

Age, All Respondents	Mall Walkers	Friday	Dec Saturday	Jan Saturday	Total	Percent Total
Under 18		● 1	● 11	● 2	14	9%
Between 18 and 25		● 10	● 9	● 10	29	19%
Between 26 and 45		● 18	● 25	● 22	65	42%
Between 46 and 65	● 7	● 14	● 12	● 13	39	25%
Over 65	● 40		● 5	● 2	7	5%
<b>Total</b>	<b>47</b>	<b>43</b>	<b>62</b>	<b>49</b>	<b>154</b>	

Travel Once Per Week	Mall Walkers	Friday	Dec Saturday	Jan Saturday	Total	Percent Total
Bike	● 3	● 1	● 2	● 1	7	3%
Walk	● 5	● 4	● 9	● 5	23	9%
Bus	● 0	● 8	● 2	● 1	11	5%
<b>Total</b>	<b>8</b>	<b>13</b>	<b>13</b>	<b>7</b>	<b>41</b>	

## What Respondents Took the Survey?

Findings: With the exception of the Mall Walker event attended largely by seniors (40 out of 47 respondents were over the age of 65), the respondents differed on the aspects measured. Forty-two percent (42%) of respondents were between the age of 25 and 49, with 9% being under the age of 18 and 5% being over the age of 65 (again, excluding the Mall Walker respondents). Nine percent (9%) of all respondents said that they walk to shopping, dining, or work at least once per week; 3% to 5% said that they ride a bicycle or take transit at least once each week.



### Duration of Trip and Mode Choice

Findings: The majority of travelers to the Mall spent between six and thirty minutes to arrive. Slightly longer averages were true for the eight respondents who cited bus travel as their mode of travel; the one cyclist cited a trip length of less than five minutes. Mall walkers (Thursday respondents) tended to average a little shorter duration, while Saturday respondents a little longer trip time duration. Interestingly, the post-Holiday respondents (Jan Saturday) generally took less time to arrive by car but had similar numbers of longer-than-one-hour travelers as pre-Holiday travelers. Inclement weather (cold) certainly affected the walking and biking percentages for every day of the study.

### Trip Origin Distributions and Spread

Findings: The illustration on the following page further summarizes trip origin distributions (as identified by zip code of starting point for their trip to the Mall) for the three study groups; note that the standard distance for Saturday respondents is represented by a considerably larger radius around the mean (center of all travel origins, by zip code). In all, the distributions of respondents appeared fairly similar through a casual inspection. Zip code 27612 had the most respondent origins, closely followed by zip codes 27607, 27615, and 27609. Note also that the Thursday respondents (Mall Walkers) tended to have origins much more tightly clustered around fewer, nearby zip codes than the general event respondents on Friday and Saturday. Again, note that the Saturday respondents had the greatest number of origin zip codes, an intuitively correct response given the previous findings of a greater geographic distribution of those respondents. The January respondents had the greatest spread of responses, indicating a willingness to travel even further to the Crabtree area (and Mall) than on a weekend leading into the Holidays.

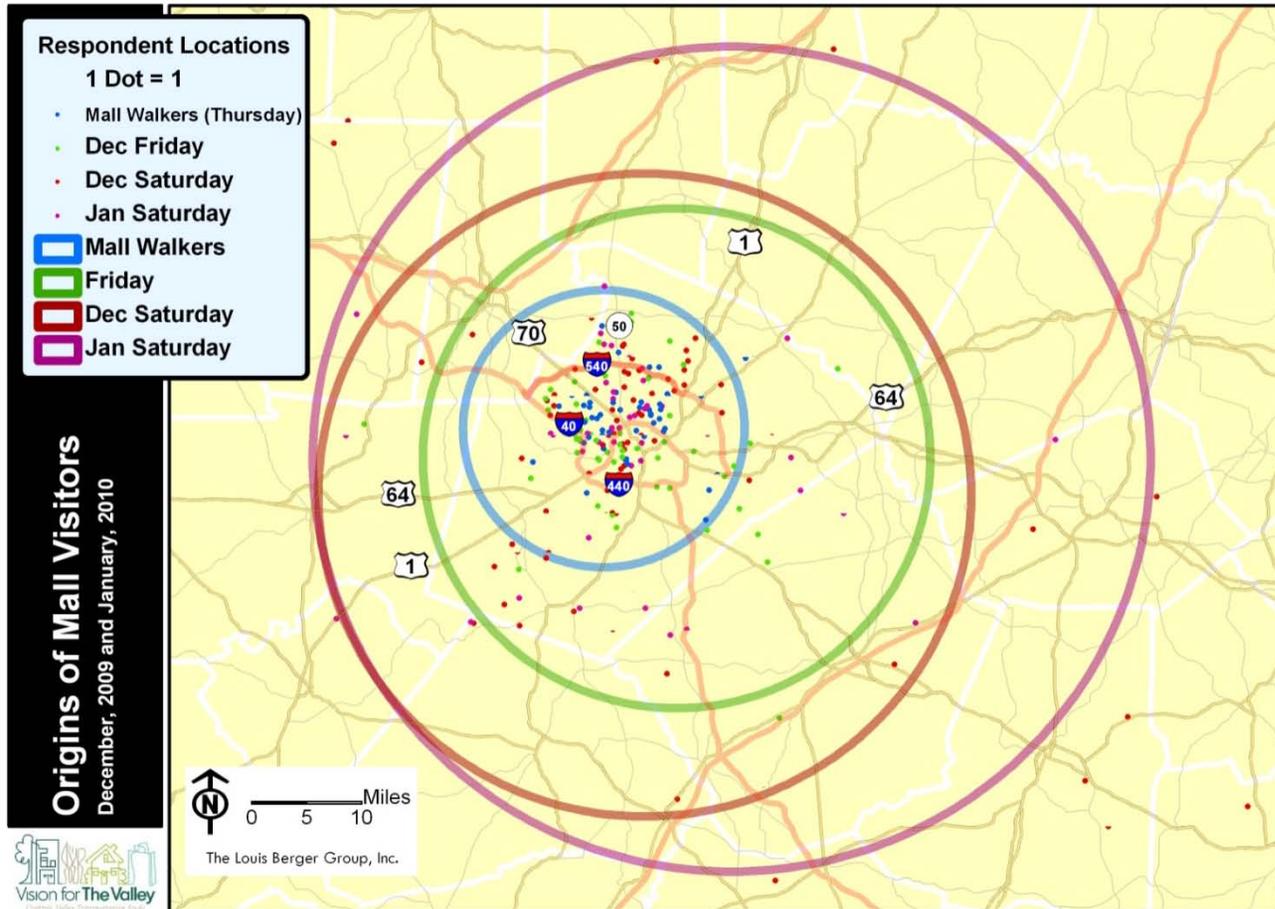
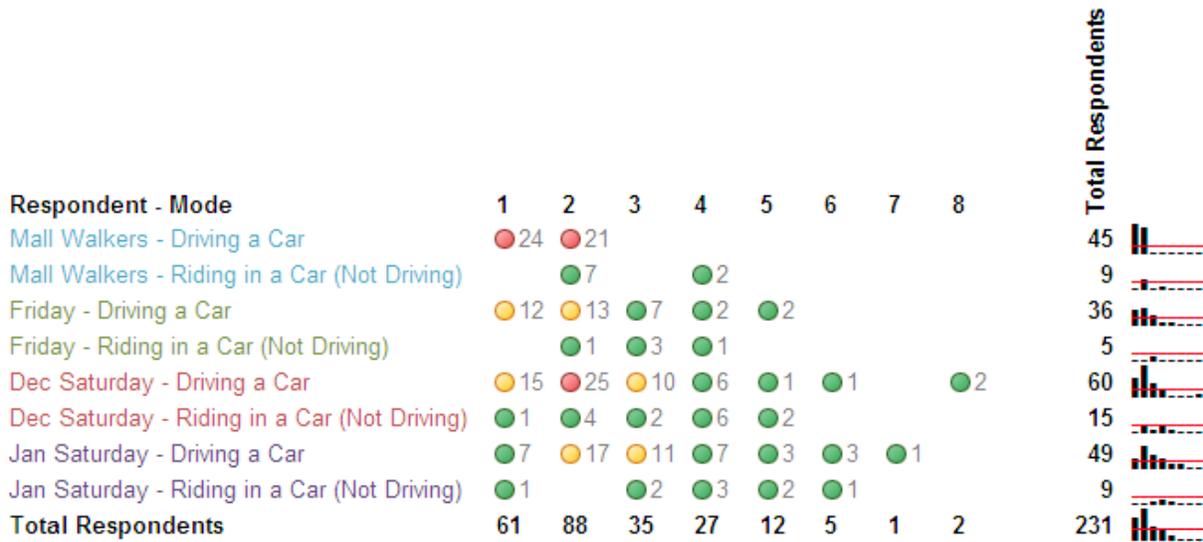


Figure B-2. Origins and Standard Distances of Survey Respondents, by Zip Code

Notes: Points are randomly dispersed inside each zip code area. Outlier zip code responses (30461 and 57592) were not included in the calculation of this distribution. Standard distance is similar to a standard deviation around a mathematical mean. If the points/respondents are centralized and thin outwards from the center of the geographic distribution, then the one standard deviation circles shown will capture 68% of the points/respondents. The standard distance circles indicate the directionality and degree of spread of responses in an intuitive way.

Respondent Zip Code	Mall Walkers	Friday	Dec Saturday	Jan Saturday
26863			1	
27231			2	
27243			1	
27330				1
27376	2			
27408				1
27409			1	
27501			1	
27504			1	
27511			1	
27513	1	1	1	3
27516		3		1
27517	1			
27518	1		1	
27520		1		
27524		1	1	
27526			1	
27529		1	1	
27534			1	
27536			1	
27539		1	1	
27540		1	6	2
27545		2	1	
27555				1
27560			1	
27565			1	
27568			1	
27571	1			
27576				1
27577			1	
27578		2		
27587		2	1	2
27591				1
27592			1	3
27597		1		
27603		2		2
27604		1	1	1
27605				1
27606	1	4	5	5
27607	7	8	5	4
27608		1	2	1
27609	12		4	4
27610	2	3		2
27612	15	5	6	5
27613	3	2	3	3
27614		3	2	1
27615	8	1	9	2
27616	1		1	
27617			1	1
27707			1	
27858		3		2
27876				1
27889				1
27892				2
27893			1	
27896				1
27958				1
28310				1
28334			1	
28363				1
28376			1	
28405			1	
28504			2	
28540			1	
30461	1			
57592	1			

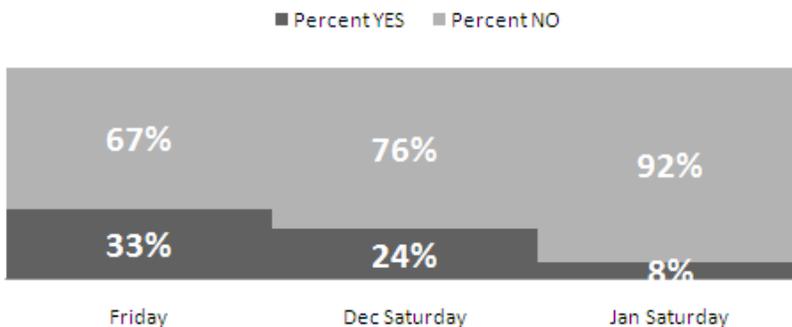


### Vehicle Occupancy

Findings: This graphic indicates the relative size of vehicle occupancies (number of people riding in a car); the only relevant findings were for those respondents that chose to drive or ride in a car. These findings are intuitively correlated with trip distances: Saturday automobile mode choice respondents tended to have more passengers, while Thursday respondents, which had shorter trips, also had fewer passengers (in fact only two respondents that rode in a car cited as having more than one other person in the car with them).

### Unusual Traffic Delays

The surveys for Friday and Saturday before the Holidays also recorded “unusual” delays meant to represent non-recurring congestion events such as construction, weather, or accidents that might elongate trip times.



Notably, a higher percentage of Friday (weekday) respondents noted traffic delays in spite inclement weather (snow) on Saturday due to an accident partially blocking an eastbound US 70 turning lane onto Blue Ridge Road. The post-Holiday respondents reported a much higher rate of no unusual delays. While expected, the degree of the negative response may be of interest.

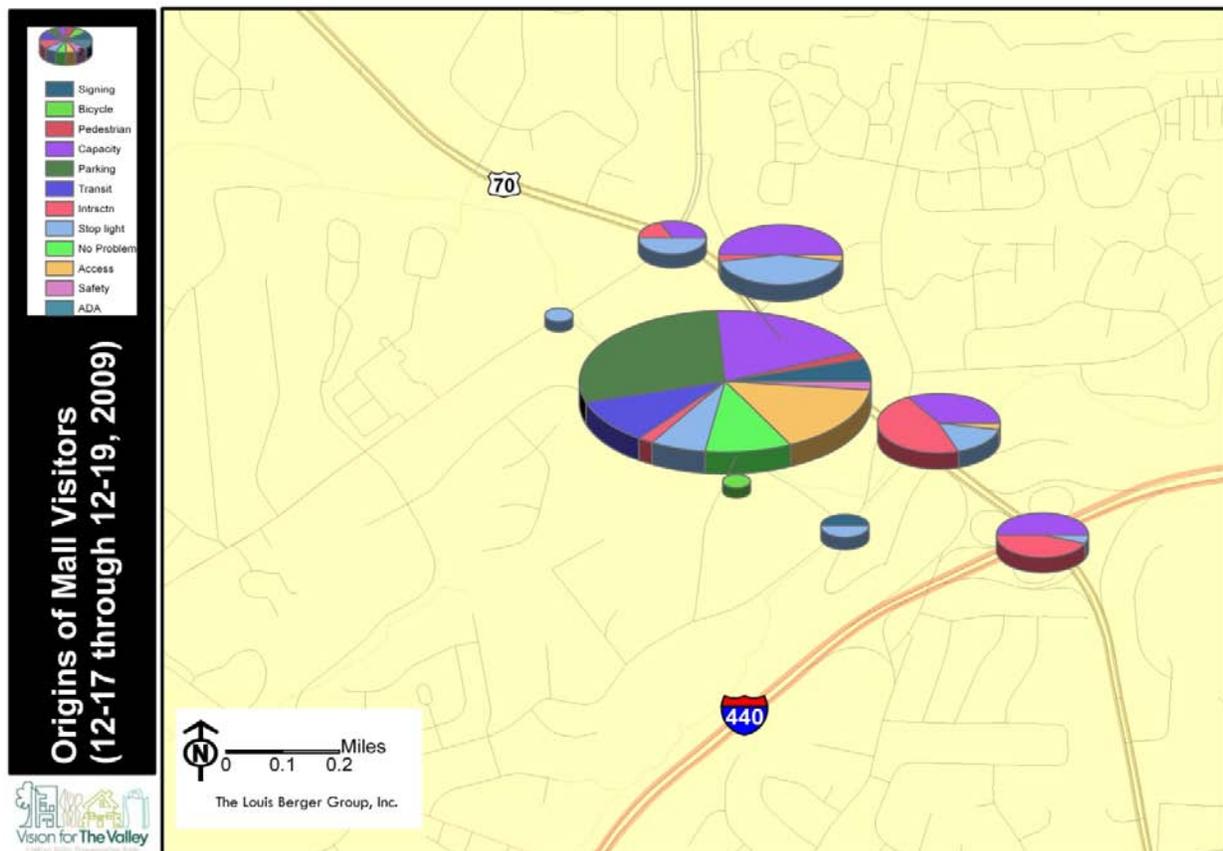
## User-Supplied Comments on Issues and Solutions

Several issues and solutions were common themes cited by several respondents ([Table B-2](#)). Additionally, many responses incorporated signalization and signal timing concerns.

**Table B-34. Top Issues and Solutions**

Issue	Solution
US 70 Glenwood Traffic and/or Signal Delays	Adding lanes/widening road, more transit options
Congestion on/off Beltline I-440	Flyover ramps, grade separations
Blue Ridge Road/Lead Mine Road/North Hills Drive	Ramps, change signal (timing)
Parking and Entering/Exiting the Mall	Parking shuttles, better signage, better transit, more parking

The figure below ([Figure B-3](#)) indicates the spatial distribution of the open-ended comments for all respondents on all four event days ( $n=243$ ). The large pie chart in the center is a catch-all for both mall-related comments and those comments that could not be categorized by spatial location at all (e.g., “Traffic is bad”). Intersection performance and capacity were significant, and sometimes overlapping, comments that were frequent. However, pedestrian-related comments were also important on the southeast end of the corridor at the Blue Ridge / Lead Mine and I-440 crossings with US 70 (Glenwood Avenue).



**Figure B-3. Comments from All Mall Respondents**

## Written Comments and Suggestions

Tables B-3 and B-4 illustrate the comments that were provide to questions “Please describe the most difficult part(s) of the trip before you got onto the Mall property” and “If we make one improvement to transportation in Crabtree Valley, what should it be?” The responses are divided among the four event days.

**Table B-3. Please describe the most difficult part(s) of the trip before you got onto the Mall property.**

Mall Walkers (Thursday)	Friday Respondents	Dec Saturday Respondents	Jan Saturday Respondents
Bike crossing on greenway	440/40 traffic	440 off-ramp traffic back up	It wasn't too difficult getting here.
Coming down Blue Ridge heading to US 70 it's hard to tell which lane to be in to cross 70	Coming down Edwards Mill road from Camden properties direction. The traffic was backed up due to the congestion coming in at the side entrance	A lot of traffic	Just heavy traffic, it's Saturday.
Coming down North Hills Drive, crossing Glenwood Ave and trying to get into the mall is a nightmare.	Crossing Crabtree Rd with blinking red light. Should be a stop light	Bad drivers and the mall's parking lot is not set up the best.	306 exit was closed completely down and we had to go toward Apex 10 minutes out of our way
Crossing safely the street behind mall from blue ridge road needs a stoplight	Edwards Mill Road congestion by the mall	Came through Apex on US 1 to Wade Ave then took Edwards Mill and had no problems.	Exit was closed off of 40
Getting into the right lane to get into the mall	Exit off 440 on to Glenwood Ave	Clearing snow from car	Stop light on Glenwood
Getting onto Millbrook from Knollwood Rd.	Exit ramps	Confusing stoplight at Glenwood and Lead Mine Road	Turning into the Art Show
Getting through the traffic lights and traffic at Glenwood Ave	Finding the mall in general.	Driving on 440	Stop lights and traffic
Glenwood from Leesville	Finding which entrance goes to what road in Crabtree Valley	Finding a parking place.	None today- Past experience include but not limited to long waits at traffic lights, confusion at intersections (right-a-way issues) and traffic flow impeded by narrow lanes.
Good	From 440 interchange to any mall entrance	Finding a parking spot, too many subcompact spots being taken up by one car using two spots.	The wait at the light before entering the mall
Hard to leave mall going out of Best Buy part of the mall.	From Beltline to mall was congested	getting around the parking garage	Glenwood Ave and turn offs into the mall and parking deck
Holiday traffic	Getting off I-440 and getting down to Glenwood to the Mall	Getting onto the mall property off of 40. We ended up going the back way to avoid the traffic.	Stop lights
Left turn into parking lot off Edwards Mill Road	Getting off of I-440.	Getting through traffic from the exit	None
No problems	Getting off the beltline at exit 7B had to wait for several light changes	Glenwood Ave light and Lead Mine and North Hills light	Beltline
None this early in the morning	Getting on the exit off of the beltline, and into the Mall parking	Glenwood Ave traffic into and in front of the Mall.	Parking

Mall Walkers (Thursday)	Friday Respondents	Dec Saturday Respondents	Jan Saturday Respondents
North hills drive crossing Glenwood ave too many left turns to Glenwood makes it hard to get into a straight ahead lane to get to the mall. That whole area has got to go. maybe redesign with ramps	I think bus here should have longer Sunday hours.	Going through Wake Forest and congestion on US1	Beltline
Please have more bike racks	I'm happy to drive to the mall. No difficulties for me today	Hard to find a parking space	Today construction, most days traffic getting off the beltline
Rush hour traffic on 401S from Rolesville and getting in the correct lane exiting I440	Intersection Glenwood and Leadmine Road	Heavy traffic.	The weekend traffic into the mall can be difficult
Stop lights	Just normal slow moving traffic on Millbrook Road	I have driven here many years and know the back roads and shortcuts.	Valet parking and the parking signs are confusing to out of towners
The length of the light on Creedmoor to make a left into the mall. Why does it need to be so long?	Listening to my wife complain about my driving. She does it all the time.	I'm happy to drive to the mall. No problems.	Parking in front of Macy's next to Sears
Traffic Congestion	Near the bus there should be a four way stop.	Long wait at lights and busy parking lot	Stop lights and turning into parking lot at Sears and making a U turn
Traffic flow at North Hills and Glenwood Ave	No difficulty or issues on this trip	Looking for parking, lights on Glenwood	Exit 301 was closed and traffic was diverted
Traffic light at North Hills and Lead mine traffic lights	None-very easy today	Lots of traffic! It's Christmas!	Parking
Traffic on 540	Out front ..poor city planning	No particular "difficulty"	Parking-need more spaces
wait for stoplight	Slow traffic.	No problems	Waiting in line to get into the mall area
	Snow	Nothing	Taking a left off Glenwood-light is not long enough
	The light to turn into the Mall by Eye Care can be backed up to the next light	Nothing difficult-came from North Hills	No problems today. Traffic was moving well.
	The snow!	Once I was in the parking lot of the food court, it took forever to find a spot because of traffic.	Turning onto Blue Ridge to get into the Belk parking lot
	The traffic!	Parking	stop lights
	the usual traffic	Parking because of holiday traffic and the weather	Parking
	There is not a problem	Parking lot	The lights and traffic on Glenwood
	traffic	Really have not encountered much. I usually come to work (mall) early.	Nothing
	Traffic backed up on Glenwood Ave exit to Crabtree Valley Mall	Road congestion around the mall	Glenwood Ave
	Traffic light on 70 west near Best Buy	Some congestion near the mall entrance	Traffic getting to the mall, not unusual
	Traffic on 440	Stop light on Creedmoor and Glenwood	Turning right from Glenwood west bound onto Edwards Mill, then merging left to turn into the mall behind Macy's
	Traffic.	Taking a left off Glenwood	Parking

Mall Walkers (Thursday)	Friday Respondents	Dec Saturday Respondents	Jan Saturday Respondents
	Turning left on Blue Ridge Rd from Glenwood, exiting mall by Just Tires and Best Buy because it's always congested there.	The light before the mall entrance was the most difficult part of my travel.	From the time you take the exit to the mall until you actually get into the mall there are a lot of lights and that takes the longest part of the trip
	Turning left onto Blue Ridge Road coming from downtown going on 70 west. After 7:30AM it sometimes takes 3 lights to make the turn.	The long trip	Having to wait 2-3 cycles at the light just to get thru it.
	Turning left onto Blue Ridge Road from Glenwood (off of Beltline), (2) Using "short cut" street to leave Mall by making right-hand turn onto Glenwood; (3) Existing Mall by Just Tires/Best Buy - always congested there	The stoplight on Creedmoor and Glenwood Ave.	Climbing the hill past the bridge
	Turning light on Glenwood.	The stoplight on Glenwood Ave last too long.	Parking
	Waiting in the cold	The traffic	When coming off of exit 7B sometimes the traffic really bad. The on coming traffic on Glenwood can't continue because it sometimes get blocked.
	We came from school rather than from my home. Also, there was lots of traffic and it was snowing!	There is always a lot of traffic when turning from Glenwood Ave to Edwards Mill because of the entrance into the mall from there. And the light seems to take a long time to change.	Getting into the mall
	When you arrive at the mall it's packed with people driving in different directions not stopping at bus stations for walkers or drop offs.	Traffic	Waiting in line to turn into the mall. I waited through 2 lights
		Traffic at Glenwood and Lead Mine Road	Traffic lights
		Traffic at the stoplight	70 near entrances
		Traffic backup at Blue Ridge waiting to turn left, traffic backup at the 2nd mall entrance blocking the through lanes	
		Traffic congestion	
		Traffic going to the Mall	
		Traffic lights	
		Traffic lights on Glenwood Ave and 70 are not synchronized.	
		traffic stop lights blocking intersections	
		Traffic sucks.	
		Turn into mall took a long time	
		Turning left on Oberlin Road from Mayview waiting through four or five lights at Blue Ridge Road	
		Waiting in traffic between I-440 and the mall.	

Survey



Your Input is Important!

You can help the City of Raleigh find ways of making traveling around the Crabtree Valley area safer and easier. To help us find out how people are getting to and from the Crabtree Valley area, please take a few minutes to answer the questions below.

1. Please tell us which zip code you came from on this trip to Crabtree Valley Mall (check only one):

- 27511
- 27513
- 27612
- 27607
- 27609
- Other: \_\_\_\_\_

2. How did you get to the Mall on this trip (check only one)?

- Driving a Car...If you checked this box, how many people total were in the car? \_\_\_\_\_
- Riding in a Car...If you checked this box, how many people total were in the car? \_\_\_\_\_
- Bus
- Walk
- Bicycle
- Other: \_\_\_\_\_

3. Please tell us about your trip. How long did it take you to arrive at the Mall (check only one)?

- Less than 5 minutes
- 6 - 10 minutes
- 11 - 15 minutes
- 16 - 20 minutes
- 20 - 30 minutes
- 30 - 45 minutes
- 45 - 60 minutes
- More than one hour

Did you encounter any unusual delays before getting to the Mall that made the trip longer than usual, such as a traffic accident, construction or bad weather?

- YES
- NO

4. Please describe the most difficult part(s) of the trip before you got onto the Mall property:

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5. If we make one improvement to transportation in the Crabtree Valley area, what should it be?

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**6. Please tell us a little about yourself:**

**Your Age** (check one)

- Under 18
- Between 19-25
- Between 26-45
- Between 46-65
- Over 65

**Car Ownership** (check one)

- I own a car and drive.
- I have a driver's license, but do not own a car.
- I do not own a car or have a driver's license.

**Biking, Walking and Riding the Bus**

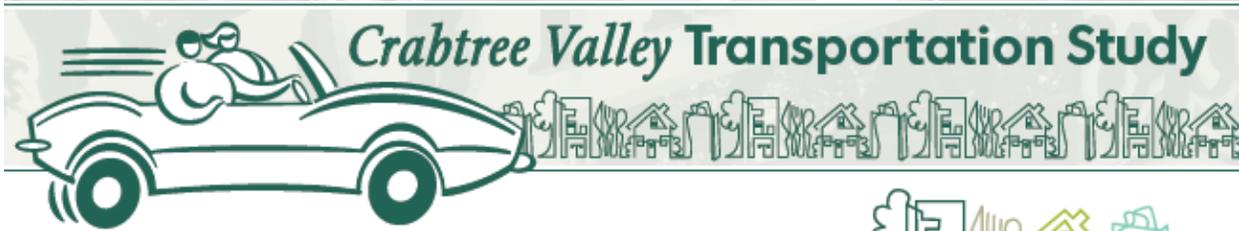
- On average, I bike to shopping, restaurants or work more than once per week.
- On average, I walk to shopping, restaurants or work more than once each week.
- On average, I take the bus to shopping, restaurants or work more than once per week.

**7. (OPTIONAL) Tell us if you would like to be kept informed about The Crabtree Valley Transportation Study.**

- YES... Please tell us how to reach you: Email: \_\_\_\_\_ Telephone: \_\_\_\_\_
- NO thanks

**Thank you for participating in  
The Crabtree Valley Transportation Study.**

**Options for submitting your survey:**  
 1. Affix postage and mail (pre-addressed for your convenience).  
 2. Fax to 919.755.3502.  
 3. Scan and email to [valleystudy@gmail.com](mailto:valleystudy@gmail.com).



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