

**REPORT
ON PARKING
LOT QUALITY IN
SHENANDOAH
COUNTY, VA**

2019

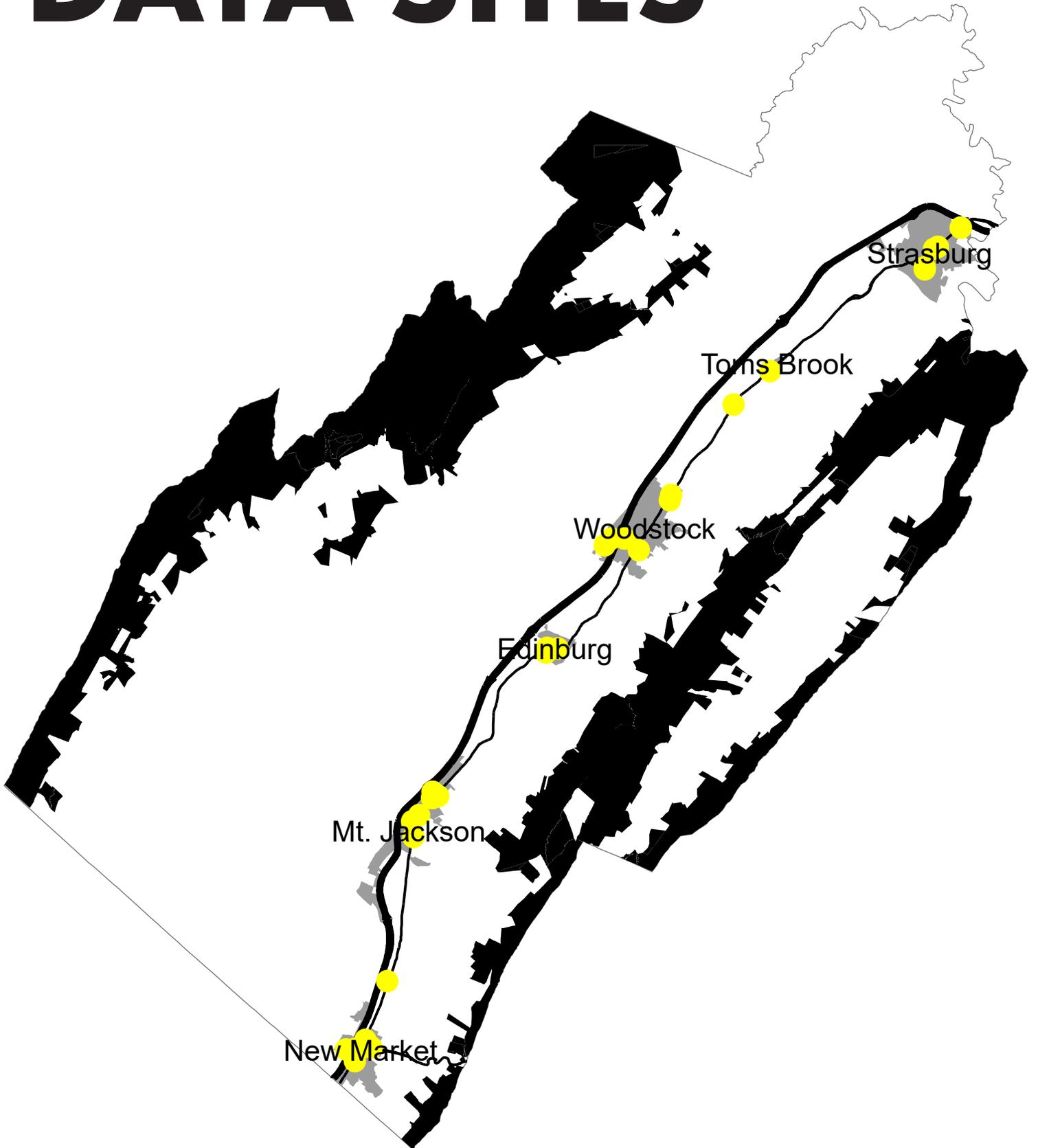


**REPORT
ON PARKING
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December 14th, 2019

**Developed By County Planner
Tyler Hinkle**

DATA SITES



INTRODUCTION

On Friday November 29th, 2019 I took the time to visit every major parking lot in Shenandoah County in order to conduct an analysis on the activity in each of the spaces. The report covers 35 different sites across eight different communities on US Route 11: New Market, Quicksburg, Mount Jackson, Edinburg, Woodstock, Maurertown, Toms Brook, and Strasburg. Three communities are less than 1,000 in population and are analyzed separately. All of the data was gathered in the afternoon of November 29th, and required five minutes at each site in order to conduct a conclusive analysis. The method used to gather the data is that I visited each site in my car, conducted an analysis from the car on multiple variables by inputting each into a predeveloped survey on ESRI's Survey123. The data was then analysed using R-Studio and Microsoft Excel in order to run the regression analysis as well as to generate the charts. The goal of this analysis is to determine where the largest amount of vacancies occurred on Black Friday and what could be the cause.

The following 13 points of data were gathered from each of the 35 sites that were analyzed:

1. Number of Parking Spots
2. Number of Vehicles
3. Number of Cars That Drive By Within 5 Minutes
4. Number of People That Walk By Within 5 Minutes
5. What Are People Doing?
6. Are There Any Bikes?
7. Sound Level
8. Are There Cracks In The Pavement?
9. Is There A Sidewalk?
10. Are There Trees In The Parking Lot Or Beside The Road?
11. Are There Both Commercial And Residential Uses?
12. Number Of Businesses
13. Number Of Vacant Buildings

The amount of cars present in the large parking lots in addition to how individuals were using the spaces informally was consistently surprising. This data was used to influence the second part of the report, which demonstrates strategies that could be implemented in order to address the lack of usage of the spaces that were analyzed, as well as those that are similar.

This report is broken into five sections: overview, data visualization, explanation of infill, four insite examples of interventions, and a concluding statement. This report is to be shared with Shenandoah County staff, in addition to staff in each of the six towns of the County. This report can also be shared with the public in addition to governing bodies if seen fit.

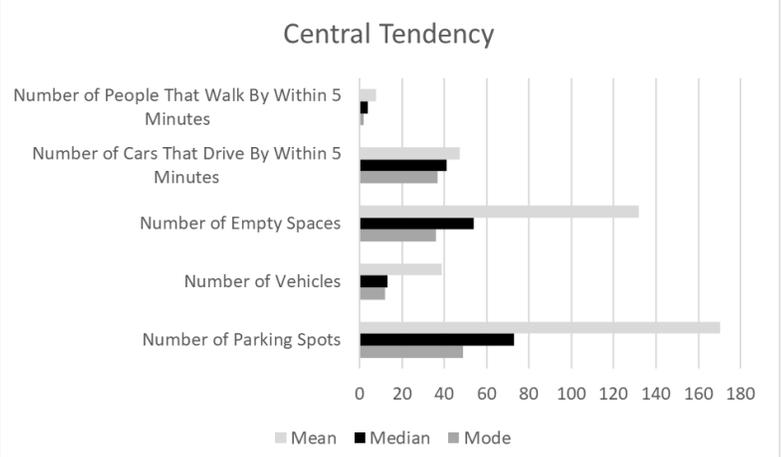
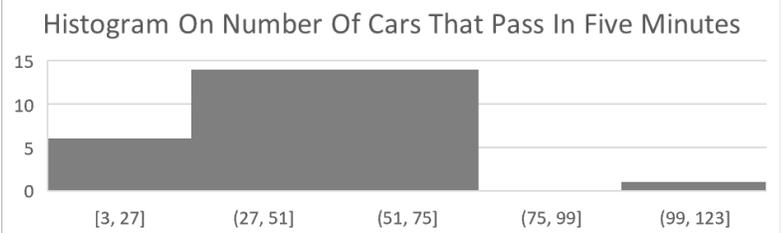
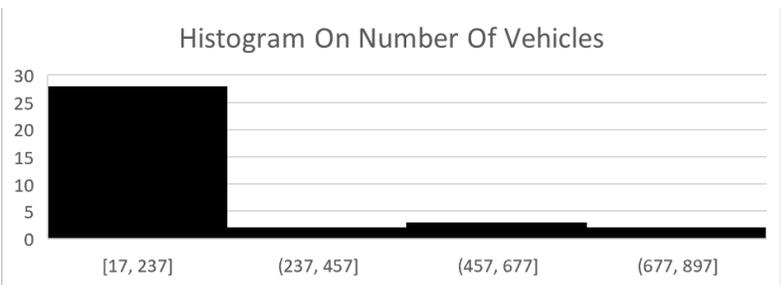
ANALYSIS

As the histogram to the right demonstrates the number of vehicles present has a positive skew in that the majority of parking lots have less than 237 vehicles. In addition the second histogram also shows a positive skew, yet it is slighter and demonstrates that majority of spaces saw less than 75 cars pass within five minutes. This shows that there are some data points that are outliers in that they show higher amounts of vehicles in comparison to the majority of data points.

On average 78% of parking spaces in parking lots in Towns, and 84% in the villages in Shenandoah County were vacant on Black Friday. The Town with the highest vacancy rate is Edinburg with 93% while New Market holds the lowest with 73%. Of the three smaller communities, Quicksburg has the highest vacancy rate with 90%, while Maurertown has the lowest vacancy rate with 75%.

A central tendency test reveals that the mean number of parking spots and vehicles is thrown off by outliers which are not similar to the rest of the parking lots that were analyzed. Since the mean is skewed it is important to look at the medians as they reveal that generally there are around 50 parking spots empty with around ten vehicles in the parking lot, while close to 50 cars will pass by within five minutes. This demonstrates that the parking lots in the County are not busy enough to reach capacity and that there are more empty parking spots than cars that drive by within five minutes. This means that even if every car turned off Route 11 within a five minute period, most parking lots would still not be full.

While in the smaller communities 75% of spaces had people who were shopping and 25% were walking, the Towns have a more diverse breakdown of actions. In the Towns 33% of spaces had individuals who were shopping or walking, while the rest broke down with 23% of spaces having people who were talking to others, and 12% of spaces had people who were recreating. As the bar chart to the right demonstrates the Town with the most amount of spaces with people shopping and talking was

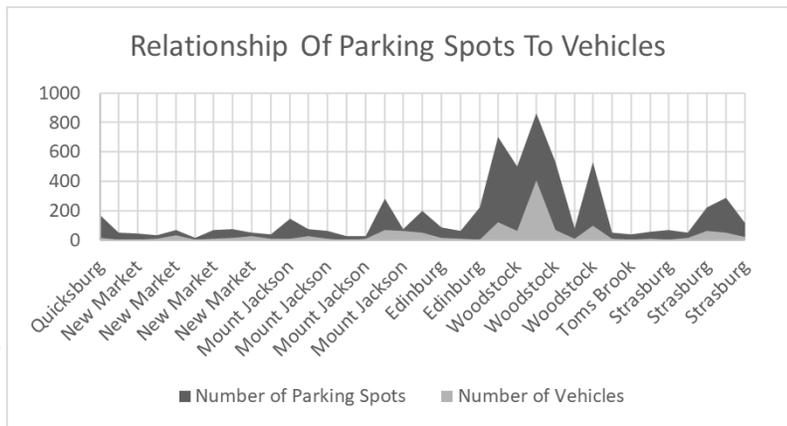
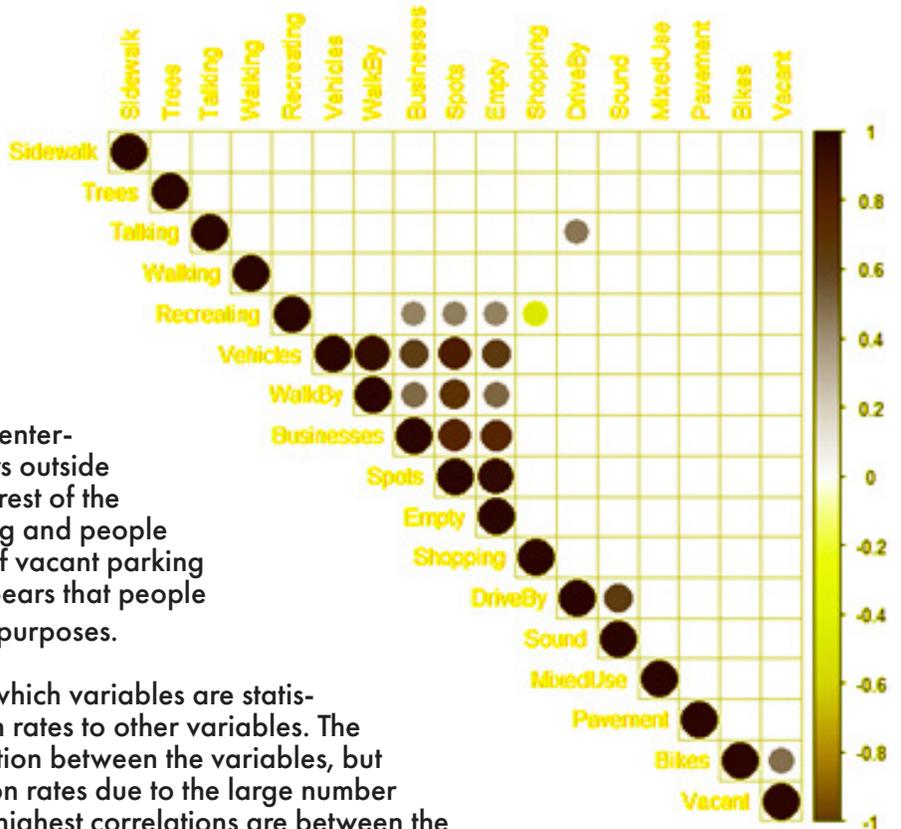


New Market, while Mount Jackson has the most amount who were walking, and Strasburg and Woodstock tied for recreating.

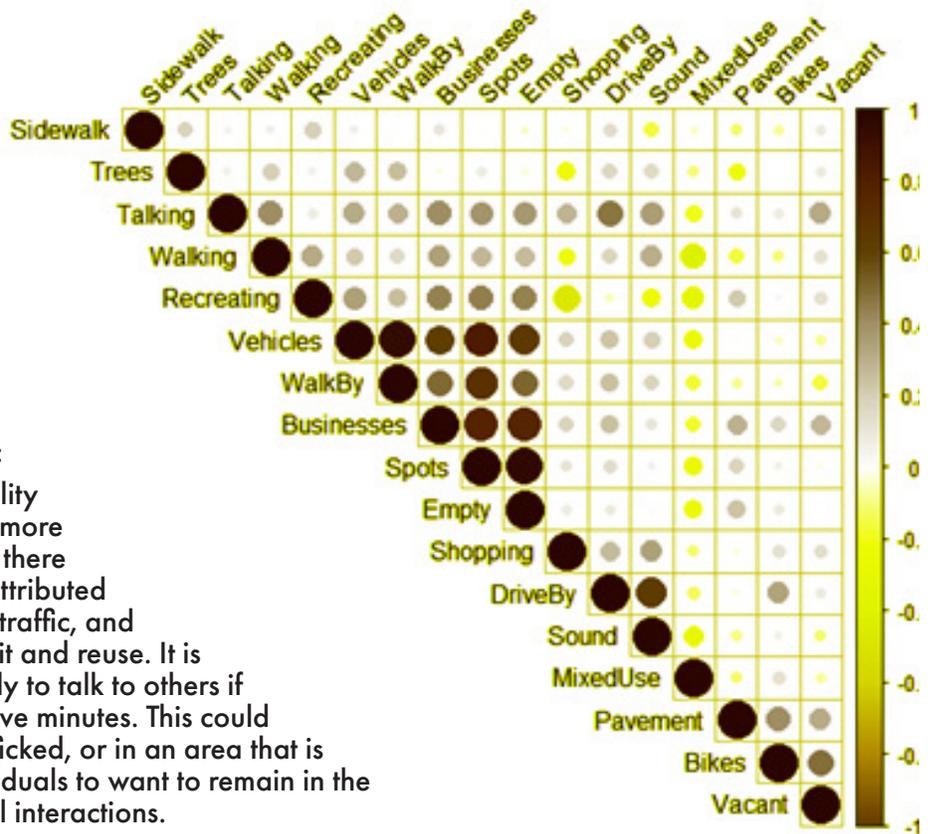
This shows that there are more individuals entering and leaving stores and talking to others outside of the stores compared to the stores in the rest of the county. Due to the lower amounts of talking and people visibly shopping, and the higher number of vacant parking spaces in Woodstock and Strasburg it appears that people are reusing the extra space for recreation purposes.

A correlation analysis helps demonstrate which variables are statistically significant and hold high correlation rates to other variables. The chart to the right demonstrates the correlation between the variables, but delineates those with the highest correlation rates due to the large number of variables taken into consideration. The highest correlations are between the number of vehicles parked and those who walk by the space within five minutes. This can be attributed to people leaving and returning to their vehicles. The other major correlation is between the number of parking spots and those that are vacant. This demonstrates that there is a positive correlation in that as the number of parking spaces increase, so do the number that will be left empty. Another important positive correlation is that as the number of parking spots so do the number of vehicles. Yet it can be determined that since the destination is the business rather than the parking spot, this statistic can be disregarded.

In discussing businesses the analysis shows that as the number of businesses increase, so do the number of parking spots as well as those that will be left empty. The third set of important positive correlations includes that as the number of vehicles increases as the number of businesses increases. In addition it shows that more individuals will walk by the space if there are more parking spots, and that the number of empty parking spots increases along with the number of vehicles in the space. These both likely come from the large supermarket parking lots as they would typically have a large amount of vehicles, yet even with the high amount they did not fill more than half of the parking lot. This can be seen with the chart to the right as it shows that even the parking lots that had over 400 vehicles were still at less than half capacity. The parking lots that were most likely to go over half of their capacity, or come close to hitting capacity were the smaller parking lots.



Another important statistic that is shown is that more individuals are will walk by a space if it has more businesses or empty parking spots. This can likely be attributed to two factors as the businesses will draw individuals out to walk by to come shopping, yet they can also be drawn to the space if most of it is not being used and they have the ability to repurpose it. The data also shows that more individuals are likely to bike in an area if there are more vacant stores, which could be attributed to that the vacant stores leads to less car traffic, and then a safer space for the bikers to inhabit and reuse. It is also shown that more individuals are likely to talk to others if there are more cars that drive by within five minutes. This could be related to that the space is highly trafficked, or in an area that is highly trafficked, which would lead individuals to want to remain in the space longer and use the space for social interactions.



Before concluding the analysis it is important to note the variables that did not have much significance at all, especially those that one would hypothesis would at first. For example the presence of sidewalks has little impact on if people walk by the space. Further analysis of the correlations shows that sidewalks are accompanied with trees, recreation, and more people who drive by, but it also has a negative correlation with sound, pavement, and the number of bikes in the space.

This deeper analysis also reveals that talking has a large number of positive correlations with the only negative correlation being the presence of both commercial and residential use beside the space. Typically these sites were smaller parking lots with small stores that would likely lead conversations to occur within the businesses. This analysis also reveals a negative correlation between walking and cracks in the pavement of the parking lot, and the presence of domestic dwellings adjacent to the site. In addition, shopping or biking is less likely to occur in areas with more people walking.

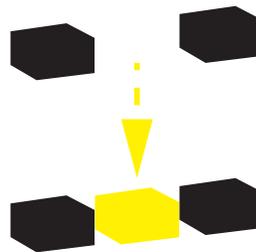
INFILL

Infill development is the concept of using all space to its highest and best use in terms of increasing the use of spaces. As demonstrated by the concept model to the right, infill can involve looking at large lots and adding housing to the space. In addition developers have build new apartments and housing on top of parking areas and shopping malls. Few developers have looked at expanding commercial uses or job opportunities with infill development, yet this is examined in the report.

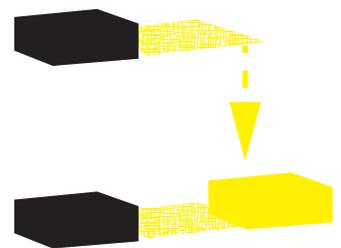
Infill development is a coordinated effort as it requires for both those in control of local ordinances, the developer, and the landowner to work together in order to achieve an increased use to a space in order to further activate it.

INFILL

URBAN



SUBURBAN



Infill development is important in Shenandoah County in order to ensure that the spaces that are for commercial purposes remain active and viable, but also so that growth can be prevented from interfering with the agricultural aspects of the community. Infill ensures that the process of development is recylcal in that it reuses already built upon land to grow the community and allow for further investments rather than paving over farmlands. This is important if Shenandoah County is to remain rural and agricultural in its character, but also so that those who live in the community have an equitable access to resources that they need in order to live with a high quality of life.

Infill development can be used as a way to both revive spaces in Shenandoah County while pushing for growth in already developed areas rather than key farmland.

SITE I

Shared Parking In Woodstock

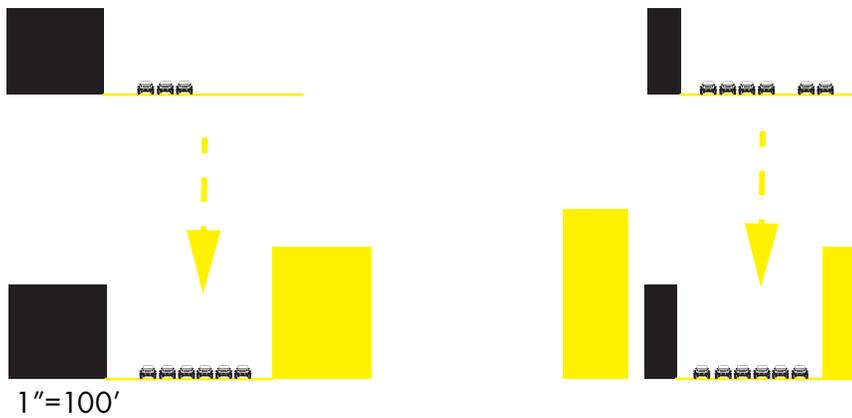


Glenmont, Maryland

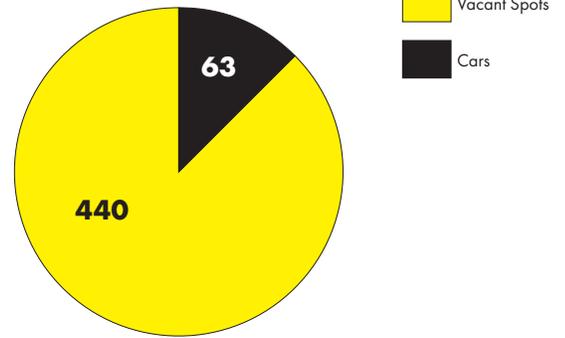
This community in Maryland is one of many infill developments that have appeared across the country. While in the model that is shown to the left focuses on growing the residential space for individuals, there is also potential for using infill as a way to increase the number of commercial buildings in a space without causing more impervious surface to occur through either building on top of the existing parking lot or building beside of it. This allows for the new commercial space to play off of the existing parking and users of the space as they will now also traffic the new commercial space.

From the analysis it was clear that infill development in terms of increasing the number of commercial uses in each of the spaces is possible for each of the 35 locations. For this model in terms of constructing on top of existing parking or adjacent to it, there are six potential sites in Shenandoah County with the Flea Market in Quicksburg, Food Lion in Mount Jackson, Walmart/Lowes in Woodstock, Food Lion in Woodstock, Woodstock North Side Shopping Center, and the Food Lion in Strasburg.





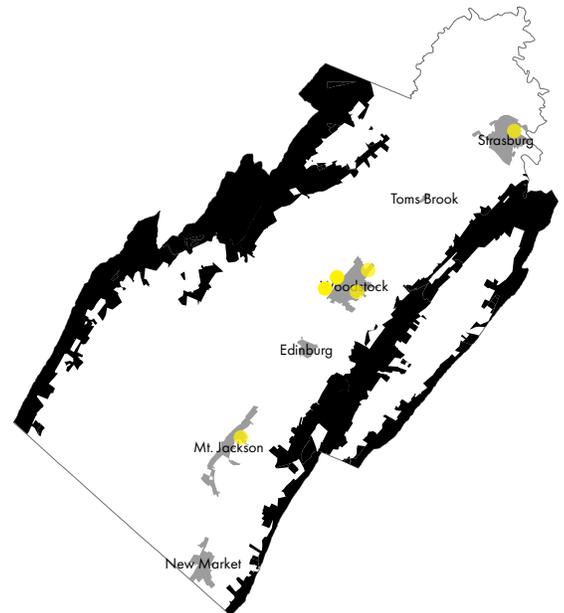
Lowes



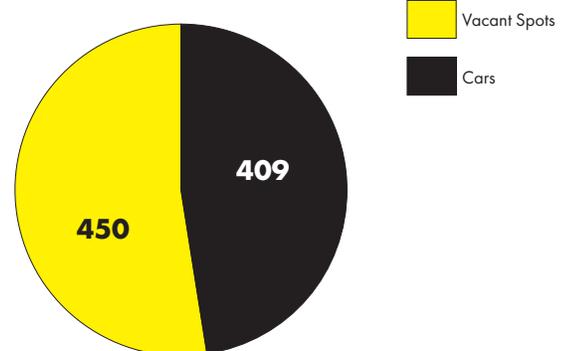
Walmart in Woodstock was found to be less than half capacity on Black Friday. This lack of activity in addition to the back of the parking lot typically being used as space for tractor trailer drivers to shop and sleep for the night demonstrates that the space could be better used. The Lowes was also low in terms of the number of people using the parking spaces as there were only 63 cars in the 503 capacity parking lot.

The interventions demonstrated on this page show how both eliminating parking minimums on new structures as well as allowing for structures to be built in parking areas allows for a higher density and use of the space. Activating the space is important economically and socially as it transforms the space from just being a place for commerce, to one where human interactions and experiences can occur. In addition more shopping will occur due to the increased option. An additional floor was added to the different shops across from the Walmart and the Lowes as this provides for space that either a new business can occupy, or residential space in order to promote the space as a community space. The additional business could be another large store such as a craft store, or small stores all together much like the extended strip attached to Walmart.

Sites



Walmart



SITE II

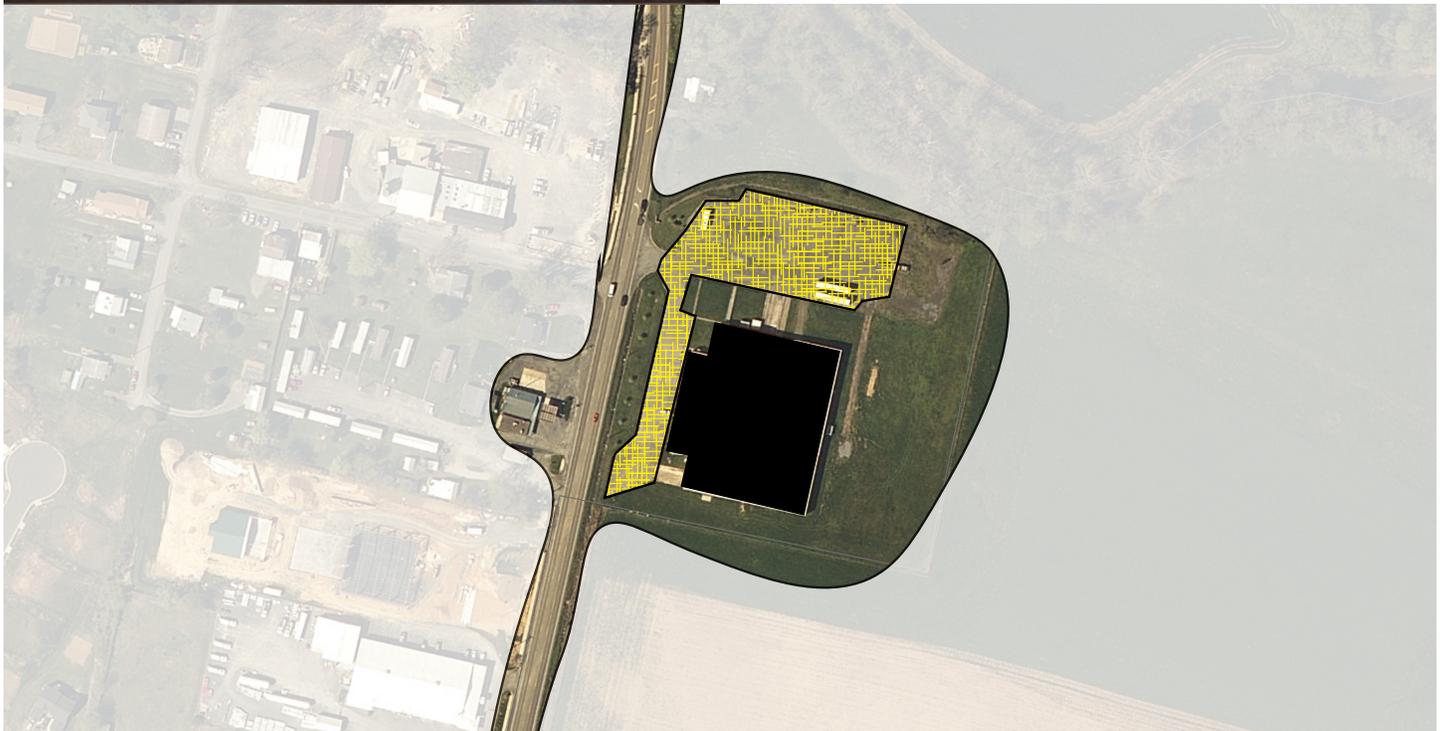
Formalizing The Informal In Mount Jackson



This is an example of a warehouse remodel in order to transform it from an abandoned space into a lived space for residence as well as for social gatherings. This allows for an unactivated space to become more active and increase the use and value of it for the users as well as the owners. Majority of warehouse remodels involve transforming the space into a place for the arts, a brewery, offices, or residential space to make the space more of a community location. Some sites are also transformed into park-like spaces in that they provide recreational amenities to the community.



From the analysis in this report it was clear that change needed to occur at the site due to the inactivity and the potential it holds for becoming a community center for the South Mount Jackson neighborhood. While the warehouse itself holds potential for change, the parking lot also holds potential for change. The interventions discussed in this site section revolve around the concept of formalizing the informal use of the space for kids to ride their bikes and use it as a park. Since the closest park is nearly a mile from the site, it holds high potential.

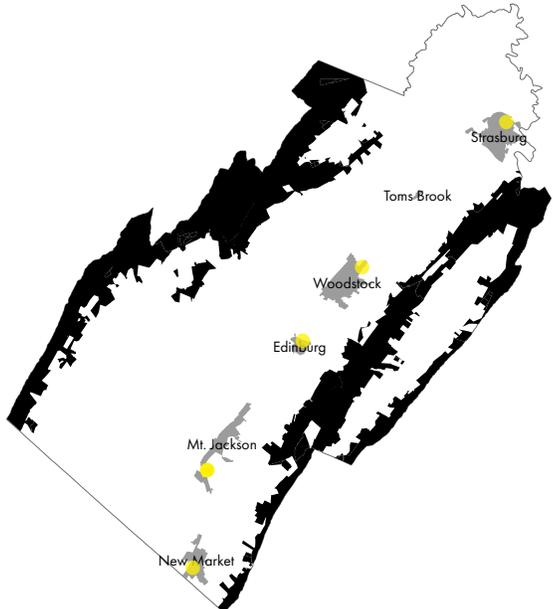




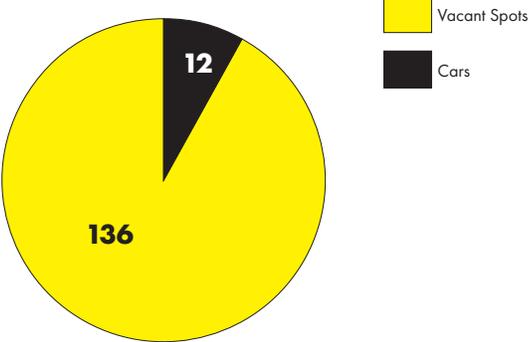
Access to Mill Creek is adjacent to the site and would allow for children in the community to enjoy the space as a park, as well as others including tourists who may want to go fishing or ride a tube down the creek into the North Fork of the Shenandoah River. A river outfitter company could open business on the site in order to accommodate all of the users who wish to access and enjoy Mill Creek and the River.

This also poses the potential for the start of a hiking trail up to The Knob, which is a local landmark which currently has no trail to the top. While the space has a lot of potential to be leveraged as another community park, it can also serve as an educational center as it is near the old Town high school, as well as the currently vocational, technical, and governor schools for the region. This can be the space where the community and student thinkers come together so it is a lived and active space all at once. There is also the potential to replicate this process in four other locations in the County.

Sites



Warehouse



SITE III

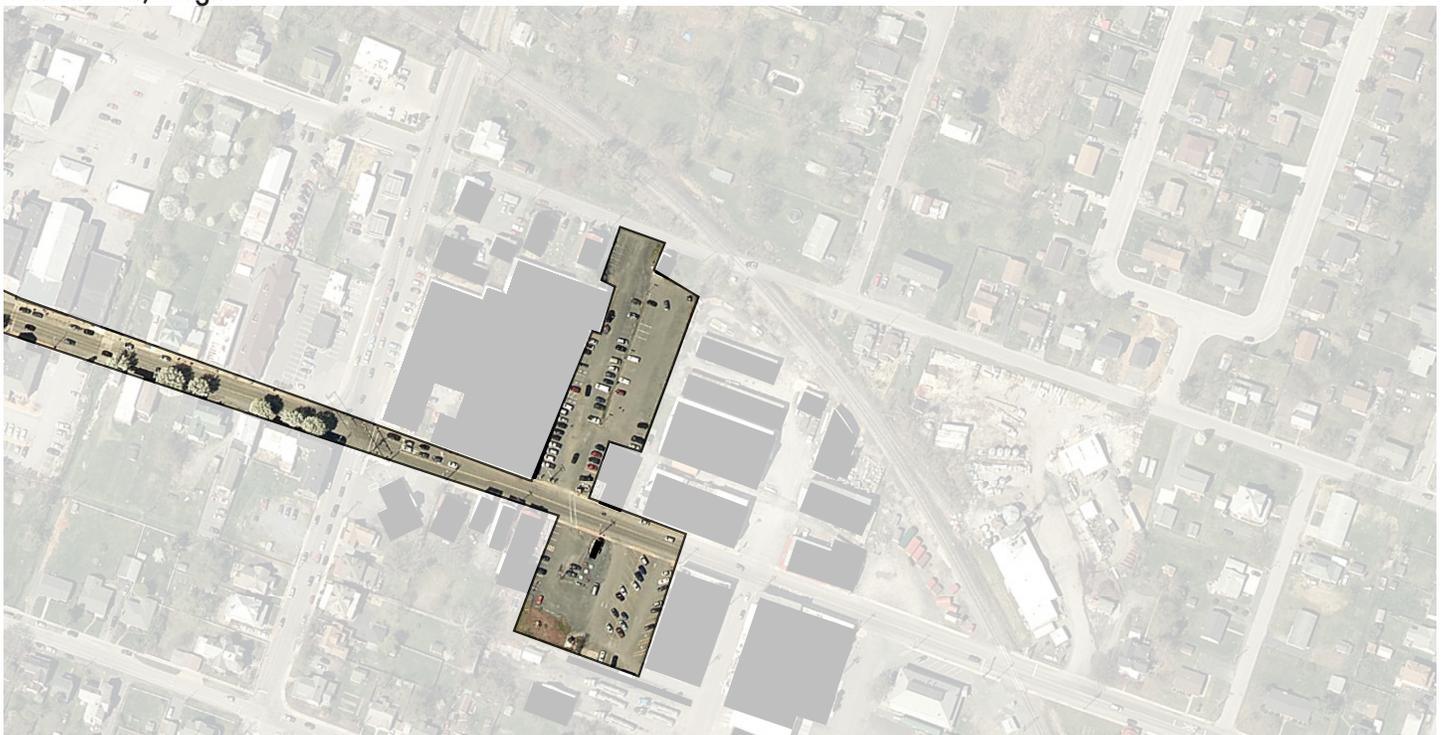
Timely Sharing In Strasburg



Winchester, Virginia

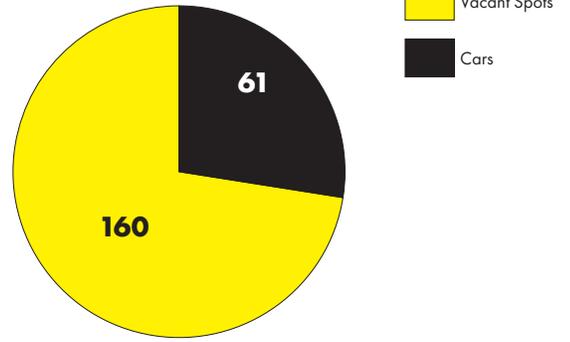
Winchester holds a strong precedent of what urban infill can look like in the Shenandoah Valley with the Bells Project which added apartments on top of an existing building, which then increased the density and activity of the space. While this again focuses on increasing the number of residences in the space there are also potentials for adding new restaurants and stores to a downtown with infill.

This intervention understands that while the parking lots assessed may not have been actively in use on Black Friday, they do pose being important assets to the community when parades occur so everyone from outside the Town, and those in the suburbs can join in the communal celebration. In order to address that parking will be needed downtown and that there is potential for more activation in the space, this intervention looks at the concept of shared parking in a time based manner as the flea market and small stores in the area do not generate as much traffic during the weekdays as they do the weekends, and the traffic they generate are towards the shoppers.

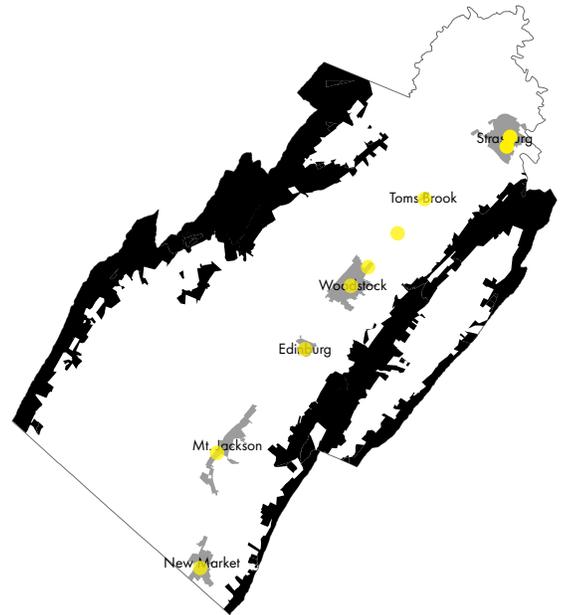




Northside



Sites



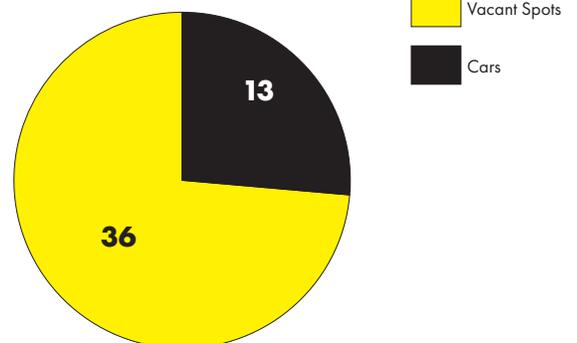
To address these two key important pieces of information the interventions proposed both play off of the timely needs of the community for parking, while at the same time looking to play off of the current uses of the space in order to further activate it.

The top diagram demonstrates the ability to add office space to the site in terms of renovating existing buildings so that the existing parking can be protected. A less feasible solution for Strasburg would be to construct an office space on top of the parking area so that people can park under the building and then use a staircase to access the floors developed as this can be costly.

The diagram to the bottom demonstrates the ability to play off the existing restaurant, icecream stand, and shoppers who use the space in order to draw them to the southside with a farmers market pavilion. There are seven other sites in the County that could consider this model of infill and activating spaces.



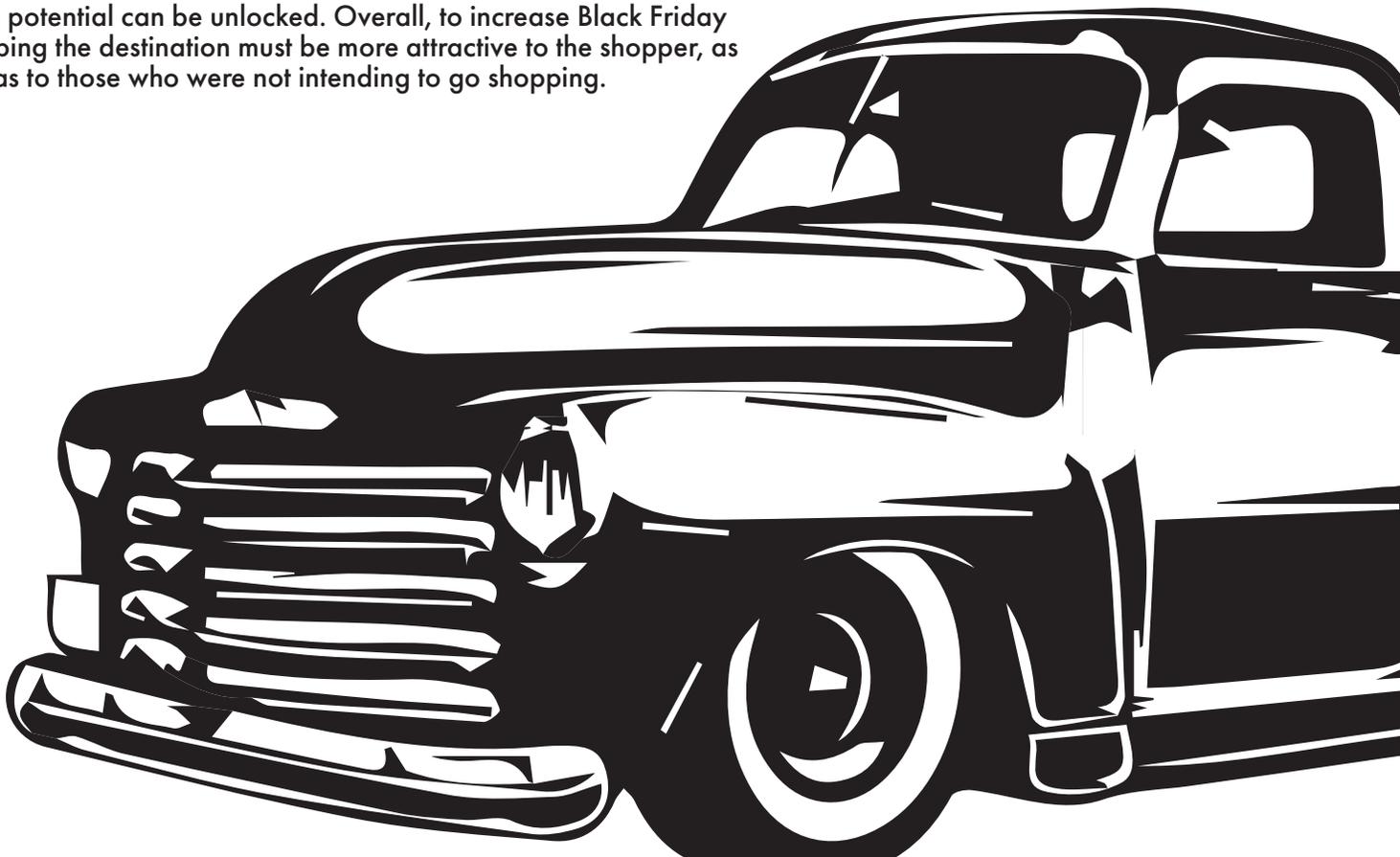
Southside



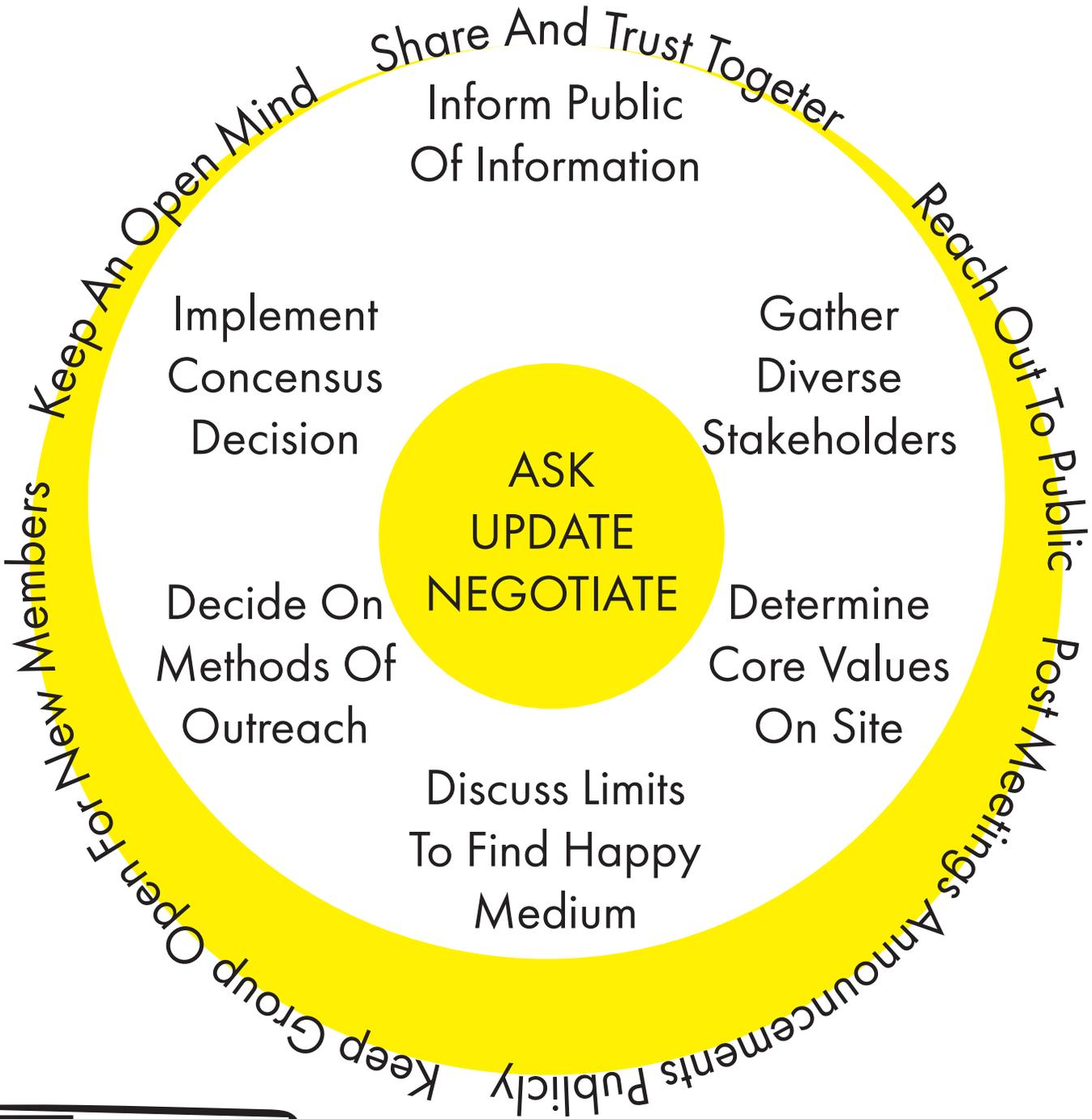
CONCLUSION

This report demonstrates that all parking lots in Shenandoah County were underused during Black Friday in 2019. In addition the report shows that even larger businesses were unable to reach half of their capacity, which in some cases left over 400 empty parking spots. Spaces that have more empty parking spots tend to attract more individuals to use the space for recreational purposes, while spaces with more talking and walking tend to demonstrate high activity for car traffic. While many may assume that shared parking spaces leads to less parking, this report shows that there is so much excess parking in shared parking locations that there could be new businesses to meet the needs of filling the empty parking spots.

Infill development at the selected sites, as well as shifting parking to be shared in places it is not, will allow for greater and more productive use of the space in terms of shopping as well as recreation. The infill development will need to include recreation spaces as currently individuals are using the empty lots as make-shift parks, with spaces with vacant stores attracting more bikers. This demonstrates that infill spaces will need to be multimodal in order to ensure that all individuals feel safe and are attracted it so its maximum potential can be unlocked. Overall, to increase Black Friday shopping the destination must be more attractive to the shopper, as well as to those who were not intending to go shopping.



A COLLABORATIVE APPROACH



Special Thanks To Kevan Klosterwill, Andrew Mondschein, Ali Fard, and Frank Dukes for informing me on the tools needed to put this report together.

