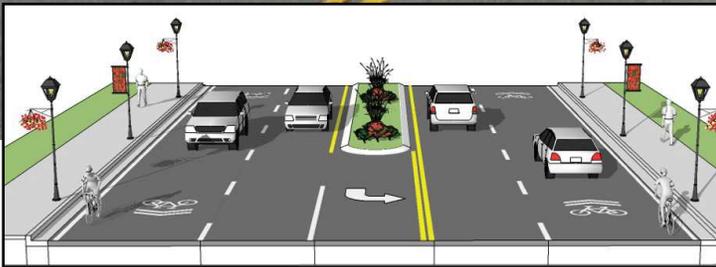


Maynardville Highway Corridor Study

August 2016



Prepared by



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on behalf of



TDOT
Department of
Transportation



Funded through the Community Transportation Planning Grant Program.

The program is designed to better integrate multimodal transportation systems ...

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Maynardville Highway Corridor Study

The Tennessee Department of Transportation (TDOT) established the Community Transportation Planning Grant (CTPG) program to assist Tennessee's small and rural communities in developing transportation plans to address

transportation, land use, and growth management issues. The program is designed to better integrate multimodal transportation systems with local land use objectives to achieve statewide transportation goals.

The City of Maynardville is one of eight grant recipients during the program's inaugural 2014 grant cycle. The memorandum documents the work efforts and findings of the Maynardville Highway/SR 33 Corridor Study.

1. OVERVIEW

Maynardville Highway, also known as State Route (SR) 33, bisects Maynardville from north to south and serves many roles. It delivers commuters from the city, points south into Knoxville and other employment centers, it is a primary route for the movement of freight and goods, it connects visitors to Lake Norris, and is the city's "main street," where the majority of businesses, schools and other civic functions are located. In essence, from a transportation standpoint, it is all things to all people.

The purpose of the Maynardville Highway Corridor Study is to develop a vision and plan that maintains the viability of the corridor as a transportation and community asset for decades to come. The study has several important objectives:

- Balance regional mobility with commercial, economic, safety, and community interests.
- Expand multimodal options by providing improved accommodations for walking and bicycling.

- Enhance and preserve the city's character.
- Engage the City, TDOT, other stakeholders, and the community at large to develop and implement a shared vision.

The study was conducted during the winter and spring of 2016. It includes careful consideration of the mobility and community context, opportunities for stakeholder involvement, development of a vision and plan for the corridor, and recommendations for implementation.

2. SETTING THE CONTEXT

Prior to making recommendations for Maynardville Highway, a public open house was held to gather input from residents and other stakeholders. Input was received

from attendees on existing concerns throughout the corridor and opportunities for improvement. The following sections highlight some of the major issues and

opportunities identified during the public input session and subsequent analysis by the project team.

... one of the major thoroughfares in Union County ...

Regional Mobility

Maynardville Highway is one of the major thoroughfares in Union County. It serves as a primary transportation corridor connecting Union County business and commuter traffic into Knoxville and with major interstates 40, 75, and 81. In 2012, Maynardville Highway was widened to five lanes within the Maynardville city limits. The section from the end of the current four lane section in Halls in northern Knox County is currently under construction to be widened to four lanes. The remaining two lane section, from the Knox County line to the Maynardville City limits is in the process of being programmed for construction. When complete, SR 33/Maynardville Highway will be a continuous four lane facility from Maynardville to Knoxville. Maynardville Highway also carries a large amount of tourist traffic accessing Norris Lake to the north.

Truck and Vehicle Movement

As shown in Table 2-1, annual average daily traffic (AADT) on Maynardville Highway remained relatively unchanged from 2006 through 2011. Beginning in 2012,

TDOT began construction on a new SR 33 bridge over the Clinch River (Norris Lake) north of Maynardville.

Table 2-1.
Annual Average Daily Traffic (AADT) on Maynardville Highway

 Year	 AADT	 Notes:
2006	13,112	
2007	12,237	
2008	13,216	
2009	12,779	
2010	14,254	
2011	13,453	
2012	11,190	
2013	5,606	Construction on SR 33 Bridge North of Maynardville
2014	5,774	
2015	11,526	

During construction, weight limit restrictions were imposed on the bridge and a detour route was established for trucks carrying heavy loads. The combined impact of construction and weight limit restrictions caused traffic volumes on SR 33 through Maynardville to decrease by approximately fifty percent from 2012 to 2014. In 2015, AADT resumed to levels comparable to those prior to the bridge construction.

Based on data obtained from the Enhanced Tennessee Roadway Information Management System (E-TRIMS) between four to seven percent of vehicles traveling on Maynardville Highway in 2014 were trucks. This percentage is most likely lower than current truck rates because of the weight limit restrictions and construction on the Clinch River Bridge. In fact, truck traffic on Maynardville Highway will likely increase because the new bridge can support much heavier loads. Businesses that are known to route trucks through Maynardville include Clayton Homes, Giles, Bushline, DeRoyal Industries, Cooper Container, England, and DTR Industries.



Downtown Maynardville pedestrian facilities.

Walking and Cycling

Providing options for active transportation is a major opportunity identified by participants. Sidewalks are present along Maynardville Highway from west of Hickory Star Road (SR 144) to Wallace Lane north of downtown. The ability for pedestrians to cross Maynardville Highway is limited. Striped crosswalks are only present at the two SR 33 and SR 144 intersections and at the SR 33 and Wilson Road intersection, resulting in long stretches of road – sometimes a mile or longer – without marked or signalized crossing locations. Higher speed, multi-lane highways are generally not safe locations for pedestrians because they must navigate traffic moving in both directions in a single crossing maneuver.

The 12-foot wide shoulder constructed during the widening of Maynardville Highway creates an opportunity for bicyclists to share the road with vehicles. However, this is not a marked or signed route for cyclists. Motorists often use the shoulder as an auxiliary or turn lane, resulting in an unpredictable environment for cyclists. No other bicycling infrastructure exists along the corridor.

Safety

Turning conflicts and vehicular speeds were noted as concerns during the public session. There are multiple driveway access points throughout Maynardville Highway that, combined with the two-way center turn, create numerous turn movement conflicts. Additionally, many drivers use the shoulder as a right turn lane. This creates conflicts with drivers who are also turning right from the appropriate travel lane. Finally, the overall design and context of the corridor, including wide travel lanes, wide shoulders, absence of a median and long straight stretches of road, encourages higher vehicular speeds. While the posted speed limit is 45 miles per hour, vehicles frequently travel at much higher speeds. City law enforcement vehicles are frequently observed enforcing speed limits along the corridor.

From 2007 to 2010, there were a total of 128 crashes along the corridor limits, with two of the crashes involving pedestrians. Since the roadway was widened, between 2012 and 2015, 64 total crashes have occurred along the corridor, with none of the crashes involving a pedestrian. Crash rates



Vehicle using shoulder as a right-turn-lane. (top)

Maynardville police officer patrolling for speeding vehicles. (bottom)



Downtown Maynardville.

have improved from 139 crashes per 100 million vehicle miles of travel between 2007 to 2010 to 107 crashes per 100 million vehicle miles of travel between 2012 and 2015.

Community

Maynardville Highway acts as the main travel hub for the City of Maynardville. Stakeholders see an opportunity to increase the visibility of the community by creating "gateways" at both ends of the corridor to create a unique sense of place where travelers are invited

into the City instead of flowing through and by-passing it.

In 2013, Maynardville completed the Downtown Maynardville Revitalization plan to help promote economic development, increase the City's visibility from Maynardville Highway and make the town more visitor and pedestrian friendly. Suggested improvements include traffic calming, downtown beautification and constructing sidewalks. Many of these recommendations address Maynardville Highway directly.



Commercial development along Maynardville Highway.



City of Maynardville gateway

Economic Development

Maynardville Highway is the primary retail center serving not only the City of Maynardville but also Union County. Vacant land and underused lots and buildings along the corridor provide significant opportunity for economic development in Maynardville. Upon completion, the continuous four-lane connection to Knox County will provide several economic development opportunities for Maynardville:

- Increased attractiveness for industry, giving it better access

to interstates and labor and material resources in Knoxville.

- Increased accessibility for residents in southern Union County to goods and services in Maynardville.
- Increases in pass-by traffic from northern Union County, Tazewell and other points to the north.

Improvements to Maynardville Highway have the potential to increase the attractiveness of the City for new development.

... seeks to change the character of the corridor to create a unique sense of place ...

3. VISION AND PLAN

The proposed vision and plan for Maynardville Highway seeks to change the character of the corridor to create a unique sense of place, supporting community and economic development, while not losing sight of its significance to regional mobility. At the same time, limited resources mean that recommendations must balance cost with the value of the improvements. To the extent possible, lower-cost improvements have been included in the vision and plan.

The strategy for achieving the corridor vision involves gradually changing the character, beginning at either end and moving to downtown Maynardville. To do this, the project team divided the corridor into a series of distinct zones, each possessing a unique context.

The vision for Maynardville Highway includes the creation of five zones. Two gateway zones in the north and south welcome motorists into the City. Two transition zones move people between the entrance to the community and the approaching downtown.

Finally, the downtown zone slows traffic and invites motorists to stop and interact with the community. Facilities for cycling and increased pedestrian amenities contribute to the change in character and make walking and cycling safer and more convenient.

Southern Gateway Zone

The Southern Gateway Zone begins at the Maynardville city limits and extends through the SR 33 and Ailor Gap Road (SR 144) intersection. It is approximately 0.4 miles (2,100 feet) in length. The Southern Gateway Zone includes a variety of high-turnover commercial development (restaurants, banks, etc.) clustered at the intersections. This zone acts as Maynardville's 'front door', inviting travelers into the community. Figure 3-1 shows the existing cross section in the zone that includes sidewalks on both sides of the road, two 10-foot shoulders with two feet of curb and gutter, four 12-foot travel lanes, and a 12-foot center continuous median turning lane.

The proposed vision for the southern gateway includes

replacing the ten-foot shoulder on either side with a five foot dedicated bicycle lane and a five foot stripped buffer (see Figure 3-2). The four 12-foot travel lanes will remain, but the continuous two-way center turn lane will be replaced by a raised landscaped median with turning bays.

Replacing the shoulder with a buffered bicycle lane creates a safe, dedicated space for cyclists while eliminating turn lane confusion. The raised median minimizes turn movement conflicts and creates an opportunity for landscape enhancement. Combined, the two changes will encourage vehicles to slow to appropriate speeds by narrowing the roadway, both from a physical (median) and visual (bicycle lane) standpoint.

Generally speaking, a continuous raised median is a relatively expensive project. However, given the unique circumstances of this stretch of road – traffic queues at both signalized intersections, resulting in conflicts associated with vehicular access and egress to roadside businesses – the project team felt it is warranted.

... the buffered bicycle lane will visually narrow the roadway, encouraging appropriate motor vehicle speeds....

Figure 3-1. Southern Gateway Zone – Existing Typical Section

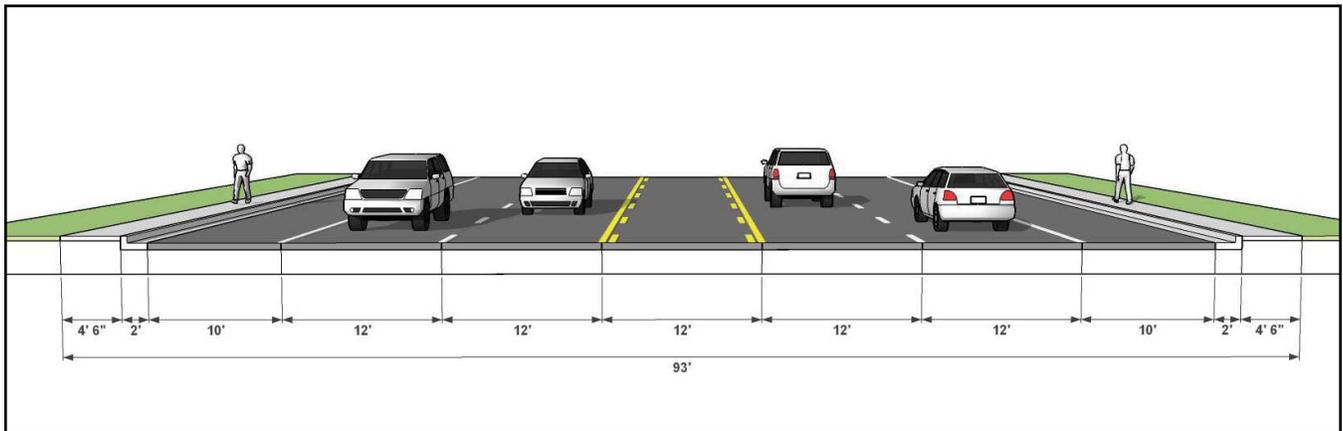
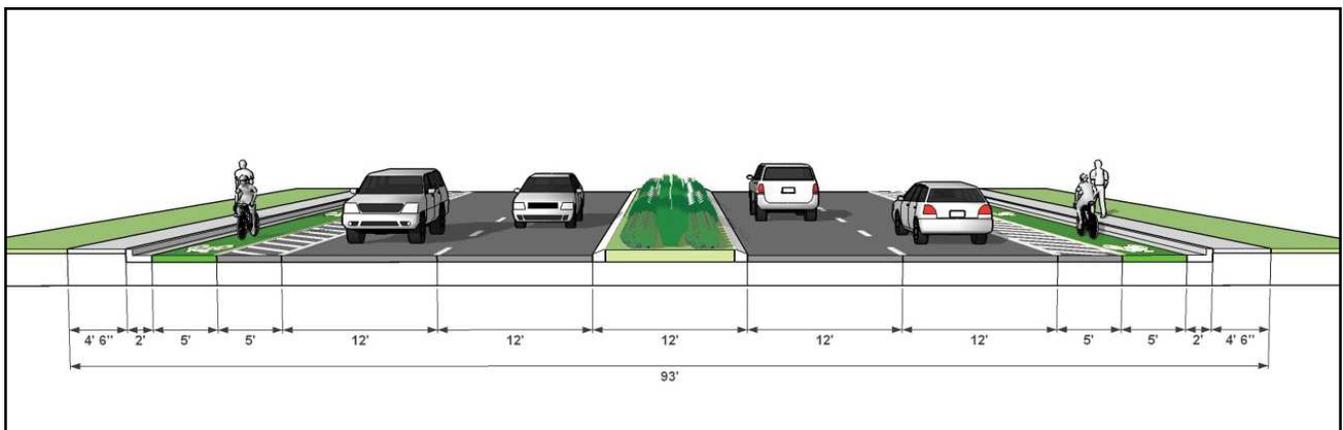


Figure 3-2. Southern Gateway Zone – Proposed Typical Section



The outside curbs are unchanged, helping to keep the cost down and minimizing disruptions associated with construction.

Southern Transition Zone

The Southern Transition Zone begins at the northern SR 33 and SR 144 intersection and extends to Veteran Street (see Figure 3-3). It is approximately 2.2 miles (11,600 feet) in length. The Southern Transition Zone includes a scattered mix of vacant land, farmland, strip commercial, industrial, and single home sites. Residential subdivisions are located on collector roads just north and south of the corridor. This zone also includes Union

County High School and the City of Maynardville administrative building. There is a large undeveloped parcel on the north side of the road that is frequently the subject of speculation regarding a major new development.

This section includes a long stretch of straight, flat roadway that encourages higher vehicle speeds leading into downtown. The existing cross section is similar to the Southern Gateway Zone and includes sidewalks on both sides of the roadway, two 10-foot shoulders with two feet of curb and gutter, four 12-foot travel lanes, and a 12-foot center continuous median turning lane.

Figure 3-4 illustrates the proposed vision for the Southern Transition Zone. Similar to recommendations for the Southern Gateway zone, the vision recommends replacing the shoulder with a buffered bicycle lane. The four 12-foot travel lanes and 12-foot continuous center turn lane will remain the same.

The presence of the buffered bicycle lane will visually narrow the roadway, encouraging appropriate motor vehicle speeds. The vision does not change the travel lanes or curb and thus can be done at minimal cost and disruption.

Downtown Zone

The Downtown Zone begins at Veteran Street and extends to

Figure 3-3. Southern Transition Zone – Existing Typical Section

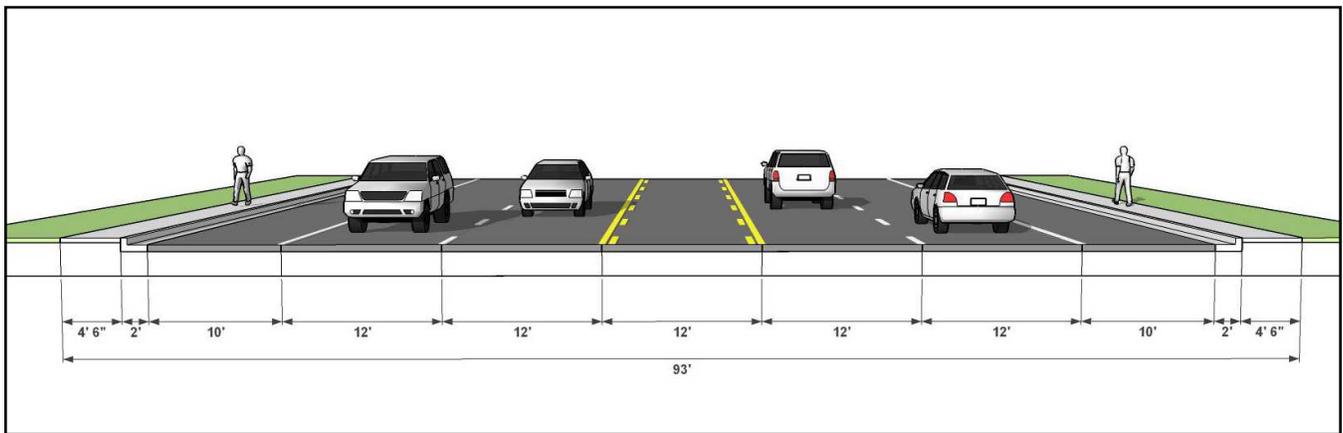
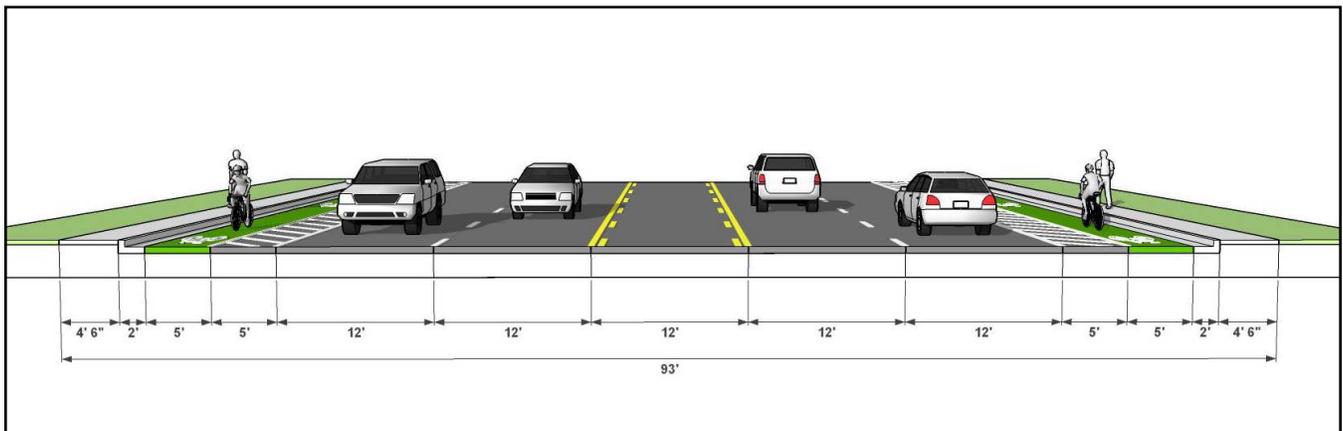


Figure 3-4. Southern Transition Zone – Proposed Typical Section



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Academy Street. It is approximately 0.7 miles (3,700 feet) in length. Along this stretch of Maynardville Highway, travel and two-way center turn lanes are the same as the preceding zones, but the shoulder disappears. A narrow (three to four feet) grass strip separates the sidewalk from the outside travel lanes. Figure 3-5 details the existing cross section.

The proposed vision includes two options for the Downtown Zone. Both take different approaches to balance regional mobility, create a walkable downtown context, and provide a continuous facility for cyclists.

Shown in Figure 3-6, Option A narrows the four existing travel

lanes to 11 feet and includes a raised median island of 10 feet. A 10-foot shared use path is located on the south to provide room for pedestrians and bicyclists and the sidewalk on the northern side is widened to five feet. The grass planting strip is replaced with hardscape improvements such as decorative lighting to create a buffer from the travelled way and encourage appropriate motor vehicle speeds through horizontal deflection. All told, the median, path construction, and hardscaping result in a relatively high level of investment in downtown.

Option B, similar to Option A, narrows the two inside travel lanes to 11 feet and includes a raised

median island of 10 feet (see Figure 3-7). However, instead of a parallel off-road multi-use path, this option widens the outside travel lanes to 13 feet to accommodate shared motor vehicle and bicycle traffic. The sidewalk on both sides is widened to five feet and the grass planting strip is replaced with hardscape improvements. Option B is less costly than Option A because it omits the path and will not require reconstruction of the curb on the south side of the road. However, the raised median and hardscape enhancements will require a significant investment.

Figure 3-5. Downtown Zone – Existing Typical Section

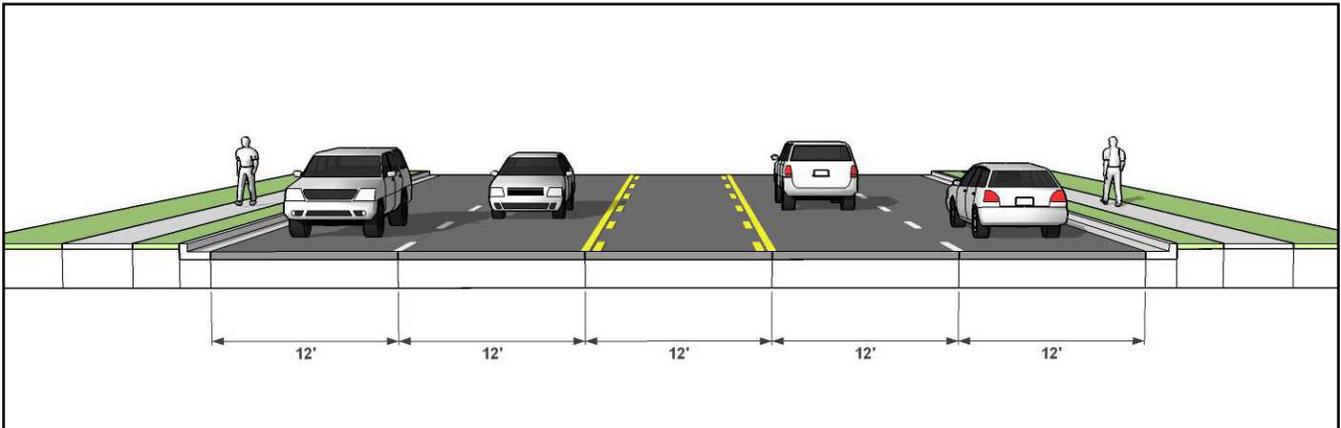


Figure 3-6. Downtown Zone – Proposed Typical Section – Option A

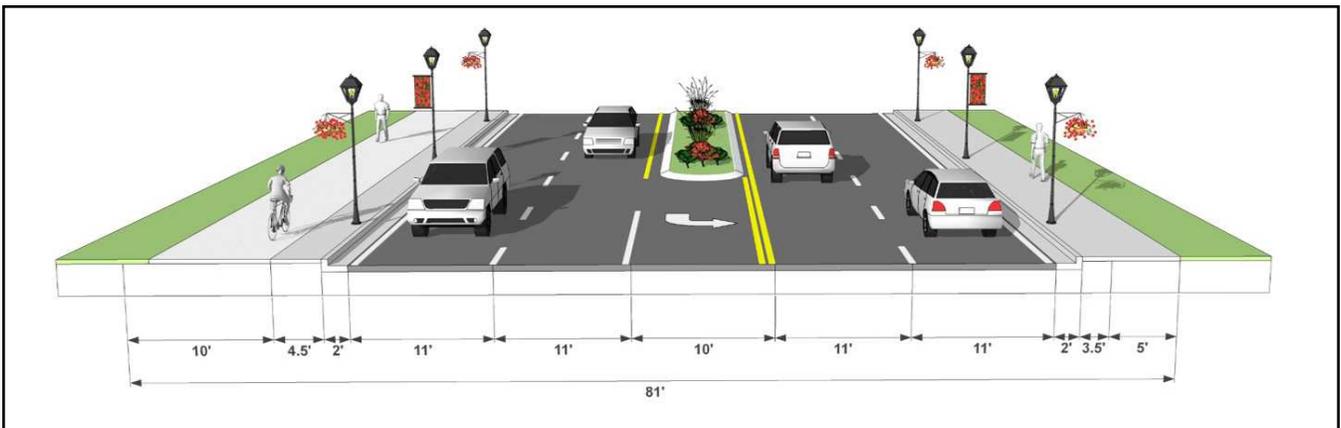
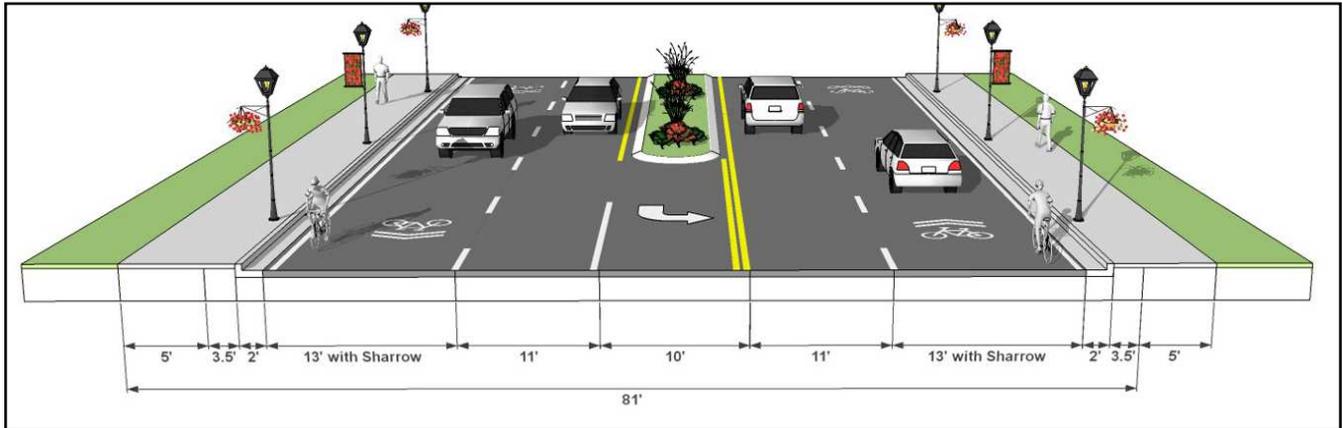


Figure 3-7. Downtown Zone – Proposed Typical Section – Option B



Northern Transition Zone

The Northern Transition Zone begins at Academy Street and extends to Wallace Lane. It is approximately 0.6 miles (3,200 feet)

in length. This roadway typical section for this zone is very similar to the Southern Transition Zone. It includes sidewalks on both sides of the road, two 10-foot shoulders with two feet of curb and gutter, four 12-foot travel lanes, and a

12-foot two-way center turn lane. This zone includes the Food Giant shopping center, a scattering of standalone retail and service oriented establishments, light industrial uses, agricultural uses, and vacant parcels (Figure 3-8).

Figure 3-8. Northern Transition Zone – Existing Typical Section

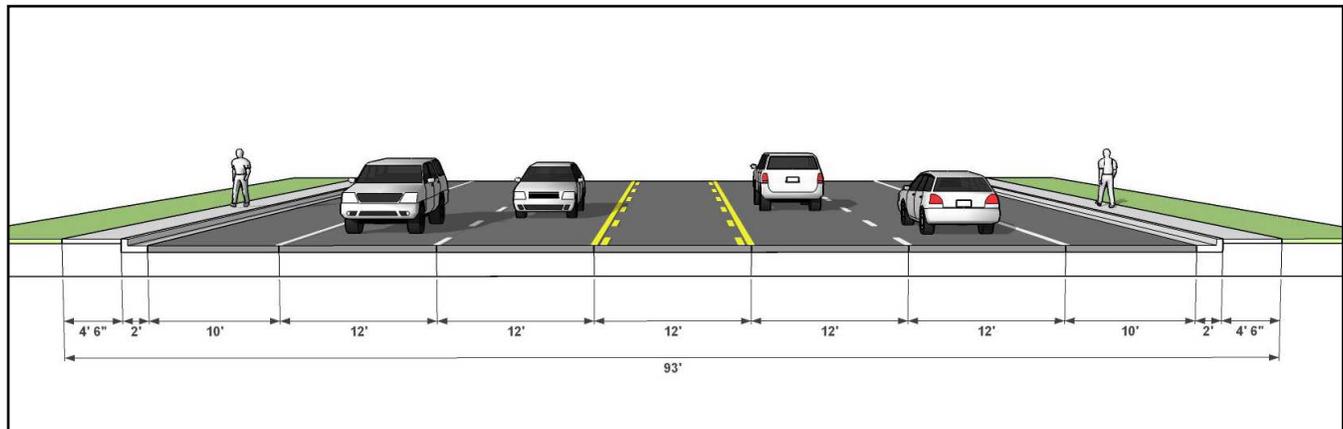
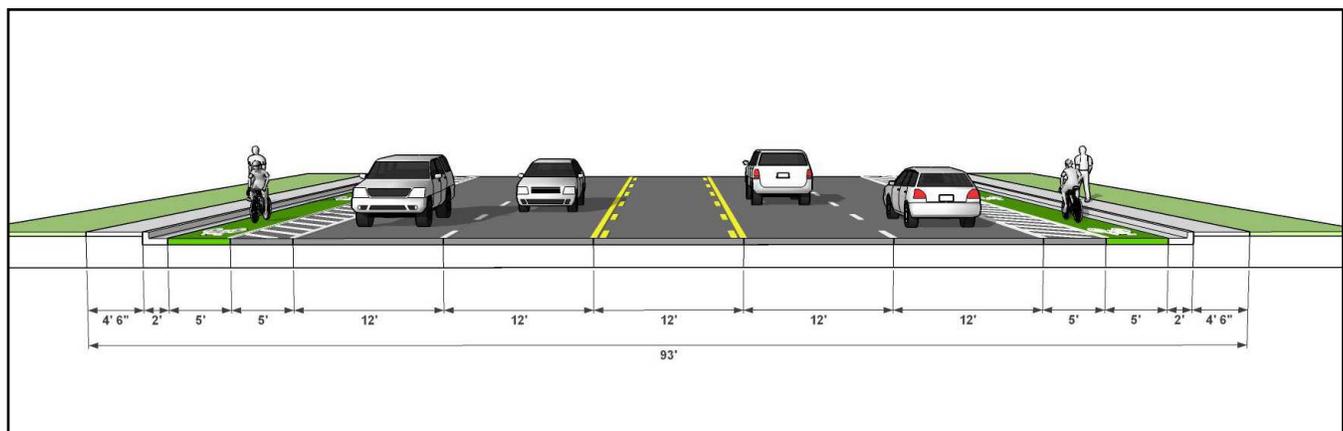


Figure 3-9. Northern Transition Zone – Proposed Typical Section



The proposed vision for the Northern Transition Zone is similar to that of the Southern Transition Zone: buffered bicycle lanes replace the shoulders (see Figure 3-9). The four 12-foot travel lanes and 12-foot continuous center turn lane remain unchanged.

Northern Gateway Zone

The Northern Gateway Zone begins at Wallace Lane and extends through Maynardville city limits. It is approximately one mile in length. This zone is mostly rural, vacant land with open swales on both sides of the road. The existing cross section is similar to the other gateway and transition zones, as

illustrated in Figure 3-10, except that the sidewalk and curb and gutter are replaced with an open grass swale.

The proposed vision for the Northern Gateway Zone, as shown in Figure 3-11, recommends a buffered bicycle lane. However, given the lack of gutter pan, the bicycle lane is expanded to six feet, reducing the striped buffer to four feet. The four 12-foot travel lanes and 12-foot continuous center turn lane remain unchanged.

Raised Median Islands

Continuous raised medians are included in the proposed visions for the Southern Gateway and Downtown Zones. It is not feasible

to recommend a continuous raised median for the other context zones.

For the Southern and Northern Transition and Northern Gateway Zones, the strategic placement of raised median islands is recommended. Rather than a continuous median, the islands are placed in a handful of strategic locations and are no more than roughly six to 12 feet in length.

The islands provide several benefits. As shown in Figure 3-12, the number and width of lanes makes pedestrians crossing Maynardville Highway a difficult, if not risky, proposition. There are long stretches of road, often a mile or longer, with no designated crossing opportunities for pedestrians.

Figure 3-10. Northern Gateway Zone – Existing Typical Section

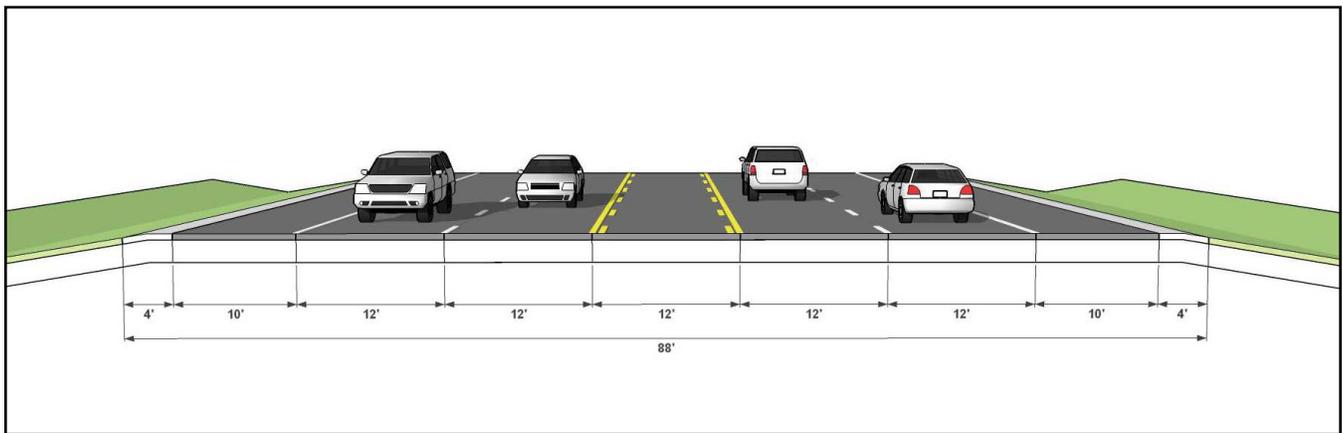


Figure 3-11. Northern Gateway Zone – Proposed Typical Section

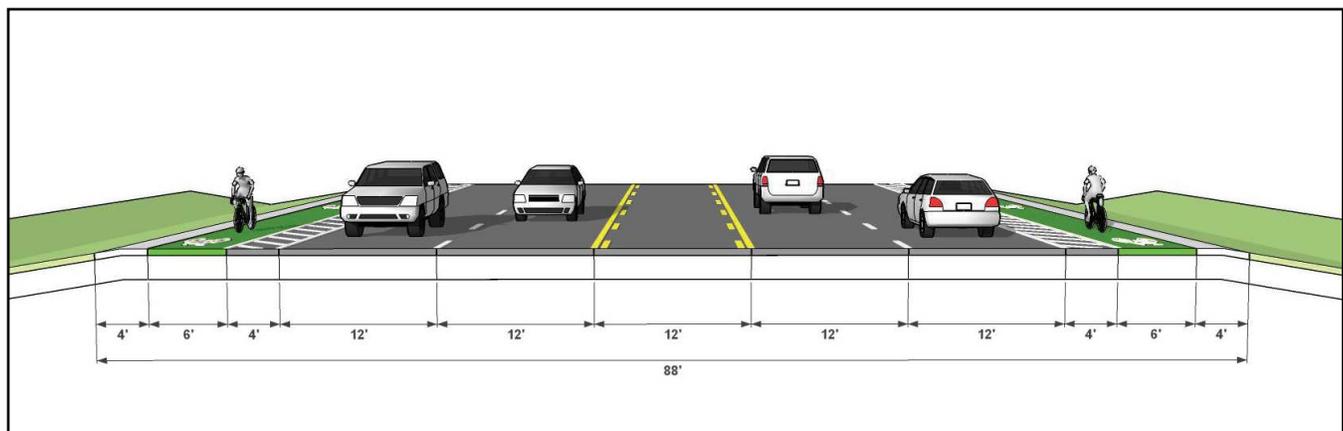


Figure 3-12. Existing Potential Raised Median Island Location



Figure 3-13. Example of Raised Median Island



Raised median islands can be used in these locations to break the long complex street crossing into two simple ones (see Figure 3-13).

Additionally, the horizontal deflection subtly calms traffic. Optional curb extensions calm traffic through narrowing of the traveled way and shortens the crossing distance for pedestrians. As noted above, these zones include long stretched of straight, flat, wide roadway that encourage higher motor vehicle speeds. The buffered bicycle lanes will help to change the character of the roads, but the raised median islands will help significantly.

Finally, the median islands provide an opportunity for aesthetic enhancement. This could be particularly useful when signaling a context change from one zone to the next.

The specific locations of raised median islands is subject to further study based on sight distance, driveway locations, and other factors.

Intersection Enhancements

Major intersections with Maynardville Highway within the corridor limits include Hickory Star Road (SR 144), Ailor Gap Road (SR 144), Oakland Road/

Wilson Road, Veteran Street, Academy Street, Wallace Lane, and SR 61. Figure 3-12 shows the existing layout of the SR 33 and Ailor Gap Road intersection. The proposed vision for Maynardville Highway (Figure 3-14) includes several enhancements to these intersections to help change the character of the corridor, improve motor vehicle operations, and create a better environment for pedestrians. The introduction of dedicated right turn lanes preserve through traffic movements and reduce the potential for rear-end and sideswipe collisions. In these locations, it will be necessary to replace the buffered bicycle lane

Figure 3-14. Existing Major Intersection Layout



Figure 3-15. Major Intersection Improvements Proposed



with a shared turn lane (sharrow marking).

The right turn lane will not require all of the right-of-way currently occupied by the shoulder. Curb extensions and/or bulb-outs are recommended to absorb the additional right-of-way. Curb extensions and bulb-outs narrow the traveled way to calm traffic and shorten crossing distance for pedestrians. Concurrent with the construction of curb extensions, it is recommended that the turn radii be reduced to 15 to 25 feet. Reduced curb radii lessen the crossing distance and encourage turn movements at appropriate motor vehicle speeds. Reduced turning radii may not be feasible at

locations with high truck turning volumes.

Minor intersections include Pine Street, John Deere Drive/Oak Street, Johnson Road, Durham Drive (see Figure 3-16), Bertha Place, the entrance to Food City, and Covenant Lane. In these locations, major investment is not warranted, but some improvement is desired.

Figure 13-7 illustrates the proposed vision for minor intersections on Maynardville Highway. The addition of dedicated right turn lanes will help preserve through traffic movement and reduce the potential for read-end and sideswipe collisions. Bicycles will need to share the turn lane at these

locations. The use of pavement markings is proposed to create the illusion of a smaller intersection and encourage appropriate motor vehicle speeds. These enhancements can be done at minimal cost.

Access Management

Access management is a set of techniques that state and local governments can use to control access to roadways. Access management includes several techniques that are designed to increase the capacity of these roads, manage congestion, and reduce crashes. For example, medians can be used to improve safety at driveways by reducing

Figure 3-16. Existing Minor Intersection Layout

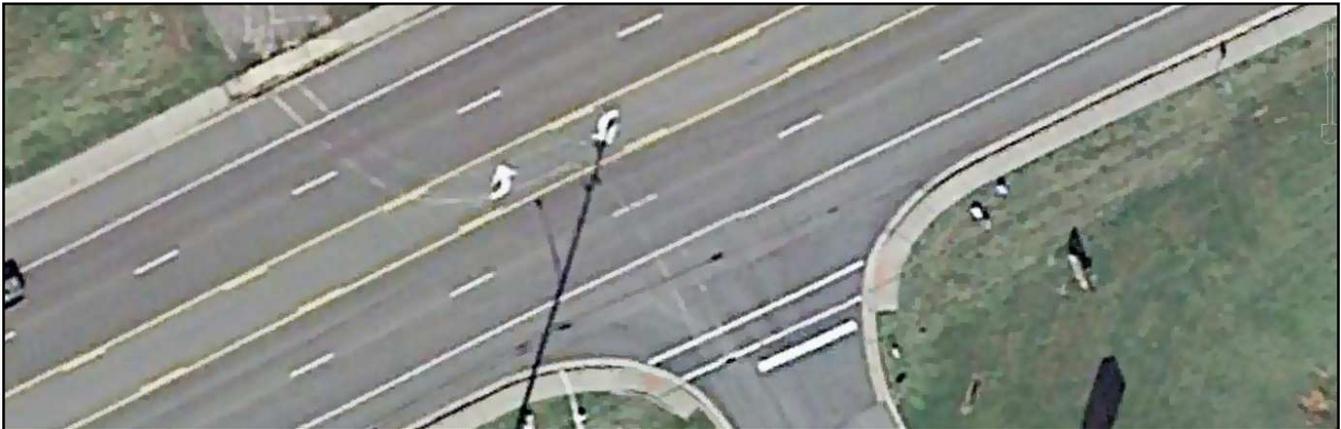
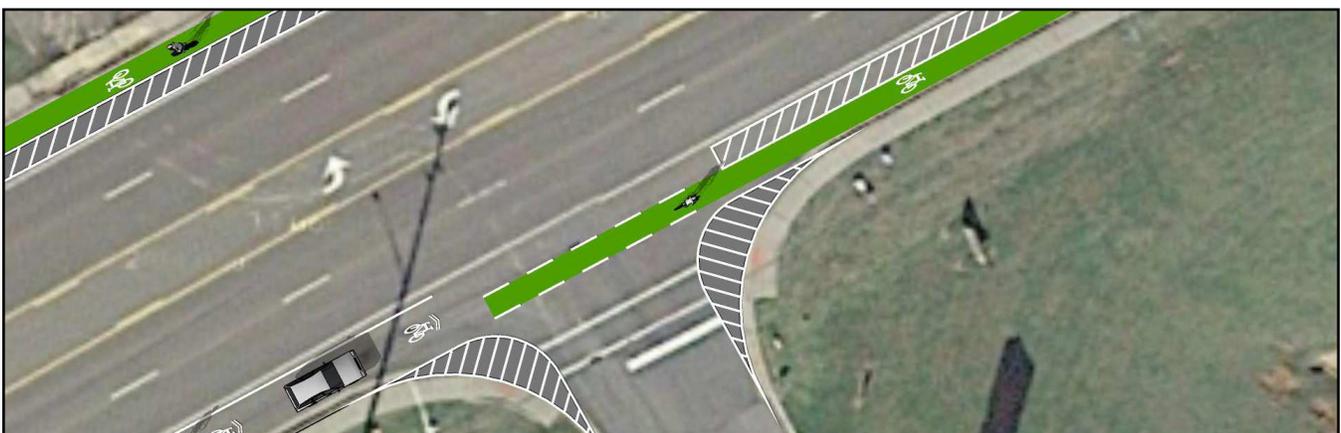


Figure 3-17. Minor Intersection Improvements Proposed



conflict points. Planning for the appropriate driveway location, spacing, and design is an important consideration.

A plan and strategy for access management is recommended for Maynardville Highway. Should new development and redevelopment occur, an access management plan would help promote safety and mobility along the corridor while providing safe access for adjacent businesses.

Two illustrative examples of how access management could be applied are provided for the Southern Gateway and Downtown Zones. These two examples are based on the application of access

management classifications to the corridor that prescribe the major elements of access, such as signals, cross-streets, and driveways. The classifications used here are derived from a major access management corridor study in Middle Tennessee (SR 109). Table 3-1 provides a summary of access management characteristics associated with each classification.

Southern Gateway – SR 144/Hickory Star Road to SR 144/Ailor Gap Road

Figure 3-18 illustrates the hypothetical application of access management in the Southern Gateway Zone. Given the context

of the area (transitioning), a Class III standard was applied. This is consistent with existing signal spacing: there are approximately 1,500 feet between the Hickory Star Road and Ailor Gap Road full access traffic signals.

The raised median would only allow for turning movements at the signalized intersections, meaning existing and future driveways are limited right in/right out access. However, a major advantage for this section is the presence of John Deere Drive, which acts as a parallel collector street on the north side of the corridor approximately 450 feet back from SR 33 and provides rear driveway access to businesses

Table 3-1 Access Management Standards by Class

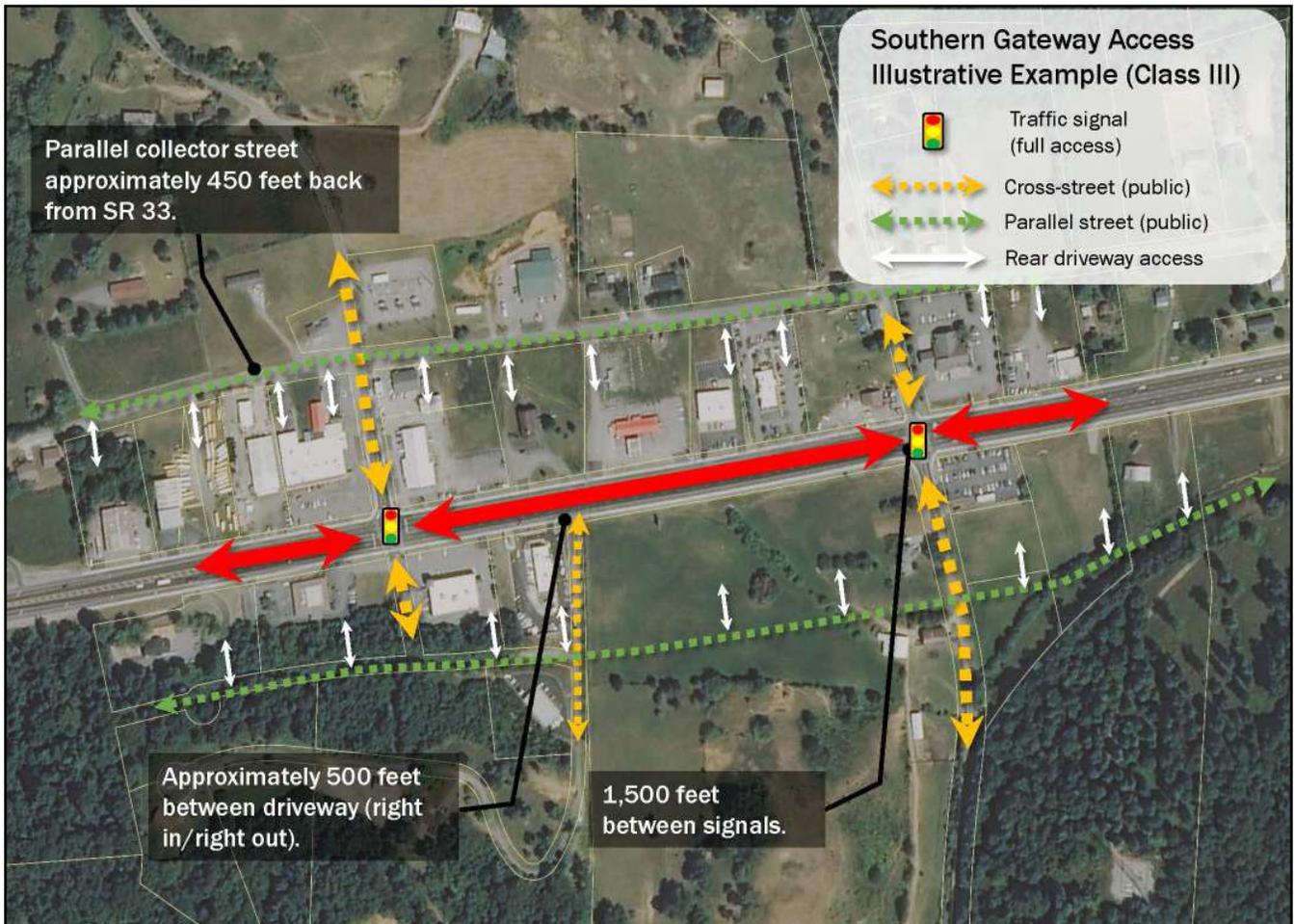
Characteristic	Class II	Class III	Class IV	Class V
 Median Opening	1,320	1,320	660	660
 Signal Spacing	5,280	2,640	2,640	1,320
 Street Spacing	1,320	1,320	660	330
 Driveway Spacing	NA	660	660	330

fronting Maynardville Highway. To provide similar access to properties on the south side of the corridor, an additional parallel collector street

could be constructed. Many of the parcels are currently undeveloped. With close coordination of the property owners, a parallel street

could gradually be completed concurrent with new development.

Figure 3-18. Southern Gateway Access Management Example



Downtown – Veteran Street to Academy Street.

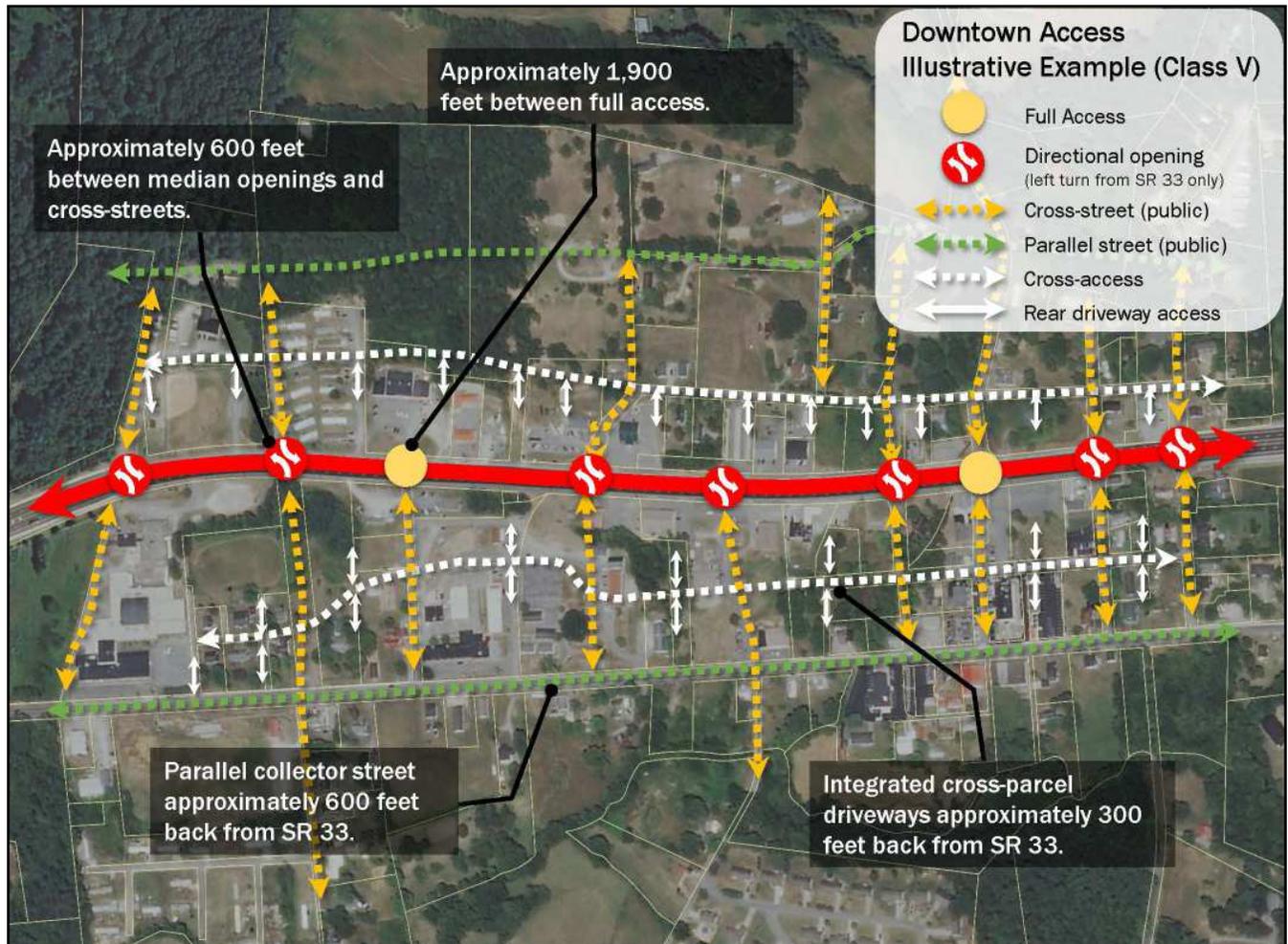
Figure 3-19 illustrates the hypothetical implementation of access management in the Downtown Zone. Given the presence of a more compact street network and the expectation for more closely spaced activities in this location, a Class V standard was applied.

The presence of a raised median limits turn movements to and from the corridor. Directional openings (left turns from Maynardville Highway only) could be established approximately 600 feet between median openings and cross streets,

with full access points (left turns to and from the corridor). Main Street would act as a parallel collector street approximately 600 feet back from SR 33 and provide additional cross street access. An additional parallel collector street could be constructed on the north side of Maynardville Highway incrementally by the private sector concurrent with new development. Integrated cross-parcel driveways could be built incrementally by the public and private sectors with cross-access easements. The cross-access would be approximately 300 feet back from the corridor and provide rear driveway access to properties.

The downtown access management example is also consistent with the Downtown Maynardville Revitalization plan that recommends adding commercial development facing Maynardville Highway with rear access and extending Broad Street from Monroe to Church Street to help with traffic flow.

Figure 3-19. Downtown Access Management Example



... a vision for Maynardville Highway to make the corridor more community-friendly ...

4. IMPLEMENTATION

The preceding section casts a vision for Maynardville Highway to make the corridor more community-friendly, to support economic development, to make walking and cycling more safe and convenient and to maintain regional mobility. Below are some suggested steps to help make the vision a reality.

Access Management Ordinance

Access management is essentially a set of standards that are applied to property owners. As such, one popular way to implement access management is through land development regulations. An access management ordinance, in the form of an overlay district, is designed to complement a city's existing zoning and subdivision regulations. The overlay can guide property access using the elements described in the illustrative examples above. An overlay is not retroactive, but rather applies only to new development or redevelopment.

To implement access management on Maynardville Highway, the City

of Maynardville will need to develop and adopt an access management ordinance. A model access management ordinance is included as an appendix.

Project Phasing

The proposed vision includes relatively low cost recommendations by design. Their implementation is more feasible than higher-cost, more capital-intensive road improvements. That said, it will still take a number of years for the City and its partners to procure the necessary resources to complete all of the projects. A suggested phasing program is included in Table 4-1.

The roadway cross sections could be completed together as a corridor wide re-striping program, with the exception of the more capital-intensive Downtown Zone. Because it is a relatively low-cost proposition and covers most of the corridor, the re-striping is recommended as a first phase. Minor intersection improvements can also be completed during this time as they consists of only striping improvements.

Improvements to the Downtown Zone are recommended as a next phase, because of the importance of the downtown transformation to the community and the need to create a continuous, corridor-wide bicycle facility. The major intersection improvements and construction of the raised median in the Southern Gateway Zone are recommended as a third a final phase.

Median islands are standalone improvements; they can be implemented on an individual basis. The installation of median islands is recommended incrementally concurrent with each phase (from two to four per phase).

Funding Sources

Funding sources for implementing the proposed roadway improvements can be pursued through state/federal funding or through private development.

Piggyback Projects

The most cost-effective way to implement projects associated with the preferred vision is to "piggyback"

... designed to complement a city's existing zoning and subdivision regulations....

Table 4-1. Proposed Phasing Program

		
Phase	Description	Planning Level Cost Estimate
Phase I	Corridor-wide re-striping.	\$150,000 to \$350,000
	Minor intersection improvements.	\$10,500 each
	Two to four median islands.*	\$22,700 each
Phase II	Downtown transformation (Option A or B).*	\$957,000 to \$1,411,000
	Two to four median islands.*	\$22,700 each
Phase III	Major intersection improvements.	\$152,000 each
	Construction of raised median in Southern Gateway Zone.*	\$292,000
	Two to four median islands.*	\$22,700 each

* Includes gateway treatments (signage and/or landscaping). Costs based on "Costs for Pedestrian and Bicyclist Infrastructure Improvements: A Resource for Researchers, Engineers, Planners, and the General Public, UNC Highway Safety Research Center"

them with other road projects that have already been programmed. This can be done at little or often no additional cost. For example, the restriping can be achieved concurrent with a programmed resurfacing of the corridor, at nominal cost (other than design). Examples of opportunities for piggyback projects include:

- Corridor resurfacing.
- Corridor reconstruction.

- Intersection and safety projects.
- Drainage projects.
- Utility projects.

There are no such projects known at this time. The City is advised to remain vigilant of TDOT's work program and its own public works program to identify opportunities to piggyback projects.

State/Federal Grant Programs

There are a handful of grant opportunities at the state and federal level for which the City can apply. Some of the more popular grant programs are described in Table 4-2.

Table 4-2. Assorted State and Federal Level Grant Programs

	<h3>Transportation Alternatives Program (TAP)</h3>	<p>The Transportation Alternatives Program (TAP) combines three previously separate sources of transportation funding: Transportation Enhancements, the Recreational Trails Program, and Safe Routes to School. TAP provides funding for programs and projects including pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation.</p>	
<h4>Examples of Eligible Project Types</h4>	<h4>Funding</h4>	<h4>How to Apply</h4>	
<ul style="list-style-type: none"> • Pedestrian and Bicycle Facilities • Safe Routes for Non-Drivers 	<ul style="list-style-type: none"> • There is a 20 percent non-federal construction share for of the proposed project must be provided as a hard cash match, and all preliminary engineering (PE), design and right-of-way expenditures are solely the responsibility of the local governmental agency. 	<ul style="list-style-type: none"> • Application materials can be accessed on the TDOT website: www.tn.gov/tdot/topic/tap • The application cycle is open from July 1 to October 3 each year. 	
	<h3>Safe Routes to School (SRTS)</h3>	<p>Safe Routes to School (SRTS) is a federally funded program focusing on the benefits of children walking and biking to school. Its primary purpose is to encourage elementary and middle schoolchildren to safely walk and bicycle to school through infrastructure improvements, educational initiatives, and promotional activities.</p>	
<h4>Examples of Eligible Project Types</h4>	<h4>Funding</h4>	<h4>How to Apply</h4>	
<ul style="list-style-type: none"> • Pedestrian and Bicycle Facilities • Safe Routes for Non-Drivers 	<ul style="list-style-type: none"> • Projects and activities were 100% federally funded for the 2016 year; no local match is required. • Maximum award amount of \$250,000. 	<ul style="list-style-type: none"> • Application materials can be accessed on the TDOT website: www.tn.gov/tdot/article/safe-routes • The previous application cycle closed on January 15, 2016. 	
	<h3>Multimodal Access Grant</h3>	<p>TDOT's Multimodal Access Grant is a state-funded program created to support the transportation needs of transit users, pedestrians, and bicyclists through infrastructure projects that address existing gaps along state routes.</p>	
<h4>Examples of Eligible Project Types</h4>	<h4>Funding</h4>	<h4>How to Apply</h4>	
<ul style="list-style-type: none"> • Pedestrian crossing improvements, including signage, signalization, median pedestrian refuge islands and crosswalks • Sidewalks • Bicycle lanes (on-road facility delineated with pavement markings and signs) • Pedestrian-scale lighting • Road diets or traffic calming measures that enhance bicycle and/or pedestrian safety 	<ul style="list-style-type: none"> • State-funded at 95 percent with a 5 percent local match. • Total project costs must not exceed \$1 million. 	<ul style="list-style-type: none"> • Application materials can be accessed on the TDOT website: www.tn.gov/tdot/topic/multimodal-multimodal-access-grant • The previous application cycle closed on January 15, 2016. 	

... increases the visibility of the City by creating community gateways and creating a friendlier downtown ...

5. SUMMARY

Maynardville Highway is a tremendous asset to the City of Maynardville. By adopting an access management ordinance the City can take the first step towards realizing a corridor that balances regional mobility with commercial, economic, safety, and community interests. The

proposed vision and plan for the corridor increases the visibility of the City by creating community gateways and creating a friendlier downtown. The plan also allows for the expansion of multimodal options by providing improved accommodations for walking and bicycling. Intersection and median

improvements increase the safety of the users of the roadway. The City is encouraged to be proactive in seeking out opportunities for grant funding and for other projects that the recommended projects can be piggybacked on to.

... expansion of multimodal options by providing improved accommodations for walking and bicycling ...

APPENDIX

CORRIDOR OVERLAY DISTRICT ORDINANCE

Draft - Model Ordinance

I. Title and Authority:

Title: This Ordinance shall be known as the State Route 109 Corridor Overlay District.

Authority: Tennessee Code Annotated title 13, Chapter 7.

II. Purpose and Intent:

The purpose of this zoning overlay district is to enhance the safety, function, and capacity of the State Route 109 (SR 109) Corridor. This ordinance implements the findings and recommendations of the SR 109 Access Management Study (AMS) which has been approved by resolution by the (City/County). The SR 109 AMS supports the important regional function of SR 109 along with defining the operational character, setting access management goals, objectives and standards, and outlining a process for moving forward with the recommendations.

A zoning overlay district establishes special conditions that address specific aspects of land use control or development design in addition to the existing or base zoning district provisions. While the underlying zoning district defines use and lot requirements, the special circumstances present along SR 109 mean that an extra level of guidance and oversight is necessary to ensure that land development does not interfere with or unnecessarily degrade the safety and long- term capacity and efficient operation of this strategic regional highway.

As a major regional traffic route and economic development corridor, SR 109 represents significant community investments and contributes to public health, safety, and welfare. The corridor provides access to jobs and schools, facilitates delivery of emergency services, supports the movement of goods, services and people, and thereby enhances economic development and opportunities. Furthermore, this corridor serves as a first impression of the community for visitors and the traveling public. The long term functional integrity of this corridor is vital to the long term health and vitality of the communities it serves.

In carrying out this purpose, this ordinance is designed to promote development, public safety, and maintain a high level of access management along SR 109 that:

- a. Enhances growth by preserving mobility in the corridor;
- b. Encourages creative solutions in the utilization of land to accomplish more efficient, safe, aesthetic, and desirable development;
- c. Improves the overall transportation efficiency of the corridor;
- d. Increases the safety of the traveling public;

- e. Maintains vehicle speeds at acceptable levels for regional mobility;
- f. Improves the location and design of all vehicular access connections;
- g. Promotes shared parking and connectivity between existing and future developments;
- h. Improves the overall streetscape and livability of the corridor;
- i. Encourages and promotes alternative modes of transportation, including walking, bicycling, and public transit;
- j. Provides for safe and functional access connections between SR-109 and the surrounding area;
- k. Ensures that all property is provided reasonable and suitable access to the public street system;
- l. Supports orderly economic development and redevelopment of the surrounding area; and
- m. Supports the continuing development of a coordinated state and local road network.

III. Applicability and Conformity:

The SR 109 Corridor Overlay District shall regulate property within the designated district as shown on the official zoning map and described herein. As an overlay district it shall complement the requirements of the underlying zone district which shall remain in effect. Wherever the requirements of the overlay district conflict with those of the underlying district, then the greater or more stringent standard shall apply. Where no standards are mentioned herein, the provisions of the underlying district shall apply.

Overlay district requirements apply to development projects regardless of whether such development requires site plan or subdivision review.

Existing non-conforming lots, traffic circulation and access conditions are allowed to continue within the overlay district but should be brought into conformity at the earliest opportunity so that public safety can be improved and the purposes of the overlay district can be achieved. The provisions as set forth in this Ordinance shall apply to new development and redevelopment.

IV. District Boundaries:

The SR 109 Corridor Overlay District shall apply to all land within the jurisdiction of the (City/County) that is within 600-feet of the right-of-way of SR 109. If a portion of a parcel, lot, plat or subdivision is within the overlay district, the entire parcel, lot, plat, or subdivision will conform to the overlay district requirements.

V. Development Standards:

No new or existing parcels or lots within the overlay district shall be provided direct access to SR 109 when adequate alternative access can be provided by way of a secondary, primary, collector, or marginal access street or through joint access with a neighboring property already provided with access. All individual uses

shall be accessed from an internal circulation system or street network designed to serve the development of which they are a part. Potentially negative impacts on the quality and character of surrounding properties or neighborhoods shall be satisfactorily mitigated by the landowner/developer. Where there is no adequate alternative access as determined by the (City/County), direct access to SR 109 may be conditionally permitted in accordance with the design standards that follow.

All site plans should include an access plan drawn to the same scale as the site plan. These plans should show the location and dimensions of all streets, driveways, cross parcel connections, parking areas and aisles, bicycle paths, sidewalks, and any other relevant circulation information and details. The proposed access plan shall be consistent with the access management techniques, policies, and specific details of the adopted AMS.

VI. Consistency with Plans and Studies:

Each access location should be consistent with the locations and criteria provided by the SR-109 AMS. The applicant shall demonstrate how the proposed development plan is consistent with the approved SR 109 AMS.

When site conditions prevent immediately meeting the SR 109 AMS access location requirements the development proposal will include a plan detailing how the SR 109 AMS access requirements will be met in the future.

Interconnecting driveways or provisions for future connections to adjacent properties shall be provided through easements for all new development with access to SR-109. This includes bicycle and pedestrian access to adjacent residential areas where practical.

VII. Non-Conforming Access:

This overlay zoning district recognizes the existence of access connections to SR 109 which were lawful when the overlay was adopted but do not meet the requirements of this ordinance. It is not the goal of this ordinance to discourage the expansion and/or intensification in the use of properties but it is the goal of the ordinance to encourage the elimination of non-conforming accesses or reduce their negative impacts on SR-109 and the surrounding area.

Any access connection in place as of the date of adoption of this Ordinance that does not conform with the standards herein is a non-conforming feature that will be allowed to continue as long as the access or the land use it serves is not expanded or discontinued and the opportunity to conform is not available.

If there is a need to expand a non-conforming access or the land use served by a non-conforming access, the non-conforming access must either be eliminated or brought into conformance with the standards of this Ordinance to the extent feasible as determined by the City/County.

If a non-conforming access or the use or structures of the property served by a non-conforming access is discontinued for more than one year, use of the access must not be re-established unless approved under the provisions of this Ordinance.

If the use or structures of the property served by a non-conforming access is destroyed, subsequent access to the property may be required to conform to the provisions of this Ordinance upon re-construction.

VIII. Coordination with Affected Road Authorities:

The City shall notify and consult with the Tennessee Department of Transportation (TDOT) and any other affected local authority regarding the access plan for each proposed development or re-development and shall consider their comments and recommendations in the review of the proposed development. Review and approval of a document required under this Ordinance does not substitute for compliance with the access permit regulations of TDOT. But where this Ordinance sets greater or more stringent standards, the more stringent standards apply to any access authorization. A driveway may not be constructed or reconstructed if it is not consistent with the requirements of the City even if permitted by the State.

The City shall notify TDOT a minimum of 10 (ten) days prior to the scheduled public hearing for any private appeal of the requirements of this Ordinance.

IX. General Considerations:

To determine whether the proposed development plans including any division of property meets the standards of this overlay ordinance, the approving authority must consider all of the following factors:

- a. The relationship to the existing and proposed land use to City plans;
- b. The transportation and road network plans of the City;
- c. The SR-109 Access Management Plan;
- d. The potential for future subdivision and development of the property and other properties in the vicinity of the proposed access;
- e. The adequacy of existing or planned roadways to accommodate the proposed development in a safe and cost effective manner;
- f. Existing, planned, and potential future access to and circulation on adjacent properties;
- g. Comments from TDOT or any other affected local agencies;
- h. The findings and conclusions of any related studies such as an environmental assessment, drainage analysis, traffic impact analysis, roadway design modifications or traffic signal improvements.

X. Standards for All Street and Driveway Connections:

An access connection should not be located within a turn lane to another public street or a private driveway.

At a non-signalized intersection or any location where a motorist may turn right without the aid of a traffic signal, intersection sight distance should be no less than 610 feet to the left (assumes 55 ph speed limit).

If a left turn onto the highway is allowed at a non-signalized intersection, there should be no less than 700-feet of clear sight distance to the right. (50 mph prevailing, crossing 5 lane widths AASHTO Case B1). If there will be a higher percentage of single unit trucks, the sight distance should be over 850-feet.

From a motorist on the highway to the access there shall be a clear line of sight for adequate stopping sight distance. There shall be a minimum of 425-feet of stopping sight distance to each access connection (assumes 50 mph prevailing highway speeds). It is preferable to have a driver decision sight distance of 890-feet.

For every access connection where the peak hour turning volume exceeds ten, a turn lane should be available. The design of the turn lane will be long enough that during the peak hour of the turn lane the speed differential at the point of vehicle departure from the through highway lane will not exceed ten miles per hour.

To ensure adequate corner clearance on every access approach to SR-109, any public or private access on the approach access should be located a minimum distance of 500-feet from the edge of the travel lane of SR-109 or greater if required by the City/County Engineer. The minimum distance set-back for a low volume secondary road is 125-feet and for a driveway is 75-feet. If an approach queue analysis is prepared, then the first access should be greater than the expected queue.

XI. Private Access:

When it is not feasible at the time of development to close a driveway, an ownership will be permitted one conditional driveway to SR-109 only if there is a necessity for the driveway and if reasonably and suitable alternative access is not available or attainable from the local road network or by a shared driveway with an adjacent parcel. A self-inflicted hardship, the creation of a parcel where the only option is access to SR-109, does not qualify for direct highway access.

A private driveway must maintain adequate intersection sight distance at all times or the access permit may be revoked and the access closed to protect public safety.

If not otherwise defined in the AMP the minimum spacing between access connections shall be the stopping sight distance at the posted speed. Example, 425-feet at 50 MPH.

If any engineering safety standard cannot be met, the access may not be approved.

If lot frontage is inadequate to provide the required minimum spacing, access should be provided via a shared entrance, cross access easement with an adjacent property and/or connecting local street network. A driveway access may be required to serve adjacent property via a shared entrance located on the common property line or a cross access easement; and when required to provide a shared entrance or cross access easement, the property owners must record an easement allowing cross access to and from the properties served by the shared driveway or cross access. The easement must include a joint maintenance agreement defining the responsibilities of the property owners.

XII. Subdivision Standards:

The street system of a proposed subdivision shall be designed to coordinate with existing, proposed, and planned streets serving the surrounding area and shall be consistent with the AMP.

All access to individual lots shall be provided from the internal street system. A prohibition of access to SR-109 shall be recorded in the chain of title of each lot within the subdivision that abuts SR-109 right-of-way.

Where a proposed development abuts undeveloped land or a future phase of the same development, stubs for future public ways shall be provided as deemed necessary by the City to provide access to abutting properties or to logically extend the street system into the surrounding area. All street stubs shall be provided with a temporary turn-around or cul-de-sac and shall be signed to indicate that future extension is planned.

XIII. Site Design Standards:

Sites must be designed to promote safe internal access between parking areas, buildings, and future development areas on the property and on adjacent properties;

Backing, loading, unloading, or other maneuvers must be accommodated on the site and not within the SR-109 rights of way;

The design of any access to SR-109 including the width, grade, and radii be no less than TDOT guidelines and standards; and

The driveway's throat length must be sufficient to prevent vehicles from stopping and queuing on the highway due to regular conflicts and stopping in the driveway throat and parking areas served.

XIV. Conditions of Approval:

The City may attach terms and conditions to the approval of a development plan as deemed necessary to promote the spirit and intent of this overlay ordinance.

An access may be approved as an interim access to be phased out at a future time or condition.

Turning movements to and from an access may be restricted at the time of development or at a future date, based upon existing or anticipated traffic volumes.

The access may be required to serve existing or future adjacent property by a shared entrance or cross access easement.

Other conditions may be required based on the conclusions and recommendations of a traffic impact study and/or the review by the City or another affected agencies.

XV. SR-109 is a multi-modal corridor:

It is necessary that the development of land accommodate and enhance efforts to increase the convenience and use of all modes of travel.

XVI. Transit Facilities:

Potential public transit access points, bus pull-outs, bus stops, signage and shelter locations may be designated along SR-109 and within the perimeter of the development. Easements should be reserved for such facilities. The development of future transit facilities shall be considered for all site plan developments that could generate moderate or higher demands of transit use. Transit facilities shall be design in a manner to encourage public transit as an alternative mode of travel including pedestrian pathways on the site between the transit stop and the buildings. Pedestrian pathways shall be compliant with the Americans with Disabilities Act (ADA).

XVII. Bicycle Facilities:

Separate bicycle facilities may be required where recommended by transportation studies and plans or where otherwise appropriate to support City bicycle goals and objectives. Bicycle racks and other amenities may be required for all developments and shall be located in a convenient and secure location.

XVIII. Pedestrian Facilities:

All sidewalks shall be constructed by the applicant/property owner as required by the City. Sidewalks located along a public street shall be designed and constructed in accordance with City standards and specifications. Sidewalks shall comply with the ADA. Pedestrian cross-walks shall be provided within the development as necessary to connect sidewalks along public streets to the pedestrian ways within the private property.

XIX. Saving Clause:

Where any provision of this Ordinance is found to be invalid, such determination shall not affect the validity of the remainder of this Ordinance.

XX. Effective Date: