



Pie Town Mobility Study

*Recommendations for successful
multi-modal transportation*

AUGUST 2022

Pie Town Mobility Study

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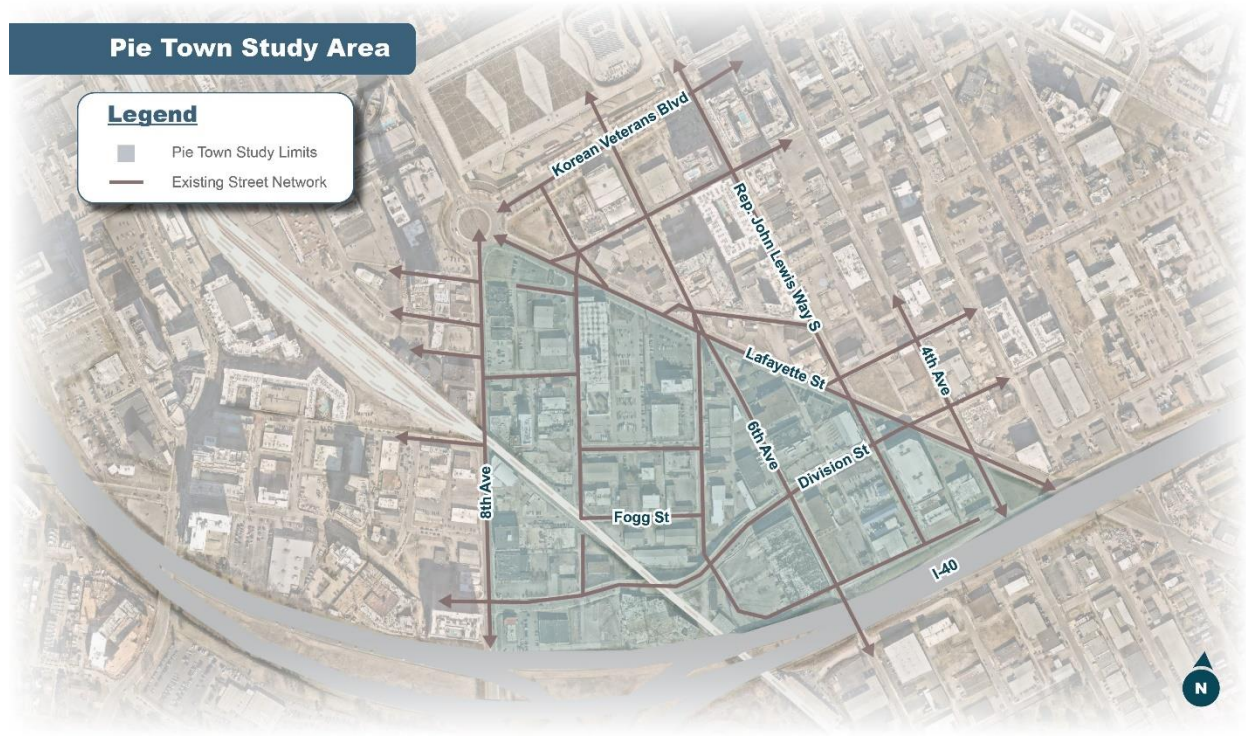
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1. Study Background and Objectives

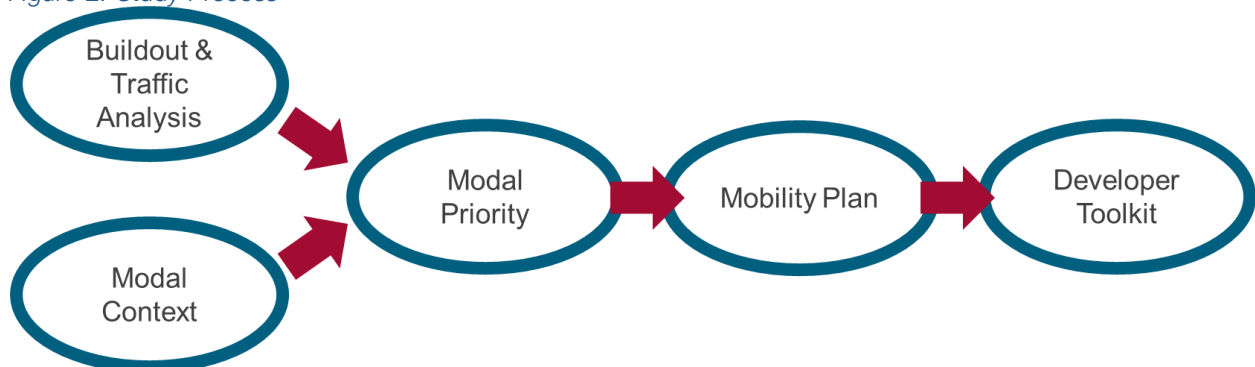
“Pie Town” is the colloquial term for the wedge of land bounded by 8th Avenue South, Lafayette Street, and I-40 (see Figure 1). Strategically positioned between the Gulch and SoBro downtown neighborhoods and two major arterials, Pie Town has become a hot spot for growth, with several major projects in various stages of development.

Figure 1. Pie Town Study Area



The Pie Town Mobility Study takes into account the full potential for development within the study area and recommends projects and strategies that build on the existing modal context to create a successful place for all forms of transportation. Ultimately, the study is intended to be tool for NDOT to understand how to provide mobility within Pie Town and for Metro Planning to communicate mobility needs to the development community. The study process is illustrated in Figure 2.

Figure 2. Study Process



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2. Modal Context

Understanding the current modal context will enable mobility recommendations for Pie Town to integrate more seamlessly with the larger downtown neighborhood and region. The modal context is derived from both existing conditions as well as plans for streets, walking and cycling and transit.

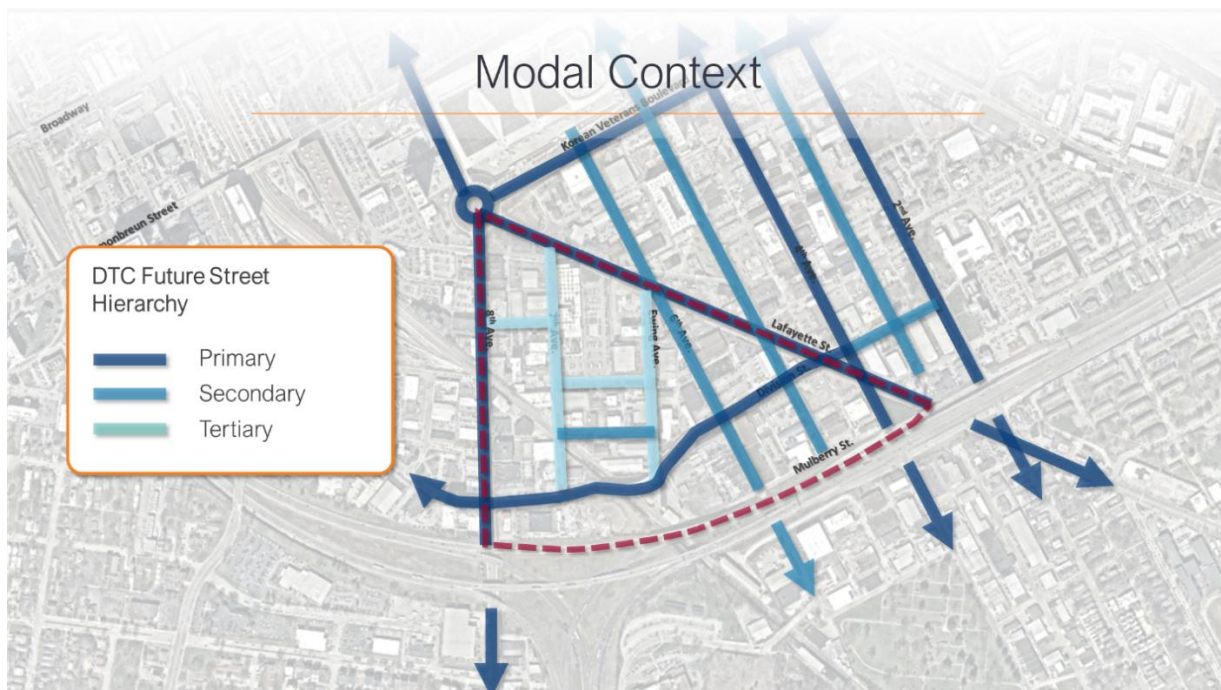
2.1 Street Network and Hierarchy

The Pie Town street network and hierarchy, which organizes streets according to their role, function and context, is addressed by two different documents. The Nashville Downtown Code (DTC) is the regulating plan for all neighborhoods in downtown Nashville. The DTC includes a street hierarchy that defines the role of each street and serves as a basis for regulatory standards such as landscaping, access and bulk standards. Streets in Pie Town fall under three categories:

- Primary Streets “accommodate high levels of pedestrian activity and high levels of vehicular traffic.” Lafayette Street, 8th Avenue South, Division Street and 4th Avenue South are classified as Primary Streets in Pie Town.
- Secondary Streets “have moderate levels of pedestrian activity and moderate levels of vehicular traffic.” Rep. John Lewis Way, 6th Avenue South, and Fogg Street (east of 7th Avenue South) are classified as Secondary Streets in Pie Town.
- Tertiary Streets are “less important than Primary and Secondary streets” and “may function as ‘back of house’ for buildings with multiple street frontages.” All other streets in Pie Town not listed above are Tertiary Streets.

The DTC Future Street Hierarchy is illustrated in Figure 3 below.

Figure 3. DTC Future Street Hierarchy



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The Major and Collector Street Plan (MCSP) is a “comprehensive plan and implementation tool for guiding public and private investment in the major streets (Arterial-Boulevards, Arterial-Parkways and Collector-Avenues) that make up the backbone of the city’s transportation system” as well as sidewalks, bikeways and parking areas. It is a component of Access Nashville 2040, the transportation element of Nashville’s General Plan, Nashville Next. The MCSP addresses three attributes of each street: the environment, the context and the functional design type.

The MCSP includes four streets in Pie Town: Lafayette Street, 8th Avenue South, Division Street and 4th Avenue South. All four are classified as T6-M-AB, representing a Downtown environment, Mixed Use context and Arterial Boulevard function design type. This means the surrounding context contains multiples uses and activities (commercial, office, residential) and is a medium to high speed, high volume street serving longer trips between communities.

The MCSP also prescribes the future right-of-way (ROW) that all future development must acknowledge. The future ROW for streets in Pie Town is identified in Table 1.

Table 1. Major and Collector Street Plan Future ROW

Street	Future ROW
Lafayette Street	106 feet
8 th Avenue South	86 feet
Division Street	72 feet
4 th Avenue South	68 feet

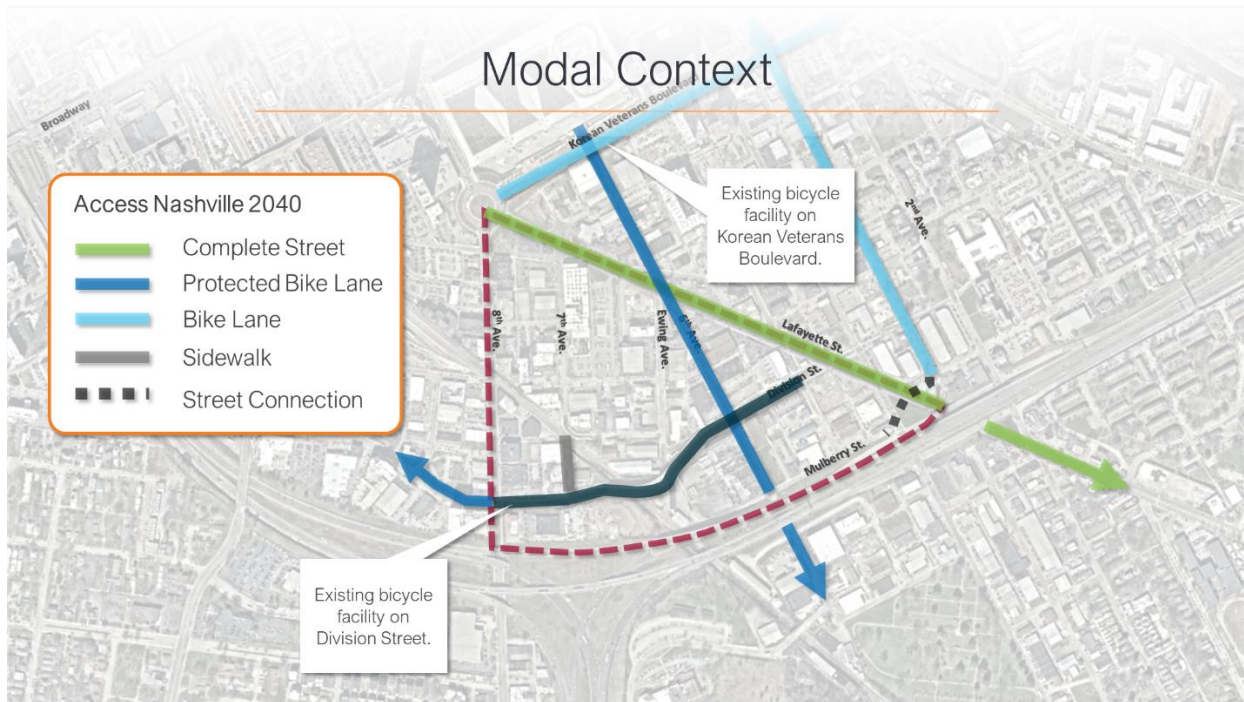
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2.2 Walking and Cycling

Access Nashville 2040 also addresses specific facilities for walking and cycling facilities in Nashville. Figure 4 identifies bicycle and pedestrian facilities for streets in Pie Town, including:

- A “complete street” on Division Street;
- A protected bike lane on 6th Avenue South, and
- A protected bike lane on Division Street, which was completed concurrent with the street’s reconstruction.

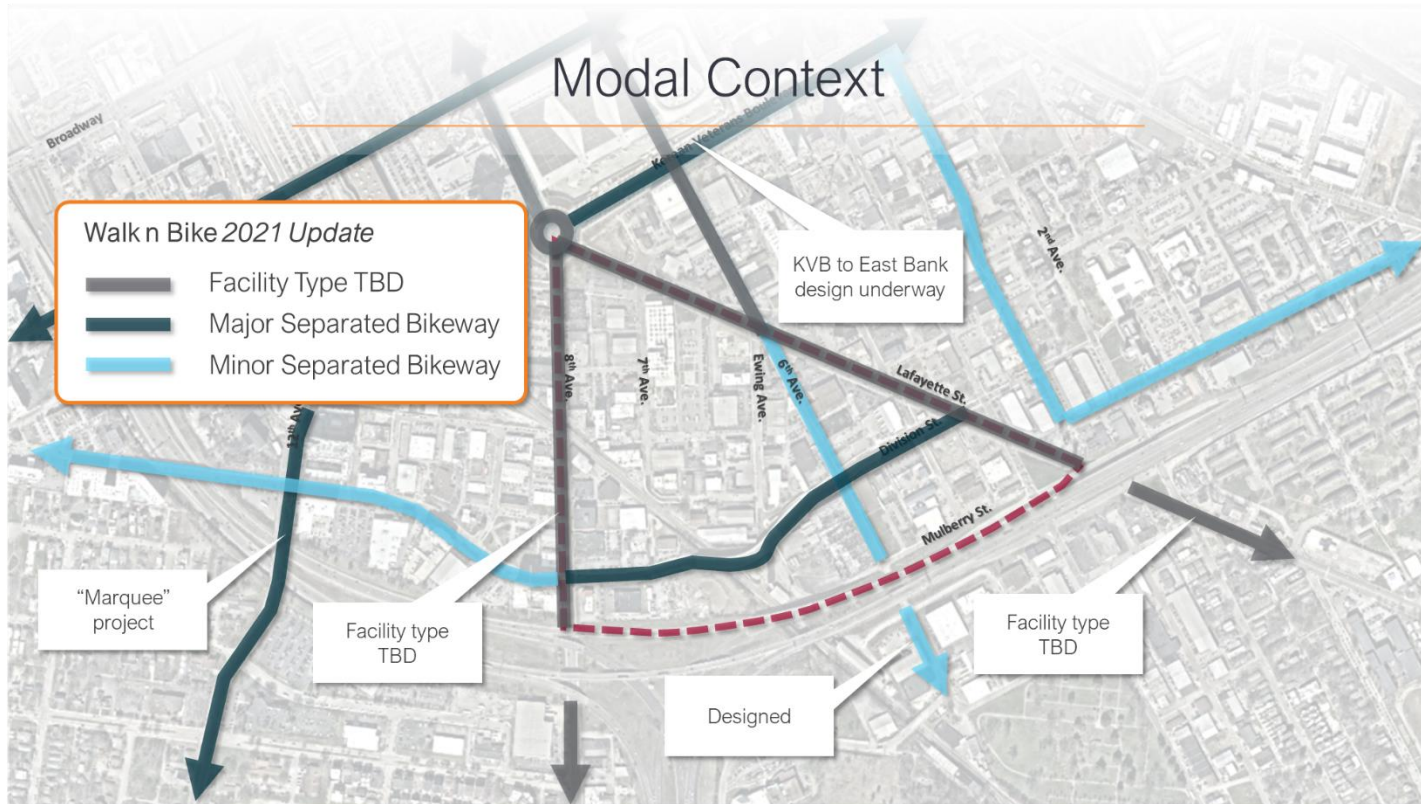
Figure 4. Access Nashville 2040



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Walk n Bike, Nashville's strategic plan specifically for sidewalks and bikeways. Walk n Bike was updated in 2022. WalknBike identifies priority bikeways, and the 2022 WalknBike update includes a three-year work plan for bikeways to be advanced to design and/or construction in Metro fiscal years 2022 - 2024..

Figure 5. Walk n Bike



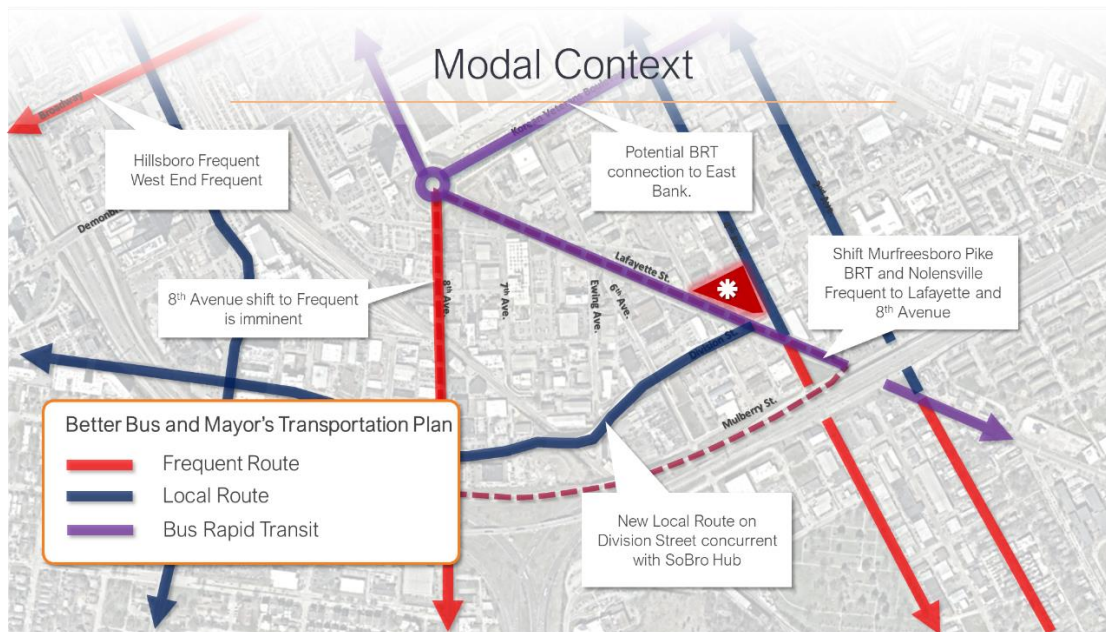
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2.3 Transit

The transit context is derived from a number of sources, including the Mayor's Transportation Plan, developed by the Mayor's Office in 2020, WeGo Transit's Better Bus Plan and discussions with WeGo staff. The transit context, as illustrated in Figure 6, includes a number of key elements:

- A future bus rapid transit (BRT) corridor, including a dedicated running way for buses with stations and intersection prioritization, on Lafayette Street, which serves as a point of convergence of Murfreesboro Pike BRT and Nolensville Pike Frequent Service (defined as 15 minute or better frequency).
- A new SoBro Transit Center between Lafayette Street and 4th Avenue South.
- A new local route on Division Street, which could use the SoBro Transit Center as its terminus.
- Frequent Service on 8th Avenue South.
- A new Frequent or BRT connection to the East Bank via Korean Veterans Boulevard, which could serve the proposed SoBro Transit Center.

Figure 6. Better Bus and Mayor's Transportation Plan



In addition to the completed plans described above, there are two planning processes currently underway that will have a direct influence on Pie Town:

- The WeGo Transit Connect Downtown study that will address all forms of mobility and transportation operations throughout the downtown area.
- The NDOT SoBro Mobility Study, similar in scope to this study, that will study the area east of Pie Town to Hermitage Avenue.

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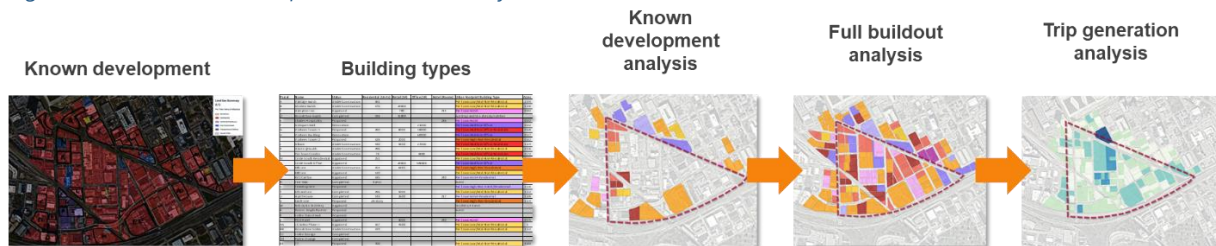
3. The Future of Pie Town

Understanding Pie Town's projected growth trajectory is paramount to understanding the study area's future mobility needs. The future analysis includes an understanding of how much growth Pie Town will absorb at buildout, translating that growth into travel demand and then estimating impacts to the transportation network.

3.1 Development Potential Analysis

The buildout analysis was completed using the UrbanFootprint planning software platform. Metro Planning provided data on known and approved development in Pie Town, which was used to create development prototypes, or building types, applied to all parcels within the study area. The development data was used to estimate the number of walk/bike, transit and motor vehicle trips at buildout. The process is outlined in Figure 7.

Figure 7. Buildout and Trip Generation Analysis Process



Building types for known development and full buildout are identified in Figure 8 and Figure 9, respectively. The range of development types include hotels, residential buildings, office buildings and mixed use (typically retail and office and/or residential) ranging in size from five stories to over 30 stories. The development shown in Figure 8 represent current data on approved and proposed development, including use, building height, floor area and dwelling units. The information was used to estimate potential development for the remaining parcels in the study areas as shown in Figure 9.

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Figure 8. Known Future Development

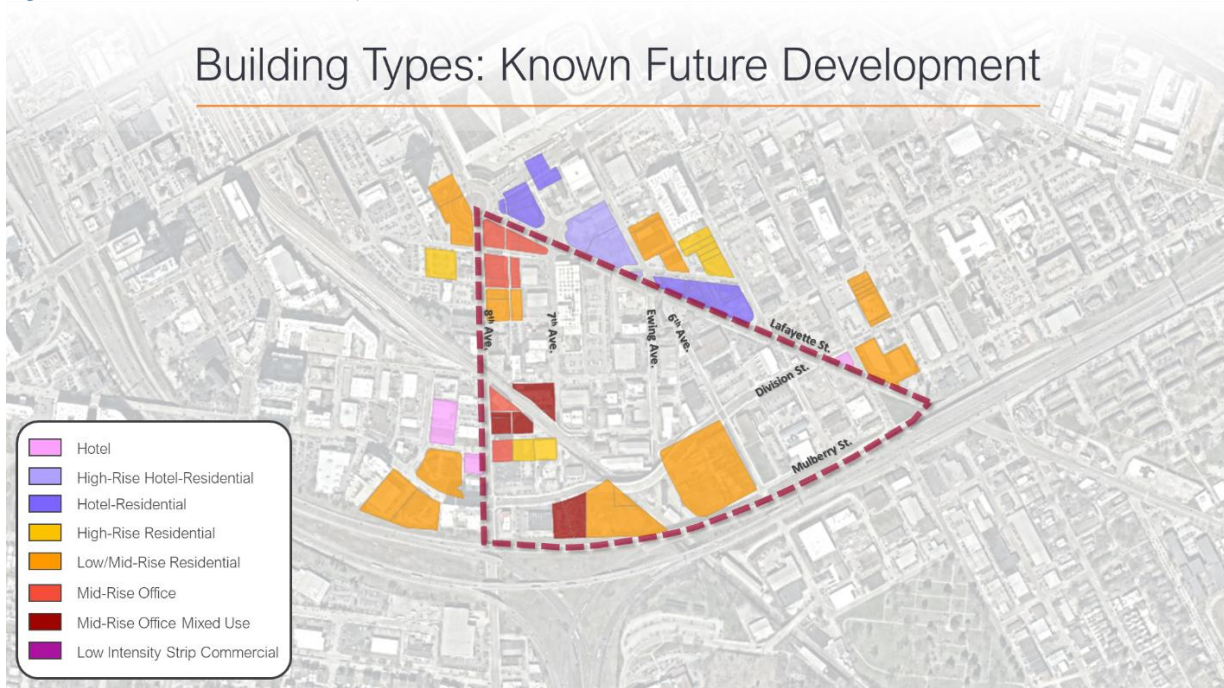
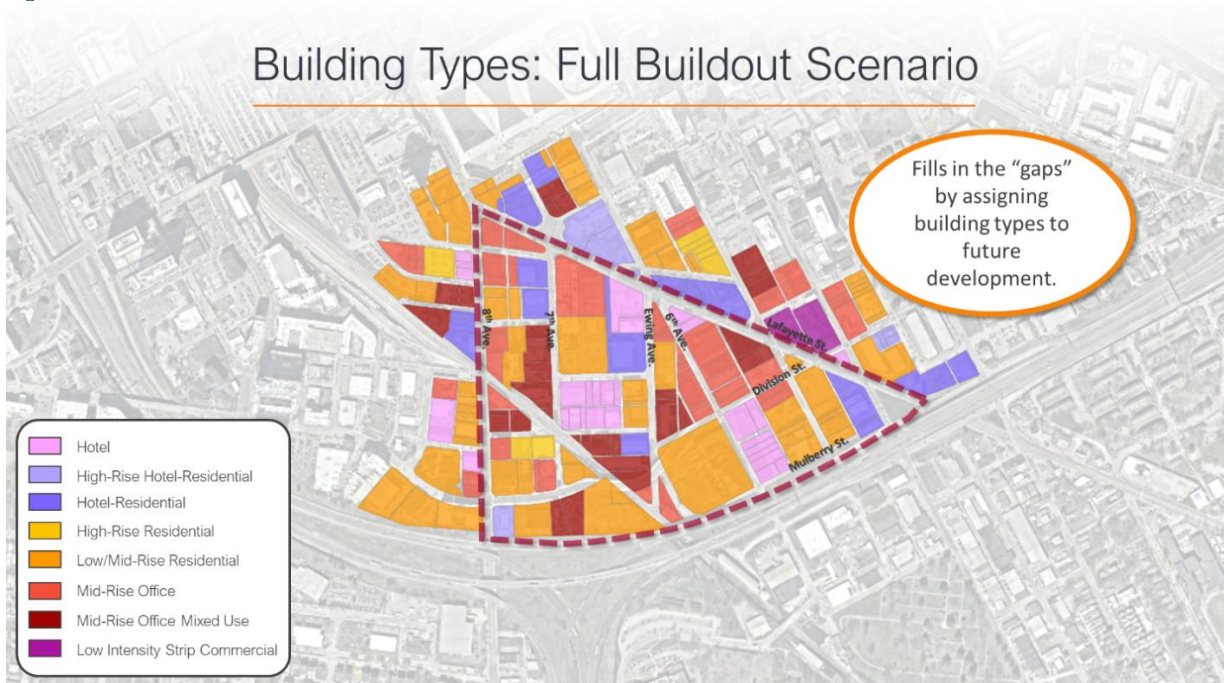


Figure 9. Full Buildout Scenario



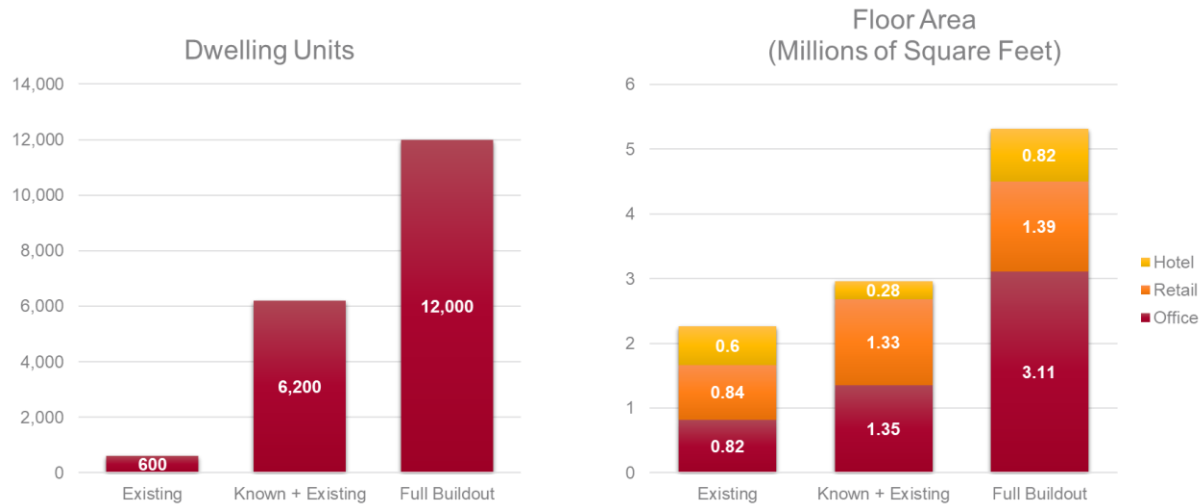
UrbanFootprint estimates the development potential of each parcel in Pie Town based on its assigned building type. The results are shown in Figure 10, of which the key findings include:

- Over 6,000 dwelling units are approved, planned or under construction. That number could double to 12,000 units at full buildout.

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- Almost three million square feet of non-residential uses are approved, planned or under construction, which could increase to over five million square feet at buildout.
- Office is the pre-dominant non-residential use (over three million square feet at buildout), followed by retail (1.4 million square feet) and hotel (800,000 square feet).

Figure 10. Summary of Pie Town Development Potential



3.2 Trip Generation Analysis

Trip generation estimation is a two-step process. First, the total number of gross trips was estimated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition*. *Trip Generation* uses precedent development types that are typically in suburban settings where walking, cycling and transit don't constitute a significant share of trips. As a result, a second step was included to account for the share of trips in Pie Town that will occur via walking/cycling and transit.

UrbanFootprint includes a trip generation module that estimates trips for all modes in more dense, urban, mixed-use contexts, known as the MXD method. The MXD method was used to estimate mode share (Figure 11), which was then used to estimate daily trips by mode from the total gross trips (Table 2). For more information on the MXD method of trip generation, visit <https://help.urbanfootprint.com/methodology-documentation/transportation-analysis>.

More than 130,000 daily trips are estimated to occur within Pie Town at buildout. About two-thirds are estimated to occur via motor vehicle (88,000), a fourth via walking and cycling (33,000) and the rest via transit (11,000). It should be noted that the goal for Pie Town is to create a quality environment where options for walking, cycling and transit and high quality, plentiful and accessible. The trip generation estimate presented here can be considered conservative, and a much higher share of walk, bike and transit trips in the goal.

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Figure 11. MXD Method Mode Share

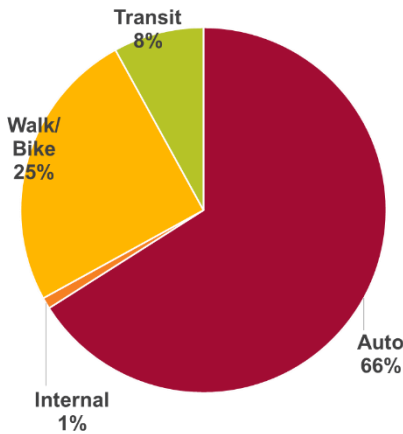
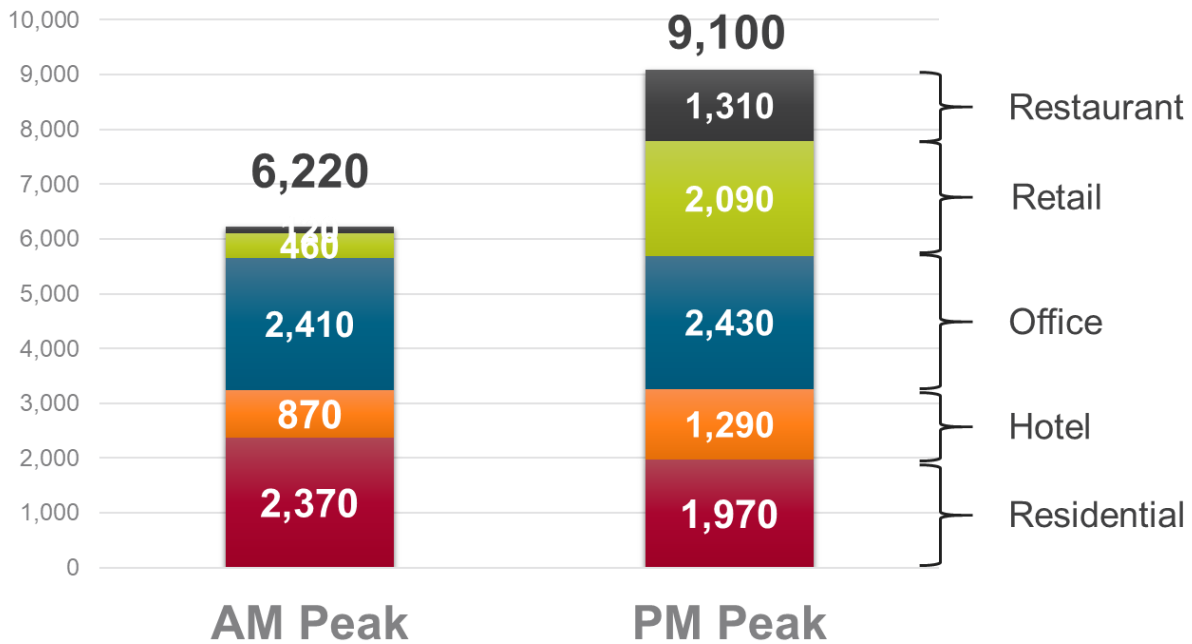


Table 2. ITE Trip Generation and MXD Reduction

Mode	Total Daily Trips
Gross Total Trips Daily	133,300
Transit	10,700
Walk Bike	33,300
Motor Vehicle	87,800

The total daily motor vehicle trips were further broken down into morning and afternoon peak hour trips in order to complete a more granular analysis of traffic impacts. Figure 9 below shows the AM and PM project trips by land use.

Figure 12. Trip Generation Summary



3.3 Travel Demand Impacts

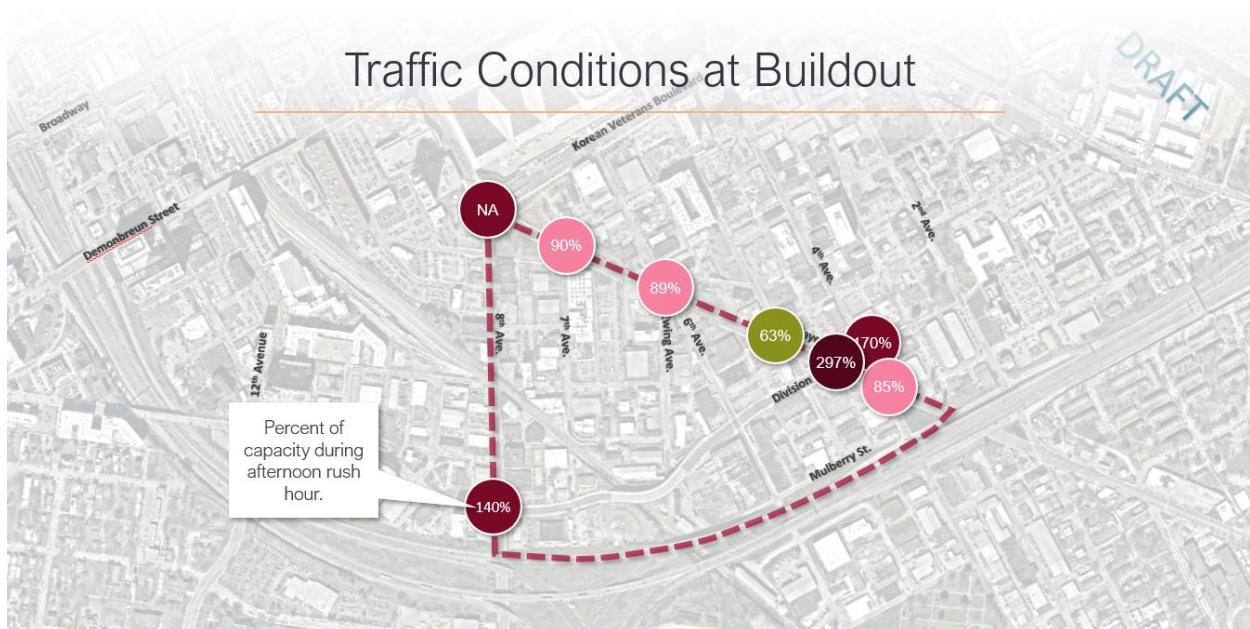
PTV Vistro software was used to determine motor vehicle travel conditions at signalized intersections in the Pie Town in the buildout year during morning and afternoon peak hours. “Background” traffic (trips with neither an origin or destination attributed to development in Pie

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Town) were estimated on 8th Avenue South, Korean Veterans Boulevard, Lafayette Street, Division Street, 6th Avenue South, and 4th Avenue South. Turning movements were derived using an estimate of trip distribution for trips within Pie Town.

The results of the traffic analysis are provided in terms of the relative capacity of each intersection, where 100% is considered the threshold for “normal” operations. Beyond that threshold, drivers begin to encounter lengthy delays. Figure 13 identifies the intersection capacity during the afternoon peak hour at buildout. The results shown in this figure represent motor vehicle delay, but not bicycle or pedestrian delay.

Figure 13. PM Peak Capacity Results



The analysis reveals that two intersections in Pie Town will exceed the normal operating capacity threshold in the afternoon peak hour. These include:

- 8th Avenue South and Division Street
- Lafayette Street and Division Street

Ash Street (which is Division Street east of Lafayette Street) also exceeds the normal operating capacity threshold in the afternoon peak hour. While technically not in the Pie Town study area, it operates in conjunction with Pie Town intersections.

Drivers can expect to encounter significant delay at these intersections, ranging from several seconds to over a minute, depending on their approach and direction, during the afternoon rush hour. Additional intersections along Lafayette Street, including Lindsley Avenue, 6th Avenue South and 7th Avenue South are approaching the normal capacity threshold, which means that some degree of delay is likely.

4. [Mobility Plan](#)

The mobility plan for Pie Town builds on an understanding of the modal context and development potential to maximize mobility for trips within Pie Town and to other places within downtown and across the region. It includes recommendations for a new multimodal network of streets, pedestrian connections, bicycle facilities and transit amenities.

4.1 [Philosophy and Approach](#)

The traffic analysis estimates that several intersections in Pie Town will experience varying levels of delay during peak periods in the future. This condition would typically be addressed through a series of recommendations to “improve” intersections and possibly entire street segments through additional lanes and other capacity projects.

However, large scale motor vehicle surface capacity improvements aren’t practical or desired in a constrained urban environment. Instead, the Pie Town Mobility Study is focused on creating a robust multimodal environment with legitimately attractive choices. This approach is supported by three underlying principles:

- As a whole, transit, walking and cycling take priority over motor vehicles.
- A fine-grained network of streets is desired to create a series of walkable blocks and human-scaled intersections.
- Transit, walking and cycling options should be readily accessible to all places within Pie Town.

4.2 [Multimodal Network](#)

The multimodal network embodies the stated approach for this study and is the backbone for future mobility in Pie Town. It includes new connections, establishment of modal priorities and target speeds and the identification of a street typology.

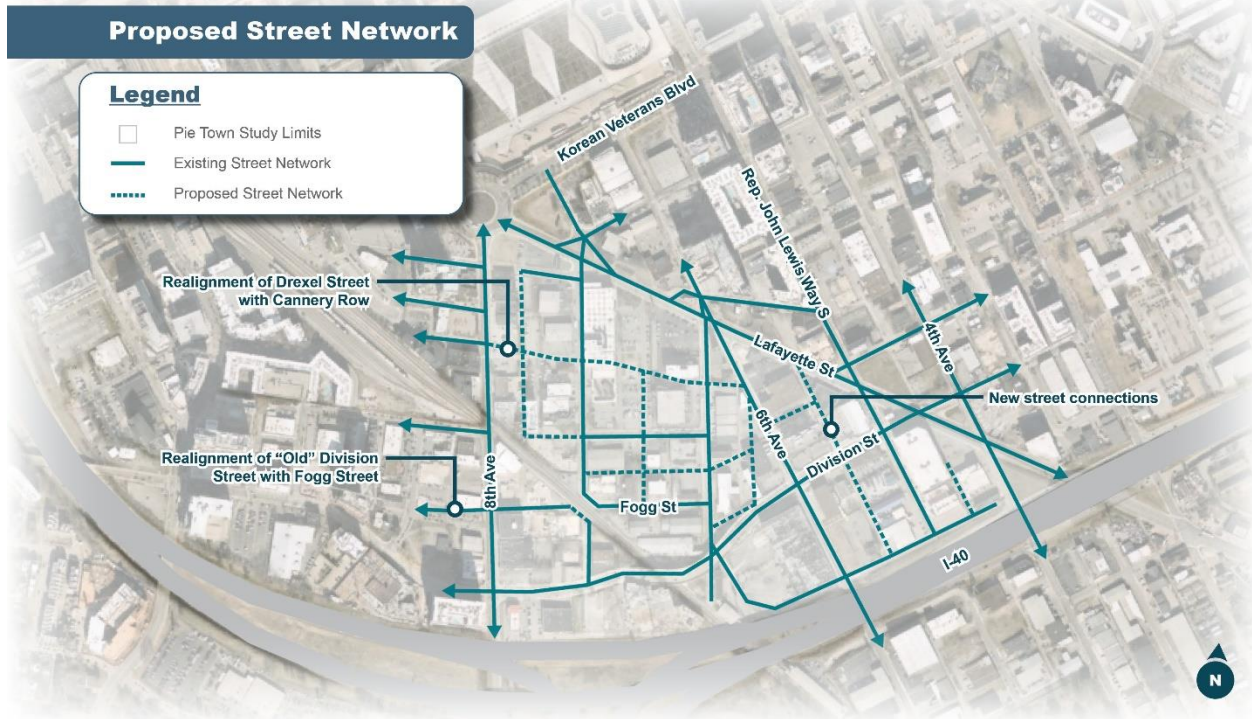
4.2.1 [New Connections](#)

A series of new street connections are proposed for Pie Town that will result in a more coherent and connected network and human-scaled block system. The proposed street network, shown in Figure 14, is highlighted by:

- The realignment of Drexel Street to create a four-way intersection with Cannery Row at 8th Avenue South and eastward extension to 6th Avenue South.
- The realignment of “Old” Division Street to create a four-way intersection with Fogg Street at 8th Avenue South.
- A series of new streets internal to Pie Town along existing parcel lines.

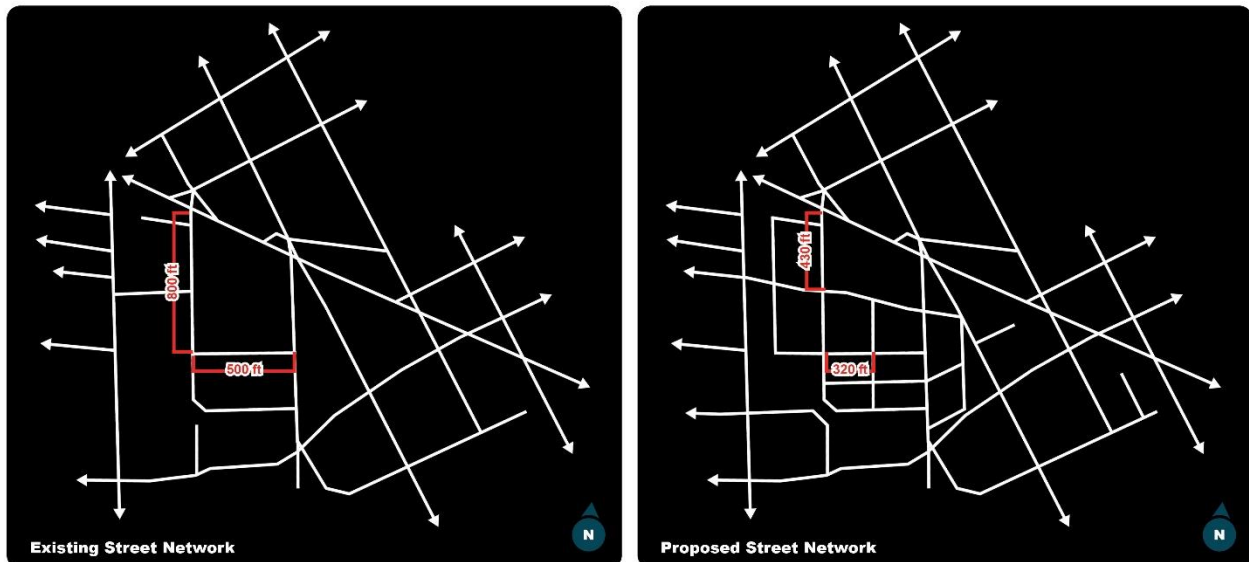
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Figure 14. Proposed Street Network



The resulting street network eliminates the long blocks within Pie Town that make walk trips lengthy and circuitous and creates a system in which almost all block faces are 400 feet – the typical size of a city block – or less. Figure 15 provides a comparison between the existing and proposed street networks.

Figure 15. Block Comparison



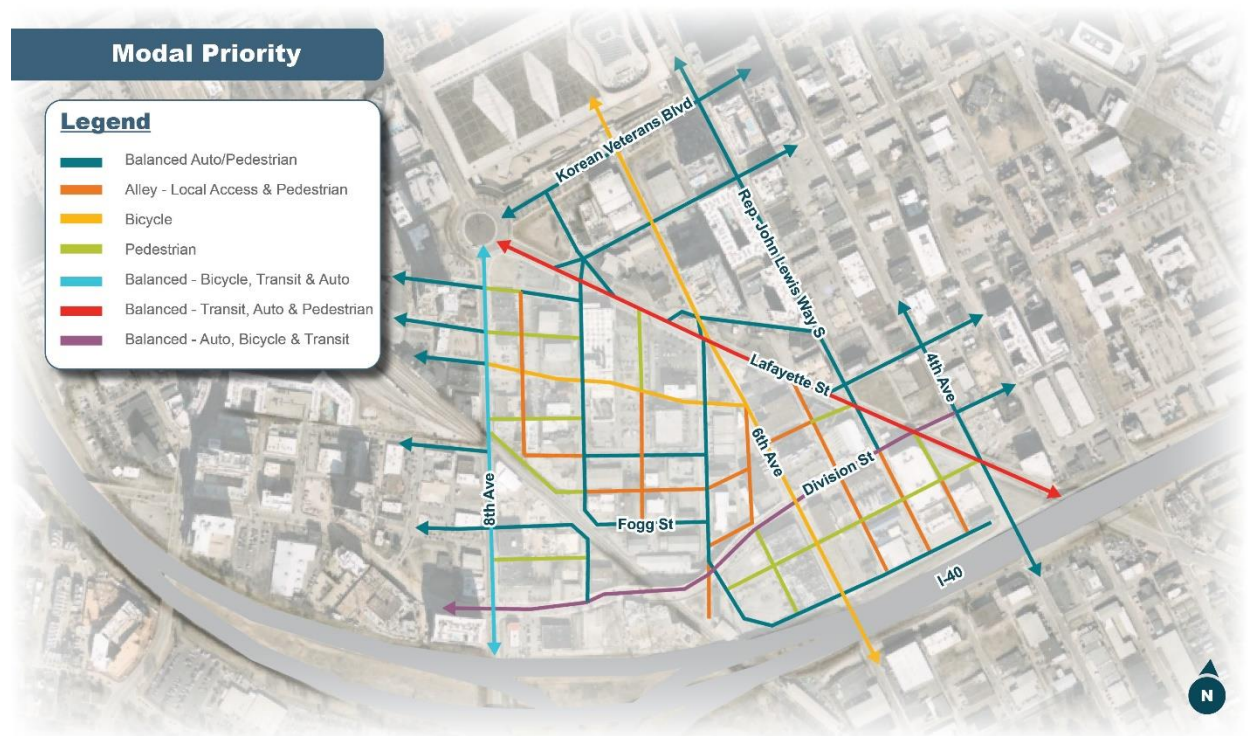
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4.2.2 Modal Priority

The philosophy and approach to the study is that transit, walking and cycling take priority. However, it is not practical or feasible to prioritize all modes on all streets. The concept of modal priority assigns priority to individual streets to help guide recommendations and takes into account the modal context and future conditions. The modal priority map, shown in Figure 16, is highlighted by:

- Lafayette Street as balanced with an emphasis on transit. Lafayette Street is the most important transit corridor in Pie Town and one of the most important in downtown because it serves as a point of convergence for Murfreesboro Pike BRT and other frequent routes and provides a direct connection to the proposed SoBro Transit Center. Motor vehicles also have a degree of priority because Lafayette Street is classified as an Arterial Boulevard.
- Division Street as balanced with an emphasis on motor vehicles, bicycles, and transit. Division Street would provide the transit connection between the Gulch area to Pie Town and further into SoBro.
- 8th Avenue South as balanced with an emphasis on bicycles, transit, and motor vehicles in order. 8th Avenue South is an important element of the bicycle network because of its spacing relative to other north-south corridors.
- 6th Avenue South as a bicycle priority corridor. It runs through the heart of Pie Town and provides an important connection between Korean Veterans Boulevard and Division Street.
- A system of paseos in which pedestrians are the only priority.
- A system of alleys that provide local and “back of house” motor vehicle access, but should also prioritize pedestrians.

Figure 16. Modal Priority



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4.2.3 Target Speed

NDOT has made safety, and more specifically Vision Zero, one of its top priorities, and the Pie Town Mobility Study echoes this sentiment. Motor vehicle speed is the number one factor that determines pedestrian fatality rates (see Figure 17). Below 30 miles per hour (mph), the pedestrian collision fatality rates decrease significantly.

Figure 17. Motor Vehicle Speed and Pedestrian Fatality Rates

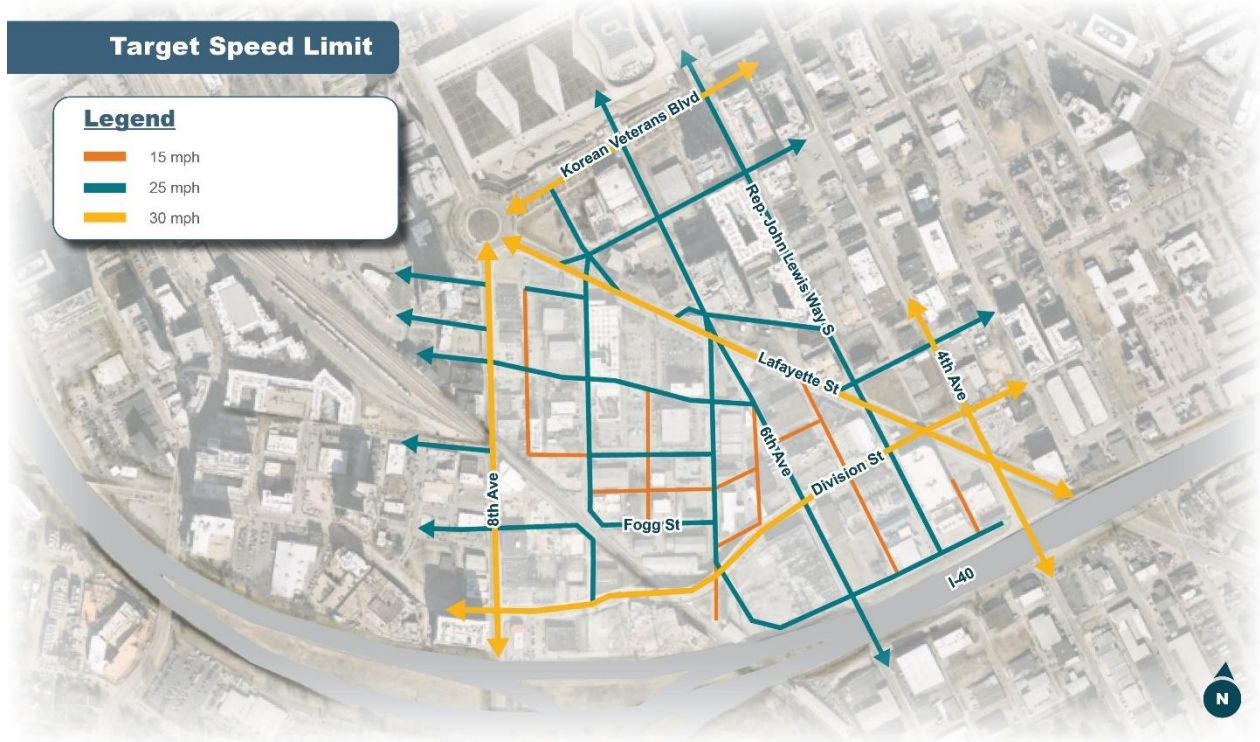


Source: US Department of Transportation. Image credit: San Francisco Vision Zero Action Plan

“Target speed” is a concept which establishes the speed at which motor vehicles are intended to operate, rather than the observed speed. The target speed is the same as the design speed. Figure 18 identifies proposed target speeds for streets within Pie Town, including 30 mph for Lafayette Street, 8th Avenue South, Division Street, and Korean Veterans Boulevard, 25 mph for internal streets and 15 mph for alleys.

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Figure 18. Target Speed Limit



4.2.4 Typology

The street typology builds on modal priority and target speed to provide guidance on street design elements. The four types are alleyways, shared streets, paseos, and local streets (8th Avenue South and Lafayette Street are addressed in their own separate sections).

The various elements of the typology are identified in Table 3 and illustrated in Figure 19 through Figure 24. The dimensions presented here are illustrative guidance. They are consistent with, but do not replace, NDOT's Standard Street Specifications.

Table 3. Pie Town Street Typology

Type	Motor Vehicle Lanes	Curb Lane ¹	Planting Zone	Sidewalk	Curb and Gutter	Bicycle Facility ²	Total ROW	
							Min.	Max.
Alleyway	Single 18' shared travel way	NA	NA	NA	NA	NA	20'	20'
Shared Street	Single 18' shared travel way	NA	10' to 15' gathering space		NA	NA	38'	48'
Paseo	NA	NA	NA	10' to 16' pathway	NA	NA	10'	16'
Local Street	10'	8'	5 to 8'	5 to 8'	2.5'	5'	36'	52'

¹ Where identified in the Curb Zone Map. Includes 2' gutter (actual pavement width is 6'). See Section 4.8 for a discussion of curb use.

² Where identified in the Bicycle Network Map in Section 4.6.

Alleyways (illustrated in Figure 19) provide access for local service and deliveries. They are intended to be very low speed (15 mph) and are not for through traffic. Pedestrians and cyclists may use the street, but local service and delivery is the priority.

In contrast, shared streets (Figure 20) are also very low speed and low volume but place emphasis on people and the personal experience. Building facades should address the street. Local service motor vehicles and deliveries (during off-peak periods) may also use the street, but pedestrians and cyclists are the priority. In certain contexts, shared streets may be appropriate where local delivery and access is not a critical need.

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Figure 19. Alleyway

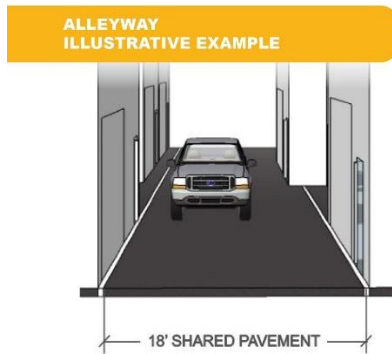
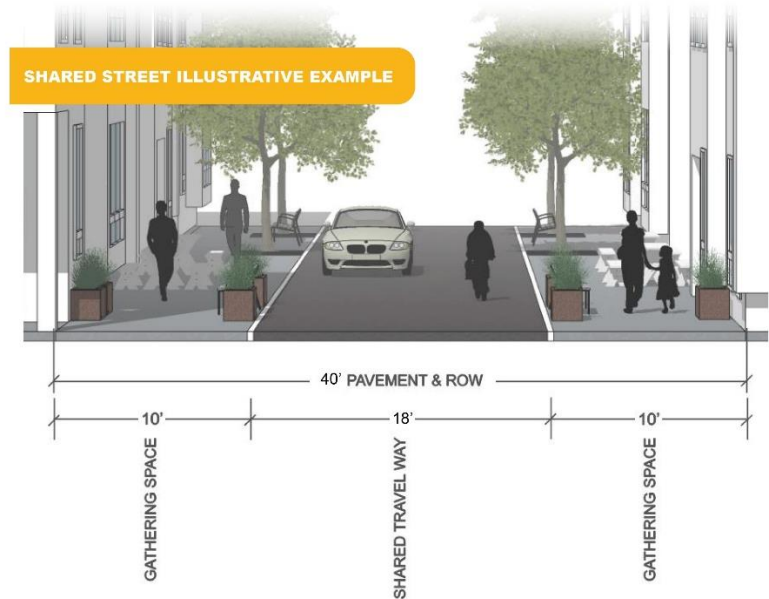
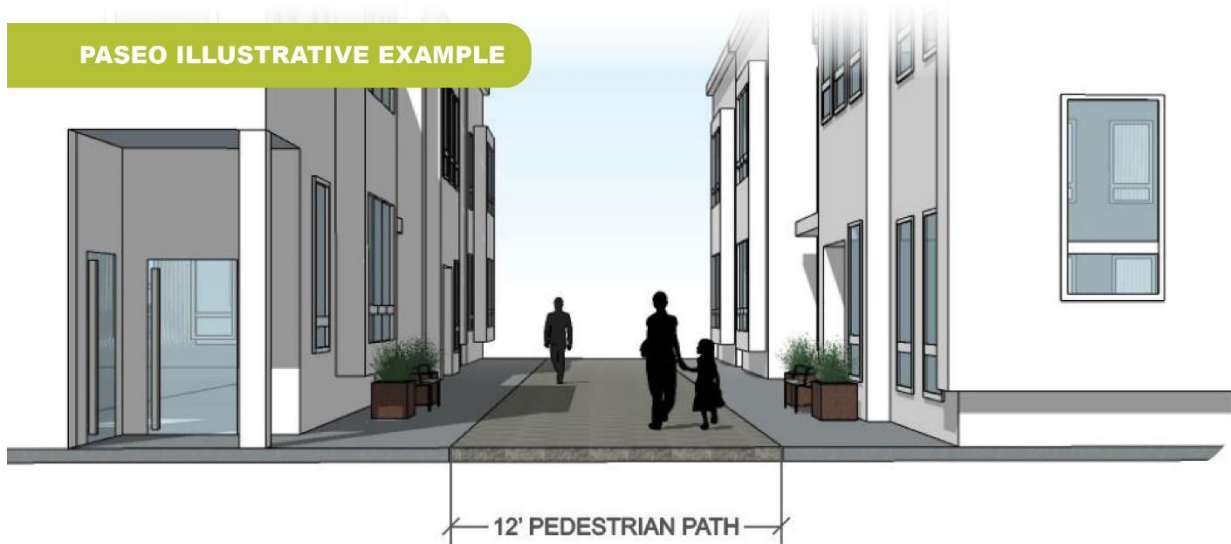


Figure 20. Shared Street



Paseos contribute to a more fine-grained and connected pedestrian network (see Figure 21). The emphasis is on pedestrian access and connectivity. Motor vehicles may not use paseos. Where appropriate and desired, buildings may address the street. Paseos will likely be privately owned and maintained, but with public access easements

Figure 21. Paseo



Local streets play an important role in connecting to the broader multimodal network. They are more than just conduits for motor vehicles. All streets should include sufficiently wide

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sidewalks, space for trees, landscaping and amenities (see Figure 22). Building facades should address the street to ensure proper activation.

Where identified for on-street loading and parking, streets should include a dedicated curbside zone (Figure 23). Where identified as part of the bicycle network, streets should include dedicated bicycle facilities (Figure 24).

Figure 22. Local Street

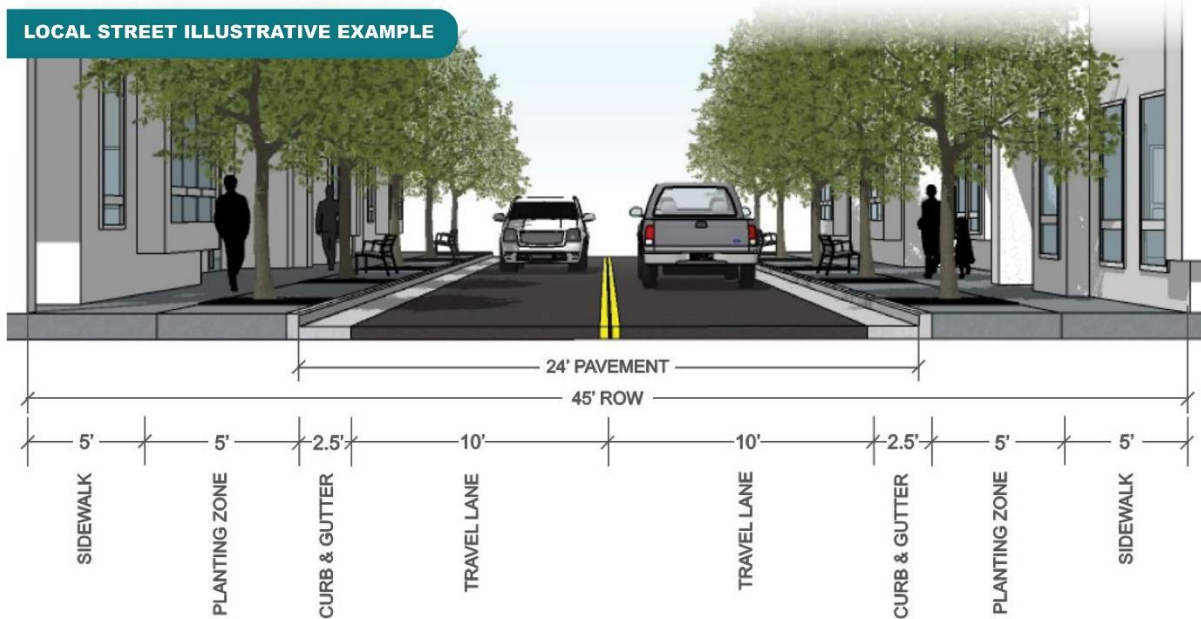
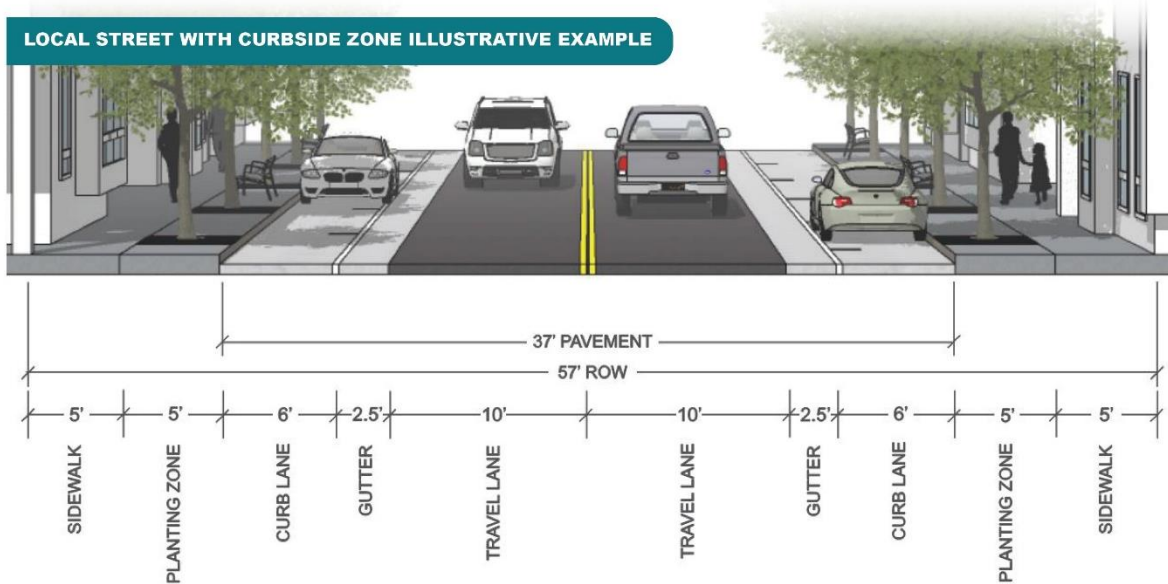
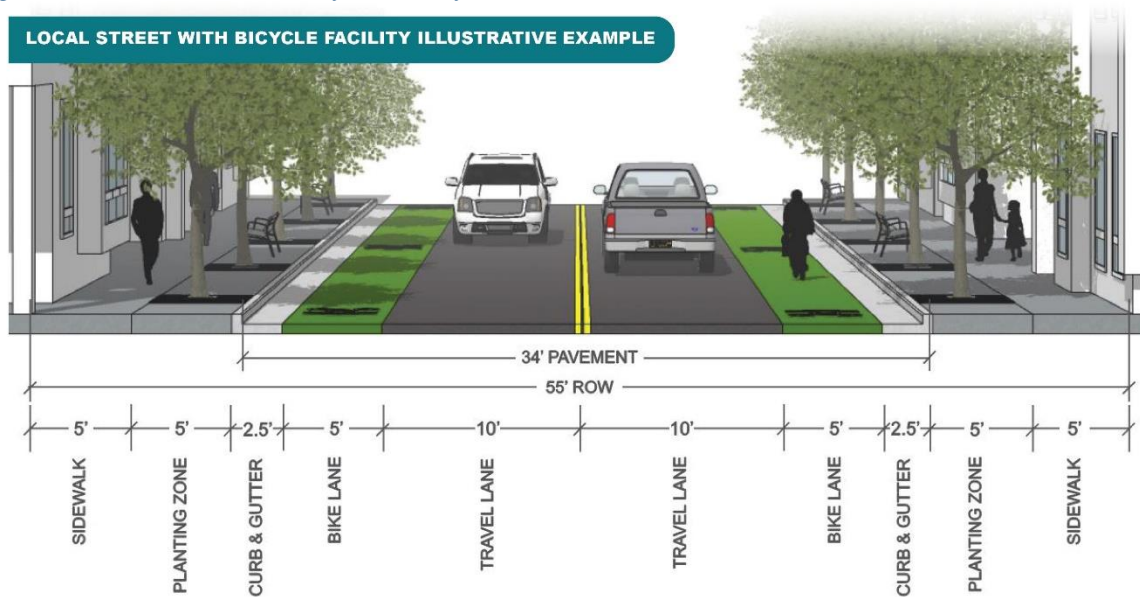


Figure 23. Local Street with Curbside Loading Zone



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Figure 24. Local Street with Bicycle Facility



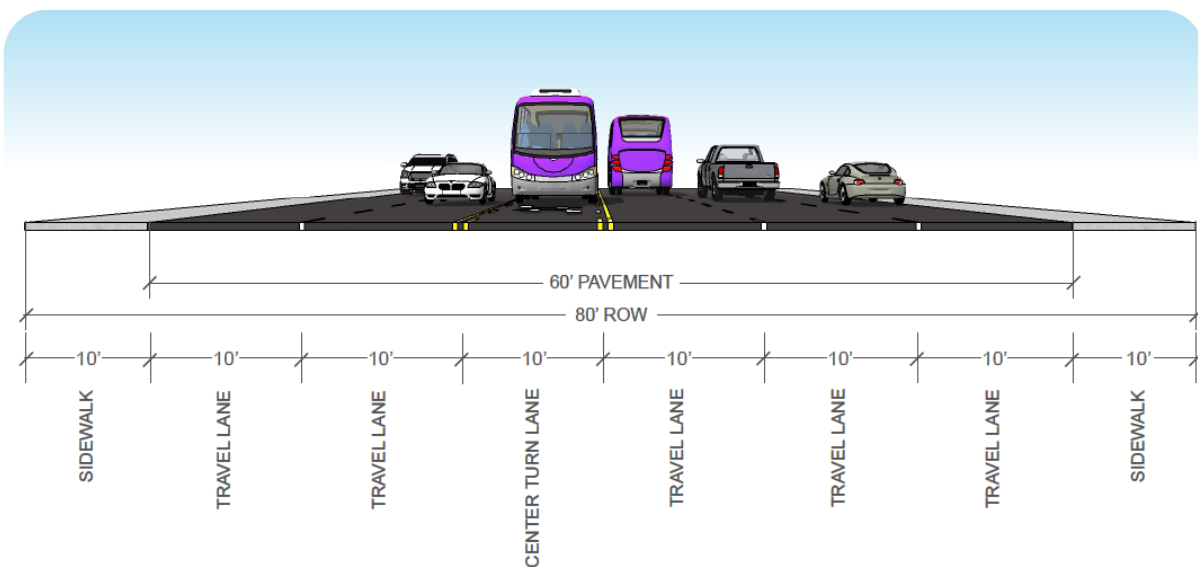
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4.3 Lafayette Street Design Concepts

The modal priority for Lafayette Street is balanced with an emphasis on transit, and the corridor will serve as a “front door” for large scale, mixed use developments. The recommended design concept is focused on providing a premium transit experience and robust streetscape environment while still maintaining mobility for motor vehicles and pedestrians.

The current configuration of Lafayette Street includes two 10-foot travel lanes in the southbound/eastbound direction, three 10-foot travel lanes in the northbound/westbound direction, a 10-foot two way center turn lane and 10-foot sidewalks on both sides of the street. The total ROW is 80 feet (see Figure 25).

Figure 25. Lafayette Street Existing Typical Section



Lafayette Street will become the confluence of several transit routes, including Murfreesboro Pike Bus Rapid Transit, Nolensville Pike Frequent Service and Route 18. Lafayette Street is envisioned as a transit priority corridor with dedicated bus lanes, wider sidewalks, street trees and space for transit passenger amenities. The MCSP establishes an ultimate ROW of 108 feet for Lafayette Street.

The recommended design concept for Lafayette Street includes dedicated BRT curb lanes, two general purpose travel lanes in each direction, a planting zone and wide sidewalks. Figure 28 shows an illustrative example of the Lafayette Street typical section.

Even though WeGo Transit’s preferred operating concept is for median-running BRT, buses will most likely operate in the curb lane on Lafayette Street in Pie Town because there is not enough ROW to include a median boarding platform. In order to accommodate curb running BRT in Pie Town, a transition from median running to curb running could happen via queue

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jump at the intersection of Lafayette street and 4th Avenue South (Figure 26). Another option is to operate continuous curb running BRT (Figure 27). Either concept will require further study as part of WeGo Transit's upcoming Murfreesboro Pike BRT Study.

Figure 26. Lafayette Street Operating Concept: Median Running BRT Transition to Curb Option



Figure 27. Lafayette Street Operating Concept: Continuous Curb Running BRT Concept



The recommended design expands the curb line from 60 to 68 feet and expands the overall ROW from 80 to 108 feet. Even though the ultimate configuration of Lafayette Street may not happen for several years, new development can respond to the design by placing new buildings at the 108-foot ROW line constructing the new sidewalk and planting zone and building the new curb line (striping the additional four feet of pavement in the interim).

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Figure 28. Lafayette Street Recommended Design Concept

Lafayette Street

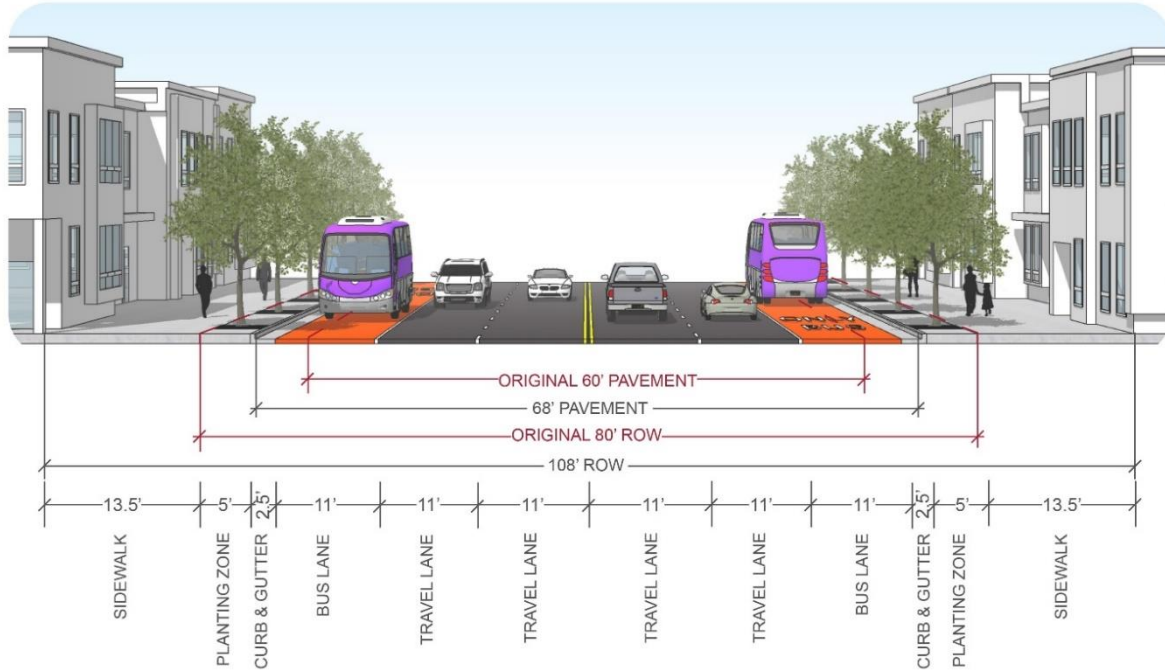
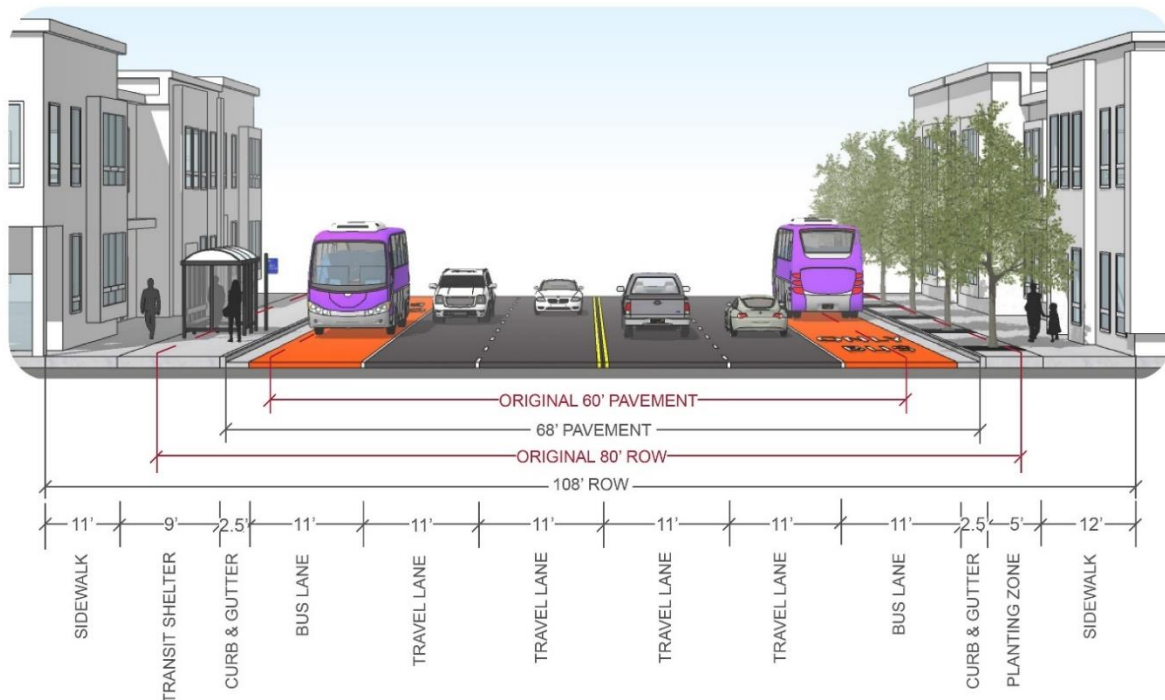


Figure 29. Lafayette Street Recommended Design Concept with Transit Boarding

Lafayette Street Recommended Design



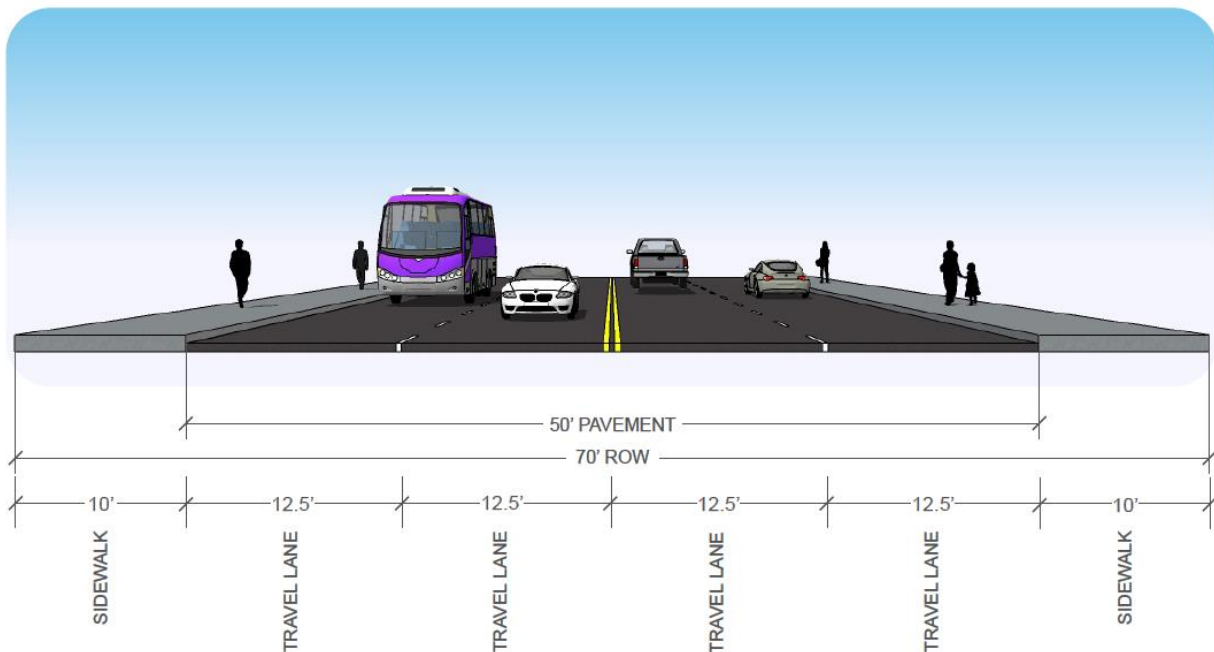
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4.4 8th Avenue South Design Concepts

The modal priority for 8th Avenue South is an overall balance between transit, bicyclists, pedestrians, and vehicle modes. The recommended design concept replaces the current motor-vehicle focused design with one that includes provisions for all modes.

The current configuration of 8th Avenue South includes two 12.5-foot travel lanes in each direction and 10-foot sidewalks on both sides of the street. The total ROW is 70 feet (see Figure 30).

Figure 30. 8th Avenue South Existing Typical Section



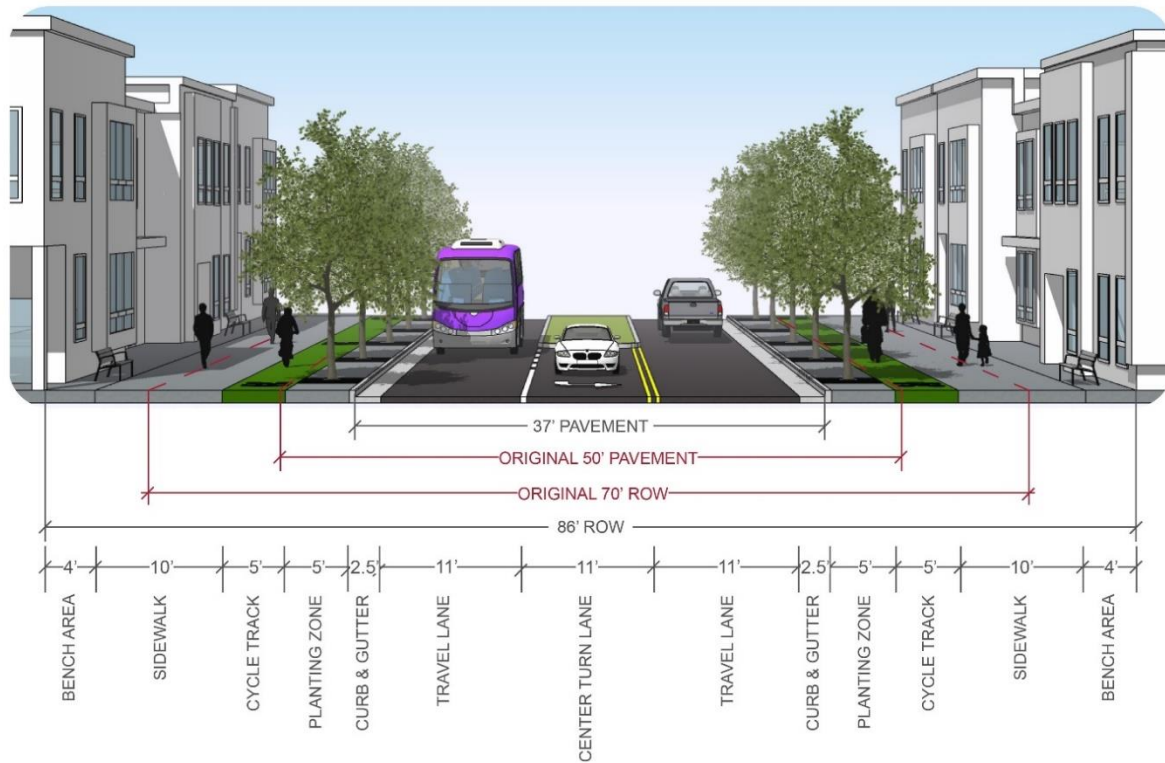
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The recommended design concept for 8th Avenue South replaces the current four lane configuration with a lane in each direction, center turn lane with refuge islands, wide sidewalks, off-street cycle track, street trees and space for street furniture and transit passenger amenities. The existing 70 feet of right-of-way is expanded to 86 feet consistent with the MCSP. Figure 31 shows an illustrative example of the 8th Avenue South typical section.

Note that the short segment of 8th Avenue South passing beneath the CSX rail overpass cannot accommodate the full typical section depicted in Figure 31. In this location, the section would narrow to include the travel lanes, center turn lane, curb and gutter and raise cycle track. An existing sidewalk passes between the overpass pilings and retaining wall.

Figure 31. 8th Avenue South Recommended Design Concept

8th Avenue Recommended Design



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The operating concept for 8th Avenue South includes a new signal with near side bus stops at the realignment of Cannery Row and Drexel Street, near-side bus stops at the intersection of Division Street (which currently exist), mid-block crossings between Lea Avenue and Palmer Place and between Gleaves Street and Old Division Street and a curbside loading zone on the east side of 8th Avenue South between Drexel Street and the CSX rail overpass. The operating concept is illustrated in **Error! Not a valid bookmark self-reference..**

Figure 32. 8th Avenue South Recommended Operating Concept



The replacement of four travel lanes with two plus a center turn lane is known as a “classic road diet” and has been shown to improve the capacity and safety of busy streets by removing turn movements from travel lanes and placing them in a dedicated turn lane. The traffic analysis performed for this study suggests that the road diet will not increase signal delay significantly.

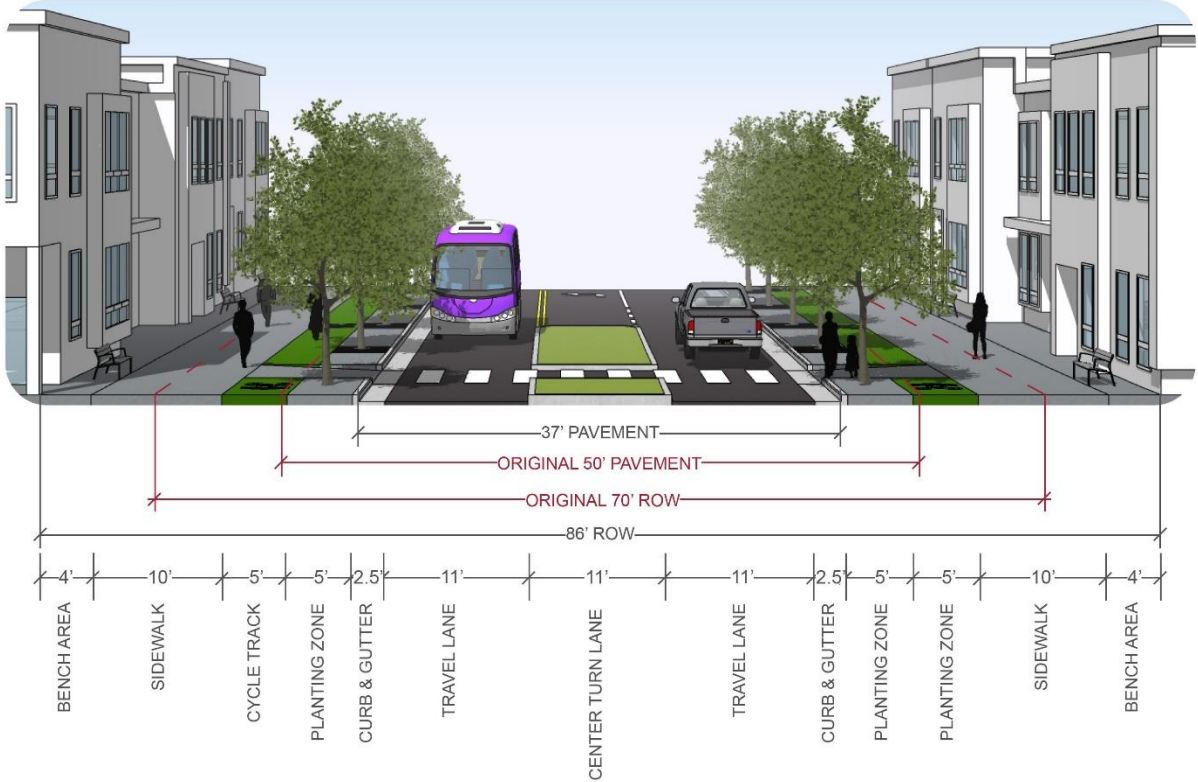
The concept will require further study and stakeholder engagement before it is implemented. In particular, the signal and intersection design should explore further how they can accommodate near side bus stops.

The raised cycle track provides a continuous, comfortable cycling experience and requires that very few or no driveways connect to the street. The cycle track and planting strip provide a significant buffer between the sidewalk and travel lanes. Where mid-block crossing locations have been identified, a raised median can be constructed to provide refuge and a shorter, two-stage crossing distance (see Figure 33).

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Figure 33. 8th Avenue South Recommended Design Concept with Midblock Refuge

8th Avenue Recommended Design with Midblock Refuge



Where bus stops are located, transit shelters can be placed between the cycle track and the street, known as a “floating bus stop.” See Figure 34.

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Figure 34. 8th Avenue South Recommended Design Concept with Transit Shelter

8th Avenue Recommended Design with Transit Shelter

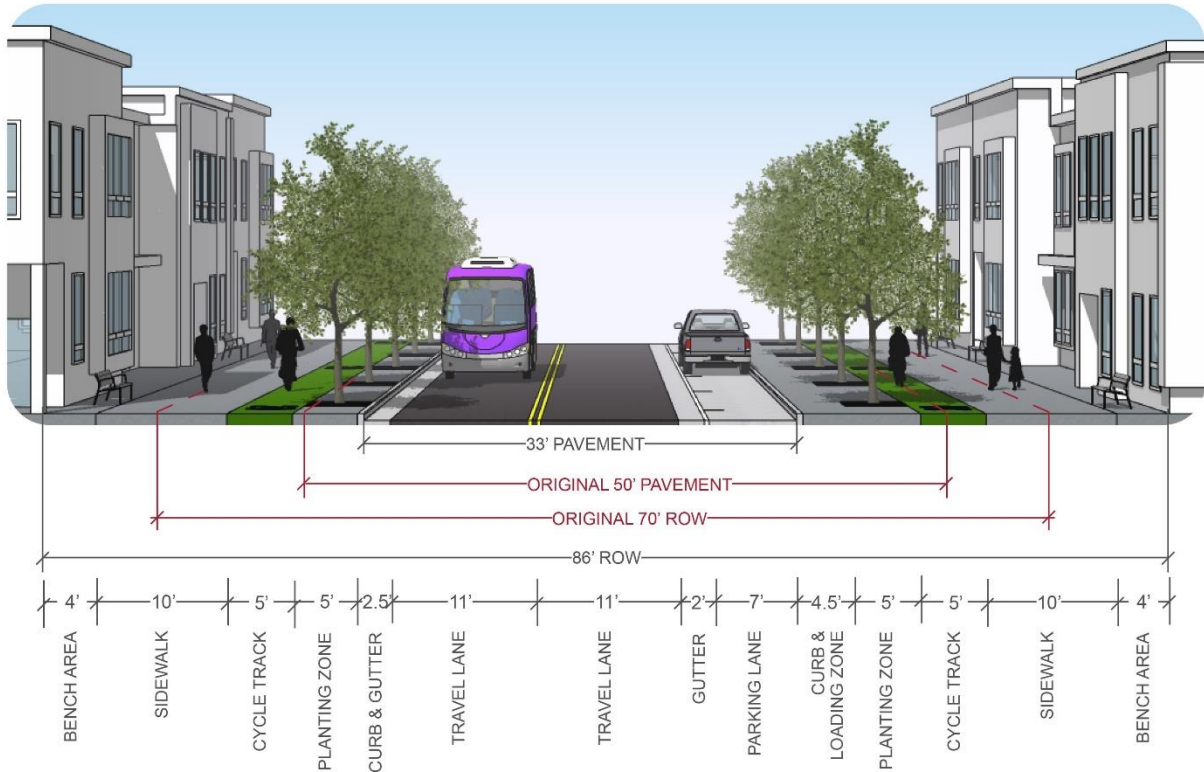


Where a curbside loading zone is proposed, the center turn lane will be replaced by a curbside zone. See Figure 35.

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Figure 35. 8th Avenue South Recommended Design Concept with Curb Loading Zone

8th Avenue Recommended Design with Curb Loading



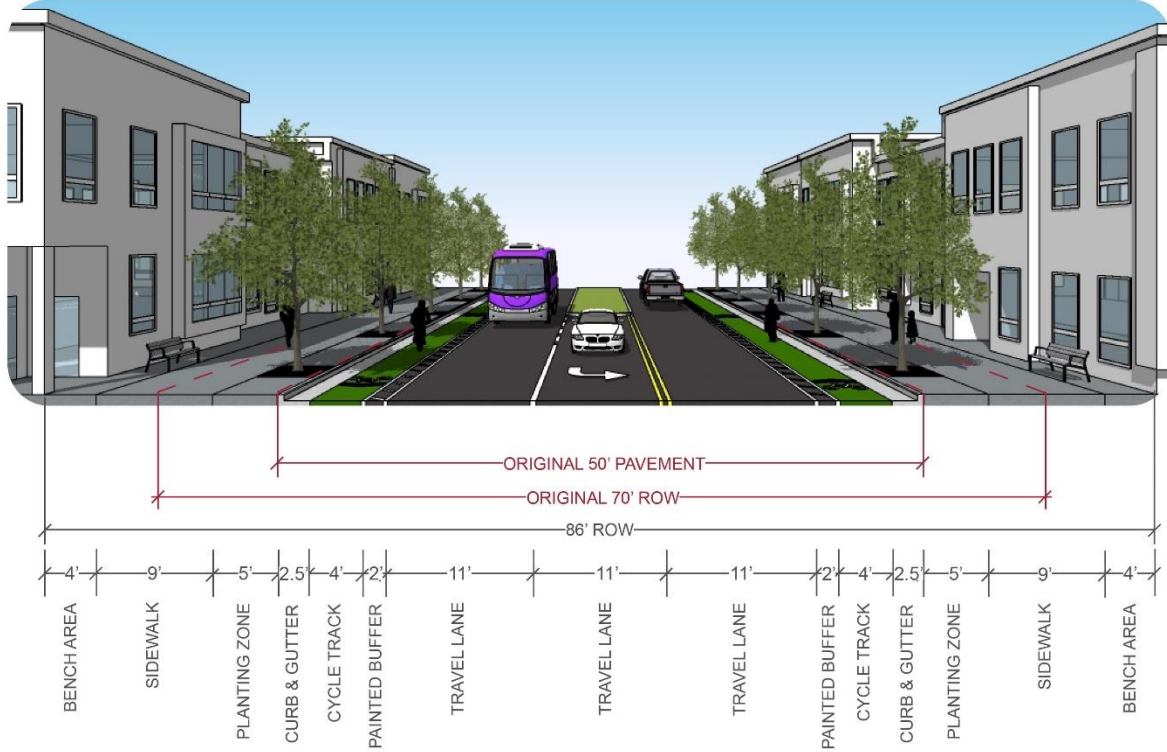
The recommended design contracts the curb line from 50 to 37 feet and expands the overall ROW from 70 to 86 feet. New development can respond to the design by placing new buildings at the 86-foot ROW line and constructing the new sidewalk and planting zone. The new curb line must be constructed continuously as it impacts the travel lane configuration and operating conditions on 8th Avenue South.

An “interim road diet” that maintains the existing curb line is possible. This configuration would replace two travel lanes in each direction with a single travel lane, center turn lane and on-street bike lanes. This interim concept is shown in Figure 36.

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Figure 36. 8th Avenue South Interim Design Concept

8th Avenue



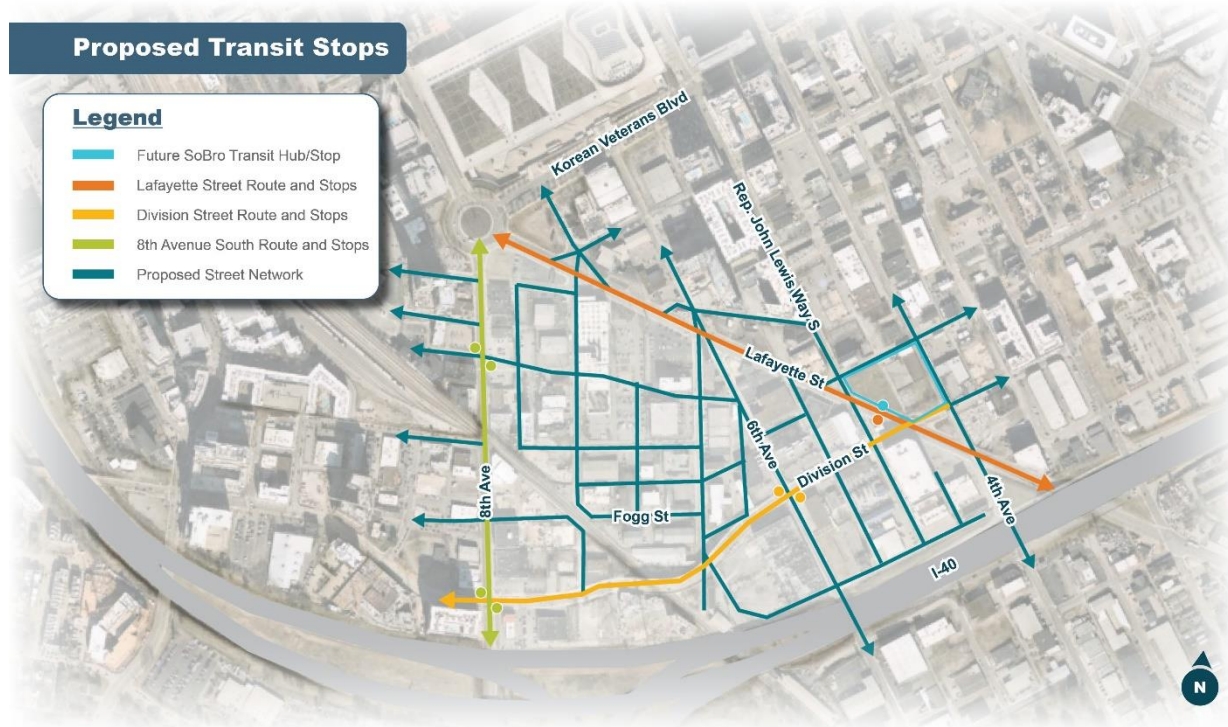
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4.5 Transit Prioritization and Facilities

4.5.1 Stop Locations and Design

The proposed stop locations (shown in Figure 37) reflect optimal crossing locations, accessibility, and the ability to transfer between routes. Proposed stops on Lafayette Street and Division Street are located on the far side of signalized intersections, consistent with WeGo Transit's *Transit Design Guidelines*. At 8th Avenue South and the realigned Drexel Street/Cannery Row intersection, bus stops are located on the near side of the intersection, consistent with proposed development orders for adjacent approved development. At 8th Avenue South and Division Street, WeGo Transit has expressed a preference for keeping the transit stops at their current on the near side of the intersection.

Figure 37. Proposed Transit Stop Locations

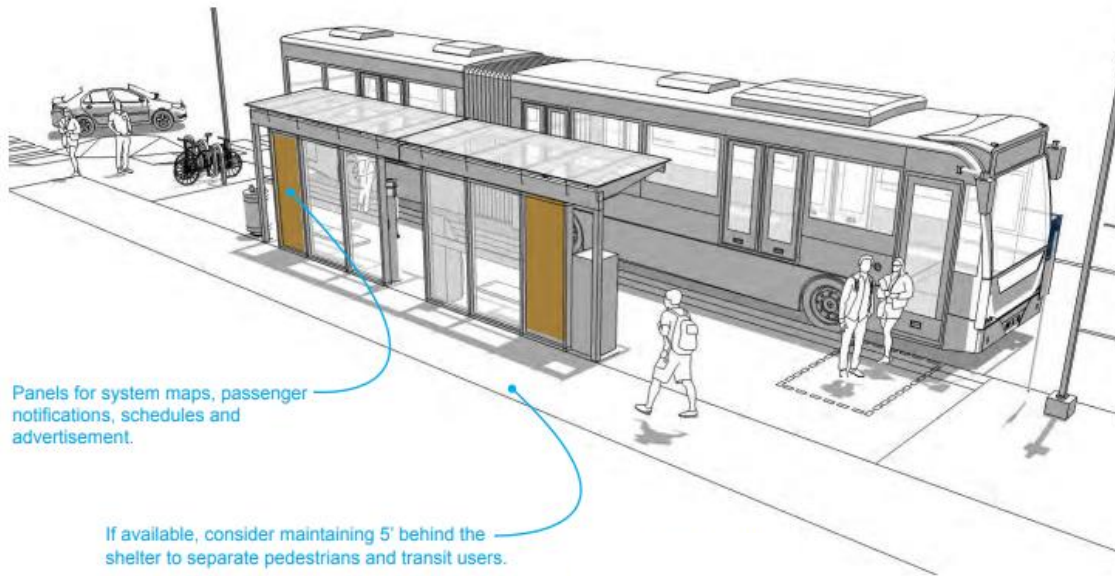


Comfortable, safe and accessible transit stops are essential to a viable passenger experience in Pie Town. The design of stops should follow recommendations in WeGo Transit's *Transit Design Guidelines* manual. This includes dedicated shelters, clear area for boarding and alighting and a buffer between pedestrians and passengers.

On Lafayette Street, where multiple frequent routes, and ultimately BRT, will converge, WeGo's Rapid Service Stop concept should be used. These stops provide a "highly visible, substantial physical presence on the street to call attention to the level and quality of service provided," and include a larger boarding area, larger shelters and potentially information panels. Figure 38 provides a Rapid Stop illustration.

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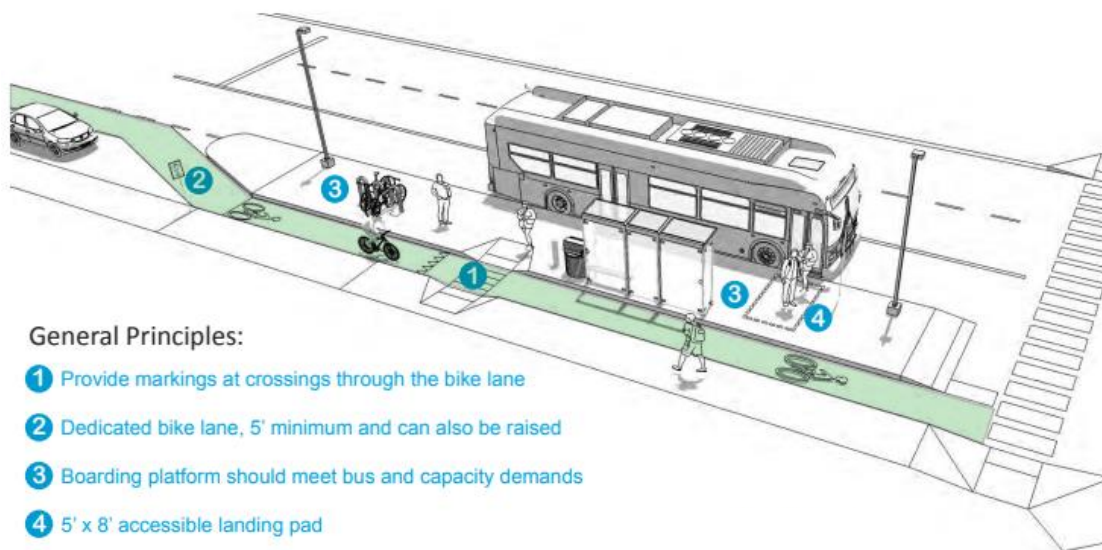
Figure 38. Rapid Stop Illustration



Source: WeGo Transit Design Guidelines

Transit stops on 8th Avenue and Division Street must coordinate with off-street protected bike lanes. An “Island Stop” concept is recommended, which places the bike lane behind the stop, minimizing conflicts between cyclists and boarding and alighting passengers. Figure 39 provides a Rapid Stop illustration.

Figure 39. Island Stop Illustration



Source: WeGo Transit Design Guidelines

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4.5.2 SoBro Transit Center

The Mayor's Transportation Plan identifies a "SoBro Transit Center" for the parcel of land east of Rep. John C. Lewis Parkway and north of Lafayette Street. The design of the SoBro Transit Center would be similar to the recently constructed North Nashville Transit Center. The SoBro Transit Center is important to Pie Town and WeGo Transit for several reasons:

- It would serve as a point of convergence for frequent service on Murfreesboro Pike and new transit service on the East Bank, as well as the potential southern extension of routes that currently serve WeGo Central on the north side of downtown.
- It would facilitate the initiation of new east-west service on Division Street by serving as a terminus/layover location.
- It would provide a one-seat ride from Pie Town to many locations throughout the region.
- It could serve as a hub for cycling/micromobility, rideshare and other forms of transportation.

This study recommends that the SoBro Transit Center continue to be a priority for WeGo Transit and NDOT because of its importance to multimodal mobility in Pie Town.



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4.6 Bicycle and Pedestrian Connectivity and Facilities

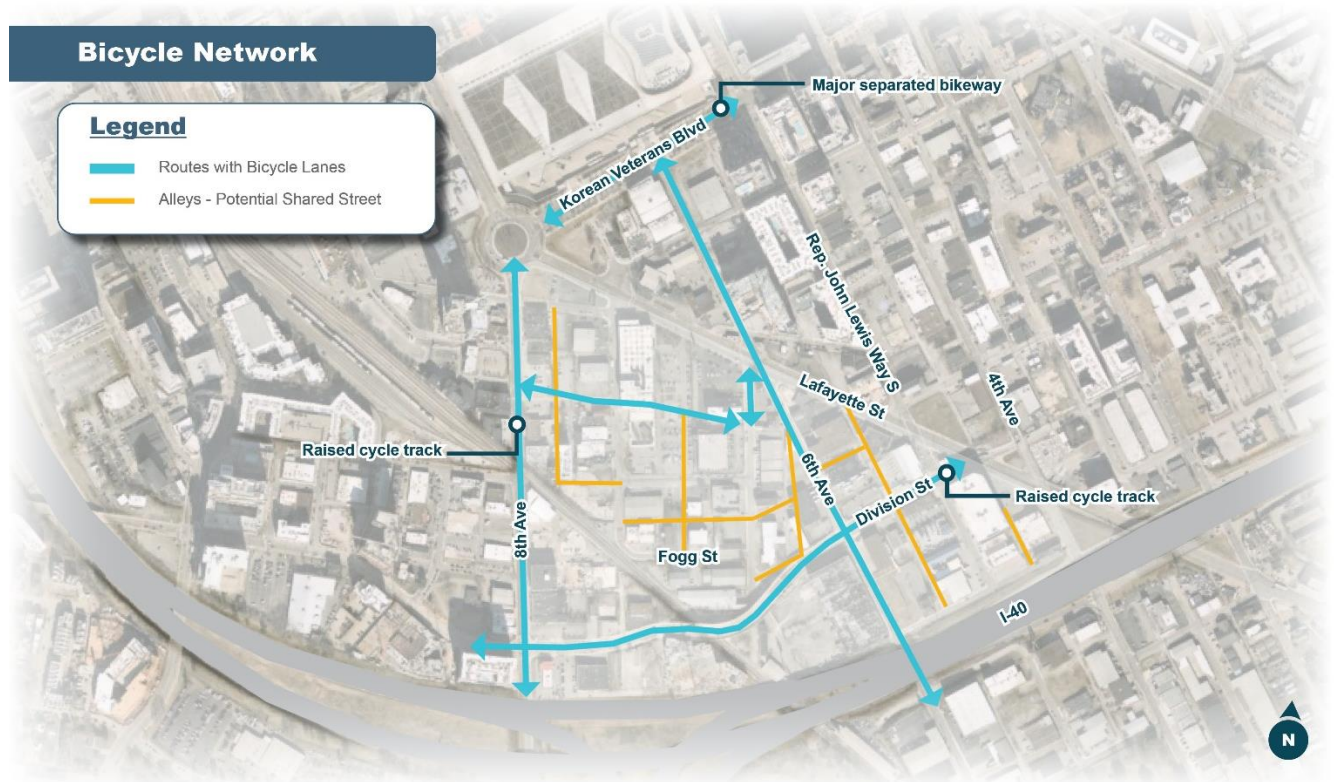
4.6.1. Bikeways Concept

The proposed bikeways concept for Pie Town, shown in Figure 40, builds on the larger network concept established in Walk n Bike and places an emphasis on dedicated protected facilities connecting Pie Town to the rest of downtown Nashville and surrounding neighborhoods. It is highlighted by:

- The existing raised cycle track on Division Street connecting to the Gulch.
- An on-street bicycle facility on 6th Avenue South serving the heart of Pie Town and connecting to Korean Veterans Boulevard to the north and Wedgewood Houston to the south.
- A raised cycle track on 8th Avenue South connecting to Melrose and Edgehill.
- A new bicycle lane on the proposed realigned and extended Drexel Avenue.

In addition to the dedicated facilities described above, the proposed multimodal network for Pie Town includes a system of low speed, low volume alleys that can be shared by cyclists and provide connectivity to a majority of places within Pie Town.

Figure 40. Bikeways Concept

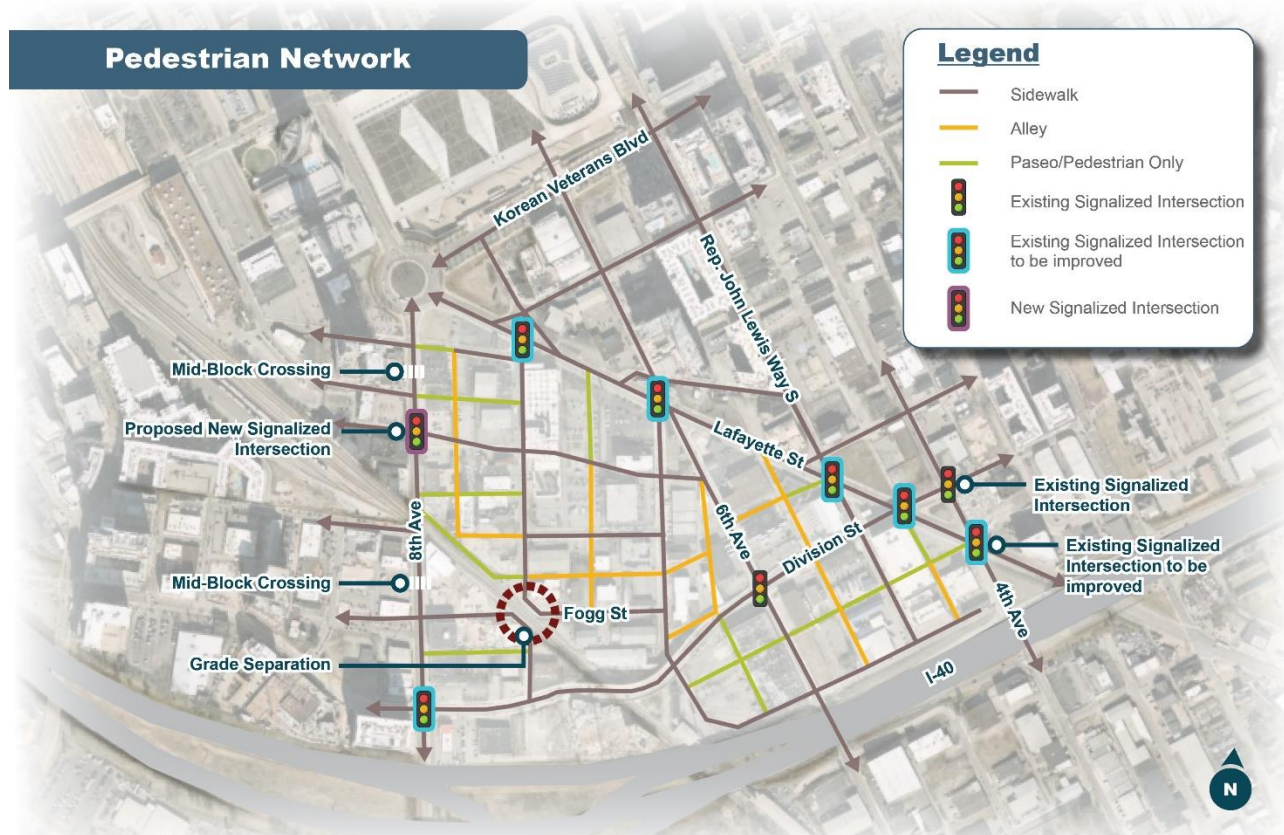


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4.6.2. Pedestrian Network

The pedestrian network weaves together several typologies, including streets, alleyways/shared streets and paseos, to provide a highly connected system of walkable blocks. Shared streets prioritize pedestrians and allow local service motor vehicles and deliveries. Alleyways prioritize local service and deliveries, but may also be used by pedestrians because of their low speed, low volume nature. Paseos are narrow passages for the exclusive use of pedestrians. All streets in Pie Town are recommended to include adequately sized and positioned sidewalks and are also part of the pedestrian network. The pedestrian network is shown in Figure 29.

Figure 29. Pedestrian Network



4.6.3. Crossing Treatments

Pie Town is formed by three arterials: 8th Avenue South, Division Street and Lafayette Street. Although this study recommends target speeds for each of these roads that are consistent with a safe walking environment, their higher volume, multi-lane characteristics are cause for emphasis on street crossing treatments. Recommended crossing treatments include enhancements to existing and proposed signalized intersections and mid-block crossings. Locations of these crossing treatments are shown in Figure 29.

Improvements to signalized intersections include pavement marking/treatments, raised islands and reduced curb radii. Section 4.7 provides more information on intersections.

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Mid-block crossings are proposed on 8th Avenue South, south of the rail overpass and south of the roundabout at Lafayette Street and Korean Veterans Boulevard. If the proposed road diet is constructed, the mid-block crossings should include a raised median to enable a protected two-phase crossing as illustrated in Figure 33. Mid-block crossings should include a rapid rectangular flashing beacon (RRFB) or high-intensity activated crosswalk (HAWK) to ensure crossing locations are highly visible to motorists (see Figure 41).

Figure 41. Rapid Rectangular Flashing Beacons (RRFB) and High Intensity Activated Crosswalks (HAWK)



Source: National Association of City Transportation Officials (NACTO)

4.6.4. 7th Avenue South Pedestrian Overpass

A CSX rail alignment traveling from the Gulch to southeast Davidson County traverses Pie Town. An underpass at 8th Avenue South and overpass at Division Street provide motor vehicle, pedestrian and bicycle (Division Street only) connectivity, but other cross streets are blocked. An at-grade crossing at Fogg Street was recently closed.

The CSX rail line represents a major barrier and impediment to the development of a connected pedestrian network in Pie Town. The development of new at-grade crossings is not likely to be agreed upon by CSX Transportation. An underpass along Fogg Street is theoretically possible, but not preferred as it brings safety and lighting challenges.

Rather, a new pedestrian overpass is proposed running north and south along 7th Avenue South. Such an overpass would provide a valuable connection in the Pie Town pedestrian network, reducing walk times by over half for some origins and destinations (see Figure 42). It could also serve as a neighborhood amenity providing opportunities for public art and gathering spaces.



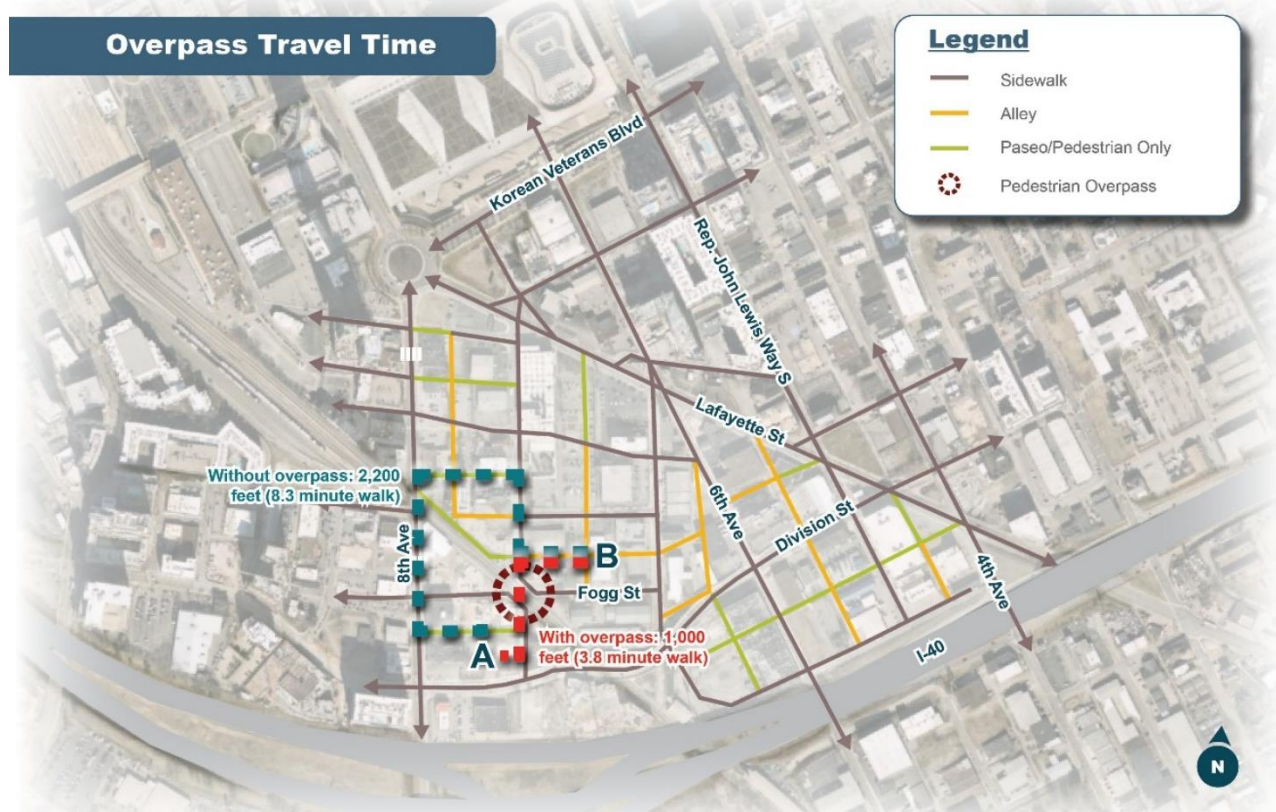
West Thames Street Pedestrian Bridge in New York City (source: Wikimedia Commons)

The upward sloping grade from north to south along 7th Avenue South means that the northern landing will require switchbacks or a spiral ramp

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design on the northern approach to maintain a five percent maximum slope. Further evaluation and study of the feasibility of an overpass is necessary.

Figure 42. Walk Times With and Without Overpass



4.6.5. Amenities

Providing adequate facilities for bicycles, pedestrians and transit riders is essential to creating a place where cycling, walking and riding transit is comfortable and convenient. The following elements should be emphasized when planning and designing for public spaces within Pie Town and when negotiating proposed development:

- Full service bus stops consistent with WeGo Transit Design Guidelines, including adequately sized benches, shelters, bicycle racks and information;
- Benches, trees, awnings and other elements that provide pedestrian comfort in both the public and private realms;
- Bicycle racks and bikeshare and micromobility stations in public spaces, including the proposed SoBro Transit Center and the reclaimed space formed by the proposed closure of a section of Lea Street (see Section 4.7);
- Bicycle storage in residential buildings and storage and showers/lockerrooms in office and mixed use buildings.

4.7 Intersections

Intersections represent the convergence of multiple modes and are a critical component of the mobility network. If not planned and design intentionally and thoughtfully, they can become a barrier in the community. This section identifies recommended best practices for all intersections as well as recommendations for a limited number of specific intersections in Pie Town.

4.7.1 Best Practices

The following represent select best practices for intersection design that are essential for creating successful places for all modes:

- Target speed: Minimizing turning speeds is crucial to pedestrian safety, as corners are where drivers are most likely to encounter pedestrians crossing in the crosswalk. It is recommended that turning speeds should be limited to 15 mph or less.
- Curb radius: The size of the corner radius impacts turning vehicle speeds, crossing distance and intersection size. A maximum curb radius of 15 feet is recommended and may be reduced to 5 or 10 feet at intersections with little or no motor vehicle turn movements.
- Turn lanes: The presence of turn lanes also impacts the crossing distance and size of intersections. The use of dedicated turn lanes is discouraged unless absolutely necessary.
- Clearly marked crosswalks: All intersections, whether signalized or unsignalized, should include clearly marked crosswalks. At a minimum, crosswalks should be painted per Manual of Uniform Traffic Control Devices (MUTCD) standards. At major intersections, a more visible marking, such as painted or tinted concrete or asphalt, should be used.
- Pedestrian, bicycle and transit prioritization: Where applicable (especially on designated and marked bicycle routes and high frequency transit routes), intersections should use prioritization treatments. These include leading pedestrian intervals, bicycle boxes and dedicated signals and exclusive transit lanes/queue jumpers.

4.7.2 6th Avenue South, Lafayette Street and Ewing Avenue

6th Avenue South is an important bicycle corridor because of its connectivity within Pie Town and to other major bicycle corridors in downtown. The intersection of 6th Avenue South and Lafayette Street is critical for cycling because of size and traffic volume on Lafayette Street. Two options for bicycle prioritization are proposed for this intersection:

- Near Term Option (Figure 43) replaces the left turn lanes with dedicated bicycle lanes and bicycle boxes at the both approaches on 6th Avenue South. A shared bicycle/right turn lane would also be provided at the Ewing Street approach. A dedicated actuated bicycle signal would provide protected entry into the intersection.
- Long Term Option (Figure 44) eliminates all motor vehicle lanes 6th Avenue South at its southern approach to Lafayette Street and shifts them to Ewing Avenue. The section of 6th Avenue South from the Drexel Street extension to Lafayette Street is bicycle exclusive with shared space on either side.

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Figure 43. 6th Avenue South, Lafayette Street and Ewing Avenue Near Term Option



The Long Term Option provides dedicated approaches for both motor vehicles and bicycles, thereby simplifying intersection operations and reducing conflicts. Traffic analysis suggests that operations improve, but that motor vehicles that would have used the southern approach at 6th Avenue South will encounter additional delay and a more circuitous route. This option is only feasible when the extension of Drexel Street is complete.

For both options, the section of Lea Street between 6th Avenue South and Lafayette Street is recommended to be closed. This space could be used as a public amenity to include landscaping, gathering space and a bikeshare and/or micromobility station.

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Figure 44. 6th Avenue South, Lafayette Street and Ewing Avenue Long Term Option



4.7.3 Lafayette Street, Division Street and Rep. John Lewis Way

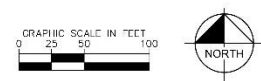
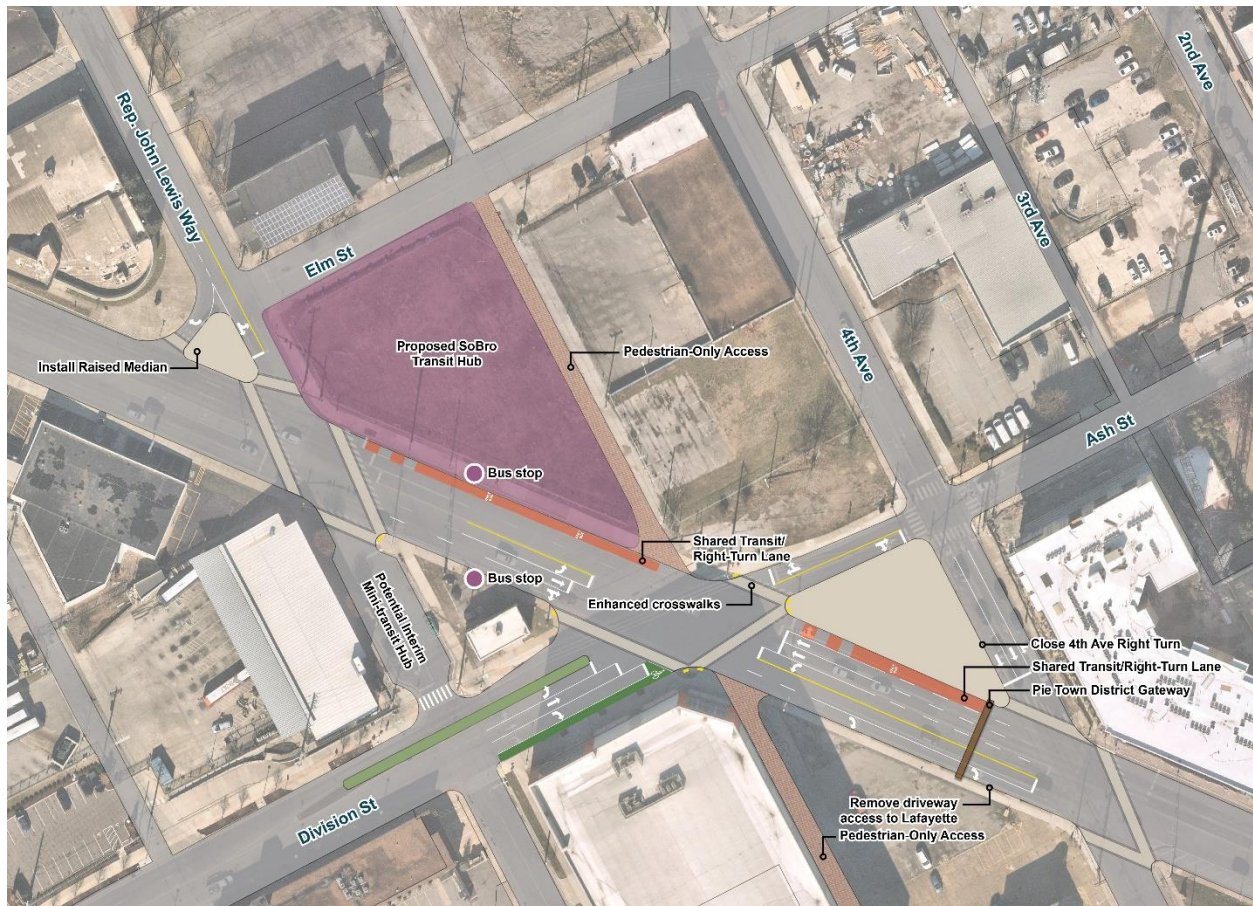
The group of intersections formed by Lafayette Street, Division Street and Rep. John Lewis Way are critical for transit because they represent the confluence of several frequent routes and potential Murfreesboro Pike BRT and new service on Division Street. As shown in Figure 45, recommended improvements at these intersections include:

- The replacement of the outside northbound lane on Lafayette Street with a shared transit right turn lane and a signal queue jump.

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- Enhanced crosswalks at all legs of each intersection.
- The installation of a raised median island at the slip lane on the northern leg of Rep. John Lewis Way.
- The potential use of Rep. John Lewis Way between Lafayette Street and Division Street as a staging/layover location for local service on Division Street.

Figure 45. Lafayette Street, Division Street and Rep. John Lewis Way Intersection Recommendations



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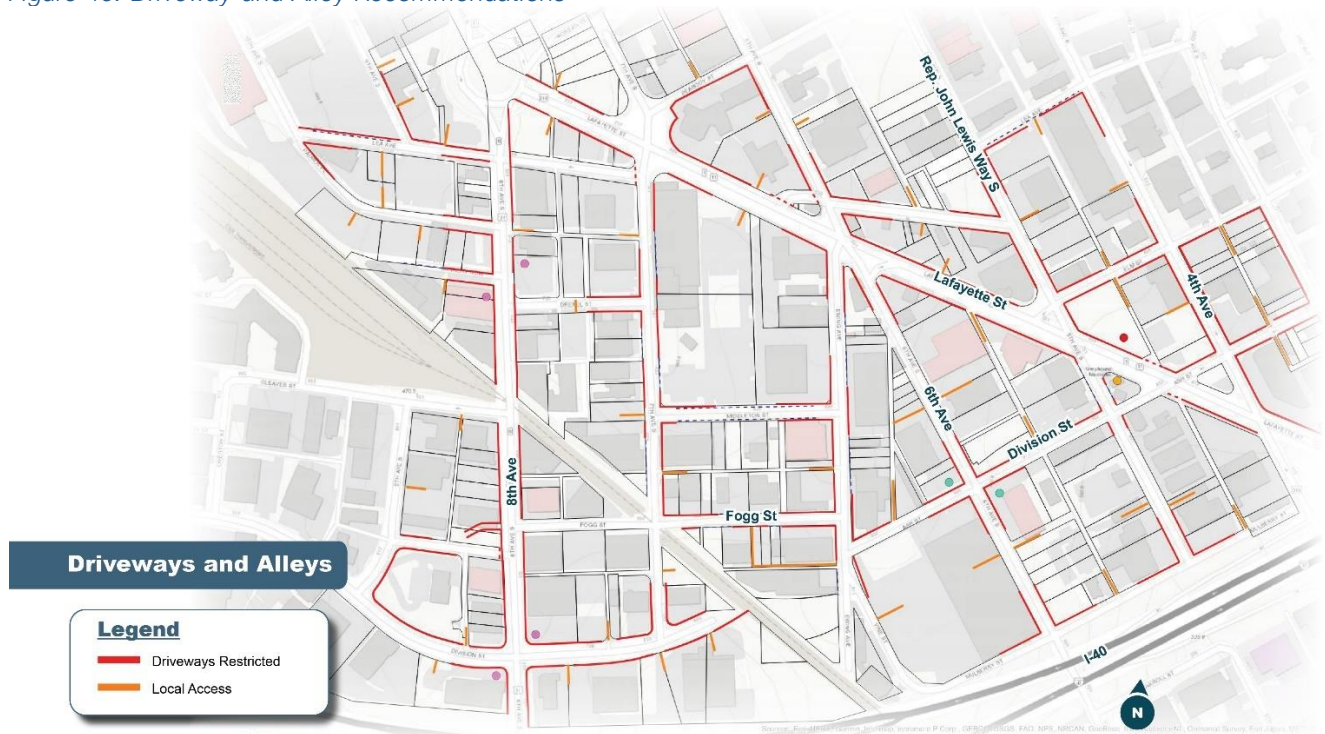
4.8 Access and Curbside Management

The local access and curbside operations plan for Pie Town balances the need to provide motor vehicle access, including private motorists, service and deliveries, to adjacent uses with the need to provide a safe and cohesive mobility experience for pedestrians, bicycles and motor vehicles. This section provides recommendations for driveways, alleys, loading and curb zones.

4.8.1 Driveways and Alleys

Figure 45 provides recommend locations for motor vehicle access via alleys and driveways and locations where motor vehicle access is specifically prohibited. Where possible, motor vehicle access should occur via alleyways, but direct driveway access may be permitted on local internal streets as indicated on the map. The minimum access spacing should be 155 feet, which allows for adequate sight distance at 25 miles per hour.

Figure 46. Driveway and Alley Recommendations



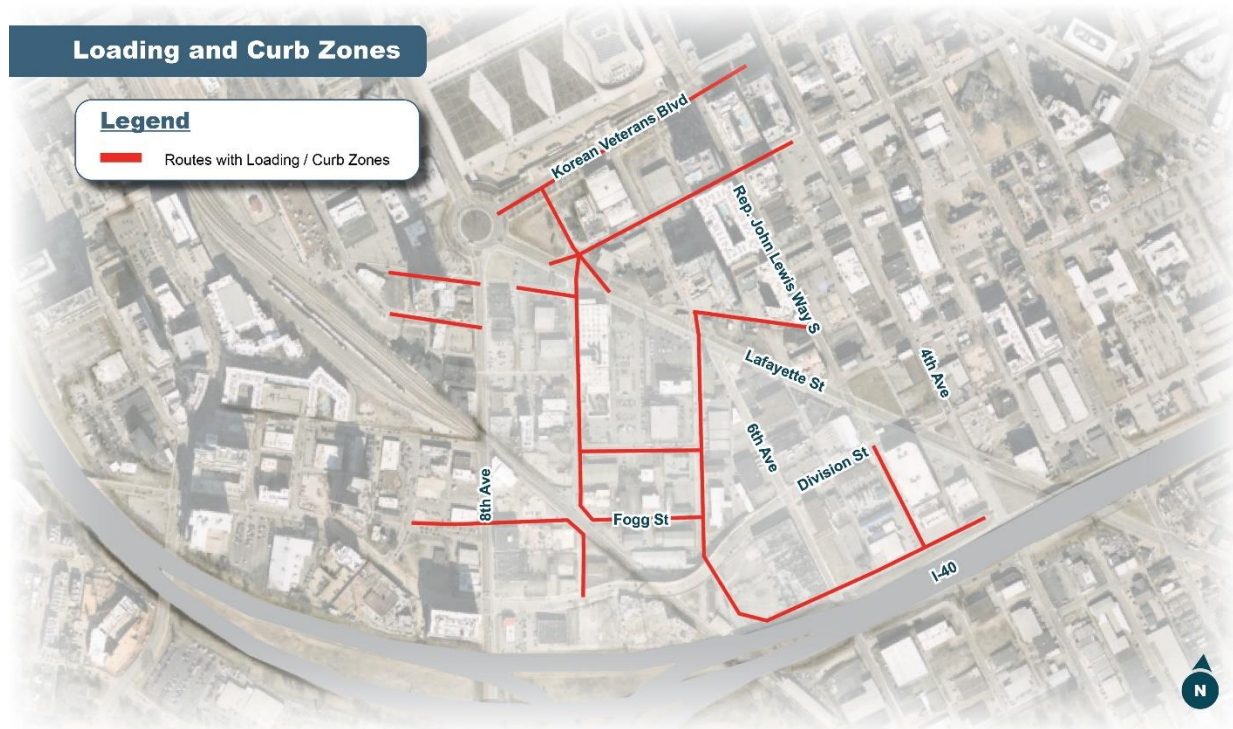
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4.8.2 Loading and Curb Zones

Curbside operations include pick up and drop off, local deliveries and parking. Figure 47 identifies specific locations in Pie Town where these activities are permitted. The street typology for curbside zones should be used on these streets.

The curbside zones identified in this map should be located in the public right-of-way (ROW) so that Metro can maintain control over their operation. The ROW map in the next section accounts for them in the width recommendations. The Connect Downtown transportation plan will inform specific policy on curbside zone operations.

Figure 47. Curbside Zone Recommendations

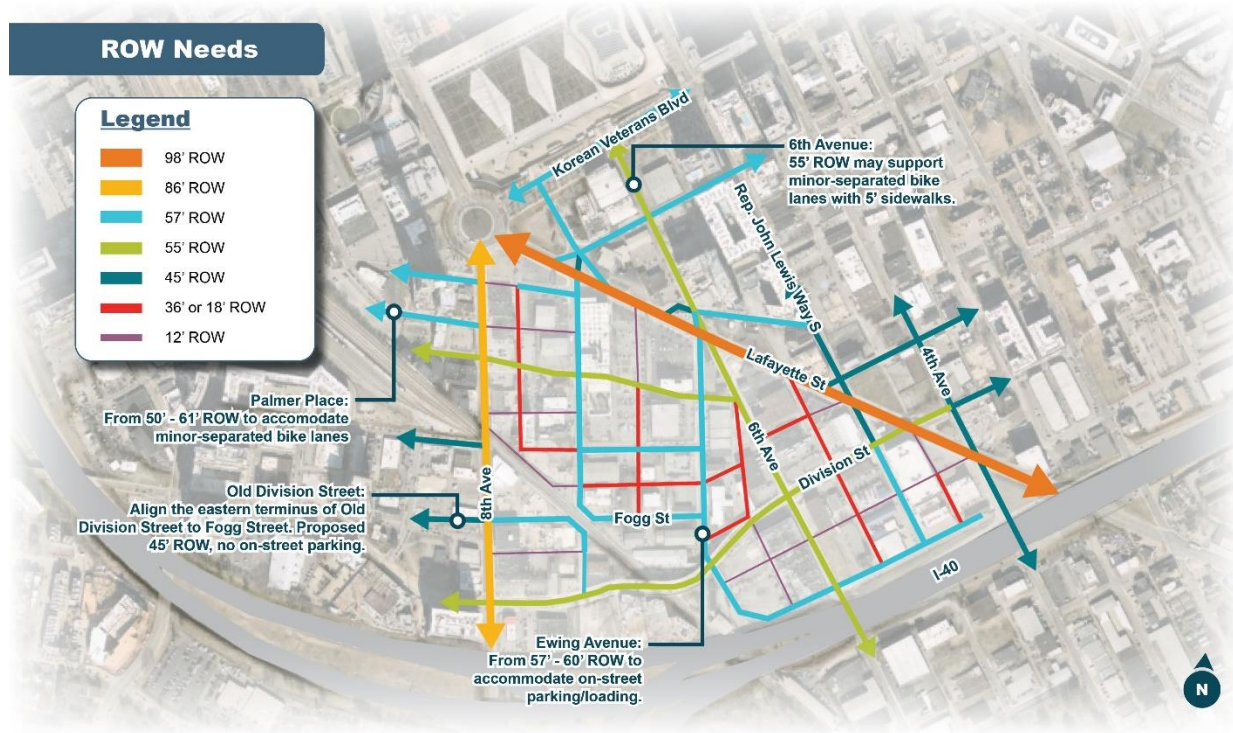


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4.9 Right of Way Preservation and Needs

Figure 48 uses the street typology with recommendations for streets, alleyways, paseos, bicycle facilities and curb zones to identify right-of-way needs for each proposed facility. This map can be used by NDOT and Metro Planning as a reference for ROW preservation during the developer site plan development and approval process.

Figure 48. Right-of-Way Needs



4.10 Off-street Parking

The residential, retail/commercial, office and hotel uses that are currently in development, have been proposed or are anticipated will generate significant demand for parking in Pie Town. The Downtown Code does not prescribe parking minimums or maximums. The code does incentivize parking as part of its bonus height program, in which buildings are allowed additional square footage in building height for every square foot of additional parking at a ratio of:

- One to one for parking space below grade;
- Two to one for building liner in upper-level parking, and
- Two to one for public parking.

A strong parking policy that prevents overparking and incentivizes shared parking is essential to providing a robust multimodal environment in downtown Nashville. It is recommended that Metro conduct a study of all of downtown, including Pie Town, to understand parking utilization and to inform standards for maximum parking and shared parking. In the meantime, the following measures are recommended for Pie Town:

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- Require developers to provide a parking study with calculations.
- Provide incentives for the provision of unbundled parking, shared parking, easements with neighboring properties and the inclusion of “mobility hub” elements, such as bicycle/micromobility storage and showers.
- Encourage design elements such as street level retail and activation, enhanced façade treatments and style that is consistent with the habitable portion of the building.

Figure 49. Examples of Preferred Parking Design



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5. Implementation

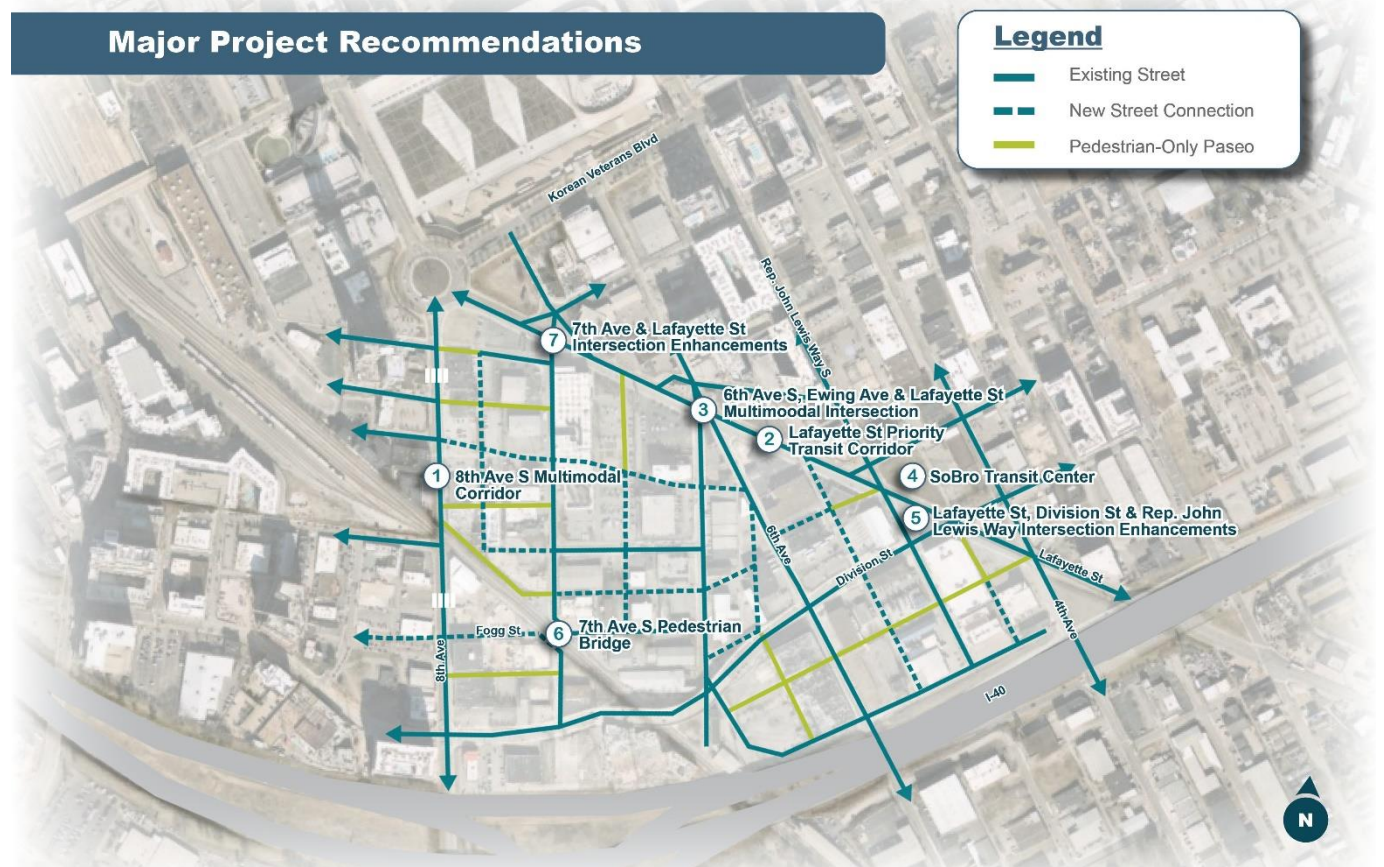
5.1 Developer's Toolkit

One of the major objectives of this study is to provide Metro Planning and NDOT with a good understanding of mobility needs in Pie Town to enable informed discussion and negotiation with developers. To that end, this study has produced a Developer's Toolkit to facilitate that discussion.

- On-site improvements including new street and paseo connections, bikeways, streetscape elements and ROW preservation needs.
- Recommendations for curbside zones and access.
- Major off-site projects that may not be paid for or constructed by a single developer but can be individually contributed to and cumulatively funded.

Figure 50 identifies the major off-site projects included in the Developer's Toolkit.

Figure 50. Major Off-site Project Recommendations



5.2 Informing Other Plans

In addition to informing developer discussion and negotiation, the recommendations of this study should inform other studies that are closely related. At a minimum, this should include:

- Connect Downtown Study (currently underway)
- SoBro Mobility Study (currently underway)
- Murfreesboro Pike Bus Rapid Transit Study

6. Conclusion

The Pie Town neighborhood of downtown Nashville is experiencing a major transformation that will make it a significant mixed use district where thousands of Nashvillians live, work and experience life. The decisions that are made today will impact how Pie Town looks, feels and operates for many years into the future.

The Pie Town Mobility Study takes into account the neighborhood's transformation and makes recommendations on how it can become a place where walking, biking, transit and other forms of transportation are not just possible, but attractive, safe and convenient options. These recommendations can be used by NDOT and Metro Planning to guide decisions and negotiations throughout the buildout process.

The image features an abstract graphic design with a teal background. In the upper left, there are several overlapping shapes: a large grey shape, a smaller red shape, and a teal shape. A white, irregular shape separates these from the rest of the page. The text 'Kimley»»Horn' is located in the bottom right corner, rendered in white. The double arrow symbol is stylized, consisting of two right-pointing chevrons.

Kimley»»Horn