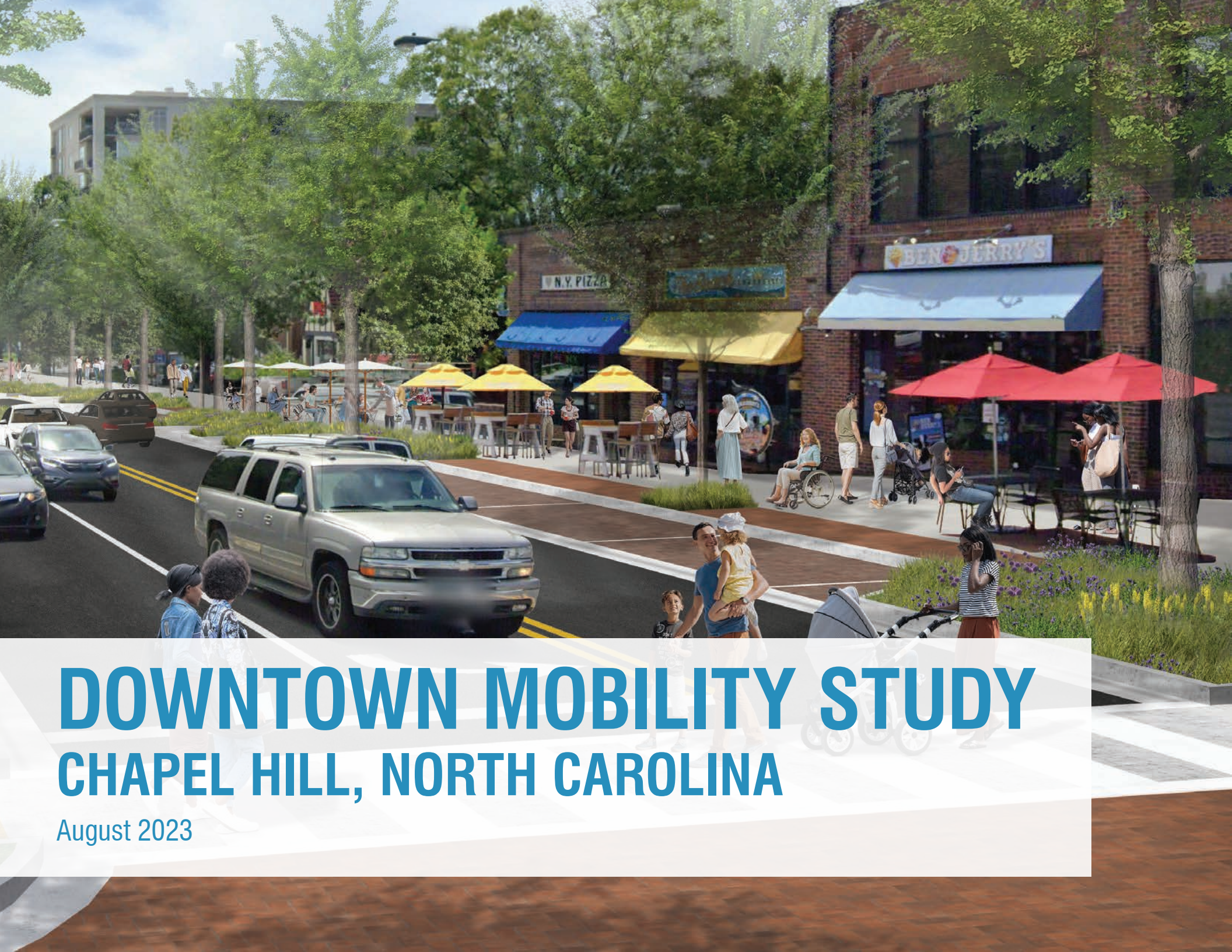


DOWNTOWN MOBILITY STUDY

CHAPEL HILL, NORTH CAROLINA

August 2023

CONTENTS

EXECUTIVE SUMMARY

Purpose and Process: The Town of Chapel Hill is undergoing a multi-phase process to increase mobility and access in its downtown. As the first step in this process, the Downtown Mobility Study (subsequently referred to as "Study") aims to set the groundwork for more design-oriented projects to follow. Using the analysis and findings of existing documents, this Study outlines opportunities for how people could move in and around downtown. It synthesizes stakeholder perspectives to establish a robust vision and set of guiding mobility principles. It applies these ideas to the existing network and outlines a set of conceptual options for the system. It sets up the next stage of this process, a Streetscape Plan, by establishing a set of best practice design guidelines applicable to this context.

Existing Conditions: Downtown Chapel Hill currently offers a wide range of mobility options, but they are not distributed to maximize their benefits. Most of these options are consolidated on downtown's primary east-west streets, Franklin Street and Rosemary Street, with few amenities provided on the secondary connector streets. The result of trying to find dedicated space for each mode along each street has resulted in unnecessary competition and is not working well for any mode. Resolving these tensions requires a system-wide approach.

Vision of Mobility: Within communities and in downtowns specifically, mobility is defined as the populations' ability to move to access what they need to live and thrive within the city. This Study adapted this definition to the local context to provide the following mobility vision for downtown: **the streets in Downtown Chapel Hill are a diverse and interconnected system that enables everyone to safely and comfortably and easily reach their destinations and bolsters the economic vitality of downtown businesses.**

Informed by the conversations and analysis throughout the process, this Study proposes the following six guiding principles to realize this vision: create more pedestrian space and comfort, design for the system, establish Franklin and Rosemary as "A Streets", reduce conflicts between users, allow traffic to flow but keep it slow, and path as place.

Concept and Recommendations: Applying these principles to the system and individual streets entails redistributing facilities and defining their role in the greater system. Franklin holds a lot of responsibility for accommodating different modes of travel. By making the most of the ample right-of-way, this Study proposes formalized separation of those users. Separated bike lanes, expanded pedestrian space, a narrower roadway, and a host of smaller changes will reduce conflicts and competition for space. On Rosemary, where the right-of-way is more narrow, this report recommends removing the bike facility to provide a truly great pedestrian experience. Wider sidewalks, safer crossings, increased buffers, and more shade all work to make Rosemary Street a welcoming connection between downtown and nearby neighborhoods.

Beyond Franklin and Rosemary, this Study recommends a variety of treatments to improve the multimodal travel capacity of the north-south connector streets and the inclusion of a new separated bicycle facility along Cameron Avenue.

This plan presents multiple options, but each recommendation reflects the Town of Chapel Hill's commitment to multimodal mobility and the desire to create a robust framework for the following Streetscape Plan.

PROJECT PURPOSE

This Study is a forward-looking document. Rather than extensively researching how and why people travel within downtown, this Study recognizes there are many existing documents that have already analyzed travel conditions within downtown. It takes the findings of previous studies into account and considers:

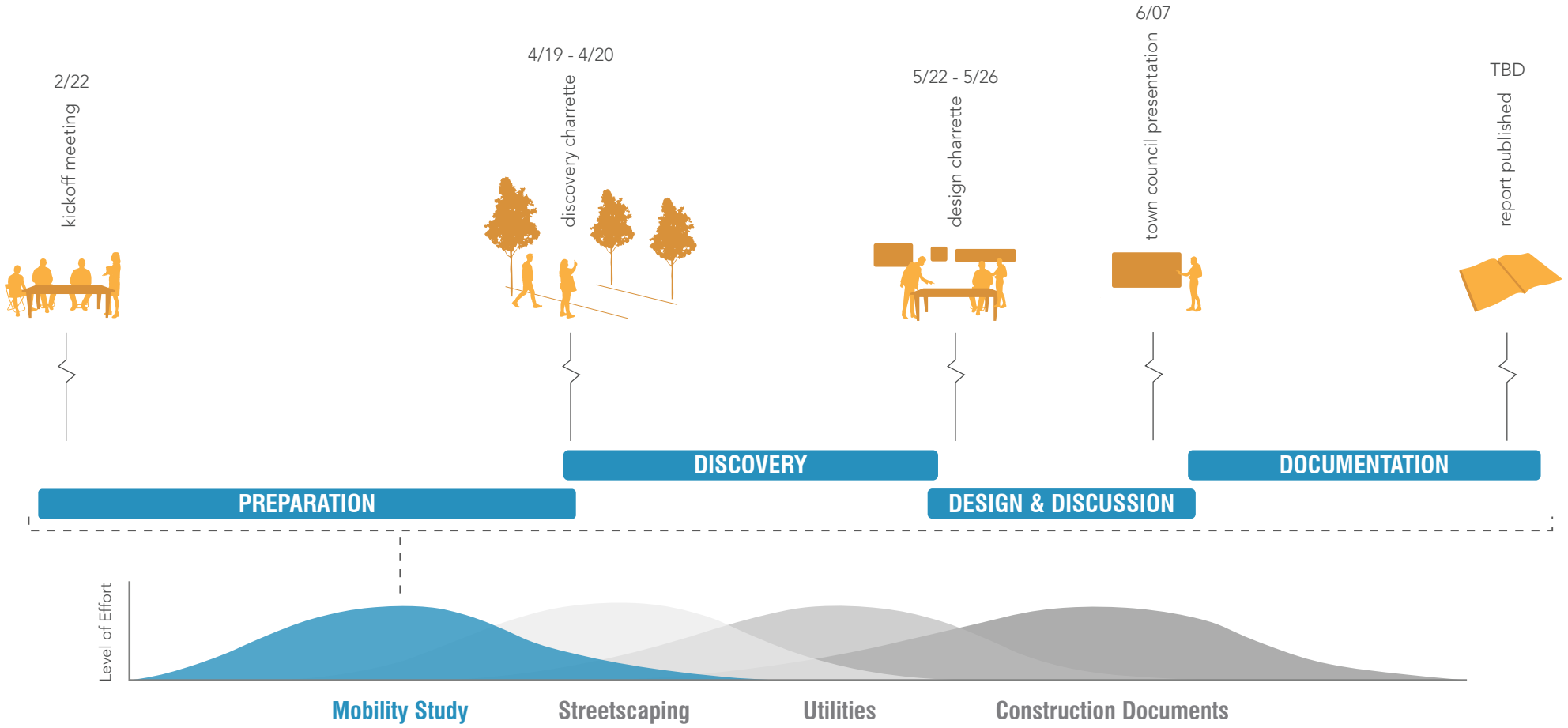
- **How could people move in downtown?**
- **How could streets and public spaces in downtown be reconfigured to support movement in a way that achieves overarching community goals?**

This entails crafting a vision for what movement in downtown could look like, and articulating the key principles that support the vision. The relationship between mobility and the public realm requires thinking about how each mode of travel is routed through downtown, how different modes of travel are arranged across the width of a street, how much dedicated space each mode receives, and how much space can be allocated to elements that influence the way people move (e.g., buffers, landscaping, and parking).

Ultimately, this Study seeks to provide a vision for reorganizing the multimodal network in downtown to set the Town up for success by establishing guiding mobility principles and developing concepts with enough flexibility for further refinement.

PROJECT CONTEXT

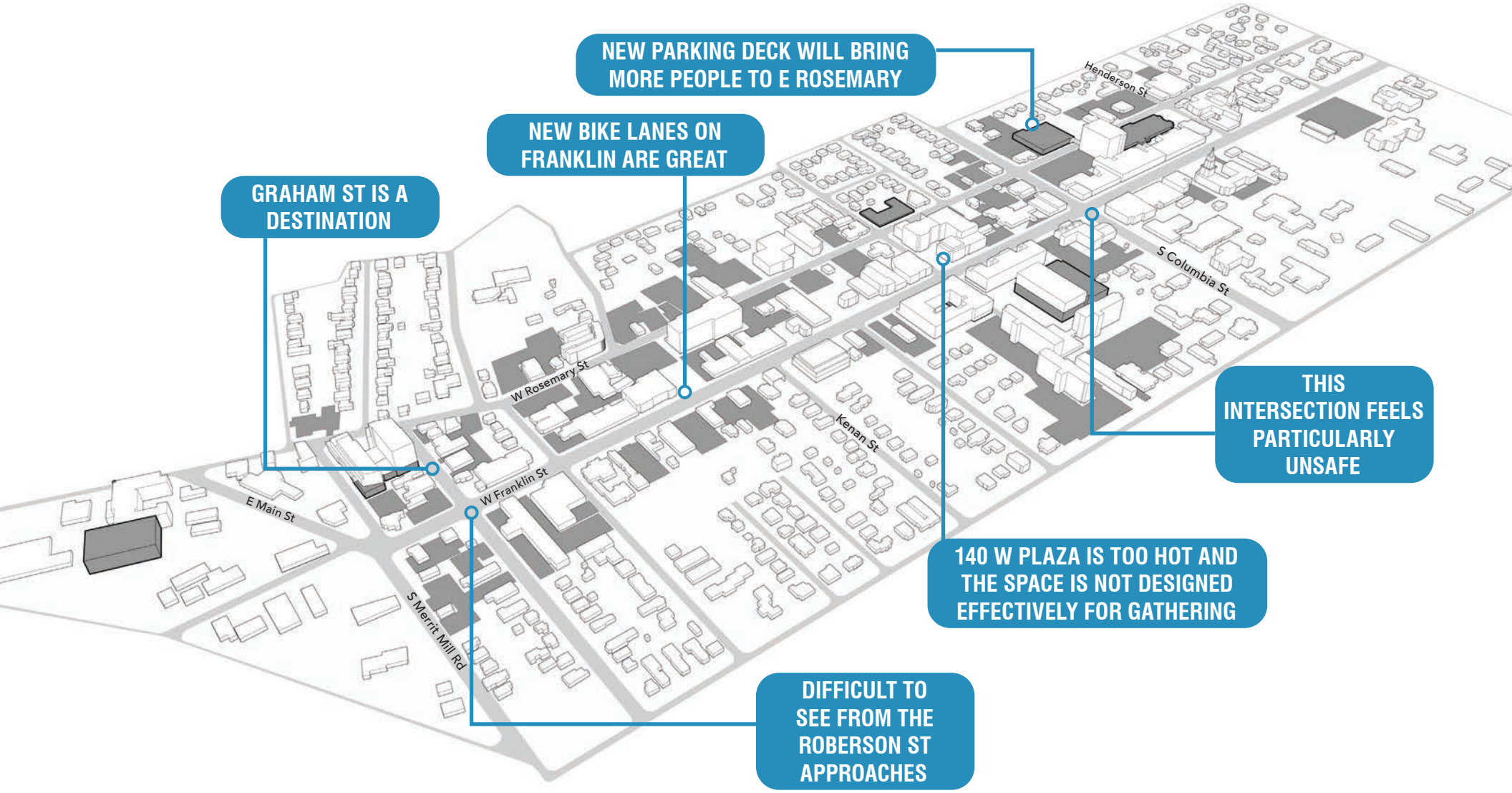
- » There is a need to define a cohesive future vision for downtown
- » Cost/benefit of taking ownership of Franklin Street from NCDOT depends on vision and desired flexibility
- » In some areas, arrangement of on-street parking is inefficient and creates conflicts with other modes
- » Lack of loading zones throughout downtown is an issue
- » Count data shows bicyclists are using the new bikeways on W. Franklin



TIMELINE & PROCESS

This mobility Study is the first phase of a multi-step process toward reimagining Downtown Chapel Hill's public realm and sets the stage for the subsequent design and engineering phases. The Study combines analysis of existing physical conditions and insights from a variety of stakeholders to develop the broader vision, goals, and principles that inform this effort. Following the project kickoff, the design team conducted two in-person charrettes -- the first to uncover the existing conditions and dynamics, and the second to generate ideas in a collaborative, real-time setting. The ideas from these events were refined into the contents of this report.

The comprehensive vision, principles, and recommendations for mobility in Downtown Chapel Hill will inform the streetscape design, utilities coordination, and construction document phases to come.



CHARRETTE OUTCOMES

Over the course of two months, the planning team met with a diverse group of stakeholders.

The team held two public charrettes, the discovery charrette in April and the design charrette in May. These multi-day events, held at 306 W Franklin St, provided a range of engagement opportunities for public input.

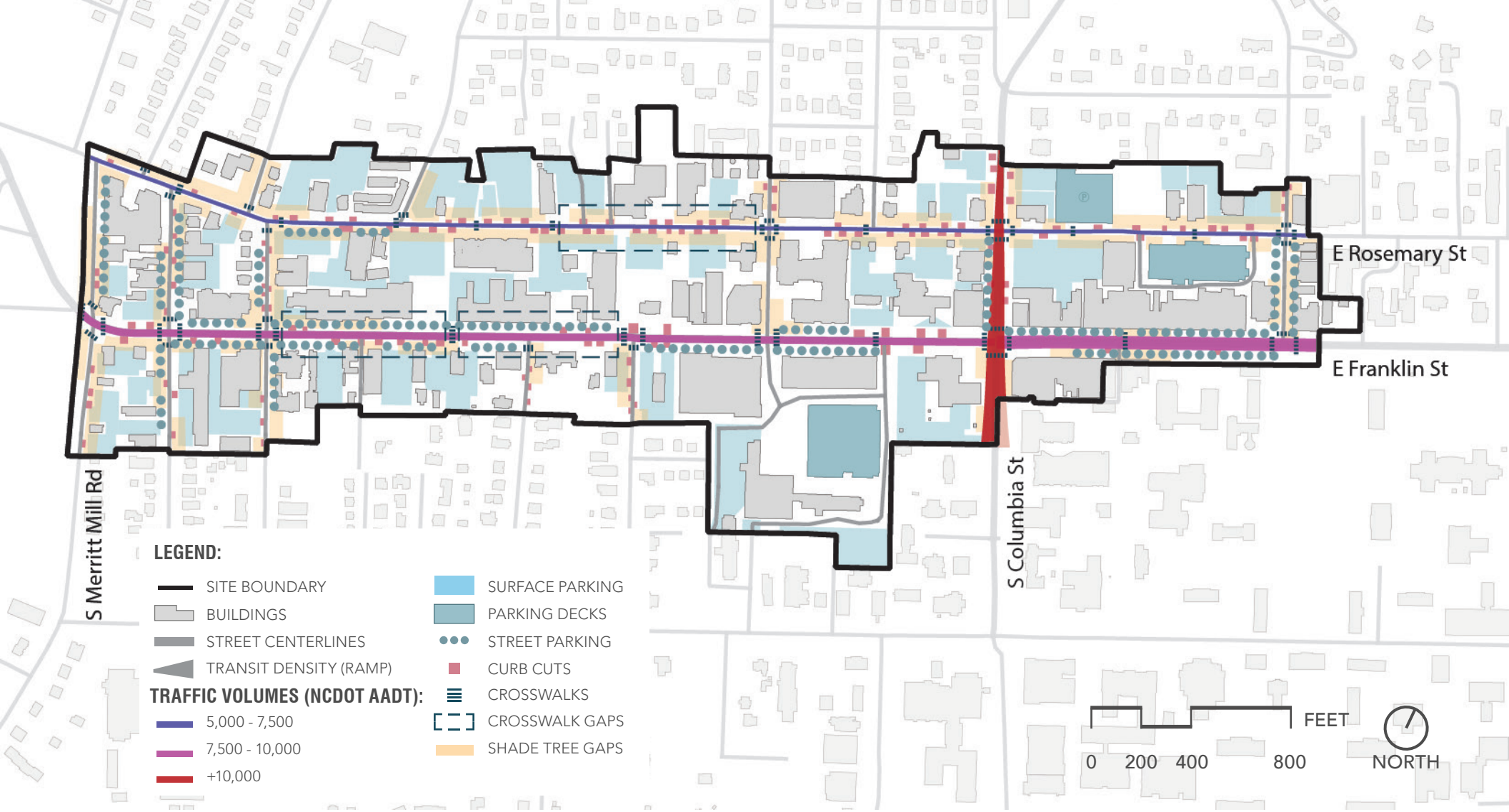
ENGAGEMENT ACTIVITIES

- 15 stakeholder meetings
- 4 public studio sessions, including 1 session at the Hargraves Community Center
- 2 in-person open houses
- 1 virtual open house
- Online platform for feedback

FEEDBACK THEMES

Conflicts between users and a feeling of competition for space were prominent themes throughout the process. This is corroborated by the physical distribution of amenities and users within the study area. Other overarching themes are shown to the right.

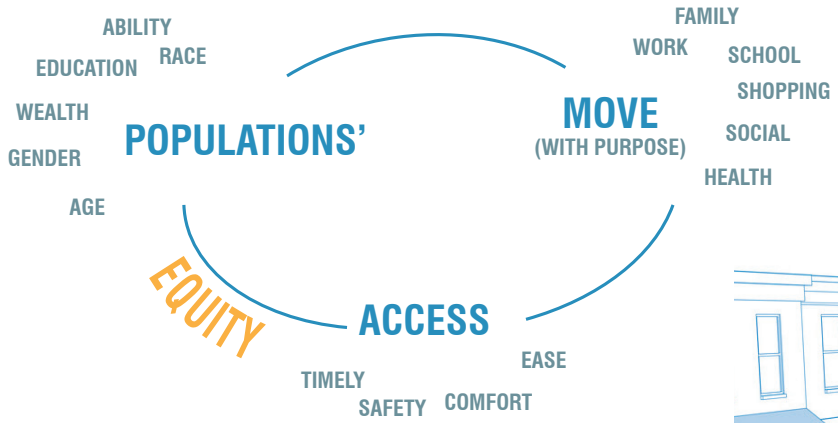
- Downtown should be a welcoming place for all, including local residents and families
- Improved safety and more space for pedestrians and bicyclists is needed
- People want places to gather
- Preserving and enhancing downtown's unique sense of place is desired
- Local businesses are a big part of what makes downtown special
- People expressed excitement for the project

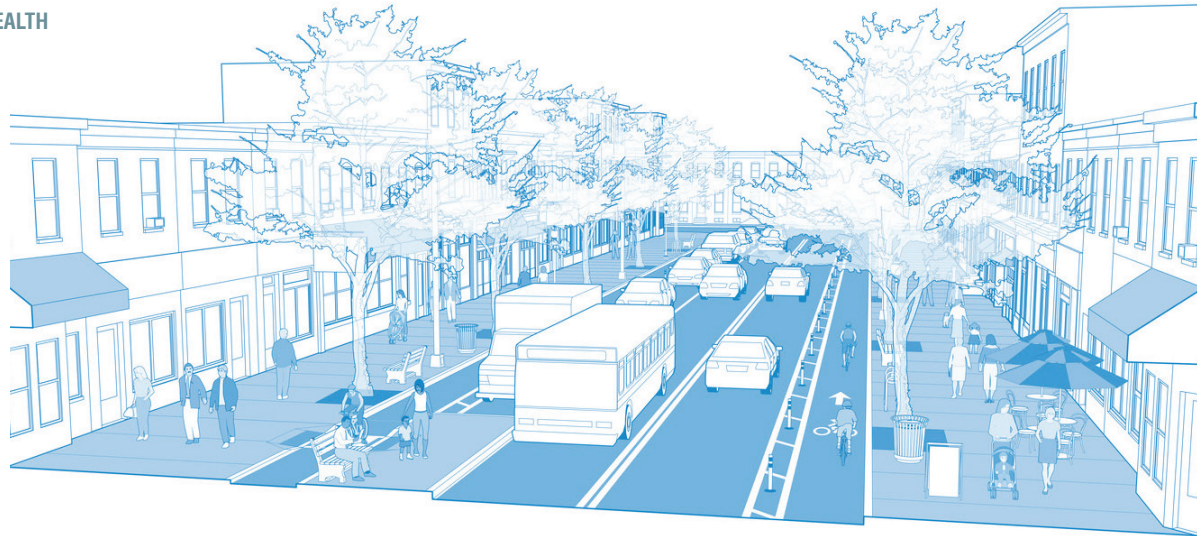


EXISTING CONDITIONS

Downtown Chapel Hill offers an abundance of amenities and opportunities for mobility but these options are all packed into the area's Rosemary, Franklin, and Columbia. By trying to provide everything, the corridors dilute the benefits of what they do offer. Franklin is the premier pedestrian space in Town, yet crossing opportunities are sparse in some areas and significant space is dedicated to vehicular travel lanes and parking. Rosemary tries to provide for both pedestrians and bicyclists, but does not create a safe or comfortable environment for either due to frequent curb cuts, abundant surface parking lots fronting streets, and lack of shade trees. Turning movements onto and off of Franklin are consolidated at Columbia. This makes the most important node in Town, Franklin and Columbia, uninviting. The north-south streets in downtown vary in terms of existing conditions. Traffic volumes on these streets are low, except for Columbia. Some streets have strong in-tact building frontages with no curb cuts across the sidewalk and lack of street trees is common.

THE POPULATIONS' CAPABILITY AND STRATEGIES TO MOVE IN ORDER TO ACCESS WHAT THEY NEED TO LIVE AND THRIVE WITHIN THEIR COMMUNITY.





DEFINING MOBILITY

This Study defines mobility as the populations' capability and strategies to move in order to access what they need to live and thrive within their community. It is essential to consider the diversity inherent in this definition. Urban areas hold a significant density of different identities, services, businesses, and modes of travel. True urban mobility encompasses all these factors, ensuring that any individual – regardless of identity, destination, and means of travel – can access what they need. This definition serves as the foundation of this Study, its approach to equity, and the subsequent vision for streetscapes in Downtown Chapel Hill.

A STREETS AND B STREETS

Street networks include both A and B Streets. A Streets are characterized by a strong relationship to building facades and are the centers of social exchange. A Streets have no driveways cuts in the pedestrian network and the impact of support services is limited geographically or temporally. The combination of design elements that make the entirety of an A Street spectacular streets may also exist on certain B Streets or within certain areas of B Streets. For example, B Streets may or may not contain engaging building facades, access to parking is more common, and support services are less restricted spatially and/or temporarily.

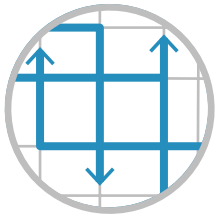
DOWNTOWN CHAPEL HILL MOBILITY VISION:

THE STREETS IN DOWNTOWN CHAPEL HILL ARE A DIVERSE AND INTERCONNECTED SYSTEM THAT ENABLES EVERYONE TO SAFELY AND EASILY REACH THEIR DESTINATIONS AND BOLSTERS THE ECONOMIC VITALITY OF DOWNTOWN BUSINESSES

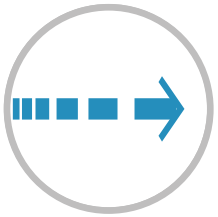
GUIDING PRINCIPLES

More Pedestrian Space and Comfort: Prioritize pedestrian amenities, safety, and comfort to make downtown a space where people spend time

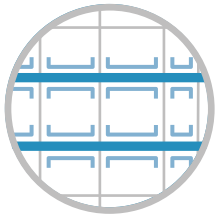
Reduce Modal Conflicts: Use design elements to lessen the likelihood of incidents between roadway users



Design for the System: More effectively use the entire system of streets to facilitate safe movement through and to downtown



Traffic Flow, but Slow: Maintain access for vehicles throughout downtown, while reducing speeds and encouraging less through traffic

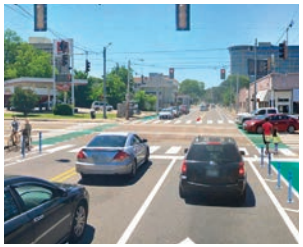


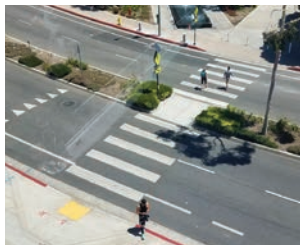
Establish Rosemary and Franklin at "A" Streets: Use urban design principles to build off of the existing grid to create engaging, people-first places

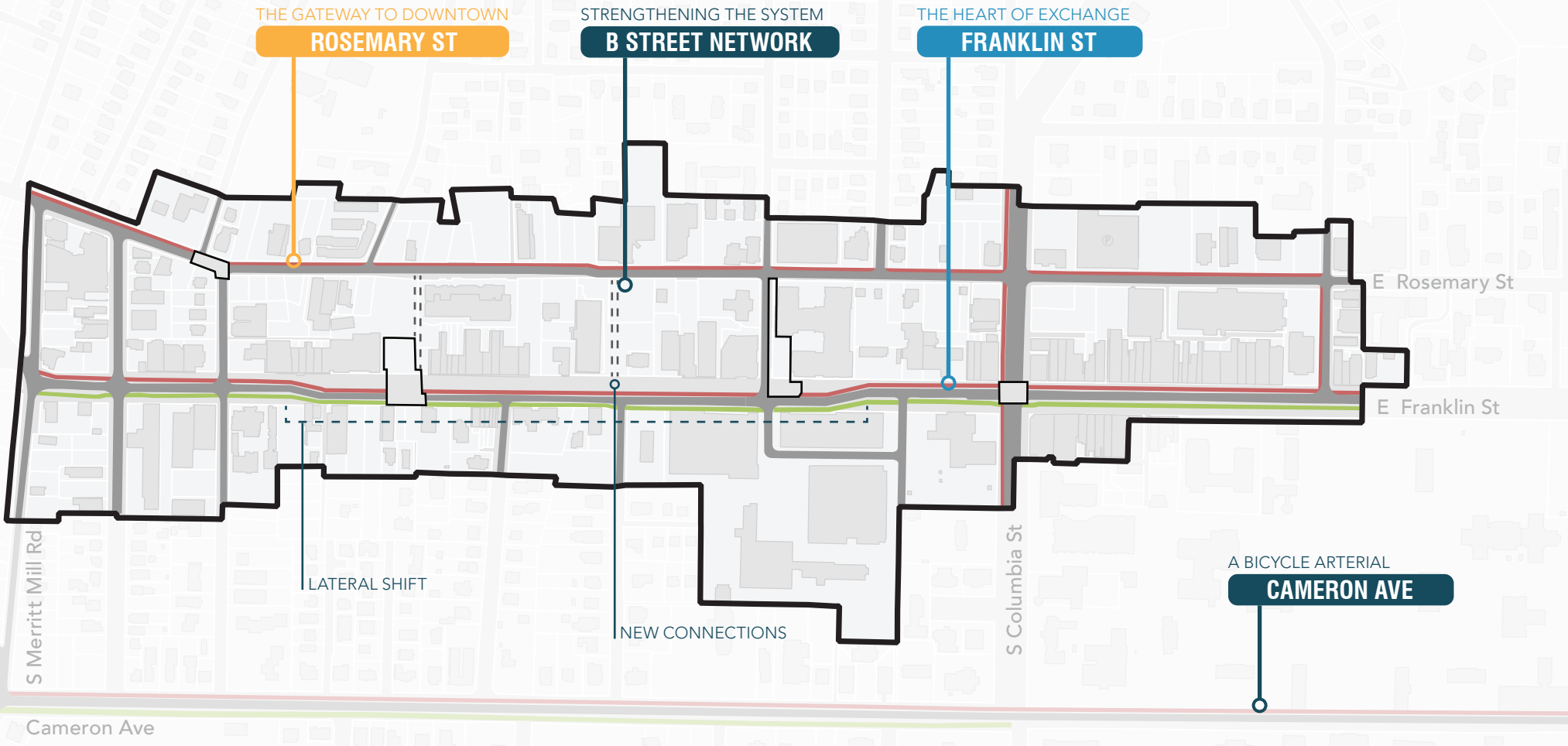
Path as Place: Embrace streets as the connective tissue of the public realm by creating dynamic streetscapes that strengthen downtown as a destination.

MOBILITY ELEMENTS

The following table presents various street elements that have the potential to help achieve the mobility vision for downtown. These elements are represented throughout the concepts presented in the following pages and can serve as a toolbox for the subsequent Streetscape Plan.

Wide sidewalks	Separated bike lanes	Transit features	Narrow vehicle travel lanes	Designated on-street parking & loading	Operational changes
					
Provide ample space for walking, outdoor dining, and more. Pedestrians can walk side by side and pass each other comfortably.	Provide high-comfort facilities for bicyclists, minimize conflicts with pedestrians, and provide sidewalks more separation from moving vehicles.	Increase comfort, raise visibility of the service, and minimize conflicts (e.g., designated boarding and alighting areas, transit shelters).	Reduce vehicle speeds by visually narrowing the travel way. 10' wide travel lanes are best for downtown areas, with 11' wide for transit.	Encourage efficient use of curb space and preserves sightlines at intersections. Can protect sidewalks and bike lanes from moving traffic.	Optimize efficiency and safety across the system (e.g., adjusting and syncing signals, increasing crossing times, and prioritizing pedestrians).

Mid-block crossings	Curb extensions & tighter corner radii	High-visibility crosswalks	Buffers & vertical delineators	Detectable edges & guides	Lateral shifts
					
Provide more frequent and convenient crossing opportunities, and help minimize unexpected pedestrian crossings.	Reduce crossing distances, provide traffic calming, guide pedestrians where to cross, create visual interest, and provide space for landscape.	Clearly identify crossings (via paint, color, materials, etc.), guide non-vehicular users where to cross, and indicate their priority.	Provide protection to pedestrians and bicyclists from vehicular traffic and minimize conflicts between transportation modes.	Alert people with vision impairments to spaces of potential conflicts with bicycles and vehicles and help guide users to specific destinations.	Slow down vehicle speeds by creating a gentle, but substantial bend in the roadway alignment. Create space for placemaking.



CONCEPT PLAN

Implementing this vision requires a system-wide approach. Streets are designed to support both their individual needs and those of the overall network.

Rather than presenting information at the same level of detail as the existing conditions, this plan sets up broader themes and bigger moves for refinement during the subsequent streetscape study.

CELEBRATORY SPACES
NEW BICYCLE FACILITIES
TRANSIT LINES

FEET
0 1 2 4

NORTH

SUMMARY OF KEY CHANGES

ROSEMARY STREET

Role: The Gateway to Downtown

» Expand pedestrian space by removing bike lanes

» Create a continuous tree canopy

» Enhance connections to distinct neighborhoods and streets

» Designate loading/unloading zones

FRANKLIN STREET

Role: The Heart of Chapel Hill

» Formalize separated bikeway with permanent buffers: two-way on the south with directional bikeway transition to Carrboro

» Increase pedestrian space for travel and interaction

» Celebrate special places along the corridor

» Designate loading/unloading zones

CAMERON AVENUE

Role: A Bicycle Arterial

» Prepare for upcoming resurfacing project

» Explore two-way separated bike lanes

» Continue bicycle facility all the way to Columbia

B STREETS

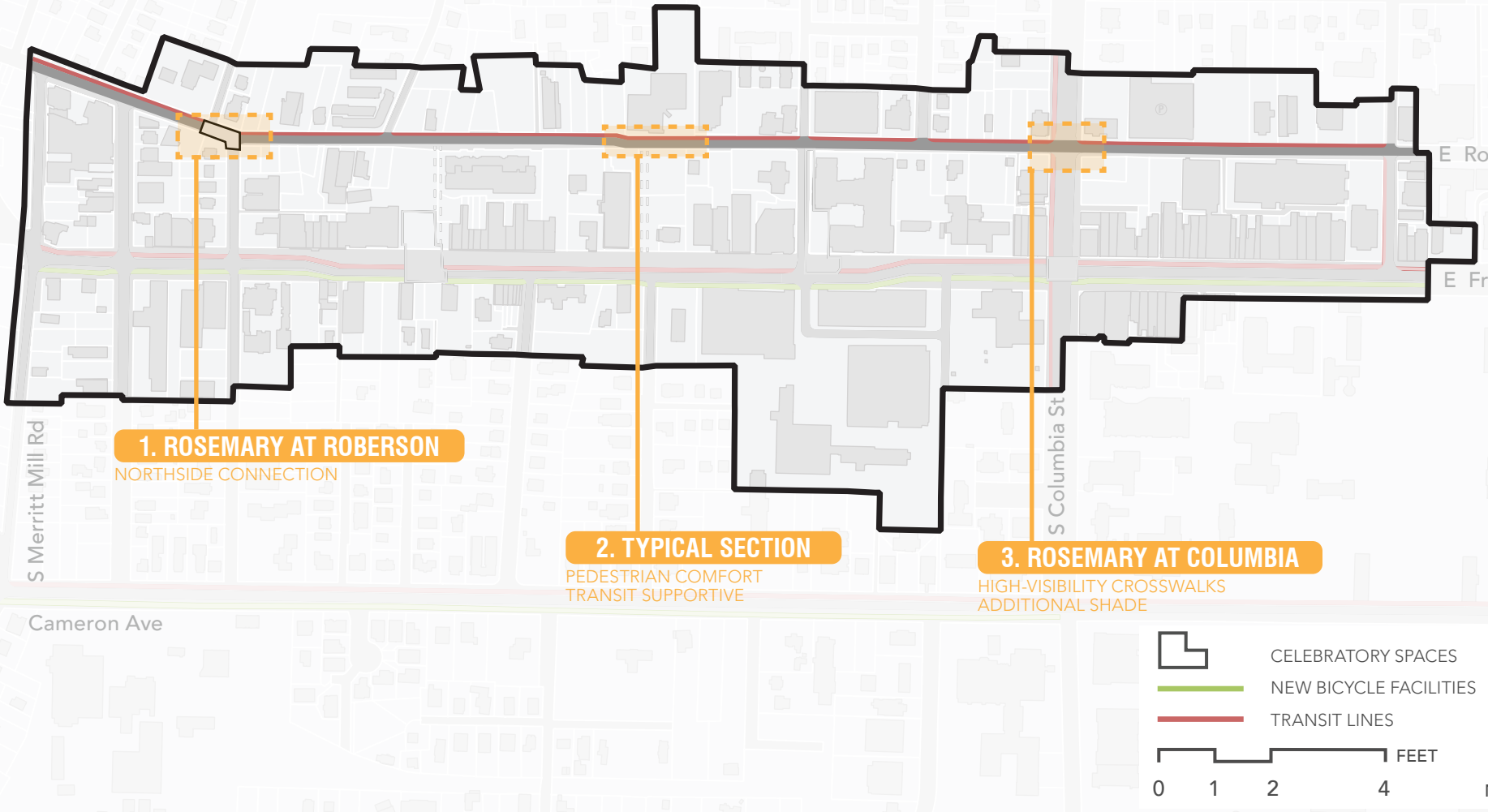
Role: Strengthen Transportation System

» Develop or enhance connections between Franklin and Rosemary

» Create a comfortable pedestrian environment

» Distribute vehicle turns to relieve pressure on key intersections

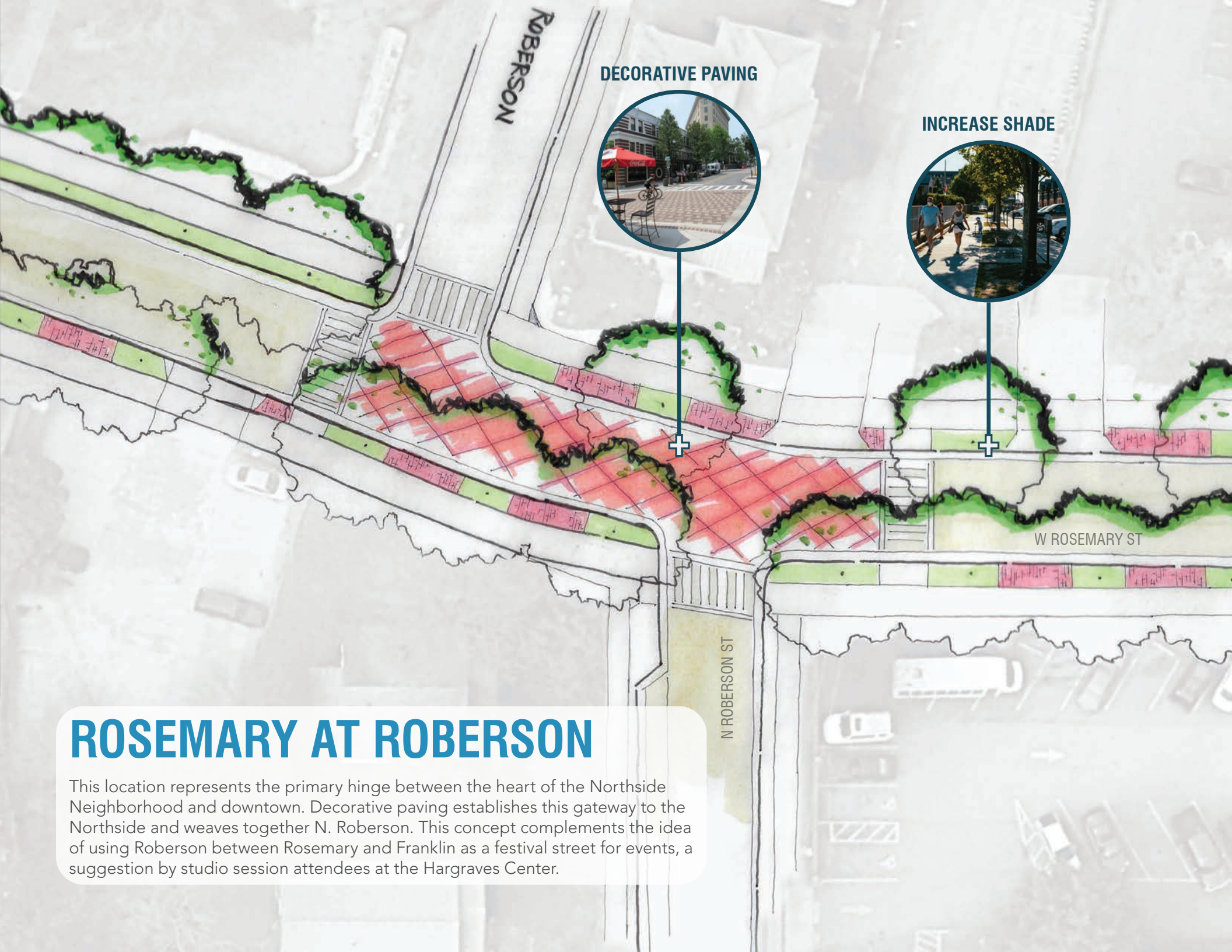
» Formalize crossings and implement safety elements



ROSEMARY STREET

Rosemary Street has the opportunity to be the key gateway to downtown. With limited right-of-way available this corridor cannot support all modes safely and comfortably. The concept removes the existing buffered bicycle lanes to provide a higher-quality pedestrian experience, complete with amenities to make Rosemary a pedestrian-oriented and transit-supportive street. Removing bicycle lanes on Rosemary is recommended with the understanding safe and legible bicycle routes will be provided on key north-south streets and paths to connect people between Cameron, Franklin, and across Rosemary.

Reducing the roadway width and creating a sense of enclosure with trees will provide traffic calming. A series of celebratory street spaces highlight the distinct character changes along the corridor. Making Rosemary an exceptional pedestrian experience will contribute to its ability to support transit users.



ROSEMARY AT ROBERSON

This location represents the primary hinge between the heart of the Northside Neighborhood and downtown. Decorative paving establishes this gateway to the Northside and weaves together N. Roberson. This concept complements the idea of using Roberson between Rosemary and Franklin as a festival street for events, a suggestion by studio session attendees at the Hargraves Center.

WIDER SIDEWALKS

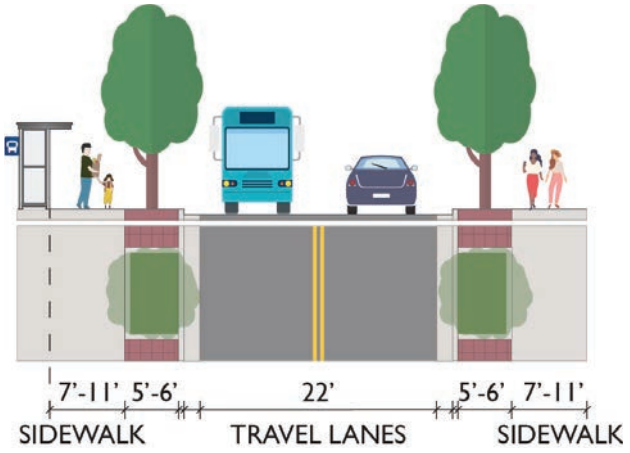
DESIGNATED LOADING/ UNLOADING ZONES

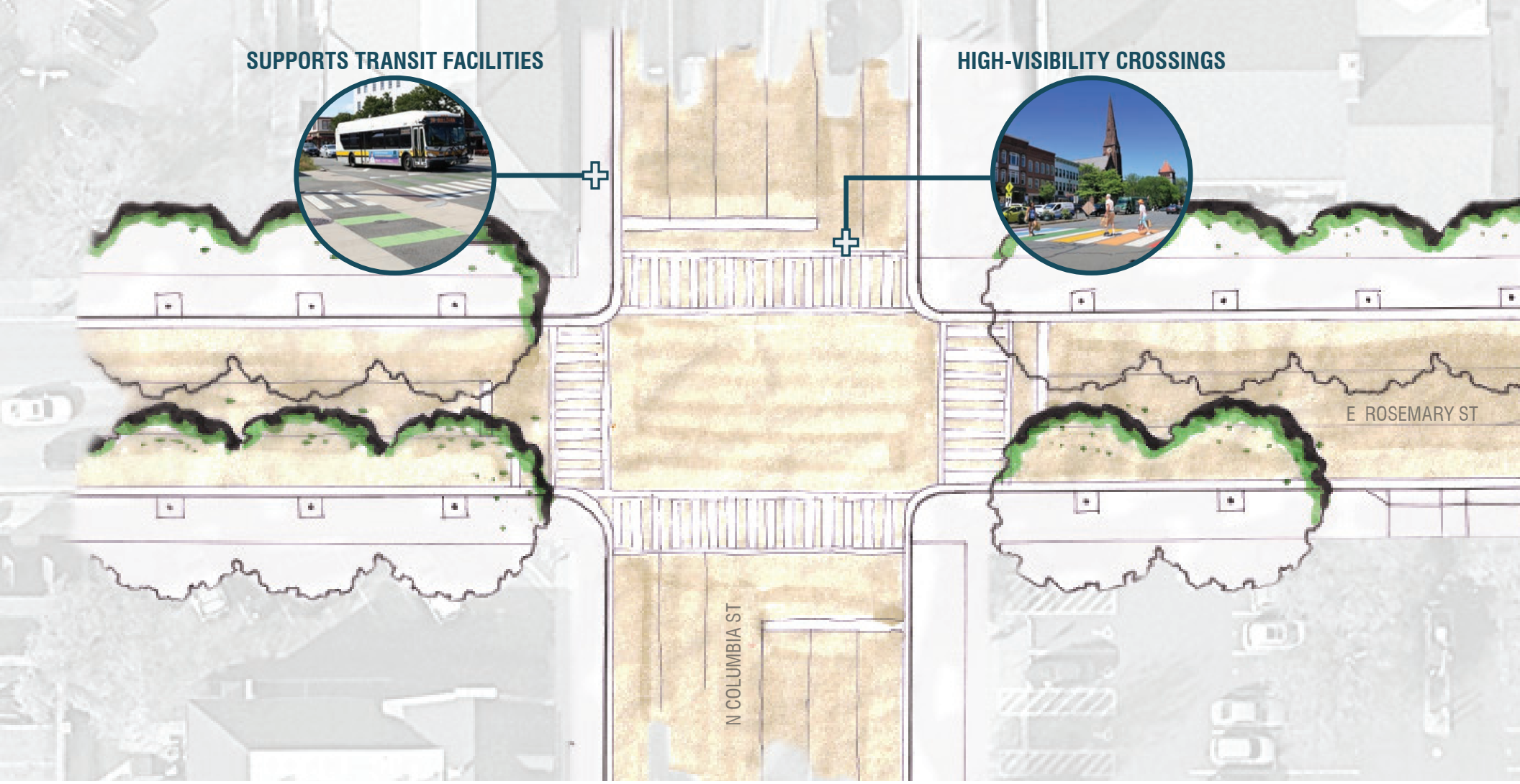
W ROSEMARY ST

TYPICAL SECTION

The proposed section narrows the roadway by approximately 10′. This shortens crossing distances and creates room for street trees along the entire corridor. Sidewalks widen from 5′ on average to 7′ minimum. The landscape area can be discrete or included in an extra-wide sidewalk that supports new uses such as sidewalk shopping and cafe dining.

Transit shelters are proposed outside the current right-of-way through agreements with property owners and developers. Transit pull-overs are not recommended as transit should stop in the street to increase reliability and reduce delay.



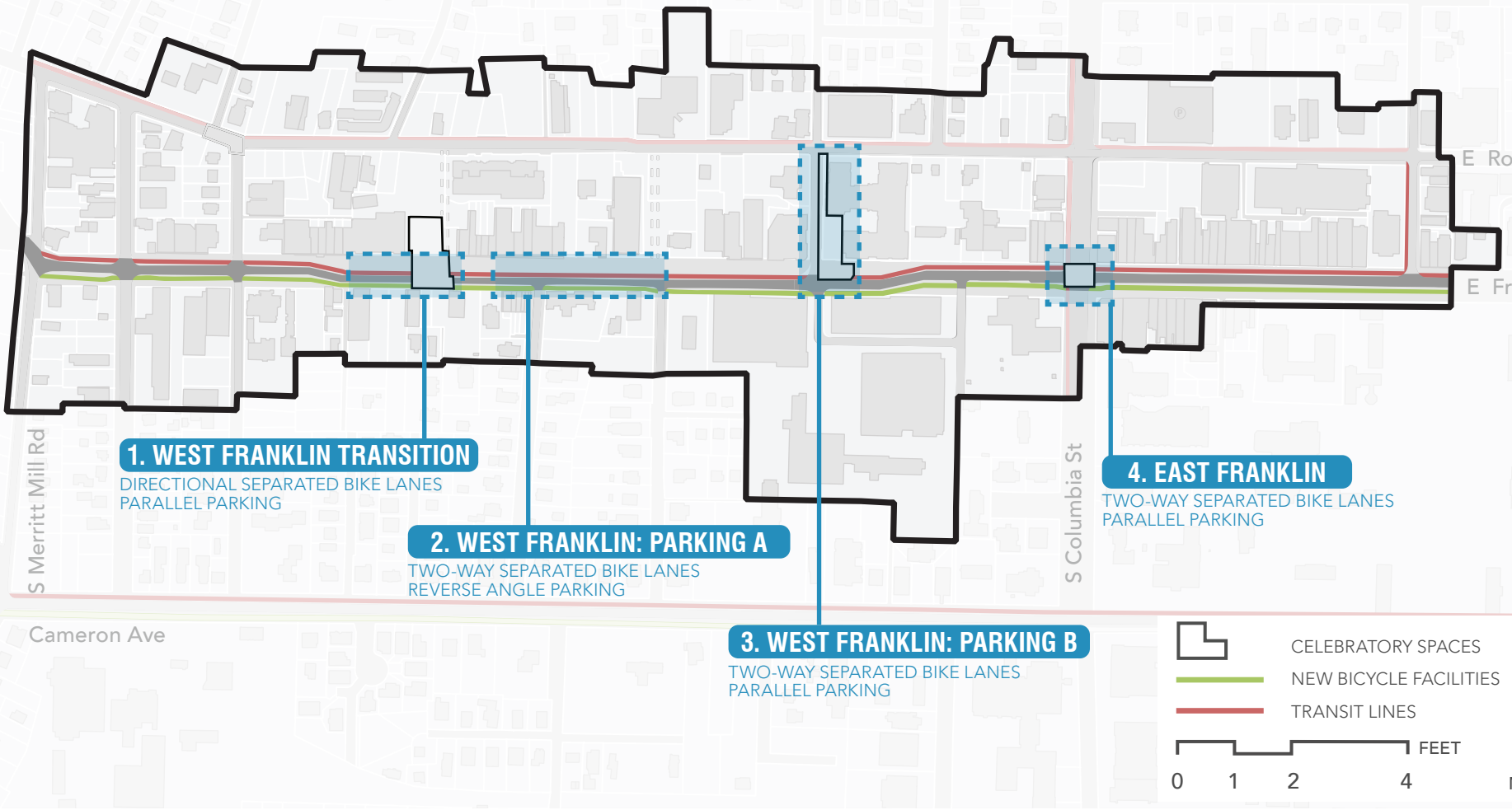


ROSEMARY AT COLUMBIA

The proposed concept for this intersection retains the existing number and configuration of travel lanes. Currently the bicycle lanes on Rosemary terminate west of this intersection due to the need for turn lanes. While removing turn lanes elsewhere across the network is feasible, keeping left turn lanes here is critical to absorbing some of the turning movements that are anticipated to shift away from the Franklin-Columbia intersection, where a lane removal is proposed.

In the near future, the E. Rosemary Parking Deck will be complete just east of the intersection and BRT stations will be built on the south side of the intersection.

Infrastructure changes such as high-visibility crossings, wider sidewalks, and street trees will provide more comfort for pedestrians passing through and those waiting for a bus. Operational changes to signalization such as Leading Pedestrian Intervals and longer crossing countdowns will also be key.

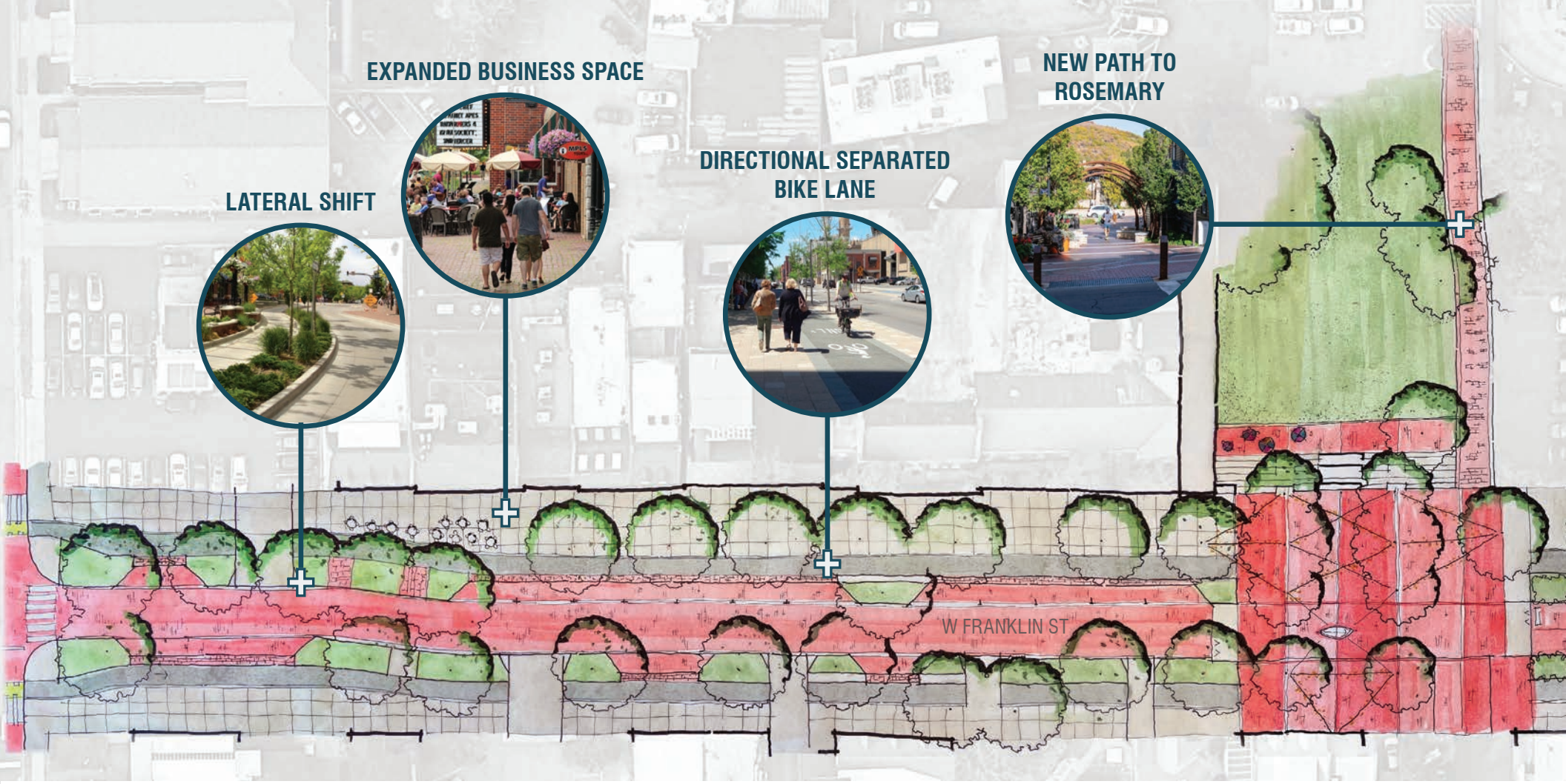


FRANKLIN STREET

The concepts for Franklin increase pedestrian space, formalize the bikeway, provide on-street parking and loading, increase shade, and create the environment for memorable experiences through playful and community-oriented spaces. This is achieved by reallocating space and reducing roadway width.

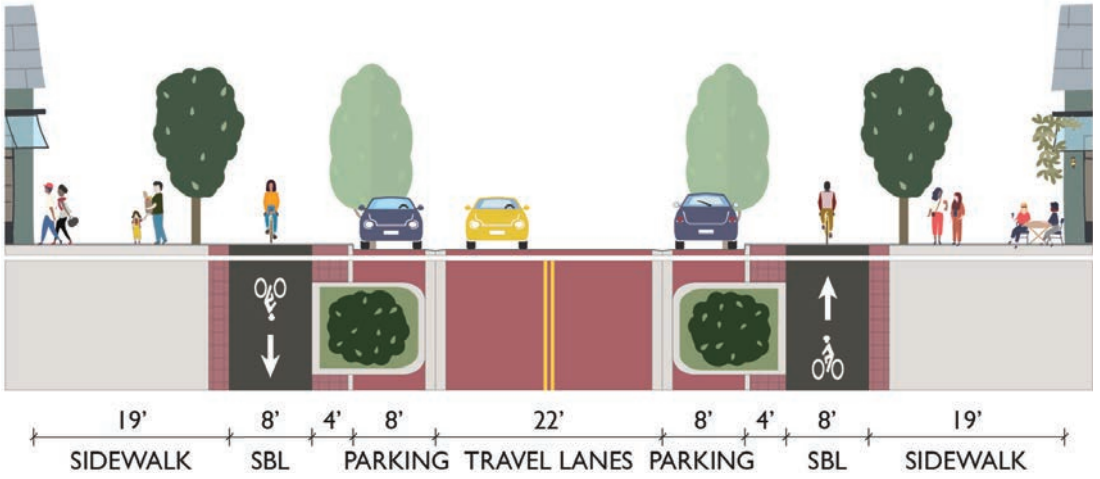
Directional separated bike lanes are recommended far west on Franklin for the transition to Carrboro. A two-way separated bike lane on the south is recommended for remainder of Franklin. This addresses public feedback, saves space needed to buffer bikes from vehicles, and directly connects to UNC.

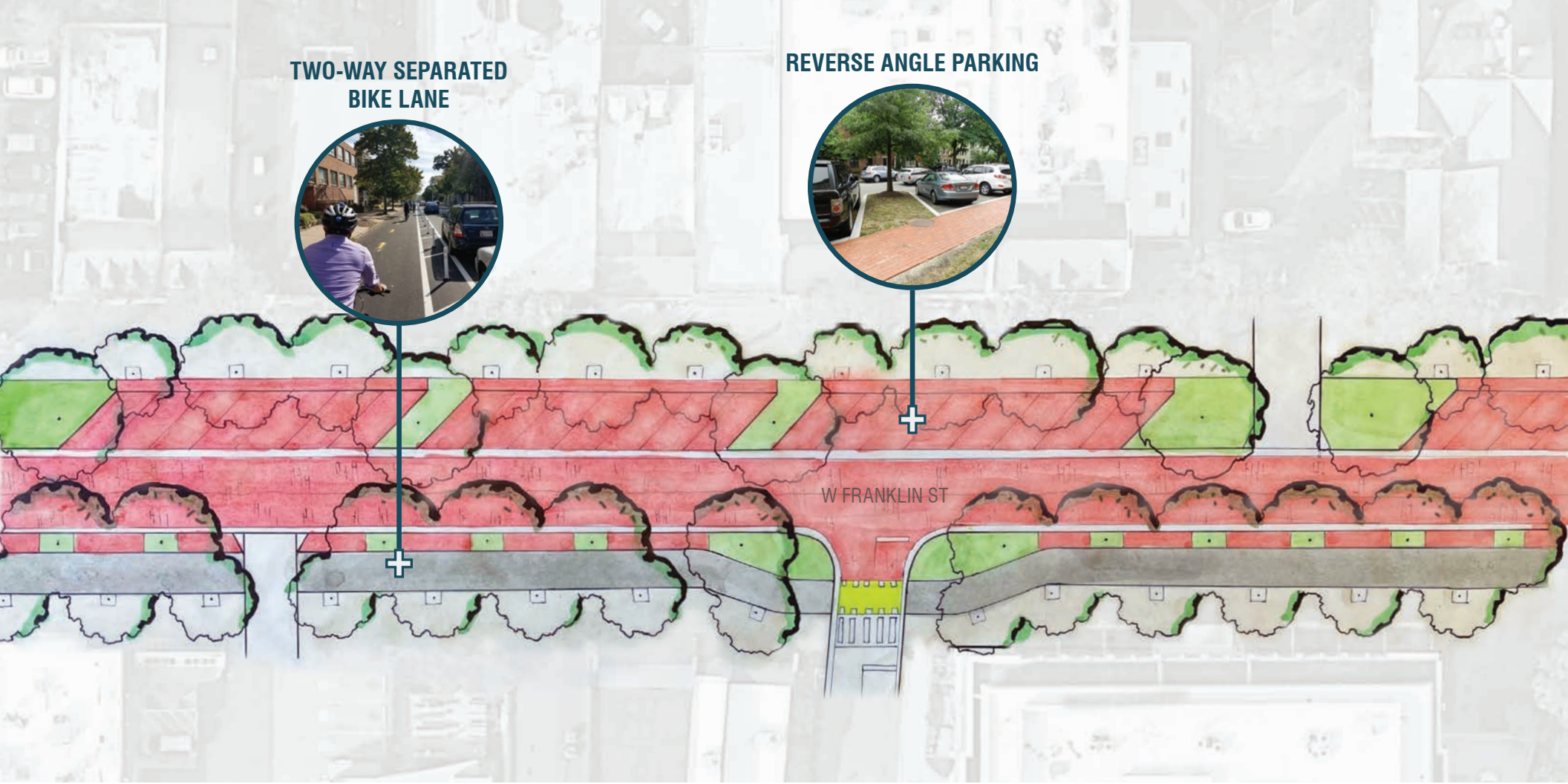
It also creates an urban greenway feel as two-way bike traffic and pedestrians move in parallel paths. Two lateral shifts in the roadway alignment on W. Franklin would provide additional traffic calming and mitigate visibility issues with glare from the setting sun when traveling west.



WEST FRANKLIN TRANSITION

This section includes narrowing the roadway to two travel lanes with parallel parking on both sides. The directional separated bike lanes are outside of the roadway with a door-zone buffer. A lateral shift in the road just east of N. Roberson will slow down vehicles. The underutilized sunken garden can be a public space with a new shared use path to Rosemary. The sunken garden becomes a focal point of the corridor and place for community events and activities. Elevating Franklin to a flush street at the garden makes a seamless pedestrian crossing.

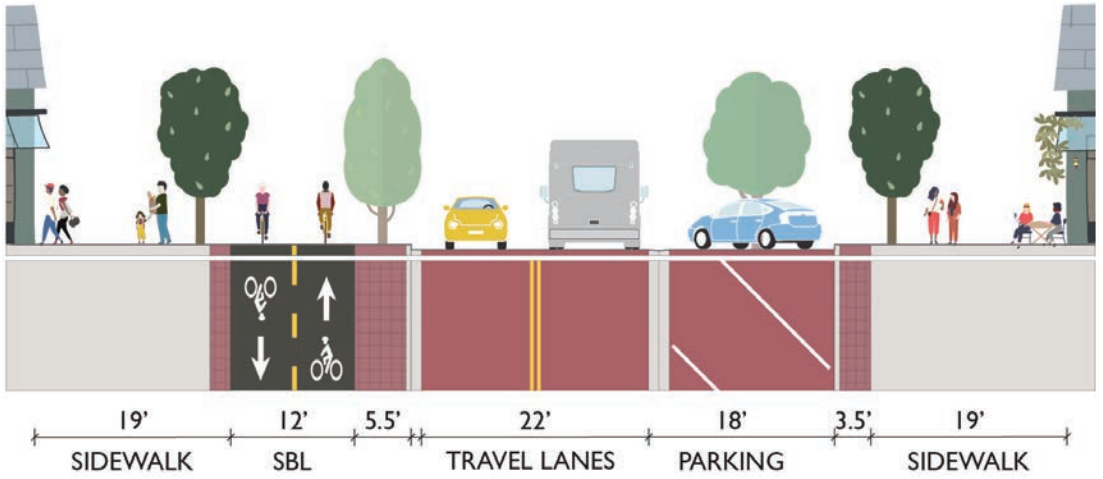


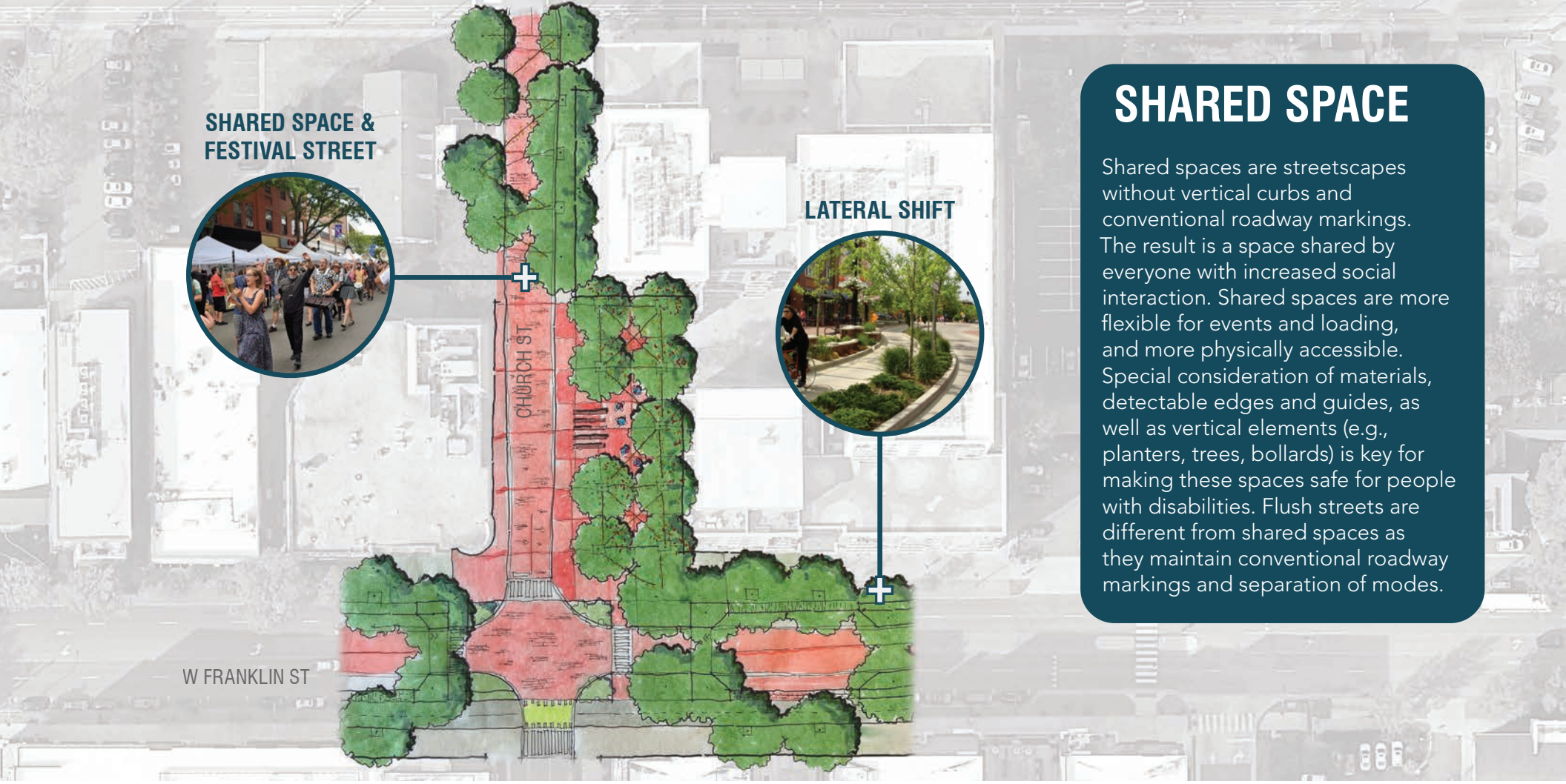


WEST FRANKLIN: PARKING A

The West Franklin: Parking A and Parking B concepts show options for configuring on-street parking in relation to the two-way separated bike lane on W. Franklin. The upcoming Streetscape Study will determine the specific configuration of parking and loading for each block.

This section includes narrowing the roadway to two travel lanes and reverse angle parking on the north, opposite a two-way separated bike lane. Reverse angle parking is safer and more efficient than parallel parking. Separating parking from the bikeway further reduces conflicts.



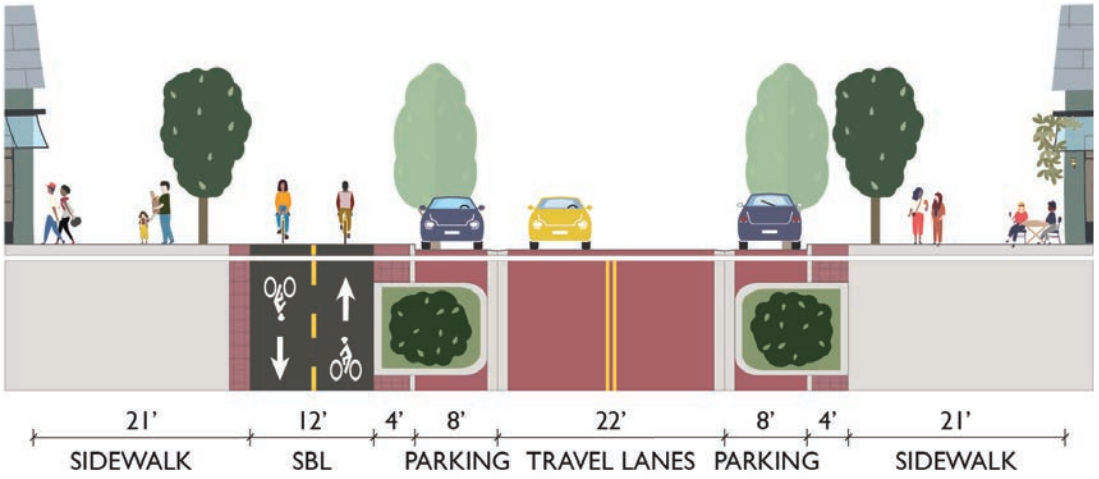


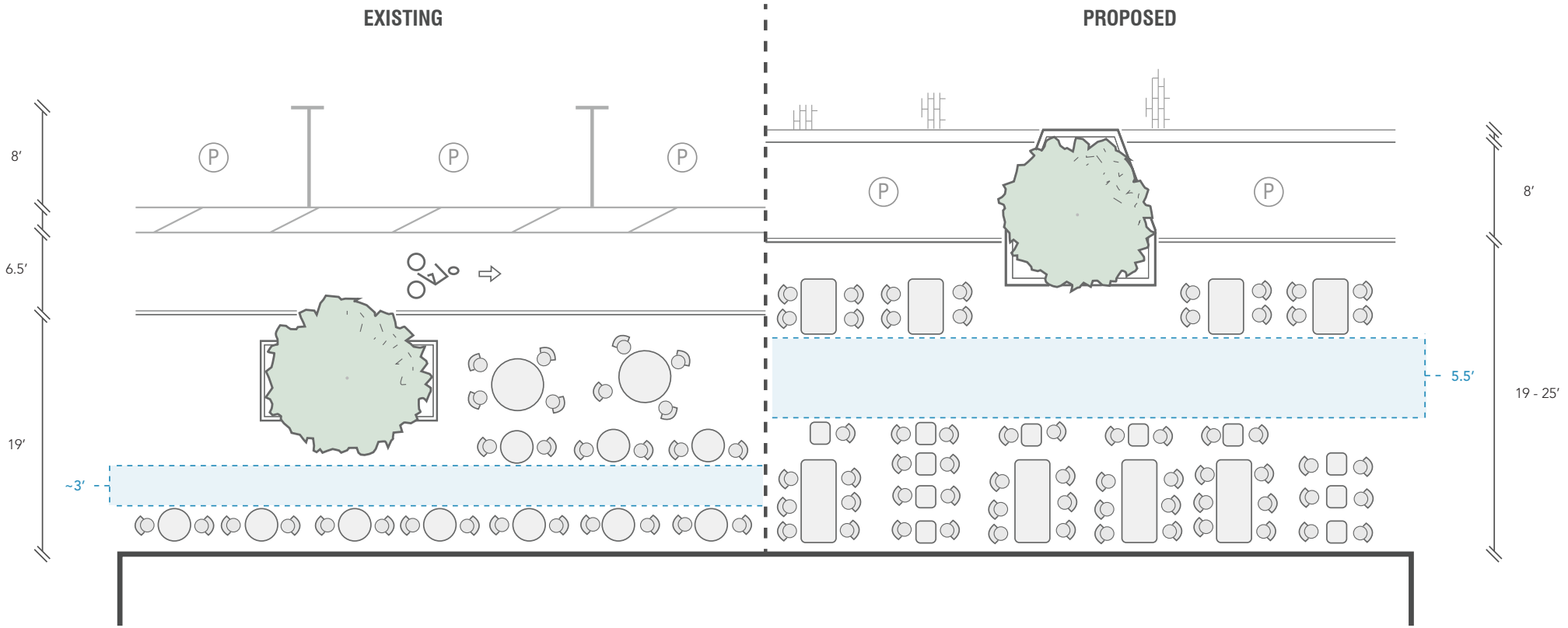
SHARED SPACE

Shared spaces are streetscapes without vertical curbs and conventional roadway markings. The result is a space shared by everyone with increased social interaction. Shared spaces are more flexible for events and loading, and more physically accessible. Special consideration of materials, detectable edges and guides, as well as vertical elements (e.g., planters, trees, bollards) is key for making these spaces safe for people with disabilities. Flush streets are different from shared spaces as they maintain conventional roadway markings and separation of modes.

WEST FRANKLIN: PARKING B

This section includes narrowing the roadway to two travel lanes with a two-way separated bike lane on the south and parallel parking on both sides of the street. This option maintains the same parking configuration proposed for the W. Franklin Transition and E. Franklin. It also maximizes pedestrian space. Regardless of how parking is arranged on W. Franklin, Church Street is envisioned as a shared space that seamlessly transitions into the plaza. Decorative materials and street trees contribute to traffic calming and sense of place.

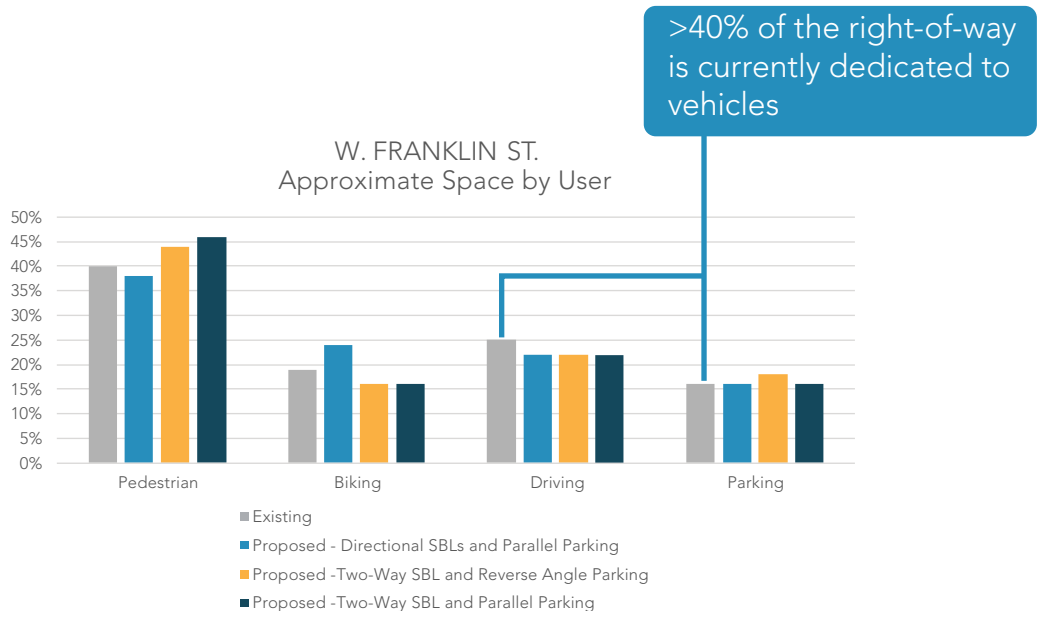




STREET SPACE BY USER

All the concepts presented for W. Franklin show options for reallocating the right-of-way for different users. The graphic above illustrates how right-sizing the road by shifting curb lines can create additional space for pedestrian routes and outdoor dining.

The chart to the right shows how street space by user differs between concepts, as compared to the approved design plans for the current configuration of W. Franklin.

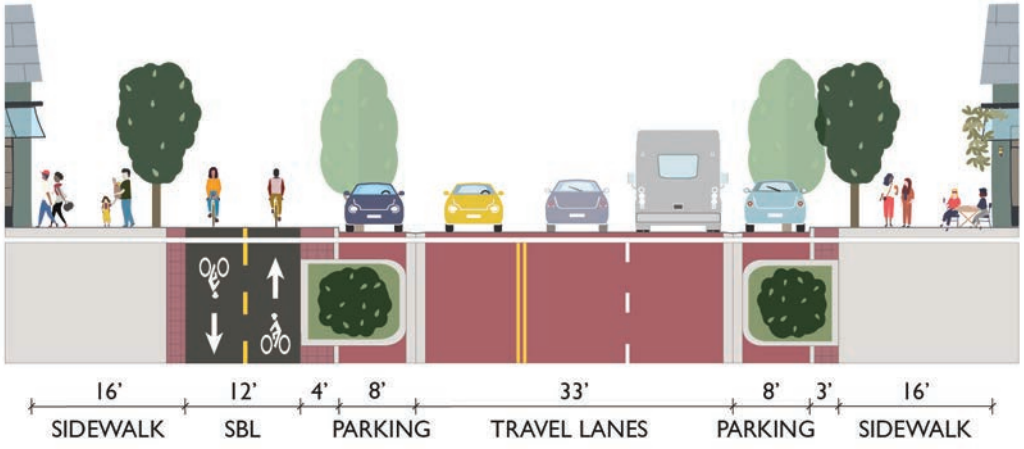


PHOTOREALISTIC RENDERING FACING WEST FROM COLUMBIA

FLUSH STREET

EAST FRANKLIN

Path as Place is key at this intersection where there is extreme demand by all users and extreme significance in the physical place - the top of the hill. Removing one eastbound lane on E. Franklin and the right-only turn lanes, makes space to maintain the existing sidewalk width, extend the two-way separated bike lane, and retain parking and loading on both sides of the street. Converting E. Franklin and this intersection in to flush streets make the space more supportive of festivals and celebrations.

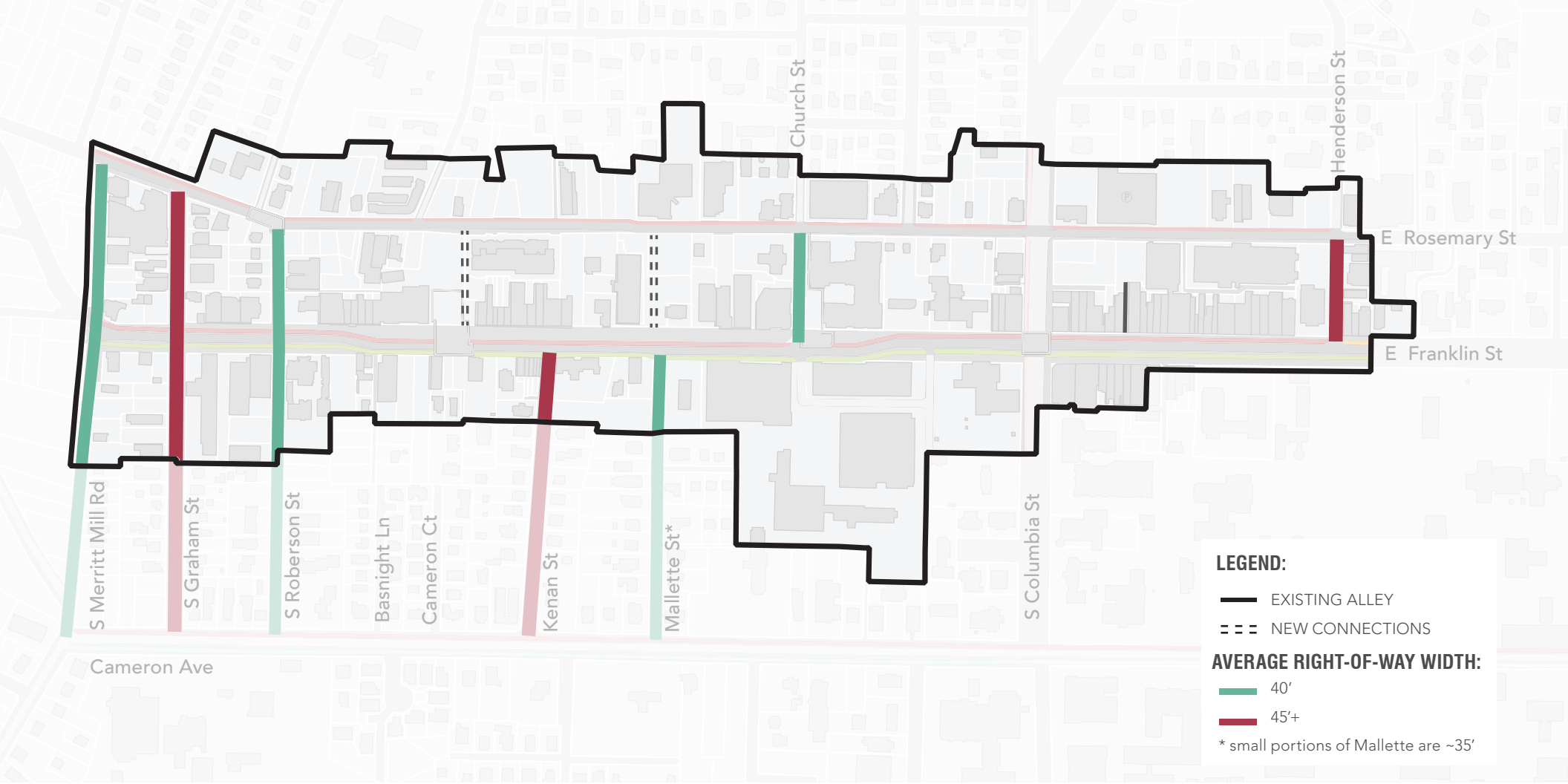


CAMERON AVENUE

The low-volume traffic, mature willow oaks, and direct connection from the Libba Cotton Greenway into the heart of UNC make Cameron a popular walking and biking route. Land use is mostly residential with many fraternity houses, the Carolina Inn, and the Cogeneration Power Substation. The low density of destinations and fewer eyes on the street affect how people move on Cameron. The existing bike lanes lack separation from vehicles and end one block west of campus.

The existing road is 45’ wide and a resurfacing project for the street is an opportunity to create a continuous high-comfort bikeway into UNC by reallocating roadway space and balancing the needs of bicyclists and motorists. Removing on-street parking or left turn lanes will be critical to providing an adequate buffer for bicyclists. Without removing a travel lane between Pittsboro Street and Columbia Street, users will be forced to merge into a shared lane condition.

A two-way separated bike lane requires less space than directional separated bike lanes and, if pursued, should be a minimum of 10’ wide. A bike lane buffer with vertical delineators that is 2’ wide minimum is also best practice for separating bicycles from vehicles. The images above show various types of buffer treatments. Additional considerations for such a project include access to bus stops, location of waste and recycling bins, leaf collection in the bicycle lane, and context-sensitive lighting.



B STREET NETWORK

Rethinking north-south links between Rosemary and Cameron is the only way to offer a connected, cohesive experience that effectively uses the entire network. Some areas of B Streets provide experiences similar to what is found on Franklin. In general, B Streets should contribute more to mobility in downtown and better wayfinding should make these connections easy to identify. Recommendations for B Streets are based on average right-of-way width, as shown above.

STREETS WITH AVERAGE WIDTHS OF ~40'

- 5' wide sidewalks on both sides of the street.
- Landscape buffer between each sidewalk and the curb, or landscape space integrated into a wider sidewalk.
- Two-way traffic with 10' wide travel lanes. Transit not anticipated on these streets.

STREETS WITH AVERAGE WIDTHS OF ~45'+

Beyond the elements provided on ~40' streets, wider streets can offer a combination of:

- On-street parallel parking
- Separated bike lanes
- Traffic calming measures
- Landscaped curb extensions

MOVING THE VISION FORWARD

This Study is the first step in taking a comprehensive look at how streets and public spaces in Downtown Chapel Hill can be reimagined and reconfigured to prioritize the experience of people seeking to enjoy downtown and to increase safety, while balancing the needs of all roadway users. The action items below should be used alongside the guiding principles, design elements, and mobility concepts in this document to move the mobility vision for Downtown Chapel Hill forward.

COMMIT TO THE PUBLIC REALM

Prioritizing a high-quality, comfortable, and engaging pedestrian experience is central to attaining the vision for Downtown Chapel Hill. Not only is every patron of downtown businesses a pedestrian at some point, but pedestrians bring energy and vitality to the public realm.

Wide sidewalks are not enough for a dynamic downtown. The relationship of the pedestrian realm to the street and buildings is paramount. Broadly, this entails consideration of building frontage zones, pedestrian through zones, and furnishing zones as well as driveway or vehicular accesses that cross over these zones. The upcoming streetscape study for downtown should ensure the goal of more pedestrian space and comfort comes to fruition through specific design details.

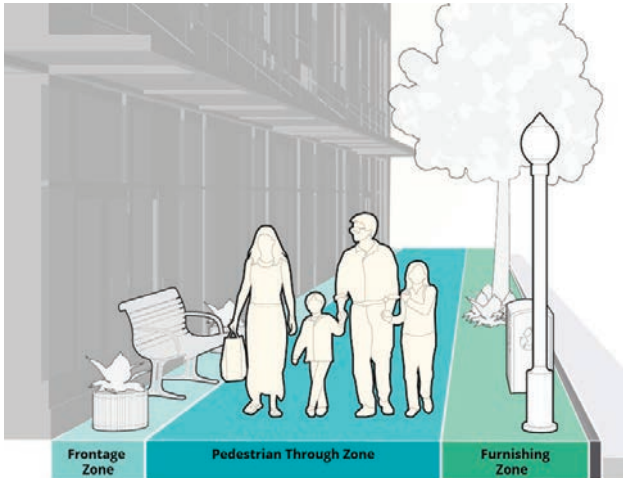
BE STRATEGIC ABOUT SEPARATING USERS

Providing separation between modes should be considered in relation to vehicle speed and volume. Buffers that provide both horizontal distance and vertical delineation from other users contribute to safety and can make the street more legible for all.

When designed properly, purposeful mixing of modes can also help achieve mobility goals. The design schemes of flush streets and shared spaces help maintain access for all users while prioritizing pedestrians, slowing vehicles, efficiently using the right-of-way, conveying importance of place, and encouraging social interaction.

RIGHT-SIZE THE ROADWAYS

Balancing the needs of all roadway users and making use of the entire network of streets in downtown highlights the need to right-size roadways. Making significant infrastructure changes, such as reconstructing roads and moving curb lines, can be costly. However, a few extra feet can make a big difference for safety and comfort (e.g., providing a bicycle lane buffer). Significant gains can be made for both mobility and environmental sustainability by right-sizing roads. By reallocating space to create an inviting public realm and for supporting vulnerable roadway users. And, by converting pervious surfaces into areas with vegetation or permeable paving systems. Once ideas are tested, committing to transformative change is the next step.



OPTIMIZE PARKING & LOADING

Just as streets are not single-use spaces, access to the curb is a commodity in downtowns that must be managed. In downtowns, parking and loading should encourage higher turnover than in other contexts. The Town continues to invest in data-driven systems for managing on-street and off-street parking in downtown, as well as efficient parking infrastructure (e.g., the E. Rosemary Deck). Encouraging people to rely less on vehicles and potentially walk further distances is more feasible when there is a compelling reason to do so.

INTEGRATE OPERATIONAL CHANGES

Operational changes are one way to start testing ideas that affect mobility in downtown. The Town manages signal timing for vehicles and pedestrians on all downtown streets, including Franklin. Signal timing and syncing, pedestrian countdowns, left turn phasing, new bicycle signals, and new leading pedestrian intervals (LPIs) are all options for influencing mobility without major investments.

Operational changes are also a way to pursue a phased approach to implementation. The Town may decide to work with GoTriangle to amend transit routes through downtown in a phased manner. This could prove particularly fruitful once Rosemary becomes more comfortable for people walking and taking transit.

TEST OUT LONG-TERM CHANGES

W. Franklin looks dramatically different than it did just 5 years ago. The Town of Chapel Hill, with NCDOT, have piloted various configurations of travel lanes, bike lanes, and parking without moving curb lines or reconstructing the roadway. Businesses have transformed sections of underutilized sidewalk into custom streetside dining experiences.

Testing ideas will continue to be crucial moving forward. This is especially true for changes on E. Franklin, such as removing right-only lanes at Columbia and an eastbound travel lane between Columbia and Henderson. Pilot projects should remain in place long enough for users to acclimate to the changes and should coincide with the Fall and/or Spring semester at UNC.