

CRAWFORD CORRIDOR

REVITALIZATION STUDY - SEPTEMBER 2019

PORTSMOUTH, VIRGINIA

PREPARED BY:

VOLKERT

FINAL SUBMISSION



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PORTSMOUTH, VIRGINIA

PREPARED FOR:
THE CITY OF PORTSMOUTH
801 CRAWFORD STREET - 4TH FLOOR
PORTSMOUTH, VA 23704

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EXECUTIVE SUMMARY

The Crawford Corridor Revitalization Study is a product of extensive time and effort invested by City of Portsmouth citizens, community leaders, staff, and consultants. The study articulates a vision based on values and aspirations set forth by the City of Portsmouth and its citizens.

The strategy for the Crawford Corridor Revitalization Study was to convene a team of experts from key disciplines to engage the public and to provide an implementation plan through clear and consistent goals and policies. The Study outlines a specific implementation plan for the redevelopment of the Crawford Corridor by establishing a vision grounded in reality and action strategies the City can take over time to achieve the desired future for this portion of Downtown Portsmouth.

The Study was developed during the course of a one-year planning process that included extensive citizen and stakeholder involvement, as well as coordination with City leaders. The Study development was guided by the citizens and stakeholders of Portsmouth, who participated in two rounds of information sharing and idea generating work sessions and a final public meeting prior to delivery to City Council for consideration and adoption.



ACKNOWLEDGMENTS

The Crawford Corridor Revitalization Study reflects the culmination of a year long research and design process to establish a vision for the Crawford Corridor. We would like to acknowledge those who helped make the project possible.

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GLOSSARY OF TERMS

amenity	design features which are valued by the users of a building or public space; examples of amenities include compatible architecture, open space, landscaping, seating, and public art
average daily traffic (ADT)	the average numbers of vehicles passing a fixed point in a 24-hour period; a conventional measurement of traffic volume
barrier-free design	building and site design which is ADA compliant and accessible to all people, regardless of age or abilities (see universal design)
biodiversity	the variety of plants and animals and other living things in a particular area or region
bioretention	the process of capturing stormwater runoff, absorbing and retaining pollutants, and then infiltrating, transpiring, or evaporating the water.
bioretention planter	a bioretention facility with walled vertical sides on all four sides of the facility, a flat bottom area, and a large surface capacity to capture, treat, and manage stormwater runoff from a contributing area
bulb out	an expansion of the curb line into the roadway either for a portion of a block, at a corner, at an intersection, or mid-block. At the curb extension, the curb-to-curb roadway width is reduced. Curb extensions define parking lanes and enhance pedestrian safety by reducing crossing distances and provide additional space for sidewalk amenities, bioretention facilities, transit boarding, and/or street trees
complete streets	streets that are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities
crosswalk	legally designated location for pedestrians to cross from one side of a roadway to the other often marked with white striping and controlled by pedestrian signals
curb cut	location where the sidewalk curb is depressed to the level of the roadway, either for a curb ramp, driveway, or other feature
curb radius	radius defining the sharpness of the curve that the curb or edge of the sidewalk follows as it turns a corner
curb ramp	location where the curb is depressed to the level of the roadway to provide a flush transition from the sidewalk to the roadway, enabling accessible pedestrian street crossings

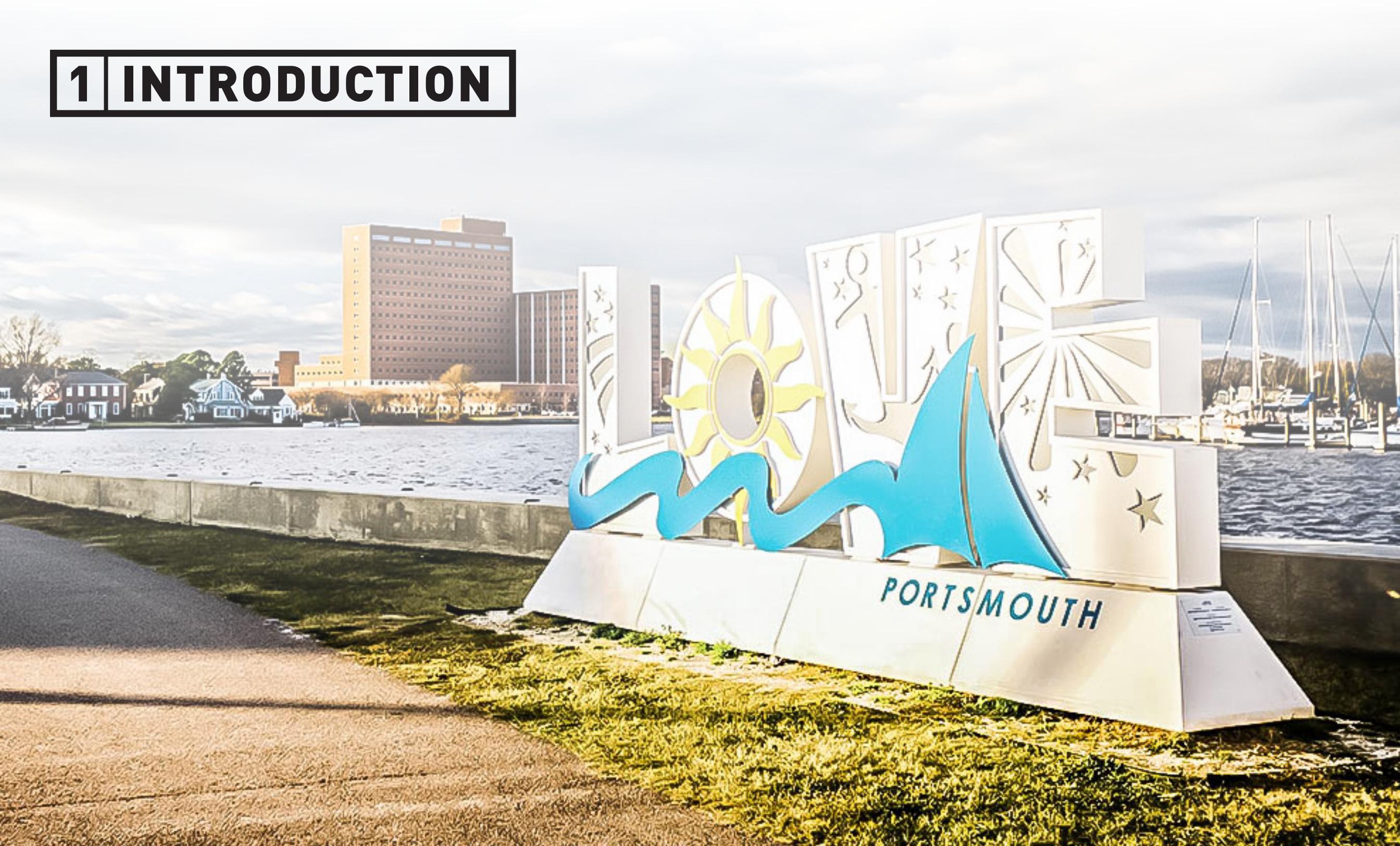
cycle track	an exclusive, physically separated bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane.
design storm	a rainfall event of specified intensity and frequency that is used to calculate the runoff volume and peak discharge rate for the design of stormwater treatment facilities (for the purpose of this study a 10-year design storm was used)
design vehicle	type of vehicle used to determine appropriate roadway design characteristics such as curb radius
detectable warning	a surface feature of truncated dome material built in or applied to the walking surface to advise of an upcoming change from pedestrian to hazardous vehicular way
dooring	traffic collision caused by a driver opening a car door into the path of a cyclist
edge zone	portion of the sidewalk between the curb and the furnishing zone, used for getting in and out of parked vehicles
enclosure	an experience in which a pedestrian feels sheltered with a semi-private realm, buildings, trees, landscaping, and street widths are all factors in creating a sense of enclosure
facade	the exterior wall of a building exposed to public view or that wall viewed by persons not within the building
frontage zone	portion of the sidewalk adjacent to the property line edge, which may be used for merchandise displays, outdoor seating, or other business activity
furnishing zone	portion of the sidewalk between the edge zone and the walking zone that contains the majority of street trees, plantings, lighting, and site furnishings
grid	a traditional method of land subdivision which results in the creation of square or rectangular blocks and public streets which intersect at right angles
historic district	a geographically definable area with a significant concentration of buildings, structures, sites, spaces, or objects unified by past events, physical development, design, setting, materials, workmanship, sense of cohesiveness, or related historical and aesthetic associations
human scale	the quality of the physical environment which creates a sympathetic proportional relationship to human dimensions and which contributes to the humans perception and comprehension of the size, scale, height, bulk and/or massing of buildings or other features of the built environment

level of service (LOS)	term for the measurement of how well automobile traffic “flows” on a roadway system or how well an intersection functions
medians	area in the center of the roadway that separates directional traffic. Medians may be painted and leveled with the surrounding roadway or “raised” using curbing
mixed-use	a development comprised of mixed land uses either in the same building or in separate buildings on either the same lot or on separate nearby sites
multi-modal transportation	refers to a transportation system that considers various modes or ways of getting around (public transit, walking, biking, car, etc.)
node	a hub of activity
opportunities	features within the corridor that can be enhanced or altered to create a better experience for all users
parklet	a re-purposed part of the street (usually 1-2 parking spaces) that provides seating area or other amenities for people; can either be temporary or permanent structure
pedestrian signal	traffic signal specifically aimed at directing pedestrian movement, such as ‘walk/don’t walk’ or the international pedestrian symbol signal
pedestrian-oriented	an environment designed to make movement by pedestrians fast, attractive and comfortable for various ages and abilities
placemaking	a multi-faceted approach to the planning, design and management of public spaces. Placemaking capitalizes on a local community’s assets, inspiration, and potential, with the intention of creating public spaces that promote people’s health, happiness, and well being
programming	assigning a specific use to a given space and supplying the assets needed to participate in that use
protected bike lane	bike ways that are at street level and use a variety of methods for physical protection from passing traffic
public art	site-specific works of art to enhance and animate public space; public art may exist in a variety of forms, from freestanding sculpture to well-crafted street lights and benches

public/private partnership	a mechanism for using the private sector to deliver outcomes for the public sector, usually on the basis of a long term funding agreement
public realm	the public and semi-public spaces of the city, especially the street spaces of the city from building face to the opposite building face (including the facade, front yard, sidewalk and streets) and open space such as parks and squares
resilient	the ability of a city to adapt and respond to opportunities and future challenges
right-of-way (ROW)	the part of the street space that is publicly owned and lies between the property lines
setback	the horizontal distance from the property line to the face of a building or from natural features to a building
streetscape	the visual appearance, physical forms, and character of a street, e.g.: roadways, medians, sidewalks, street furniture, crosswalks, signs, open space, and landscaping, among many other factors.
street furniture	municipal equipment placed along streets, including light fixtures, hydrants, trash receptacles, signs, benches, newspaper boxes and kiosks
strength	the existing assets within the corridor
SWOT analysis	for the purposes of this document it is a strategic planning tool used to evaluate the Strengths, Weaknesses, Opportunities, and Threats of the existing corridor
tactical urbanism	small-scale, often temporary, low cost project that enhances in the public realm and engages the community (e.g., painting a crosswalk or bike lane)
threats	existing conditions within the corridor that may inhibit it’s success in the future
traffic calming	changes in road alignment, installation of barriers and other physical measures to reduce traffic speeds in the interest of street safety and livability
universal design	design which is accessible to “all” people, regardless of age, disability, etc
urban heat island effect	the elevated temperature in urban areas as compared to rural, less developed areas caused by unnatural surfaces and increased human activities
weaknesses	features within the corridor that detract from the users’ experience

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1 | INTRODUCTION



INTENT + SCOPE

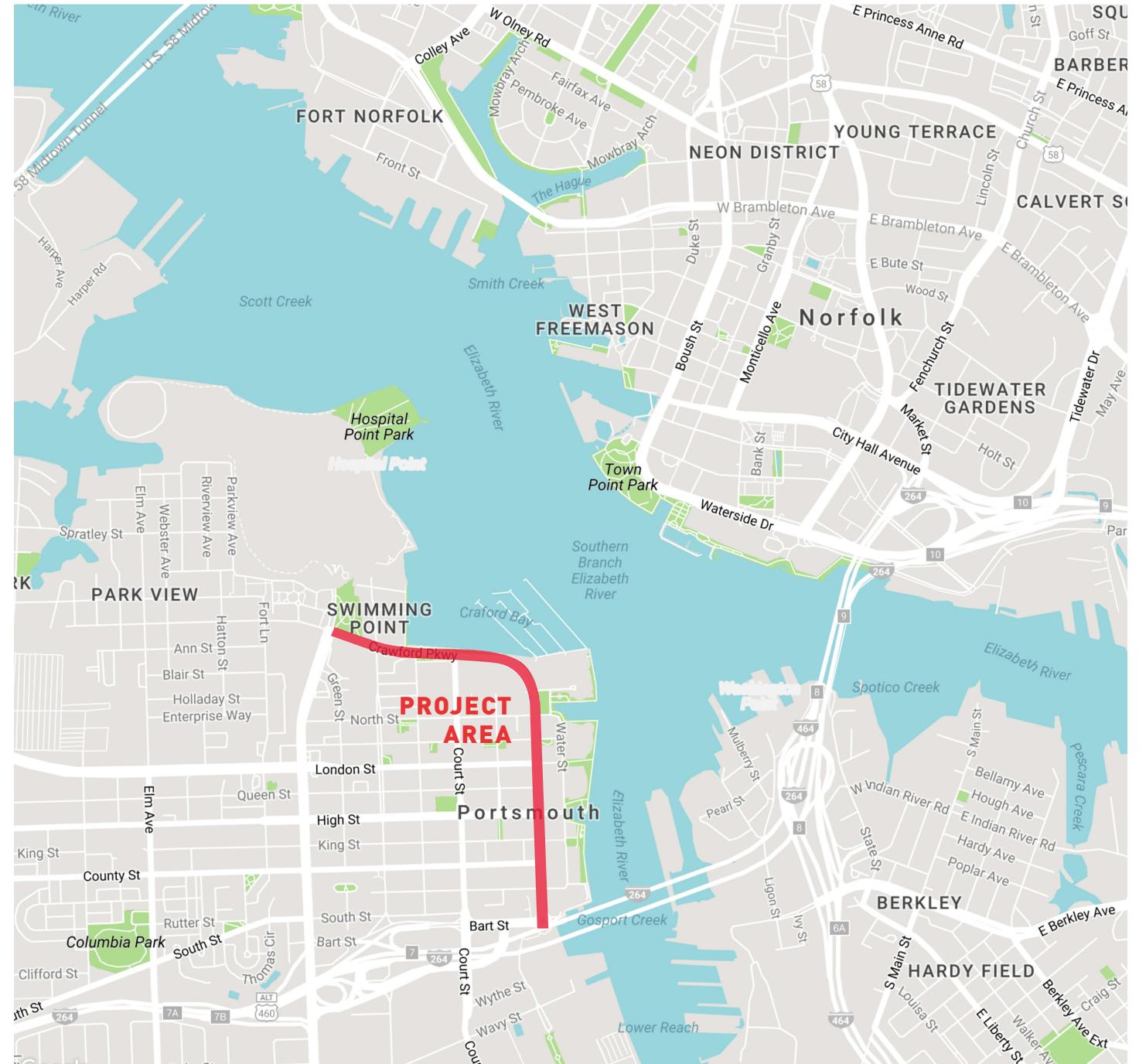
The purpose of this project is to provide a revitalization study for the Crawford Corridor from Bart Street to Effingham Street, a distance of approximately one mile. The study area is bounded on the west by Court Street and on the east by the Elizabeth River. The study includes a conceptual roadway extension of County Street from Crawford Street to Water Street. The study also includes conceptual designs and recommendations for Middle Street, County Street, King Street, and parts of Water Street.

Utilizing existing and projected traffic conditions improvement strategies are identified to satisfy the existing and future traffic demands, reduce congestion, and improve the pedestrian, vehicular, and bicycle mobility along the corridor.

In addition to roadway improvement strategies, the study provides recommendations for public realm enhancements along the entire length of the corridor as well as one block of connecting streets in both directions. The public realm enhancement recommendations focus on the streetscape from the back of curb to the face of building. Recommended enhancements address the character of the sidewalk and include material considerations, street furnishings, and placemaking opportunities.

The study utilizes a Complete Streets design approach to ensure all users of the corridor are accommodated in a manner that is equitable and provides a framework for future redevelopment within the area.

Upon completion and review of the final study by the City, the study will be presented to City of Portsmouth City Council for their consideration and adoption.



EXISTING CORRIDOR CONFIGURATION

For the purposes of this study, the Crawford Street corridor was divided into three (3) segments; the Downtown Segment, the Transition Segment, and the Olde Towne Segment. Crawford Street/Parkway offers a unique challenge when developing alternatives to create a uniform aesthetic along the almost one-mile long corridor. Similar design principles were employed with each segment to maintain a cohesive corridor. Below are brief descriptions for the segments as defined in this study.

DOWNTOWN SEGMENT

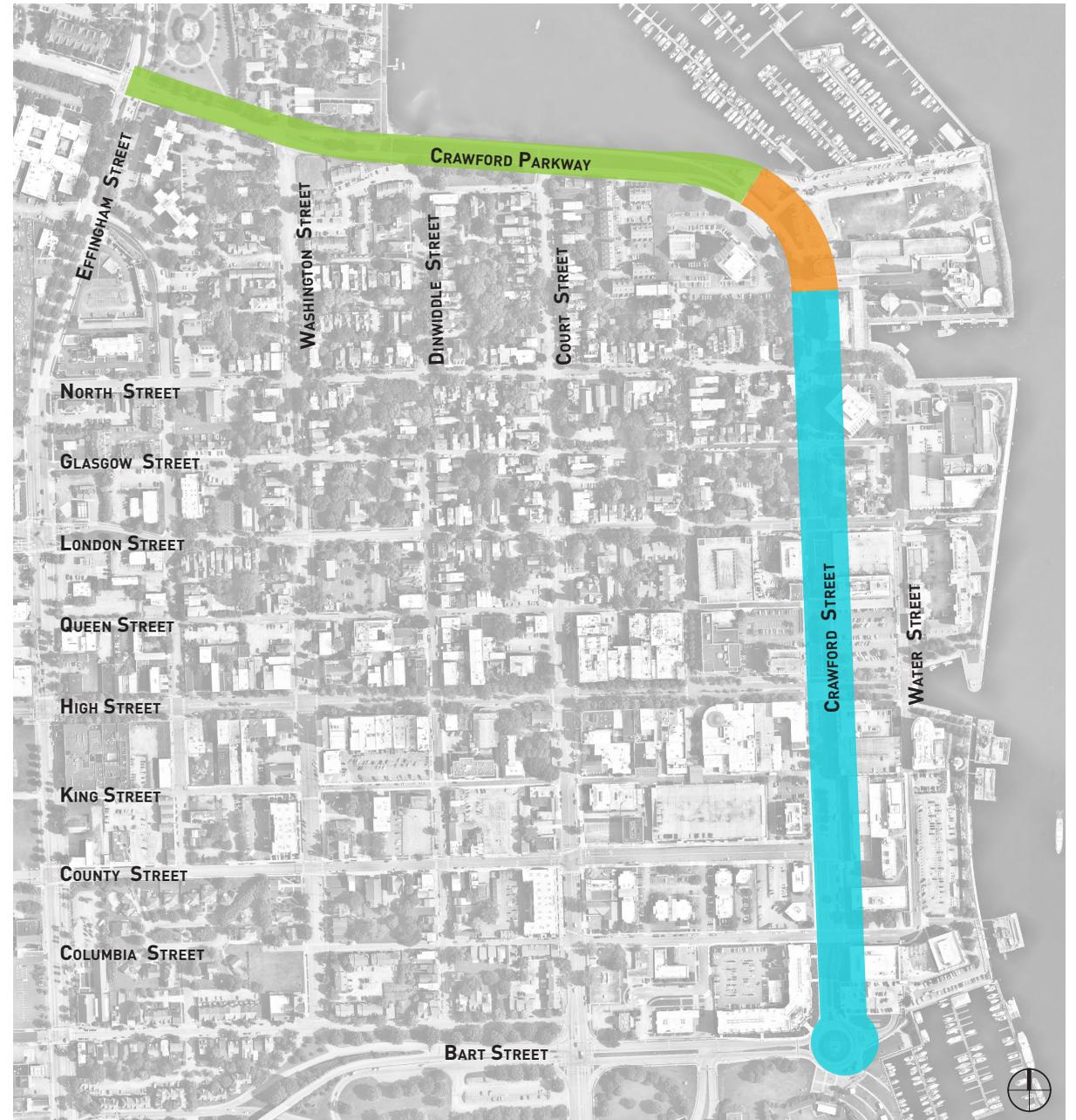
The downtown segment of the corridor extends from Bart Street to an area north of North Street. Considered the commercial/government district along Crawford Street, this segment is comprised of an existing four-lane divided roadway with on-street parking and bike lanes in each direction. Sidewalks are present on both sides of this segment for pedestrian access and vary in width from 8 to 15-feet.

TRANSITION SEGMENT

This segment is a small part of the corridor that transitions the roadway from a north-south street to an east-west parkway. It is within this segment that the four-lane divided roadway transitions to a two-lane undivided parkway. Within the limits of this segment, the bike lanes from the Downtown Segment have been eliminated and the sidewalks narrow to roughly 6-feet. Land-use adjacent to this segment includes a mixed use of development including commercial and residential.

OLDE TOWNE SEGMENT

This segment extends from just east of Court Street to Effingham Street and includes an existing two-lane divided roadway with a separated shared-use path with pedestrian-scale lighting bordering the Elizabeth River. Although the shared-use path connects to the sidewalk on the east side of Crawford Street, there is no bike connection through the transition zone. The Historic Olde Towne District is adjacent to this segment on the south side of the parkway however there is no sidewalk present on the south side of Crawford Parkway and only two pedestrian crossing from Olde Towne to the waterfront.



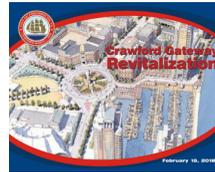
STUDY FOUNDATION

Previous planning documents were studied and relevant recommendations were analyzed in relation to the Crawford Corridor. These recommendations, highlighted below, serve as the foundation for the decisions presented in this document. In addition, the study recognizes the efforts to convert the City parking lot between Water Street and the Elizabeth River, adjacent to City Hall and the City Jail. The recommendations provided within this study explore additional opportunities to manage stormwater along the Corridor and ensure pedestrian connections to the future Stormwater Park are provided.



DOWNTOWN MASTERPLAN AND WATERFRONT STRATEGY (2009)

- + Create a vibrant, walkable Downtown that supports the City of Portsmouth's quality of life and economic viability.
- + Future growth in the built environment must consider resistance to flooding and comply with Chesapeake Bay buffer requirements.
- + Create, protect, and connect open space.
- + Promote better transit usage and bicycle access.
- + Express the City's street grid system through to the waterfront and maintain view corridors.
- + Crawford Street is situated in the T6(Urban Core) which includes high-density mixed-use, 4-6 story buildings with no setbacks.
- + Provide connected bike ways, trails, and sidewalks throughout Downtown and along the waterfront.
- + Restore the County Street connection to the waterfront with a pedestrian passage aligning with the current right-of-way, culminating as a public open space at the water.
- + Crawford Street is located within the "A" Grid which has requirements to guarantee high activity and pedestrian comfort. These requirements include; close distance between building entrances, high visibility between interior and exterior spaces, and projections and recesses to add visual interest to building facades.



CRAWFORD GATEWAY REVITALIZATION (2018)

- + Create greatly enhanced connectivity along Crawford and the Elizabeth River waterfront.
- + Enhance value of development opportunities for redevelopment sites.
- + Improve stormwater management and flood protection.
- + Increase downtown daytime population and improve livability through bike and pedestrian enhancement, quality open space, and expanded retail and dining options.
- + Focus on quality of experience, value and opportunities for more connected seawall and open space amenities.
- + Expand private sector opportunities while retaining civic and public safety presence downtown.
- + Reconfigure County Street Parking garage to provide additional space for redevelopment.
- + Extend Middle Street from King Street to County Street as a pedestrian promenade and from County Street to Bart Street roadway with tree-lined median.
- + Extend County Street from Crawford Street to Water Street aligning with current right-of-way and connecting to planned Stormwater Park.



BUILD ONE PORTSMOUTH COMPREHENSIVE PLAN (2018)

- + Highlight significant landmarks through urban design, connectivity, and public investments.
- + Promote modern development that reflects Portsmouth's unique identity.
- + Promote walking and biking as both recreational and viable daily transit options.
- + Improve streetscapes, gateway enhancements, and other urban design features to make the City more attractive.
- + Create public spaces with arts and cultural amenities to support placemaking.
- + Design infrastructure for future flood protection, provide temporary flood control in public spaces, seek modern and environmentally sustainable methods to promote drainage.
- + Design and build pedestrian paths and bike ways with landscaping, lighting, and adequate signage to promote safety.
- + Adapt urban form and infrastructure to respond to the emergence of driverless vehicles.
- + Provide multi-modal, complete streets.
- + Reduce the overall amount of impervious surface in the city, increase tree and vegetation cover in public space, utilize rain gardens and bioswales in existing rights-of-way.

PORTSMOUTH'S STRATEGIC VISION

The Build One Portsmouth Comprehensive Plan, adopted November 27, 2018, presents an actionable series of guiding principles, visions, goals, strategies, and tactics for the City of Portsmouth. Developed through a community-driven approach, the plan articulates a shared vision for the future of the City and identifies goals, policies, and strategic tactical action strategies. The Crawford Corridor Revitalization Study acknowledges this document and adheres to the vision set forth within it. The Vision Statements below summarize information from the Build One Portsmouth Plan and anchor it within the context of the Crawford Corridor.



THRIVING

The rich history of Portsmouth provides a unique opportunity to create a safe, walkable, and active corridor that blends into the surrounding scale and character of the city, while meeting the needs of all users. The design of Crawford Corridor should establish a framework for future redevelopment and utilize complete street strategies to improve safety, strengthen connections to cultural resources, and enhance economic opportunity.



RESILIENT

To ensure the long-term prosperity of Portsmouth, careful considerations must be made to effectively adapt to future conditions. The Crawford Corridor Revitalization Study presents an opportunity to implement a sustainable design focused on smart-growth principles, complete streets, flood mitigation, emerging autonomous technologies, and heat island effect reduction as well as providing guidance for future projects.



EVOLVING

The opportunity for Portsmouth to emerge as a regional and national destination can be strengthened through the framework set by the Crawford Corridor Revitalization Study. The design should enhance the character of Portsmouth while creating an attractive frontage for developers. Providing strong connections and increasing and beautifying the public realm will set the stage for reinvestment along the corridor.



EQUITABLE

Portsmouth's diversity and civic pride cultivates a vibrancy that can be enriched with the revitalization of the Crawford Corridor. The needs of all user groups must be met while protecting, enhancing, and celebrating the City's cultural and natural resources. Employing complete street, universal design, and green infrastructure strategies will create an active and sustainable corridor that amplifies the city's cultural vibrancy.

STAKEHOLDER ENGAGEMENT

MEETING #1

On October 25, 2018 a Stakeholder Meeting was held to present preliminary findings and concepts for the Crawford corridor. The meeting was attended by 13 representatives of the City government and business leaders within the community. The purpose of the meeting was to receive feedback from community leaders about proposals for the corridor.

Concepts and mapping were displayed at the meeting to allow stakeholders to provide feedback to the preliminary study. The Consultant formally presented progress-to-date to the stakeholders and fielded questions in a group setting. Positive feedback was received from the stakeholders with some of the main takeaways listed below.



KEY TAKEAWAYS

- + Design considerations must be made to avoid impacting the newly installed utilities.
- + Concerns about the impact of sea level rise and the 11.5-foot required finished floor elevation along Crawford Street were expressed. This constraint will require innovative solutions along the sidewalk to ensure physical and visual connections to new development.
- + Providing adequate sidewalk widths, amenities, and bike infrastructure are vital for promoting walkability, fostering redevelopment, and attracting new residents to the area.

MEETING #2

A working meeting is planned with City Staff to review and provide comments on the Crawford Corridor Revitalization FINAL SUBMISSION Report developed January 2019.

A public meeting, planned for the end of February, will display the Preferred Alternate to the to the public.

GOALS

- + *Provide information*
- + *Garner support from the stakeholders*
- + *Solicit feedback*

MEETING #3

A public meeting is planned for May to present the report.

GOALS

- + *Promote Public / Private collaboration*
- + *Create project advocates*

2 ASSESSMENT OF THE CORRIDOR

The survey of existing conditions presented in this chapter focuses on analyzing the Crawford Corridor first at a broad scale within the larger context of the City of Portsmouth, then at detailed level to evaluate how the existing roadway is organized. A traffic analysis was conducted in coordination with these efforts. The information from this data collection and analysis phase provided key insights that enabled the design team to understand how the Crawford Corridor functions and revealed opportunities for improvements.



CORRIDOR CONTEXT

The character of Downtown Portsmouth can be attributed to its physical form, geography, transportation networks, and its natural and cultural resources. The following pages document these characteristics and analyzes their influence on the existing Crawford Corridor.

DEVELOPMENT PATTERN



■ development pattern

Downtown Portsmouth is emblematic of other historic cities from the same time period. The rigid, north-south street grid and compact block size establish a standardized pattern for development. This pattern produces a downtown that is comfortable in scale and easily walkable if the infrastructure is provided. The significance of the Crawford Corridor as the eastern boundary of the development pattern is readily discernible, however the corridor's scale can be construed as a barrier to the waterfront. The redesign of the corridor should establish stronger waterfront connections, influenced by the historic development pattern.

URBAN FABRIC



■ existing building

The inventory of existing building footprints reveals the large extent of build-out. However, the intensity of this build-out is not immediately perceived at street-level due to downtown's human-scale character. The balance of small footprint, low-rise buildings within the historic districts and larger footprint, mid-rise buildings along the waterfront and High Street, in combination with the compact block structure, contributes to the human-scale character. Although land is scarce west of the Crawford Corridor, there are opportunities for new development on the waterfront to the east. It is vital that this new development and the redesigned corridor sustain and enhance this character.

PARKING FACILITIES



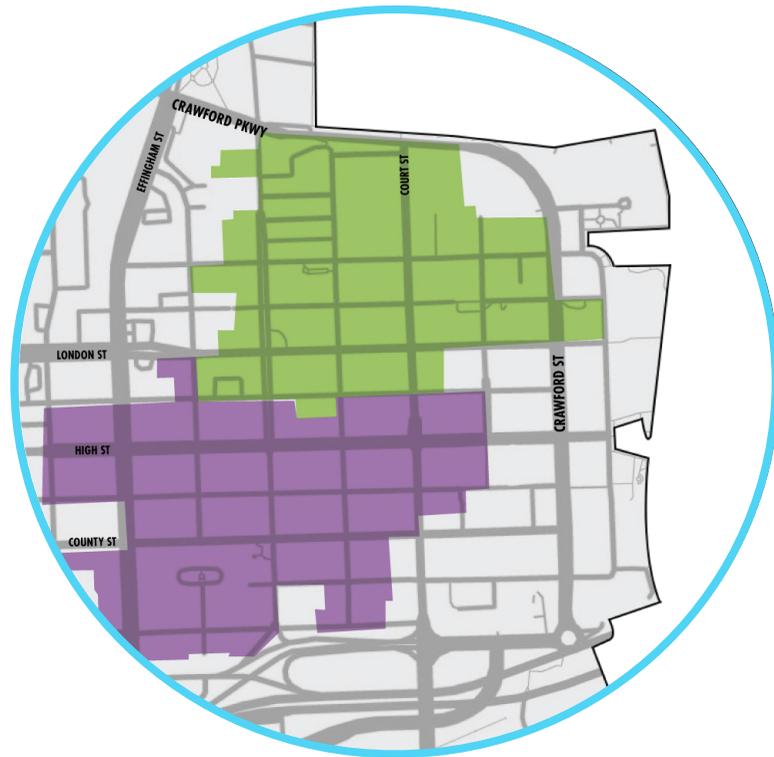
■ parking facility (lot/surface)

The availability of parking is a significant factor for the success of a city's downtown. The mapping inventory above identifies parking facilities within Downtown Portsmouth. Although a number of areas highlighted above are designated parking areas for public service fleets and employees, there is still ample parking provided. In addition to the facilities above, Crawford Street accommodates on-street parking between County Street and London Street. The redesign of the corridor should consider on-street parking an amenity and enticing asset for potential future residential and retail developers. As development occurs the balance of public and private parking will need to be managed.

Bird's-eye view looking north, showing the existing Crawford Corridor and surrounding built environment.



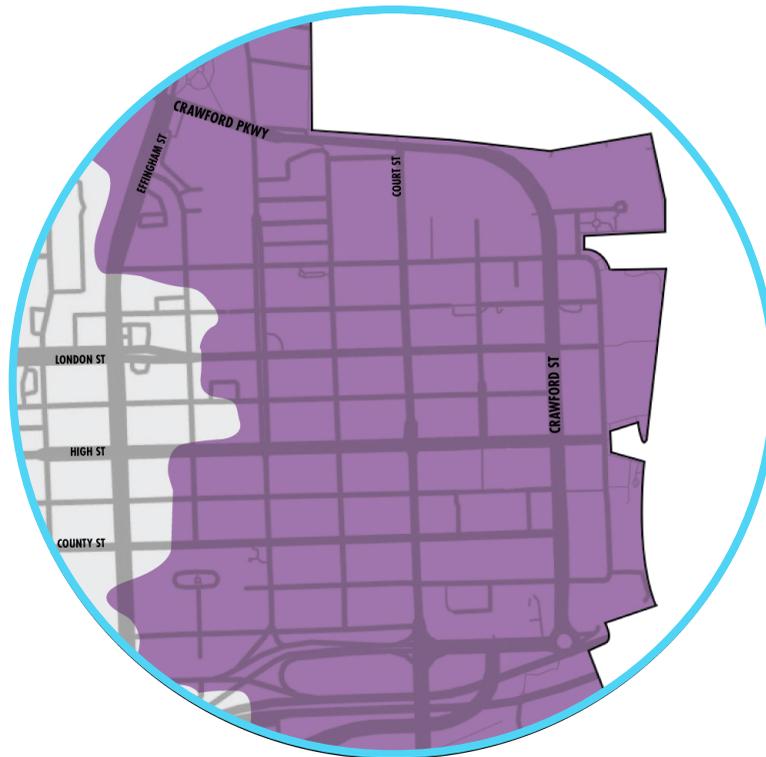
HISTORIC DISTRICTS



- Olde Towne Historic District
- Downtown Portsmouth Historic District

The presence of two historic districts and the cultural resources they encompass is a unique asset contributing to the character of Downtown Portsmouth. The Olde Towne Historic district directly abuts and even intersects the Crawford Corridor north of London Street. The influence from this historic district is directly experienced at street level through a narrowing of the roadway width, change in pavement material, and decrease in building height. It is crucial, specifically in this area that the redesign of the Crawford Corridor account for this interface with the Olde Towne Historic District.

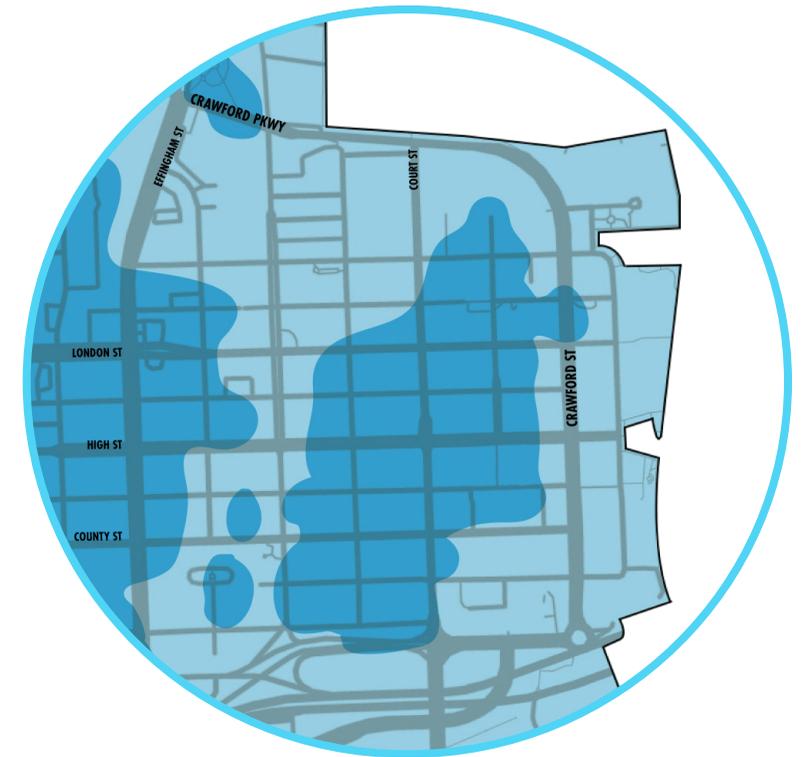
CHESAPEAKE BAY PRESERVATION AREA



- Chesapeake Bay Preservation Area

The Chesapeake Bay Preservation Area focuses on efforts to increase water quality, conserve water, and reduce pollution within the bay and its surrounding water bodies. The proximity of Downtown Portsmouth to the Elizabeth River assures a majority of downtown, including the entire Crawford Corridor are encompassed by the Preservation Area. Careful attention must be administered during the corridor redesign and subsequent redevelopment of parcels along the waterfront to ensure negative impacts to the Elizabeth River are avoided and opportunities to enhance the quality of water are explored.

FLOOD ZONES



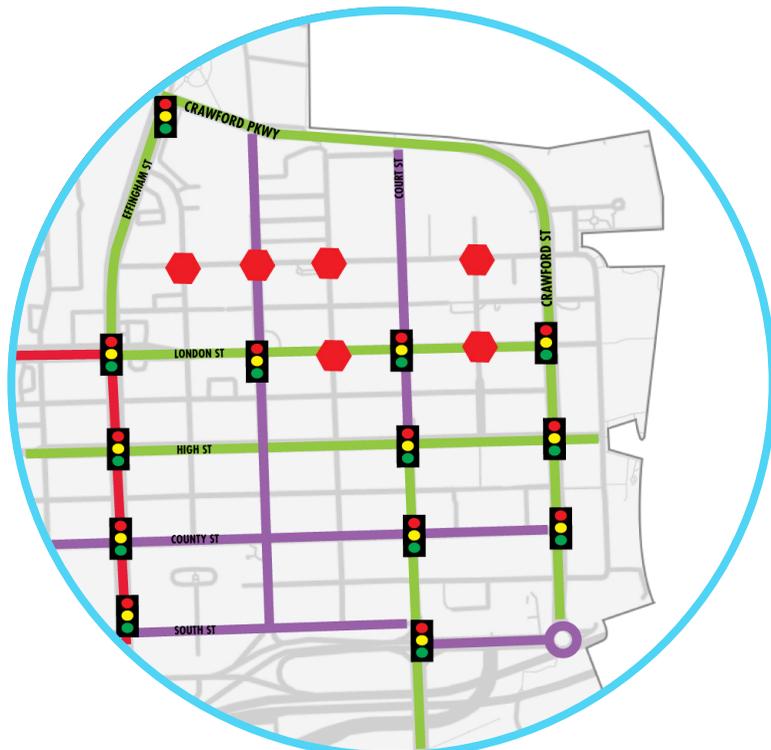
- 100 yr. flood zone
- 500 yr. flood zone

The proximity of Downtown Portsmouth to the Elizabeth River provides an attractive location for residents, visitors, and developers. However, this proximity increases the propensity for flooding, as seen in the inventory above. Since the Crawford Corridor and the potential redevelopment sites are located within the flood zones, careful considerations must be made to minimize flood risk. Innovative solutions such as utilizing existing open space to capture tidal flooding and designing the public realm to connect to a higher finished floor elevation would protect residents and properties.

View from Olde Towne street showing the extent and impact of flooding in 2006. Crawford Parkway can be seen in the distance.



ROADWAY NETWORK



- █ Minor Arterial
- █ Major Collector
- █ Principle Arterial
- ◻ 4-way stop
- 🚦 signalized intersection

Downtown Portsmouth is comprised of a well-connected network of roadways. The area contains a number of route alternatives for motorists as a result of the compact block size and grid layout. However, these strengths alone are not sufficient at managing traffic during peak periods. The redesigned Crawford Corridor must not only accommodate local traffic but ensure that the roadway network as whole is not negatively impacted by the proposed improvements. The redesign must also account for and make assumptions regarding the traffic impacts of potential future development along the corridor.

PUBLIC TRANSPORTATION NETWORK



- ↔ Route 41
- ↔ Route 45
- ↔ Route 47
- ↔ Route 50
- ↔ Route 43
- Ferry

Currently there are five bus lines and a Paddlewheel Ferry that provide public transportation to and from Downtown Portsmouth. All bus lines stop at the transit hub located on County Street, however this location provides minimal access to amenities offered downtown. The lack of convenient stops, absence of stops along the Corridor, and limited daily service diminish the usability of the bus service. In comparison, the Paddlewheel Ferry provides a critical link between downtown Portsmouth and downtown Norfolk. The redesign of the corridor should explore opportunities to expand the public transportation network.

BIKE NETWORK



- █ bike lane
- █ shared-use trail

The street network, block size, and flat topography provide ideal riding conditions for cyclists. Despite these attractive conditions, the infrastructure for utilizing bikes as an alternative mode of transportation is lacking. The bike lanes on Crawford Street and shared-use trail along the Parkway are the only demarcated bike infrastructure present and are disconnected through the Transition Segment. Although other streets may be utilized by cyclists there are no pavement markings present. The redesigned corridor should maintain and expand upon the bike network and provide infrastructure such as bike racks.



View of Crawford Street as it intersects the Olde Towne Historic District showing the roadway configuration and character.

HISTORIC + CULTURAL RESOURCES

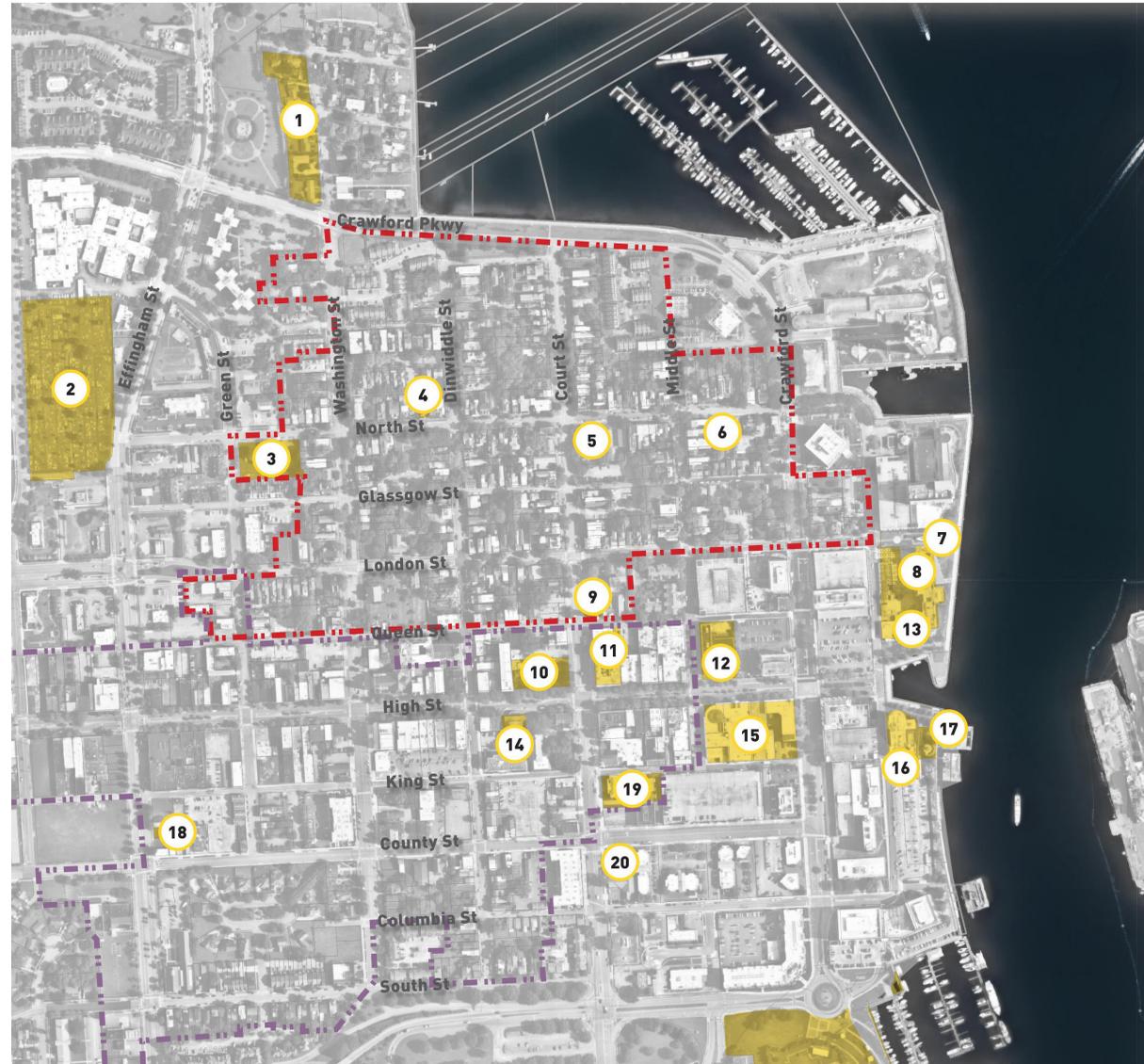
The high concentration of architecturally significant structures and cultural resources within Downtown Portsmouth can be seen in the map to the right. These resources reinforce Portsmouth's significance within the region and visually portray the evolution of a dynamic port city. The area contains two historic districts - the Olde Towne Historic District and the Downtown District - each with their own distinct architectural styles, character, and assets that embody the era of their development. The eclectic composition of structures and rigidity of the street grid foster a unique experience for travelers within the city.

In addition to the compelling collection of historic resources, Downtown Portsmouth offers local amenities to attract a variety of visitors. Museums, event venues, and public spaces complement the historic resources and appeal to a broader range of residents and visitors.

The distribution of historic and cultural resources throughout Downtown Portsmouth provides easy accessibility and encourages exploration of the city.

Key Considerations

The Crawford Corridor and future redevelopment should successfully leverage the historic and cultural resources to create a compelling streetscape and promote a sense of place. The selection of materials, scale and style of buildings, and use of effective wayfinding must be considered to ensure the corridor fits within its surrounding context and builds upon the city's existing historical and cultural resources.



--- Olde Towne Historic District Boundary

--- Downtown District Boundary

- 1 Fort Nelson Park
- 2 Cedar Grove Cemetery
- 3 Lincolnsville
- 4 The Watts House
- 5 Elks Lodge
- 6 Hill House
- 7 Lightship Portsmouth Museum
- 8 Portsmouth Naval Shipyard Museum
- 9 Court St. Baptist Church
- 10 1846 Courthouse
- 11 TCC Visual Center
- 12 Virginia Sports Hall of Fame and Museum
- 13 Seaboard Railroad Building
- 14 The Commodore Theatre
- 15 Children's Museum of Virginia
- 16 Riverview Gallery
- 17 Fresnel Lens
- 18 Chevre T'Helim Temple
- 19 Portsmouth Public Library
- 20 Museum of Military History
- 21 nTelos Wireless Pavilion
- 22 Railroad Museum of Virginia

The Portsmouth Naval Shipyard Museum (8), located on Water Street is a resource that should be integrated with the corridor.



OPEN SPACE FRAMEWORK

A mapping inventory of the existing parks and open space in Downtown Portsmouth reveals a series of small open spaces predominantly located in the Olde Towne Historic District. Although these features are a major contributor to the quality of life for most residents of Portsmouth the poor distribution of open space makes it difficult for those that live south of London Street to easily access them.

A major strength of Downtown Portsmouth's open space is the linear segment along the Elizabeth River. The visual connection to the water and physical connection to a series of open spaces and cultural resources along this segment provides the residents with an attractive experience within the city.

Key Considerations

As the Crawford Corridor traverses a number of existing open spaces and parallels the segment along the Elizabeth River, the redesign offers an opportunity to improve access to these spaces. It is imperative to ensure pedestrians and cyclists are encouraged to utilize the corridor as a route to these open spaces. Providing well-connected, universally accessible sidewalks along the length of the corridor will afford users, regardless of starting point, convenient access to these amenities. The Crawford Corridor redesign should consider traffic calming measures, such as a road diet, to provide a safer and more inviting experience for these users and utilize reclaimed roadway width as areas for street tree planting and landscaping to establish a complete, well-connected open space network.



Legend

Open Space

- A** Fort Nelson Park
- B** Waterfront Promenade
- C** Square
- D** Square
- E** North St. Park
- F** Square
- G** Square
- H** Playground
- I** Marquis Delfayette Park
- J** High Street Landing
- K** Urban Plaza
- L** Urban Green
- M** Festival Park
- N** Park

The revitalization of the corridor presents an opportunity to further enhance the linear open space of the Waterfront Promenade (B).



TRAFFIC OPERATIONS

EXISTING CONDITIONS

In general, vehicle operations along the corridor can be described as very good (level of service B or better) with relatively little vehicle delay or queuing at the signalized intersections under existing conditions. VDOT's public database shows the five-year historical trend (2013-2017) for annual average daily traffic (AADT) volumes along the corridor as steady with only the south end of the corridor between High Street and County Street seeing low to moderate increases in demand.

FUTURE (DESIGN YEAR 2040) CONDITIONS

Future traffic volumes, as forecasted by the Hampton Roads Regional Travel Demand Model, shows moderate to high growth in traffic demand along the corridor over the next 22 years. The highest growth is projected along the Downtown segment of the corridor between Crawford Parkway and High Street. Traffic operations along the corridor, even with the corridor experiencing moderate to high growth in traffic volume, is expected to remain at acceptable levels of service (level of service B or better).

LANE REDUCTION - ROAD DIET

Considering the level of service, even with projected growth, remains at an acceptable level of service, the corridor presents itself as a great candidate for a road diet. The City recently completed a road diet project that removed a travel lane in each direction along Crawford Street between North Street and London Street. The further removal of travel lanes to reconfigure the existing four-lane section of Crawford Street between London Street and Columbia Street to a two-lane divided roadway is recommended. The lane reduction will provide adequate space to accommodate enhanced bike and pedestrian infrastructure and increase multi-modal transportation use along the Corridor.

TABLE 1 - ANNUAL AVERAGE DAILY TRAFFIC (AADT)

CORRIDOR SEGMENT	HISTORICAL TREND					FORECASTED AADT
	2013	2014	2015	2016	2017	2040
Effingham St. to Court St.	3,400	3,200	3,300	3,200	3,200	4,000
Court St. to London St.	2,500	2,500	2,600	2,500	2,500	5,000
London St. to High St.	4,900	4,800	4,800	4,900	4,900	9,000
High St. to County St.	5,000	4,800	4,900	5,400	5,400	7,000

TABLE 2 - CRAWFORD CORRIDOR EXISTING AND FUTURE TRAFFIC CONDITIONS

INTERSECTION	PEAK HOUR	EXISTING TRAFFIC CONDITIONS					FUTURE 2040 NO-BUILD CONDITIONS				
		LOS	Delay (sec)	V/C	Q95 (FT)		LOS	Delay (sec)	V/C	Q95 (FT)	
Crawford Pkwy/ Effingham St.	AM	B	17	0.51	EB 74 WB 99	C	22.2	0.73	EB 148 WB 157		
	PM	B	16.4	0.33	EB 66 WB 113	C	21.8	0.54	EB 93 WB 221		
Crawford St./ London St.	AM	B	11.9	0.2	NB 67 SB 69	B	13.6	0.37	NB 151 SB 140		
	PM	B	12.1	0.28	NB 52 SB 140	B	18.6	0.59	NB 128 SB 341		
Crawford St./ High St.	AM	A	7.1	0.22	NB 77 SB 59	A	8.8	0.3	NB 122 SB 87		
	PM	A	7.4	0.33	NB 68 SB 94	B	10.1	0.39	NB 124 SB 145		
Crawford St./ County St.	AM	A	9.1	0.26	NB 65 SB 80	B	10.3	0.38	NB 110 SB 151		
	PM	B	10.6	0.35	NB 57 SB 102	B	14.4	0.39	NB 93 SB 202		

CORRIDOR ORGANIZATION + ANALYSIS

To effectively analyze the corridor, it was critical to understand how motorists, cyclists, and pedestrians utilize the allocated space provided within the right-of-way. The study of existing space allocation is conducted most effectively by creating sections at critical points along the corridor, ensuring that each segment (Downtown, Transition, and Olde Towne) is documented.

The following pages summarize the findings from these section studies. Each section highlights the typical right-of-way width, identifies the width provided for each mode of transportation, and roughly portrays the heights and uses of adjacent buildings. The sections help to identify relationships between the modes of transportation and exposes the strengths and weaknesses of the corridor's organization

A description of how the space allocation and organization impacts the experience of each corridor user is briefly summarized. Development adjacent to the corridor plays a major role in impacting the experience of users, therefore it's effect on the public realm is also analyzed.

The combination of detailed section studies and site visits culminate in a Visual SWOT Analysis. An explanation and example of this type of analysis is provided to the right.

Questions asked during the Visual SWOT Analysis

S	Strengths What are the existing assets within the corridor? ex. Existing large trees	W	Weaknesses What features within the corridor detract from the experience for all users? ex. Fragmented streetscape
O	Opportunities Does the existing situation provide opportunities to enhance the corridor? ex. Connection to waterfront	T	Threats What existing conditions within the corridor pose threats to its' success in the future? ex. Lack of economic development

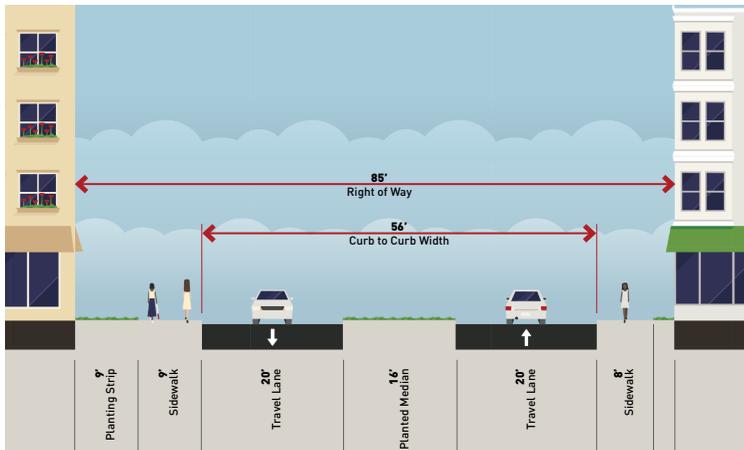
A. CRAWFORD STREET - BART STREET TO COLUMBIA STREET

 **Motorist** - One wide travel lane in each direction, transitioning to and from roundabout.

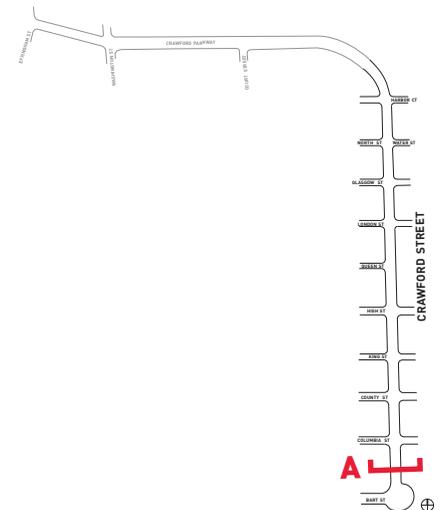
 **Pedestrians** - Curb abutted sidewalk on both sides of the street. Presence of light poles creates pinch points. Wall of the City Hall building creates an uncomfortable condition on the east sidewalk.

 **Cyclist** - No bicycle facilities present.

 **Development** - The facade and landscaping of the residential building on the west adds character, however on the east, City Hall's inactive facade is intimidating.



- W** WIDE MEDIAN
- S** URBAN LIGHTING
- S** NEW RESIDENTIAL LANDSCAPING
- W** LACK OF TREE CANOPY
- W** INCONSISTENT ROADWAY WIDTH
- O** BIKE LANE INTRODUCTION
- O** ROADWAY WIDTH ADJUSTMENTS
- T** POOR CONNECTIVITY
- T** ADA NON-COMPLIANCE



B. CRAWFORD STREET - COLUMBIA STREET TO HIGH STREET



Motorist - Two travel lanes in each direction with curb abutted parallel parking. A controlled left-turn lane onto High Street is present as well.



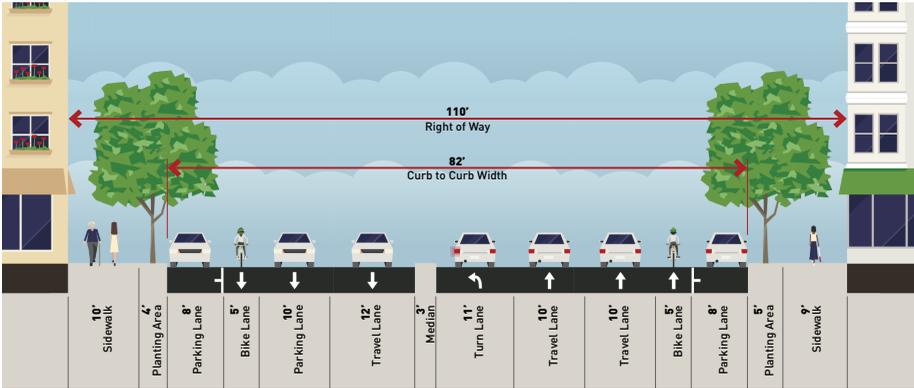
Pedestrians - A comfortable walking experience is created by the overhead canopy of the street trees however the condition of the sidewalk paving creates tripping hazards.



Cyclist - A 5-foot unprotected bike lane is present in each direction. The location of the bike lane outside of the parking area increases the chance of dooring.



Development - Inactive building facades add minimal interest to the streetscape character.



- BIKE LANES**
- S ON-STREET PARKING**
- MATURE STREET TREES**
- W OVERLY WIDE TRAVEL LANES**
- LONG PEDESTRIAN CROSSINGS**
- O LANE WIDTH REDUCTION**
- REORGANIZATION OF ROW**
- BUILDING FACADE ENHANCEMENT**
- T LACK OF DESTINATIONS**



C. CRAWFORD STREET - HIGH STREET TO LONDON STREET



Motorist - Two travel lanes in each direction with curb abutted parallel parking. Dedicated left-turn and right-turn lanes onto London Street are present as well.



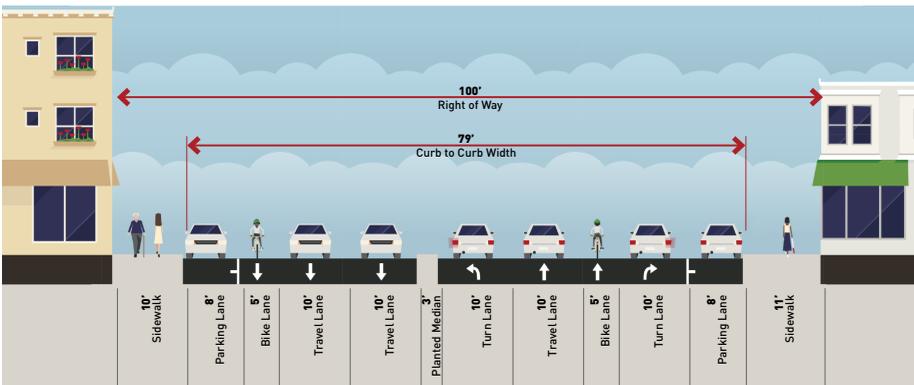
Pedestrians - The east sidewalk provides adequate space for pedestrian movement; however new construction on the west side encroaches on the sidewalk and creates pinch points.



Cyclist - A 5-foot southbound bike lane outside of the parking lane increases the chances of dooring. A 5-foot northbound bike lane conflicts with dedicated right-turn lane onto London Street.



Development - Attractive landscaping outside of the Post Office adds character to the streetscape however the lack of building height detracts from a sense of enclosure.



- BIKE LANES**
- S PLANTED MEDIAN**
- ON-STREET PARKING**
- W NARROW SIDEWALKS ON WEST SIDE**
- VEHICULAR AND CYCLIST CONFLICTS**
- O STRONGER TRANSITION TO HISTORIC DISTRICT**
- RECLAIM ROADWAY SPACE AND REORGANIZE R.O.W.**
- T LACK OF DESTINATIONS**
- MINIMAL OPPORTUNITY FOR REDEVELOPMENT**



D. CRAWFORD STREET - LONDON STREET TO HARBOR COURT



Motorist - One 13-foot travel lane in each direction with a 12-foot center turn lane. No on-street parking is present in this area.



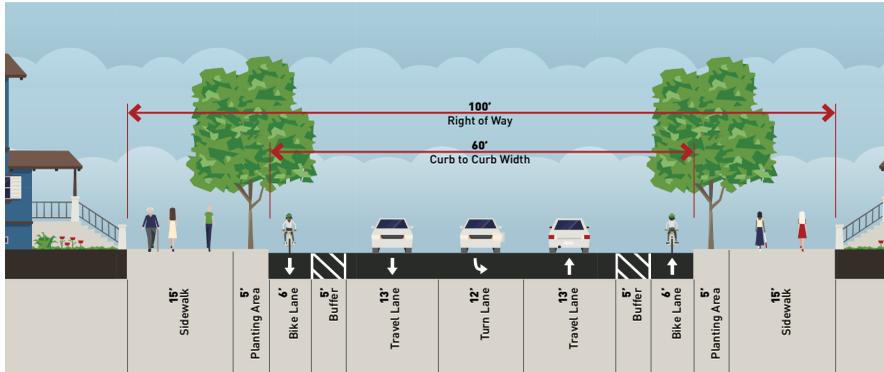
Pedestrians - 15-foot wide sidewalk on each side of the street. The sidewalks, 60-foot roadway width, low building heights, and mature trees create a comfortable experience.



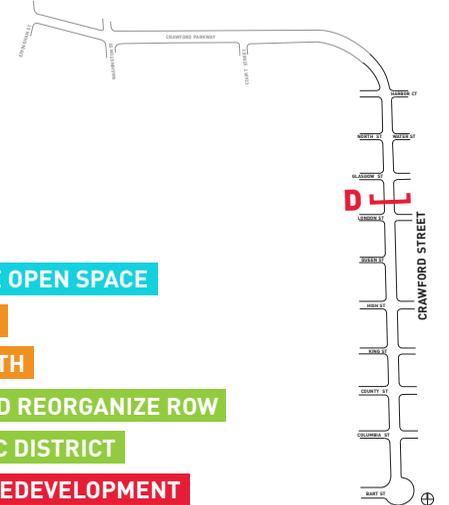
Cyclist - 6-foot protected bike lane in each direction. No conflicts with parked vehicles.



Development - Residential 2-3 story units. The buildings contribute to the Olde Towne Historic District.



- S** HISTORIC CHARACTER
- S** MATURE STREET TREES
- S** SEPARATED BIKE LANES
- S** COMFORTABLE HUMAN-SCALE OPEN SPACE
- W** LACK OF ON-STREET PARKING
- W** INCONSISTENT ROADWAY WIDTH
- O** RECLAIM ROADWAY SPACE AND REORGANIZE ROW
- O** FURTHER HIGHLIGHT HISTORIC DISTRICT
- T** MINIMAL OPPORTUNITY FOR REDEVELOPMENT



E. CRAWFORD STREET AT HARBOR COURT



Motorist - Two 12-foot wide southbound travel lanes. Two 12-foot wide northbound travel lanes with left turn lane. The wide travel lanes encourage high speeds.



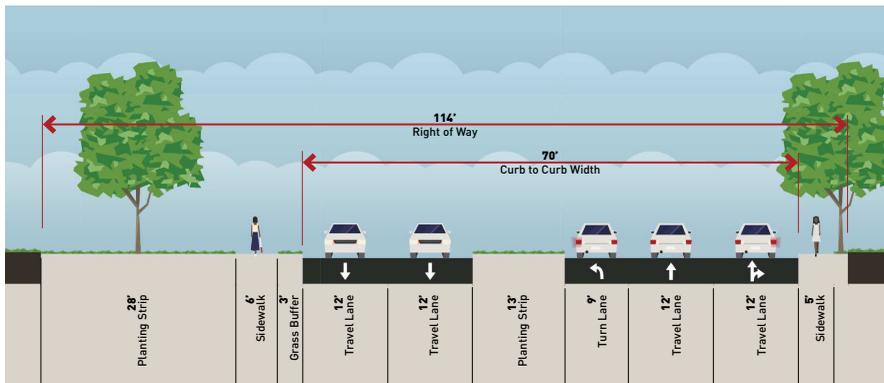
Pedestrians - Narrow curb abutted sidewalk on east side of roadway. Narrow sidewalk on west side of the roadway separated by small landscape buffer.



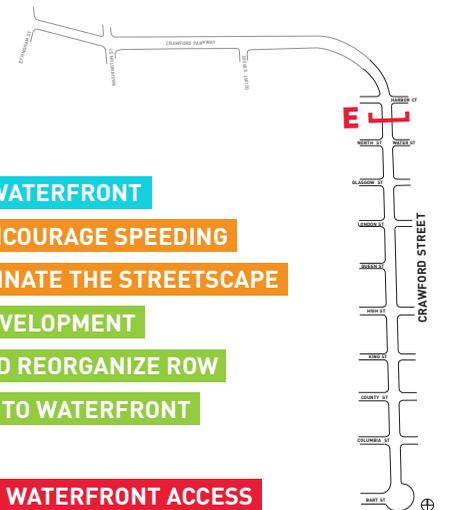
Cyclist - No bicycle facilities are present.



Development - The Olde Town Historic District abuts the roadway on the west. There is large open space present on the east.



- S** MATURE STREET TREES
- S** VISUAL CONNECTION TO THE WATERFRONT
- W** OVER SIZED TRAVEL LANES ENCOURAGE SPEEDING
- W** LARGE PARKING GARAGE DOMINATE THE STREETScape
- O** HIGH OPPORTUNITY FOR REDEVELOPMENT
- O** RECLAIM ROADWAY SPACE AND REORGANIZE ROW
- O** CONNECT LARGE OPEN SPACE TO WATERFRONT
- T** POTENTIAL FLOODING
- T** EXISTING STRUCTURES DETER WATERFRONT ACCESS



F. CRAWFORD PARKWAY AT TRANSITION AREA



Motorist - One 21-foot wide eastbound travel lane and one 13-foot wide westbound lane separated by a large grass median. No parking is present.



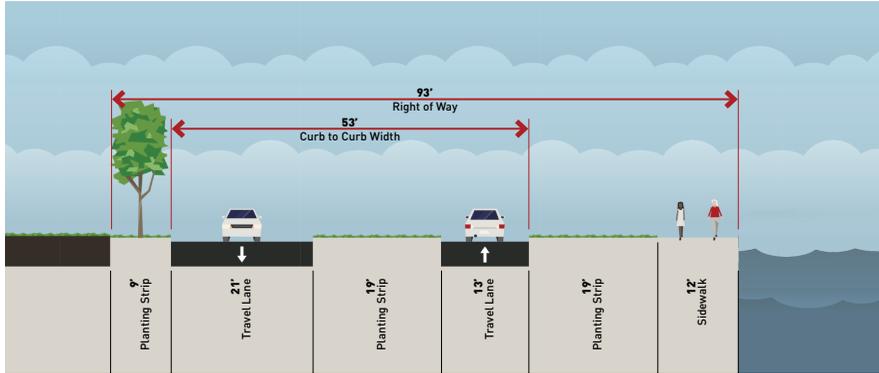
Cyclist - No bicycle facilities are present.



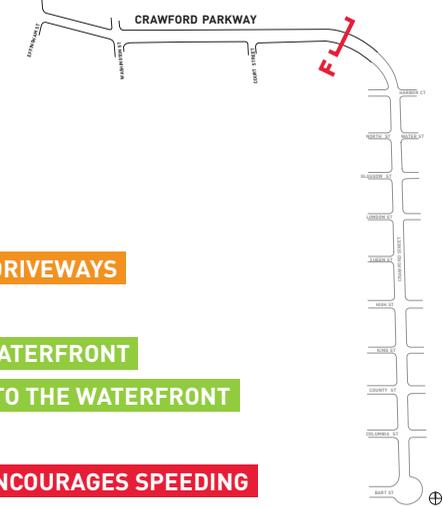
Pedestrians - Narrow curb abutted sidewalk on east side of roadway. Narrow sidewalk on west side of the roadway separated by small landscape buffer.



Development - A tall residential tower is setback from the roadway on the south. A parking lot for the marina abuts the roadway on the north.



S	SCENIC CHARACTER
	LARGE OPEN GREEN SPACE
W	LACK OF BIKE LANES
	NUMEROUS CURB CUTS AND DRIVEWAYS
O	LACK OF SAFE CROSSINGS
	ENHANCE GREEN SPACE AT WATERFRONT
T	STRENGTHEN CONNECTIONS TO THE WATERFRONT
	POTENTIAL FLOODING
	GRADUAL ROADWAY CURVE ENCOURAGES SPEEDING



G. CRAWFORD PARKWAY AT COURT STREET



Motorist - Two-lane roadway with 12-foot lanes in each direction. No separation between the lanes. On-street parking is not present in this area.



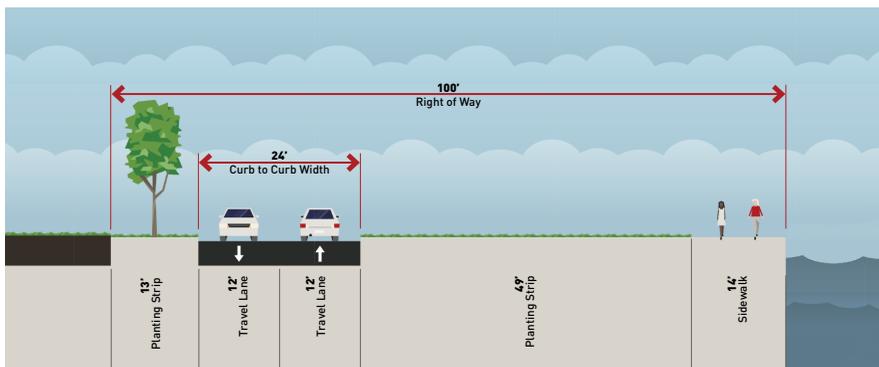
Cyclist - No bicycle facilities are present in the roadway. Cyclists utilize the shared trail along the waterfront.



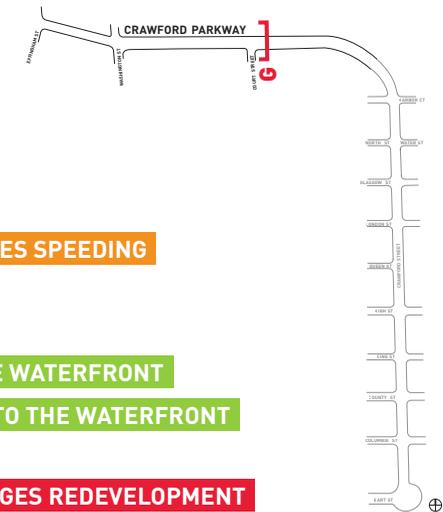
Pedestrians - No sidewalks are present along Crawford Parkway. However there is a pedestrian crossing linking Olde Towne to the waterfront trail at Court Street.



Development - Minimal additional space is provided on the sidewalk for permitted business activities.



S	LARGE OPEN SPACE
	SCENIC CHARACTER
W	ROADWAY LAYOUT ENCOURAGES SPEEDING
	NUMEROUS CURB CUTS
O	LACK OF SAFE CROSSINGS
	ACTIVATE OPEN SPACE AT THE WATERFRONT
T	STRENGTHEN CONNECTIONS TO THE WATERFRONT
	POTENTIAL FLOODING
	HISTORIC DISTRICT DISCOURAGES REDEVELOPMENT



H. CRAWFORD PARKWAY - COURT STREET TO WASHINGTON STREET



Motorist - Two-lane roadway with 12-foot lanes in each direction. A right turn provides access to apartment complex near the intersection.



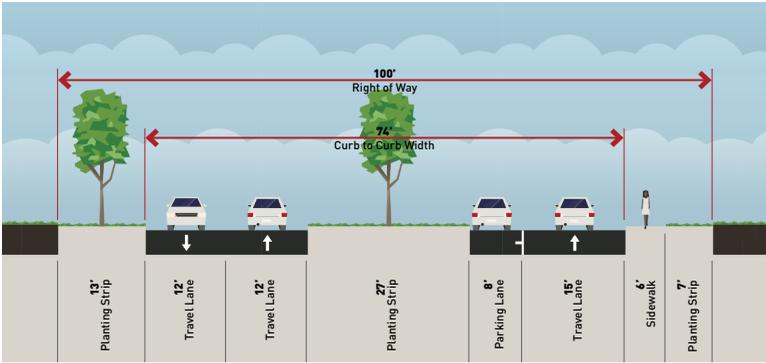
Pedestrians - A 6-foot wide sidewalk is provided on the north side of the roadway adjacent to the apartment complex. No sidewalk is provided on the south side.



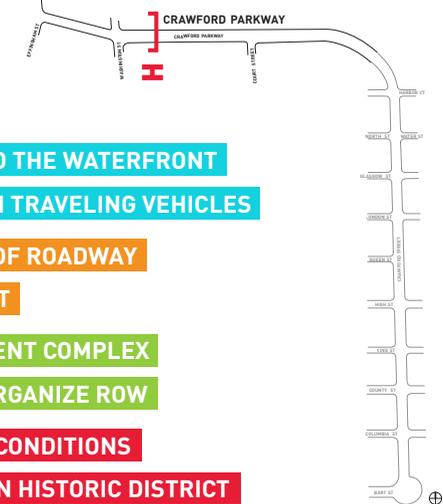
Cyclist - Shared-use trail ends and no additional bicycle facilities are provided.



Development - The Olde Town Historic District abuts the roadway on the south and an apartment complex abuts the roadway on the north.



- S** DIRECT PEDESTRIAN CONNECTION TO THE WATERFRONT
- S** PEDESTRIANS ARE SEPARATED FROM TRAVELING VEHICLES
- W** LACK OF SIDEWALK ON SOUTH SIDE OF ROADWAY
- W** NO BICYCLE FACILITIES ARE PRESENT
- O** PROVIDE SAFER ACCESS TO APARTMENT COMPLEX
- O** RECLAIM ROADWAY SPACE AND REORGANIZE ROW
- T** SHARP TURN CREATES DANGEROUS CONDITIONS
- T** NO CONNECTIONS TO THE OLDE TOWN HISTORIC DISTRICT



I. CRAWFORD PARKWAY WASHINGTON STREET TO EFFINGHAM STREET



Motorist - Wide travel lanes in each direction separated by 10-foot-wide striped buffer. Dedicated right turn lane onto Effingham Street provides access to Naval Hospital.



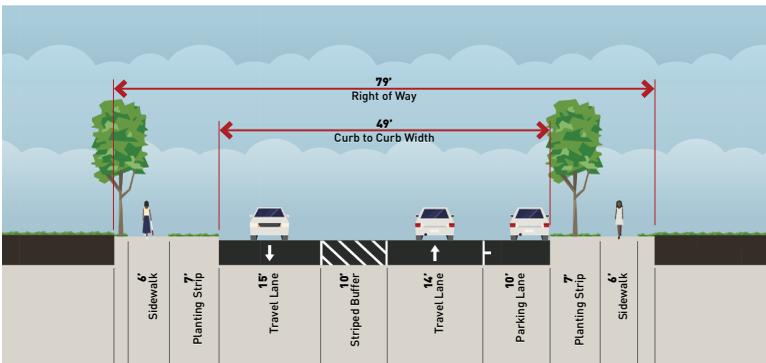
Pedestrians - The pedestrian experience is comfortable due to the 6-foot wide separated sidewalks and street trees. However, the sidewalk on the south ends after the Washington Street.



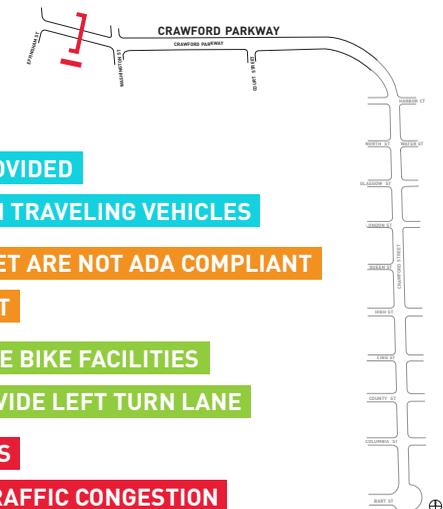
Cyclist - No bicycle facilities are present.



Development - The roadway abuts a tall residential complex and surface parking lot on the south and Fort Nelson park on the north.



- S** PEDESTRIAN ACCESS TO PARK IS PROVIDED
- S** PEDESTRIANS ARE SEPARATED FROM TRAVELING VEHICLES
- W** CURB RAMPS AT WASHINGTON STREET ARE NOT ADA COMPLIANT
- W** NO BICYCLE FACILITIES ARE PRESENT
- O** RESIZE TRAVEL LANES TO INTRODUCE BIKE FACILITIES
- O** REALLOCATE BUFFER SPACE TO PROVIDE LEFT TURN LANE
- T** NO REDEVELOPMENT OPPORTUNITIES
- T** ENTRANCE TO HOSPITAL CREATES TRAFFIC CONGESTION



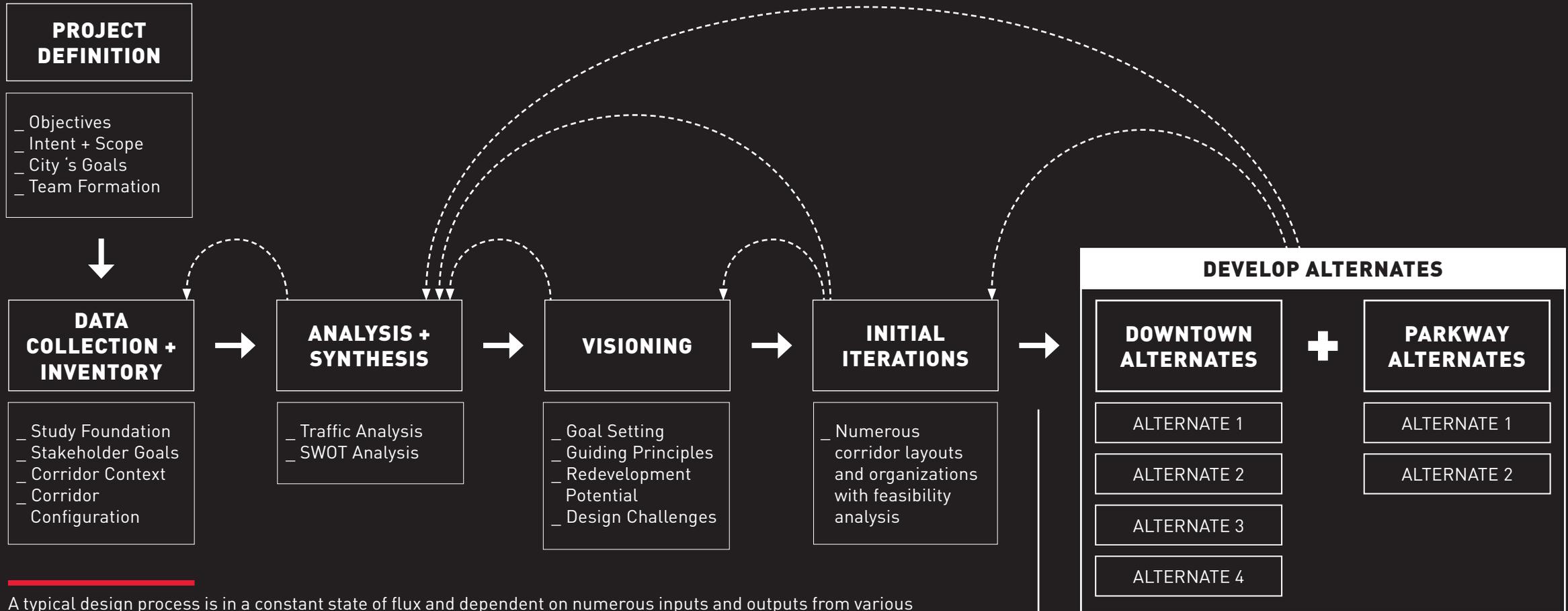
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3 CREATING A COMPLETE CORRIDOR

To create a truly thriving, complete corridor that is sensitive to the needs of all citizens and users, it is important to recognize the role the roadway operations and streetscape play in encouraging future development. The following chapter synthesizes the information from Chapter 2 and identifies a set of Guiding Principles that informed the design decisions for a series of Design Alternates. The Guiding Principles and Design Alternates offered in the following chapter are observant of the City of Portsmouth's goals and recognize the potential for redevelopment along the corridor. Together they serve as a framework for the City's vision to come to fruition.



DESIGN PROCESS + CONSIDERATIONS



WHERE WE ARE NOW

A typical design process is in a constant state of flux and dependent on numerous inputs and outputs from various stakeholders. As the design process progresses additional information is uncovered and refinement is constant. The diagram shown highlights the design process undertaken by Volkert to reach the preferred alternate presented in this document. The outcome of the data collection, analysis, vision and iteration stages of this process are four(4) Alternates for the Downtown Segment and two(2) Alternates for the Parkway. Each Alternate was then carefully evaluated based on criteria such as cost, development potential, urban design, and flexibility to reach a Preferred Alternate that fits within the City of Portsmouth's goals and the Guiding Principles of the project.

EVALUATE + REFINE

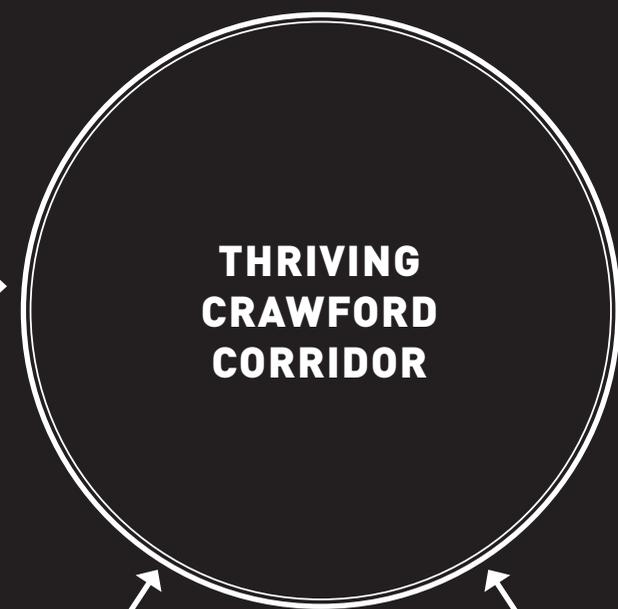
EVALUATE + REFINE



ADJACENT IMPROVEMENTS

- MIDDLE STREET
- COUNTY STREET
- KING STREET
- WATER STREET

Four additional areas are also identified in this document as areas for improvement. The layout, organization, and character of these areas are all influenced by the Preferred Alternate presented. When stitched together the designs create a cohesive urban fabric that improves pedestrian and vehicular mobility, strengthens connections to existing cultural resources, and sets a strong framework for future redevelopment to further activate Downtown Portsmouth.



- STORMWATER PARK
- FUTURE REDEVELOPMENT
- PUBLIC REALM ACTIVATION

INFLUENCING FACTORS

The design process for this type of project, where future redevelopment along the corridor is a vital factor, requires assumptions to be made about future scenarios. Any assumptions that were made are identified in this document and reasoning for the decision is presented. The Preferred Alternate establishes a framework, derived from the City of Portsmouth's goals and Guiding Principles for the project, for these influencing factors to build upon. The Preferred Alternate recognizes these influencing factors and builds a strong base for them to be fully realized.

URBAN REDEVELOPMENT

REDEVELOPMENT POTENTIAL

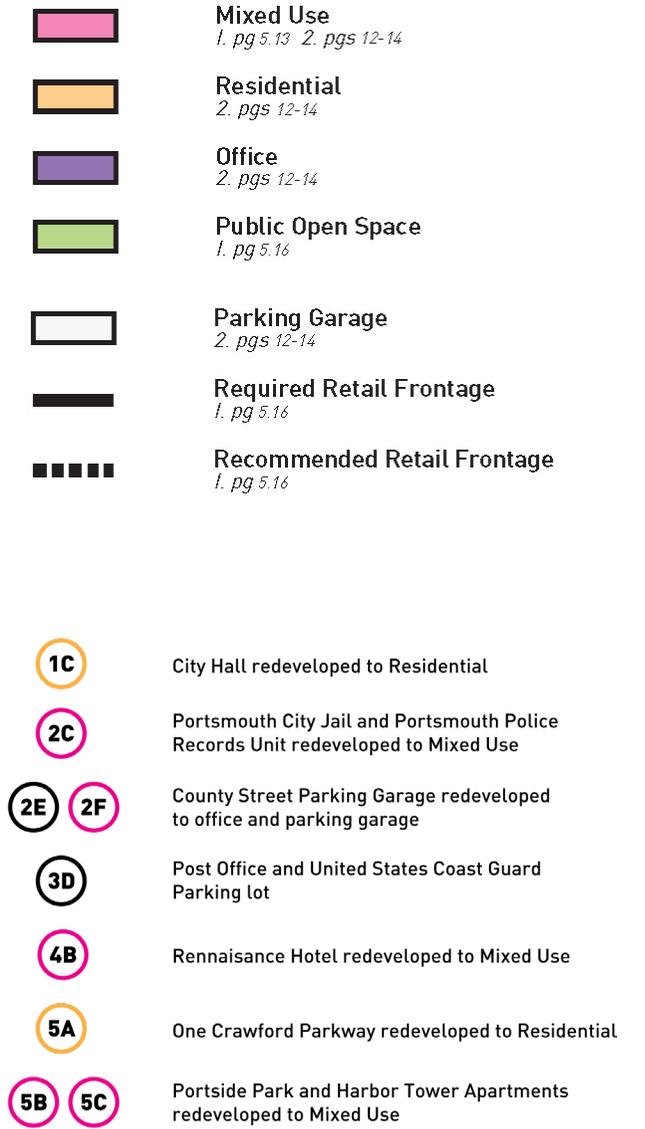
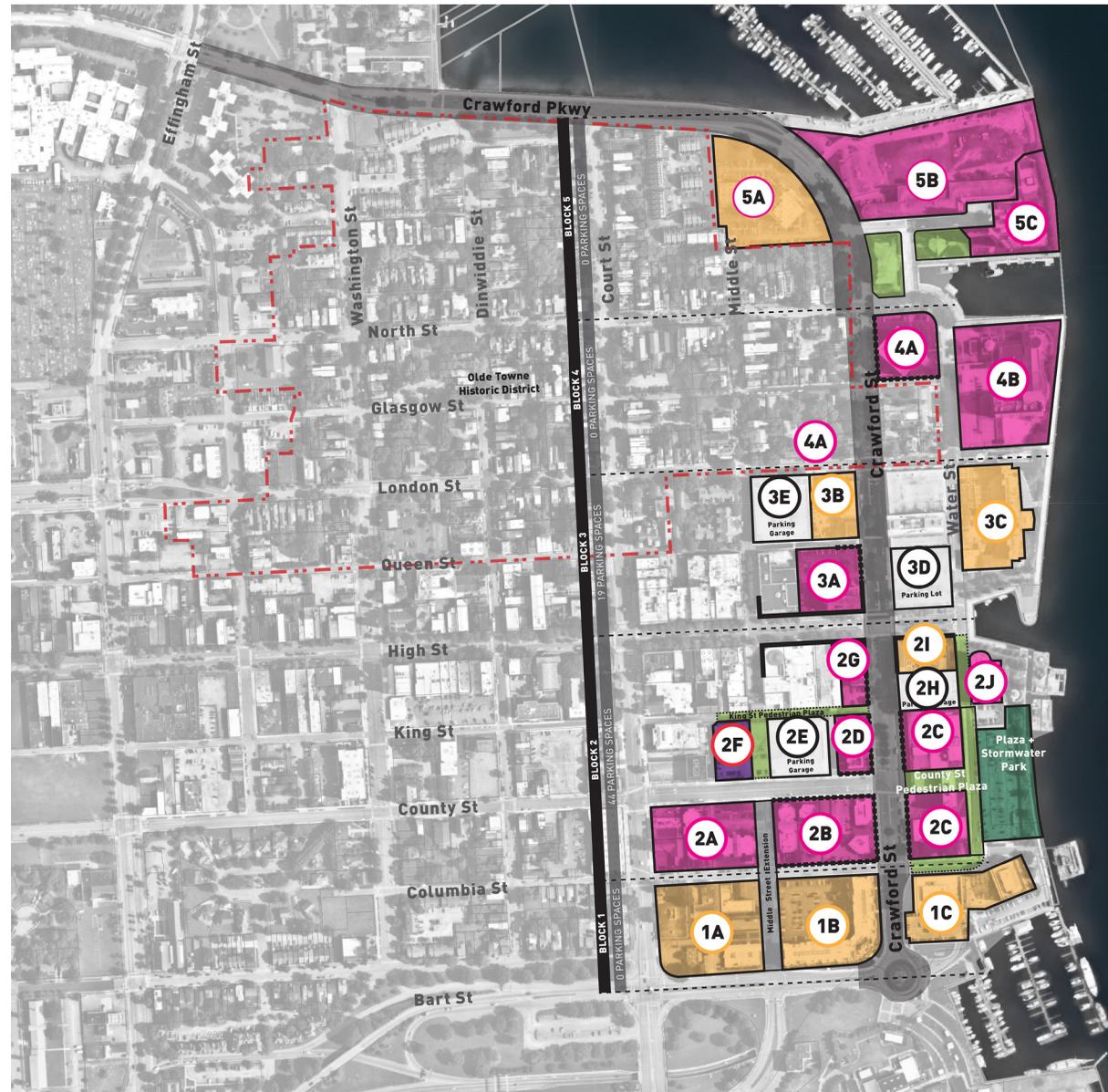
Providing a multi-modal, complete corridor that is attractive to all users and connects to the existing cultural and natural resources of Downtown Portsmouth will bring more people to the area. However the lack of destinations will discourage these users from stopping and lingering along the corridor. Today the Crawford Corridor is bordered by a number of government buildings such as the City Jail and Police Records Unit that contribute little to the character and vitality of the public realm. Fortunately, the area offers a number of high-value redevelopment opportunities.

The map to the right highlights these high-value sites that are opportunities for redevelopment (roughly 65 acres including the Corridor) and utilizes previous studies produced by the City of Portsmouth to identify recommended land uses for each parcel. The presence of new mixed-use development will attract new residents and bring visitors in from neighboring areas.

The infusion of new residences, shops and restaurants with active and inviting building facades will bring a vibrancy to the corridor that is currently lacking.

Pairing this new development with a reconfigured and inviting public realm will generate economic growth for the area and create a new destination within the Hampton Roads region. It is vital that the redesign of the Crawford Corridor works in symbiosis with new development.

See Appendix ____ for detailed description of potential redevelopment and new parking.



URBAN REDEVELOPMENT PRECEDENT

The existing cultural and natural resources of Downtown Portsmouth provide an appealing base for future redevelopment. These resources in connection with a redesigned Crawford Corridor will provide the framework for future redevelopment. Careful detailed, considerations must be examined for all features of the project. To ensure the success of this type of project it is important to evaluate previous urban redevelopment projects and understand the strategies employed to mitigate issues, engage citizens, and create a revitalized area. The examples below have all succeeded in transforming and reinvigorating their surroundings.



NATIONAL HARBOR, MARYLAND

Roughly 350 acres in the D.C. region, National Harbor capitalizes on its location along the Potomac River. The multi-use site offers permanent residences, shopping and dining, and outdoor spaces that provide direct water access. Although disconnected from other major populated areas in the region, National Harbor utilizes thoughtfully designed parking structures and open spaces, providing visitors with a variety of destinations to encourage prolonged visits. The attractive public realm, active building facades, and lively outdoor spaces are key contributors to the success of this project.



H STREET NE, WASHINGTON DC

The corridor fell victim to blight following suburbanization and social unrest in the late 1970's. However by working with the local community, focusing on introducing multi-mobility, road-diets and improving the public realm, the corridor has become a model of urban renewal. By enhancing connections within the corridor and creating a commercial overlay zoning district the city was able to attract local businesses and in turn, visitors which has spurred growth. The increased activity along the corridor has subsequently attracted larger retailers and additional mixed-use development.



THE WHARF, WASHINGTON DC

A mixed-use development that stretches 27 acres of waterfront land in Southwest DC, The Wharf has injected life into an area that was long disconnected from the rest of the city. The Wharf is built on the vision of creating a place that brings the community together while honoring the past and embracing the future. The high quality outdoor spaces, active building facades, and programmed free events entice visitors to explore and linger within the neighborhood. The Wharf's focus on sustainability, thoughtful urbanism, and connection to the water make it a model of redevelopment.

GUIDING PRINCIPLES

ESTABLISH A MULTI-MODAL NETWORK

Currently, the Crawford Corridor prioritizes vehicular traffic, dedicating most of the right-of-way to travel lanes and parking. The redesign should reclaim this space for more active and sustainable modes of transportation. Providing safe, efficient, and comfortable experiences for all users is critical to establishing an effective complete street.



Actions

- + Implement Road Diet Strategies including; reduction of travel lanes, narrowing of lane widths, introduction of traffic calming
- + Increase the width of pedestrian areas and ensure complete, universally accessible connections are provided
- + Introduce protected bicycle facilities and expand network
- + Provide adequate buffers between alternate modes of transportation and vehicular traffic
- + Introduce bulb outs at intersections and strategically at mid-blocks to calm traffic, shorten pedestrian crossings, and provide space for potential future transit stops

ENHANCE SAFETY AND COMFORT FOR ALL

The existing Crawford Corridor lacks certain features that are common in walkable and comfortable streets. The redesign must be equitable and inclusive, ensuring all users, regardless of gender, age, or physical ability can navigate the corridor safely. Direct, barrier-free connections will help to weave the redesigned Crawford Corridor into the City's urban fabric.



Actions

- + Shorten and improve pedestrian crossings
- + Ensure sidewalks and street crossings meet universal design principles
- + Increase buffer space and introduce additional street trees to provide shade and noise reduction
- + Provide adequate, uniform lighting to promote safe use of the street at night
- + Activate the building facades to encourage passive surveillance and deter criminal activities

SUPPORT DIVERSE AND HEALTHY EXPERIENCES

The City of Portsmouth consists of a diverse population of residents with varying needs. Currently the corridor provides little variance in the types of spaces offered and discourages walking. As the area is redeveloped and new businesses enter the market it is vital to provide an attractive public realm that can seamlessly interact with these businesses and support the diversity of user's needs.



Actions

- + Create an attractive public realm that connects to existing open space to encourage walking and healthy lifestyle choices
- + Provide a variety of spaces with varying microclimates to sit and interact with businesses and other residents
- + Provide adequate space to entice new businesses and residents to activate the corridor through outdoor cafes, shops, and community events
- + Maximize tree planting and green infrastructure strategies to improve air and water quality, reduce stress levels, and improve mental health

REMAIN AUTHENTIC AND COMMUNITY-FOCUSED

Reverence for the historic character and local culture of Downtown Portsmouth must guide the design of the Crawford Corridor. As the corridor traverses the three segments, the public realm organization and materiality must be informed by its adjacencies. The redesigned corridor must seamlessly blend into its surroundings to become a genuine part of the City of Portsmouth.



Actions

- + Maintain the right-of-way width in each segment of the corridor
- + Select hardscape, softscape, and street furnishings that reflect the character of the corridor's context
- + Provide adequate seating and stopping opportunities in the Downtown Segment but avoid adding seating within the boundaries of the Olde Towne Historic District
- + Create new community spaces and gateways at intersections improved by traffic calming techniques

FOSTER PLACEMAKING AND PROMOTE ECONOMIC VITALITY

In alignment with the City of Portsmouth's vision for the area, the redesigned Crawford Corridor must become a public space that provides social and economic benefits to the local community. Currently, the corridor does not function as a public space due to the prioritization of vehicular movement. To foster placemaking and promote economic vitality the focus of the corridor must be altered.



Actions

- + Reallocate space within the right-of-way to prioritize pedestrians
- + Create an environment that entices people to stay and spend time, generating higher revenue for businesses
- + Create an attractive and memorable public realm that incorporates a variety of seating and public art
- + Designate space within the public realm as a frontage zone that can be utilized by local businesses for outdoor dining and shopping

PROMOTE ENVIRONMENTAL DESIGN

As the City of Portsmouth progresses into the future it is important to consider the potential impacts its location on the Elizabeth River could have on new development. The redesign of the Crawford Corridor presents an opportunity to introduce innovative green infrastructure and urban design strategies for flood mitigation, heat island effect reduction, and air quality improvement.



Actions

- + Reduce the overall amount of impervious surface and utilize durable materials to extend life-cycle
- + Increase tree and vegetation cover in public space and provide adequate soil volumes to ensure plant health
- + Provide adequate space to entice new businesses and residents to activate the corridor through outdoor cafes, shops, and community events
- + Maximize opportunities for on-site stormwater retention and infiltration and provide recommendations for locating bioretention planters

DRAINAGE CONSIDERATIONS

STORM DRAINAGE

The outfall of storm drainage for the proposed corridor will largely incorporate the drainage design of the existing roadway, as significant storm sewer infrastructure is already in place. Per the available GIS mapping data in the area, there are 12 project outfall locations. All of these outfalls are storm sewer pipe outlets ranging from 15 inches to 48 inches, and one 8-foot by 4-foot box culvert outlet, emptying directly into the Elizabeth River through the harbor walls to the north and east of the project limits.

These existing outfall storm sewer systems will be tied into as necessary to drain the new roadway; some new drop inlets and pipes are expected. Provided they are in good condition and of adequate capacity, existing trunk lines will be maintained. The total drainage areas to the project outfalls generally range from one to 140 acres, and the pipe sizes are well-suited to their drainage areas, lending confidence regarding the continuing adequacy of the outfalls. The road diet approach to this redevelopment ensures that changes in runoff quantity will be of minimal concern.

Tide gates and other new technologies, which prevent tidal events from passing the harbor wall, will be incorporated into the redevelopment. This will serve to protect the roadway, the investment property to the south and west of the corridor, and the storm drainage system.



STORMWATER MANAGEMENT

The current laws and regulations for stormwater management criteria dictate that Technical Criteria II B apply to this redevelopment of the corridor, which requires use of Version 3.0 of the Virginia Runoff Reduction Method (VRRM) to determine phosphorus removal requirements for water quality, and satisfaction of site-dependent outfall criteria for water quantity.

WATER QUALITY

Based on a preliminary examination of the anticipated size of the site and the amount of newly-proposed greenspace using the VRRM, the redevelopment will likely require between four and five pounds of phosphorus removal credit, regardless of the chosen typical roadway section for the Downtown segment. The phosphorus removal requirement can be satisfied in two ways: purchase of nutrient credits, construction of onsite low-impact development (LID) facilities such as bioretention planters, or a combination of the two.

A nutrient credit purchase offers the lowest expense, as it spares the time and materials costs associated with the design and construction of LID facilities, and additionally avoids the need for future maintenance. On the other hand, meeting the partial or full removal requirement with onsite LID facilities presents many post-construction benefits: greater functional utilization of the existing public right-of-way may be achieved; the nutrient credits which are not purchased remain available for future projects, which may present greater challenges to providing onsite water quality control; bioretention plantings are aesthetically pleasing, and contribute to the look and feel of the modern cityscape; and the presence of LID facilities demonstrates civic commitment to the future of sustainable infrastructure to visitors and residents alike.

Green Infrastructure options (see images on following page) such as bioretention planters, or bioswales, envisioned for this development would be primarily located in continuous planting buffer areas between the roadway and sidewalks, bulb outs at intersections, and in the median - with a minimum width of four feet. Where possible, these bioretention facilities should be interconnected to create stormwater "treatment trains" and be integrated with the streetscape design. Bioretention facilities in urban environments need to consider multiple factors, other than stormwater runoff, to be successful such as parking requirements, sight clearances, aesthetics, and utility conflicts. Due to these reasons and limited available space in Alternates 1 and 2, bioretention planters are more suitable in Alternates 3 and 4. The alternates offer more opportunities because of the larger continuous square footage in the sidewalks (Alternate 3) and the median (Alternate 4). Where feasible, curb cuts would be used to convey roadway drainage to the bioretention facilities, and the existing storm drain inlets would be modified to serve as the new bioretention outlet structures.

WATER QUANTITY

Technical Criteria II B stipulates, for man-made outfalls such as storm sewers, adequate protection from erosion for the two-year design storm and from flooding for the ten-year design storm, to a point where the total drainage area exceeds the site's contributing drainage area by a factor of at least 100. All of the outfall storm sewer systems will be evaluated for adequacy to their outlets at Elizabeth River, where the total drainage area is approximately 100 square miles (64,000 acres). Thus, demonstrating adequacy of the pipe systems will satisfy the water quantity criteria.



Stormwater planter at roadway edge



Stormwater planter in sidewalk



Bulb outs used to reduce impervious surfaces



Permeable pavement in parking areas

TIDES AND FLOODING

NOAA Tides and Currents data, The National Map by USGS, and the local FEMA Flood Insurance Rate Map, were consulted in evaluating the potential effectiveness of gearing development efforts toward reducing the flood risk on the Crawford Corridor. These options include upgrading the tide gates along the harbor walls, raising the elevation of the road above the flood elevation, and introducing a series of topographic changes in the existing greenspace that could accommodate the bicycle facility and prevent flooding.

The existing tide gates provide total bank cover, and the Parkway segment of the project is buffered from the harbor by a drainage swale, so the area is currently protected from typical high tides (which reach about 3.11 feet above typical low tides). Upgrading the tide gates to protect against less-frequent tidal events can be pursued, and would require detailed analysis of the historical storm and tide data, as well as a current detailed survey of the existing elevations along the top of the harbor wall.

The existing roadway varies in elevation from four feet to nine feet above mean sea level (MSL), while the FEMA map of the existing Crawford corridor shows almost the entire roadway within Flood Zones between eight and nine feet MSL. Part of the Parkway segment also lies within delineated Limits of Moderate Wave Action. Based on these data, and the fact that mitigating roadway floods for historic storm events would require raising the profile of the road by multiple feet for most of the corridor, raising the roadway elevation would likely prove unrealistic. On the other hand, hydraulic storm drainage improvements will be incorporated into the project, in order to reduce roadway flooding during short, high-intensity storm and tidal events.

A wide existing greenspace is located between Crawford Parkway and the harbor wall. A series of low continuous berms could be designed to prevent flooding, accommodate a bicycle facility, and provide visual interest. The design would need to provide pedestrian access to the waterfront promenade from the Olde Town District, and could create informal gathering spaces along the bicycle path where pedestrian crossings and the bicycle path meet.

Many redeveloped properties adjacent to the project will have finished floor elevations which are set significantly higher than their existing floor elevations because of their legal flood insurance requirements. Connections from public space to these private developments (interior or exterior ramp and stair combinations) will be critical for the success of the corridor and must be carefully considered. Besides accessibility and connectivity, designers need to consider visual aesthetics and the unique sense of place this situation presents. In this regard, continuing coordination with the redeveloping property owners will be necessary.

TRAFFIC CALMING

TRAFFIC CALMING TECHNIQUES

Traffic calming devices are used in roadway designs to provide physical measures to improve safety for motorists, pedestrians and cyclists. They aim to encourage safer, more responsible driving and potentially reduce speeding and traffic flow. These devices can be introduced into the urban environment by changing pavement marking along the roadway, retrofitting roadways with spot improvements, or reconstructing an entire roadway with planned traffic calming devices as part of the overall design.

LANE REDUCTION - "ROAD DIET"

A Road Diet is generally described as "removing travel lanes from a roadway and utilizing the space for other uses and travel mode." Road Diets have the potential to improve safety, convenience, and quality of life for all road users.

LANE NARROWING

Reducing the width of a lane slows down traffic by funneling through a narrower street. Narrowing lanes enhances movement and safety of bicyclists and pedestrians, and creates space for transit, parking lanes, and widening sidewalks.

MEDIANS

Medians are an effective method of making a streetscape more pedestrian-friendly. Landscaped medians can dramatically alter the visual character of street for both motorists and pedestrians. Medians serve three primary purposes: to separate opposing traffic, to provide space for planting, and to provide a refuge for pedestrians crossing the road.

CURB EXTENSION / BULB OUTS AT INTERSECTIONS OR MID-BLOCK

A curb extension is a horizontal extension of the sidewalk into the street resulting in a narrower roadway section. Curb Extensions are an effective method for slowing automobile turning speeds, shortening pedestrian crossing distances and increasing pedestrian visibility at crosswalks, and goes hand-in-hand with on-street parking bays.

STREET TREES

Narrow a driver's visual field and create rhythm along the street, creating a physical and psychological separation between the roadway and the sidewalk. Tree boxes or "Stormwater Planters" also play an important role in sustainable urban design by minimizing stormwater runoff, reducing water pollution, and creating a greener and healthier appearance of the built environment by providing space for plants and trees near buildings and along streets.

ON-STREET PARKING

On-street parking narrows the street and slows traffic by creating friction for moving vehicles.

INTEGRATING TRAFFIC CALMING INTO THE STREET DESIGN

Many of these techniques include reducing the roadway footprint by removing travel lanes, meandering the movement of cars, or shrinking the roadway at strategic locations such as at intersections or at transit stops. All of these techniques increase the potential area allocated for non-motorist users. This would be space for pedestrians, bicyclists, and transit users; as well as areas dedicated for storage facilities, Street trees and other green spaces, artwork, wayfinding, commercial outdoor activities, stormwater facilities, and countless other uses in the public realm.

In an urban context, roadway design becomes street design and must accommodate people walking, cycling, and taking transit in a constraint space. The design must meet multiple stakeholder expectations. These expectations may include increasing property value, improving conditions for existing business activities, attracting private investment for new developments, and enhancing the quality of connectivity and accessibility. In this sense, streets need to be viewed as a great place for public spaces, places for businesses to extend their operation outdoors, and as opportunities to extend natural systems into the lives of the City's residents.

DEMONSTRATION PROJECTS

Temporary, low-cost design interventions can be utilized to explore the impacts of traffic calming along a corridor. This strategy allows local agencies to study the effectiveness of these interventions and serve as an educational tool for the public to help acclimate them to potential future changes.



TRAFFIC CALMING EXAMPLES



BIKE INFRASTRUCTURE

For the most part, cyclists use the same transportation network as motorists, except for high speed roadways such as highways. In response, bike lanes and cycle tracks have been built to link popular destinations and accommodate cyclists. These facilities are mostly provided in parks, in reclaimed linear spaces, and along parkways or greenways.

SPATIAL COMPOSITION



PUBLIC SPACE OPTIMIZATION

Limited space necessitates that roadway real estate be engineered to fully, sustainably, culturally, and efficiently maximize its full capabilities.



SIZE REQUIREMENTS

Restricted amounts of space require masterful knowledge of bicycle and vehicular spatial dimensions to develop beneficial bike-way design to the broadest audience.

In urban environments, pedestrians and cyclists may come into conflict due to the high density of buildings, on-street parking, retail and office foot traffic, and other multi-modal activities in the urban environment. Urban environments present unique challenges for designers, tasked to provide safe and efficient transportation options for all users.

TRAFFIC CONTROL MEASURES



EFFECTIVE PAVEMENT STRIPING

By following MUTCD, AASHTO, AND NACTO design standards, a definitive striping methodology can be followed.



SIGNAGE

Regulatory signs and plaques provide guidance and information to the cyclist and convey order, guidance and warnings about traffic flow.

The existing bike infrastructure along the Corridor provides a basis for additional and enhanced bike facilities to be implemented to provide additional safety and more efficient connections. A few measures to encourage safe and efficient cycling are identified below.

PUBLIC EDUCATION



DISPARITY OF RIDING SKILLS

Incongruity of bicyclist abilities creates moving conflict areas without the correct design strategies to efficiently and safely transport bicycle traffic.



BICYCLE AWARENESS

Knowledge on bike transportation should be taught to increase bicycle safety by improving the bicyclist's abilities and heightening motorist / pedestrian awareness of typical cyclist behavior.

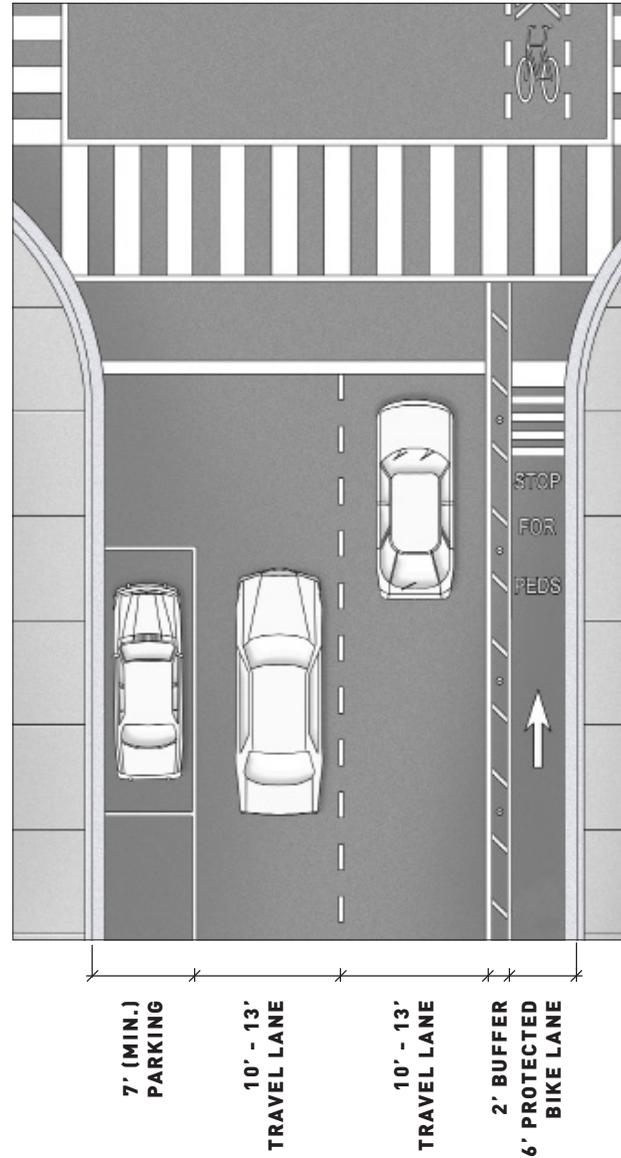
TYPICAL PROTECTED BIKE LANE

Benefits

- Reduces injuries to bicyclists by separating with barrier and reduces risks of dooring and vehicular collision.
- Parking conflicts reduced.
- Provides a safer environment on streets with greater speeds.
- Interim improvement: easy to implement using AASHTO standards, low implementation costs resulting from rearranging roadway operations.

Applications

- Useful in streets with challenging intersections in concurrence with parking setbacks, bicycle markings through intersections, bicycle specific signal heads.
- Most common on one way streets that can accommodate separate cycle tracks and movement of traffic.



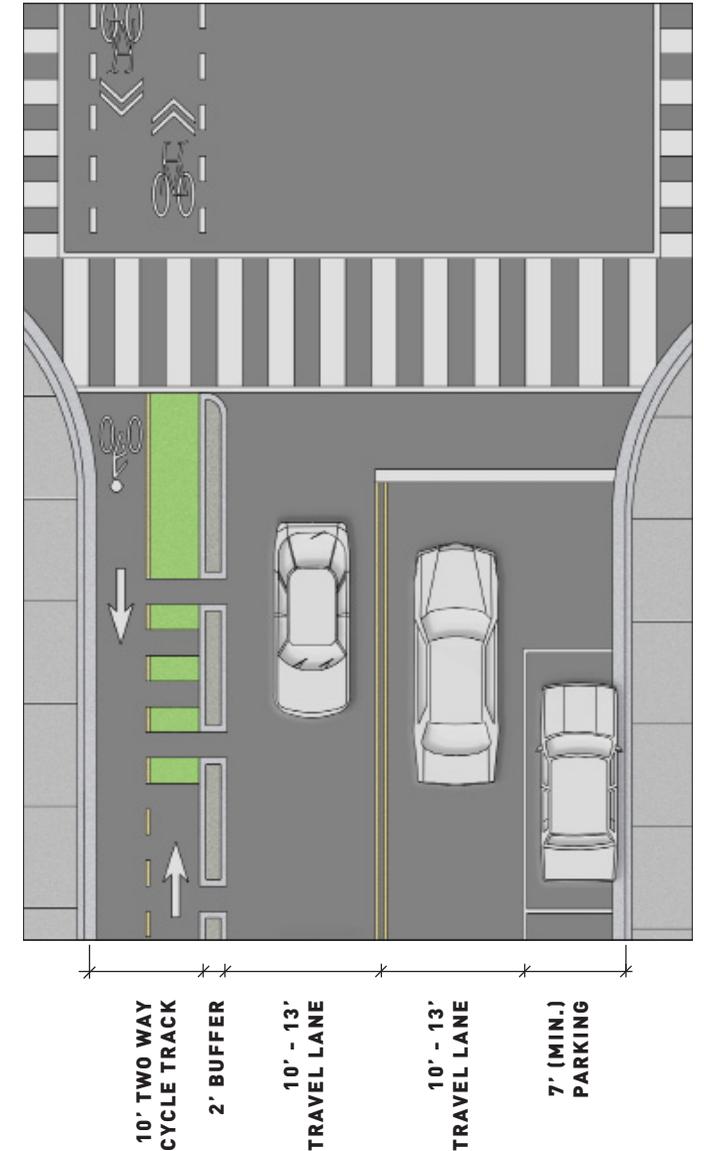
TYPICAL TWO-WAY PROTECTED CYCLE TRACK

Benefits

- Reduces injuries to bicyclists by separating movements with barriers and reduces risks of dooring and vehicular collisions.
- Separation with a raised barrier or a painted buffer.
- Parking conflicts reduced.
- Provides a safer environment on streets with greater speeds.
- Interim improvement: easy to implement using AASHTO standards, low implementation costs resulting from rearranging roadway operations.
- Reduces out-of-direction travel by providing flow movement against traffic.

Applications

- Useful in streets with challenging intersections in concurrence with parking setbacks, bicycle markings through intersections, bicycle-specific signal heads.
- Strengthens bicyclists' presence by grouping facilities together.
- Fewer intersection treatments needed than two one way cycle tracks.



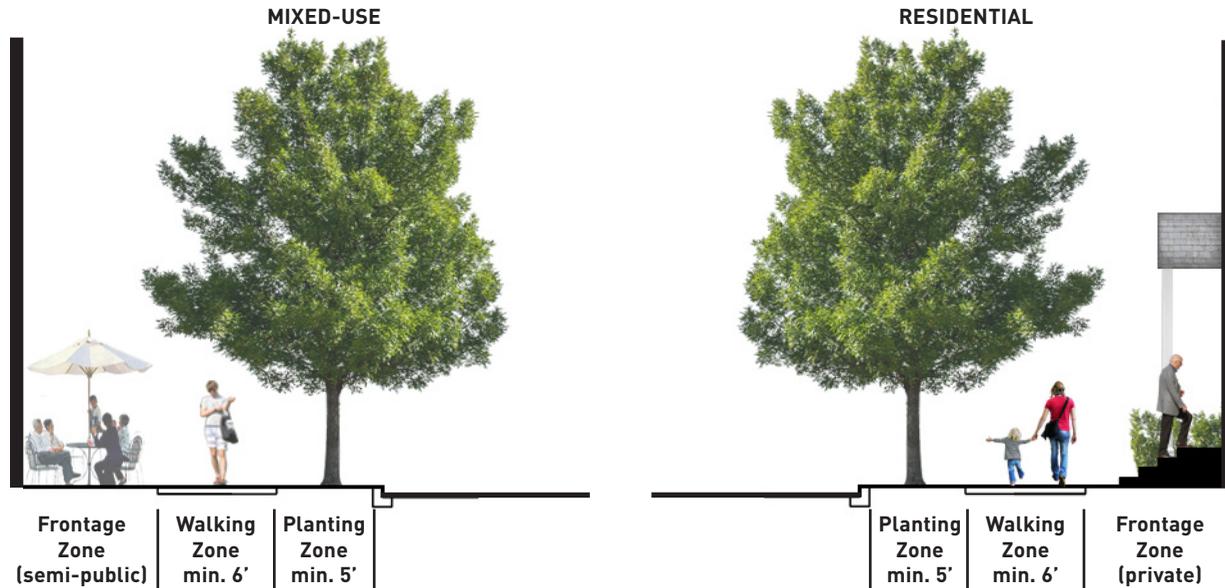
STREETSCAPE

CREATING PUBLIC SPACES IN URBAN ENVIRONMENTS

An inviting and active street is a valuable factor for a great urban environment. Families walking to destinations or strolling for pleasure, shoppers or window shoppers, and people enjoying a rest in a comfortable outdoor restaurant or on a park bench all contribute to a street's vitality. To ensure a memorable experience along the Crawford Corridor, effective spatial design, appropriate amenities, and experiential variety must be provided to create an atmosphere that supports an active street.

STREETSCAPE DESIGN

Critical to the success is the design of the streetscape. The streetscape is generally composed of three intertwined zones parallel with the street – the Furnishing/Planting Zone, the Walking Zone, and the Frontage Zone. These three zones can vary in width and layout depending on the surrounding context, and are prioritized based on spatial requirements and aesthetics.



Priority 1: The Walking Zone is the section of the sidewalk that is given highest priority because it must provide a continuous and unobstructed walking space. This zone is designated for clear pedestrian circulation and must meet ADA requirements.

Priority 2: If a sidewalk is wider than six feet, a Furnishing / Planting Zone is included to feature street lights, trees, site furnishings, parking meters; as well as LID facilities, artwork, and wayfinding. The narrowest width for this zone should be 4 feet.

Priority 3: Once the minimum widths for both the Walking Zone, and the Furnishing / Planting Zone have been met, a Frontage Zone can be added to the streetscape. The Frontage Zone needs to be designed based on its surrounding context, and if planned accordingly will add significant value to the urban environment. Around commercial areas, the Frontage Zone can accommodate sidewalk cafes and eateries, outdoor seating for restaurants, and outdoor commercial activities for retailers. Outside a residential building, the Frontage Zone can provide additional greenspace or other features to make the transition from the public to private space more inviting.

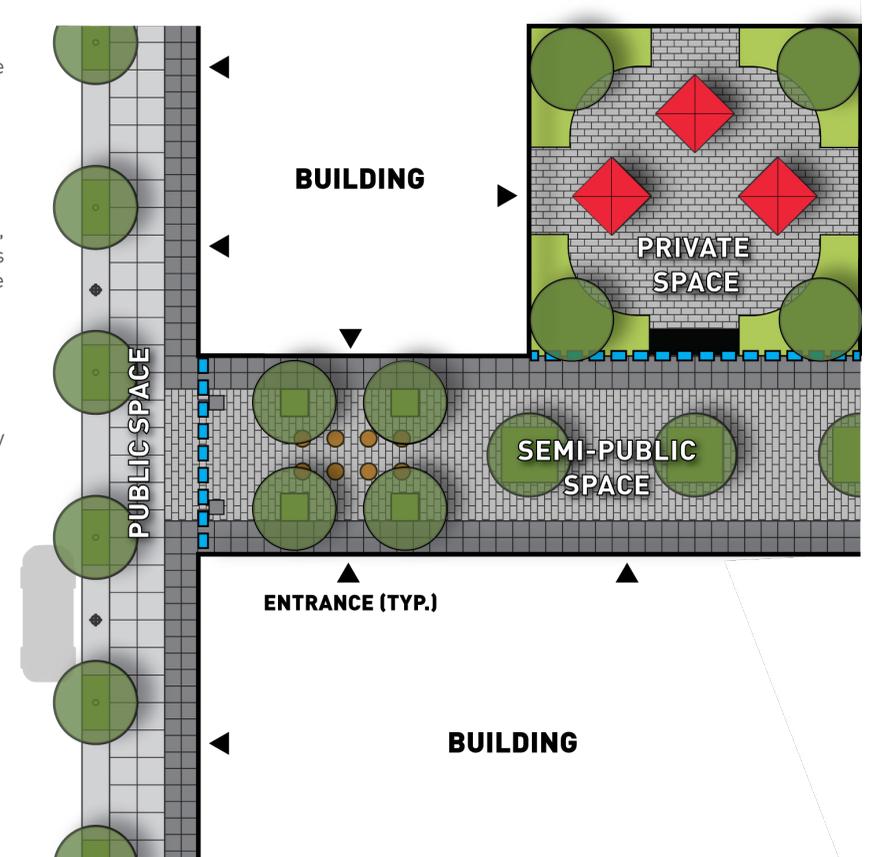
EFFECTIVE CONNECTIONS BETWEEN PUBLIC SPACE AND PRIVATE PROPERTY

A wide sidewalk alone will not necessarily bring new life to a street. Multiple contributing factors need to be integrated successfully to meet regulatory requirements and create attractive places that generate repeat traffic for economic stability. The most obvious distinction between public and private space is accessibility or the perceived limitations of accessibility – conditions placed for an individual or a group of people to occupy, or not occupy, a place. In many successful urban areas, the lines between public and private spaces are often not clear. The design of buildings and the public realm should relate to each other to create a smooth transition without visual or physical obstructions. Design guidelines should influence aesthetics and functional requirements between public and private open spaces. For the purposes of this study, open space has been defined into three major categories:

Public Space:
Space accessible to all with little restriction on activities.

Semi Public Space:
Space that allows for public access, but is designed to meet the needs of a specific user group or private development.

Private Space:
A space that can only be accessed by specific users.



ACTIVATING THE BUILDING EDGE

The finished floor elevation for any new development along the Crawford Corridor needs to be approximately four feet higher than existing street level due to the probability of tidal flooding.

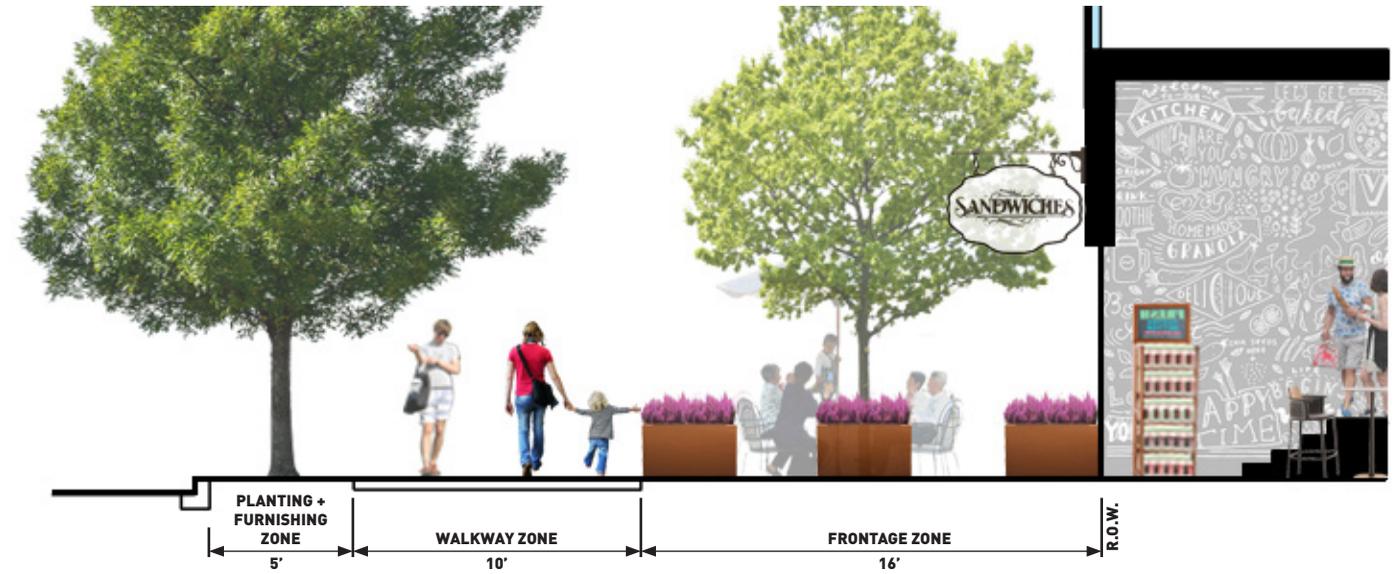
If new development simply follows the finished floor elevation requirements, a four-foot concrete wall would be facing the sidewalk rather than attractive retail storefronts. A retailer's storefront is a valuable tool for marketing one's business. Storefronts offer a positive first impression and allow customers to transition from viewing merchandise to actually making a purchase. It is important to consider how the streetscape design can accommodate high visibility, accessibility, and a positive atmosphere for retailers.

This study presents options for dealing with flood mitigation and creating a vibrant streetscape able to sustain downtown business activities.

Several design solutions can be introduced within this Frontage Zone to resolve the elevation change if enough space is provided within the ROW.

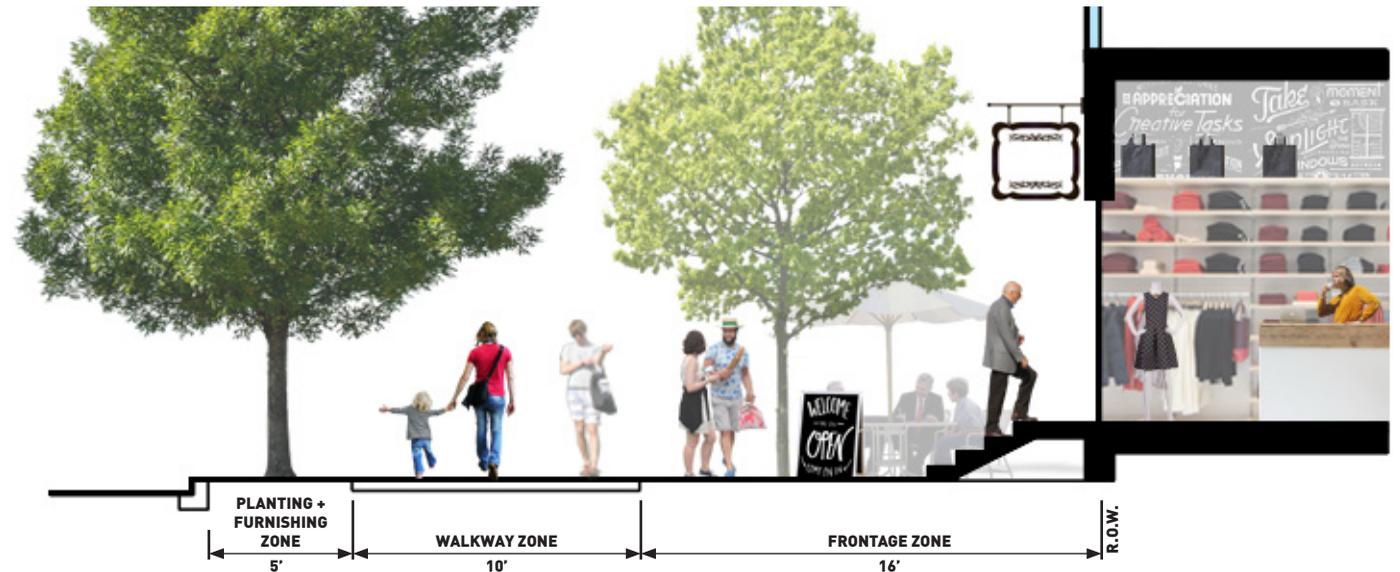
Scenario 1

A strong visual and physical connection to the storefront is provided in Scenario 1 by providing a flush condition between the walkway zone, frontage zone and store entrance. This condition increases ease of access and entices pedestrians to enter the store. To address the potential for flooding and minimize risk of property damage, a change of elevation (through stairs and ramps) would occur within the building footprint and raise the finished floor elevation to the required height.



Scenario 2

This scenario utilizes the wide frontage zone to accommodate the necessary change in elevation to mitigate the risk of flooding. Although this strategy solves the issue of elevating the finished floor elevation, it takes up frontage zone space that could be occupied by other uses and visually disconnects pedestrians from the interior of the store. This condition could potentially detract from the pedestrians likelihood to explore the businesses along the street.



STREETSCAPE

CREATING GREEN CORRIDORS IN URBAN ENVIRONMENT

Street trees are desirable urban elements along commercial areas. They provide shade, beauty, and separation; as well as contribute to wildlife habitats, provide a sense of order and help define other elements in the landscape. Species selection is important when planting new trees. Urban conditions limit the number of trees, shrubs, and ornamental plantings suitable for planting along a roadway. Plantings in urban environments need to tolerate conditions that mimic drought and flooding. They need to tolerate heat, winds, and other urban stresses. The combination of these conditions make plantings more susceptible to disease and pests. Due to the high visibility in an urban environment, plantings need to have a “proper” appearance and not look messy. Since appearance is a subjective factor, plantings in urban environments also have to deal with changing preferences in society.

The transformation of the Crawford Corridor should include a consistent row of street trees and healthy-looking understory plantings in bioretention planters to help define the public realm and provide comfort for pedestrians.



Existing trees can be damaged or killed through various construction activities. Protecting trees during construction increases the likelihood of survival. The preservation of street trees helps maintain natural systems in urban areas, helps with stormwater management by capturing rainfall before it hits the roadway, and provides a sense of longevity for an area. Approximately 90% of a mature tree’s root system is in the top three feet of soil, and more than half is within the top foot. Construction activities need to be avoided within the trees drip line and, when possible, the soil around a tree should be amended.

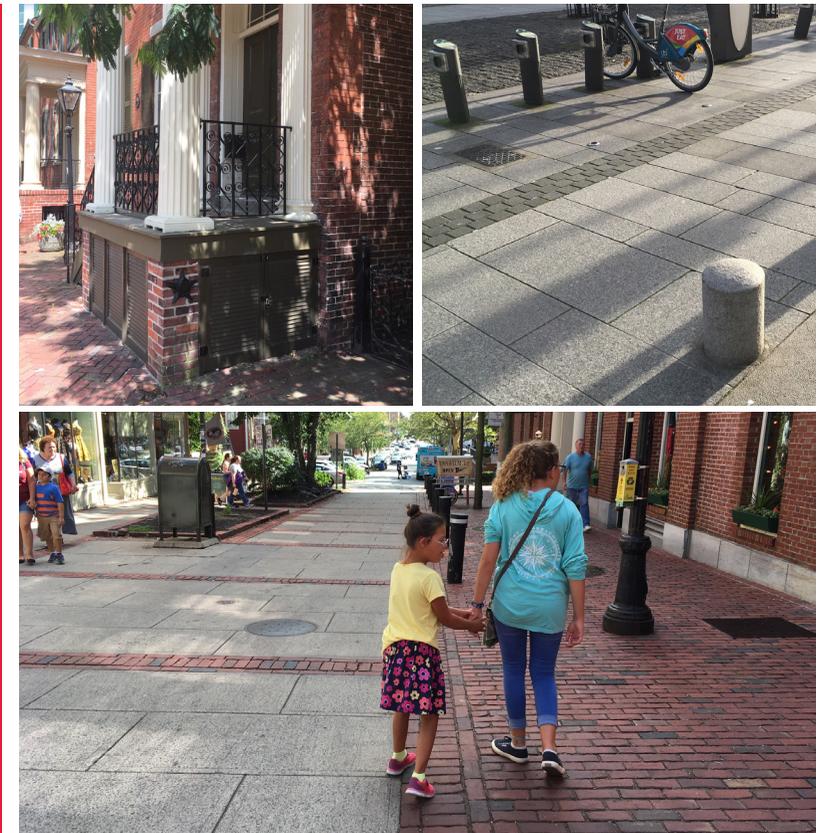
Numerous existing trees along the Crawford Corridor should be protected and maintained and the planting areas around them expanded and improved.



SIDEWALK TREATMENT

The sidewalk’s walking surface is a large percentage of the public realm area, yet it is often the most overlooked component of the streetscape. Of all the streetscape elements, it has the potential to be the one that has the greatest impact on the experience and the budget of a project. Traditional pavement materials such as concrete and asphalt are often considered without great thought towards the color, layout, or composition. Where the sidewalk is narrow, concrete sidewalks can be made attractive with carefully laid out score joints or different textures. In sidewalk areas where walkways are wide or extensive, non-traditional materials should be considered as accents or in key locations. Accent pavement materials and treatments can enhance the aesthetics of a city’s public spaces and help the transition into commercial or historic areas. These pavement treatments can be selected from a range of options including natural stone, brick, or concrete pavers varying in many sizes, colors and textures. Entrances into parks, plazas, or businesses are often enhanced with a different pavement material other than the traditional concrete sidewalk.

For the Crawford Corridor, the design should consider a combination of sidewalk materials where the corridor transitions into historic and commercial areas. In and within close proximity of a historic district, park, or building, the sidewalk pavement should be brick. Sidewalk pavements in private and public areas when part of a private development, should include at least 50% accent pavement materials. The material should relate with the adjacent buildings, yet be consistent with a uniform sidewalk treatment for the entire corridor. The consistent sidewalk pavement treatment for the corridor should be 50 to 75% concrete pavement and 50 to 25% accent pavement materials - natural stone, brick, or concrete pavers.



STREETSCAPE FURNISHINGS

Street furniture is a collection of objects and pieces of equipment installed along the street and sidewalks to provide comfort and aesthetic interest. These elements provide an amenity for not only pedestrians, but motorists as well. If placed strategically within the sidewalk, they can help direct traffic, direct views towards storefronts, and create gathering spaces. They can also create an environment in which motorists are made aware of other modes of transportation and therefore provide safety throughout the corridor.

Furnishings expected along the Crawford Corridor are benches, trash receptacles, street lights, traffic signals, bollards, parking meters, and similar streetscape elements. They can also come in the form of artwork or natural elements. Artwork can often be designed to serve a functional use, such as a place to sit or rest, as well as being part of a wayfinding system. Natural elements such as boulders are used as traffic barriers or places to sit. This is often done near a park or as an attempt to connect people with nature in an urban environment. Any and all of the furnishings need to provide some sort of consistency and connection to the surrounding environment. Street furniture can reflect local culture or famous aspects of an area.

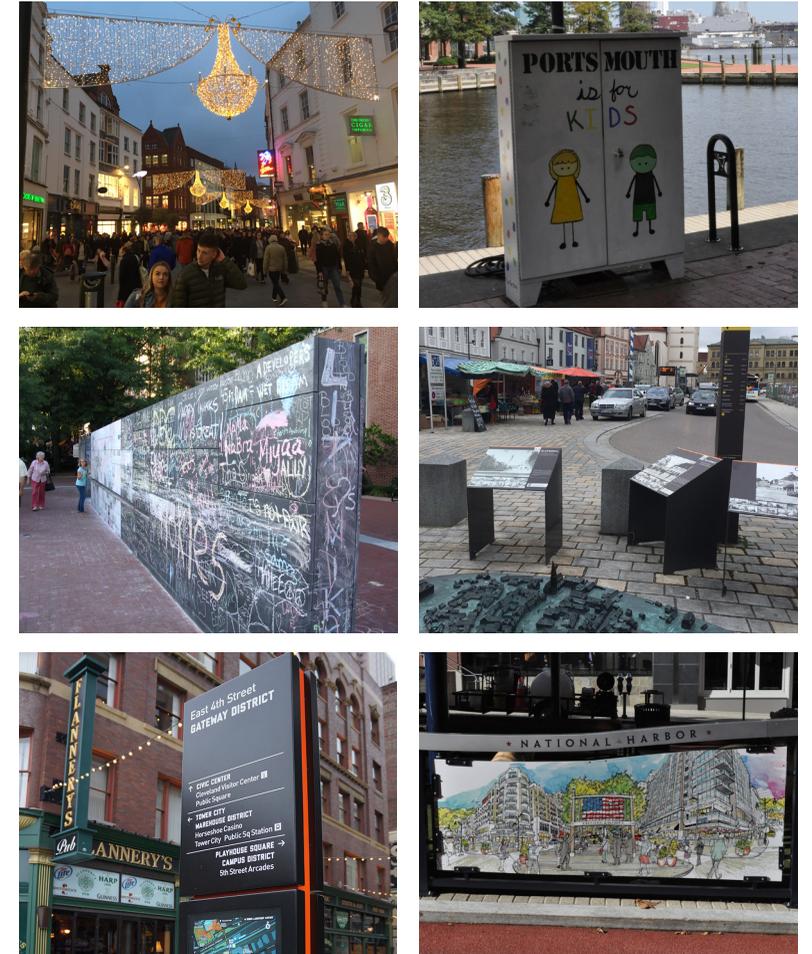


Light poles are an important streetscape element and need to be incorporated within the context of an urban environment. Lighting of the roadway and pedestrian scale lighting need to be coordinated and relate to each other. Roadway light poles should be placed opposite from each other on either side of the street, as opposed to an alternate layout which would stagger the lights. In sidewalk areas 15 to 30 feet in width, pedestrian lighting should be introduced in the Frontage Zone. Pedestrian lighting should illuminate the sidewalk and not distract storefronts. Private developments should provide landscape lighting to add interest for evening activities. The location and forms of the light installations may vary based on site specific conditions, but the atmosphere created should be one that unifies the urban environment at night. Streetscape elements, such as artwork or plantings, can be highlighted at night to add a unique experience.

WAYFINDING + PUBLIC ART

Unique elements in urban areas such as a wayfinding system and public art are often integrated into the overall streetscape design. A successful wayfinding system allows people to orientation themselves and navigate through the urban environment. The wayfinding system does not necessarily have to be a series of signs directing people from place to place. Parts of the wayfinding system can include historical markers or monumental plaques commemorating an event, people or an individual; as well as artwork showcasing uniqueness and a sense of identity. Artwork can act as a vehicle for creating meaningful connections between users of the corridor and the place itself. The successful integration of artwork in the public realm reinforces community life and strengthens the visual character of the corridor.

For the Crawford Corridor, wayfinding and public art should be a combination of relocated permanent artwork and new curated public art projects; along with a wayfinding system that reinforces direction within the corridor and identifies the City's historic features. A range of artwork should be explored by the City as well as private developments. Whether artwork is at ground level, interactive, or overhead above the roadway or sidewalk – integrated artwork with the streetscape design provides lasting impressions for residents and people passing through the corridor. Art can come in an infinite number of materials, shapes, layouts, and technologies. Cities and local communities can use artwork as an expression of the City's character, history, and culture, and create memorable experiences for people traveling the corridor.



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4 EVALUATION OF ALTERNATES

The focus of the four Alternates presented centered on downtown Crawford Street between High and County Streets. The reasoning for selecting this area to develop initial alternates stemmed from the Crawford Gateway Revitalization (Feb. 2018). The document identified the area as a potentially high value redevelopment site which should establish development quality expectations for subsequent downtown projects. The future vision of this area envisioned in the Crawford Gateway Revitalization influenced the organization of the roadway and configuration of the public realm to accommodate the future redevelopment. A detailed Evaluation of these Downtown Alternates focused on overall cost, traffic operations, accessibility, and multi-mobility. The four Downtown Alternates provided a design framework, strategies, and evaluation criteria that were extended through the Corridor and used to develop two Alternates for the Olde Towne Segment (Crawford Parkway) and Transition Segment. Evaluation of the two Parkway Alternates presented on pages 61-62 focused on overall cost, efficient connectivity, and impacts to the open space.





EVALUATION CRITERIA

To successfully evaluate the Downtown Alternates presented on the following pages, it was necessary to establish criteria to evaluate their feasibility and appeal. The four major criteria (Cost, Private Development Potential, Urban Design, and Flexibility) and their sub-categories are explained to the right. These criteria are applied to the four Downtown Alternates presented on the following pages in combination with a plan and section of each alternate.

COST

PRIVATE UTILITY IMPACTS

The relocation and installation of private utilities can have a significant impact on the cost and schedule of a project. Does the reconfiguration of the roadway impact power lines? Can additional drainage impact the existing underground utilities?

PUBLIC INFRASTRUCTURE IMPACTS

Relocation and installation of new facilities can significantly impact existing utilities and increase the cost of a project. How will the reconfiguration of the roadway impact existing infrastructure such as drainage, roadway lighting, and traffic signals? Will the relocation of curb lines require the relocation of existing infrastructure?

TRANSPORTATION IMPACTS

How will the reconfiguration of the roadway in the alternate add to the cost of the overall project? Will the curbs need to be relocated? Will new curbs need to be built to widen the median? Will there need to be adjustments made to the signalization?

RIGHT-OF-WAY ACQUISITION

Acquiring additional property to widen the right of way can add significant costs to a project and require agreements between the public and private sector. Does the Alternate fit within the existing right-of-way or will additional right-of-way need to be purchased?

PRIVATE DEVELOPMENT

COMMERCIAL APPEAL

Commercial developers seek areas with potential for an active public realm, efficient accessibility, and opportunities for growth. Wide, comfortable, and interconnected spaces attract people and encourage exploration. Does the Alternate have the potential to provide these characteristics?

RESIDENTIAL APPEAL

Residential development favors a safe, quiet, and well connected public realm. Sidewalk widths can be more intimate. Safe, well-lit areas provide comfort and attract residential users. Does the Alternate have the potential to provide these qualities? existing infrastructure?

PARKING

Short term and on-street parking are critical for the success of commercial development. This type of parking provides convenient access and entices motorists to travel longer distance to the retailer. Does the Alternate have the potential to provide parking?

PUBLIC / PRIVATE SPACE

A well-organized and aesthetically pleasing urban area can generate foot traffic and create destinations within itself. Attractions within the corridor will promote further developments which will increase economic growth in the downtown area. Does the Alternate have the potential to create an appealing public realm?

URBAN DESIGN

OPEN SPACE

The presence of open space along a streetscape allows the user to escape the movement on the sidewalk. By providing shaded, resting areas at certain intervals the streetscape becomes more walkable and attractive to pedestrians. Does the Alternate provide opportunities for this?

GREEN SPACE

The presence of green space is a major amenity in urban areas. Comfortable, shaded, and well-programmed urban green space can become destinations and generate high-foot traffic. Does the Alternate connect to existing green space and provide additional areas for it?

GREEN INFRASTRUCTURE

Opportunities to implement green infrastructure practices into the Alternate is vital due to the corridors proximity to the waterfront. Green infrastructure can mitigate the potential impacts caused by climate change and protect the area from significant damage.

CONNECTIVITY AND ACCESSIBILITY

A well-organized and aesthetically pleasing urban area can generate foot traffic and create destinations within itself. Attractions within the corridor will promote further developments which will increase economic growth in the downtown area. Does the Alternate have the potential to create an appealing public realm?

FLEXIBILITY

INFRASTRUCTURE ADJUSTMENTS

Innovative strategies can be implemented to minimize the impacts on existing infrastructure. Does the Alternate impact the existing infrastructure in a significant way or are their strategies that can be used to reuse or retrofit this infrastructure?

PUBLIC REALM ENCROACHMENT

Encroachment into the public right-of-way is common for many commercial properties. The space provided by this encroachment allows the retailer to program the public realm. Does the Alternate provide possibilities for encroachment or will setbacks be required to provide space?

PROGRAMMABLE SPACE

Programmable space is not only desirable to developers but also to the city and it's residents. The space provided can be designed permanently or be flexible to accommodate seasonal activity. Does the Alternate provide adequate space that can be programmed to the needs of the user?

RETAIL TENANT ALTERNATIVES

Retail tenants vary greatly in size, ownership, and use. The wide spectrum of possible tenants with varying needs requires a public realm that is adaptable. Does the Alternate provide a flexible public realm that can be adjusted to fit the needs of the prospective tenants?

COST

This Alternate relocates the curbs on both the west and east sides of Crawford Street to expand the public realm. The relocation of the curb lines will encroach upon existing utility lines and require the excavation and installation of new relocated utility lines. Although providing additional space in the public realm would create a more walkable corridor, the costs associated with relocating the curbs and the utility lines may outweigh benefits provided by this adjustment.

\$9.0M - \$10.2M*

* Costs for construction utilizing mill and overlay of existing pavement to fullest extent possible. Range based on bike lane vs. cycle track in Olde Towne Segment of corridor.

PRIVATE DEVELOPMENT POTENTIAL

This Alternate focuses on expanding the space within the public realm. By relocating the curb and shifting it inwards towards the existing roadway, space for sidewalk and amenities is provided. The additional space creates a more walkable corridor and provides the private development with an opportunity to “spill-out” onto the sidewalk. This strategy helps to activate the building edge and creates a more appealing and inviting environment, encouraging pedestrians to enter the storefront.

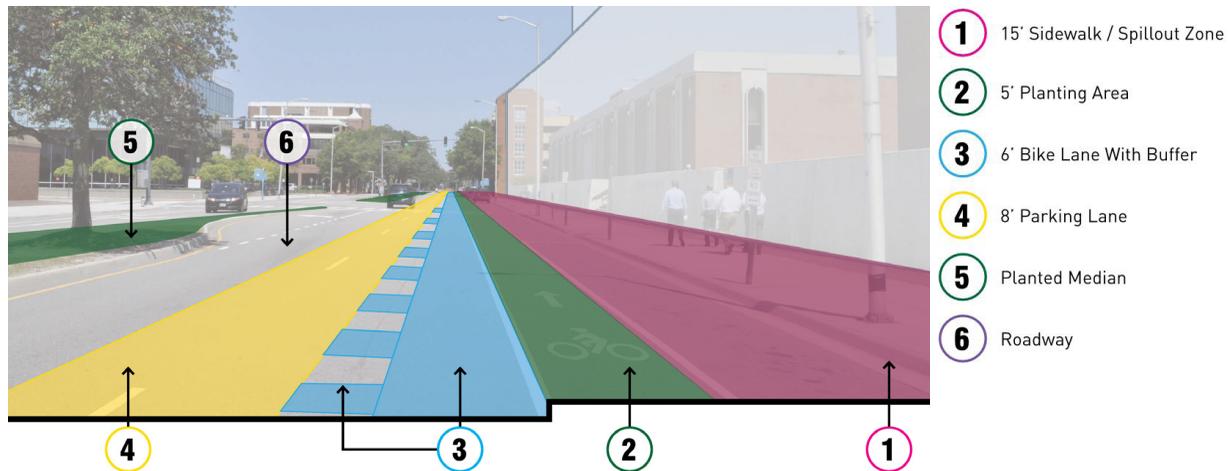
URBAN DESIGN

The proposed improvements recommended in this Alternate create a much more pedestrian and cyclist friendly environment. By reducing the travel lanes in each direction from two to one, the alternate modes of transportation become more appealing. The street crossings become shorter and safer for pedestrians and protected bike lanes on both sides of the street extend the length of corridor. The additional sidewalk space provided allows for “spill-out” zones and increased planting areas for street trees.

FLEXIBILITY

Although this design provides additional space within the public realm, it is unlikely that there will be adequate space for large outdoor dining areas or other programmable space that may attract large-chain establishments: without the use of private space for outdoor activities. The intimate feel creates a character that should encourage local businesses such as coffee shops and book stores to establish businesses along the corridor. This design promotes a more small town atmosphere and blends nicely into the existing character of the Olde Towne district.

FRAMEWORK DIAGRAM



PRECEDENT



Protected bike lanes - Arlington, VA



Mid-size outdoor “spill out” zone

DOWNTOWN ALTERNATE 2

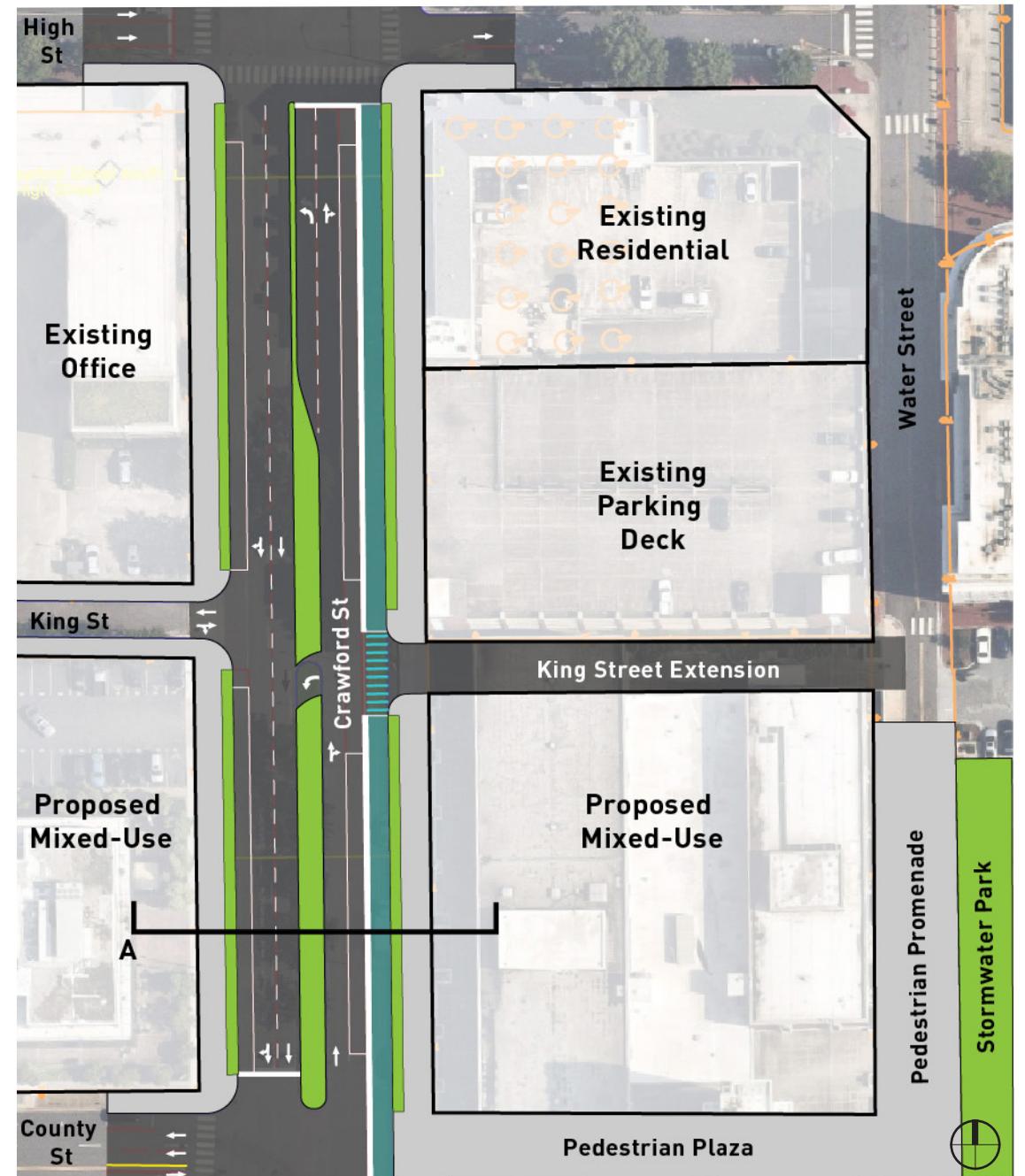
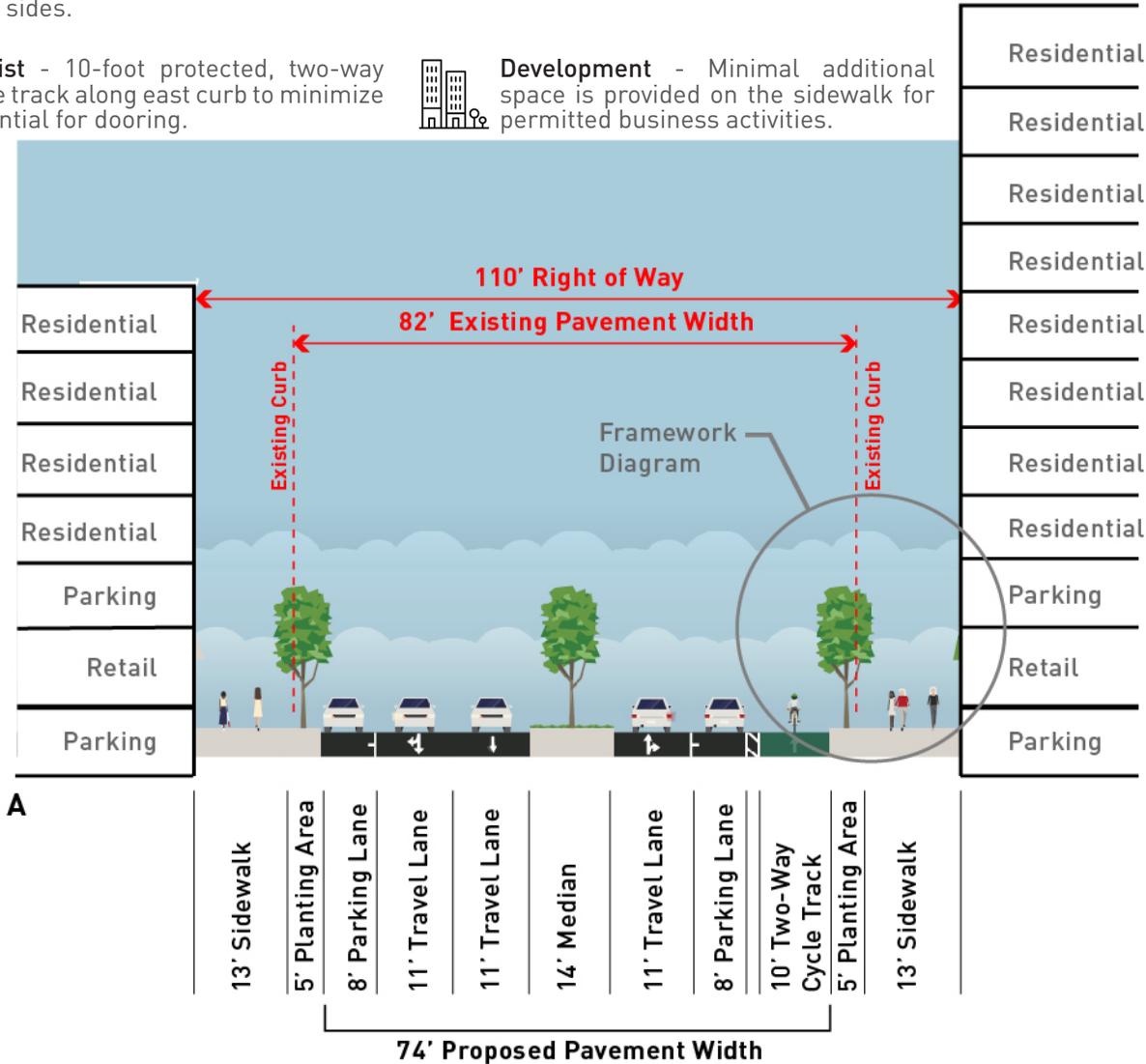
This alternate reduces the overall street width by approximately 8-feet. This alternate reduces travel lanes to one northbound lane while maintaining 2 lanes southbound, with on-street parking on both sides of Crawford Street. A 2-way 10-foot cycle track is provided on the northbound side of Crawford Street. Alternate 2 also provides for a 5-foot planting area and a 13-foot sidewalk on both sides of Crawford Street.

 **Vehicular** - Removal of travel lane in northbound direction. Narrow travel lanes to 11-feet. Maintain parking on both sides.

 **Pedestrians** - Roughly 13-feet of sidewalk provided on both sides of the street.

 **Cyclist** - 10-foot protected, two-way cycle track along east curb to minimize potential for dooring.

 **Development** - Minimal additional space is provided on the sidewalk for permitted business activities.



COST

This Alternate relocates the curbs on both the west and east sides of Crawford Street to expand the public realm. The relocation of the curb lines will encroach upon existing utility lines and require the excavation and installation of new relocated utility lines. Although providing additional space in the public realm would create a more walkable corridor, the costs associated with relocating the curbs and the utility lines may outweigh benefits provided by this adjustment.

\$8.9M - \$10.0M*

* Costs for construction utilizing mill and overlay of existing pavement to fullest extent possible. Range based on bike lane vs. cycle track in Olde Towne Segment of corridor.

PRIVATE DEVELOPMENT POTENTIAL

This Alternate provides a reduced benefit from Alternate 3 for private development. By relocating the curb and shifting it inwards towards the existing roadway, new space is provided. The additional space creates a more walkable corridor and provides the private development with an opportunity to “spill-out” onto the sidewalk. This strategy helps to activate the buildings edge and create a more appealing and inviting environment, encouraging pedestrians to enter the storefront.

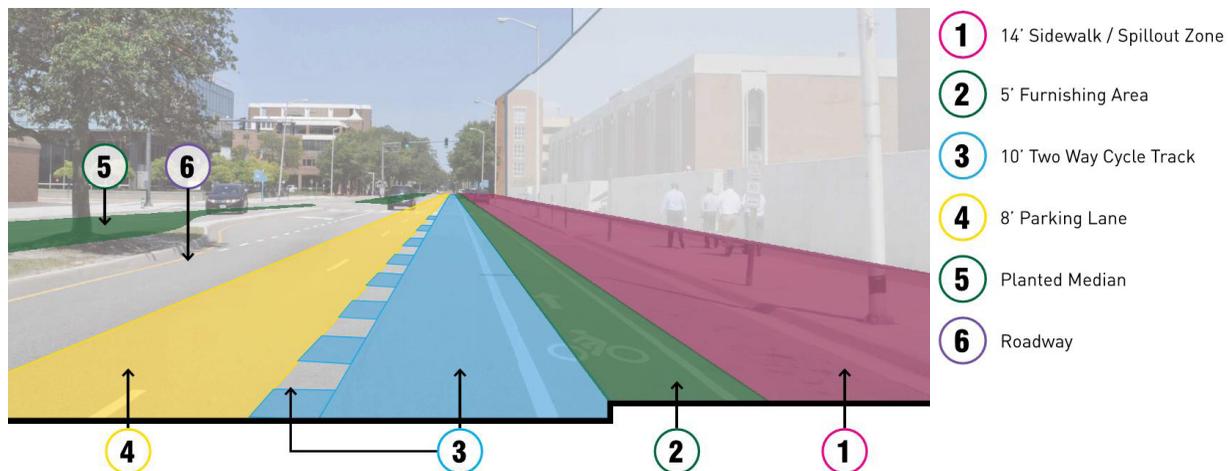
URBAN DESIGN

This Alternate create a more pedestrian and cyclist friendly environment. Unlike in Alternate 1 however, two lanes inbound will be retained and a cycle track is proposed on the east “waterfront edge” of Crawford Street. The cycle track connects to the existing trail at Crawford Parkway and provides additional access to the green space along the waterfront. There is a unique opportunity here to further activate this green space with furnishings, plantings, and other programming elements.

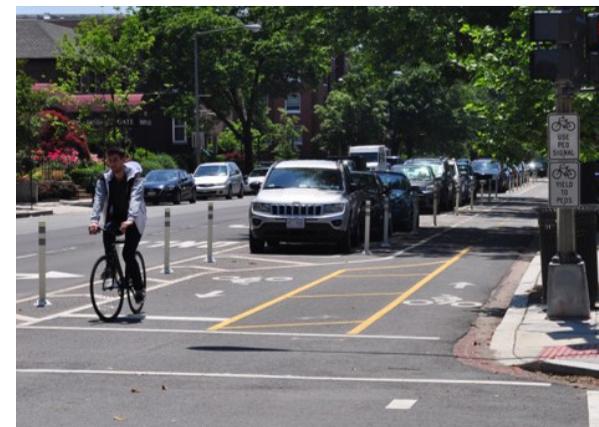
FLEXIBILITY

Although this design provides additional space within the public realm, it is unlikely that there will be adequate space for large outdoor dining areas or other programmable space that may attract large-chain establishments: without the use of private space for outdoor activities. The intimate feel creates a character that should encourage local businesses such as coffee shops and book stores to establish businesses along the corridor. This design promotes a more small town atmosphere and blends nicely into the existing character of the Olde Towne district.

FRAMEWORK DIAGRAM



PRECEDENT



Two-way cycle track - Washington, DC



Mid-size outdoor “spill out” zone

DOWNTOWN ALTERNATE 3

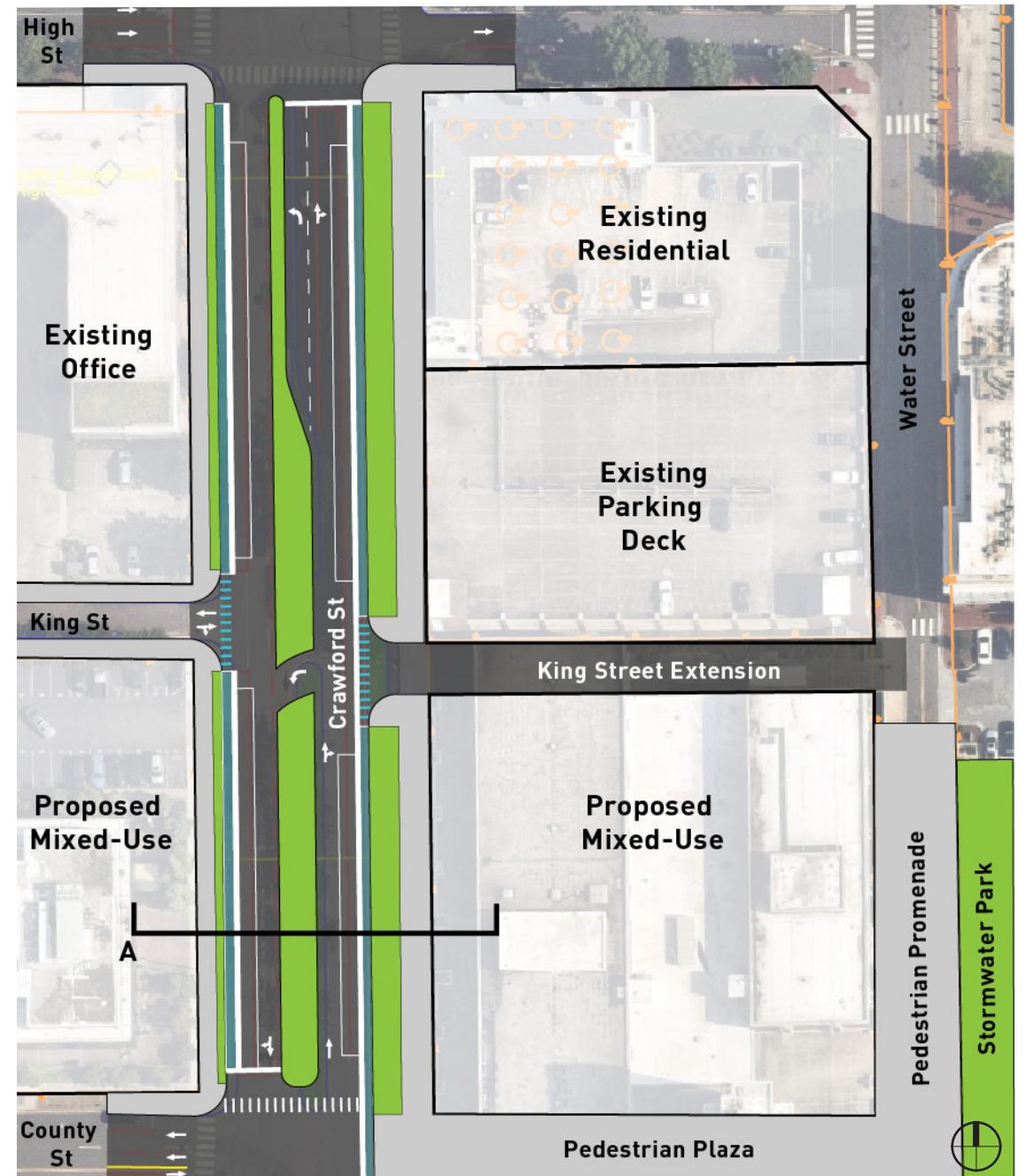
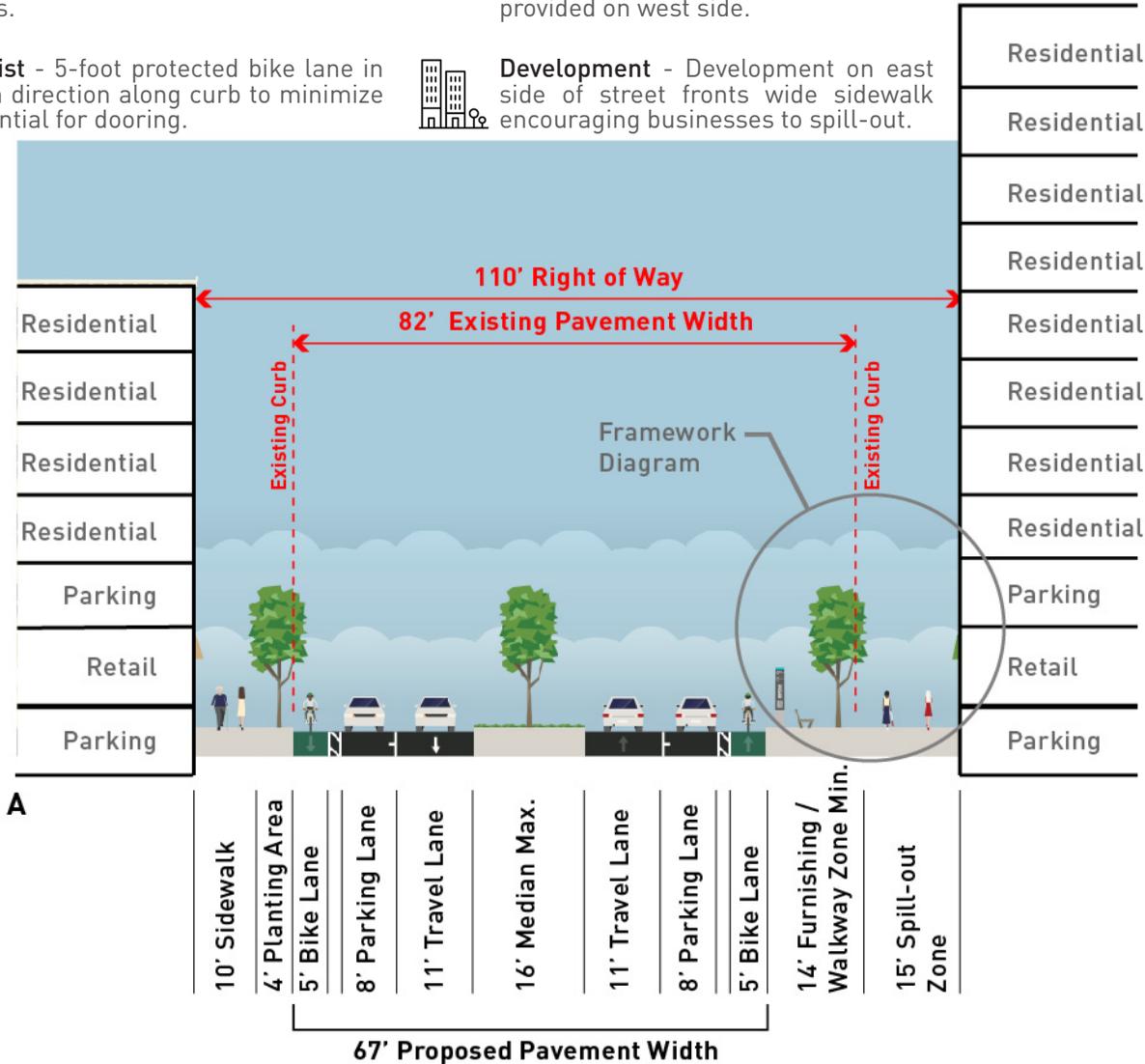
This alternate reduces the overall street width by approximately 15-feet, with all of the reduction occurring on the east side of Crawford Street. This alternate reduces travel lanes to one lane in each direction with on-street parking and bike lanes on both sides of Crawford Street. Alternate 3 also provides for a 29-foot wide pedestrian zone on the east side of Crawford Street.

 **Vehicular** - Removal of travel lane in each direction. Narrow travel lanes to 11-feet. Maintain parking on both sides.

 **Pedestrians** - Roughly 30-feet of sidewalk provided on east side of street. No additional sidewalk space is provided on west side.

 **Cyclist** - 5-foot protected bike lane in each direction along curb to minimize potential for dooring.

 **Development** - Development on east side of street fronts wide sidewalk encouraging businesses to spill-out.



COST

This Alternate focuses on the public realm along the east “waterfront side” of Crawford Street. The design maintains the curb line and much of the infrastructure along the west side. The space added to the public realm would help accommodate larger development near the waterfront. This intervention would provide adequate space for outdoor cafes, furnishing zones, and other programmatic opportunities to create a more attractive and active public realm.

\$8.3M - \$9.4M*

* Costs for construction utilizing mill and overlay of existing pavement to fullest extent possible. Range based on bike lane vs. cycle track in Olde Towne Segment of corridor.

PRIVATE DEVELOPMENT POTENTIAL

This Alternate maximizes the valuable land near the waterfront. By providing significantly larger space within the public realm the developer has the opportunity to “spill out” into the sidewalk a greater distance. The spill out area could easily accommodate larger outdoor eating areas and other programmatic opportunities while still providing a comfortable pedestrian walking zone. Parallel parking is also maintained on both sides of Crawford Street which could encourage development with ground floor retail. This alternate maximizes development potential.

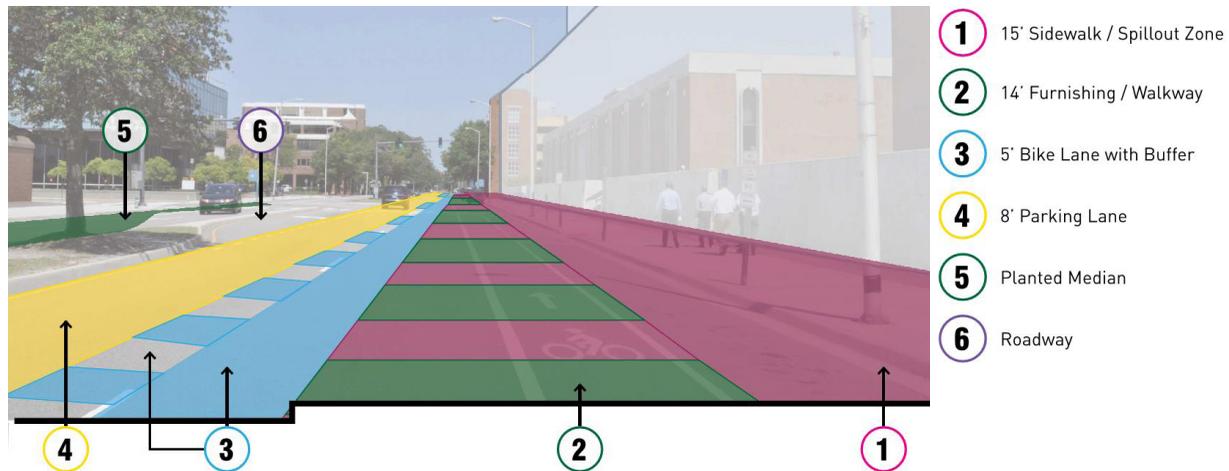
URBAN DESIGN

Although this Alternate focuses on increasing walkability on the east side of the corridor, the west side of Crawford Street still provides wide sidewalks with planting areas. The strength of this design comes from the programmatic flexibility that is provided by the wide public realm along the east side. Stronger connections to the waterfront are created and the scale of the streetscape becomes more comfortable. By removing one travel lane in each direction and adding bike lanes, the corridor becomes safer for all modes of traffic.

FLEXIBILITY

By moving the east side curb a significant distance into the existing roadway, it should be possible to bypass existing utilities and either reuse or re-purpose them. The additional space within the public realm is extremely flexible and presents opportunities for programming such as: outdoor cafes, parklets, furnishing zones, art installations, and wayfinding/branding. This additional space also allows the developer to maximize the building footprint and utilize the “spill out” zone to activate the building edge.

FRAMEWORK DIAGRAM



PRECEDENT



Wide outdoor “spill out” zone for east side



Narrow outdoor “spill out” zone for west side

DOWNTOWN ALTERNATE 4

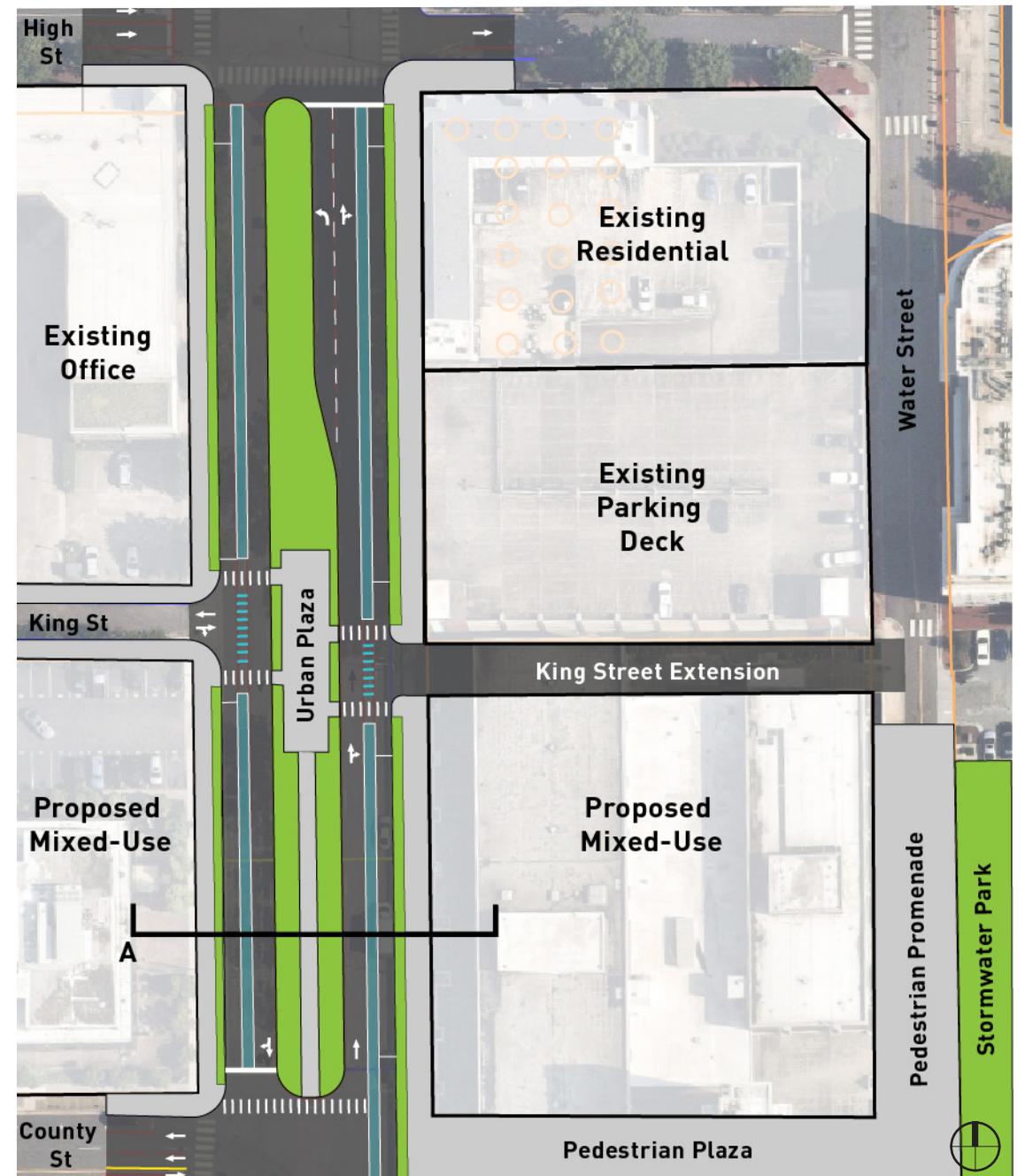
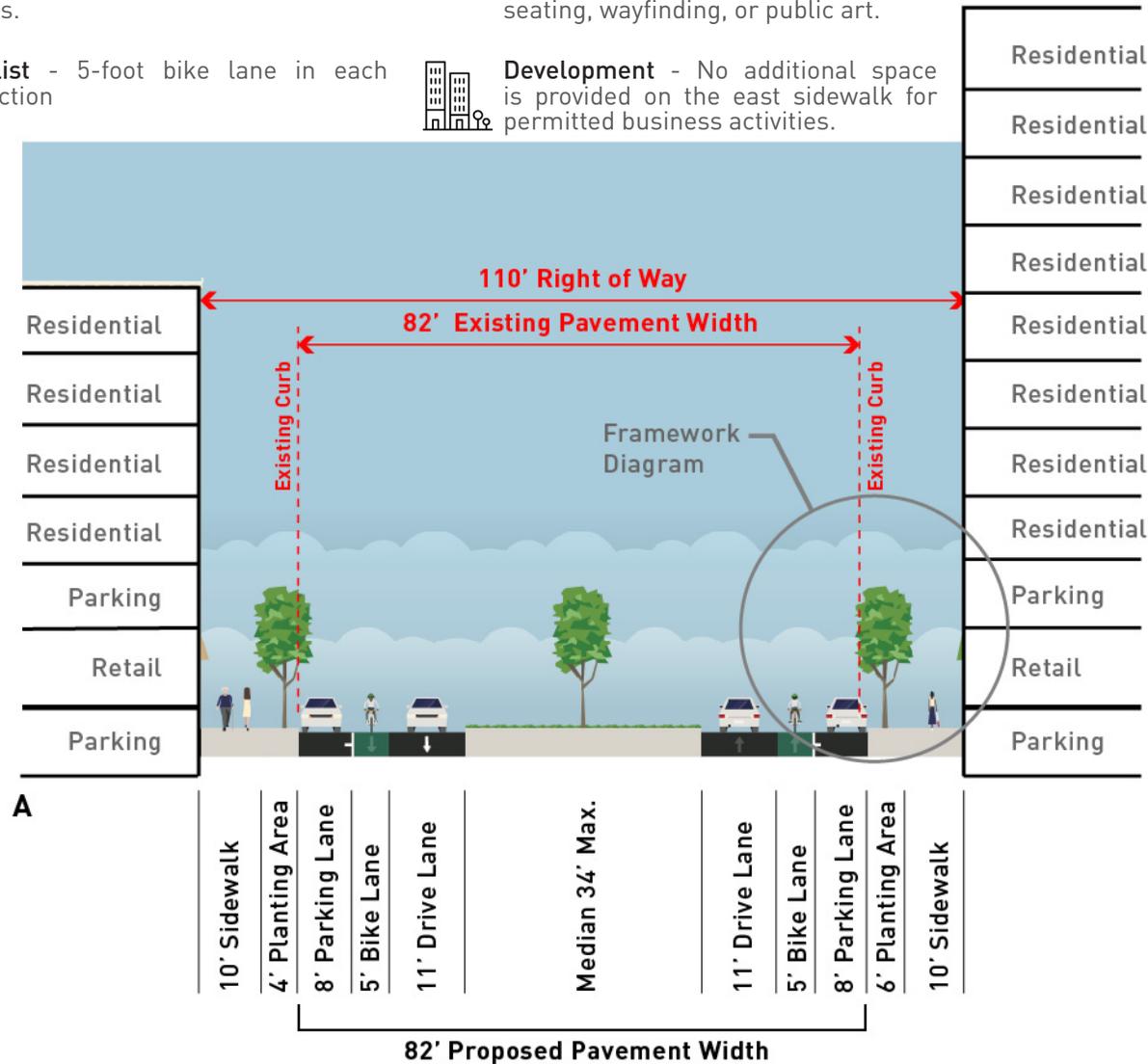
This alternate reduces the overall street width by approximately 15-feet, with all of the reduction occurring on the east side of Crawford Street. This alternate reduces travel lanes to one lane in each direction with on-street parking and bike lanes on both sides of Crawford Street. Alternate 3 also provides for a 29-foot wide pedestrian zone on the east side of Crawford Street.

 **Vehicular** - Removal of travel lane in each direction. Narrow travel lanes to 11-feet. Maintain parking on both sides.

 **Pedestrians** - No additional sidewalk space provided. The widened median can support programming such as seating, wayfinding, or public art.

 **Cyclist** - 5-foot bike lane in each direction

 **Development** - No additional space is provided on the east sidewalk for permitted business activities.



COST

This Alternate helps reduce overall cost by maintaining the curbs along the east and west side of the corridor. This allows the majority of the existing utility lines to remain in place. A wider median will require operation and maintenance costs. To further calm traffic, bulb outs at the intersections would be introduced, adding to the cost of the project. This Alternate could also be implemented in a much shorter time frame than the other Alternates.

\$8.7M - \$9.8M

* Costs for construction utilizing mill and overlay of existing pavement to fullest extent possible. Range based on bike lane vs. cycle track in Olde Towne Segment of corridor.

PRIVATE DEVELOPMENT POTENTIAL

This Alternate reduces significant benefit for private developers. Since the public realm would remain the same on both sides of the corridor there is very little potential for outdoor cafes or other programming that would entice pedestrians to stop and engage at storefronts. Instead of "spill out" zones the development would need to be setback from the right-of-way to provide outdoor programming. This strategy would reduce the building footprint and lower the appeal to developers.

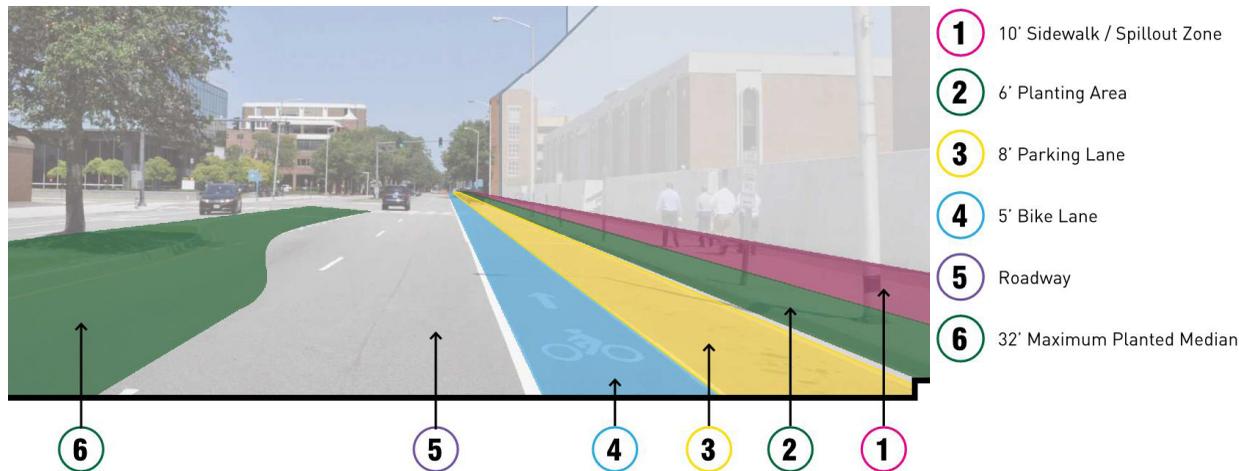
URBAN DESIGN

From an urban design standpoint this Alternate does not increase the walkability along the corridor or provide a comfortable, human-scale streetscape. The enclosure created by new development combined with a narrow sidewalk creates a claustrophobic environment and discourages pedestrians from stopping and engaging with the storefronts. The wide median does provide a unique opportunity for programming and could include; seating, areas, a dog park, play areas, or flexible festival space.

FLEXIBILITY

This Alternate does not offer much in terms of flexibility for the developer. There is minimal space to "spill out" into the sidewalk and setbacks may be required to create any meaningful or usable outdoor space. Although this may be discouraging for some developments, it may entice a niche type of business to occupy the space and provide more intimate outdoor areas. The flexibility in this Alternate is provided mainly by the wide median and bulb outs which could accommodate a variety of program.

FRAMEWORK DIAGRAM



PRECEDENT



American Way - National Harbor, MD



North Kent Street - Arlington, VA

TRAFFIC OPERATIONS EVALUATION

Four alternate design concepts for the Crawford Corridor were developed. Many of the proposed roadway improvements and design elements are common among the four alternates, with the primary difference being the number of southbound vehicle travel lanes. In Alternates 1, 3, and 4 a travel lane is removed in each direction along Crawford Street reducing the number of lanes from two to one lane. Alternate 2 removes a travel lane from the northbound direction only and maintains two southbound travel lanes. All of the alternate designs reduce the vehicle travel lane widths to 11' for the purpose of calming traffic and dedicated left-turn lanes are maintained at the signals. In addition, the traffic impacts related to the extension of Middle Street from Bart Street to County Street with the redevelopment of the city parking garage and the King Street extension to Water Street with the construction of a new Pedestrian Plaza /Stormwater Park are considered in the traffic analysis for all four alternate designs.

The differences between Alternate 1, 3, and 4 are seen in the positioning of the bike lanes and sidewalk and/or median widths. For purposes of evaluating the traffic impacts between the designs, the roadway improvements proposed with Alternate 1, 3, and 4 are equivalent and are analyzed using the same traffic model.

The traffic analysis for the intersection operations suggest that the reduction to one lane in each direction of Crawford Street between London Street and Columbia Street- will not result in significant degradation to the operating conditions in the corridor. The total intersection level of service for the four signals are expected to operate at LOS C or better.

TABLE 3 - TRAFFIC OPERATIONS SUMMARY

INTERSECTION	PEAK HOUR	EXISTING				2040 NO-BUILD				ALTERNATIVE (1, 3, & 4)				ALTERNATIVE (2)			
		LOS	Delay (sec)	Q95 (ft)		LOS	Delay (sec)	Q95 (ft)		LOS	Delay (sec)	Q95 (ft)		LOS	Delay (sec)	Q95 (ft)	
Crawford Pkwy/ Effingham St.	AM	B	16.6	EB 74 WB 92	C	22	EB 148 WB 157	C	22.4	EB 136 WB 181	C	22.4	EB 136 WB 168				
	PM	B	16.4	EB 66 WB 113	C	21.8	EB 93 WB 221	C	22.1	EB 90 WB 225	C	22.1	EB 102 WB 230				
Crawford St./ London St.	AM	B	11.9	NB 65 SB 68	B	13.6	NB 151 SB 140	B	15.1	NB 144 SB 139	B	15.1	NB 135 SB 145				
	PM	B	12.1	NB 52 SB 140	B	18.6	NB 128 SB 341	B	19.5	NB 137 SB 338	C	19.5	NB 136 SB 333				
Crawford St./ High St.	AM	A	7.1	NB 74 SB 59	A	8.8	NB 122 SB 87	B	16.9	NB 152 SB 152	B	15.5	NB 159 SB 101				
	PM	A	7.4	NB 68 SB 94	B	10.1	NB 124 SB 145	C	20.2	NB 153 SB 292	B	16.9	NB 155 SB 182				
Crawford St./ County St.	AM	A	9.1	NB 63 SB 87	B	10.3	NB 110 SB 151	B	11	NB 120 SB 173	A	10	NB 135 SB 110				
	PM	B	10.6	NB 57 SB 102	B	14.4	NB 93 SB 202	B	15.8	NB 135 SB 240	B	11.6	NB 124 SB 168				

EVALUATION MATRIX

The matrix below identifies four major criteria (Cost, Private Development Potential, Urban Design, and Flexibility) and their sub-categories that were considered during the evaluation. These topics were chosen based on the City of Portsmouth’s vision for the area and their goals for the Crawford Corridor Revitalization project specifically. Each sub-category was evaluated for the four Alternates to help determine the most feasible and appealing Alternates to select.

	COST				PRIVATE DEVELOPMENT POTENTIAL				URBAN DESIGN				FLEXIBILITY				TOTAL
	PRIVATE UTILITY IMPACTS	PUBLIC INFRASTRUCTURE IMPACTS	TRANSPORTATION IMPACTS	RIGHT-OF-WAY ACQUISITION	COMMERCIAL APPEAL	RESIDENTIAL APPEAL	PARKING	PUBLIC REALM	OPEN SPACE	GREEN SPACE	GREEN INFRASTRUCTURE	CONNECTIVITY AND ACCESSIBILITY	INFRASTRUCTURE ADJUSTMENTS	PRIVATE DEVELOPMENT ENCROACHMENT OF THE RIGHT OF WAY	PROGRAMMABLE SPACE	RETAIL TENANT ALTERNATIVES	
ALTERNATE 1	●●●	●●	●●	●	●●	●●●	●●●	●●	●●	●●	●●	●●	●	●●	●●	●●	33
ALTERNATE 2	●●●	●●	●●	●	●●	●●●	●●●	●●	●●	●●	●●	●●	●	●●	●●	●●	33
ALTERNATE 3	●●	●	●●	●	●●●	●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●	40
ALTERNATE 4	●	●	●	●	●	●●●	●●●	●	●	●	●	●	●●●	●	●●●	●	24

●●● HIGH COST ●● MEDIUM COST ● LOW COST ●●● HIGH APPEAL ●● MID-RANGE APPEAL ● LOW APPEAL ●●● GREAT ●● GOOD ● POOR ●●● HIGHLY FLEXIBLE ● FLEXIBLE ● INFLEXIBLE

SELECTING AN ALTERNATE

Based on the criteria identified above, it is determined that **ALTERNATE 3** provides the City of Portsmouth with the most feasible and appealing approach to redesigning Crawford Street. This alternate will be utilized throughout the remainder of the corridor study.

The next step is to evaluate the two alternates for the Crawford Parkway, implementing similar design principles from the Crawford Street design, but with an understanding that the existing context and spatial character differs.

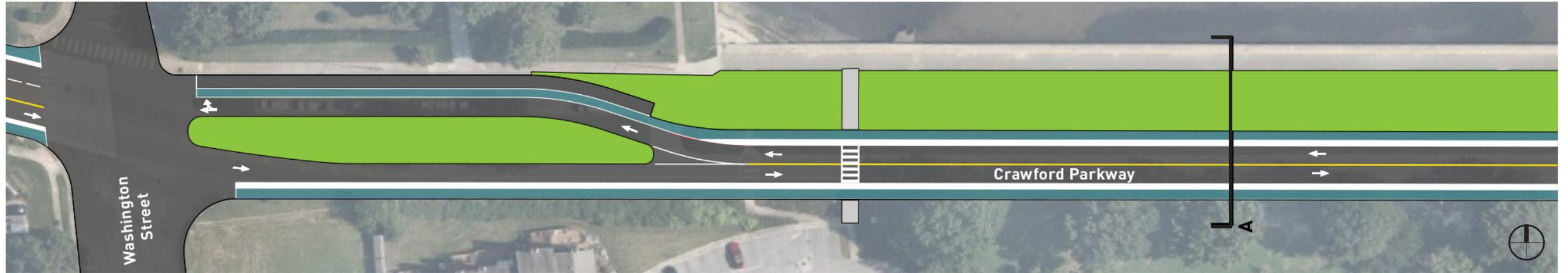
PARKWAY ALTERNATE 1

 **Vehicular** - Roadway and lane width is maintained however as you approach Washington Street the westbound lane splits around an enlarged median. Parking is shifted from the median side to the sidewalk side.

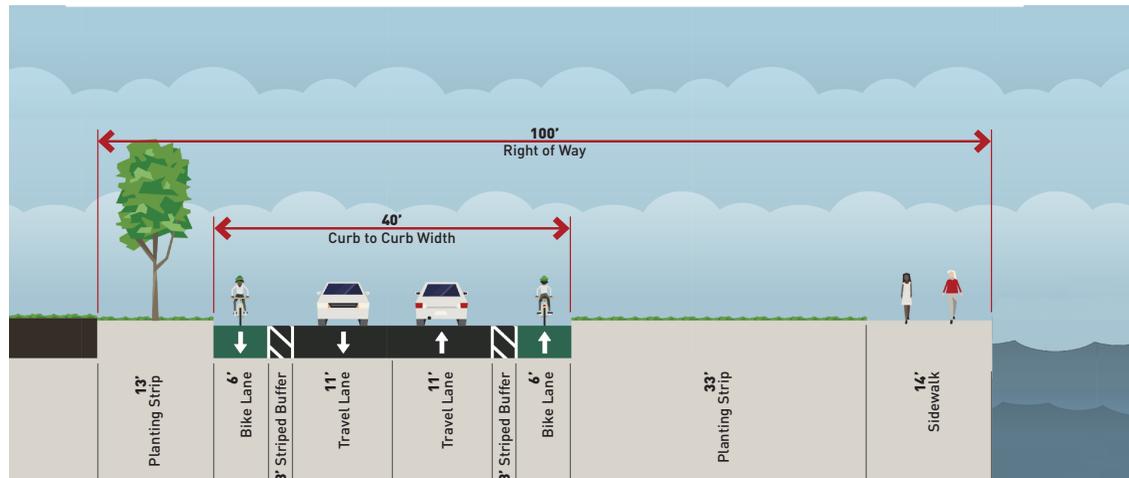
 **Cyclist** - 5-foot bike lane in each direction

 **Pedestrians** - No additional space provided on sidewalks. Pedestrians are further separated from traveling vehicles by introducing bike lane and relocating parking.

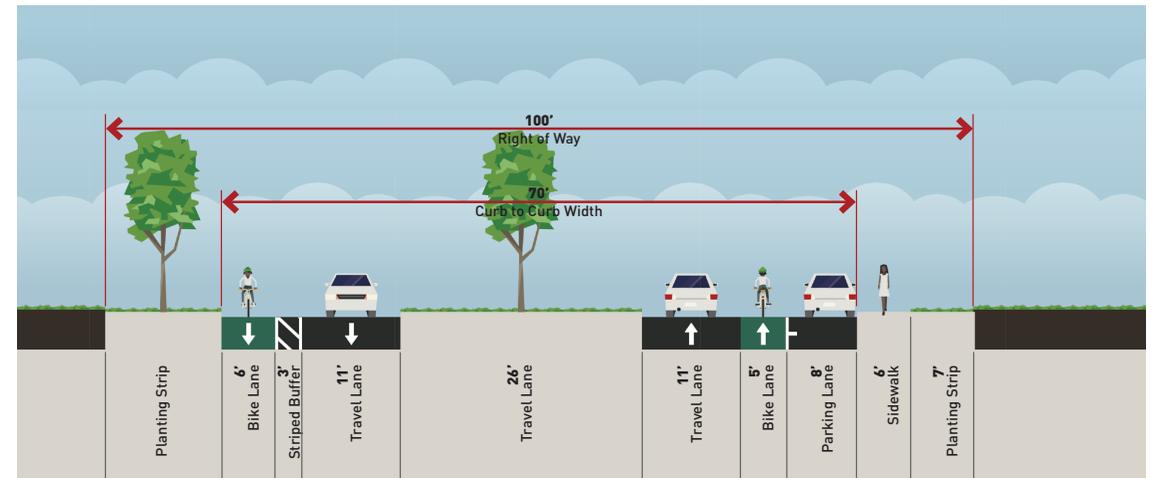
 **Open Space** - 5-feet of green space along the waterfront park is removed adjacent to the roadway to accommodate the bike lanes.



A. CRAWFORD PARKWAY AT COURT STREET



B. CRAWFORD PARKWAY AT WASHINGTON STREET



PARKWAY ALTERNATE 2



Vehicular - Roadway and lane width is maintained however as you approach Washington Street the westbound lane splits around an enlarged median. Parking is shifted from the median side to the sidewalk side.



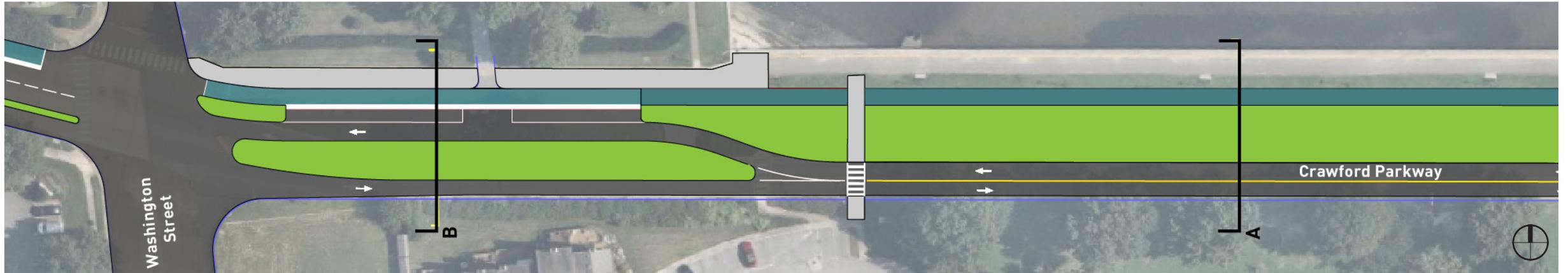
Cyclist - A 10-foot, two-way cycle track is introduced adjacent to the Crawford Bay Trail. As the cycle track approaches Washington Street it descends to the elevation of the roadway and becomes a curb-abutted.



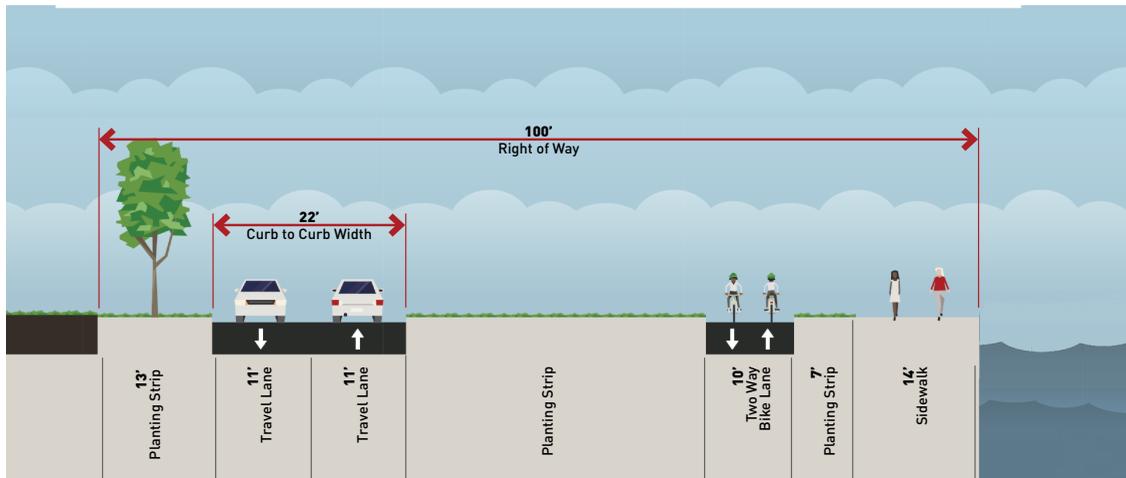
Pedestrians - No additional space sidewalk space is provided



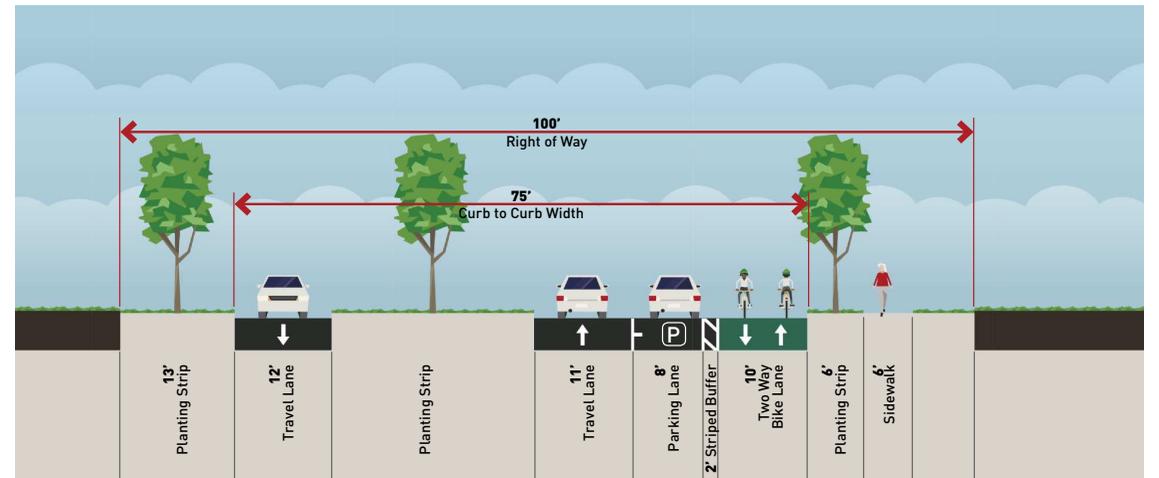
Open Space - 10-feet of existing open space is taken to accommodate the cycle track. However, there is still ample width to activate the open space with programming and introduce flood mitigation techniques.



A. CRAWFORD PARKWAY AT COURT STREET



B. CRAWFORD PARKWAY AT WASHINGTON STREET



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5 DESIGN AND RECOMMENDATIONS

Recommending a single alternative for the Crawford Corridor is a balancing act that involves all users, as well as perspective of the role of the roadway as it relates to the City's transportation network. The development of the corridor vision is continually progressing. Working with a range of community advisors and residents has enabled the project team to document the most important elements for the community. At times, the function of a roadway may come at odds with the desires of the surrounding community, but the various opinions assist in shaping the resulting analysis and public outreach needed to generate a successful project.



DESIGN AND RECOMMENDATIONS

STREET FUNCTION

While the Crawford Corridor is important for the mobility of all modes of transportation, it also creates a physical disconnect between the residents of Portsmouth's and the waterfront that detracts from the overall walkability downtown.

This study was not only mindful of the corridor's function as a vital roadway within the overall transportation network, but establishes opportunities and recommendations to increase walkability, strengthen connectivity to local resources, and enhance the quality of life for the residents of Portsmouth.



CITY VISION

The Crawford Corridor is a prime location for redevelopment. Throughout the course of the study, city leaders expressed a desire to provide improved conditions for walking, cycling, and on-street parking while maintaining the function of the roadway.

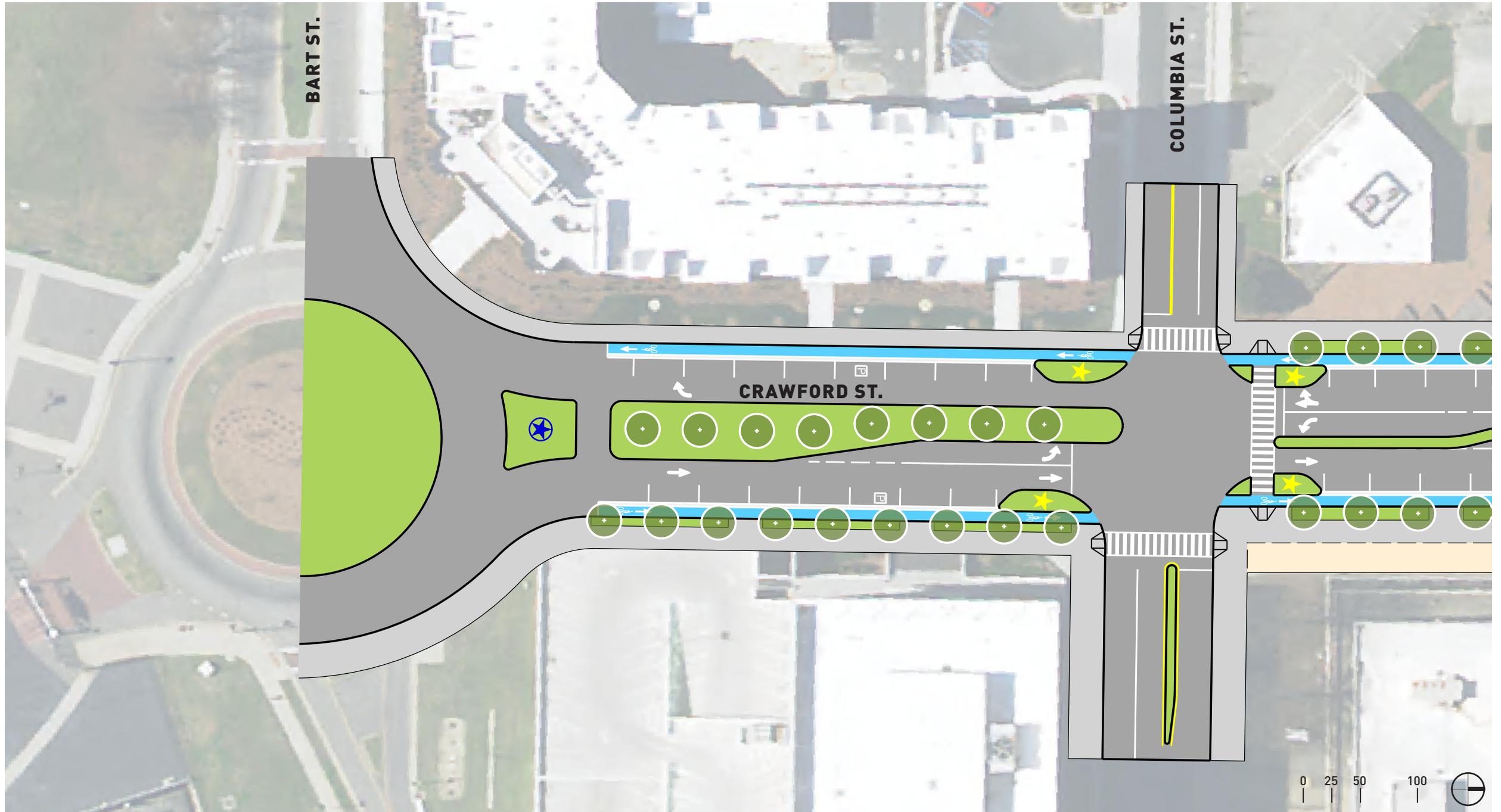
Past studies have all recognized the importance of Crawford Corridor in supporting a wide range of activities and a variety of users as a basis for the redevelopment of the corridor. The redesigned roadway improve conditions for all users and establish the basis for the future redevelopment.



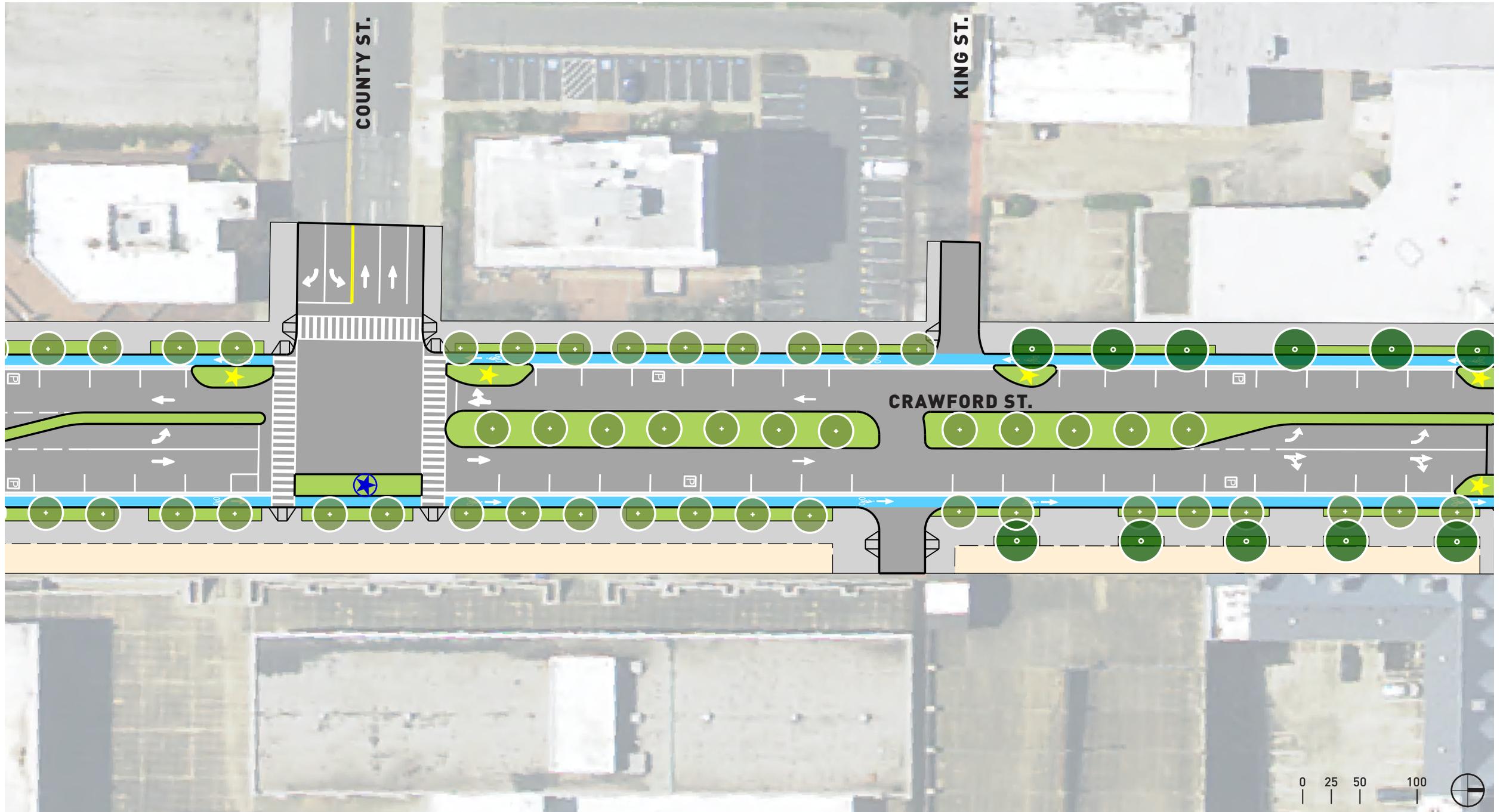
RECOMMENDATION

Choosing a Preferred Alternate for the Crawford Corridor balances the intended use of the corridor with the desires of the stakeholders for it to serve the residents' needs. These two ideals must be checked against physical constraints present within the corridor. The alternates developed were evaluated and presented to community leaders and the citizens of Portsmouth. Based on factors previously discussed within this study, the project team recommends the Preferred Alternate be a composition of **DOWNTOWN ALTERNATE 3** and **PARKWAY ALTERNATE 2**.

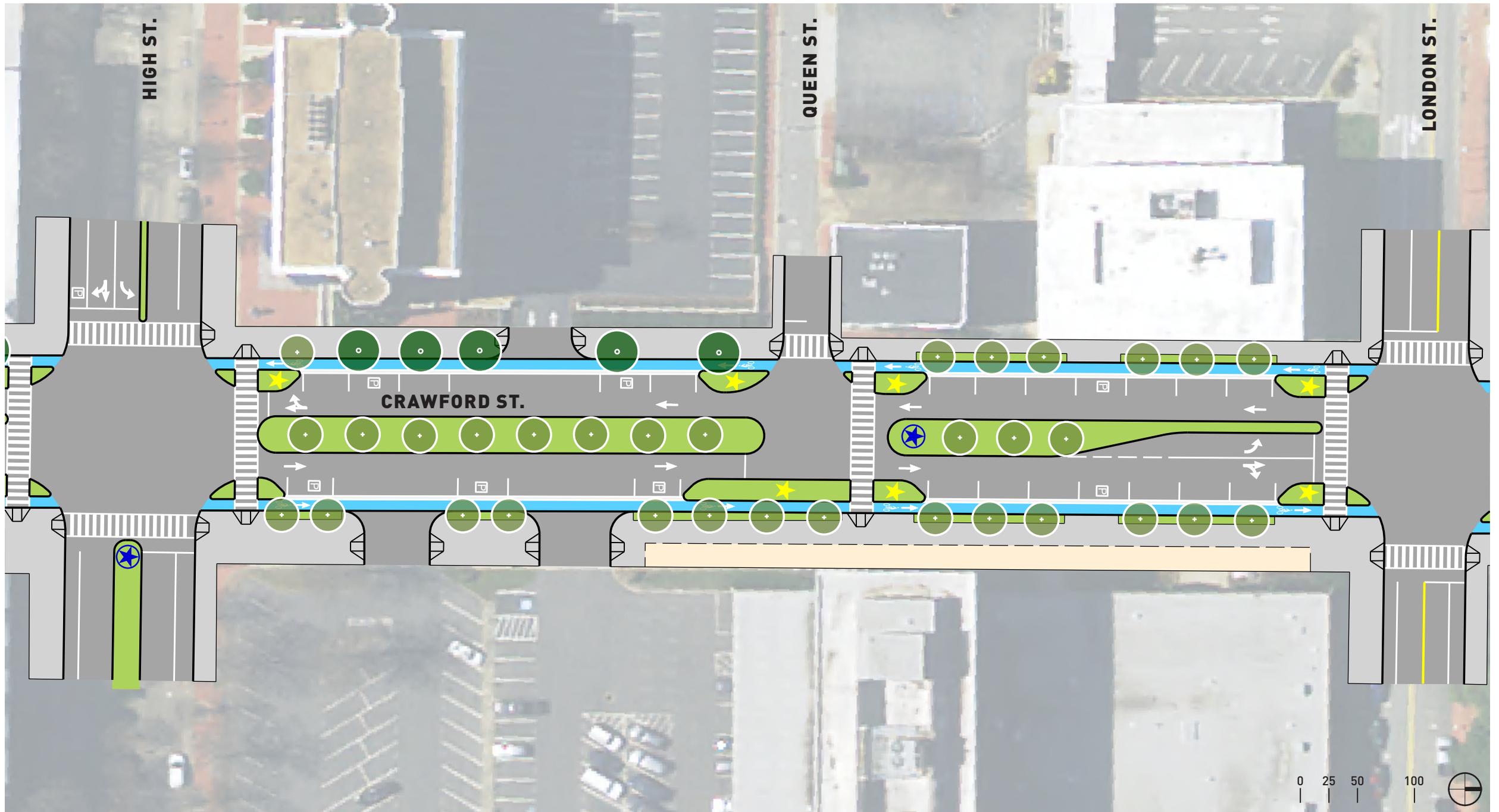
This composition provides a lower-cost construction alternate, while providing the highest level of appeal to potential developers. It allows greater flexibility to integrate the public realm with potential development, and presents the greatest opportunity to enhance the urban design character along the corridor. In addition it creates a more integrated connection to the Crawford Parkway. The following pages offer a detailed layout of the roadway organization and identifies areas within the public realm that could accommodate improvements such as; bioretention cells, street trees, and seating areas.



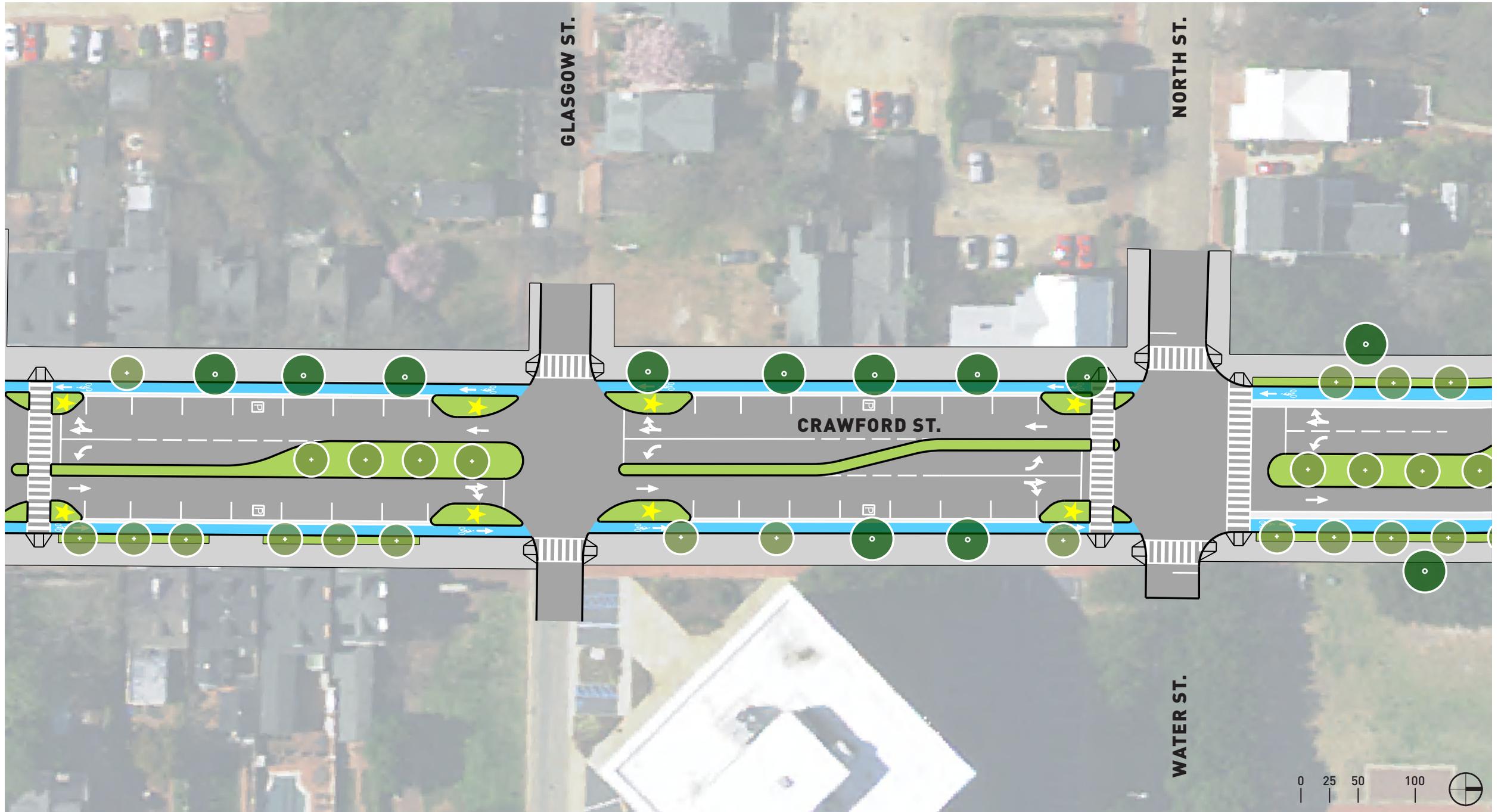
ROADWAY SIDEWALK FRONTAGE ZONE BIKE LANE / CYCLE TRACK GREEN SPACE / MEDIAN [P] PARKING ★ POTENTIAL BIORETENTION PLANTER ★ POTENTIAL PUBLIC ART ● EXISTING TREE ● PROPOSED TREE



ROADWAY SIDEWALK FRONTAGE ZONE BIKE LANE / CYCLE TRACK GREEN SPACE / MEDIAN PARKING POTENTIAL BIORETENTION PLANTER POTENTIAL PUBLIC ART EXISTING TREE PROPOSED TREE



■ ROADWAY ■ SIDEWALK ■ FRONTAGE ZONE ■ BIKE LANE / CYCLE TRACK ■ GREEN SPACE / MEDIAN ■ P PARKING ★ POTENTIAL BIORETENTION PLANTER ★ POTENTIAL PUBLIC ART ● EXISTING TREE ● PROPOSED TREE



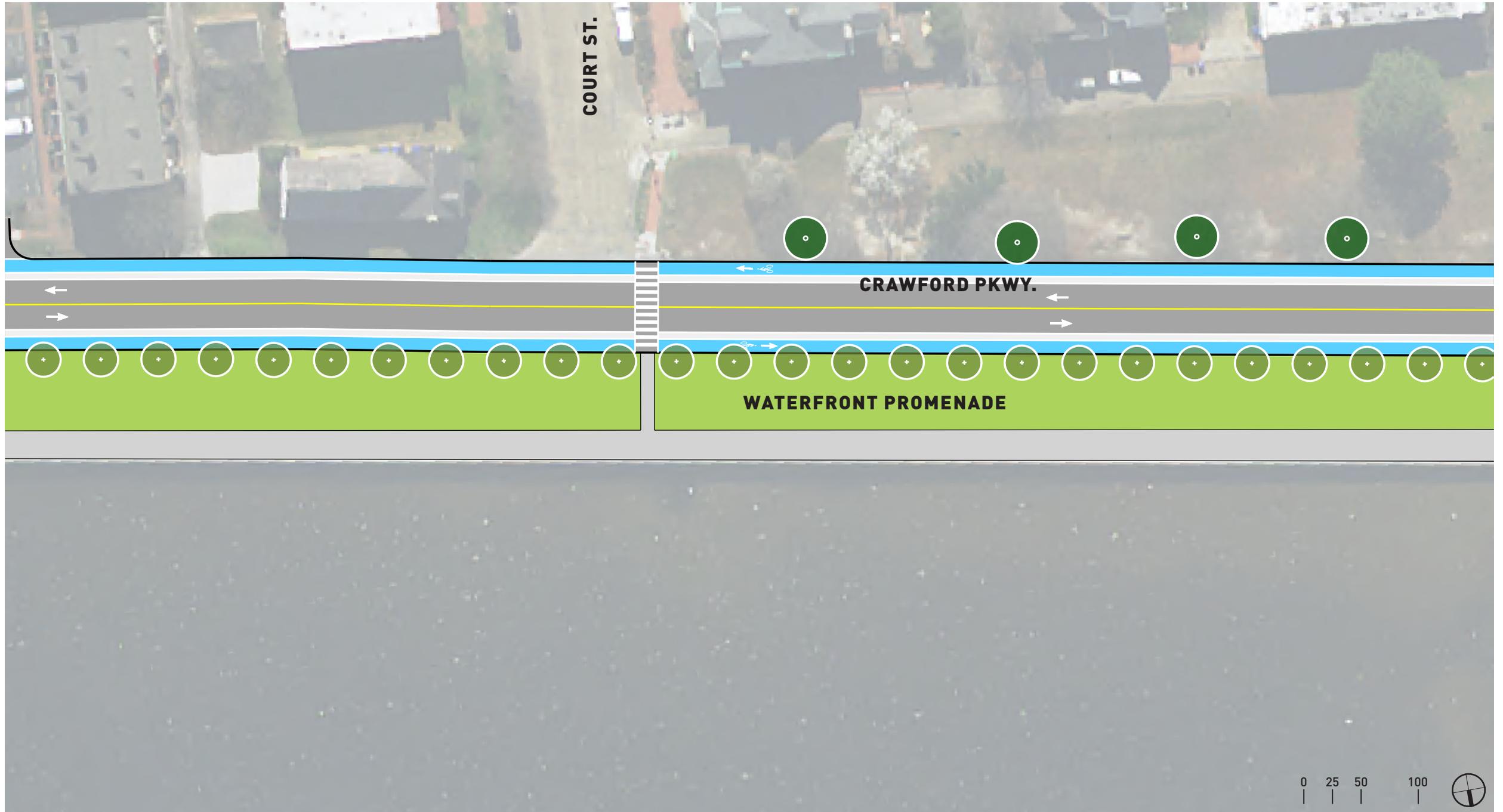
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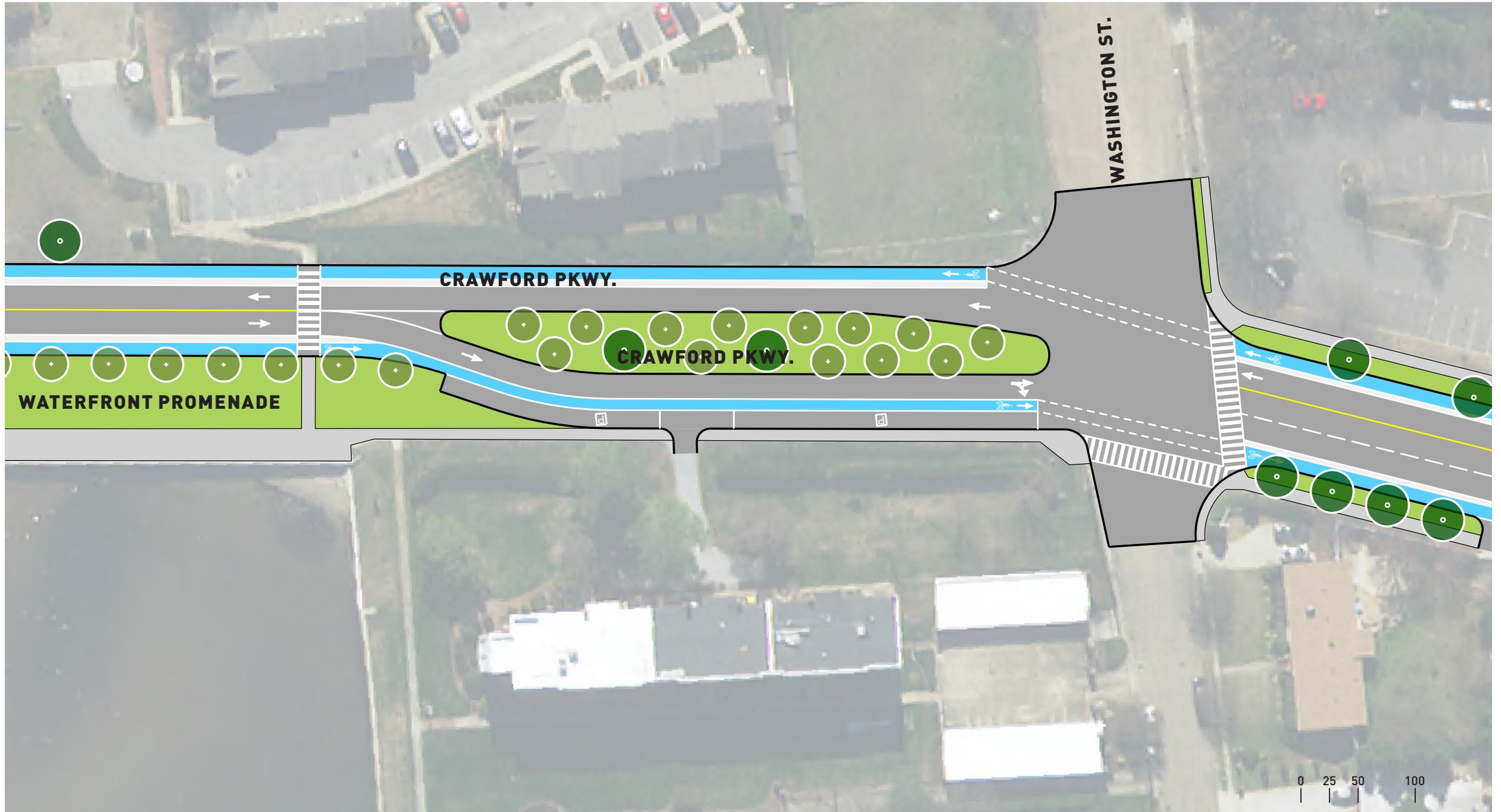
ROADWAY
 SIDEWALK
 FRONTAGE ZONE
 BIKE LANE / CYCLE TRACK
 GREEN SPACE / MEDIAN
 PARKING
 POTENTIAL BIORETENTION PLANTER
 POTENTIAL PUBLIC ART
 EXISTING TREE
 PROPOSED TREE



ROADWAY SIDEWALK FRONTAGE ZONE BIKE LANE / CYCLE TRACK GREEN SPACE / MEDIAN PARKING POTENTIAL BIORETENTION PLANTER POTENTIAL PUBLIC ART EXISTING TREE PROPOSED TREE



ROADWAY SIDEWALK FRONTAGE ZONE BIKE LANE / CYCLE TRACK GREEN SPACE / MEDIAN [P] PARKING ★ POTENTIAL BIORETENTION PLANTER ★ POTENTIAL PUBLIC ART ● EXISTING TREE ● PROPOSED TREE



ROADWAY SIDEWALK FRONTAGE ZONE BIKE LANE / CYCLE TRACK GREEN SPACE / MEDIAN PARKING POTENTIAL BIORETENTION PLANTER POTENTIAL PUBLIC ART EXISTING TREE PROPOSED TREE



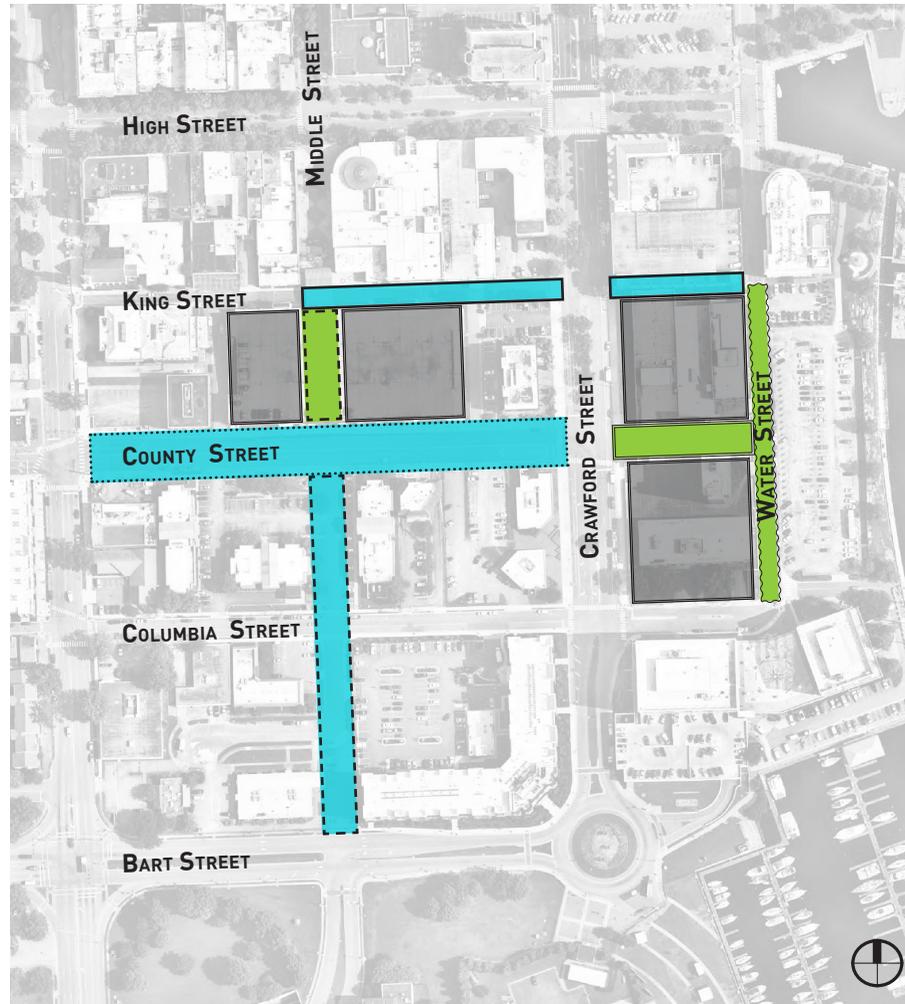
ROADWAY SIDEWALK FRONTAGE ZONE BIKE LANE / CYCLE TRACK GREEN SPACE / MEDIAN PARKING POTENTIAL BIORETENTION PLANTER POTENTIAL PUBLIC ART EXISTING TREE PROPOSED TREE

ADJACENT INITIATIVES

Infrastructure corridor improvement alone will not transform Downtown Portsmouth. A coordinated effort between public and private investments is more likely to succeed in bringing economic development to the area and create an attractive place to live, work, and be entertained.

This section looks at other nearby initiatives which would help improve traffic patterns and pedestrian conditions within the Crawford Corridor.

CONTEXT MAP



PROJECTS

- Middle St. Extension
- County St.
- County Square
- King St. Extension
- Water St. Promenade
- Future Development

IMPROVEMENT TYPE

- Roadway + Pedestrian
- Pedestrian

TEMPORARY (TACTICAL) URBANISM

Planning for long and steady growth in urban areas is a challenge. Unexpected conditions are bound to happen and sometimes reliable sources experience problems which prevent planned developments from proceeding. If a planned development stalls, the City needs to consider temporary solutions to attract investments and maintain interest. Temporary Urbanism, sometimes called Tactical Urbanism, is a trending strategy to implement low-cost, temporary changes to the built environment intended to improve local neighborhoods and city gathering places. Within the last decade, communities have sought ways to expedite the urgent need to transform their car dominated roadways into more pedestrian friendly environments and deliver more sensitive, cheaper, and quicker solutions. These are short term solutions that can activate a place and demonstrate that the changes in the public realm are not detrimental and can, in fact, help traffic patterns, economic development, and social awareness. They can also maintain interest for improving a neglected part of the city or a long awaited urban development which may take many years to fulfill.



MIDDLE STREET EXTENSION

Currently Middle Street extends northward from High Street to Crawford Parkway. A plaza at the Children's Museum, a parking garage, and two urban blocks with developments prevent Middle Street from extending to Bart Street. The plan is to provide an improved pedestrian link from High Street to Bart Street, and introduce a two-block street allowing vehicular traffic on Middle Street from County Street to Bart Street.

LIMITS OF WORK



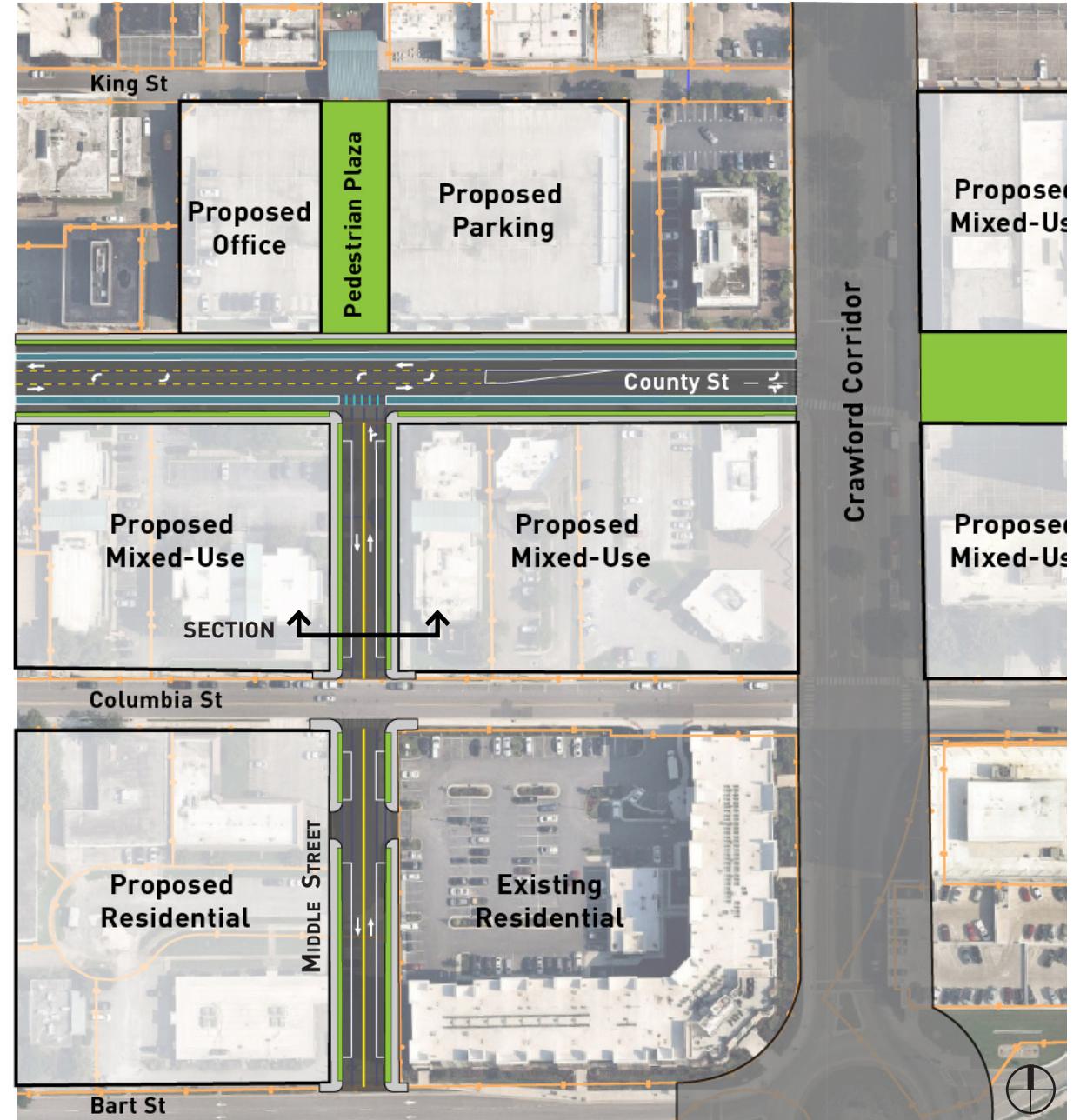
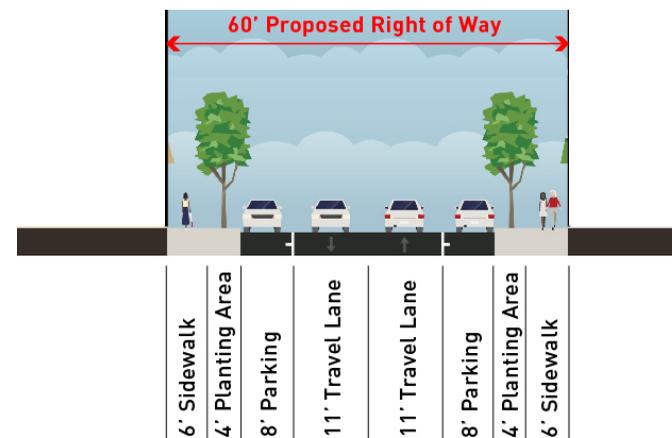
EXISTING CONDITIONS



PRECEDENT



MIDDLE STREET TYPICAL SECTION

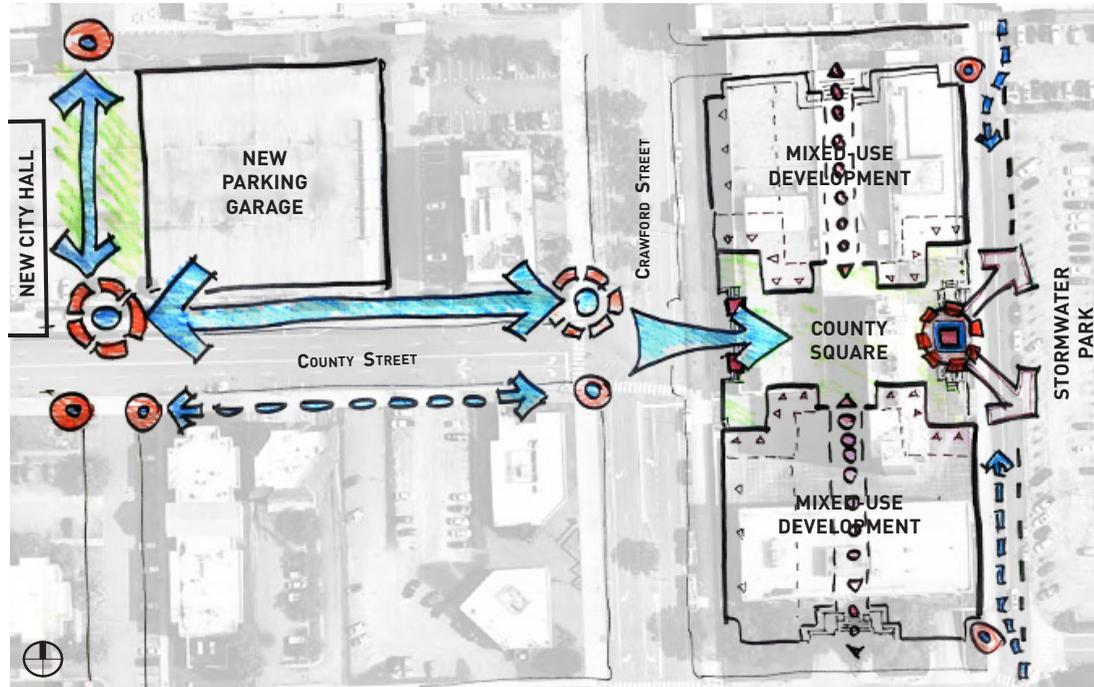


ADJACENT INITIATIVES

COUNTY STREET

Currently County Street is a typical urban street with parking and two travel lanes in each side of the street. A concrete sidewalk without street trees provides a space for a bus transfer area on the north sidewalk. A plan to relocate the bus transfer areas to the existing parking lot at the intersection of Bart Street and Court Street, combined with the relocation of City Hall and the reconstructed parking garage would allow for County Street to be reconfigured to include bicycle facilities and wider tree-lined sidewalks. The transformed County Street, between Court Street and Crawford Street will provide improved pedestrian and bicycle facilities, and more efficient vehicular circulation leading people to the future mixed-use development and Portsmouth waterfront.

CONCEPT DIAGRAM

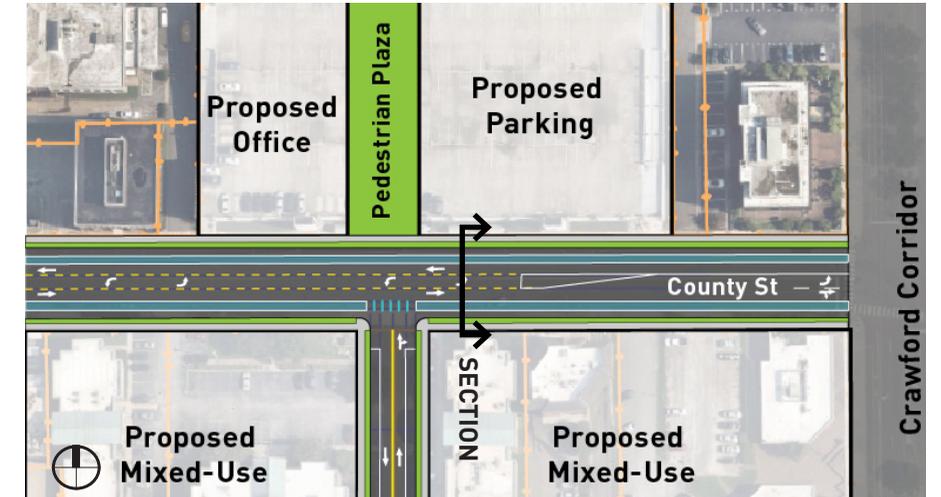


The creation of multiple nodes within comfortable walking distances of the corridor, the waterfront, and one another will enhance walkability and provide refuge areas for pedestrians. Establishing a network of interconnected sidewalks, new plazas, and squares will create a complete pedestrian experience throughout the public realm for residents, visitors, and employees within the downtown area.

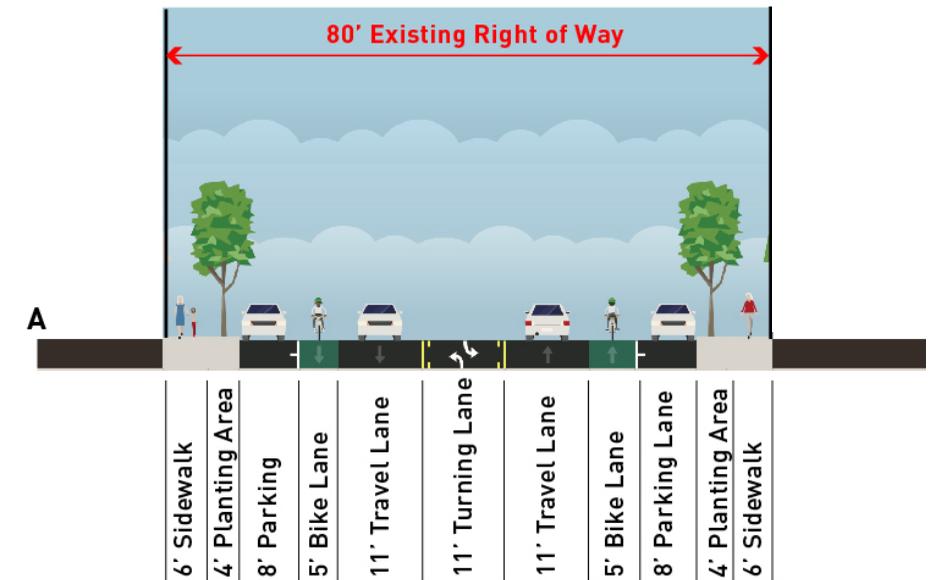
EXISTING CONDITIONS



LANE RECONFIGURATION



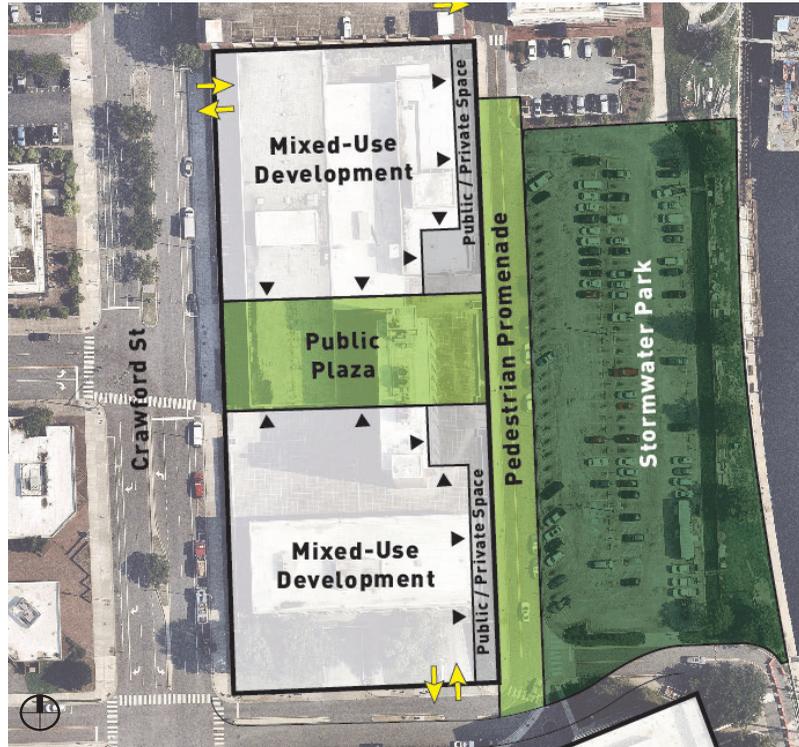
COUNTY STREET TYPICAL SECTION



COUNTY SQUARE

The Portsmouth City Jail Complex is located on a site slated for a future mixed-use development. The entire site will be privately developed and provide opportunities for meaningful gathering spaces. It is important for private and public parties to collaborate in providing public open spaces and allow County Street to extend through the development - ultimately leading to the Portsmouth Waterfront. The space should be a car-free area and should emphasize the pedestrian experience. Consider raising County Square to the required finished floor elevation. This would allow an unobstructed entrance into retail space unlike the sidewalk entrances which need to respond to flooding potential. The entrance design to the County Square from the sidewalk needs to be inviting and blend into the streetscape. Staircase, ramps, and elevators should provide meaningful access to the square for pedestrians and provide additional entrances to commercial activities.

CONCEPTUAL DIAGRAM



EXISTING CONDITIONS

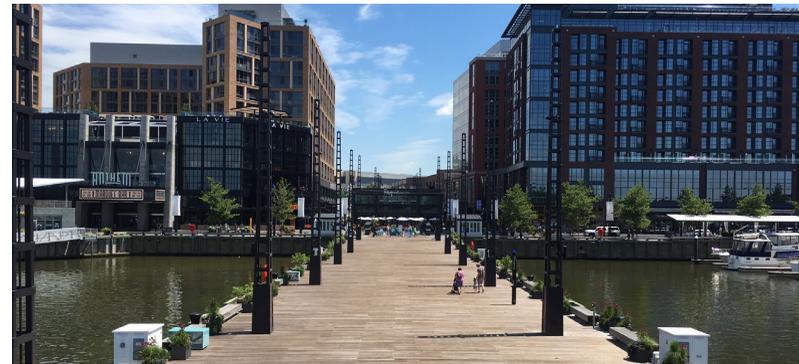


PRECEDENT

THE WHARF, WASHINGTON DC

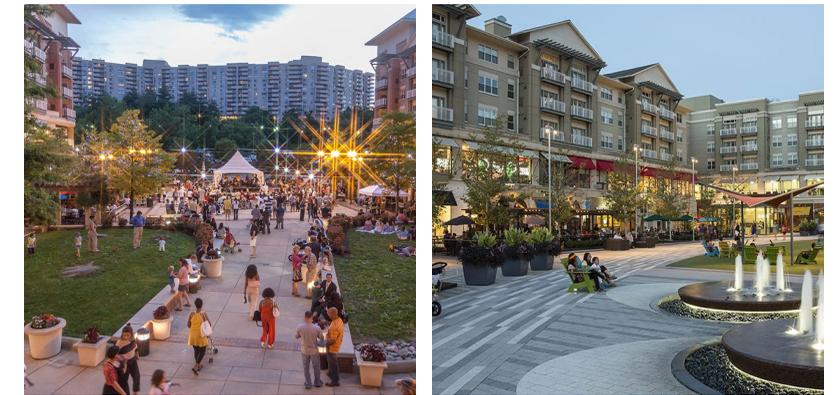


Consider allowing the County Square experience to extend beyond the Water Street Promenade and out to the Stormwater Park through contrasting or complementing materials and integrated layout.



Provide an opening in the mixed-use development allowing access to the waterfront enhances the quality of the open space and the potential for planned activities.

PENTAGON ROW, ARLINGTON COUNTY



A sizable courtyard, surrounded by retail space on the ground floor and residential units in the levels above is an attractive amenity for private development and the general public. Designing these spaces to allow a seamless transition from public to private space provides social and economic benefits.

ADJACENT INITIATIVES

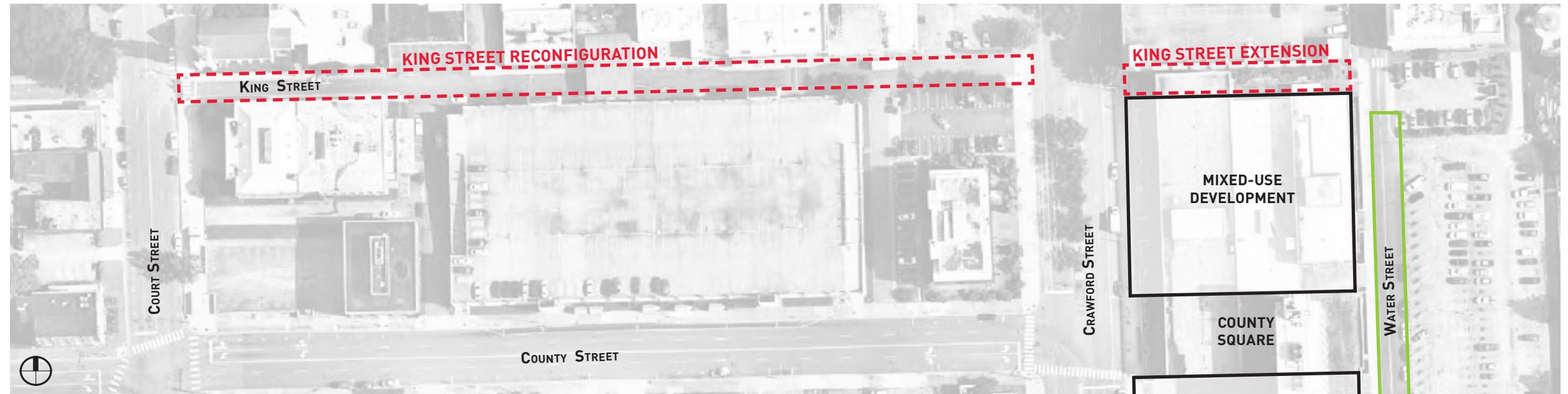
KING STREET EXTENSION

Currently, King Street is a very narrow one-way street with limited access behind the parking garage. This restricted area bisects King Street in two, with one-way patterns westbound to Court Street and eastbound to Crawford Street. Access to King Street is from County Street for both sections of King Street. The part of King Street behind the parking garage is mostly dedicated to pedestrians and allows safe access to the Children's Museum from the parking garage.

Future developments will reconfigure King Street into a more efficient and safer environment. If the alleys connecting County Street to King Street are closed with the proposed City Hall development on the parking garage site, vehicular patterns will be restricted to a one-way street with only one direction. It is recommended that the one-way direction towards Court Street be maintained to avoid potential circulation problems with the proposed King Street extension east of Crawford Street.

A proposed King Street extension linking Crawford Street and Water Street would allow vehicular and pedestrian access to the parking garages on Water Street and the Portsmouth Waterfront. This would be a two-way street with comfortable sidewalks, or a multi-purpose street used as a shared-space for pedestrians and motorists. The two-way street on King Street will ease traffic at the intersection of Crawford Street and High Street, which is expected to receive more traffic due to the closure of Water Street between the proposed King Street and Columbia Street.

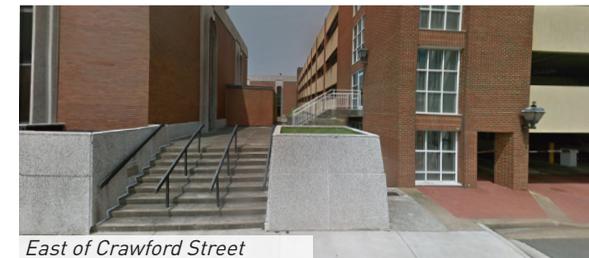
CONCEPTUAL DESIGN



EXISTING CONDITIONS

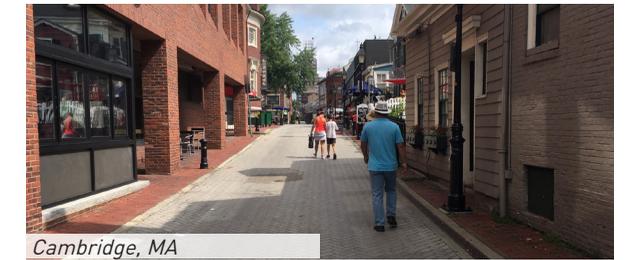


West of Crawford Street



East of Crawford Street

PRECEDENT



Cambridge, MA



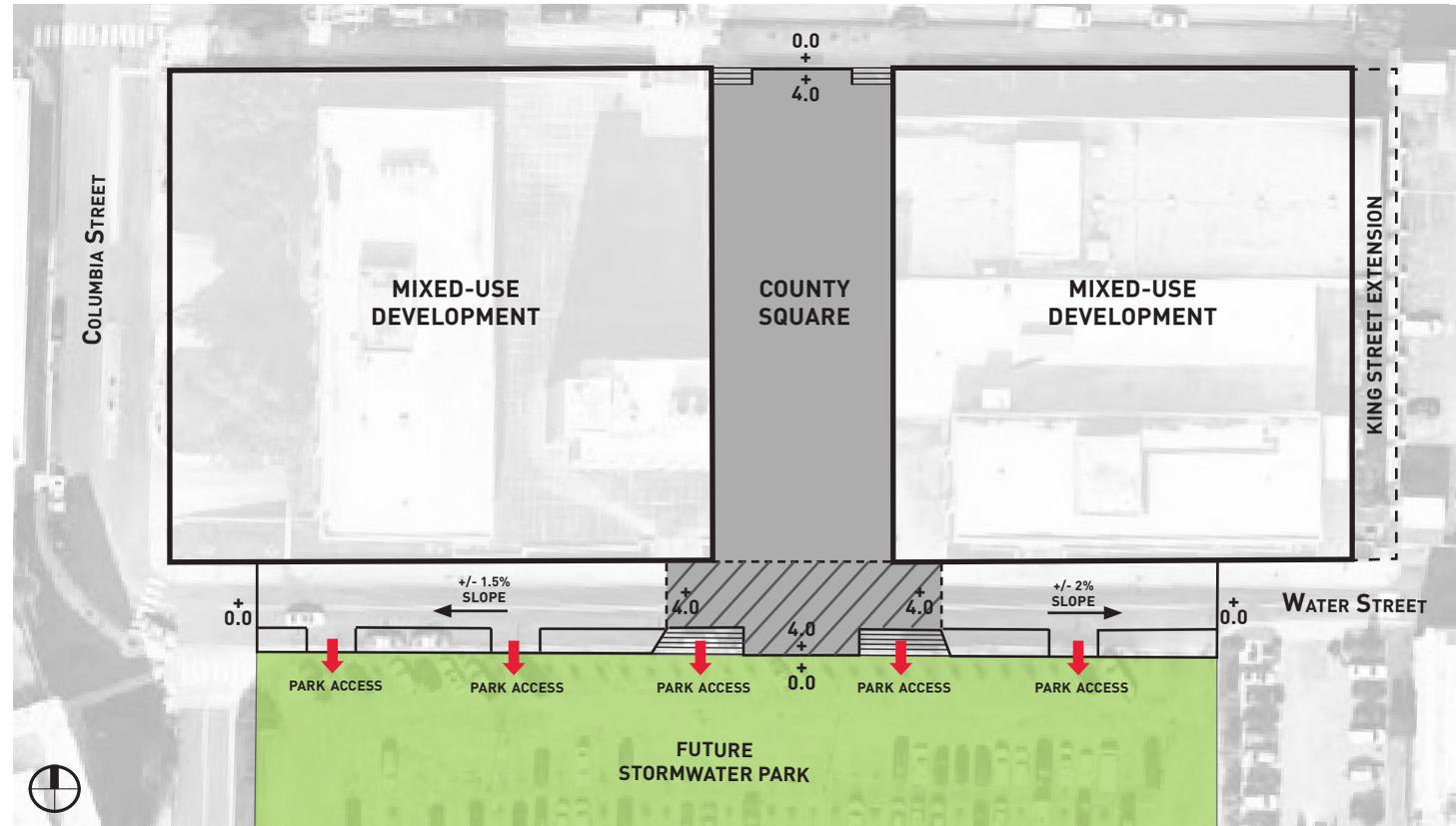
Georgetown, DC

WATER STREET PROMENADE

The portion of Water Street between the proposed mixed-used development and Waterfront Park will be open to pedestrians only – with limited access to service and delivery vehicles. The Water Street Promenade will be an important link to the redeveloped Portsmouth Waterfront and help the mixed-use development maximize its economic potential. Material selection, placement of street trees, and layout should relate with the proposed Crawford Street streetscape palette and Waterfront Park. It is recommended that the City and the mixed-use development collaborate to create an environment that relates with County Square.

A seamless transition from the Waterfront to Crawford Street through three different open spaces may be a challenge. Consider designing Water Street to visually integrating the Stormwater Park and County Square by sloping the street upwards towards County Square from Columbia Street and King Street. The sloped transition will follow universal design principles and allow for an elevated viewing area and retail entrances on County Square, and a series of staircases to provide access from the Promenade to the park.

CONCEPTUAL DIAGRAM



PRECEDENT

THE WHARF, WASHINGTON DC



GRAND CANAL DOCK, DUBLIN



PHOTO CREDITS

COVER:

August, Brendan. Portsmouth Ship. Source: Volkert

01:

Lusher, Eric. City of Portsmouth: Memorial Day Parade. 2013. [accessed Dec. 11, 2018 <SmugMug.com>]

INTRODUCTION

06:

Portsmouth Love Sign. Source: altdaily.com [accessed Nov. 29, 2018 <<https://altdaily.com/destination-p-town-portsmouth-promotes-new-arts-and-cultural-district/>>]

10:

Greenberg, Jeffrey. Virginia, Portsmouth, Court Street, Olde Towne Historic District, Betsy Ross flag, 13 stars, porch, patriotic. 2008. [accessed Dec. 11, 2018 <<https://portsmouthva.smugmug.com/Quaint-Historic-Seaport/Portsmouth-Virginia/i-XvMCJ5D/A>>]

Greenberg, Jeffrey. Virginia, Portsmouth, Elizabeth River, Olde Towne Historic District, Court Street homes, water. 2008. [accessed Dec. 11, 2018 <<https://portsmouthva.smugmug.com/Quaint-Historic-Seaport/Portsmouth-Virginia/i-JVThjfG>>]

Portsmouth, Virginia Aerial Waterfront. 2009. [accessed Dec. 11, 2018 <<https://portsmouthva.smugmug.com/Business/Economic-Development/i-g87Qq9/A>>]

Lusher, Eric. City of Portsmouth: Memorial Day Parade. 2013. [accessed Dec. 11, 2018 <SmugMug.com>]

11:

August, Brendan. Stakeholder Meeting #1. Source: Volkert

ASSESSMENT OF THE CORRIDOR

12:

August, Brendan. Crawford Street at High Street. Source: Volkert

14:

Portsmouth, Virginia Aerial Waterfront. 2009. [accessed Dec. 11, 2018 <<https://portsmouthva.smugmug.com/Business/Economic-Development/i-g87Qq9/A>>]

16:

Tidewater Muse. Pictures-11222006 020. 2006. [accessed Dec. 28, 2018 <<https://www.flickr.com/photos/tidewatermuse/303773928/in/album-72157594166020479/>>]

18:

August, Brendan. Olde Towne Crawford Street. Source: Volkert

20:

August, Brendan. Portsmouth Naval Shipyard Museum. Source: Volkert

22:

1801 One Crawford Parkway. 2018. [accessed Dec. 5, 2018 <<https://www.roseandwomble.com/real-estate/1801-one-crawford-parkway-portsmouth-va-23704/10196333/55901480>>]

24:

Crawford Street – Bart Street to Columbia Street. Source: Volkert

25:

Crawford Street –Columbia Street to High Street. Source: Volkert
Crawford Street –High Street to London Street. Source: Volkert

26:

Crawford Street – London Street to Harbor Court. Source: Volkert
Crawford Street at Harbor Court. Source: Volkert

27:

Crawford Parkway at Transition Area. Source: Volkert
Crawford Parkway at Court Street. Source: Volkert

28:

Crawford Parkway – Court Street to Washington Street. Source: Volkert

Crawford Parkway Washington Street to Effingham Street. Source: Volkert

CREATING A COMPLETE CORRIDOR

30:

IMG_2140. 2010. [accessed Nov. 29, 2018 <<https://portsmouthva.smugmug.com/Travel/Portsmouth-Virginia-July-2010/>>]

34:

National Harbor. [accessed Nov. 21, 2019 <<https://www.wdgarch.com/portfolio/projects/national-harbor>>]

Eytan, Ted. H Street corridor. 2017. [accessed Nov. 21, 2018 <<https://ggwash.org/view/72501/why-everyones-talking-about-upzoning-environment-equity>>]

The Wharf, Washington DC. Source: Volkert

35:

Seattle Department of Transportation. First phase of the 9th Ave N protected bike lane. 2017. [accessed Dec. 19, 2018 <<https://www.flickr.com/photos/35660569@N08/35528717272>>]

NACTO. WashingtonDC_unknown. 2017 [accessed Dec. 19, 2018. <<https://www.flickr.com/photos/nacto/15701252916/in/album-72157645727749164/>>]

Downtown Farmers' Market. [accessed Dec. 19, 2018 <<https://www.theplazadsm.com/neighborhood-directory/>>]

36:

Rein Inc. 421 Crawford Street. 2018 [accessed Dec. 19, 2018 <https://www.movoto.com/portsmouth-va/421-crawford-st-portsmouth-va-23704/pid_kfvuai3aph/#popphotoview>]

August, Brendan. Foster Placemaking and Promote Economic Vitality. Source: Volkert

37:

Greenberg, Jeffrey. Virginia, Portsmouth, Elizabeth River, Olde Towne Historic District, Court Street homes, water. 2008. [accessed Dec. 11, 2018 <<https://portsmouthva.smugmug.com/Quaint-Historic-Seaport/Portsmouth-Virginia/i-JVThjfG>>]

38:

Fisher, Eric. Bioswale. 2018 [accessed Dec. 19, 2018 <<https://www.flickr.com/photos/walkingsf/40369762221>>]

BeyondDC. Sidewalk bioswale. 2014. [accessed Dec. 19, 2018 <<https://www.flickr.com/photos/beyonddc/14117045006/in/photolist-nvtxDG-m3zUF-dYArLz-ohAMCh-gRzi1h-5ZbXe3-eWKAas-5rGFfi-nr56qz-nr5feC-ohAMAU-ohKfK5-ohKfKW-oN6Tv5-ojxHtP-bkVcWU-7TsT7g-eWxJRz-eWKAoo-dQruF4-dVp38L-hJfMok-fK4bZb-m3yVw-ofKLCY-fctoS8-k7Bvuh-dRf8KD-bjYXSG-72FvXS-eSiMe2-omtEGS-dbsUqg-77wgtL-k7Bpg5-dRkGYA-hJfMhi-s4hXd6-77skLp-dRfajB-cw3dBy-k7yZX6-cw3ez1-dvBXh6-dbsUk2-dbsWGo-dRkHdb-eSiMjD-cw3egL-eM856D>>]

Kimley-Horn. Streetscape/Landscape/Irrigation. 2018 [accessed Dec. 20, 2018 <<https://www.kimley-horn.com/service/roadwaybridge/streetscape-landscape-irrigation/>>]

Papazian, David. Riverscape Streetscape. [accessed Dec. 20, 2018 <<https://www.shapirodidway.com/work/riverscape-streetscape>>]

39:

Greenfield, John. Lincoln Hub traffic calming. [accessed Dec. 20, 2018 <<https://archpaper.com/2015/06/chicago-beckons-pedestrians-dr-seussian-green-blue-dots/>>]

JC Walks Pedestrian Enhancement Plan | Jersey City, NJ. 2018. [accessed Jan. 19, 2019 <<https://www.street-plans.com/jc-walks-pedestrian-enhancement-plan-jersey-city-nj/nggallery/thumbnails/>>]

40:

Before and After: Union Square. [accessed Dec. 20, 2018 <<https://archpaper.com/2014/01/before-after-24-of-new-york-citys-most-transformative-road-diets/>>]

NACTO. Shared street, Bell Street, Seattle, WA. [accessed Jan. 3, 2019 <<https://nacto.org/case-study/bell-street-park-seattle/>>]

NYC DOT. Allen-Pike-3-phase-Capital_A_3-p. 2014 [accessed Jan. 3, 2019 <<https://www.flickr.com/photos/nacto/36748721806/>>]

Before and After: Union Square. [accessed Dec. 20, 2018 <<https://archpaper.com/2014/01/before-after-24-of-new-york-citys-most-transformative-road-diets/>>]

41:

Weir, Christopher. Public Space Optimization. Source: Volkert
Weir, Christopher. Effective Pavement Striping. Source: Volkert
Weir, Christopher. Disparity of Riding Skills. Source: Volkert
Weir, Christopher. Size Requirements. Source: Volkert
Weir, Christopher. Signage. Source: Volkert
Weir, Christopher. Bicycle Awareness. Source: Volkert

45:

Thomas, Lee. Lexington Streetscape. 2016. [accessed Dec. 17, 2018 <<https://www.bhamgov.org/>>]

August, Brendan. High Street. Source: Volkert
August, Brendan. Crawford Street. Source: Volkert
August, Brendan. Crawford Street at London Street. Source: Volkert

August, Brendan. Historic Porch. Source: Volkert
Sidewalk Treatment I. Source: Volkert
Sidewalk Treatment II. Source: Volkert

46:

Outdoor Seating at the Wharf. Source: Volkert
August, Brendan. Portsmouth Pedestrian Lighting. Source: Volkert

Golings, John. Lonsdale Street Dandenong. [accessed Jan 4, 2019 <<https://www.archdaily.com/412359/lonsdale-street-dandenong-bkk-architects/>>]

August, Brendan. Charlottesville Mall Furnishings. Source: Volkert
Alley Lighting. Source: Volkert

Portsmouth is for Kids: Source: Volkert
Charlottesville Mall Chalk Wall. Source: Volkert
Germany Information Signs. Source: Volkert

Shiple, Drew. East 4th Street minilith sign. [accessed Jan. 7, 2019 <<http://appliedwayfinding.com/projects/seamless-cleveland/>>]

August, Brendan. National Harbor Artwork. Source: Volkert

48:

August, Brendan. Crawford Street at City Jail. Source: Volkert

49:

August, Brendan. Crawford Street at Harbor Vista. Source: Volkert

52:

August, Brendan. Protected bike lanes. Source: Volkert

Walsh Bay Kitchen. [accessed Jan. 7, 2019 <<https://www.hiddencitysecrets.com.au/sydney/walsh-bay-kitchen-restaurant-restaurants-sydney/>>]

54:

Weir, Christopher. Two-way cycle track. Source: Volkert
Piccolo Roma. [accessed Jan. 7, 2019 <<http://www.piccoloroma.com.au/>>]

56:

H, Eric. Casual dining on Newbury Street, Boston. [accessed Jan. 7, 2019 <<http://visitingnewengland.com/Newbury-Street-Boston.html>>]

58:

August, Brendan. American Way – National Harbor. Source: Volkert

August, Brendan. North Kent Street. Source: Volkert

DESIGN AND RECOMMENDATIONS

64:

August, Brendan. Crawford Street at London Street. Source: Volkert

65:

Love Sign. [accessed Dec. 27, 2018 <<https://oldtowneportsmouth.com/>>]

August, Brendan. Harbor Vista Apartments. Source: Volkert

75:

Nashville's Envision Broadway Project. 2018. [accessed Jan. 7, 2019 <<https://www.cnu.org/publicsquare/2018/02/06/better-%E2%80%98honky-tonk%E2%80%99-urbanism>>]

PARKing Day in Stamford Downtown. 2018. [accessed Jan. 7, 2018 <<https://news.hamlethub.com/fairfield/events/47420-park-ing-day-in-stamford-downtown-fri-sept-21>>]

SDOT. PARK(ing) Day. 2013. Source: Flickr

Sehr, Eric. Pink Balls Montreal. 2013. [accessed Dec. 29, 2018 <<https://commons.wikimedia.org/w/index.php?curid=36326942>>]

Marshall Monroe Overhead. [accessed Dec. 29, 2018 <<https://www.downtownmemphis.com/guide-to-downtown/edge-plaza/>>]

Christman, Noah. SPUR's Installation from above. [accessed Dec. 29, 2018 <<https://nextcity.org/daily/entry/photos-the-best-of-parking-day-2013>>]

78:

The Wharf DC. Source: Volkert
The Wharf DC II. Source: Volkert

Pentagon Row Ice Skating Rink. [accessed Dec. 18 2019 <<https://www.gokidtrips.com/our-blog/archives/01-2015>>]

Pentagon Row. [accessed Dec. 18, 2019 <<http://pentagonrow.com/photo-gallery/>>]

Pentagon Row. [accessed Dec. 18, 2019. <<https://www.mahanrykiel.com/portfolio/pentagon-row/>>]

79:

West of Crawford Street. Source: Volkert
Cambridge, MA. Source: Volkert
East of Crawford Street. Source: Google Streeview
Georgetown, DC. Source: Volkert

80:

The Wharf, DC. Source: Volkert
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Grand Canal Dock, DC. Source: Volkert
Grand Canal Dock II, DC. Source: Volkert

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August, Brendan. Portsmouth Ship. Source: Volkert



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