Chapter 1: Introduction

What is Multimodal Transportation?

Multimodal transportation describes the movement of people and goods by a variety of different modes – by car, bus, bike, walking, scooter, wheelchair, truck, train, ferry, airplane, barge, and more. Each mode is an important component of the overall system with unique needs and characteristics.

For decades, Norfolk's streets and transportation system, like most cities across the US, have been designed with a primary focus of moving as many motorized vehicles, namely automobiles, as quickly and efficiently as possible. Decisions about how to improve transportation in Norfolk have typically considered the efficient movement of vehicles the highest priority.

However, not all of Norfolk's residents, workers, and visitors own a personal vehicle, and many people desire options for getting around that don't rely on a car. Instead of moving as many vehicles as fast as possible, Norfolk's City Council adopted a new focus on safety, particularly for pedestrians and bicyclists who are most likely to be injured or killed in a crash.

A well-functioning multimodal transportation system provides safe facilities and balances the needs of all travel modes. Pedestrians, bicyclists, scooter riders, buses, trucks, private automobiles, and ride-share vehicles are all users of the multimodal transportation system.

The goal of a multimodal transportation system is to move people and goods safely where they need to go for all travel modes.

Norfolk is one among many cities across the nation and globe who are working to convert a transportation system that was built primarily for the automobile into one that meets the needs of the future and provides a variety of safe and convenient options for getting around without a car. As cities grow, multimodal mobility is a critical ingredient in solving the most pressing challenges that limit economic potential and increase environmental consequences. By advancing the hard work of making multimodal investments, these cities are preparing to meet the challenges of tomorrow.

This multimodal transportation master plan focuses primarily on pedestrians, bicyclists, scooter riders, and transit passengers. These modes have been historically underrepresented in past transportation planning and decision-making processes, and they are most likely to be injured or killed in a crash.

Other modes, like automobiles and freight movement, serve critical roles in Norfolk's transportation system. Many of Norfolk's residents, employees, and visitors use autos to get around, and freight movement is critical to the City's economic health. The City of Norfolk, Hampton Roads Transportation Planning Organization, Virginia Department of Transportation, Port of Virginia, and other entities study and plan for improvements for autos and freight movement as part of other planning processes.

This multimodal transportation master plan fills in the gaps to envision a balanced multimodal transportation system that safely accommodates all travel modes. This master plan recognizes the key roles that automobiles and freight movement serve. It seeks to provide additional options for getting around so that everyone who lives, works, and visits Norfolk can access all that the City offers by any mode they choose.

The Future of Transportation in Norfolk

Norfolk is a multimodal city. Today, Norfolk is home to the Commonwealth of Virginia's only light rail system. It is the hub of the Hampton Roads Transit bus network. The City has made recent investments in bicycling infrastructure to encourage residents and visitors to ride bicycles and scooters. Its compact neighborhoods and vibrant commercial centers make it possible to walk to nearby destinations. Norfolk has intercity passenger rail and ferry boat service. It is home to the Elizabeth River Trail, as well as the Norfolk International Airport and the Port of Virginia's Norfolk International Terminals.

These assets are a strong foundation upon which the City can build to achieve its vision for transportation from plaNorfolk 2030, the City's adopted comprehensive plan:

Norfolk is a great place to live, work, and play, with a comprehensive transportation system – rare among cities of its size – that offers a wide variety of choices, while also serving as a regional transportation hub.

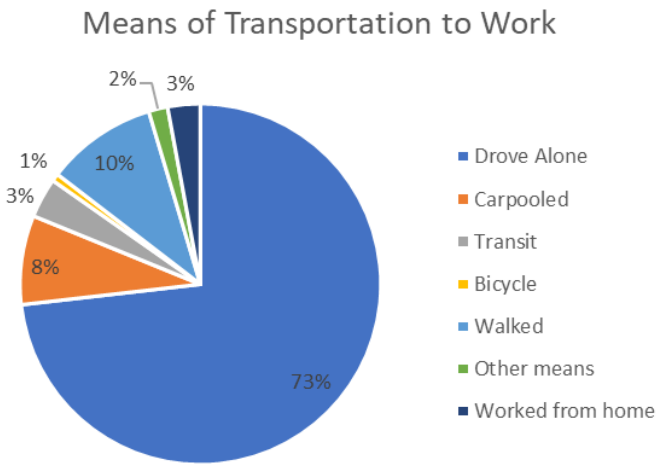
A comprehensive, truly multimodal transportation system is necessary for the Norfolk to be a resilient, thriving, and equitable city.

The future of transportation in Norfolk is about more than just moving cars; it is about moving people and supporting quality of life.

The future of transportation in Norfolk is about safety. When Norfolk City Council adopted its Vision Zero policy on November 26, 2019, the City embraced a strategy to:

Eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all because no traffic-related loss of life is acceptable.

Words that embody the vision for Norfolk's future transportation system, from public and stakeholder input.



Today, nearly three quarters of Norfolk's residents drive alone to work. Data source: 2019 American Community Survey 5-Year Estimates for Norfolk city, Virginia

The future of transportation in Norfolk is about resilience. The City is building a long-term strategy, outlined in Norfolk Vision 2100, to address flooding challenges and build a resilient future for the entire city, including areas at risk of sea level rise, areas that can bear the burden of redevelopment, and all the areas in between. Improving transportation connections and choices is a key piece of the puzzle.

Improving transportation connections is a critical part of Norfolk's transition to a resilient coastal community of the future.

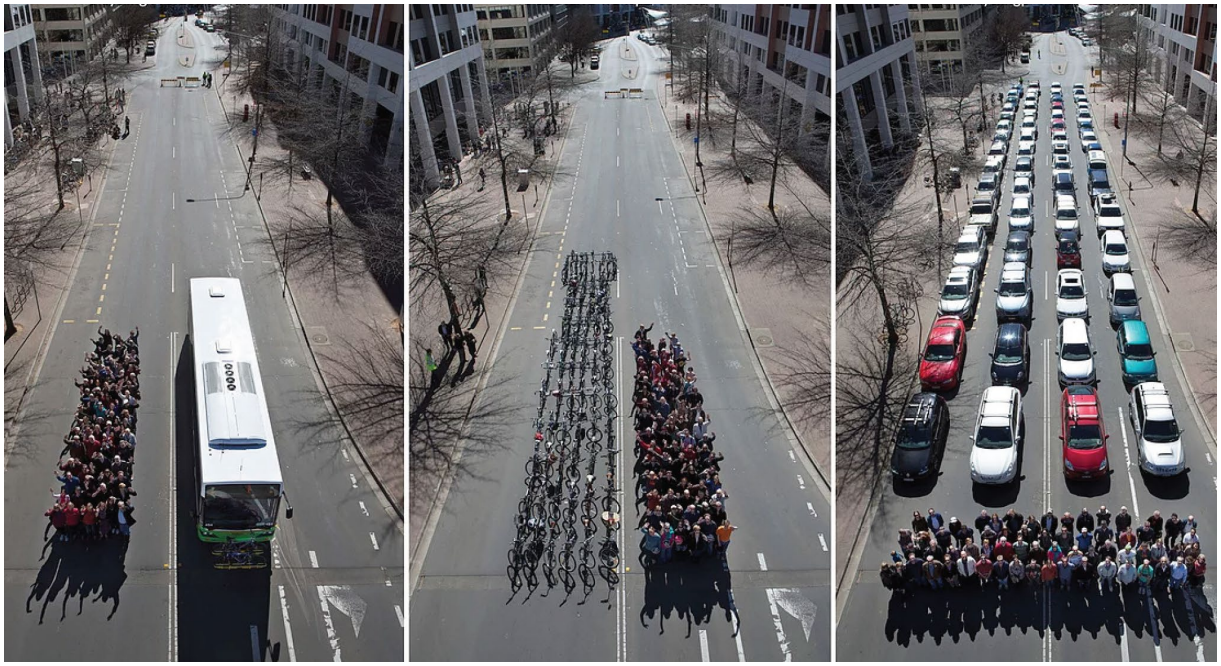
Why Norfolk Needs More Multimodal Choices

While we cannot know for certain what the future looks like, we know that the future will look different from today.

It's about economic development and community vitality

We know the Hampton Roads region is in a favorable position for continued economic growth, which will benefit both Norfolk and the rest of the region.[i] We know that the skilled 21st century workforce desires to live in places with options for getting around.

If we want our city and its neighborhoods to be vibrant active places full of people, not just full of cars, we need to make it easy for everyone to live their daily lives without depending on driving their own cars.



By providing more multimodal options for getting around, more people can move about in less space. Investing in transit service and facilities for walking and riding bicycles and scooters means Norfolk can continue to grow and thrive with a functional transportation system.

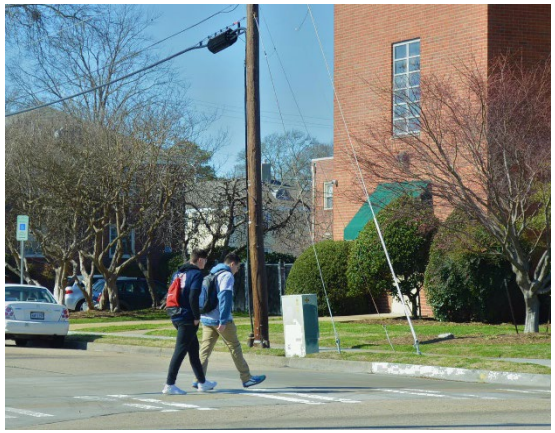
Norfolk is projected to grow by 17,000 people and over 4,000 jobs by 2045,[ii] and only three percent of its 28,000 acres of land is vacant.[iii] More people and more jobs will put more pressure on the transportation network.

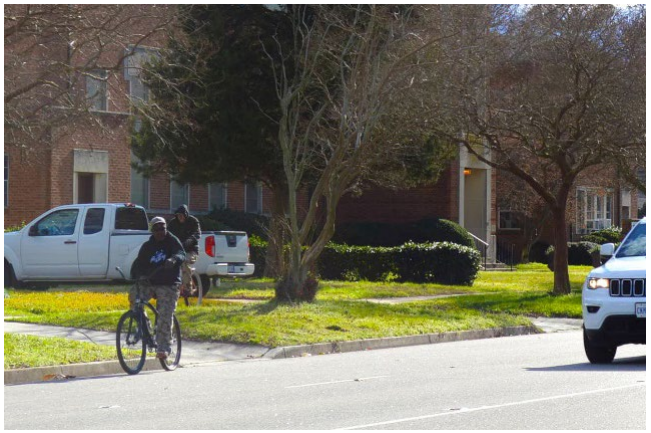
The 21st century skilled workforce prefers to live in places with options for getting around that do not depend on owning your own car. Multimodal options are vital for future economic growth.

It's about safety

In 2020, 25 people were killed in traffic crashes on Norfolk's streets, and on average, six pedestrians and bicyclists are killed every year.[iv] The City adopted a Vision Zero policy with a goal to eliminate all traffic-related fatalities, with a special emphasis on the most vulnerable road users - pedestrians and bicyclists.

To grow and thrive, Norfolk needs improved options for getting around that do not rely on driving a car and are safe, easy, and affordable for everyone.





Multimodal Norfolk is about creating a transportation system for Norfolk that is safe and convenient for everybody. Investments are needed to provide safe facilities for pedestrians, including those who use mobility devices, and people who ride bicycles and scooters.

Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries, while increasing safety, mobility, and equity for all road users. It originated in Sweden in 1994 as an approach to road safety thinking with the mindset that "No loss of life is acceptable".

In November 2019, Norfolk City Council adopted a Vision Zero policy establishing a goal of zero traffic-related fatalities and serious injuries while making the city's streets safer for all, especially for the most vulnerable users – pedestrians, cyclists, scooter users, and bus riders.

Norfolk's Vision Zero Priorities:

- Education – Promote a culture of safe driving, walking, biking, and scootering
- Engineering – Repurpose streets to reduce risk of crashes and to protect vulnerable road users
- Enforcement – Strengthen enforcement practices to reduce and prevent unsafe roadway behavior
- Evaluation – Assess efforts to ensure resources are being used effectively

Norfolk is setting out to be a truly multimodal city offering residents and visitors a variety of ways to travel. It is our goal to ensure all residents are safe when using our streets. Instituting a Vision Zero policy provides an avenue for the city to address safety concerns.

VISION ZERO

ZERO IS THE GOAL

It's about climate action

Norfolk's identity and history are steeped in its coastal assets. Norfolk's shoreline is one of its greatest resources, yet as global temperatures rise, this asset threatens the City with the largest number of people who would be displaced by land subsidence and sea level rise in the United States, only after New Orleans.[v] The transportation sector is the largest contributor to greenhouse gas emissions both in the United States[vi] and in Norfolk. Transportation accounts for 41 percent of the City's community greenhouse gas emissions.[vii]

Reducing vehicle reliance is critical to achieving the City's climate action goals.

To successfully cut carbon emissions and combat climate change, driving a car around Norfolk must change from the norm to the exception. This transformation requires the City to make strategic investments to provide safe and connected networks for getting around without a car.

It's about equity

Norfolk ranked #12 out of 99 cities across the US on the Racial Equity Index in 2019. This high ranking means that compared to other cities, Norfolk has relatively lower racial disparities on indicators such as poverty, disconnected youth, rent burden, and air pollution.[viii]

Yet, there are significant racial inequities in Norfolk, especially in the economic vitality indicators. And while Norfolk scores in the top 5 percent on racial inclusion indicators, it ranks 43rd on overall prosperity measures.[ix]

Creating a more equitable transportation system, where all neighborhoods, especially low-income communities and communities of color have safe and complete sidewalks and bike paths and access to reliable transit service to opportunities for employment, education, daily errands, and social recreation is necessary to overcoming these inequities and the resulting disparities in health outcomes.

Sea level rise projections for 2100 range from 1.6 to 7.5 feet above present-day levels. This map shows the areas that would be in AE flood zone after three feet of sea level rise. Image Credit: Norfolk Vision 2100.

It's about more than reducing traffic congestion

Traffic congestion is an often-cited source of complaint, but decades of investments that solely focus on moving more vehicles more quickly through Norfolk's streets have resulted in an imbalanced transportation system that emphasizes the movement of vehicles over the movement of people and vehicle safety over safety for people in all modes. In the future, we must look to provide safe facilities that balance all modes and allow all people to access opportunities to thrive.

While the COVID-19 pandemic disrupted normal travel patterns, it is unknown how travel behaviors will shift in the long term. Early in the pandemic, people drove less and walked and rode bicycles more. How travel patterns evolve as the immediacy of the pandemic subsides is unknown, but could be a game changer for mobility and transportation within cities.

Speeding vehicles are also a source of concern for residents, and some of the recommendations of this plan are intended to slow down vehicle speeds to create safer streets for motorists and other road users. Other recommendations involve reconfiguring streets and reallocating the space within the right-of-way to balance the space allocated to non-auto modes and other uses. Later chapters in this plan discuss tradeoffs between vehicular capacity and meeting the City's multimodal transportation goals.

Multimodal Norfolk is about making sure Norfolk's transportation system is equitable, so all residents can get where they need to go.

In some instances, projects that improve facilities for walking, bicycling, scooter riding, and taking transit may reduce the vehicle capacity of a street or lower the level of service for vehicles.

This Multimodal Transportation Master Plan represents a new framework for making decisions and balancing tradeoffs of transportation improvements in Norfolk. This framework evaluates how well a project meets the vision and goals for a truly multimodal transportation system. It may involve examining tradeoffs for traffic congestion and other considerations among all travel modes and roadway users.

What is Multimodal Norfolk?

Norfolk's residents and businesses envision a new day for transportation. The old options of being frustrated behind the wheel or taking hours to ride the bus are replaced with freedom of choice on how to get around.

Norfolk envisions a city where walking, riding a bicycle or scooter, and taking transit are safe and easy.

The future of transportation in Norfolk has safe and affordable choices for everyone to meet their daily needs for mental, physical, and financial health and well-being without having to step into their own car.

Multimodal Norfolk is the City's first Multimodal Transportation Master Plan. It is a plan to take that vision from imagination to reality.

Multimodal Norfolk represents a shift in priorities. Instead of focusing primarily on moving as many cars as fast as possible, our transportation system should first make sure everyone gets where they're going safely. Our transportation decisions should put our most vulnerable users – pedestrians – first. Our transportation system will provide choices and opportunities for everyone, especially our low-income communities and communities of color.

Multimodal Norfolk represents a clear direction for the future. It contains policies for making decisions in line with our vision and values. It provides maps that show future connected networks for all modes to guide future decisions about transportation investments and to guide coordinated planning with land use decisions.

Multimodal Norfolk defines a new process for designing transportation improvements. It provides frameworks for designing and evaluating projects to further Norfolk's goals and values.

Multimodal Norfolk represents a strategic rethinking of how to best use available resources. It includes a redesign of the Hampton Roads Transit bus network in Norfolk and identifies the most important investments needed in the short, medium, and long term to most fully realize the vision within available resources.

The future of transportation in Norfolk has safe and affordable choices for everyone to get around without having to step into their own car.

Multimodal Norfolk is about providing safe options for riding a bicycle or scooter, walking, or taking transit, regardless of age or ability.

Plan Purpose

The Multimodal Norfolk Transportation Master Plan represents a set of guidelines and best practices that will help improve the City of Norfolk's ongoing planning and decision-making processes.

The plan represents an objective framework, supported by public and stakeholder input, for future multimodal transportation in the City. The plan is a playbook for how to handle competing priorities for use of Norfolk's streets that minimizes ambiguity and balances competing needs around a publicly supported vision for the City's streets.

The plan is also a living document that will be updated as new issues arise, funding becomes available and technology advances. It is intended to be implemented through the various planning and design initiatives of city departments by providing them with decision-making guidance.

This Multimodal Transportation Master Plan focuses on modes other than the automobile. Planning for the automobile has been the prime focus of transportation planning for several decades, in many cases to the detriment of planning for other travel modes. This plan focuses on the traditionally underrepresented modes of walking (including mobility for people who use mobility devices), bicycling, scootering, and taking public transportation.

This plan recognizes automobiles, including personally owned vehicles, taxis, and ride-share vehicles, as well as trucks, buses, and emergency vehicles as road users, all of whom require space within the right of way. Its focus, however, is on enhancing the city's streets for walking, bicycling, scootering, and transit, to ensure that transportation decisions are centered around moving people, not just vehicles.

Finally, this plan does not provide detailed proposals for redesigning every segment of every street in Norfolk. Nor is it a prescriptive manual without flexibility to adapt to existing conditions. Instead, it gives a new dimension to the way transportation design decisions are made in the city today and ensures that future decisions consider the city's multimodal goals and the vision for a city that is accessible to all travel modes in the future.

The Multimodal Norfolk Transportation Master Plan is one piece in the broader transportation planning process that occurs on many levels and through different entities:

- City of Norfolk Department of Transit
- City of Norfolk Department of Planning
- City of Norfolk Department of Public Works
- City of Norfolk Department of General Services
- Hampton Roads Transportation Planning Organization
- Virginia Department of Transportation
- Port of Virginia
- U.S. Navy
- Hampton Roads Transit

These entities and others not listed here conduct transportation and traffic studies; develop transportation plans: and suggest, plan, and fund transportation improvements, the majority which are focused on moving and improving safety for automobiles and freight vehicles.

Multimodal Norfolk fills a gap in the broader transportation planning process by focusing on pedestrians, bicyclists, scooter riders, and transit passengers. These modes have historically been underrepresented in other planning processes. They are the modes most likely to be injured or killed in crashes, and pedestrian fatalities fall disproportionately on minorities. Addressing these most vulnerable modes and ensuring their safety is a key goal of this multimodal transportation master plan, and the City's adopted Vision Zero policy.

What is in this Report?

This report contains the Multimodal Norfolk Transportation Master Plan. It documents the process of developing the master plan and contains a series of policy recommendations, maps, and recommended projects.

This report contains 14 chapters and nine appendices.

Chapter 1: Introduction describes what the Master Plan is and sets the context for why it is needed.

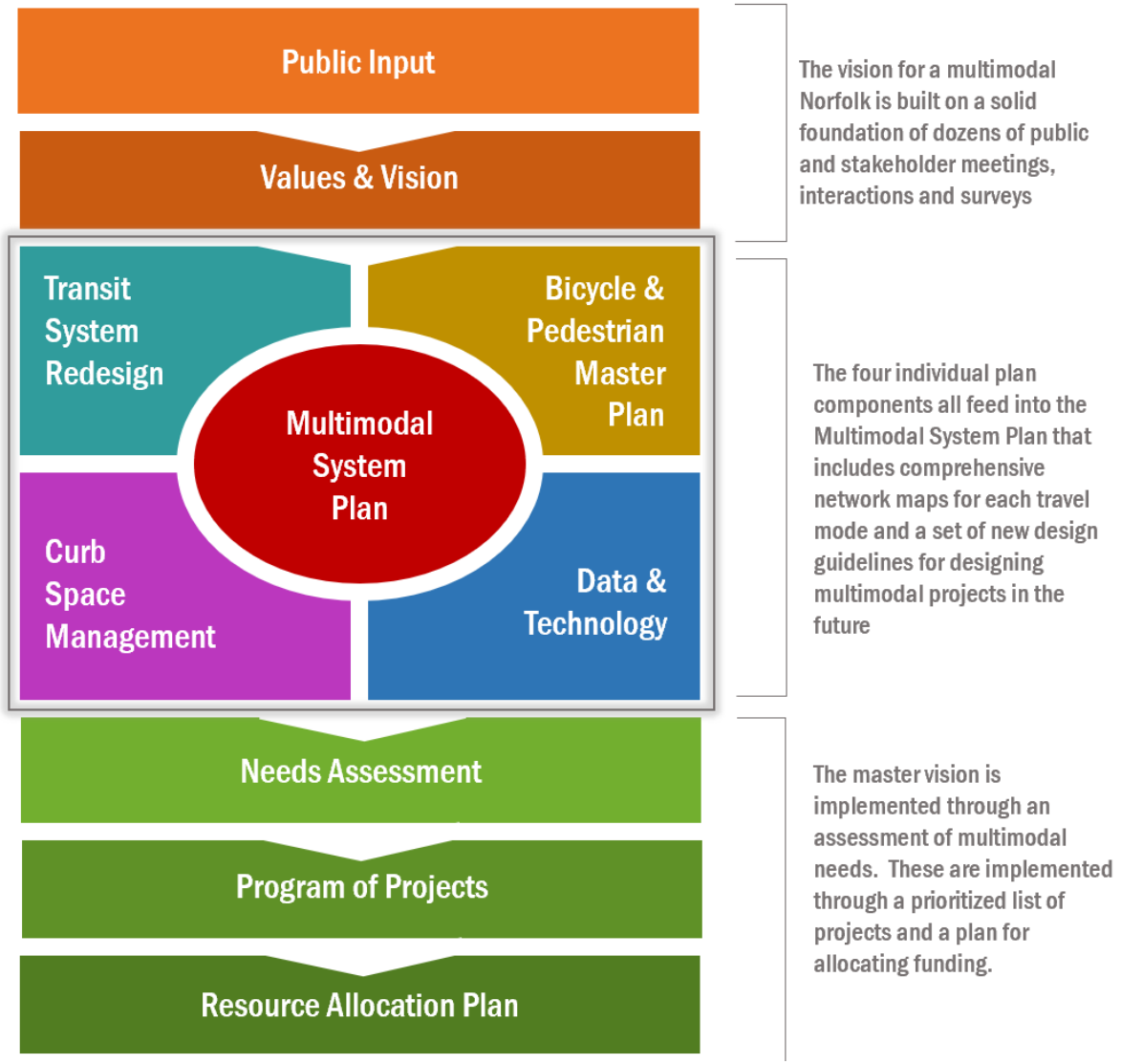
Chapter 2: Vision and Values provides the guiding vision, goals, and objectives for the master plan process.

Chapter 3: Public Engagement describes the robust process to develop the plan with interactive public and stakeholder engagement throughout.

Chapter 4: Multimodal System Plan explains the process for developing the multimodal system plan, which is the basis for the modal networks and shows the geographic vision for an interconnected system for all modes.

Chapter 5: Bicycle and Pedestrian Master Plan describes how this plan builds on the Strategic Bicycle and Pedestrian Plan.

Chapter 6: Multimodal Project Design – Overall Framework presents a new framework for designing multimodal corridors. This framework represents a new process for



This diagram explains the basic organization of this report into three parts.

designing transportation improvement projects to put pedestrians first and to achieve the multimodal system plan from Chapter 4.

Chapter 7: Multimodal Project Design – Approaches for Different Modes expands upon the overall Multimodal Design Framework and provides design approaches and considerations for different modes.

Chapter 8: Multimodal Project Evaluation presents a framework for evaluating potential changes to the transportation system that align with the City's vision and goals. It introduces new metrics that shift away from traditional transportation evaluation metrics.

Chapter 9: Curb Space Management presents a framework for setting priorities for one of Norfolk's most limited assets – curb space – and discusses ways to maximize the usefulness of this limited asset.

Chapter 10: Data and Technology provides recommendations for capitalizing on emerging technology trends and preparing for future innovations in multimodal transportation.

Chapter 11: Transit System Redesign provides an overview of the process and recommendations for redesigning Hampton Roads Transit's bus service in Norfolk. The recommended network is anticipated to be implemented in 2023. This transit system redesign represents the first major step in implementing the Multimodal Norfolk transportation master plan.

Chapter 12: Multimodal Needs Assessment identifies the areas within the City with the greatest needs for pedestrian, bicycle, and scooter improvements, based on a combination of data-driven analysis and public input. Transit needs are also presented based on a combination of public input and technical assessments.

Chapter 13: Program of Projects and Resource Allocation Plan explains the process to develop the Program of Projects – a comprehensive list of all potential projects to address the City's multimodal needs – and the Resource Allocation Plan – a shorter list of priority projects that the City can feasibly move forward with in the near-term.

Chapter 14: Implementation and Next Steps outlines immediate next steps and provides recommendations for revisiting the master plan in the future.

Appendix A: Multimodal System Plan Maps provides a series of high-resolution maps of Norfolk's Multimodal System Plan at the citywide scale and zoomed in to different areas of the city.

Appendix B: Additional Maps provides additional maps that were used during the development of the Multimodal System Plan.

Appendix C: Multimodal Corridor Design Matrix provides the full length and full-scale version of the Corridor Matrix that provides optimal and minimum standards for each corridor element, as explained in Chapters 6 and 7.

Appendix D: Freight Design Considerations contains guidance for designing multimodal corridors in the context of regional freight movement needs.

Appendix E: Pedestrian Crossing Design Considerations provides best practices for designing pedestrian crossings on multimodal corridors at intersections and mid-block locations.

Appendix F: Multimodal Needs Assessment Technical Appendix provides more detail on the data-driven analysis used to produce the needs maps.

Appendix G: Program of Projects provides the full list of projects included in the current Program of Projects.

Appendix H: Resource Allocation Plan provides the current list of projects in the Resource Allocation Plan.

Appendix I: 2015 Norfolk Bicycle and Pedestrian Strategic Plan is the strategic plan adopted by City Council in 2015. The recommendations from the strategic plan remain valid. However, implementation of the project recommendations from the strategic plan will follow the latest industry standard design guidance, which continues to evolve.

[i] Hampton Roads is home to more than 1.7 million residents and is projected to grow to over 2 million by the year 2045. Source: Hampton Roads Transportation Planning Organization, 2019. Hampton Roads 2045 Socioeconomic Forecast and Transportation Analysis Zone Allocation. Retrieved Dec 22, 2020 from https://www.hrtpo.org/uploads/docs/Hampton%20Roads%202045%20Socioeconomic%20Forecast%20and%20TAZ%20Allocation%20Report.pdf.
[ii] Ibid.
[iii] Land vacancy statistic from plaNorfolk 2030
[iv] City of Norfolk, Department of Transit, 2019. *Citywide Crash Analysis (2015-2018)*.
[v] City of Norfolk, Mayor's Advisory Commission on Climate Change Mitigation and Adaptation, 2019. *Climate Action Plan*.
[vi] U.S. Environmental Protection Agency. "Fast Facts on Transportation Greenhouse Gas Emissions." Retrieved Nov 17, 2020 from https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions.
[vii] City of Norfolk, Mayor's Advisory Commission on Climate Change Mitigation and Adaptation, 2019. *Climate Action Plan*.
[viii] National Equity Atlas. Racial Equity Index. Data retrieved for the City of Norfolk, VA on May 19, 2022 from https://nationalequityatlas.org/research/racial_equity_index/index#/?geoSectionName=City&geo=06000000000051078
[ix] Ibid.