



Thoroughfare Plan Update

City of Lancaster
Final Report

Adopted September 28, 2020



Acknowledgements

City Council

Clyde C. Hairston, Mayor

Carol Strain-Burk, District 1

Marco Mejia, District 3

Racheal Hill, Mayor Pro Tem, District 5

Stanley Jaglowski, District 2

Derrick D. Robinson, Deputy Mayor Pro Tem, District 4

Nina Morris, District 6

Planning and Zoning Commission

Ernest Casey

Lawrence Prothro

Isabel Aguilar

Angela Murphy

Temika Whitfield

City Staff

Opal Mauldin-Jones, City Manager

Fabrice Kabona, Assistant City Manager

Carey Neal, Assistant to the City Manager

Vickie Coleman, AICP, Development Services Director

Than Nguyen, P.E., City Engineer

Dipak Patel, Engineering Project Manager

Bester Munyaradzi, AICP, Senior Planner

Emma Chetuya, Planner

Consultant Team

Freese & Nichols, Inc.

Edmund Haas, AICP, Project Manager

Brian Crooks, Transportation Planner

Daniel Herrig, P.E., Project Planner



Table of Contents

ACKNOWLEDGEMENTS 2

TABLE OF CONTENTS..... II

LIST OF FIGURES.....IV

LIST OF TABLESVI

CHAPTER 1: INTRODUCTIONVII

 THOROUGHFARE PLANNING 101.....2

Understanding Proposed Alignments3

Thoroughfare Plan Limitations.....4

 PREVIOUS PLANNING EFFORTS.....5

Regional Initiatives.....5

City Initiatives.....9

 CURRENT PLANNING EFFORTS.....12

Lancaster Hike and Bike Trails Master Plan12

Lancaster Streetscape Master Plan Update.....13

Southern Dallas Regional Veloweb Alignment Study.....13

CHAPTER 2: GOALS AND OBJECTIVES 15

 COMPREHENSIVE PLAN VISION AND PRINCIPLES15

Vision Statement.....15

Supporting Principles15

Transportation Strategies16

 THOROUGHFARE PLAN GOALS AND OBJECTIVES16

Expand Mobility and Access.....16

Focus on Maintenance and Fiscal Responsibility17

Improve Economic Vitality17

Enhance Quality of Life17

CHAPTER 3: EXISTING CONDITIONS..... 19

Existing Transportation Framework.....19

 EXISTING ROADWAY OPERATIONS19

Traffic Volumes20

Existing Network Level of Service.....21

Existing Major Traffic Generators.....23

Future Major Traffic Generators24

 CRASH STATISTICS24

 TRANSIT SERVICES AND CONNECTIVITY27

Existing Rail Connectivity27

Existing Bus Connectivity.....27

 NON-MOTORIZED TRANSPORTATION28

Existing Non-Motorized Transportation Network.....28

CHAPTER 4: MODELING AND THOROUGHFARE ANALYSIS..... 31

 MODELING PROCESS.....31

Thoroughfare Analysis Modeling Methodology.....31

Travel Demand Modeling Steps32

 FORECASTING GROWTH.....32

Travel Demand Model Base Year Conditions	32
Travel Demand Model Analysis.....	33
Projected Level of Service.....	33
Projected Thoroughfare Volumes	34
CHAPTER 5: THOROUGHFARE PLAN	37
PROPOSED 2019 LANCASTER THOROUGHFARE PLAN	37
Key Changes to Current Plan.....	37
FUNCTIONAL STREET CLASSIFICATION.....	41
FUNCTIONAL STREET CLASSIFICATION SYSTEM ANALYSIS AND RECOMMENDATIONS	44
Typical Roadway Characteristics by Functional Classification	44
Recommended Functional Classification Amendments	44
RECOMMENDED THOROUGHFARE DESIGN STANDARDS.....	46
Recommended Thoroughfare Design Standards	46
Design Standard Cross-Sections	49
BIKE & PEDESTRIAN NETWORKS.....	55
Bike Plan Recommendations.....	55
2019 THOROUGHFARE PLAN MAP.....	56
CHAPTER 6: CONTEXT-BASED ROADWAY DESIGN	59
CONTEXT-BASED APPROACH.....	59
CONTEXT SENSITIVE DESIGN ELEMENTS	59
Travel Way	60
Flex Zone	60
Pedestrian Realm	60
CONTEXT TYPES	60
Urban Commercial	62
Town Center.....	62
Suburban Neighborhood.....	63
Suburban Commercial.....	63
Rural Neighborhood.....	63
INTEGRATING CONTEXT SENSITIVE DESIGN ELEMENTS WITH LAND USE TYPES	64
CONTEXT SENSITIVE STRATEGY CORRIDORS	65
Pleasant Run Road (from IH-35E to SH 342 / Dallas Avenue)	66
SH 342 / Dallas Avenue (from Veterans Memorial Parkway to Belt Line Road)	66
Houston School Road (from IH-20 to Wintergreen)	67
Main Street (from Belt Line Road to SH 342 / Dallas Avenue)	67
Belt Line Road (from Bluegrove Road to SH 342 / Dallas Avenue).....	68
ROADWAY RIGHTSIZING.....	68
Rightsizing Analysis.....	69
Bike and Pedestrian Complete Streets Integration	69
Key Intersections	71
Intersection Congestion Mitigation	73
CHAPTER 7: PLAN IMPLEMENTATION	75
Committed and Funded Projects.....	75
Project Prioritization	75
Recommended Funding Strategies	79
CONCLUSION	84



List of Figures

FIGURE 1: PLAN GOALS5

FIGURE 2: LEVELS OF CONGESTION AND DELAY6

FIGURE 3: NCTCOG LOGISTICS HUB STUDY.....6

FIGURE 4: PROPOSED LOOP 9 ALIGNMENT7

FIGURE 5: LANCASTER VELOWEB8

FIGURE 6: DART 2030 PLAN – POTENTIAL NEW MEMBER CITIES.....9

FIGURE 7: 2006 MASTER THOROUGHFARE PLAN9

FIGURE 8: 2006 STREETScape MASTER PLAN.....10

FIGURE 9: 2015 THOROUGHFARE PLAN UPDATE.....11

FIGURE 10: 2020 HIKE AND BIKE TRAILS MASTER PLAN12

FIGURE 11: CONNECTIONS BETWEEN COMPREHENSIVE PLAN AND THOROUGHFARE PLAN18

FIGURE 12: 2018 DAILY VOLUME20

FIGURE 13: VOLUME/CAPACITY RATIOS VS LEVEL OF SERVICE21

FIGURE 14: 2018 LEVEL OF SERVICE22

FIGURE 15: TOTAL ACCIDENTS (2013-2017).....24

FIGURE 16: HIGH ACCIDENT LOCATIONS IN LANCASTER26

FIGURE 17: 2020 HIKE AND BIKE TRAILS MASTER PLAN29

FIGURE 18: COMPONENTS OF TRAVEL DEMAND MODELING.....31

FIGURE 19: STEPS OF TRAVEL DEMAND MODELING32

FIGURE 20: 2045 DAILY LEVEL OF SERVICE33

FIGURE 21: 2045 DAILY VOLUMES.....35

FIGURE 22: THOROUGHFARE PLAN AMENDMENTS39

FIGURE 23: ROADWAY CLASSIFICATION41

FIGURE 24: MAJOR 6-LANE URBAN ARTERIAL49

FIGURE 25: MAJOR 5-LANE URBAN ARTERIAL49

FIGURE 26: MAJOR 4-LANE URBAN ARTERIAL50

FIGURE 27: MINOR 4-LANE URBAN ARTERIAL50

FIGURE 28: MINOR 4-LANE RURAL ARTERIAL51

FIGURE 29: MAJOR 4-LANE URBAN COLLECTOR.....51

FIGURE 30: MAJOR 4-LANE RURAL COLLECTOR52

FIGURE 31: MAJOR 3-LANE URBAN COLLECTOR.....52

FIGURE 32: MINOR 2-LANE URBAN COLLECTOR.....53

FIGURE 33: MINOR 2-LANE RURAL COLLECTOR53

FIGURE 34: LOCAL URBAN ROADWAY54

FIGURE 35: LOCAL RURAL ROADWAY54

FIGURE 36: 2020 HIKE AND BIKE TRAIL MASTER PLAN55

FIGURE 37: PROPOSED 2020 THOROUGHFARE PLAN57

FIGURE 38: CONTEXT SENSITIVE URBAN ZONES.....59

FIGURE 39: CONTEXT SENSITIVE STREET DESIGN ELEMENTS.....60

FIGURE 40: THOROUGHFARE CONTEXTS IN LANCASTER.....61

FIGURE 41: STRATEGIC CORRIDORS.....65

FIGURE 42: POTENTIAL CORRIDOR CONFIGURATIONS FOR PLEASANT RUN ROAD66

FIGURE 43: POTENTIAL CORRIDOR CONFIGURATIONS FOR DALLAS AVENUE66

FIGURE 44: POTENTIAL ROADWAY CONFIGURATION FOR HOUSTON SCHOOL ROAD67

FIGURE 45: POTENTIAL ROADWAY CONFIGURATION67

FIGURE 46: POTENTIAL ROADWAY CONFIGURATIONS68

FIGURE 47: SIGNALIZED INTERSECTIONS IN LANCASTER72

FIGURE 48: MINOR ROADWAY INTERSECTIONS73

FIGURE 49: MAJOR ROADWAY INTERSECTIONS73
FIGURE 50: RIGHT TURN CAPACITY DESIGN74
FIGURE 51: LEFT TURN CAPACITY DESIGN74
FIGURE 52: COMMITTED AND FUNDED PROJECTS75
FIGURE 53: PROJECT PRIORITIZATION76



List of Tables

TABLE 1: CORE FUNCTIONS OF THE ROW3

TABLE 2: LEVEL OF SERVICE AND CONGESTION21

TABLE 3: CONGESTED ROADWAYS IN LANCASTER.....23

TABLE 4: HIGH ACCIDENT LOCATIONS.....25

TABLE 5: ROADWAY CHARACTERISTICS BY FUNCTIONAL CLASS44

TABLE 6: COMPARISON OF CITY OF LANCASTER THOROUGHFARE CLASSIFICATIONS.....45

TABLE 7: 2006 STREETScape MASTER PLAN THOROUGHFARE DESIGN STANDARDS47

TABLE 8: 2016 COMPREHENSIVE PLAN THOROUGHFARE DESIGN STANDARDS47

TABLE 9: RECOMMENDED 2020 LANCASTER THOROUGHFARE PLAN DESIGN STANDARDS48

TABLE 10: CONTEXT SENSITIVE DESIGN AND LAND USE64

TABLE 11: CRITICAL INTERSECTION ROW REQUIREMENTS71

TABLE 12: THOROUGHFARE PLAN PROJECT LISTING77

TABLE 13: FUNDING SOURCES FOR ROADWAY CONSTRUCTION80

TABLE 14: FUNDING SOURCES FOR ROADWAY REHABILITATION81

TABLE 15: FUNDING SOURCES FOR INTERSECTION IMPROVEMENTS82

TABLE 16: POTENTIAL FUNDING SOURCES FOR MISCELLANEOUS PROJECTS.....83

THIS PAGE INTENTIONALLY LEFT BLANK

INTRODUCTION

Chapter 1: Introduction

The thoroughfare system forms one of the most visible and permanent elements of the community. It establishes the framework for community growth and development and forms a long-range statement of public policy for transportation. As the alignment and right-of-way (ROW) of major transportation facilities are established and adjacent property developed, it is difficult to facilitate system changes without significant financial impacts. However, by incorporating programmed land uses and densities, strategies can be developed that maximize the land use/transportation relationship **thereby increasing the community's chances in achieving** mobility, safety, transportation choice, and economic development.

The changing social and economic climate dictate an integrated network of transportation systems be considered to support and sustain viable long-term growth.

In addition to vehicular mobility, many communities, including Lancaster, have expanded transportation planning to include a broader range of considerations for transit, bike and pedestrian initiatives. When coupled with land use considerations, viable walkable places with value capture can be achieved. The City has begun incorporating more transportation alternatives through the development of a bike and pedestrian network, trails and streetscape plans, and a more walkable and mixed-use land use policy.



The process of developing a thoroughfare plan involves balancing the existing supply of infrastructure with the projected needs of the future. These future needs help to determine how much vehicle capacity is required and what multi-modal elements should be considered such as walking, biking or riding transit.

The Thoroughfare Plan will provide individual, yet integrated, strategies for vehicular, transit, pedestrian and bicycle network development and capital projects planning that will serve as a blueprint for future investment related decisions into the transportation system. The Plan is aimed at addressing the dynamic and changing needs that have occurred in Lancaster since the last Thoroughfare Plan. These policies, in conjunction with the Thoroughfare Plan Map, will guide long-term transportation decisions.

Thoroughfare Planning 101

While there is substantial variation between thoroughfare plans, all plans share several key attributes:

- **Role as a Policy Document:** While all thoroughfare plans provide long-term solutions to shape and direct future growth, a key feature of all plans is to set policies for orderly development of the roadway network that emphasize network connections, roadway capacity, and stakeholder/public involvement. All thoroughfare plans identify the general location and type of facilities required to support growth.
- **Long-Range in Scope:** All thoroughfare plans are focused on addressing long-range transportation needs to manage forecast growth. The planning horizon for implementation is typically 20 years or more.
- **Focused on ROW Preservation:** A key component of the thoroughfare plan is to create a mechanism to preserve land for future roadways (ROW) so that an effective and efficient roadway network can be developed over time to support growth as it occurs.
- **Defined Roadway Functional Classification:** All plans include a discussion of proposed roadway functional classifications and design cross-sections for the study area. The thoroughfare plan designates roadway classifications of thoroughfares and supports the regional transportation system.
- **Thoroughfare Plan Map:** All thoroughfare plans include a map of proposed roadway recommendations, usually limited to major and minor arterials. The map identifies and integrates existing City thoroughfare plans within the study area to produce a clear and consistent vision for the development of the roadway network.
- **Living Document:** Roadway recommendations outlined in thoroughfare plans are not final. The plan itself is subject to constant revision and amendment and is typically updated every 5 to 7 years to provide considerations in accommodating the changing growth patterns of the county. As such, the thoroughfare plan acts as a “living document”.

“A [Thoroughfare] plan is a statement of intention, not a guarantee of action.”

Source: 2016 Montgomery County Thoroughfare Plan, HGAC.



INTRODUCTION

Understanding Proposed Alignments

The alignments outlined in the plan are not final and can be revised several times before a final alignment is approved, engineered, and implemented. Such revisions happen for a variety of reasons, some of which include environmental review, engineering design, compatibility with surrounding developments, future potential development, available funding, and stakeholder/public involvement.

Updates to recommended alignments identified in the plan are allowed, provided they support the long-range goals of network connectivity, safety and mobility, and additional capacity as outlined in the thoroughfare plan's map of roadway recommendations. A brief description of the core functions of proposed alignment ROW is presented in Table 1.

Table 1: Core Functions of the ROW

Core Functions of the ROW	
Mobility	Accommodates the movement of people and good towards their destinations.
Access for People	Allows for people to get on or off the mobility system on-route to or from a destination. Access for people can be provided in many ways: short-term on-street parking, a bus stop, or a bike-rack.
Access for Commerce	Accommodates deliveries of goods and site services. Ensuring adequate access for commerce facilitates the delivery of goods and materials while aiding service provider's access in and out of buildings.
Storage	Provides for on-street parking for vehicles and temporary accommodation of construction activities that intrude in the ROW.
Greening	Enhances environmental sustainability by planting and/or installing street trees, planter boxes, and vegetated curb extensions, adding to aesthetic conditions and the environmental health of the built environment.
Activation	Recognizes the placemaking is an important function of the public ROW. It creates vibrant streetscapes and serves an essential placemaking function. This can include street cafes, parklets, and food trucks.

Thoroughfare Plan Limitations

Thoroughfare plans are aimed at serving as a vision for long-term need based on forecasted growth and development. As a high-level planning document, they typically do not discuss:

- Specific projects or specific project-related issues, including final alignment, design, and construction timeframe.
- Funding commitments by local agencies to construct specific projects.
- Local traffic issues such as signage, wayfinding, and parking.
- Local roadways (with some exceptions).
- Traffic enforcement.
- Transportation and air quality.
- Traffic calming strategies.
- Traffic signalization issues.
- Specific intermodal issues.
- Managed facilities, such as High Occupancy Vehicle lanes or tolled facilities.
- Complementary transportation facilities, such as:
 - Transportation Network Companies (UBER, LYFT)
 - Travel Demand Management or Transportation System Management
 - Future Transportation Technologies
 - Automated People Movers

INTRODUCTION

Previous Planning Efforts

Past planning efforts in a city are essential to any thoroughfare plan. They provide a snapshot of the steps a city took to reach its current position and a guidebook of strategies that may or may not have had success in the past.

Regional Initiatives

Mobility 2045 - The Metropolitan Transportation Plan for North Central Texas

Mobility 2045 is the latest Metropolitan Transportation Plan for the Dallas - Fort Worth Metroplex and is maintained by the North Central Texas Council of Governments (NCTCOG). The primary purpose of the plan is to direct plans, policies, and programs to manage **the multimodal needs of the region's growing population**. The plan goals for Mobility 2045 are illustrated in Figure 1 and discussed below.

Plan Goals

- Improve the availability of transportation options for people and goods.
- Support travel efficiency measures and system enhancements targeted at congestion reduction and management.
- Assure all communities are provided access to the regional transportation system and planning process.
- Preserve and enhance the natural environment, improve air quality, and promote active lifestyles.
- Encourage livable communities which support sustainability and economic vitality.
- Ensure adequate maintenance and enhance the safety and reliability of the existing transportation system.
- Pursue long-term sustainable revenue sources to address regional transportation system needs.
- Provide timely project planning and implementation.
- Develop cost-effective projects and programs aimed at reducing costs associated with constructing, operating, and maintaining the regional transportation system.

Figure 1: Plan Goals



As part of the greater Dallas/Fort Worth Metropolitan Area, Lancaster is directly impacted by issues occurring at the regional level. Mobility 2045 indicates that even with improvements to area transportation facilities, congestion is expected to significantly increase within the metropolitan area. As shown in Figure 2, the Lancaster area has light congestion in 2018, but by 2045 the area within and around the city is

forecast to experience higher levels of traffic congestion, with areas to the north experiencing severe levels of congestion. It is important that the City continue to be aware of regional initiatives aimed at improving circulation and mitigating congestion.

The following are regional initiatives that should be considered as future land use as transportation decisions are made for the City of Lancaster. Planned highway improvements for IH-35E and the construction of Loop 9 between IH-35E and IH-45 will enhance accessibility for residents, local businesses, and visitors to and from the City. Planned enhancements to the regional rail system and bike and pedestrian network will improve overall connectivity in Lancaster and provide viable multimodal transportation alternatives and improve mobility for all users of the Lancaster transportation network.

NCTCOG Logistics Hub Study

Adopted in October of 2012, NCTCOG's Logistics Hub Study is shown in Figure 3. Amongst the study findings, it stated that as the Southern Dallas County area continues to grow, the most pressing issue will be increases in roadway capacity due to passenger vehicles and truck freight movement.

The document identified the major north-south arterials in Lancaster as SH 342 (Dallas Avenue), Houston School Road, and Jefferson Street. The major east-west arterials include Pleasant Run Road, Wintergreen Road, Belt Line Road, Daniieldale Road, and Bear Creek. The study gives specific recommendations for how wide

Figure 2: Levels of Congestion and Delay

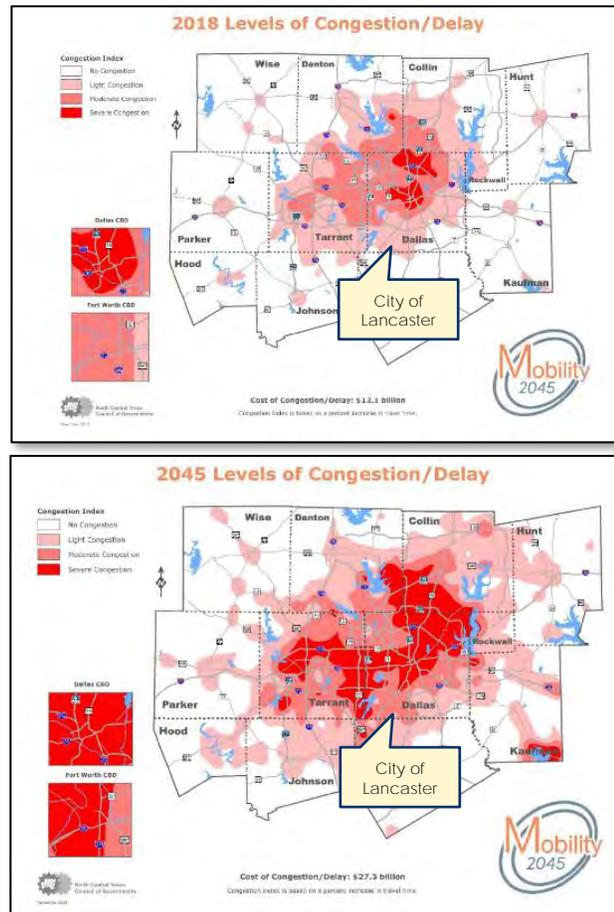


Figure 3: NCTCOG Logistics Hub Study



INTRODUCTION

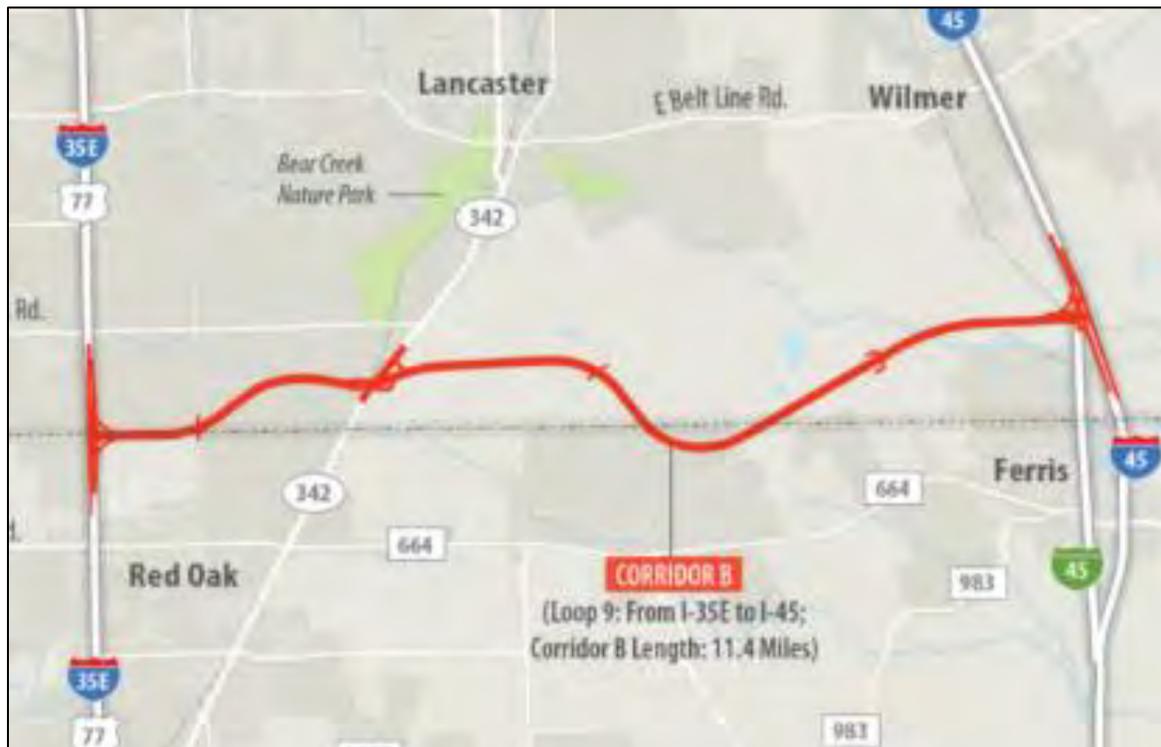
certain arterials should be that continue through Lancaster.

Improvements focused on widening of multiple east-west arterials to provide connectivity between the freight centers and IH-45. These roads included Wintergreen Road, Pleasant Run Road, and Belt Line Road, all of which are major roadways that cut through Lancaster. Additional expansions of north-south arterials such as Bonnie View Road, and Lancaster-Hutchins Road that provide connectivity to IH-20 would also be needed. A new alignment to connect the International Inland Port of Dallas (IIPOD area) to Lancaster Regional Airport and the City of Ferris would also be needed.

Loop 9

The updated alignment of Loop 9 is identified in Lancaster's 2016 Comprehensive Plan and presented in the updated Master Thoroughfare Plan. As illustrated in Figure 4, Loop 9 would enter Lancaster's city limits on the west at the inter-section with I-35E and continue east within the city limits and extraterritorial jurisdiction (ETJ). Introduced in 1964, this loop has been revisited, studied, and realigned multiple times. The project addresses population growth in the region and provides east-west connectivity throughout communities in southern Dallas and Ellis counties. Economic development on the southern end of the city will most likely occur as a result.

Figure 4: Proposed Loop 9 Alignment



Source: TxDOT

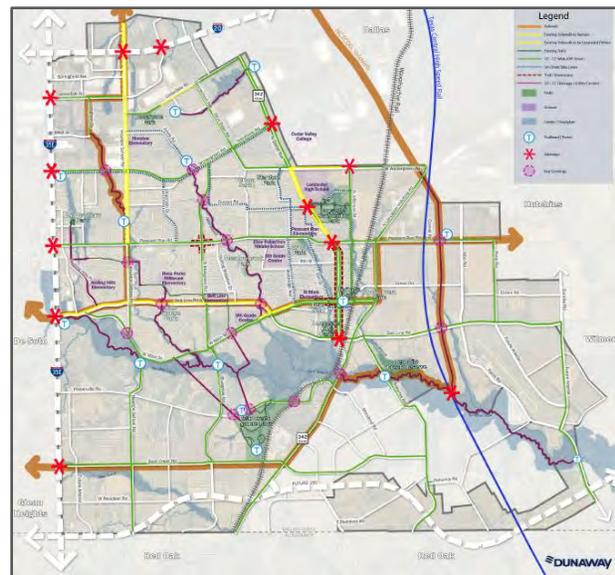
Regional Veloweb

The Regional Veloweb, as defined by NCTCOG, is an 1,883-mile bike and pedestrian network spanning 10 counties and 117 cities within the Dallas-Fort Worth Metroplex. The Veloweb consists of existing and planned off-street shared use paths designed to accommodate all non-motorized modes of transportation.

Design considerations for the Regional Veloweb include the following:

- Minimum 12-foot width and grade separated crossing of roadways with significant traffic flows.
- 16- to 24-foot sections or separated facilities for pedestrians and bicyclists in areas with high peak-volumes of users.
- Independent corridors such as greenways or other active or abandoned ROW.
- Continuous linear corridors that provide long-distance connections through cities and across counties.
- Provide connections to major destinations, including transit stations, employment and education centers, and/or other major activity venues with high volumes of users.
- Grade-separated crossings of roadways with significant traffic flows.
- Few, if any, driveway crossings and signalized or stop sign intersections.
- Supported by a network of local community paths, sidewalks, and on-street bikeways that provide connections to local neighborhood destinations.
- Constructed with long-lasting impervious surfaces.

Figure 5: Lancaster Veloweb



NCTCOG has identified plans to expand the Veloweb into Lancaster in its latest long-range Metropolitan Transportation Plan, Mobility 2045. Figure 5 shows the regional Veloweb plans for Lancaster as part of its 2020 Hike and Bike Trails Master Plan.

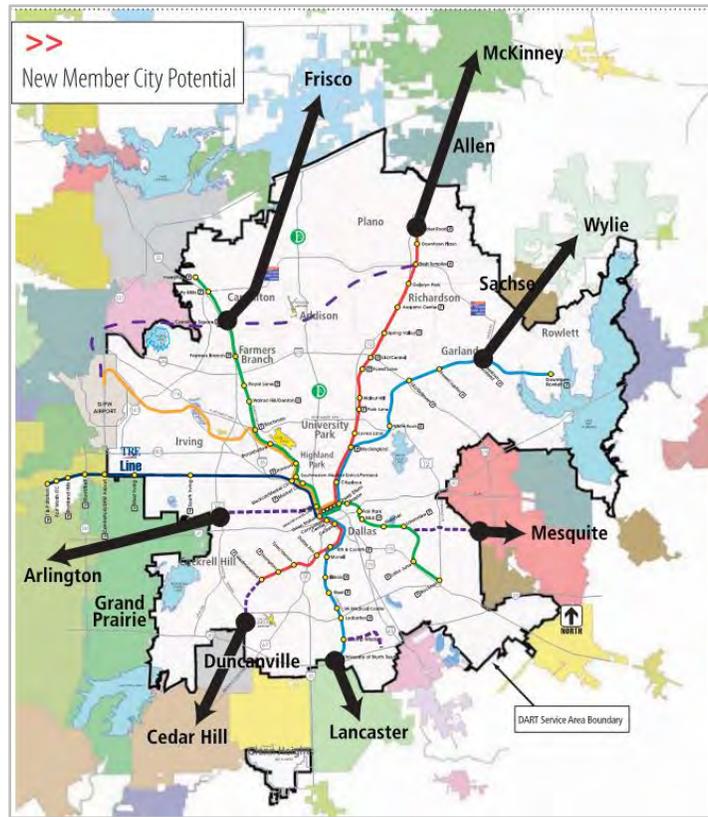
INTRODUCTION

DART 2030

The DART 2030 plan was revised in January of 2007 and focused on enhancing the existing transit system to accommodate additional services as well as expansion projects. As shown in Figure 6, several cities were identified as an expansion opportunity for DART including Lancaster which showed potential to support rail. In 2020, DART will update its Transit System Plan, which will incorporate:

- The 2019 Bus Service Plan
- Its capital expansion program to identify future expansion opportunities
- DART's Mobility as a Service strategy, which will enhance system access, mobility, and service flexibility through emerging technologies
- Opportunities for future streetcar expansion within the DART service area
- Regional opportunities beyond its current service area

Figure 6: DART 2030 Plan – Potential New Member Cities



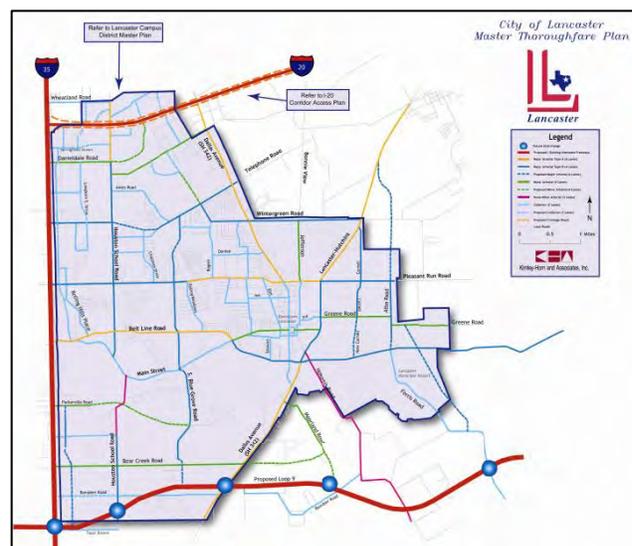
Source: DART 2030 Transit System Plan, page 45.

City Initiatives

Lancaster 2006 Master Thoroughfare Plan

The City of Lancaster's Master Thoroughfare Plan (MTP) was the guiding document on the location and design of major roadway facilities within Lancaster and is shown in Figure 7. Adopted in 2006, it recommended expansions of several roadways in the city. Only a handful of new alignments are planned, and they are mainly extensions of existing roadways such as Alba Road, Cornell and Wintergreen Road. Many of the planned improvements were the expansions of two-lane roads into major arterial routes through the city. These

Figure 7: 2006 Master Thoroughfare Plan



included east-west roads such as Belt Line Road, Pleasant Run Road and Wintergreen Road, and north-south routes such as Houston School Road, and Lancaster Hutchins.

Lancaster 2006 Streetscape Master Plan

Adopted in 2006, Lancaster's Streetscape Master Plan was a planning tool for developing aesthetics of future streets. The goals of the plan were to create and reinforce a unified image of Lancaster, design for vehicular and pedestrian safety, create a pedestrian friendly environment, proven wayfinding devices, and provide an overall sense of interest to the streetscape.

The intent of the document was to facilitate the creation of an attractive system of streets that would beautify the city.

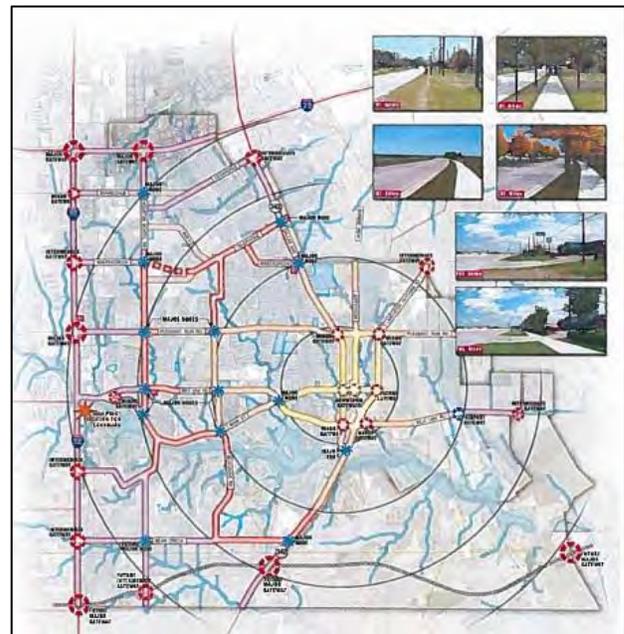
The streetscape design concept recommended using a multi-ring approach with four concentric rings emanating from the city center (see Figure 8), each with their own defined character. Each ring would have their own specific set of signages, trees, colors, pavement types, and node monuments to be used. The ring approach provided a sense of reference to the City's downtown without making downtown the ultimate destination.

1. Outer Ring / Gateway access - This ring provided the introduction to the city, would be highly visible, and provide wayfinding devices.
2. Middle Ring/ Intermediate - Its purpose was to define emerging neighborhoods and greenways.
3. Inner Ring/ Midtown - Its purpose was to define established neighborhoods. Signage would be for specific destination and parking information.
4. City core- downtown - Its purpose was to focus on downtown and town square and would be mostly pedestrian oriented.

The plan provided a recommended layout of thoroughfares and streets broken out into 5 types:

- A. Major Thoroughfare (Max 120' ROW)
Three travel lanes on each side of a tree lined median with parkway, sidewalk, and then landscape setback.
- B. Major Thoroughfare (Max 110' ROW)
Three travel lanes on each side of a tree lined median with parkway, sidewalk, and then landscape setback.

Figure 8: 2006 Streetscape Master Plan



INTRODUCTION

- C. Secondary Major Thoroughfare (Max 100' ROW)
Two travel lanes on each side of a tree lined median with parkway, sidewalk, and then landscape setback.
- D. Collector (Max 65' ROW)
Two travel lanes with no median, but parkways, sidewalks, and a landscape setback on each side of outer lanes.
- E. Residential (Max 50' ROW)
Two travel lanes, with parkway and sidewalks on each side of outer lanes.

The design standards would be implemented as a priority on streets and roadways that were recently widened and improved as of the CIP. These roadways would consist of Belt Line Road, Wintergreen east of Dallas Avenue and Houston School Road north of Belt Line Road.

Lancaster Master Thoroughfare Plan (MTP) 2015 Update

The MTP dictates the number of lanes for a roadway facility by its thoroughfare classification system. Each classification outlines design features of the roadway. The 2015 update (see Figure 9) added Loop 9 as a proposed interstate freeway. The plan proposed to fill gaps in any major arterial that does not provide a full connection from one link to another.

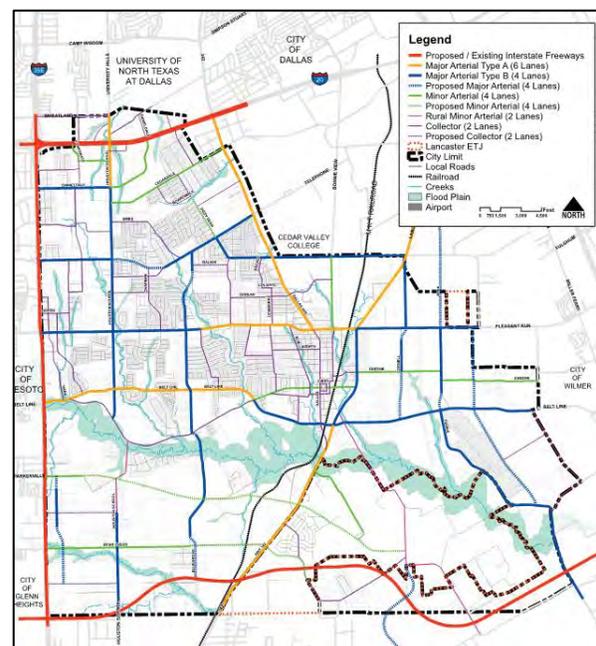
Lancaster 2016 Comprehensive Plan

Adopted in 2016, the City of Lancaster's Comprehensive Plan identifies a need for a transportation system that is less focused on the automobile and more attuned to alternative modes of transportation. The plan recommends a street context framework that breaks out roadways into five different categories based on their land use:

1. Urban Commercial Streets - Wide range of uses, including live, work, shop, and play.
2. Town Center Streets – Residential and service retail.
3. Suburban Neighborhood Streets – Primarily residential.
4. Suburban Commercial Streets – Wide range of uses including live, work, shop, play, dining, and lodging.
5. Rural Neighborhood Streets – Limited range of uses including special industrial, agricultural, and single-family.

As part of the comprehensive planning process, the MTP for Lancaster was evaluated and updated. The updated plan assessed existing roadways for number of lanes,

Figure 9: 2015 Thoroughfare Plan Update



connectivity, and congestion. Most of the changes to the MTP included new connections between existing facilities and extensions of existing roadways.

The Plan recommended connecting east/west arterials that are not currently continuous through the city. Areas identified include Wintergreen Road, Telephone Road and Bear Creek Road. The ROW acquisitions needed for these connections are shown in the plan. Lastly, a revision of codes and ordinances would be required to reflect the five types of street contexts that were developed in the comprehensive plan to provide more uniform standards for road construction and expansion in the city.

Current Planning Efforts

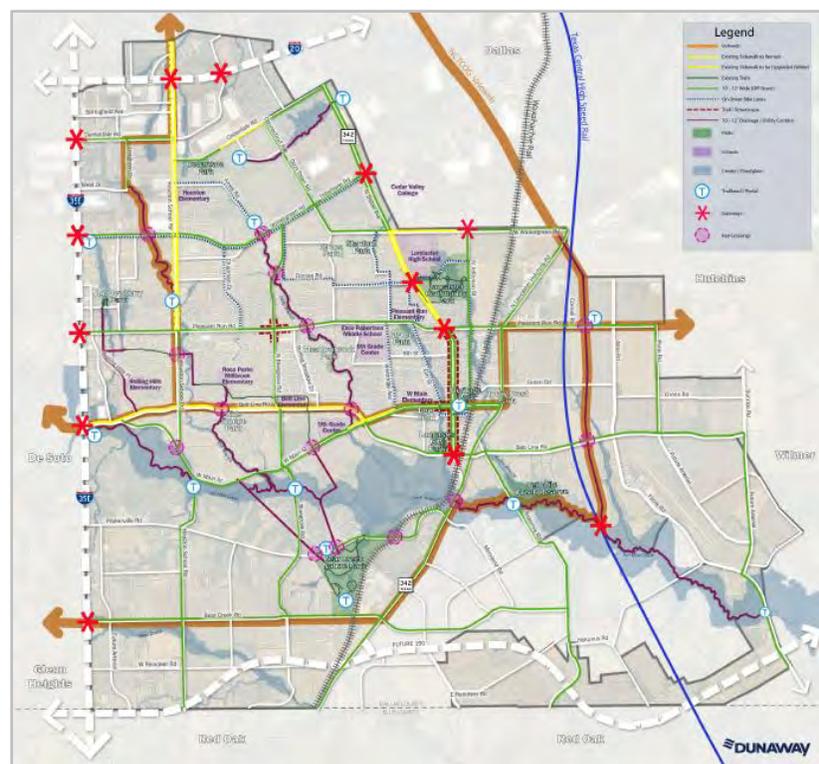
Considerations from several current planning efforts were incorporated into the thoroughfare plan update and are summarized below.

Lancaster 2020 Hike and Bike Trails Master Plan

The City of Lancaster recently updated its Hike and Bike Trails Master Plan. The development of this master plan update was based on the 2006 Trails Master Plan Summary for planning a well-connected trail system throughout Lancaster. The plan development process included an analysis of the existing system, including identification of challenges and opportunities to expand the system, conceptual trail planning and design and community engagement, and finally development of a trail network, design standards, trail hierarchy, and the final report.

The final trail plan provides City officials and key decision-makers a guide and tools to develop and implement the proposed network of trails.

Figure 10: 2020 Hike and Bike Trails Master Plan

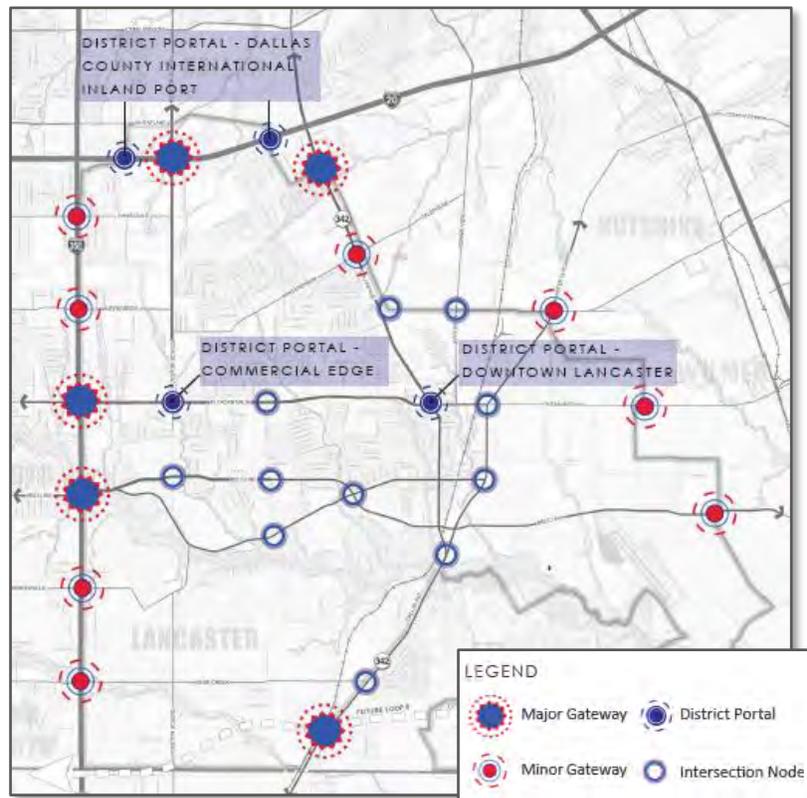


Courtesy Dunaway Associates

Lancaster 2020 Streetscape Master Plan Update

The 2020 Streetscape Master Plan Update focuses on enhancing the identity and character of the community through beautification of entryways, key intersection areas, and corridors. The Streetscape Master Plan identifies classes of enhancements with specific visual qualities that address identity, context, and function. The Plan also discusses landscaping, monumentation, public art, and intersection treatments.

Figure 11: 2020 Streetscape Master Plan - Gateways



Southern Dallas Regional Veloweb Alignment Study

The North Central Texas Council of Governments (NCTCOG) is leading a study to review the feasibility of bikeway segments in southern Dallas County to link the cities of Cedar Hill, DeSoto, Duncanville, and Lancaster. The study will investigate gaps between existing or planned paths and bikeways and examine key destinations along proposed routes and connections to existing transit services. The final report will discuss conceptual schematics, project phasing, environmental review, ROW requirements, and opinions on costing.

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 2: Goals and Objectives

The transportation network forms the skeleton of the city and must serve to support the larger vision of the community. Transportation strategies were developed through input and discussion with City officials and key stakeholders. While these strategies are distinct from the general vision, they reinforce and expand upon community strengths and promote transportation as a key element of community success.

Comprehensive Plan Vision and Principles

Vision Statement

A vision statement sets out the long-term aspirations or desires of the community. Lancaster's vision for the future is based upon four key points.

- It is built on our existing natural, cultural, and historic community assets.
- It creates Lancaster as a destination community.
- **The community's educational excellence** supports its people and businesses.
- The diverse choices in Lancaster appeal to people of all ages and businesses in a variety of industries.



Supporting Principles

Supporting the vision are 10 principles or policies that provide more direction on how to achieve the overall vision for the City of Lancaster.

1. **Lancaster's quality of life attracts people of all ages.**
2. Natural and historic assets are the foundation for distinctive neighborhoods and business areas.
3. **The City's continued** investments in existing neighborhoods offer desirable choices for current and future residents.
4. New residential developments expand the range of neighborhood choices, so Lancaster appeals to people throughout all stages of life.
5. **Lancaster's economic base is strong because it includes businesses in diverse and growing industries.**
6. The enhanced Medical District is a key reason Lancaster is the wellness center of southern Dallas County.
7. **Development and investment decisions support Lancaster's fiscal sustainability over time.**
8. Lancaster has great mobility choices – walking and biking routes to destination within the community, public transportation connections to the DFW region, and street networks that link Lancaster residents to jobs and Lancaster businesses to their employees and customers.

9. Lancaster residents of all ages can find the resources for success here in this community (resources for education, training, healthy living, job search, etc.).
10. The Comprehensive Plan is the foundation for unified action to implement the City's long-term vision. The City works in partnership with other agencies including the Lancaster ISD, the Chamber of Commerce, and Economic Development among others to carry out the Plan.

Transportation Strategies

Specific guidance for transportation and related categories of land use, infrastructure, economic development, open space/recreation, community character and design, historic preservation, and public facilities build upon the vision statement and guiding principles. Defined strategies for transportation include:

- Providing a full range of mobility choices:
 - Anticipate and benefit from potential commuter rail.
 - Plan development that is "Transit-Ready" around Lancaster's desired rail stations.
 - Minimize the impacts of potential high-speed rail.
- Taking advantage of Lancaster's location within regional mobility systems (highways, public transportation, freight, air, etc.).
- Using transportation improvements to strengthen key destinations within Lancaster.

Thoroughfare Plan Goals and Objectives

The goals and objectives are designed to relate directly to the supporting principles and strategies of the 2016 Comprehensive Plan while providing additional guidance:

Expand Mobility and Access

Objectives:

- Judiciously improve the capacity and flow of the transportation infrastructure, as appropriate.
- Continuously evaluate existing and planned roadway corridors for future transportation needs.
- Integrate trails, bike lanes, bus transit, commuter rail, roadways, and sidewalks into a more interconnected comprehensive plan.
- Explore use of new technologies to enhance transportation options.
- Develop roadway streetscape and context sensitive design policies and standards that enhance multi-modal utilization, connectivity between communities, historic preservation, economic development, and user safety.
- Maintain a functional classification and roadway design standards in the City's Thoroughfare Plan.



GOALS AND OBJECTIVES

- Promote system connectivity to adjacent cities and the regional transportation network.

Focus on Maintenance and Fiscal Responsibility

Objectives:

- Maintain and enhance the condition of the existing transportation infrastructure with special consideration for older neighborhoods and rural areas.
- Identify and investigate new pavement technologies and paving systems.
- Implement robust asset management program to ensure system condition is continuously monitored, maintenance projects prioritized, and the overall network kept in good condition.
- Leverage public and private funding sources to optimize transportation investments.
- Identify and investigate regional, state, and federal funding initiatives to support local transportation programs and projects.
- Include roadway conditions into the ranking and prioritization of roadway projects.

Improve Economic Vitality

Objectives:

- Improve access to employment, commerce, education, and community resources.
- Provide for the efficient movement of goods and services.
- Give priority for freight movement in selected corridors, where appropriate.
- Strengthen the integration of transportation and land use.
- Employ roadway design principles that support community identity and wayfinding.
- Plan for Transit Oriented Development (TOD) as well as freight-oriented land use.
- Promote commuter rail initiatives to the City of Lancaster.
- Support connections and improvements to roadways adjacent to Loop 9.



Enhance Quality of Life

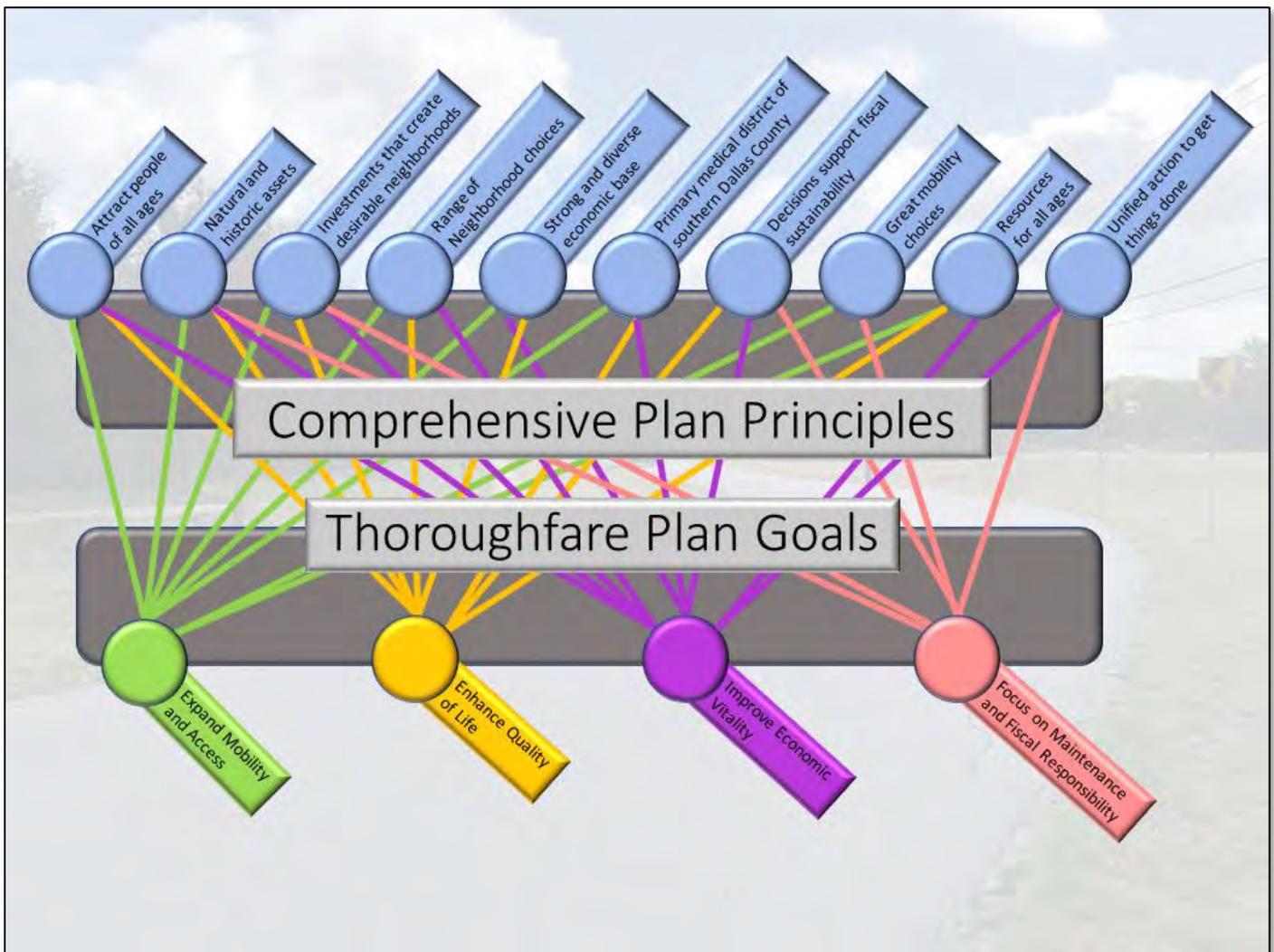
Objectives:

- Focus on moving people, not vehicles, safely and efficiently.
- Exceed federal, state and local air quality standards.
- Promote and incorporate active transportation activities into all events within the City.

- Embrace principles of streetscape and context sensitive roadway design where possible.
- Promote mixed-use developments at select locations to reduce auto use, improve air quality, and promote active transportation options.
- Make pedestrian and cyclist safety a priority when considering roadway rehabilitation or construction.
- Ensure safe and efficient routes to schools for pedestrians and cyclists, with preference towards elementary and middle schools.

Figure 11 illustrates the connections between the principles of the 2016 Comprehensive Plan and Thoroughfare Plan goals.

Figure 11: Connections between Comprehensive Plan and Thoroughfare Plan



EXISTING CONDITIONS

Chapter 3: Existing Conditions

The City of Lancaster has an advantage over many cities in the region and around the state because it already offers a multi-modal transportation network. The City is located just south of the DART Blue Line station at the University of North Texas at Dallas and has a developing bike and pedestrian network and excellent connections to the regional roadway network and the proposed high-speed rail station in Dallas.



The existing conditions section of a thoroughfare plan sets the foundation of the plan. It provides a baseline description of the city's transportation network as it stands today regarding capacity, functional classification, modal accommodations, and serves as a platform for recommended system adjustments.

Existing Transportation Framework

Lancaster contains a robust road network that provides access throughout the city and connectivity to the surrounding area. The network is generally composed of a grid network based on a functional hierarchy of streets. The purpose of the street classification system is to reduce traffic and improve connectivity to surrounding land uses.

Ease of access and efficient connectivity are important features of the overall network. Understanding the functionality and framework of facilities in Lancaster require an evaluation of different aspects of the transportation system. The purpose of evaluating existing conditions is to better define transportation needs in order to identify solutions to meet Lancaster's **current and future** transportation demands.



Existing Roadway Operations

Roadway operations describe the mechanics of a roadway network. These factors are typically gauged by examining traffic volumes, or the number of vehicles utilizing the network during a specified time interval, and level-of-service, a measure of the amount of congestion on a roadway given the number of vehicles it was designed to accommodate at a given time (capacity).

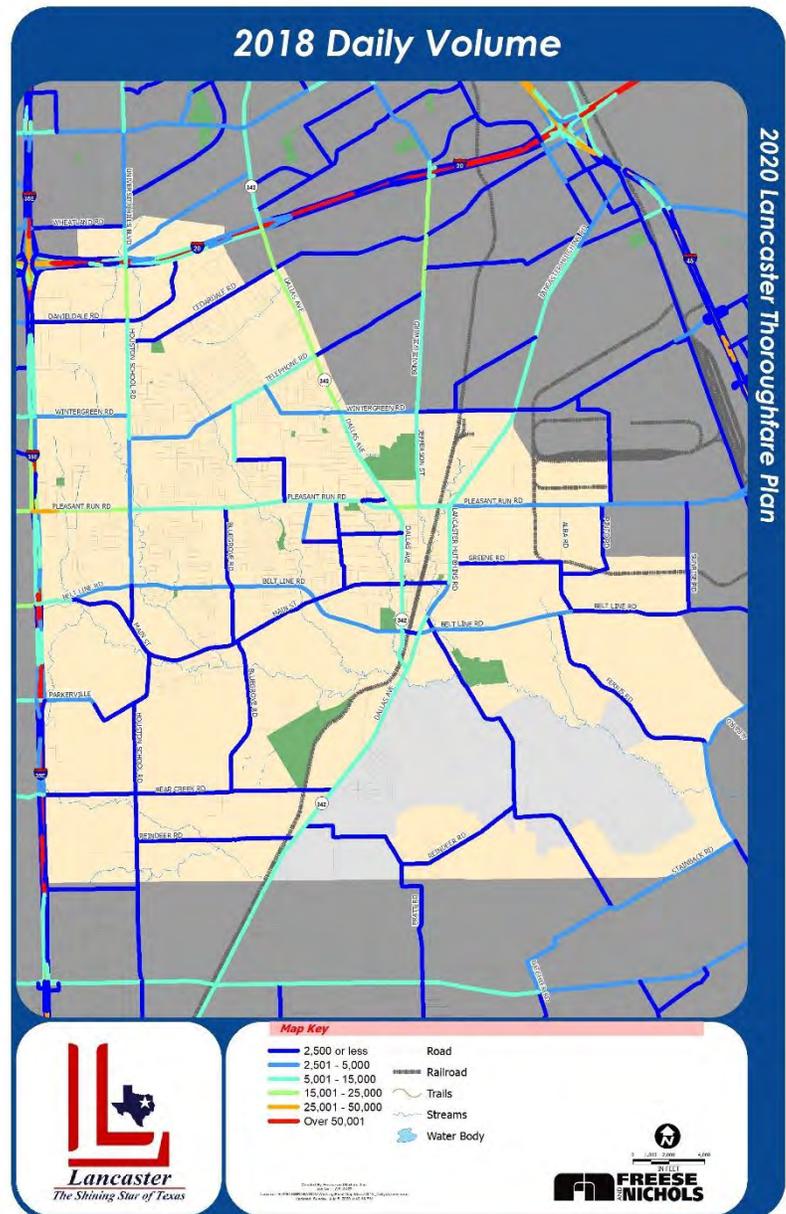
Traffic Volumes

Understanding current traffic volumes on a road network is an important step in determining if facilities are functioning at capacity under current conditions. The Annual Average Daily Traffic (AADT) provides information on traffic history. AADT is the total volume of vehicle traffic divided by 365 days. Traffic counts can also be collected over a specific time period.

Figure 12: 2018 Daily Volume

Current Daily Traffic Volumes

The bulk of thoroughfares in Lancaster were reported to be carrying volumes of up to 2,500 vehicles per day in 2018. The range of traffic volumes in the city is as low as 4 vehicles per day and up to nearly 28,000 vehicles per day. As shown in Figure 12, Pleasant Run Road from Park Circle Drive to IH-35E has the highest AADT at just under 28,000 vehicles per day. Much of this traffic can be attributed to the roadway's proximity to a major shopping center. The next highest traffic volumes in 2017 were along Dallas Avenue from Telephone Road to Cedardale Road carrying 22,000 vehicles per day. This stretch of roadway provides access from residential communities to IH-20 and can be attributed to residents using it to commute back and forth between the Dallas-Fort Worth Metroplex. Pleasant Run Road, from Dallas Avenue to Jefferson Street, recorded a daily volume of 17,600, while Houston School Road, from Daniieldale Road to IH-20, recorded 15,500. Except for these few higher volume roadways, most roadways in Lancaster operate with daily traffic volumes under 15,000 vehicles.



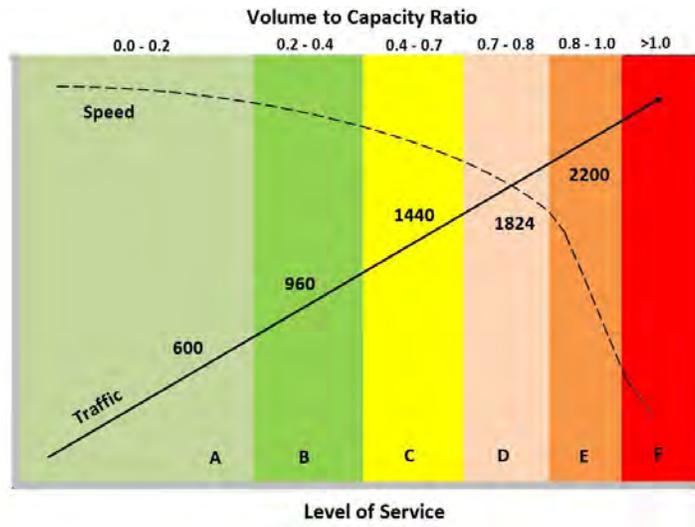
EXISTING CONDITIONS

Existing Network Level of Service

Level-of-Service (LOS) is a performance measure used to evaluate the function and flow of traffic through a transportation network. LOS is a measure of congestion expressed as the volume to capacity ratio of a roadway. Volumes represent an estimate of the number of vehicles on a road segment. Capacity is the maximum number of vehicles a roadway was designed to accommodate within a segment.

Traffic operational performance is based on an LOS scale from A through F, with A referring to free flow traffic conditions and F representing severely congested facilities. The closer a roadway's volumes are to equaling or exceeding their capacity, the lower the level-of-service (LOS D-F); the lower the volumes and further below the roadway's capacity, the higher the level-of-service (LOS A-C). Figure 13 illustrates the relationship between level-of-service and traffic volume, volume to capacity ratios, and speed.

Figure 13: Volume/Capacity Ratios vs Level of Service



Most cities design for LOS C and D operational conditions during the peak hours. Economically, LOS C or D roadways slow traffic down just enough for commuters to take notice of local businesses along a corridor; these conditions are also ideal for pedestrian activity. In some cases, mitigation of LOS may be constrained due to ROW or environmental factors. A description of operational conditions and congestion is listed in Table 2 below.

Table 2: Level of Service and Congestion

<p>LOS ABC: Traffic flow in this category moves at or above the posted speed limit. Travel time in this category is not hindered as a result of congestion because traffic volumes are much less than the actual capacity.</p>	
<p>LOS DE: This category is slightly more congested than LOS ABC; however, traffic volumes are beginning to reach their capacity of the thoroughfare. Traffic usually moves along at an efficient rate and posted speeds may not be fully reached.</p>	

LOS F: Congestion is apparent in this level-of-service category. Traffic flow is irregular, and speed varies. The posted speed limit is rarely, if ever, achieved in this category. In more congested corridors, traffic can be at a mere standstill with limited progression during peak hours.

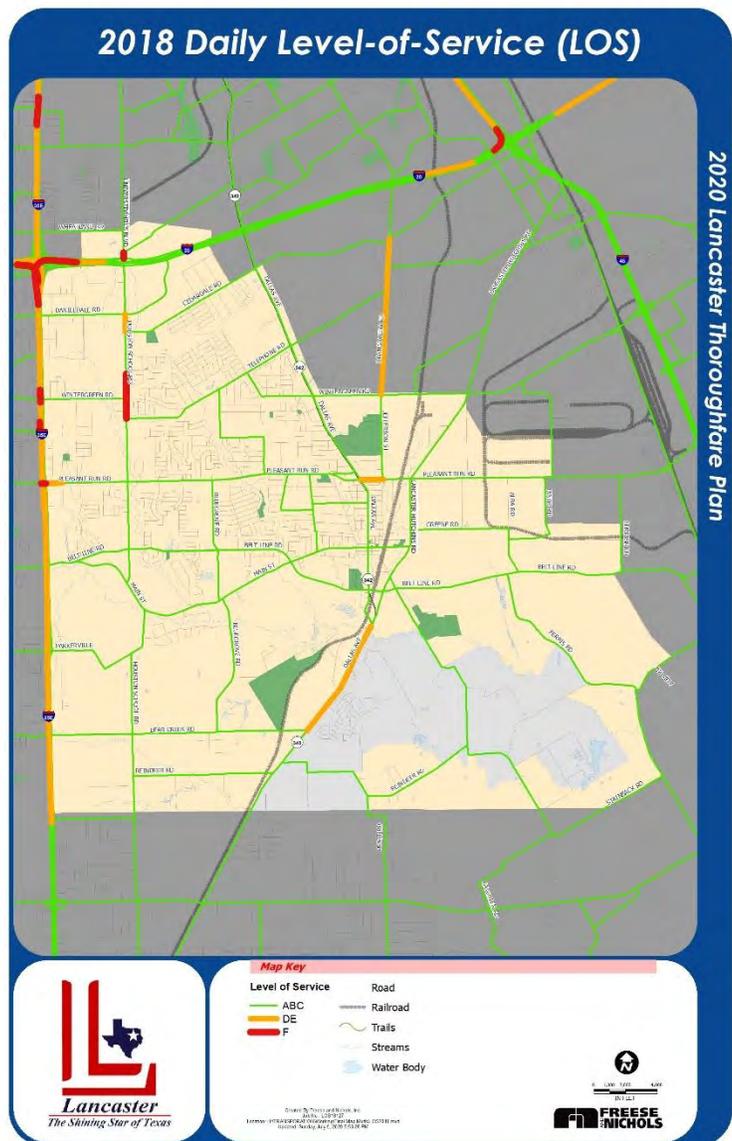


Figure 14: 2018 Level of Service

2018 Level of Service

As illustrated in Figure 14, Lancaster operates on a LOS of ABC with very few roadway segments having a rate of DE, or F. The daily LOS numbers indicated the worst projected conditions within a 24-hour period within the segment. The most congested segment is on North Houston School Road, from Wintergreen Road to approximately 600 ft north of Meadowgate Lane. This roadway is in the middle of this congested stretch of roadway and is the sole entrance/exit to a residential community of over 500 households. With five lanes and a 35-foot raise median, this unsignalized intersection has a stop sign for vehicles exiting from the community.

Traveling north on Houston School Road, the segment from Cedardale Road to Daniieldale Road operates on a level of DE. The intersections on Daniieldale Road and Cedardale Road are both large and unsignalized, and feed into major industrial business centers. At the Daniieldale Road intersection, a vehicle would have to cross over 100 feet of roadway while making a left turn. Being less than 1 mile away from IH-20, this intersection may need traffic signals to reduce congestion. Crossing IH-20 from North Houston Road on the north side is a



EXISTING CONDITIONS

small segment that operates at an LOS of DE. Such congestion is expected as there is significant demand to access IH-20.

Another major corridor with LOS operations of DE to F is Pleasant Run Road. The overpass in between the IH-35 E frontage roads has a LOS of F which rises to a LOS of DE as it reaches Rolling Hills Place.

Besides the small segments of congestion next to areas of activity, there is a larger stretch of DE level of congestion on Pleasant Road from Dallas Avenue to Jefferson Street, and from Jefferson Street running north past the city limits. This is due to Jefferson Street being an alternative route to reach IH-20. Table 3 lists the congested roadways in Lancaster as of 2018.

Table 3: Congested Roadways in Lancaster

Roadway	Segment	LOS	Daily Vol	AM Vol	PM Vol
Pleasant Run Road	Southbound IH-35E frontage road to northbound IH-35E frontage road.	F	26,429	3,966	6,926
Pleasant Run Road	Northbound IH-35E frontage road to Rolling Hills Place.	D, E	28,325	4,843	7,176
Houston School Road	Wintergreen Road to Wintergreen Road.	F	9,376	1,721	2,481
Houston School Road	Wintergreen Road to 600' N of Meadowgate Lane.	F	9,690	1,787	2,559
Houston School Road	Cedardale Road to Daniieldale Road.	D, E	14,748	2,694	3,616
University Hills Drive	IH-20 westbound frontage road to Wheatland Road.	D, E	9,798	2,429	2,839
Pleasant Run Road	Dallas Avenue to Jefferson Street.	D, E	18,318	2,902	4,480
Jefferson Street	Pleasant Run Road to Wintergreen Road.	D, E	12,422	1,860	2,762

Existing Major Traffic Generators

Major employers (greater than 150 employees) and areas of high commercial development can create an abundance of traffic and varying patterns of traffic flow. Recognizing these areas as major traffic generators can have important implications when planning future roadways. Major generators with over 200 employers include

Walmart, Lancaster Independent School District, Bass Craft, Cedar Valley College, Oak Creek Homes, and the City of Lancaster¹.

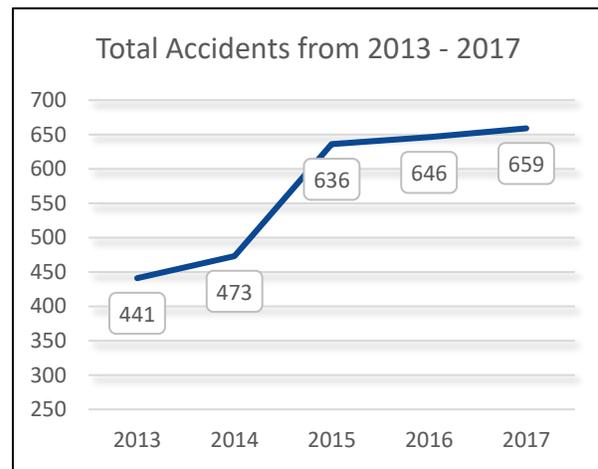
Future Major Traffic Generators

The construction of Loop 9 in southern Dallas County is expected to create numerous significant residential and commercial developments within Lancaster. With such development, an increase in traffic is likely to occur along the City's southern periphery and will have a significant impact on the transportation network within the City.

Crash Statistics

The annual number of vehicle crashes is important in telling whether a roadway network is safe, and where improvements can be made to improve public safety. Traffic accident data supplies critical information on the causes of congestion and whether they are the source of confusion among drivers. Through analyzing public data from the Texas Department of Transportation, corridors and locations with the highest crash rates were determined.

Figure 15: Total Accidents (2013-2017)



Texas Department of Transportation (TxDOT) Crash Records Information System (CRIS) reported 2,855 traffic accidents in the city of Lancaster from 2013 to 2017; 12 of these accidents resulted in fatalities. As shown in Figure 15, the crash rate rose by over 34 percent from 2014 to 2015 and then flattened out the following years with crash rates rising around 2 percent year over year. Although the number of crashes has increased slightly in recent years, the trend indicates that it is becoming normal for the roads to operate at a higher crash rate.

Specific road segments with high crash rates were identified in Table 4 and in Figure 16 on the following pages. Approximately 600 crashes were reported along the IH-35E, which makes up over 20% of total accidents within the city limits. Pleasant Run Road experienced 417 crashes, while 388 were reported on IH-20.

¹ Source: City of Lancaster website.

EXISTING CONDITIONS

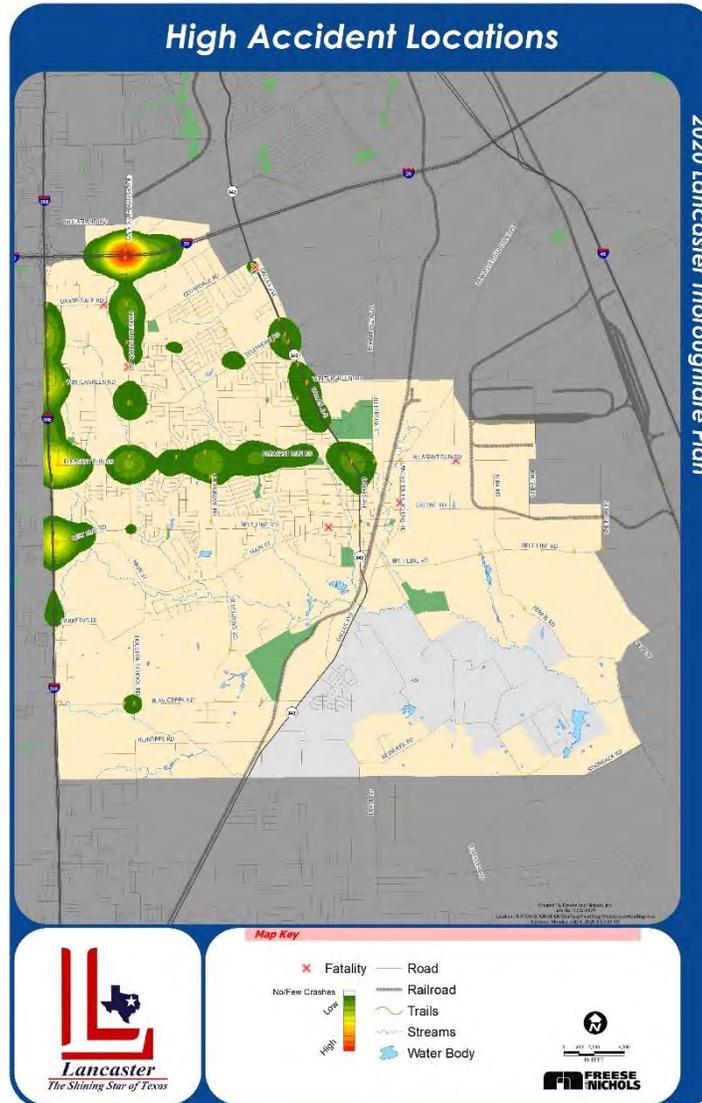
The one-mile roadway segment from Corporate Drive to Daniieldale Road along IH-20 has the highest number of crashes, with a high concentration occurring as IH-20 intersects North Houston School Road. The high volume of vehicles in this specific area is due to a cluster of industrial and business developments just south of the interstate. Pleasant Run Road, a major arterial that intersects through the core of the city from east to west, has the highest crash rate on its segment from IH-35E to Marsalis Road. There are more crashes than usual here because the intersection of Pleasant Run Road and IH-35E is in a major activity center and is surrounded by major retail, shopping and entertainment centers and commercial businesses.

Table 4: High Accident Locations

High Accident Areas	Total Accidents	Crash Rate by Route Length
IH-20 from Corporate Drive to Daniieldale Road	357	63.75
West Pleasant Run Road from IH-35E to Marsalis Road	159	81.53
IH-35E from East Pleasant Run Road to Southpointe Drive	141	56.4
IH-35E from The Meadows Parkway to Wintergreen Road	130	41.93
IH-35E from West Drive to Daniieldale Road	104	41.6
Pleasant Run Road from Chapman Drive to Rolling Meadows Drive	76	27.64
Pleasant Run Road from Glendover Drive to Springcrest Circle	67	36.22
North Houston School Road between Daniieldale Road and Cedardale Road	67	60.91
West Belt Line Road from IH-35E to West Main Street	60	32.43
North Dallas Avenue from West 8 th Street to East Park Place Drive	49	23.9

Source: TxDOT CRIS 2013 - 2017

Figure 16: High Accident Locations in Lancaster



Of the total accidents that occurred, approximately 12% were caused by a vehicle going over 70 miles per hour. The bulk of accidents were documented at speeds of 45 – 55 miles per hour (38%), and 30 – 40 miles per hour (32%). Many of these crashes occurred in areas with wide, multilane intersections leading to a center of activity in the city.

The top contributing factors for accidents include, but are not limited to, driver inattention, failure to control speed, failure to yield on a left turn and failure to yield at a stop sign.

Of all crashes reported in this four-year period, 37 involved pedestrians. Around 65% of total accidents were non-injury-related and approximately 95% of crashes had property damages exceeding \$1,000. Between 2012 to 2015, the annual number of fatalities decreased. From 2015 to 2016, fatal crashes rose from 4 to 11.

EXISTING CONDITIONS

Transit Services and Connectivity

Lancaster is served by numerous transit agencies that provide service in and around the City limits. Light rail service to downtown Dallas and points beyond are provided via the DART Blue Line at the UNT Dallas Station. City residents enjoy access to STAR transit bus services within the City and DART bus services in nearby Glenn Heights.



Existing Rail Connectivity

The DART Blue line opened in 1996 and is one of the original light rail lines in the DFW Metroplex. In late 2016, the Blue Line expanded its service to the University of North Texas (UNT) Dallas Station, just outside Lancaster's northern city limits. The Blue Line currently runs north from the UNT Station, through downtown Dallas, then east to Rowlett. DART's 2030 System Plan shows an expansion of the Blue Line via a branch to IH-20 and the SouthPort Intermodal Terminal.

Existing Bus Connectivity

The City of Lancaster has several agencies that provide bus service to its residents. DART provides nearby bus service via bus route #555 with service to Cedar Valley College and has Glenn Heights Park and Ride located just west of the City near IH-35E and Bear Creek Road in Glenn Heights.



STAR Transit provides a fixed-route service within Lancaster via the Hutchins Shuttle on route #401 with service to Crescent Medical Center, Cedar Valley College, and the DART UNT Dallas Station. It also provides additional fixed route service adjacent to Lancaster along IH-35E in DeSoto on route #501.

Non-Motorized Transportation

Non-motorized transportation is one of the most essential elements of a transportation network. This is because all trips, regardless of mode, begin with the pedestrian. It is important to build a transportation network that not only accommodates but plans for pedestrian and bicycle activity. Common elements of a non-motorized network include on-street and off-street bike trails, signed bike routes, and sidewalks.

Non-Motorized Transportation Elements

- Sidewalk – A primarily pedestrian off-street facility between the curb line of the roadway and the adjacent property.
- Shared Use Path - An on or off-street facility separated by a barrier or open space that is designed to accommodate all non-motorized modes including pedestrians, bicyclists, skaters, and joggers.
- Cycle Track – On or off-street facilities, designated for bicyclists, that is separated sidewalks, motorized travel lanes, and parking lanes.
- Bike Lane – On-street facility, designated for bicyclists that is separated from the motorized travel lanes through pavement striping.
- Wide Paved Shoulders – Wide shoulders, typically along rural highways, used to accommodate bicyclists and joggers.



These elements are often bolstered by landscaping and pedestrian amenities such as benches, shade trees, pedestrian lighting, and raised cross walks.

Existing Non-Motorized Transportation Network

Lancaster's non-motorized transportation network includes sidewalks, on and off-street trails, signed routes, and wide shoulders along certain roadways throughout the city. It accommodates several users, including pedestrians and bicyclists traveling to work and school, shopping and entertainment venues, and for general recreation.

Bicycle and Pedestrian Connectivity

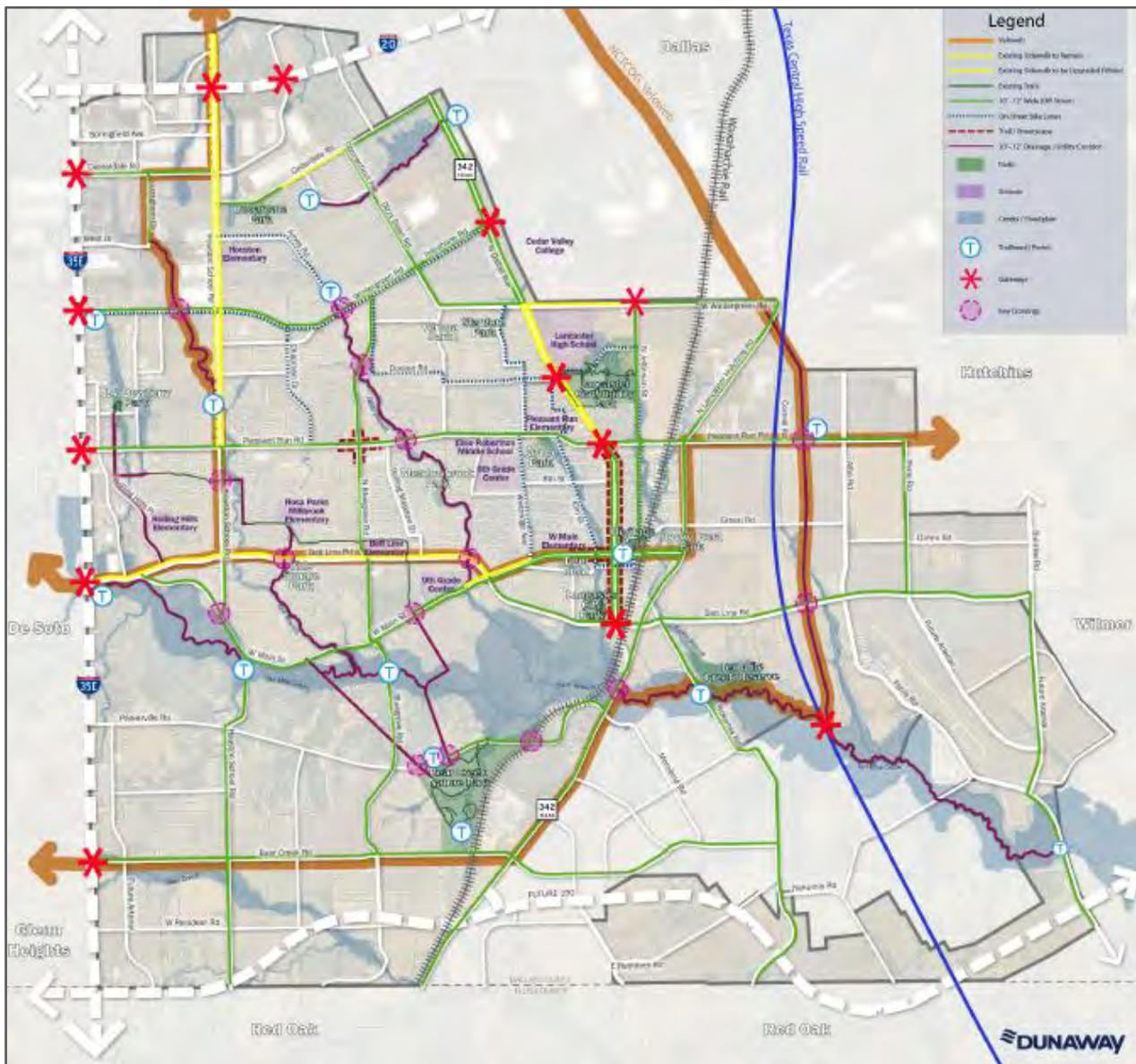
Currently, the City of Lancaster has limited opportunities for bicycle and pedestrian mobility, but officials have recognized the need to develop these networks and are working diligently to improve the quantity and quality of these networks.

There are several bicycle and pedestrian trails within the City, mostly located along creeks and parks, such as the 10 Mile Creek Preserve, Cedardale Park, and the popular Pleasant Run Trail. Sidewalks are generally well developed within existing subdivisions, however, there is limited sidewalk network outside these areas, especially in rural areas.

EXISTING CONDITIONS

The City of Lancaster has recently updated its Hike and Bike Trail Master Plan with the proposed network shown in Figure 17. Recommendations include trails through the downtown core and an extensive network of off-street bike lanes along major and minor arterials with on-street facilities along collectors and select minor arterials.

Figure 17: 2020 Hike and Bike Trails Master Plan



Courtesy of Dunaway Associates

THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 4: Modeling and Thoroughfare Analysis

Modeling Process

The City of Lancaster’s Thoroughfare Plan was developed using several mobility analysis tools, including the Dallas Fort Worth Regional Travel Model for the Extended area (DFX), maintained by the North Central Texas Council of Governments (NCTCOG). The DFX model forecasts trips in the region based on several factors, including trip purpose (work, home and shopping), trip length, and congestion. Regional trip forecasts are based on projections of future population and employment which help determine total daily trips, trip origins and trip destinations.



The data provided by the DFX model, along with expert technical judgment, was used in tandem to develop the Lancaster Thoroughfare Plan. Using a regional model in the thoroughfare planning process provides a more comprehensive analysis in anticipating future trips within and around the City of Lancaster.

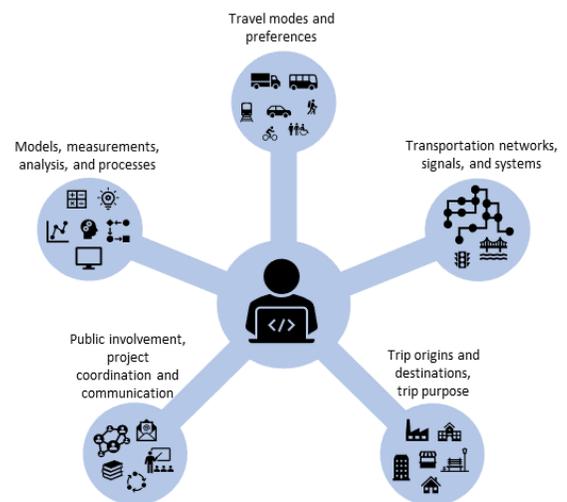
The model was used to help prioritize projects and aid in making recommendations for the future street network. General components associated with the development of travel demand models are illustrated in Figure 18.

The model-based analysis was completed using the following steps.

Thoroughfare Analysis Modeling Methodology

- Review of Lancaster population and employment projections by Traffic Survey Zone (TSZ).
- Review of NCTCOG model network to match currently adopted Lancaster Thoroughfare Plan.
- Review of 2045 model performance outputs on Lancaster thoroughfare network.
- Adjusted proposed thoroughfare network to reflect needed capacity improvements or possible capacity reductions.

Figure 18: Components of Travel Demand Modeling

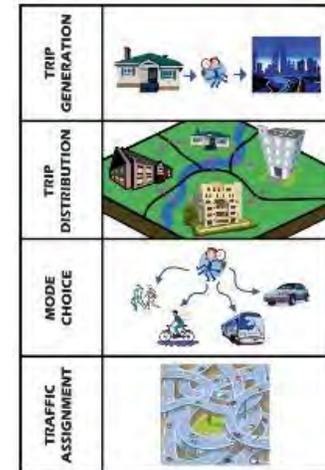


Travel Demand Modeling Steps

Travel demand modeling is comprised of a series of mathematical models that simulate travel on the transportation system. The model divides the City of Lancaster into TSZs which have specific demographic and land use data associated with them and are used to determine trip demand and travel patterns. The modeling process encompasses the following four primary steps as illustrated in Figure 19:

- Trip Generation – the number of trips produced and attracted to a destination or TSZ based on trip purpose.
- Trip Distribution – the estimation of the number of trips between each TSZ, i.e., where the trips are going.
- Modal Split – the prediction of the number of trips made by each mode of transportation between each TSZ.
- Traffic Assignment – the amount of travel (number of trips) loaded onto the transportation network through path-building. This is used to determine network performance.

Figure 19: Steps of Travel Demand Modeling



The model provides the City with an accurate tool to identify system improvements to create a forecast network that will accommodate future transportation needs.

Forecasting Growth

Two essential inputs for the travel demand model are population and employment data. This information helps determine the origin and destination of each trip. The number of trips produced by each person or job varies depending on many factors, including income level and job type.

Traffic changes between the base year and the forecast/build-out year are evaluated to determine relative change and the impact of proposed improvements. These changes serve as a guide for decision-makers to determine how to develop their roadway networks and which projects are most important for their community.



Travel Demand Model Base Year Conditions

NCTCOG maintains an updated version of the base year demographics and transportation network for the region. This includes most of the major and minor thoroughfares in the City of Lancaster. The model's demographics undergo a comprehensive update at least once every 5 years. The 2018 demographics provided from NCTCOG were used in the analysis of the base year conditions.

MODELING AND THOROUGHFARE ANALYSIS

Travel Demand Model Analysis

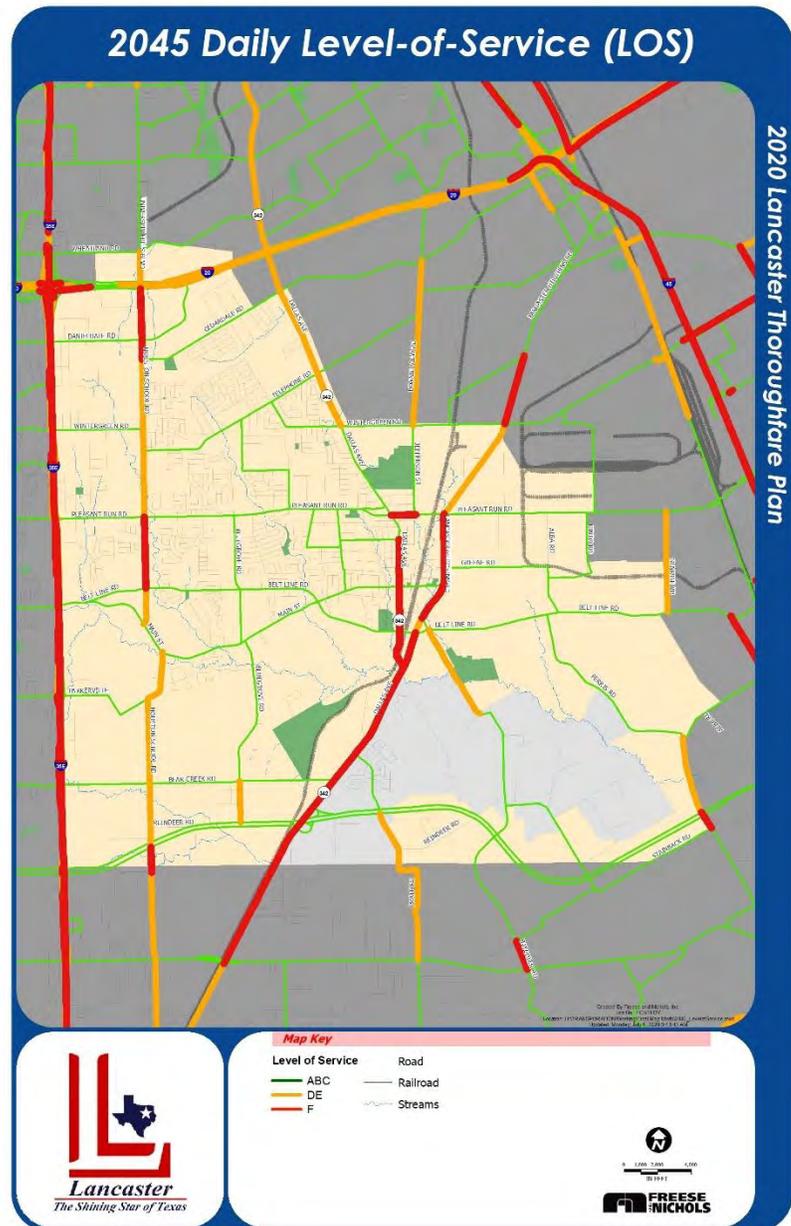
The results from the DFX help to determine the capacity and thoroughfare needs in the City of Lancaster. The goal of a thoroughfare plan is to balance the supply and demand of the roadways to ensure that resources are maximized and the system functions safely and efficiently. The purpose of the analysis was to determine where the mobility needs in the region are and to adjust roadway size and functional class based on forecast volumes, congestion and known constraints. The new thoroughfare plan network was developed through an extensive process of engagement with city staff, public participants, and other stakeholders.

The two primary indicators for evaluating future need are traffic volumes and congestion or level-of-service (LOS). Traffic volumes help to determine the appropriate sizing of a road. Congestion on the other hand compares the projected volumes to the proposed capacity of the roadway; this is known as the Volume to Capacity (V/C) Ratio. The results of the V/C Ratio are presented in an A through F grading system with a LOS A roadway representing free flow conditions and LOS F representing extremely congested conditions.

Projected Level of Service

An evaluation of future thoroughfare conditions in Figure 20 reveals that most major north-south corridors are forecast to have high traffic volumes and be heavily congested by 2045. This is compounded by the observation that IH-35E, IH-20, and IH-45 will also be heavily congested by 2045, indicating few alternative routes for travelers.

Figure 20: 2045 Daily Level of Service



Some of these major thoroughfares that are forecast to experience poor levels-of-service are:

North-South Corridors:

- North Dallas Avenue (SH 342), from IH-20 to West Telephone Road.
- SH 342, from East Beltline Road to the southern city limits.
- North Houston School Road, from IH-20 to West Wintergreen Road.

East-West Corridors:

- West Pleasant Run Road, from North Jefferson Street, to SH 342.

In addition, some roadways are forecast to experience low volumes, but high level-of-service. These corridors include:

North-South Corridors:

- North Houston School Road, from West Wintergreen Road to the southern city limits.
- North Lancaster Hutchins Road, from South Dallas Avenue (SH 342) to West Wintergreen Road.
- South Bluegrove Road, from Bear Creek Road to Loop 9.
- North Dallas Avenue, from 8th Street to South Lancaster Hutchins Road.

Note that while Loop 9 is not expected to be congested at this point in the future, several connecting roadways are expected to be heavily congested. These roadways include Pratt Road, Ferris Road, Bluegrove Road and Houston School Road.

It is also important to note that while the many north-south corridors through the City are forecast to become congested, only one small segment of the east-west roadway network is expected to become congested.

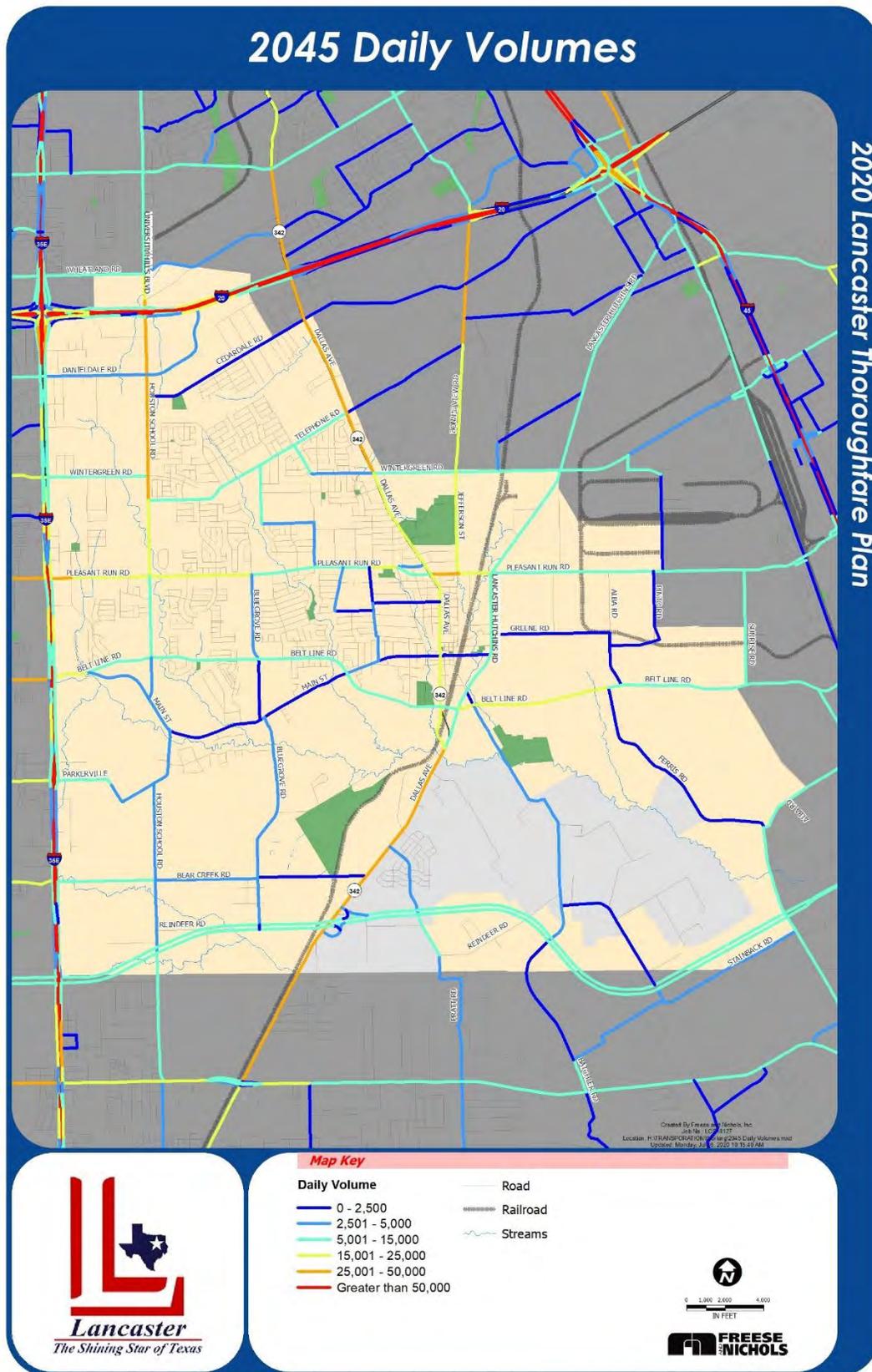
Projected Thoroughfare Volumes

An analysis of forecast daily volumes in Figure 21 supports the LOS analysis, showing high volumes along north-south corridors, with lower forecast volumes along east-west thoroughfares. Roadways with high volumes include Houston School Road past Pleasant Run Road, Dallas Avenue/SH 342, Jefferson Street, and Lancaster Hutchins Road.

Main Street, Houston School Road and Bluegrove Road (south of Pleasant Run), Cedardale Road, Daniieldale Road and Bear Creek Road have some of the lowest volumes in Lancaster in 2045.

Note that the discrepancy of volumes and LOS between east-west and north-south corridors was the most obvious observation shown in the analysis, indicating *a clear preference of travelers to use north-south over east-west corridors though the City.*

Figure 21: 2045 Daily Volumes



THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 5: Thoroughfare Plan

The process of developing a thoroughfare plan involves balancing the existing supply of infrastructure with the projected needs of the future. These future needs help to determine how much vehicle capacity is required and what multi-modal elements should be considered such as walking, biking, or riding transit. Included in each functional classification recommendation is the amount of required ROW that is needed as the thoroughfares are built, widened, or as development occurs. Preserving ROW is an important part of the plan for the City of Lancaster.

Lancaster's Thoroughfare Plan is built upon traditional thoroughfare planning concepts, which focus on functionality in providing mobility and accessibility for vehicular traffic, as well as accommodations for transit and non-motorized forms of transportation.

Proposed 2020 Lancaster Thoroughfare Plan

Key Changes to Current Plan

Thoroughfare plan amendments recommended to help meet the land use and transportation goals had to be developed with respect to existing ROW constraints. This was accomplished by creating flexibility within the existing functional classification system and ROW requirements to meet future land use and transportation needs. To accomplish this goal, the following changes were recommended for the existing thoroughfare plan. A graphical representation of the plan amendments is shown in Figure 22 on page 39.

Deletions:

- West Drive and North Longhorn Drive extensions.
- West Main Street spur, from Bear Creek Nature Park west boundary to Nokomis Road.
- Extension of Cedar Valley Drive, from Dallas Avenue to Dizzy Dean Drive.
- Springfield Street and Corporate Drive extensions.
- New roadway from IH-20 frontage road to University Hill Blvd.
- East Wheatland to University Hills Blvd (built).
- New roadway from North Houston School Road to IH-20 frontage road.
- Removal/Realignment of Ferris Road connections to Sunrise Road.



Realignments:

- Batchler Road, from Stainback to Nokomis Road.
- Fairweather Drive from Dallas Avenue to Bear Creek Drive Extension

- Bear Creek Drive extension, from Bradberry Drive to Nokomis Road.
- East Reindeer Road, from Poe Road across Loop 9 to Bear Creek extension.

Rightsizing / ROW Reallocation (see page 68):

- Dizzy Dean Drive, from West Telephone Road to Connecticut Avenue.
- Cedardale Road, from Houston School Road to Dallas Avenue.
- Main Street, from Belt Line Road to Lancaster Hutchins Road.



Additions:

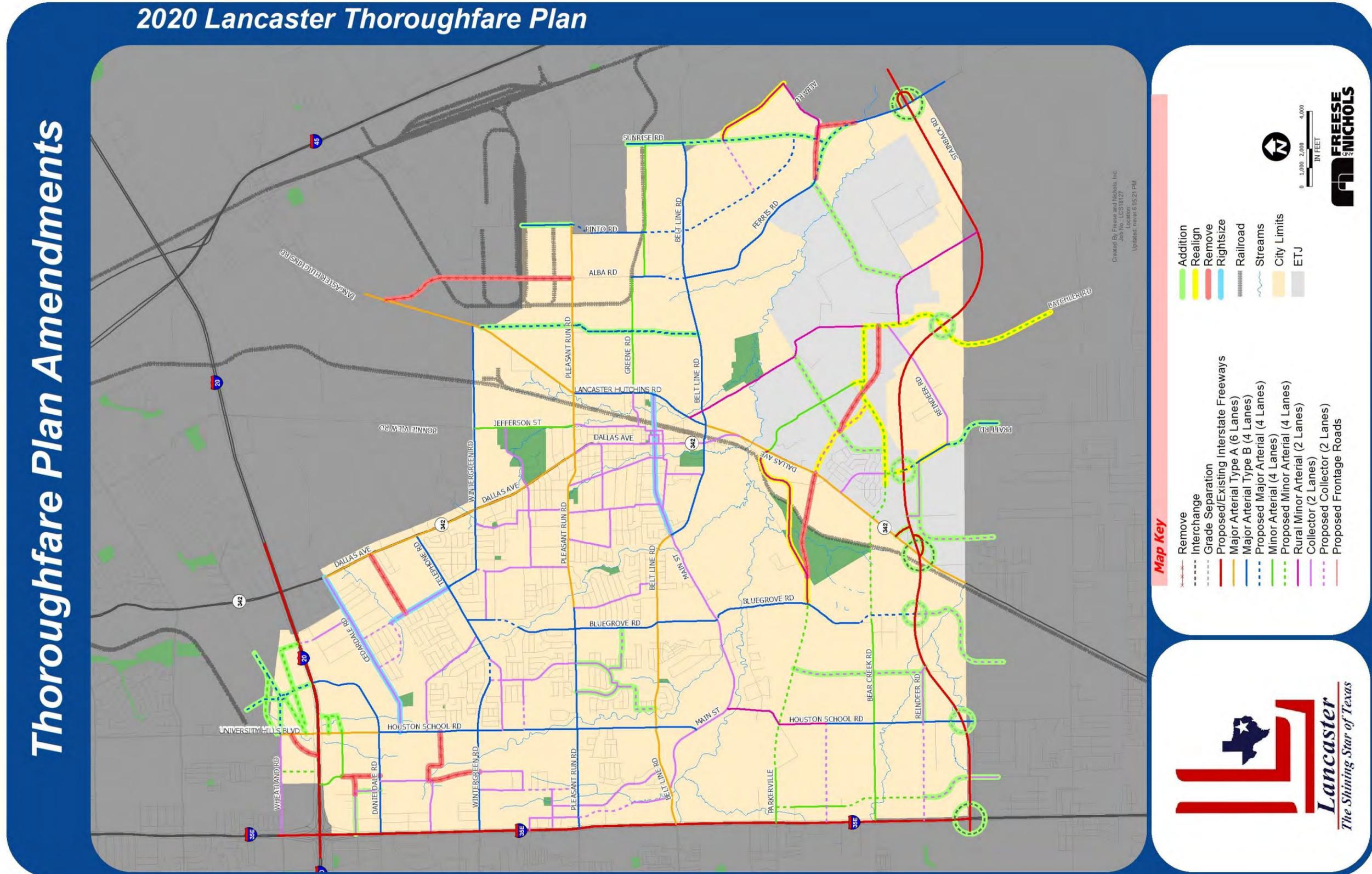
- New collector road extension of East Wheatland Road from University Hills Blvd to East Wheatland Road (west of University Hills Blvd).
- New collector road from East Wheatland Road to DART Blue Line ROW.
- New collector road from Lee Street north across Loop 9 to Meadowlark Lane.
- New collector road from Loop 9 to Parkerville Road, between Houston School Road and Bluegrove Road.
- Extension of Reindeer Road, east from Houston School Road to Loop 9.
- New collector road from Nokomis Road to Ferris Road.
- Extension of Bluegrove Road across Loop 9 south.
- Extension of East Reindeer Road south of Loop 9.
- Extension/Realignment of Pratt Road north to East Reindeer Road.
- New Collector from Bear Creek extension to Nokomis Road.
- Extension of Sunrise Road to Ferris Road.
- Extension/Realignment of Ferris Road at Sunrise Road.
- Extension of Millbrook Drive south to West Belt Line Road.
- Upgrade of Rawlins Drive and Chapman Drive to collector.
- Extension of Indian Lilac Drive to Bluegrove Road.

Interchanges/Grade Separations:

- IH-35E at Loop 9.
- Houston School Road at Loop 9.
- Bluegrove Road at Loop 9.
- SH 342 (Dallas Avenue) at Loop 9.
- Bradberry Drive extension at Loop 9.
- Batchler Road at Loop 9.
- Ferris Road at Loop 9.
- Lee Street at Loop 9.



Figure 22: Thoroughfare Plan Amendments



THIS PAGE INTENTIONALLY LEFT BLANK

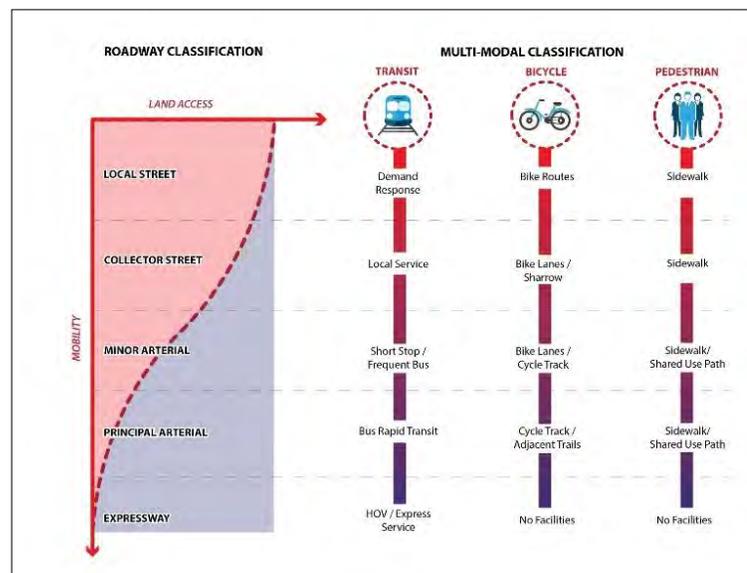
THOROUGHFARE PLAN

Functional Street Classification

As shown in Figure 23, the functional classification of streets is used to identify the hierarchy, function, and dimensions of a facility. Streets and highways are grouped into classes based on facility characteristics, such as geometric design, speed, and traffic capacity. The roadway functional class allows travelers ease of access to origins and destination through a combination of streets. Functional class can be updated over time if surrounding land uses change significantly. A facility will move up in hierarchy as the surrounding area becomes denser and additional cars are drawn to the area. Population and land use densification may also decrease the functional class of a roadway as the area becomes more walkable. The network in Lancaster varies in functional classes, with a mixture of freeways, major and minor arterials, rural minor arterials, collectors, and local roads.

Figure 23: Roadway Classification

Most large cities in Texas incorporate a traditional functional classification system to organize roadway types within their jurisdiction. This system provides key information and standards for each roadway type to assist citizens and developers in understanding the types of roadways that are planned for the region's transportation system and how those roadways may be designed.



The Lancaster Thoroughfare Plan consists of all the major roadways in the City of Lancaster by their assigned functional classification. This classification sets the required ROW to be acquired or preserved to accommodate future traffic demand in the region. This plan also looks at ways to incorporate multi-modal elements along identified corridors within the city. Where these elements are needed, alternative thoroughfare design elements may be implemented through retrofit or redesign as reconstruction is needed. The street types or functional classification in the City of Lancaster identifies thoroughfares as freeways and frontage roads, major and minor arterials, collectors and local roadways.

Freeways and Frontage Roads

Freeways are also not typically designated on a thoroughfare plan. The regional, statewide and national scale of the freeways that traverse through Lancaster limit the ability for the City of Lancaster to impact the decisions made at the state and national level. However, the impact of these facilities on the mobility and needs in the City are essential to consider as thoroughfare planning processes continue.

Frontage roads are significant as they provide important access parallel to limited-access freeways and toll roads in and around the City. Access to these roads is essential for the success of businesses that front these roads.

Lancaster is currently serviced by three freeway facilities: IH-35E, IH-20, and IH-45. For Lancaster residents, these interstate facilities provide regional access to many metroplex cities. Interstate 20 provides an east-west connection in the north of the city and forms its northern border. IH-35E and IH-45 provide excellent north-south access to nearby cities as well as superior connections to major cities within Texas as well as Oklahoma. The proposed Loop 9 will provide additional east-west connectivity to the south. Note that there are no existing or planned toll facilities within or adjacent to the City of Lancaster.



Major Arterials

Arterials focus on moving regional traffic. These types of thoroughfares typically carry the highest amounts of traffic and have the highest speeds depending on the context environment. These facilities are classified into major and minor arterials.

Major arterials are designed to allow large volumes of traffic to operate at a high level of mobility. A major arterial is designed for longer distance trips and provides access to major activity centers and adjacent cities. There should be a limited number of driveways directly accessing major arterials and should only connect to other major arterials or freeways. Typically, on-street parking should not be allowed on a major arterial.

Major arterials in the City of Lancaster are sub-classified as Type "A" or "B" facilities. These sub-classifications are based on the current and future demands and the potential development. Type "A" facilities have six (6) lanes, while Type "B" roadways have four (4) lanes.



State Highway 342 (Dallas Avenue) is an example of a Type "A" major arterial. It provides a north-south corridor through the city and serves as a link between cities in southern Dallas County and north Ellis County. This facility intersects Lancaster and runs through downtown before connecting with IH-35E and US 77 in Red Oak in Ellis County.

Bluegrove Road and Wintergreen Road are examples of Type "B" major arterials. Several major arterials have both Type "A" and "B" classifications, including Belt Line Road, Pleasant Run Road, Lancaster Hutchins Road, and Houston School Road.

THOROUGHFARE PLAN

Minor Arterials

Minor arterials connect traffic from collectors to primary arterials. They are designed to accommodate moderate traffic volumes at relatively low speeds, and often extend to a larger geographic area. If ROW and/or level-of-service are adequate, minor arterials may accommodate on-street parking. Parkerville Road, Cedardale Road and Greene Road are examples of minor arterials.



Collectors

Roadways designated as collectors are designed for short trips and low speeds. They serve primarily to connect trips to higher functional class facilities and on moving traffic between neighborhoods and different areas within the City. These types of thoroughfares carry moderate volumes of traffic and have lower speeds to accommodate access to adjacent properties. The number of lanes range from two (2) to four (4) depending on the current and future demands and the potential development. Center turn lanes may be incorporated on Major Collectors, but raised medians are rarely found on these types of streets. Main Street and Reindeer Road are examples of collectors.



Sometimes collectors are broken down into major and minor collectors. Major collectors provide higher levels of mobility, handle more traffic, and have fewer driveways and intersections than minor collectors.

Local Streets

Local streets are typically not designated on a thoroughfare plan because it is a street type that does not require ROW dedication. As new development occurs, local streets are typically built by the developer and once the development is complete, the city takes over maintenance and ownership of the ROW. Local streets are focused on providing access to homes in residential neighborhoods where speeds are less than 30 miles per hour (mph), and traffic volumes are the lowest. In most cases lane striping is not implemented, and on-street parking occurs in a variety of locations depending on the surrounding uses and building types.



Functional Street Classification System Analysis and Recommendations

In the past, functional classification systems have been rigid and inflexible, providing little ability to incorporate alternative design options. This concept of rigidity has evolved over time as the relationship between transportation and land use has become more influential in the design and operation of our streets. Now, as development patterns are changing, roadways are accommodating multiple modes of transportation. Thoroughfare design practice has begun to involve several different design considerations such as pedestrian, bicycle and transit accommodations. This has resulted in a variation of the typical street design along certain corridors to incorporate multi-modal design implementation.



Typical Roadway Characteristics by Functional Classification

All functional classes have general characteristics, such as spacing, capacity, speed, required ROW, and specific design criteria to delineate how each facility should be utilized. Table 5 below sets out current characteristics defined for each type of functional class of roadway.

Table 5: Roadway Characteristics by Functional Class

Attributes	Freeway	Major Arterial	Minor Arterial	Collector	Local
Roadway Spacing	2-10 miles	1-2 miles	0.25-1 mile	0.1-0.25 miles	200-500 feet
Facility Length	15+ miles	5-15 miles	1-5 miles	0.25-1 mile	<0.25 mile
Traffic Volume (vehicles/day)	100,000+	35,000-80,000	10,000-35,000	1,000-10,000	<1,000
ROW (feet)	300-500	100-120	70-100	60-70	50-60
Number of Lanes	Main + Frontage Roads	4 to 6	3 to 5	2 to 4	2
Median	Yes	Typical	Optional	Not Typical	No
Speed Limit (mph)	55-75	35-55	30-45	25-35	30 Max.

Recommended Functional Classification Amendments

As mentioned previously, the thoroughfare network was amended to accommodate updated growth projections. New classifications were developed to provide

THOROUGHFARE PLAN

consistency with existing roadway design implementation, provide options for multi-modal elements, and to provide more flexibility in developing new street sections. Recommendations address potential expansion of existing thoroughfares (5-lane major arterial) as well as providing more flexibility by redefining and expanding the sub-classes of collectors.

Table 6 contains the current and proposed functional classifications for the Lancaster Thoroughfare Plan. Descriptions and cross-sections of each classification are discussed in the following pages.

Table 6: Comparison of City of Lancaster Thoroughfare Classifications

Roadway Class	Lanes	Area Type	Min ROW (feet)		
			Recommended 2020 TP	2016 Comp Plan	2006 Streetscape Plan
Major Arterial (Type A)	6	Urban	120'	120'	110'-120'
	5 (New)	Urban	110'	-	-
Major Arterial (Type B)	4	Urban	100'	100'	100'-110' (6 lanes)
Minor Arterial (Type C)	4	Urban	100'	86'	85'-100'
	4 (New)	Rural	100'	-	110'
Major Collectors (Type D1)	4 (New)	Urban	80'	-	65'
	4 (New)	Rural	80'	-	110'
	3	Urban	60'	60'	-
Minor Collectors (Type D2)	2 (New)	Urban	60'	-	-
	2	Rural	60'	86' (Rural Minor Arterial)	-
Local Roads (Type E)	2	Urban	60'	60'	50'
	2	Rural	60'	60'	60'

Recommended Thoroughfare Design Standards

Versatility is a strength in any policy document because it gives policymakers flexibility to address unforeseen issues that may arise during the implementation phase. To provide flexibility in the thoroughfare plan, new thoroughfare design standards were developed to accommodate a variety of land uses adjacent to both urban and rural ROW, including future developments associated with Loop 9.

It is recommended that the new thoroughfare design standards from the 2020 Thoroughfare Plan update be incorporated in existing subdivision regulations to ensure consistent roadway construction throughout the County.



Recommended Thoroughfare Design Standards

There are established roadway design standards that are utilized by communities across the United States; these standards are based upon decades of research and field experience. Guidelines for these revised design standards came from a variety of sources, including:

- American Association of State Highway and Transportation Officials (AASHTO), [A Policy on Geometric Design of Highways and Streets](#), latest edition.
- Transportation Research Board, [Highway Capacity Manual](#), latest edition.
- [Texas Manual on Uniform Traffic Control Devices](#), latest edition.

Previous design standards for the City of Lancaster from the 2006 Streetscape Plan and the 2016 Comprehensive Plan were evaluated and referenced to ensure consistency of the revised design standards. Tables 7 through 9 on the following pages list these previous design standards for comparison, as well as the new recommended design standards for the 2020 Thoroughfare Plan Update.

Changes to the design standards focused on more clearly defining urban versus rural roadways. There was also an effort to provide more flexibility for major arterials in commercial areas. This was accomplished by adding in a 5-lane roadway arterial class with a continuous left turn lane to enhance access to local businesses where appropriate.

THOROUGHFARE PLAN

Table 7: 2006 Streetscape Master Plan Thoroughfare Design Standards

Roadway Class	Lanes	Area Type	Min ROW (feet)	Travel Lane Pavement (feet)	Median (feet) (Flush / Raised)	Sidewalk Buffer (feet)	Sidewalk (feet)	Parking
Major Arterial (Type A)	6	Urban	110'-120'	2 @ 33'	17'	7'-11'	5'-6'	No
Major Arterial (Type B)	6	Urban	100'-110'	2 @ 33'	14'	5'-10'	5'	No
Minor Arterial (Type C)	4	Urban	85'-100'	2 @ 22'	17'	6'-14.5'	5'-6'	No
Collectors (Type D)	4	Urban	65'	45'	-	5'	5'	No
Local Roads (Type E)	2	Urban	50'	27'	-	6.5'	5'	No
Rural Thoroughfares (Type F)	2	Rural	60'	28'-30'	-	Ditch	-	No
Rural Thoroughfares (Type F – Divided)	4	Rural	110'	2 @ 28'-30'	20'	Ditch	-	No

Table 8: 2016 Comprehensive Plan Thoroughfare Design Standards

Roadway Class	Lanes	Area Type	Min ROW (feet)	Travel Lane Pavement (feet)	Median (feet) (Flush / Raised)	Shoulders (feet) (Inside/Outside)	Pedestrian Realm (feet)	Parking
Major Arterial (Type A)	6	Urban	120'	2 @ 36'	17'	-	15.5'	No
Major Arterial (Type B)	4	Urban	100'	2 @ 24'	16'	-	18'	No
Minor Arterial	4	Urban	86'	2 @ 24'	17'	-	10.5'	No
Rural Minor Arterial	2	Rural	86'	24'	-	5'	26' (Drainage / Buffer)	No
Collectors	3	Urban	60'	2 @ 12'	14' CLT*	-	11'	No
Local Roads	2	Urban	60'	2 @ 18.5'	-	-	11.5'	No

*Continuous left turn lanes.

Table 9: Recommended 2020 Lancaster Thoroughfare Plan Design Standards

Roadway Class	Lanes	Area Type	Min ROW (feet)	Travel Lane Pavement (feet)	Median (feet) (Flush / Raised)	Shoulders (feet) (Inside/Outside)	Sidewalk (feet)	Parking
Major Arterial (Type A)	6	Urban	120'	2 @ 36'	14'/18'	-	6'-8'	No
	5 (New)	Urban	110'	62'	CLT*	-	6'-8'	No
Major Arterial (Type B)	4	Urban	100'	2 @ 24'	14'/16'	-	6'-8'	No
Minor Arterial (Type C)	4	Urban	100'	2 @ 22'	14'/16'	-	5'-6'	No
	4	Rural	100'	48'	-	4-8'	Optional	No
Major Collectors (Type D1)	4 (New)	Urban	80'	44'	-	-	5'-6'	No
	4 (New)	Rural	80'	44'	-	4'	Optional	No
	3	Urban	60'	38'	CLT*	-	5'-6'	No
Minor Collectors (Type D2)	2 (New)	Urban	60'	30'	-	-	5'	Optional
	2	Rural	60'	24'	-	4'	Optional	Optional
Local Roads (Type E)	2	Urban	60'	28'	-	-	5'	Optional
	2	Rural	60'	28'	-	2'	Optional	Optional

*Continuous left turn lanes.

THOROUGHFARE PLAN

Design Standard Cross-Sections

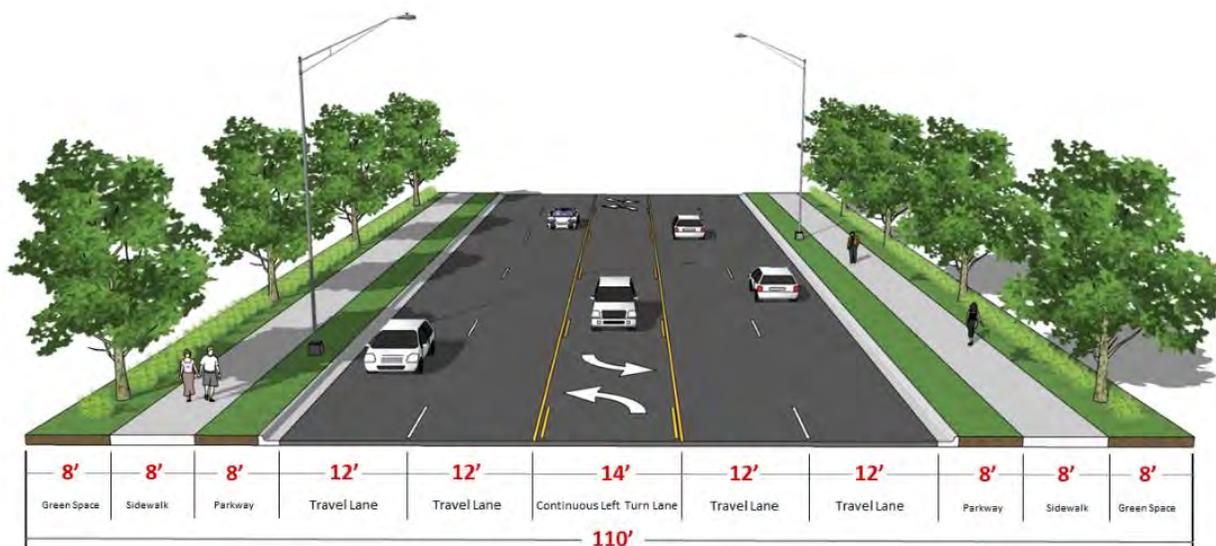
Graphics depicting recommended design cross-sections are shown below and on the following pages through Figures 24 to 35.

Figure 24: Major 6-Lane Urban Arterial



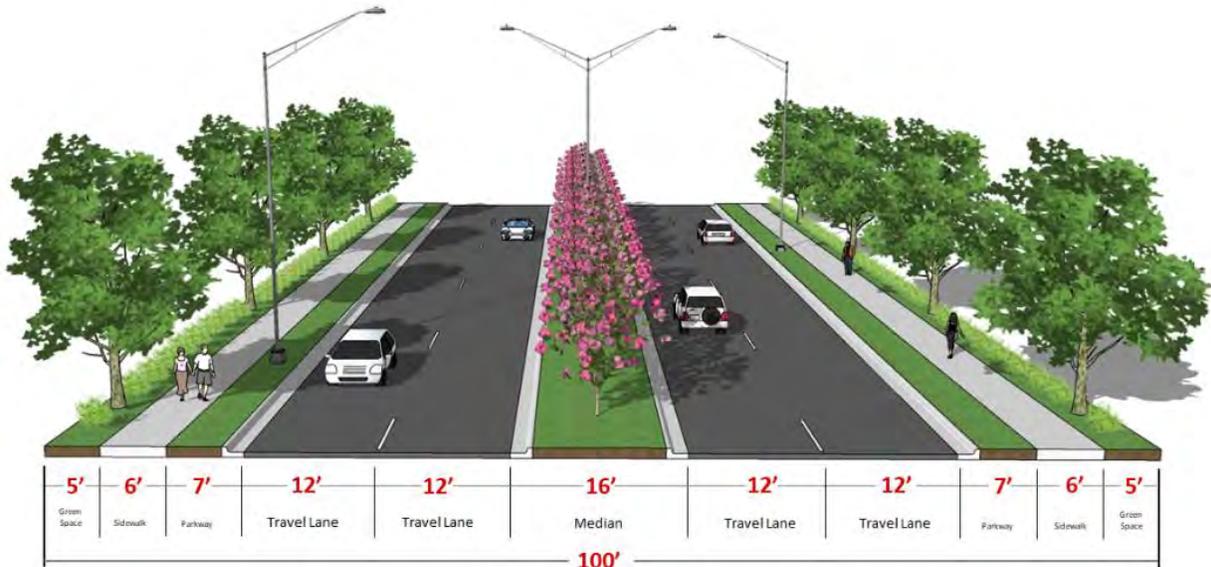
Major Urban Arterial (Type A) – 6 Lane, 120' ROW, 12' Lanes

Figure 25: Major 5-Lane Urban Arterial



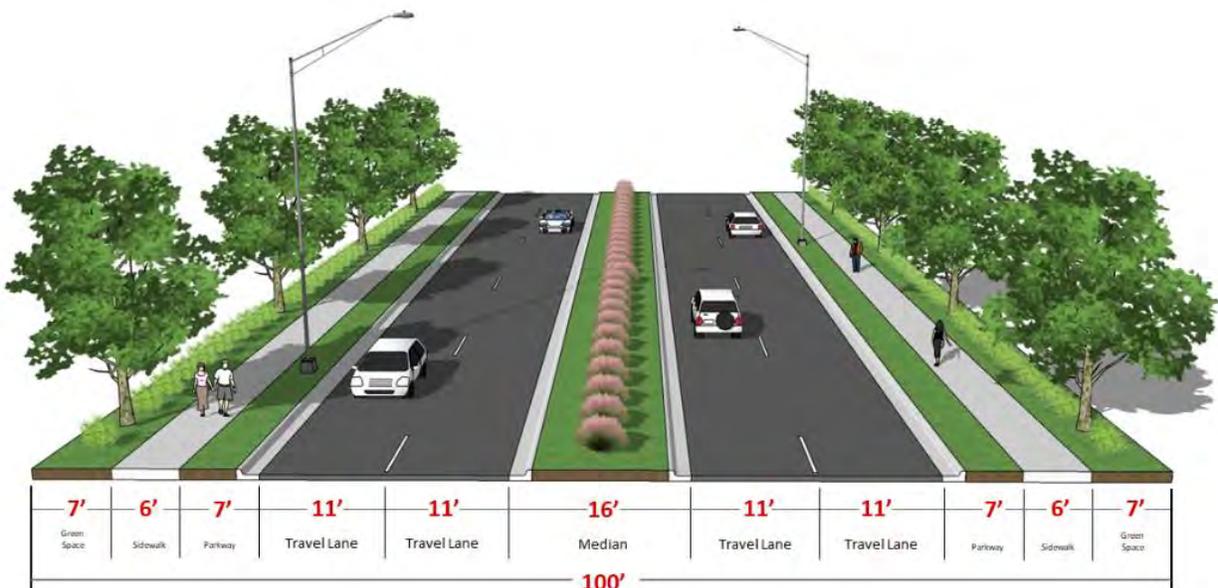
Major Urban Arterial (Type A) – 5 Lane, 110' ROW, 12' Lanes w/ CLT

Figure 26: Major 4-Lane Urban Arterial



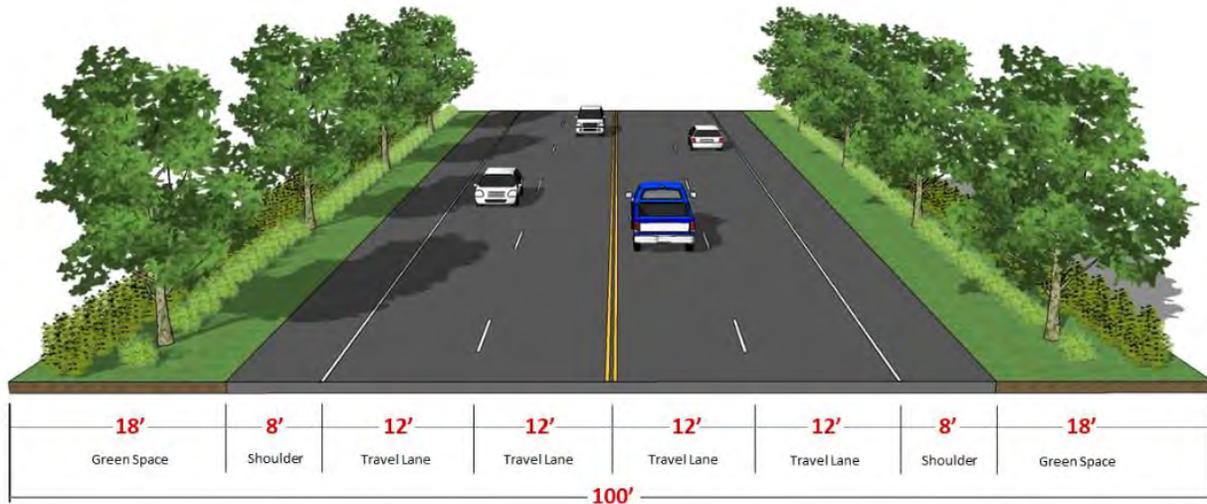
Major Urban Arterial (Type B) – 4 Lane, 100' ROW, 12' Lanes

Figure 27: Minor 4-Lane Urban Arterial



Minor Urban Arterial (Type C) – 4 Lane, 100' ROW, 11' Lanes

Figure 28: Minor 4-Lane Rural Arterial



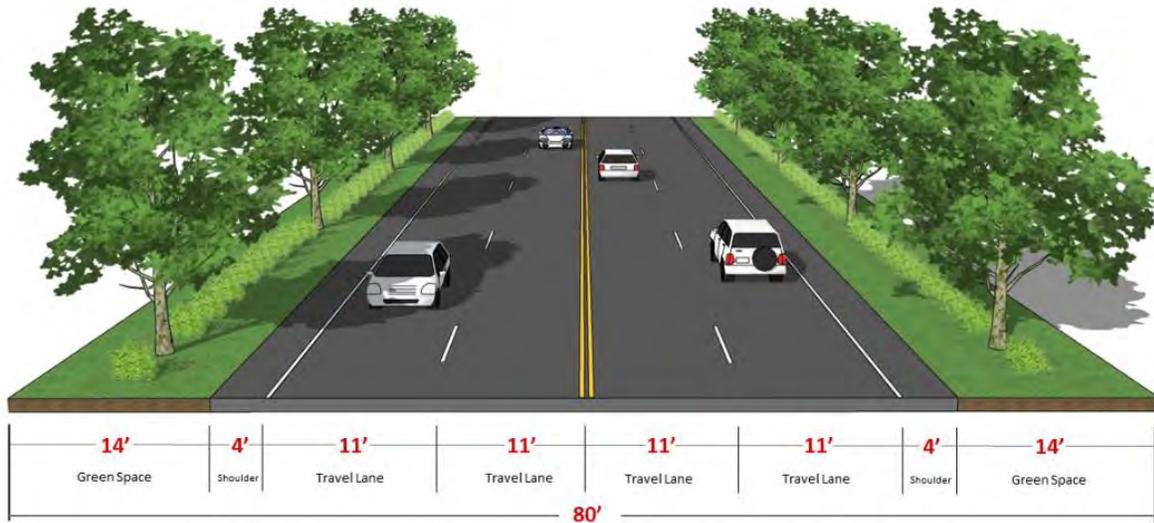
Minor Rural Arterial (Type C) – 4 Lane, 100' ROW, 12' Lanes

Figure 29: Major 4-Lane Urban Collector



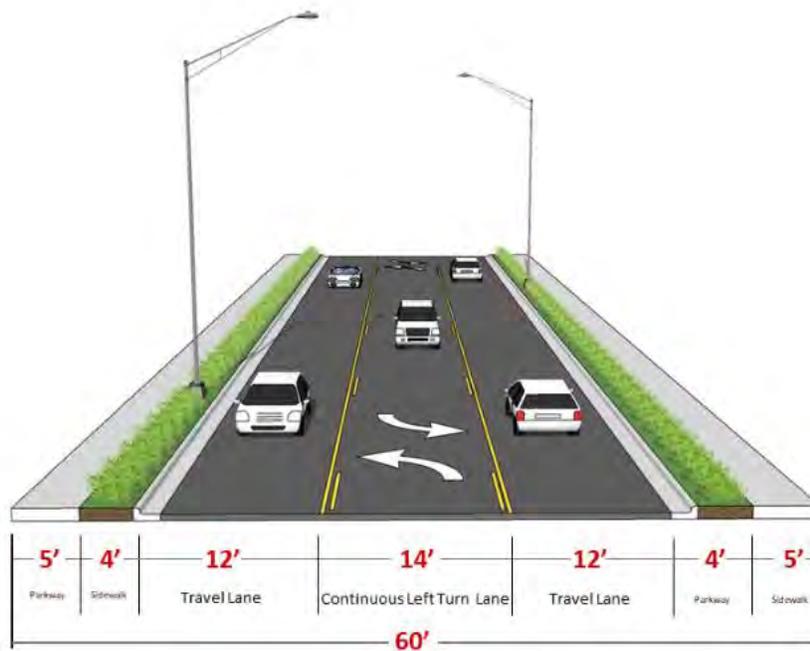
Major Urban Collector (Type D1) – 4 Lane, 80' ROW, 11' Lanes

Figure 30: Major 4-Lane Rural Collector



Major Rural Collector (Type D1) – 4 Lane, 80' ROW, 11' Lanes

Figure 31: Major 3-Lane Urban Collector



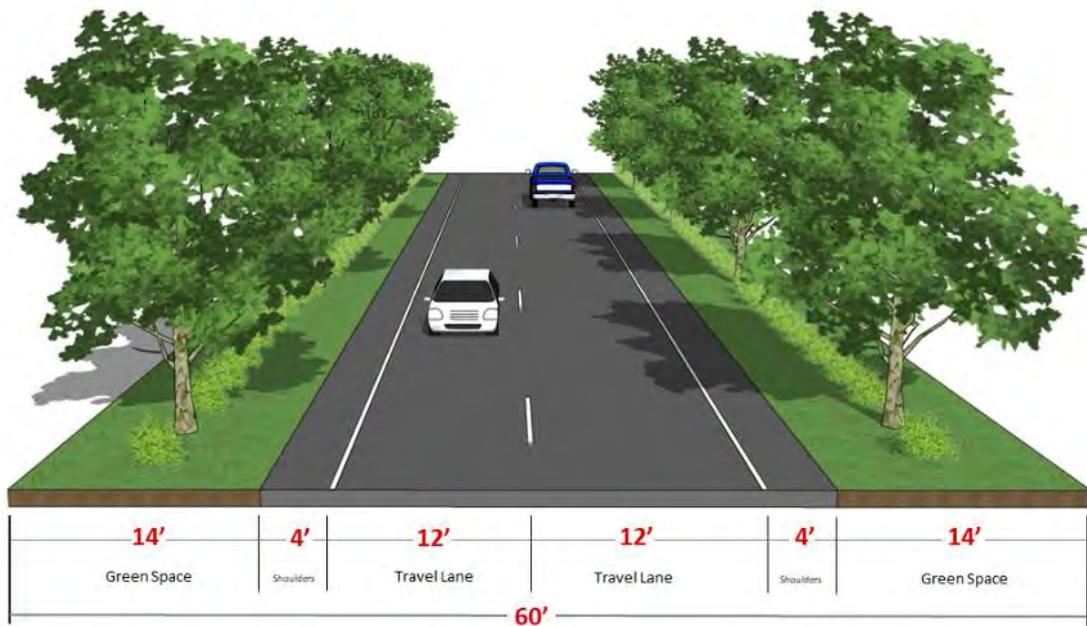
Major Urban Collector (Type D1) – 3 Lane, 60' ROW, 12' Lanes

Figure 32: Minor 2-Lane Urban Collector



Minor Urban Collector (Type D2) – 2 Lane, 60' ROW, 15' Lanes

Figure 33: Minor 2-Lane Rural Collector



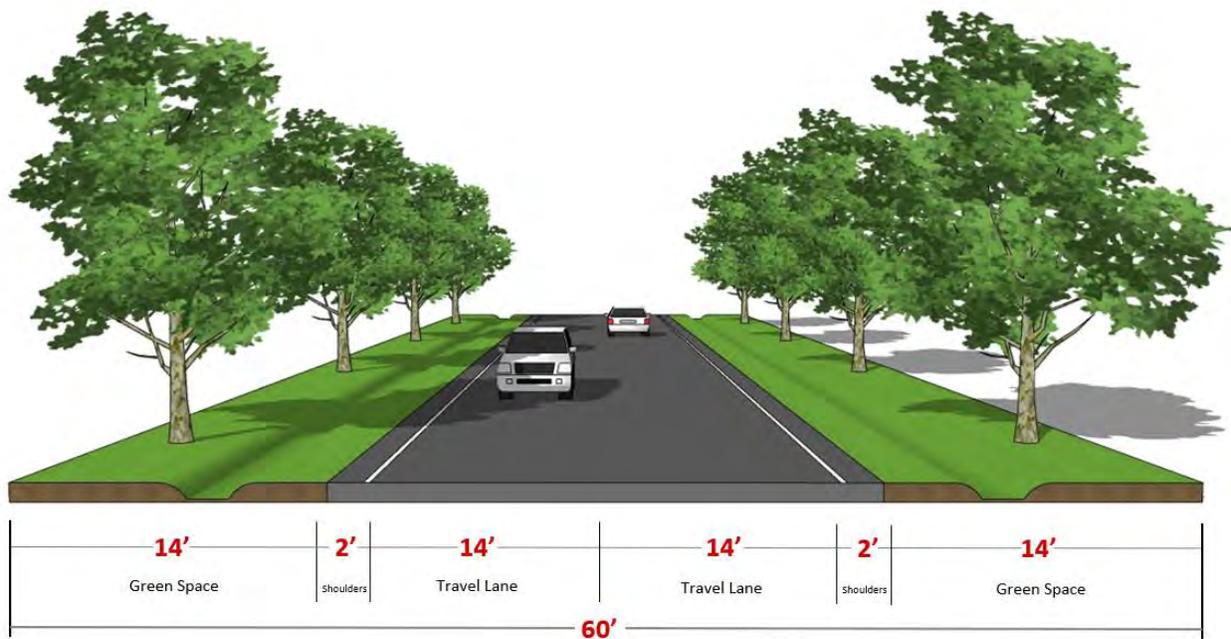
Minor Rural Collector (Type D2) – 2 Lane, 60' ROW, 12' Lanes

Figure 34: Local Urban Roadway



Local Urban Roadway – 2 Lane, 60' ROW, 14' Lanes

Figure 35: Local Rural Roadway



Local Rural Roadway – 2 Lane, 60' ROW, 14' Lanes

THOROUGHFARE PLAN

Transitions between Design Sections

In cases where thoroughfare corridors cross between municipal and county boundaries, it is recommended that staff from affected agencies develop a memorandum of understanding or other legally binding agreement to determine final design and/or design of transition between roadway sections.

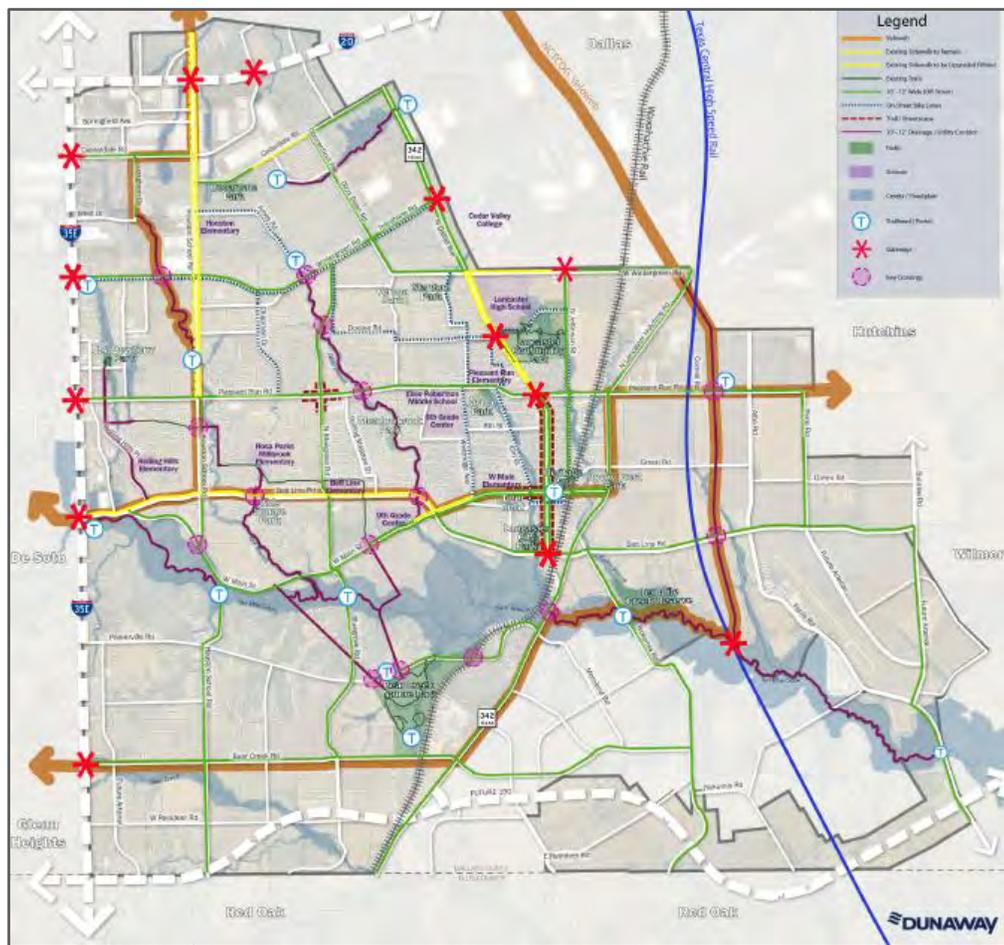
Bike & Pedestrian Networks

The framework of the Lancaster bicycle network will be a system of routes and trails throughout the city connecting key destinations or bike access areas such as schools, parks, transit stations, major employers and activity centers.

Bike Plan Recommendations

The City of Lancaster is currently in the process of updating its Hike and Bike Trails Master Plan. An initial review of the plan in Figure 36 reveals a well-connected network of both on and off-street bicycle and pedestrian facilities.

Figure 36: 2020 Hike and Bike Trail Master Plan



Courtesy of Dunaway Associates

It is recommended that the City incorporate the final recommendations from the Trail Master Plan, the new Streetscape Plan, and the Southern Dallas Regional Veloweb Alignment Study into the new Thoroughfare Plan once they are complete.

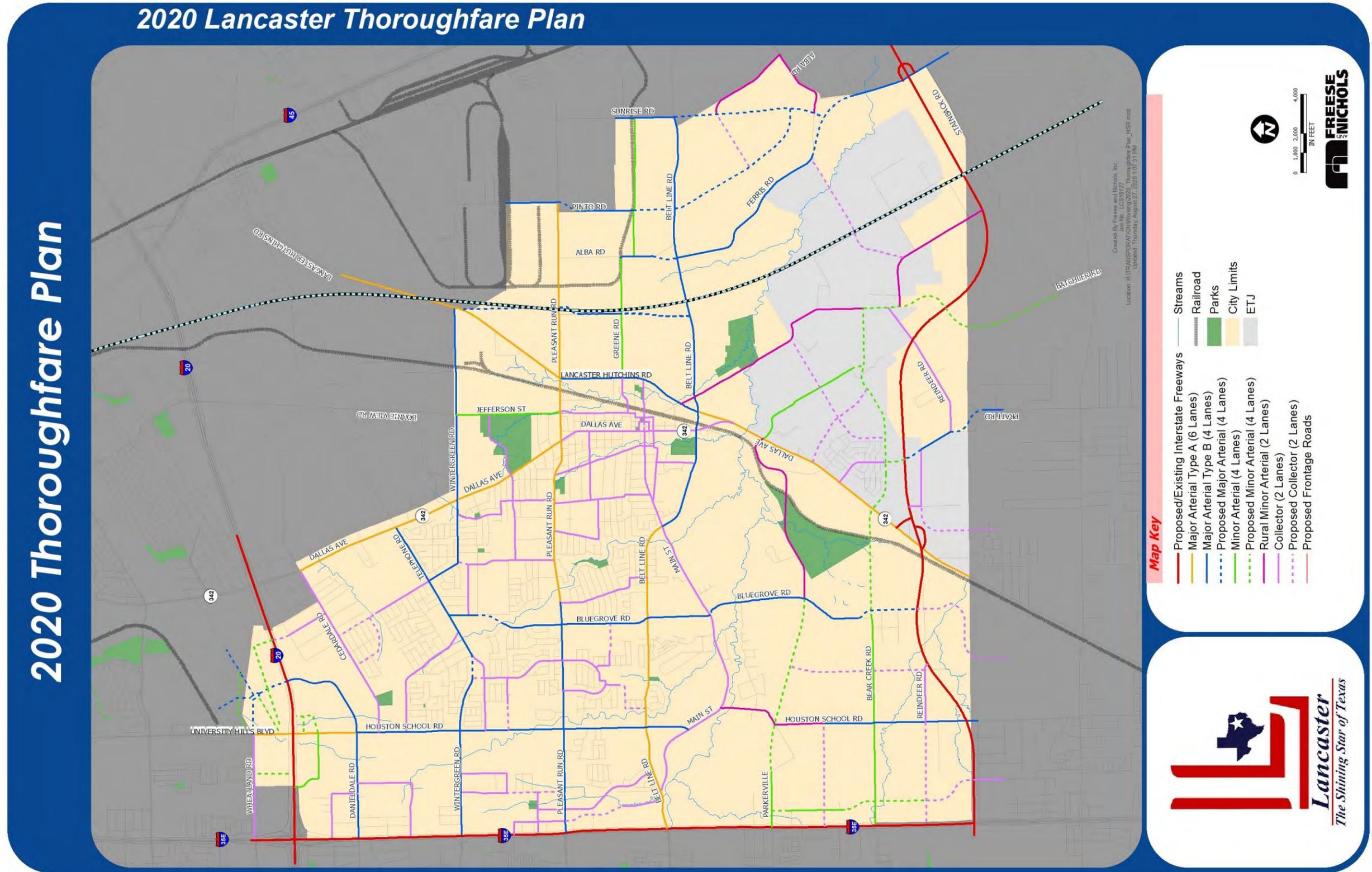
Based on our review of existing thoroughfares within the City of Lancaster, the following guidance is recommended for the expansion of bicycle and pedestrian networks in the City of Lancaster.

- Identify which groups of riders the City wishes to attract to its bike/ped network and *design a system specifically focused on their needs and concerns.*
- Focus on projects that produce early “wins” in promoting bicycling and walking. Such examples could be expanding the Pleasant Run Trail south to Bear Creek Nature Park or connecting downtown to Pleasant Run Road facilities via Main Street.
- Place on emphasis on buffered or separate ROW for cyclists over on-street facilities as they are safer than simple bike lanes. There should be focus on attracting new riders to the system, which must be balanced against satisfying the needs of existing riders.
- The City should also develop a bicycle education and activities program in parallel with development of its bicycle network and in coordination with local cycling organizations and businesses. Efforts should be made to include cycling promotions during community events and engage stakeholders in promoting active transportation. An example of such promotions could be the introduction of “Ciclovias” or Open Streets, a community event that creates car-free streets for several hours on a set day to encourage residents to bike, walk, or run through their community. Work with regional cycling groups to create special events or other initiatives that promote cycling.
- Consider “Pop-up” bike lanes as interim measures along selected streets.
- Create bike parks and other bike-centric facilities within the parks network that create a safe place for children to learn to bike and practice biking.
- Work with the Lancaster Independent School District to identify safe routes to school and develop a cycling education program within schools for children.
- Make bicycle and pedestrian networks a priority in new development areas within the City, as appropriate.
- Create a separate dedicated funding source for bicycle and pedestrian facilities within the City’s Capital Improvement Program.
- Avoid large scale implementation of bicycle and pedestrian facilities along Houston School Road, north of Wintergreen Road. This area is being developed by the City as an industrial area focused on intermodal freight and is a challenging environment for active transportation. It is recommended that future initiatives explore parallel corridors with lower truck activity.

2020 Thoroughfare Plan Map

The 2020 Thoroughfare Plan map is shown in Figure 37 on the following page. This map also identifies proposed high-speed rail for general alignment purposes and is subject to change.

Figure 37: 2020 Lancaster Thoroughfare Plan



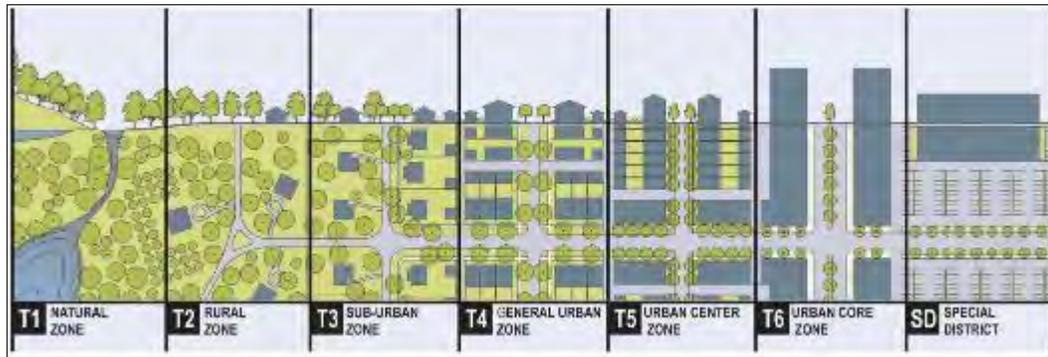
THIS PAGE INTENTIONALLY LEFT BLANK

Chapter 6: Context-Based Roadway Design

Context-based Approach

Recent trends in thoroughfare planning practices have provided opportunities for greater flexibility in thoroughfare design. This new trend better complements surrounding land use by creating different roadway standards based on the users of the facility and the surrounding context. The Context Sensitive Solutions (CSS) Design Manual, written by the Institute of Transportation Engineers and the Congress for the New Urbanism, provides a guide on how this emerging practice can be implemented during the thoroughfare planning process. Opportunities for multi-modal corridors that advance economic development and create a safer, more efficient transportation system, arise when the context of a roadway is considered during the planning and design process. The context sensitive approach has been adopted by the Texas Department of Transportation (TxDOT) and has already been successfully implemented in thoroughfare planning processes in other cities across the State of Texas. The updated Lancaster Thoroughfare Plan will advance the concept of flexible roadway design for multi-modal purposes by taking advantage of context sensitive design principles.

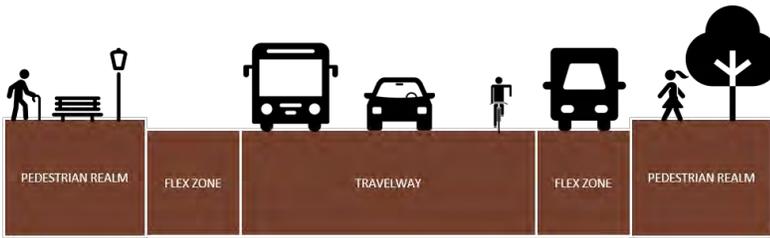
Figure 38: Context Sensitive Urban Zones



Context Sensitive Design Elements

As Lancaster continues to mature as a community, essential functions within the ROW become more diverse to serve existing and emerging activities. As shown in Figure 38, context sensitive design can define networks that add activity to certain corridor areas. Since every function cannot be accommodated within the ROW, a framework for integration and prioritization of functions must be developed. A description of context sensitive street design elements is illustrated in Figure 39 on the next page.

Figure 39: Context Sensitive Street Design Elements



	Definition	Travelway	Flex Zone	Pedestrian Realm
Mobility	Moves people and goods	✓	✓	✓
Access for People	People arrive at their destination or transfer between different travel modes		✓	✓
Access for Commerce	Goods and services reach their customers and markets		✓	✓
Storage	Provides storage for vehicles or equipment		✓	
Greening	Enhances aesthetics and environmental health		✓	✓
Activation	Offers vibrant social spaces		✓	✓

Travel Way

The travel way (travel lanes) includes the central portions of the roadway or thoroughfare. Typically, the travel way is from curb-to-curb when on-street parking is not available. Primarily including the travel lanes, the travel way contains the elements of the roadway that involve the movement of vehicles, transit, bicycles and truck traffic. The design of this portion of the thoroughfare includes travel lane considerations, transit accommodations, and in some cases, bicycle integration.

Flex Zone

A transition area between the travelway and pedestrian realm, this area provides space for people and goods to transition between moving vehicles and people in the

pedestrian realm. This zone can contain multiple uses along a street including on-street parking, passenger loading, commercial deliveries, and parklets, which are street-side miniature parks that provide a space for people to sit while enjoying the activity of the street.

Pedestrian Realm

Comprised of sub-zones, including frontage, clear walk, and buffer zones, this area lies between the property line and the flex or travelway zones. This space includes the sidewalk, planting areas, street furniture, lighting, and other pedestrian and business amenities.

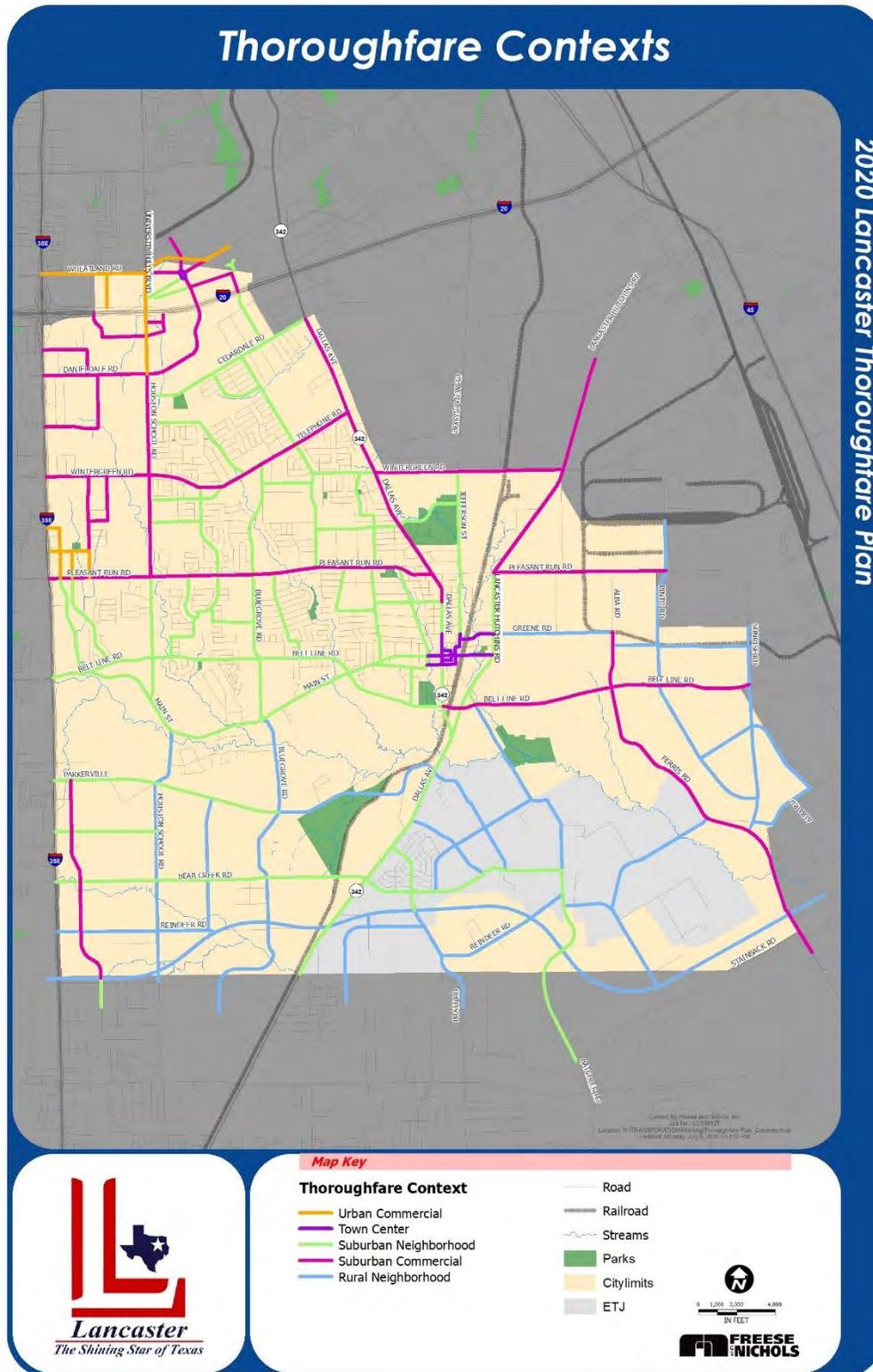
Context Types

Along with the more flexible functional-classification design standards, the character of the area adjacent to the roadway (street context) will play an important role in the way a street looks. One type of street design will not satisfy all the different needs within Lancaster. Therefore, it is important that the standards incorporate design elements to provide flexibility for differing types of land use characteristics. As illustrated in Figure 40 on the following page, the City of Lancaster has five (5) different context types; Urban

CONTEXT-BASED ROADWAY DESIGN

Commercial, Town Center, Suburban Neighborhood, Suburban Commercial and Rural Neighborhood.

Figure 40: Thoroughfare Contexts in Lancaster



Urban Commercial

The urban fabric in this zone includes a diverse mix of uses with nominal building setbacks. Roadways provide for bicycle and pedestrian uses and transit service as these activities are usually present. On street parking and loading/unloaded zones for commercial vehicles are provided. Posted speeds are low and roadway design encourages interaction with surrounding land uses. Parklets and other street-side amenities are often present. Sidewalks may be wider than usual to accommodate high pedestrian activity. Roadways may be closed to traffic on occasion to support special events such as farmers markets or festivals.



Town Center

Town Center context zones are comprised of a mix of land uses and activity centers that attract all types of people and trips on a daily basis. The mix of land uses in this context type accommodates several different travel modes such as vehicles, transit, pedestrian and bicyclists. In this context type it is sometimes difficult to differentiate between arterials and collectors because the volumes and speeds are similarly ranged. Transit service can be provided on most urban arterials and collectors; the slower speeds allow more frequent transit stops.



Bicycle users are more common in urban commercial and town center zones due to the type of development and context. Bicycle infrastructure can range from cycle tracks along corridors with additional ROW, to shared lanes where speeds are low. Pedestrian accommodation is also important in urban contexts. Higher volumes of pedestrians in urban areas usually warrant additional pedestrian accommodations such as wider sidewalks, street furniture and more intense landscaping along a corridor. On-street parking is an important consideration in urban areas because they serve businesses that front urban center streets. Different types of parking can be implemented such as parallel parking, angled parking and reverse angled parking depending on the needs of the surrounding business and available ROW.

CONTEXT-BASED ROADWAY DESIGN

Suburban Neighborhood

Suburban areas typically contain both suburban homes (single family, multifamily, mobile homes) and some neighborhood-scale commercial uses. Access to suburban neighborhoods from the arterial network is primarily through the collector and local network of streets. Driveway management is paramount in these areas. On-street parking is common. Speed restrictions around schools are commonplace.



Public transit routes for suburban developments are usually located on arterial streets, however school bus activity can occur on any street. Bicycle use in suburban development is primarily for leisure with a small percentage of bicycle commuters. Pedestrian use can be either for commuting (to a transit stop or school) or for leisure. Sidewalks provide pedestrian access for those that live in the surrounding neighborhoods.

Suburban Commercial

In Lancaster, there are several industrial districts near major freeways or rail facilities. Industrial thoroughfares are designed to connect heavy vehicles to and from major highways to industrial areas. These streets are designed with wider travel lanes with larger turning radii than most typical thoroughfares. Industrial streets have limited pedestrian infrastructure but can incorporate bicycle and transit infrastructure.



Pedestrian and bicycle facilities may require buffers due to traffic speeds and volumes.

Rural Neighborhood

Rural neighborhoods typically consist of very low-density rural residences with agricultural and occasional light industrial uses. Most buildings have substantial setbacks from the roadway. Roadways are usually widely spaced with lower posted speeds and have no on-street parking. Roadways and bridges can be narrow in places and have weight restrictions for trucks. Some local roadways or access roads may be dirt or gravel. Bicycles and pedestrians share the roadway with vehicles and there is very limited transit service, if any. Farm vehicles are often present on roadways. Equestrian travel may occasionally be present on some roadways.



Integrating Context Sensitive Design Elements with Land Use Types

Table 10 discusses the relationship between context sensitive design and land use between the different context types for the City of Lancaster.

Table 10: Context Sensitive Design and Land Use

	Rural Neighborhood	Suburban Commercial	Suburban Neighborhood	Town Center/Urban Commercial
Land Use	Limited range of uses including special industrial, agricultural, and single-family Larger rural building setbacks	Wide range of uses including live, work, shop, play, dining, and lodging Larger suburban building setbacks	Primarily residential Homes can frontage on low volume facilities	Wide range of uses including live, work, shop, and play Minimal building setbacks
Travelway	Lower speeds on collector facilities Transit service limited Shared lanes with bicycles and vehicles	Higher speeds and volumes Driveway management important Raised medians desirable Transit service available; stops spaced no closer than ¼-mile to increase efficiency On-street bike facilities desirable; may require buffer due to traffic speeds and volumes	Low to moderate speeds and volumes Driveway management important Emergency vehicle accommodation Transit service available On-street bicycle facilities desirable	Low speeds on collector facilities Emergency vehicle accommodation Frequent transit service; stops spaced no greater than ½-mile Shared lanes with bicycles and vehicles On-street bicycle facilities desirable where ROW is available
Flex Zone	No on-street parking Limited transit stops	No on-street parking Limited transit stops; Stops spaced no closer than ¼-mile to increase efficiency	On-street parking common Transit stops	On-street parking encouraged High quality, weather protected transit stops Freight delivery zones Pick-up/drop-off zones Activation spaces (food trucks, festivals)
Pedestrian Realm	Low pedestrian activity Shared-use path desirable where ROW is available Limited transit stops Landscaping and trees to provide shade	Low to moderate pedestrian activity Wider sidewalks with wide landscaping buffer Pedestrian access to transit and adjacent land uses Off-street trails where ROW permits Limited transit stops; Stops spaced no closer than 1/4 – mile to increase efficiency	Low to moderate pedestrian activity Wider sidewalks with wide landscaping buffer Off-street trails where ROW permits Transit stops Landscaping and trees to provide shade Activation spaces (parklets, outdoor dining, public art)	Moderate to high pedestrian activity Wider sidewalks with landscaping buffer Bicycle parking High quality, weather protected transit stops Pedestrian-scaled lighting and street furniture Activation spaces (parklets, outdoor dining, public art)

CONTEXT-BASED ROADWAY DESIGN

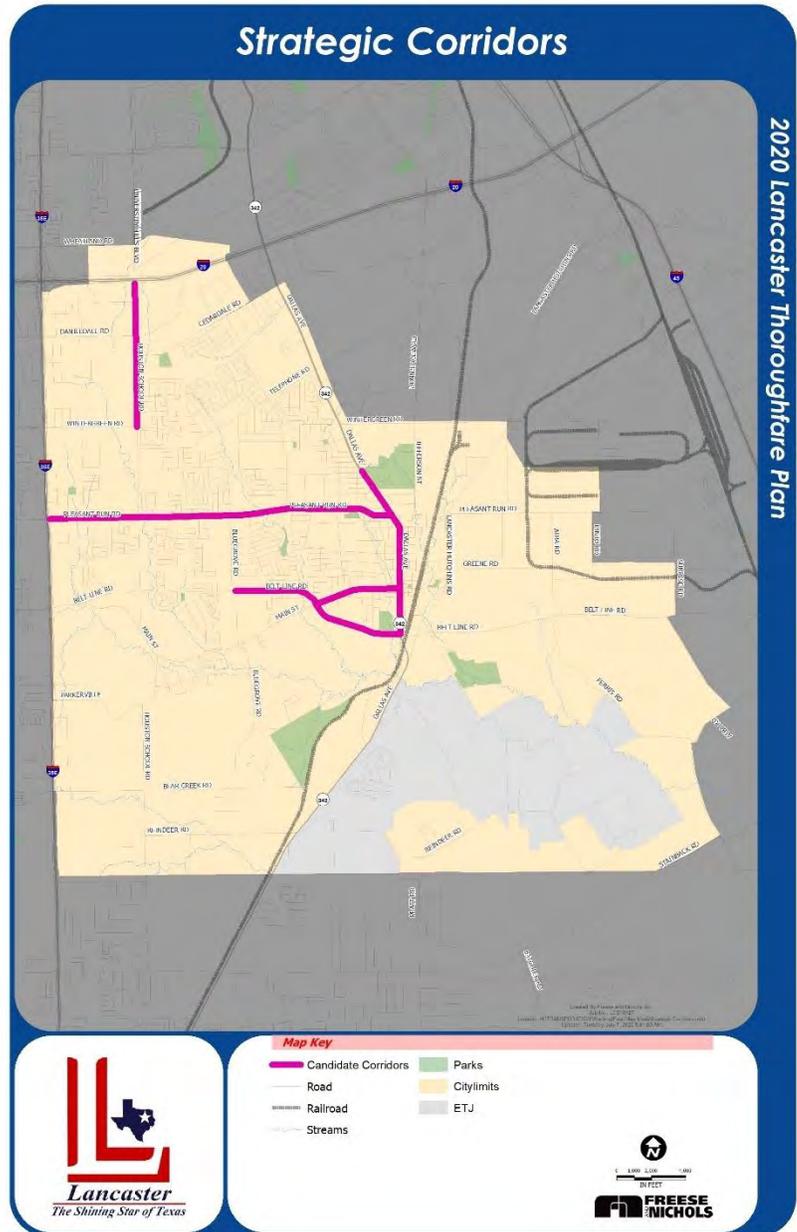
Context Sensitive Strategic Corridors

Implementing context sensitive design and complete streets into an existing network of thoroughfares can range in difficulty. In some cases, simply adding signage and restriping the roadway may change the entire character of the corridor. In other cases, implementation may involve repaving or acquiring ROW to build the complete street. Retrofitting streets with new design elements are most effective when combined with other improvements such as utility maintenance or pavement overlay.

One of the best ways to introduce complete streets is to incorporate the design elements into the construction of an entirely new thoroughfare. The ability to do this in Lancaster is challenging as most of the urban thoroughfare network is complete.

In Lancaster, there are several key corridors with potential for context sensitive design implementation. This includes expanding upon the existing multi-modal characteristics of the corridor. For each strategic corridor, a few options are considered as potential improvements. The following corridors shown in Figure 41 were examined in specific detail. Cross sections are provided to provide a visual guide to explain the balance between the different uses of the street and illustrate how portions of ROW can be effectively dedicated for specific uses.

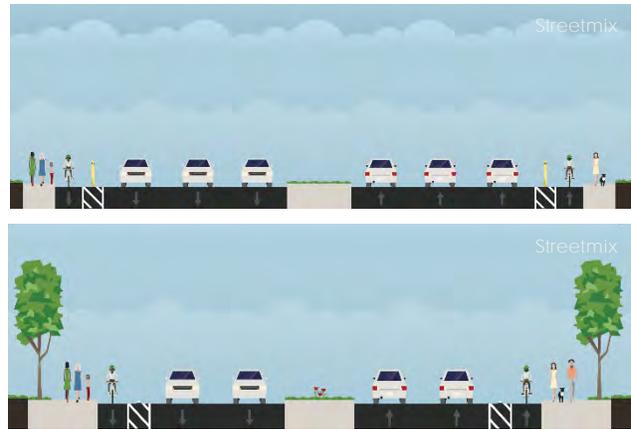
Figure 41: Strategic Corridors



Pleasant Run Road (from IH-35E to SH 342 / Dallas Avenue)

Pleasant Run Road is an east-west major arterial that runs through the center of Lancaster and connects its downtown core to the City of DeSoto's downtown to the west and Wilmer to the east. Pleasant Run Road is a 4-lane undivided roadway from IH-35E to Dallas Avenue (SH 342). The 2018 network from the regional mobility plan (Mobility 2045) shows current traffic volumes on Pleasant Run Road ranging from 28,000 vehicles per day (vpd) near IH-35E to 10,000 vpd at Dallas Avenue. Future traffic projections show traffic increasing near IH-35E to 34,500 vpd, with 13,000 vpd at Dallas Avenue.

Figure 42: Potential Corridor Configurations for Pleasant Run Road



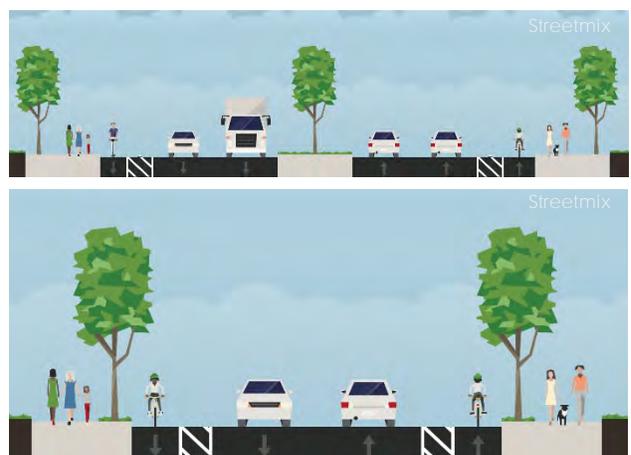
The focus of this corridor is to provide access for a range of modes connecting downtown to IH-35E. This includes transit, bicycling and walking as additional modes to be accommodated along with the automobile. The roadway corridor to the east of Dallas Avenue is expected to remain in its current configuration.

Figure 42 displays potential multi-modal improvements for Pleasant Run Road.

SH 342 / Dallas Avenue (from Veterans Memorial Parkway to Belt Line Road)

Dallas Avenue is one of the primary north-south mobility corridors in the City. It connects to the proposed Loop 9 to the south and IH-20 to the north. The land uses along the corridor are primarily commercial, residential, and institutional. This corridor runs through downtown Lancaster to connect with Lancaster Community Park, the Public Library, Recreation Center, Lancaster High School, Tiger Stadium, and the Public Safety Building. This corridor starts as a 6-lane divided major arterial to the north and transitions to a 2-lane undivided collector as it approaches downtown.

Figure 43: Potential Corridor Configurations for Dallas Avenue



Modeled 2018 counts show just over 10,000 vpd at Veterans Memorial Parkway and just 6,000 vpd at Belt Line Road. The presence of the high school, recreation center, park, seniors center, and historic downtown suggest that improvements should

CONTEXT-BASED ROADWAY DESIGN

be considered along the corridor to promote bicycle, pedestrian, and transit activity (see Figure 43). Accommodations for low speed vehicles, such as golf carts and electric scooter-type vehicles may also be considered at a future date.

Forecast 2045 volumes show consistent volumes along the corridor, with 18,800 vpd at Veterans Memorial Parkway with almost 19,000 vpd at Belt Line Road. Since there is limited ROW through downtown, accommodations for vehicle mobility pose significant challenges along this section of the corridor. One option is to expand the 4-lane section of the corridor by right-sizing the roadway from Veterans Memorial Parkway south of Oak Street and retaining the 2-lane undivided section through the historic downtown.

Houston School Road (from IH-20 to Wintergreen)

This facility is a 4-lane divided major arterial that connects residential and major warehousing and intermodal facilities to IH-20 to the north. This corridor is expected to generate substantial truck traffic and is therefore should be designed primarily for vehicles and large trucks. Current volumes of 10,000 to 15,000 vpd are expected to increase substantially to 30,000 to 34,000 vpd. As illustrated in Figure 44, sidewalks should be designed with special care to ensure the safety of pedestrians and cyclists. Any proposed transit stops along this route should include turnouts. Due to the volume of truck traffic and the continued development of intermodal facilities along this corridor, the promotion of transit, walking and cycling along this roadway is not recommended. Alternative corridors should be explored for bicycle, pedestrian, and transit connections to the DART Blue Line and the University of North Texas Campus to the north.

Figure 44: Potential Roadway Configuration for Houston School Road



Main Street (from Belt Line Road to SH 342 / Dallas Avenue)

This 2-lane undivided collector runs from Belt Line Road to Dallas Avenue. There is ample ROW along the corridor providing flexibility in future design. This corridor runs primarily through residential neighborhoods as well as an elementary school and retail as it approaches Dallas Avenue.

Figure 45: Potential Roadway Configuration for Main Street



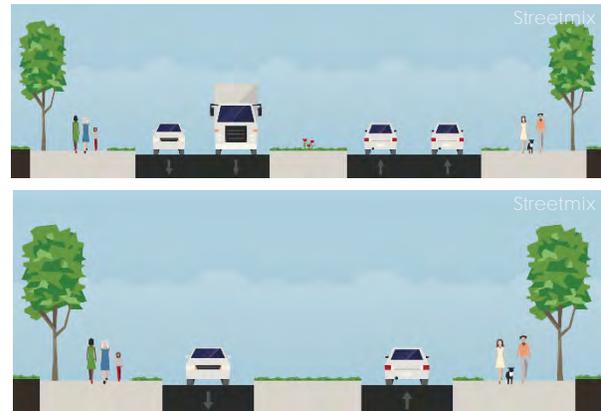
Currently this roadway only carries about 1,400 vpd, which is expected to increase to only 2,000 to 4,000 vpd by 2045. This suggests that no additional roadway capacity is required, and that excess ROW could be reallocated for bicycle and pedestrian uses as shown in Figure 45.

Belt Line Road (from Bluegrove Road to SH 342 / Dallas Avenue)

This corridor is but one section of Belt Line Road, a key east-west corridor that runs through southern Lancaster, between DeSoto and Wilmer. The primary land uses along this corridor are residential, with variety of commercial, institutional, and retail uses at select locations. This 2-lane undivided roadway has a good bike and pedestrian pathway on its northern half until Main Street. This facility is expected to increase its traffic volumes from 2,500 to 3,300 vpd in 2018 to between 7,500 to 8,400 vpd in 2045.

Since this corridor provides key east-west mobility and connects several growing residential areas, it is expected to require mobility upgrades in the future. Additional bicycle and pedestrian facilities are recommended on its northern edge from Main Street to Dallas Avenue, with a new bike/ped facility running along its southern edge from Bluegrove Road to Dallas Avenue (see Figure 46).

Figure 46: Potential Roadway Configurations for Belt Line Road



Roadway Rightsizing

Rightsizing is the process of reallocating pavement and ROW space to better serve the context of the roadway and the goals of the community. A road built many years ago in an undeveloped area or developing area was sized for a future condition, but now housing, shops, schools, and other destinations have matured in the community. Traffic conditions have stabilized and are more predictable and the needs of adjacent development is better known. These conditions, prevalent in some areas of Lancaster, provide the opportunity to rightsize roadways to optimize these assets for the community.

Using data from the regional travel demand model, corridors were evaluated for rightsizing under two scenario types which both reduce the ultimate number of lanes on the facility.

1. Reallocation – reducing the number of existing travel lanes.
2. Redesignation - preempting roadway widening by acknowledging new ultimate sizing.

CONTEXT-BASED ROADWAY DESIGN

Reallocations consider ultimate vehicular demands and reallocate existing pavement and/or ROW space to other uses when excess vehicular capacity remains.

Reallocations identified with Lancaster include both straight lane reductions, and rightsizing conversions. The former is straightforward in the reallocation of space with similar intersection and driveway traffic operations and reducing existing vehicular capacity by the travel lane loss.

Redesignations reconsider future investments in expansion, but existing pavement conditions are unaffected.

These are made to align traffic demands with roadway capacity

supply, reducing excess infrastructure liabilities and reducing overall cost to the City. No existing capacity is lost, only potential future capacity.

Rightsizing
is the process of reallocating pavement and ROW to better serve the context of the roadway and goals of the community

It is important to note that vehicular capacity is made up of two parts: link-level segments and intersections. While roadway rightsizing reduces link segment lane configurations, typical capacity bottlenecks are found at intersections so the reduced lane configuration between intersections does not affect true corridor capacity.

Intersection treatments through dedicated turn bays, traffic control devices, and signal timing and coordination can offset reduced link-level capacities of roadway rightsizing.

By analyzing the travel demand model for anticipated demand on the network in the future, major movements could be tracked to determine vehicular capacity needs that need absorbed in the collector and arterial network.

Rightsizing Analysis

Many corridors in Lancaster are experiencing a LOS between A and D and have low daily traffic volumes. These roadways provide excellent opportunities, where ROW is available, to provide additional infrastructure and accommodations for multi-modal elements. Recommended roadways for rightsizing include Main Street, Bluegrove Road, Cedardale Road, Bear Creek Road, and Dizzy Dean Drive. Additional analysis is recommended to determine if these and other roadways are eligible for rightsizing, but preliminary analysis suggests there may be opportunities for rightsizing on these roadways.

Bike and Pedestrian Complete Streets Integration

Complete Streets is a transportation planning approach that aims to maximize the use of public ROW for all transportation users, regardless of age, ability, or modal choice. This method uses high-level policy direction to influence everyday decision-making processes in roadway design, rather than design prescription. Complete Streets is not about special projects, but about changing the approach to projects on all streets. It is an incremental approach aimed at long-term results. These policies utilize the entire

ROW while focusing on safety, comfort, and convenience as well as cohesiveness within the context of the community. Complete Streets make it easier to cross the street, walk to shops, and bicycle to work, which in turn makes the town a better place to live. These traits are essential to a seamless multimodal transportation network.

Benefits

Complete Streets improve safety, provide modal choices, reduce costs, and lead to better health and stronger economies. By considering the many different users of the roadway, streets can be designed to accommodate everyone and improve the livability of the community.

- Improve Safety – Reduced travel speed which lowers risk to pedestrians and cyclists as well as include pedestrian infrastructure such as sidewalks, bicycle lanes, crossings, median islands, and curb extensions.
- Provide Modal Choices – By building safe, comfortable, and convenient infrastructure for other modes of transportation, residents are more willing to use them.
- Reduced Costs – Encouraging and installing provisions for non-motorized transportation – particularly within and around employment and activity centers, reduce transportation system operation and maintenance costs. It also decreases travel costs for Lancaster residents who can walk or ride a bike to work as opposed to automobiles alone. Further, by reevaluating the needs of the residents and incorporating community input at the beginning of the project, the schedule, scope, and budget can often be reduced. Narrowing the pavement area will also reduce costs.
- Better Health – Accommodating pedestrians and bicyclists in the transportation network enhances the overall health of Lancaster residents. Lancaster's aging, but active population, in addition to kids and teens who cannot drive, look for pedestrian and bicycle facilities to become more active and independent.
- Stronger Economies – Areas that provide safe and comfortable walkability have lower commercial vacancies and higher home and office space values.

Economic Benefit

Complete Streets affect the local economy in various ways. By providing convenient alternatives to driving, such as transit, walking, or biking, residents and visitors save money on transportation costs which can then be used for other expenses, such as housing, restaurants, and entertainment. Congestion costs can also be reduced if residents use alternative modes.

Local businesses see the benefits in improving access to people traveling by foot or bicycle. By increasing pedestrian and bicycle activity, businesses often see increased sales. Bicycle infrastructure can often create jobs directly through increased tourism, bicycle manufacturing, sales and repair, bike tours, and other activities.

CONTEXT-BASED ROADWAY DESIGN

Complete Streets also create a framework for economic development and spur private investment by improving the public space and making it a more pedestrian and cyclist friendly place. In a downtown area or commercial boulevard, the Complete Streets framework defragments the overall development landscape by visually reducing the space between developments and thus encouraging pedestrian movement between adjacent businesses. Revitalizing key areas throughout Lancaster with pedestrian plazas, wide sidewalks, landscaping, and traffic calming elements may entice private investors to build or redevelop more residential, retail, and office buildings. In addition to private investments, property values increase with the walkability of a neighborhood. Today's college graduates, who comprise an increasing percentage of the workforce and add to the vitality of a local economy, prefer walkable urban neighborhoods.

Key Intersections

The ability for the roadway network to operate effectively relies on the ability of intersections to efficiently process traffic. Operational conditions typically break down when insufficient turn-lane capacity is available to remove turn movements from the traffic stream. To ensure the ability to provide channelized turn movements, such as a second left-turn or right-turn lane, an additional 22 feet should be provided at key major and minor arterial intersections. To determine the exact dimensional requirements of specific intersections, a traffic analysis should be conducted at the time of facility implementation.

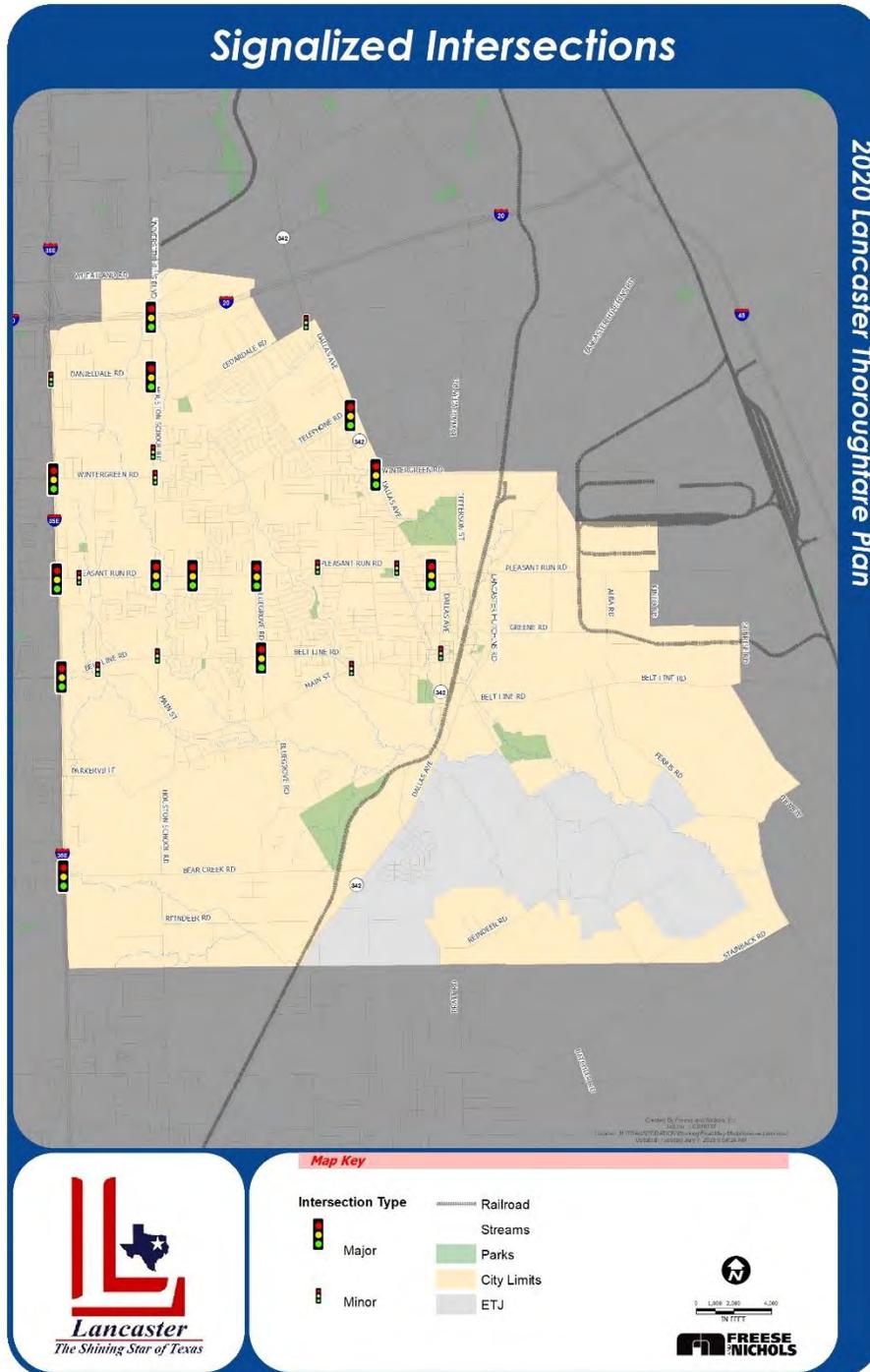
Table 11: Critical Intersection ROW Requirements

Critical Intersection ROW Requirements					
Roadway	Major Arterial	Minor Arterials	Major Collector	Minor Collector	Greenway Arterial
Major Arterial / Greenway Arterial	350'	350'	300'	260'	350'
Minor Arterial	300'	300'	260'	260'	300'

As currently defined, divided roadways could accommodate a separate left-turn lane. By adding 22 feet of width, a second left-turn and separate right-turn bay can be added as needed to an intersection. Travel lanes of 11 feet provide enough roadway width for turn movements. Table 11 presents the ROW requirements for critical intersections in Lancaster.

Twenty-three signalized intersections were identified in Lancaster (see Figure 47) and are located at crossings between major and minor arterials or freeway frontage roads. At these intersections, the City should require additional ROW (via the platting process if possible) to allow for additional turn lanes that may be needed in the future. Note that a review of intersections suggest that significant, widespread intersection upgrades and the expansion of the signalized intersection network are expected in the near term.

Figure 47: Signalized Intersections in Lancaster



CONTEXT-BASED ROADWAY DESIGN

Figures 48 and 49 below identify the necessary distances by roadway class for storage and transition requirements. The distances allow for minimum turn-lane storage and lane transitions. In high intensity development areas, a traffic analysis should be conducted to determine appropriate intersection requirements.

Figure 48: Minor Roadway Intersections

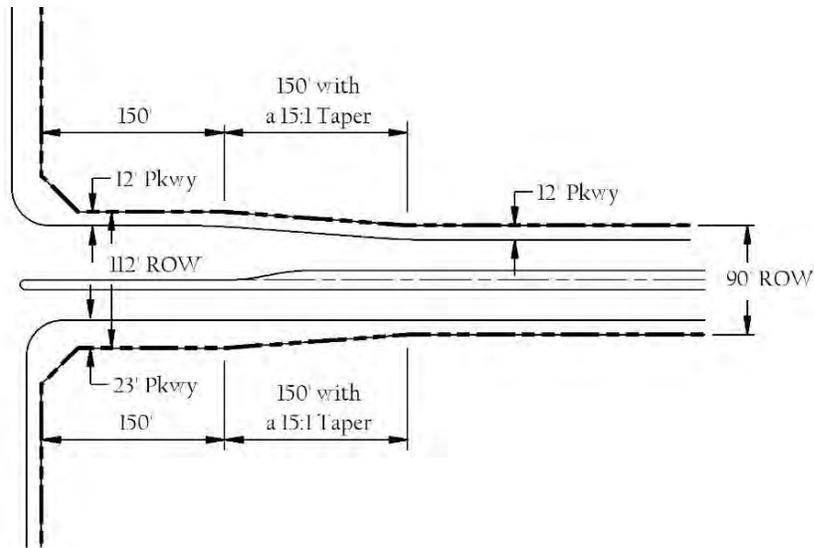
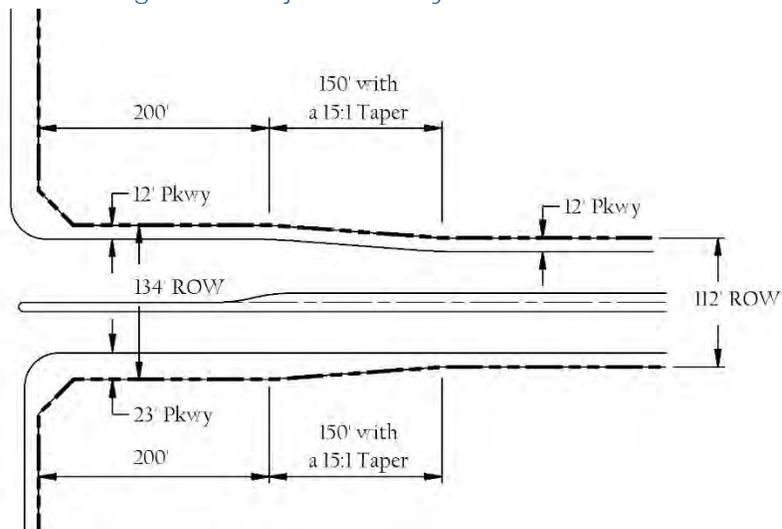


Figure 49: Major Roadway Intersections



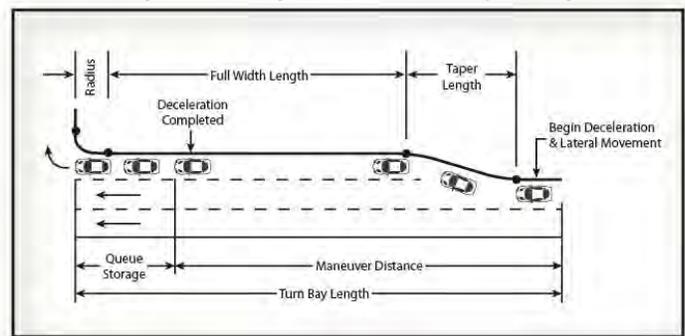
Intersection Congestion Mitigation

Intersection performance can be improved through several different mitigation techniques. These techniques can be applied to better handle the current traffic or the forecasted traffic. The following are some of the intersection improvements that can be implemented at critical intersections within the City of Lancaster.

Signal Timing – Signal timing is a critical technique that involves synchronizing the sequence and duration of each phase of a traffic signal to improve the overall traffic flow throughout the corridor. The timing of signals often involves coordinating an entire signal system or series of signals. Advanced traffic signal controllers provide the traffic engineer great flexibility in controlling the flow of traffic through an intersection. Proper signal timing along a corridor can increase the efficiency of the roadway by allowing for the maximum number of vehicles to pass in the shortest time. It also affects the air quality of the city because travel time and idling are reduced. This technique can be used to increase capacity on corridors and is a less expensive option than adding lanes.

Right Turn Capacity Increase – The addition of acceleration and deceleration lanes can provide operational benefits throughout a corridor and at an intersection by allowing turning vehicles to exit the roadway without affecting the through movement of traffic. As shown in Figure 50, this design allows a more efficient flow of traffic along a corridor and allows vehicles to form platoons at the signalized intersections, thereby maximizing the flow that the signal can handle.

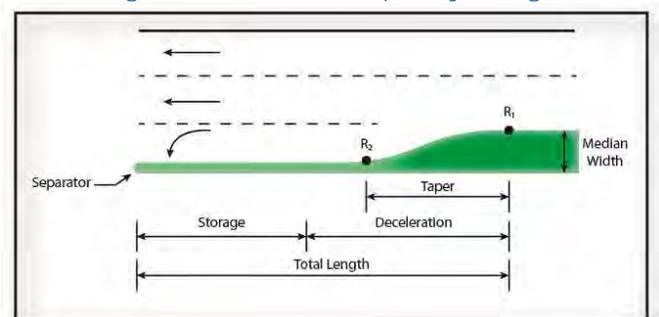
Figure 50: Right Turn Capacity Design



Right turn lanes consist of storage length and acceleration or deceleration length. Lengths of auxiliary lanes (acceleration or deceleration) are a function of the posted speed, but queue lengths are normally established on a case by case basis. The Highway Capacity Manual and TxDOT's Operations and Procedures Manual provide guidance on the provision of auxiliary lanes. These improvements are not one size fits all. Consideration must be given for posted speed, traffic volume, and development type.

Left Turn Capacity Increase – Much like right-turn lanes, left-turn lanes also allow the turning vehicles to exit the through lanes without affecting the through traffic. As illustrated in Figure 51, left-turn lanes should provide adequate queue storage for signalized and unsignalized intersections based on an operational analysis. The length of deceleration is dependent on the posted speed and the amount of speed differential acceptable for the thoroughfare.

Figure 51: Left Turn Capacity Design



Chapter 7: Plan Implementation

The recommended projects include improvements to enhance connectivity within the city through several modes, including, but not limited to, roadway and intersection improvements, complete streets applications, bike and pedestrian enhancements, and transit connectivity.

Committed and Funded Projects

Both TxDOT and the North Central Texas Council of Governments have several committed and planned projects within the City of Lancaster and the surrounding area. Figure 52 reveals the location of these projects within the City of Lancaster.

Project Prioritization

Final prioritization of transportation improvements within the city of Lancaster will be at the discretion of the City. The recommendations shown in Figure 53 and Table 12 on the following pages are preliminary in nature and will need to be vetted by the City before the list is finalized.

Figure 52: Committed and Funded Projects

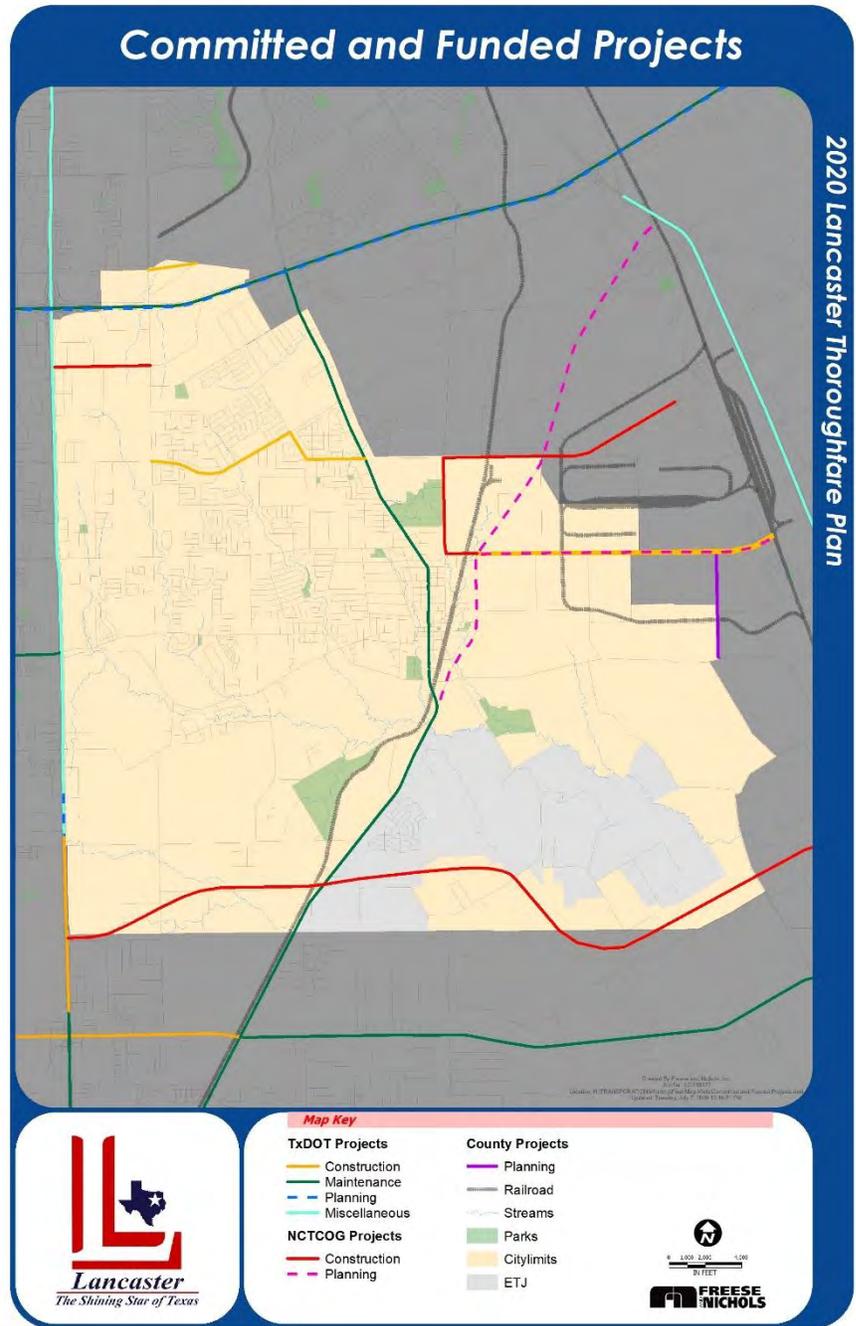


Table 12: Thoroughfare Plan Project Listing

ID	Project Description	Recommendation	Time Frame	Comment
1	Cedardale Road (Houston School Road to Dallas Avenue)	Rightsize and reconstruct to a 2-lane facility; Flare at ends	Medium Term	Residential use, industrial access on other facilities Low travel demand model volume (4,000 daily) Dallas extension east is 4-lane
2	Dizzy Dean Road (Wintergreen North of Telephone Road to Cedardale Road)	Extend and rightsize to 2-lane collector; Flare near Telephone Road	Long Term	Logistics/distribution planned for land on east side Encourage access via Telephone and Dallas instead (away from res.) Minimize bridge width
3	Marsalis Road Connector (Longhorn Drive to Pleasant Run Road)	Construct a 2-lane collector	Long Term	Connection improves north-south mobility in northern Lancaster
4	Indian Lilac Drive Extension (Millbrook Drive to Bridle Path Drive)	Construct a 2-lane collector	Short Term	Charter school on Pleasant Run; need alternate routes for pickup/drop off Elementary school also in neighborhood Ensure future connections to Bluegrove and Belt Line
5	Pleasant Run Road (Dallas Avenue to Lancaster Hutchins)	Rightsize to 4-lane facility	Short Term	Low travel demand model volume (16,000-24,000 daily; 1,900 pk hr dir) Repurpose space for other objectives E-W through-travel shifting to Loop 9. Dallas County / TxDOT Project.
6	Belt Line Road (West Main to Dallas Avenue)	Rightsize to 4-lane facility	Medium Term	Low travel demand model volume (20,000 daily; 1,600 pk hr dir) E-W through-travel shifting to Loop 9
7	Main Street (Belt Line to Lancaster Hutchins)	Reconstruct and rightsize to a 2-lane collector	Short Term	Constrained ROW for any future widening Low travel demand model volume (2,000-4,000 daily) Maintain historic character through downtown
8	Meadowlark Lane (Reindeer Road south)	Extend backage	Medium Term	Align with major collector in Red Oak Plan Secondary Loop 9 access
9	Reindeer Road (Houston School to Loop 9)	Extend collector	Long Term	Maintain roadway ROW and access to Loop 9 Secondary Loop 9 access
10	New North-South Collector (Parkerville to Bluegrove Road)	New 2-lane collector	Long Term	Ensure ROW preserved in future for collector between Houston School and Bluegrove
11	Bluegrove Road (Loop 9 south to Red Oak)	New 2-lane collector	Long Term	Align with major collector in Red Oak Plan Need full intersection access at Loop 9 Leverage existing creek crossing
12	Parkerville Extension / Realignment (Bluegrove Road to SH 342)	Realign, downgrade to Rural Minor Arterial	Long Term	Current alignment goes through Bear Creek Nature Park Realign to follow Ten Mile Road, cut through tip of park E-W travel covered from other facilities per travel demand model
13	Moreland Extension (SH 342 to Bear Creek extension #14)	Remove and realign, downgrade to collector	Long Term	Ensure ROW preserved in future Realign to meet other objectives (see Bear Creek extension)
14	Bear Creek Road Extension (Bluegrove Road to Nokomis Road)	New 2-lane collector	Medium Term	Extend to east to support: local E-W travel (without Loop 9), access, and circulation Move tie-in point on Nokomis Road north to avoid home/pond on Moreland Road Ensure ROW preserved in future
15	Reindeer Road/Pratt Road (south of Bear Creek)	Realign, upgrade segment	Medium Term	Realign for traditional intersection at Bear Creek and Reindeer Continue Minor Arterial status to align with Red Oak Plan
16	Reindeer Road Collectors (east of Dallas Avenue)	New 2-lane collector	Long Term	Ensure ROW preserved in future Align with major collector in Red Oak Plan
17	New Collector Roadway	New 2-lane collector	Long Term	Implementation timeline dependent upon development activity

	(Nokomis Road to Bear Creek Extension #14)			
18	Nokomis Road (south of Bear Creek)	Upgrade to Minor Arterial	Medium Term	Upgrade segment from Rural Arterial to Minor Arterial to meet with Bear Creek extension Upgrade south of Nokomis Road 90 turn to align with Red Oak Plan
19	Pinto Road Connector (Greene Road to Sunrise Road Extension #22)	Construct 4-lane major arterial (type B)	Medium Term	Dependent upon Loop 9 construction and subsequent development activity
20	Loop 9	Add grade separations and planned ramping	N/A – TxDOT Project	According to Feasibility Study
21	Ferris Road Realignment (Watermill Road Extension #36 to Ferris Road)	Realign major arterial	Medium Term	Dependent upon Loop 9 construction and subsequent development activity
22	Sunrise Road (Belt Line Road to Ferris Road)	New 4-lane major arterial	Medium Term	Leverage Loop 9 interchange Straighten facility for easier N-S mobility for industrial development
23	Danieldale Road Extension (IH-20 north to Campus District Village Center)	New 4-lane major arterial	Long Term	Construction dependent upon development activity
24	Alba Road Extension (south of Greene Road to Belt Line Road)	New 4-lane major arterial	Long Term	Construction dependent upon development activity
25	Reynolds Drive Extension (Reynolds Drive to Houston School Road)	New 2-lane collector	Medium Term	Construction dependent upon development activity
26	New Collector Roadway (Lancaster Hutchins Road to Bear Creek Extension #14)	New 2-lane collector	Long Term	Construction dependent upon development activity
27	Boardwalk Avenue Extension (Boardwalk Avenue to Dizzy Dean Extension #2)	New 2-lane collector	Long Term	Construction dependent upon development activity
28	Wheatland Road Extension (from East Wheatland Road to Houston School Road)	New 2-lane collector	Short Term	City of Dallas Project. Construction phase imminent.
29	New Collector Roadway (Houston School Road to IH-35E)	New 2-lane collector	Long Term	Construction dependent upon development activity
30	Reindeer Road Connector (Houston School Road to IH-35E)	New 2-lane collector	Long Term	Construction dependent upon development activity and Loop 9 construction
31	New Collector Roadway (IH-20 north to East Wheatland Road)	New 2-lane collector	Long Term	Construction dependent upon development activity
32	Danieldale Road Extension (IH-20 north across East Wheatland Road Extension)	New 4-lane major arterial	Long Term	Construction dependent upon development activity
33	New Minor Arterial (Danieldale extension - #23 east then south to IH-20 frontage roads)	New 4-lane minor arterial	Long Term	Construction dependent upon development activity
34	Trippie Street Connector (Lyle Street north to IH-20 frontage roads)	New 2-lane collector	Long Term	Construction dependent upon development activity
35	Sunrise Road Connector (Sunrise Road to Pinto Road)	New 2-lane collector	Long Term	Construction dependent upon development activity
36	Watermill Road Extension (Wilson Road to Ferris Road)	New 2-lane collector	Long Term	Construction dependent upon development activity

PLAN IMPLEMENTATION

37	New Collector Roadway (Parkerville extension (#10) south to Reindeer Road))	New 2-lane collector	Long Term	Construction dependent upon development activity
38	Pinto Road Realignment (Pinto Road at Pleasant Run Road)	Realign 4-lane major arterial connection	Medium Term	Dependent upon Loop 9 construction and subsequent development activity
39	Chapman Drive Extension (Wintergreen Road to Wintergreen Road)	Construct new 4-lane major arterial connection	Short Term	Creates new east-west connection and supports ongoing development in northern Lancaster
40	Bluegrove Road Connector (Kings Cross Drive to Sunny Meadow Road)	Construct new 4-lane major arterial connection	Short Term	Strengthens north-south connections and supports ongoing development in northern Lancaster
41	Rodgers Avenue Connector (Balkin Drive to Wintergreen Road)	New 2-lane collector	Short Term	Strengthens north-south connections and supports ongoing development in northern Lancaster
42	Wintergreen Connector (East of Godiva Street to Baskin Drive)	Construct new 4-lane major arterial connection	Short Term	Immediate improvement to east-west connectivity in Lancaster.
43	Bluegrove Road Extension	Construct new 4-lane major arterial connection	Medium Term	Dependent upon Loop 9 construction and subsequent development activity
44	Millbrook Drive Extension	Construct new 2-lane collector	Short Term	Enhance access to Rosa Parks-Millbrooks Elementary School Ensure future connections to Bluegrove and Belt Line
45	New Collector Roadway (Campus District Village Center to Houston School Road)	Construct new 4-lane collector	Long Term	Construction dependent upon development activity
46	New Collector Roadway (Danieldale Road Extension to Campus District Village Center)	Construct new 4-lane collector	Long Term	Construction dependent upon development activity
47	New 4-lane Major Arterial Roadway (Wheatland Road Extension to Campus District City Center)	Construct new 4-lane major arterial	Long Term	Construction dependent upon development activity
48	Cornell Road (Lancaster-Hutchins Road to Belt Line Road)	Construct new 4 lane major arterial	Medium Term	Construction dependent upon Prime Pointe development activity
49	S. Point Drive Extension (Houston School Road to #50)	Construct new 4-lane collector	Long Term	Construction dependent upon development activity
50	New Collector Roadway. (Houston School Road to IH-20 south frontage road)	Construct new 4-lane collector	Long Term	Construction dependent upon development activity

Recommended Funding Strategies

Several potential funding sources have been identified for the implementation of recommended transportation improvements in Lancaster.

The funding and implementation matrix were developed to identify potential funding sources for Plan recommendations. For this section of the document, the matrix was broken into four (4) categories:

- Roadway Construction
- Roadway Rehabilitation
- Intersection Improvements
- Miscellaneous

Roadway Construction

Roadway construction funding sources, such as Category 12: Strategic Priority Funds, are geared towards new road roadway construction, roadway realignments, and interchange construction. Table 13 provides a list of funding sources that could be used to fund roadway construction. Category 12 Funds are specifically obligated to projects that promote economic development and improve interstate connectivity. Eligible projects include construction of additional lanes and new roadways, grade separations, interchanges, bottleneck removal, and safety improvements. These funding sources could be instrumental in the construction of recommended mobility projects.

Table 13: Funding Sources for Roadway Construction

Roadway Construction		
Recommendation	Problem Addressed	Potential Funding Source(s)
Street Construction	Improved Access Capacity Improvement Congestion Relief Economic Development	Category 12: Strategic Priority Funds Category 4E: Rural Mobility/Rehabilitation Category 11: Texas Mobility Fund Category 8B: Texas FM Road Expansion Proposition 7 Funds
Frontage Road Construction	Congestion Relief Economic Development Capacity Improvement	Category 12: Strategic Priority Funds Category 11 Proposition 7 Funds
Roadway Realignment	Safety Improved Traffic Flow Congestion Relief	Category 12 Category 4E Category 11 Proposition 7 Funds
Interchange Construction	Capacity Improvement Congestion Relief	Category 12 Category 11 Proposition 7 Funds

PLAN IMPLEMENTATION

Roadway Rehabilitation

Roadway rehabilitation projects include investments in transportation improvements that increase capacity, improve safety, or facilitate economic development. It includes enhancements such as grade separations, roadway resurfacing, lane additions, and ROW acquisitions. Funding options for roadway rehabilitation include, but are not limited to, Category 4F: Rehabilitation in Urban and Rural Areas, which are geared towards the rehabilitation of on-system roadways that are functionally classified higher than minor collectors. Table 14 provides a list of funding sources that could be used for roadway rehabilitation improvements.

Table 14: Funding Sources for Roadway Rehabilitation

Roadway Rehabilitation		
Recommendation	Problem Addressed	Potential Funding Source(s)
Grade Separation	Congestions Relief Safety	CMAQ Category 2: Metro Corridor Funds Category 11 Texas Mobility Fund
Lane Addition	Congestion Relief Improved Capacity	STP-MM Category 12: Strategic Priority Funds Category 11 Texas Mobility Fund
Roadway Widening	Congestion Relief Improved Capacity Accommodates wider vehicles	STP-MM Category 12 Category 4F Category 3C Category 11 Texas Mobility Fund
Narrower Lanes	Traffic Calming Safety	Category 11 Category 4E
ROW Acquisition	ROW for future Road Expansion	Category 2 Category 4E Proposition 7 Funds
HOV Lane	Congestion Relief Capacity Improvement	Texas Mobility Fund
Road Dieting	Traffic Calming Safety Economic Development	Category 11 Category 4E

Intersection Improvements

Intersection improvement funds are geared towards intersection safety improvements and access management projects that improve the overall flow of traffic within a corridor. Intersection improvements include traffic signalization, intersection lighting, roundabouts, turn lanes, and intersection geometry improvements. Intersection improvement funding sources include but are not limited to Category 10A Traffic Control Devices and Category 4E: Rural Mobility/Rehabilitation. Category 10A funds can be used for the installation or rehabilitation of traffic signals and intersection lighting on on-system roadways. Category 4E funds can be used in rural unincorporated areas or cities with populations below 5,000. Eligible projects include right and left turn lanes, intersection Geometry improvements, and roundabouts. Table 15 includes a list of funding sources for intersection improvements.

Table 15: Funding Sources for Intersection Improvements

Potential Funding Sources for Intersection Improvements		
Recommendation	Problem Addressed	Potential Funding Source(s)
Traffic Signalization	Congestion Relief Safety	CMAQ Category 10A: Traffic Control Devices category 10B: Rehab of Traffic Management Systems Category 11
Intersection Geometry Improvements	Safety Congestions Relief Capacity Improvement Accommodates Wider Vehicles	CMAQ Category 4E Category 11
Intersection Lighting	Safety	Category 12 CMAQ Category 11
Left and Right Turn Lanes	Safety Congestions Relief Capacity Improvement	CMAQ Category 11 Category 4E
Round-A-Bout	Congestion Relief Capacity Improvement Safety Traffic Calming	CMAQ STEP Funds Category 11 Category 4E

PLAN IMPLEMENTATION

Miscellaneous Projects

Miscellaneous improvements range from bridge construction to pedestrian amenities and traffic impact assessments. Some of the eligible funding sources for these improvements include the Statewide Transportation Enhancement Program (STEP) funds. STEP funds are available for non-traditional transportation projects such as bike and pedestrian initiatives, landscaping, and special studies. Although federally funded, these funds are not restricted to on-system facilities. Table 16 provides a list of funding options available for miscellaneous projects.

Table 16: Potential Funding Sources for Miscellaneous Projects

Potential Funding Sources for Miscellaneous Projects		
Recommendation	Problem Addressed	Potential Funding Source(s)
Bridge Construction/ Reconstruction	Safety Capacity Improvement Accommodate Wider Vehicles	Category 6A: On System Bridge Program Category 6B: Off System Bridge Program Category 11
Street Lighting	Safety Economic Development	CMAQ STEP Funds Category 11
Railroad Grade Separation Repair/ Construction	Congestion Relief Safety	Category 4G: Railroad Grade Separation Category 11
Pedestrian Amenities/ Landscaping	Traffic Calming Safety Economic Development Beautification	CMAQ STEP Funds Green Ribbon Funds Category 11
Transit Expansion	Transit Needs Multimodal Connectivity	CMAQ STEP Funds Category 11
Traffic Impact Assessment	Congestion Relief Traffic Calming Safety Improved Access	CMAQ Regional Toll Revenue
Miscellaneous	Safety Congestion Relief Capacity Improvement	Category 4F: Category 4E Category 3C: NHS Rehabilitation Category 8A: Rehabilitation of FM Roads Category 11 Texas Mobility Fund

Additional funding sources for the cities located in the North Central Texas Region is available at NCTCOG's One Stop Shop for Transportation Funding:

<http://www.nctcog.org/trans/onestop/>.

Impact Fee Program²

Another source of funding for roadways involves the development of an Impact Fee Program. This involves conducting traffic impact analysis (TIA) to assess the effects of a specific development activity on the existing and planned thoroughfare system. Development activity may include: rezoning, preliminary site plans and plats, driveway permits, certificates of occupancy, and Thoroughfare Plan amendments.

Impact analysis methodology involves evaluating the design level of service, trip generation rates, potential trip reductions, and the impact of proposed developments on both existing and future traffic conditions. Specific data used for TIAs includes:

- Site location information and density of development
- Existing and proposed/projected zoning, site development, traffic volumes, trip generation, traffic signals and roundabouts
- Thoroughfare systems
- Net change in trip generation
- Trip distribution and traffic assignment
- Intersection and roadway level of service
- Proposed mitigation (if needed)

The benefits of such an analysis could be applied to the development review process and used to have developers finance upgrades of roadways when adjacent developments require such an improvement.

Conclusion

Successful implementation of the Lancaster Thoroughfare Plan will require the coordination between agencies and stakeholder groups to gain public acceptance and acquire funding. Two of the biggest deterrents to plans implementation are public resistance and a lack of agency coordination.

Public acceptance is essential to the implementation of a project. Many projects, though planned, designed, and funded, have fallen apart due to public disapproval. In order to avoid this, all recommendations presented in this plan need to be vetted through the public participation process prior to implementation. Each project needs to

² Sourced from the City of Frisco Engineering Design Standards Manual

PLAN IMPLEMENTATION

be presented and reviewed by the public to provide awareness of any negative or positive impacts of the project.

Agency coordination is also essential in the implementation of transportation projects. Because transportation is regional, different agencies and jurisdictions must **communicate to ensure more seamless connectivity**. One city's or county's strategy to widen a roadway in order to accommodate more traffic can create issues for an adjacent city attempting to accommodate traffic on the same facility through the implementation of complete streets and sustainable land use policies. Successful implementation of the Lancaster Thoroughfare Plan will require constant and transparent communication with Dallas, DeSoto, Hutchins, Red Oak, Wilmer in addition to Dallas County, NCTCOG, and TxDOT.

The current work in progress on roadways throughout the county would not be possible without the leadership of elected city officials advocating together for improvements to roads and other transportation infrastructure. To implement this plan, continued leadership from the City will be required.