

## TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	E-1
1.0 PURPOSE AND NEED.....	1-1
1.1 Description of Proposed Action .....	1-1
1.2 Overview of the Project Area .....	1-1
1.3 Relevant Corridor and System Planning Activities .....	1-3
1.4 Need for Action .....	1-6
1.4.1 Specific Transportation Needs in the Corridor .....	1-6
1.4.2 Purposes of the Proposed Action.....	1-6
2.0 ALTERNATIVES CONSIDERED.....	2-1
2.1 Alternatives Analysis .....	2-1
2.1.1 Screening and Selection Process.....	2-1
2.1.2 Alternatives Considered for Conceptual Evaluation .....	2-1
2.1.3 Alternatives Considered for Detailed Evaluation.....	2-2
2.1.4 Rationale for Choosing the Locally Preferred Alternative .....	2-5
2.2 Selected Light Rail Transit Alternative .....	2-6
2.2.1 Alignment.....	2-6
2.2.2 Light Rail Transit Stations.....	2-8
2.2.3 Capital Costs.....	2-16
2.2.4 Bus Operating Plan.....	2-16
2.2.5 Rail Operating Plan.....	2-20
2.2.6 Rail Operating Facility .....	2-22
2.2.7 Operations and Maintenance Cost .....	2-23
2.3 No-Build Alternative.....	2-23
3.0 AFFECTED ENVIRONMENT.....	3-1
3.1 Land Use.....	3-1
3.1.1 Regional Context .....	3-1
3.1.2 Existing Land Use .....	3-1
3.1.3 Regional and Local Land Use Plans and Policies .....	3-6
3.1.4 School, Community Services and Public Facilities, and Resources .....	3-9
3.1.5 Major Activity Centers .....	3-10
3.2 Socioeconomic Characteristics.....	3-10
3.2.1 Population Dynamics and Demographic Profile .....	3-12
3.2.2 Income and Poverty .....	3-14
3.2.3 Ability to Speak English .....	3-17
3.2.4 Employment.....	3-18
3.2.5 Means of Transportation to Work .....	3-20
3.2.6 Neighborhoods.....	3-23
3.3 Transportation .....	3-25
3.3.1 Roadway Infrastructure .....	3-25
3.3.2 Traffic Volumes and Trends .....	3-27
3.3.3 Transit Operations and Ridership .....	3-30
3.3.4 Non-Motorized Circulation .....	3-32
3.3.5 Parking .....	3-35

3.3.6	Regional and Local Transportation Improvement Plans.....	3-35
3.4	Air Quality .....	3-38
3.4.1	Airborne Pollutants .....	3-38
3.4.2	Air Quality Standards and Regulatory Setting .....	3-40
3.4.3	Regional Attainment and Conformity Status .....	3-40
3.4.4	Existing Setting.....	3-43
3.4.5	Transit Air Quality Criteria .....	3-47
3.5	Noise .....	3-47
3.5.1	Transit Noise Criteria .....	3-49
3.5.2	Existing Noise Conditions .....	3-50
3.6	Vibration.....	3-53
3.6.1	Ground-borne Vibration Criteria.....	3-54
3.6.2	Existing Vibration Conditions .....	3-54
3.7	Visual and Aesthetic Resources .....	3-56
3.7.1	Overview of the Corridor .....	3-56
3.7.2	Visual Analysis Unit Descriptions .....	3-56
3.8	Historic Resources.....	3-70
3.8.1	Applicable Legal and Regulatory Requirements .....	3-70
3.8.2	Methodology and Study Area Historic Resources .....	3-71
3.9	Archeological Resources .....	3-72
3.9.1	Applicable Legal and Regulatory Requirements .....	3-72
3.9.2	Methodology and Study Area Archeological Resources.....	3-73
3.10	Parks and Recreational Resources .....	3-74
3.11	Ecosystems .....	3-77
3.11.1	Vegetation Inventory .....	3-77
3.11.2	Wildlife Inventory.....	3-81
3.11.3	Protected Species.....	3-82
3.12	Geology and Soils .....	3-86
3.12.1	Geology .....	3-86
3.12.2	Soils .....	3-86
3.13	Water Resources .....	3-89
3.13.1	Waters of the U.S., Including Wetlands .....	3-89
3.13.2	Groundwater.....	3-97
3.13.3	Floodplain.....	3-98
3.14	Hazardous/Regulated Materials .....	3-98
3.14.1	Methodology.....	3-98
3.14.2	Identified Sites .....	3-101
4.0	TRANSPORTATION IMPACTS .....	4-1
4.1	Impacts on Transit Service and Ridership .....	4-1
4.1.1	Transit Levels of Service.....	4-1
4.1.2	Transit Ridership .....	4-6
4.1.3	Ridership Impacts of Mobility 2035 Rail Improvements.....	4-8
4.2	Highway and Roadway Impacts .....	4-9
4.2.1	Regional Impacts.....	4-9
4.2.2	Local Impacts.....	4-12
4.3	Impacts on Movement of Freight .....	4-16
4.3.1	Freight Railroads .....	4-16

4.3.2	Trucking and Deliveries .....	4-16
4.4	Impacts on Non-Motorized Circulation.....	4-16
4.4.1	Pedestrian Movements.....	4-16
4.4.2	Bicycle Movements .....	4-17
5.0	ENVIRONMENTAL CONSEQUENCES .....	5-1
5.1	Land Use Impacts .....	5-1
5.1.1	Consistency with Land Use Plans .....	5-1
5.1.2	Regional Land Use and Development Impacts .....	5-2
5.1.3	Study Area Land Use and Development Impacts.....	5-4
5.1.4	Neighborhood Level Land Use and Development Impacts.....	5-5
5.1.5	Station Vicinity Land Use and Development Impacts .....	5-7
5.1.6	Economic Impacts and Development Opportunities .....	5-8
5.1.7	Land Use Impact Mitigation .....	5-12
5.2	Acquisition and Displacement Impacts.....	5-12
5.2.1	Station Acquisitions and Displacements .....	5-12
5.2.2	Alignment Acquisitions and Displacements.....	5-19
5.2.3	Acquisition and Displacement Impact Mitigation.....	5-20
5.3	Environmental Justice Impacts .....	5-21
5.3.1	Overview .....	5-21
5.3.2	Public Participation .....	5-22
5.3.3	Environmental Justice Assessment Methodology .....	5-22
5.3.4	Environmental Justice Impact Assessment.....	5-23
5.3.5	Environmental Justice Impact Mitigation .....	5-26
5.4	Air Quality Impacts.....	5-26
5.4.1	Air Quality Impact Assessment Methodology.....	5-26
5.4.2	Air Quality Impact Assessment .....	5-27
5.4.3	Air Quality Impact Mitigation.....	5-30
5.5	Noise Impacts.....	5-30
5.5.1	Noise Impact Assessment Methodology.....	5-30
5.5.2	Noise Impact Assessment .....	5-31
5.5.3	Noise Impact Mitigation.....	5-33
5.6	Vibration Impacts.....	5-34
5.6.1	Vibration Impact Assessment Methodology.....	5-34
5.6.2	Vibration Impact Assessment .....	5-34
5.6.3	Vibration Impact Mitigation.....	5-36
5.7	Visual and Aesthetic Resource Impacts .....	5-36
5.7.1	Visual and Aesthetic Impact Assessment Methodology.....	5-36
5.7.2	Visual and Aesthetic Impact Assessment.....	5-37
5.7.3	Visual and Aesthetic Impact Mitigation .....	5-41
5.8	Cultural and Historical Resource Impacts .....	5-41
5.8.1	Application of the Criteria of Adverse Effect .....	5-44
5.8.2	Formal Finding as to Whether Historic Properties May Be Affected.....	5-45
5.8.3	Finding of Effect .....	5-45
5.8.4	Determination of Adverse Effect .....	5-45
5.8.5	Cultural and Historical Impact Mitigation.....	5-45
5.9	Archeological Resource Impacts .....	5-45
5.9.1	Formal Finding as to Whether Archeological Resources May be Affected.....	5-46

5.9.2	Finding of Effect .....	5-46
5.9.3	Determination of Adverse Effect .....	5-46
5.9.4	Archeological Impact Mitigation.....	5-46
5.10	Park and Recreational Resource Impacts.....	5-47
5.10.1	Park and Recreational Impact Assessment Methodology .....	5-47
5.10.2	Park and Recreational Impact Assessment .....	5-47
5.10.3	Park and Recreational Impact Mitigation .....	5-48
5.11	Ecosystem Impacts.....	5-49
5.11.1	Long-term Vegetation Impact.....	5-49
5.11.2	Wildlife Impact.....	5-55
5.11.3	Impact on Protected Species .....	5-56
5.12	Geology and Soil Impacts .....	5-57
5.12.1	Geology Impact .....	5-57
5.12.2	Soil Impact.....	5-58
5.13	Water Resource Impacts.....	5-59
5.14	Hazardous and Regulated Material Impacts.....	5-64
5.14.1	Hazardous and Regulated Material Impact Assessment Methodology.....	5-65
5.14.2	Hazardous and Regulated Material Impact Assessment .....	5-65
5.14.3	Hazardous and Regulated Material Impact Mitigation.....	5-66
5.15	Safety and Security Impacts .....	5-67
5.16	Construction Impacts .....	5-71
5.16.1	Construction Scenario.....	5-71
5.16.2	Construction Impact Assessment.....	5-74
5.17	Required Permits and Authorizations .....	5-83
5.18	Relationship between Short-Term Uses of the Environment and Long-Term Productivity .....	5-84
5.19	Irreversible or Irrecoverable Commitment of Resources.....	5-84
5.20	Indirect and Cumulative Effects .....	5-85
5.20.1	Introduction and Methodology.....	5-85
5.20.2	Indirect Impacts .....	5-85
5.20.3	Cumulative Effects .....	5-93
6.0	PUBLIC AND AGENCY INVOLVEMENT.....	6-1
6.1	Public Involvement Plan.....	6-1
6.1.1	Summary of Public and Agency Participation .....	6-2
6.2	Agency Coordination.....	6-4
6.3	Public and Agency Involvement and the Draft Local EA.....	6-5
6.4	Comments and Responses received .....	6-5

**APPENDICES**

- Appendix A – List of Recipients
- Appendix B – List of Preparers
- Appendix C – 5% Design Plan and Profile Drawings/Additional Design Information
- Appendix D – Race/Ethnicity Data by Block
- Appendix E – Photo Documentation of Potential Water Crossings
- Appendix F – Agency Coordination Letters
- Appendix G – Chapter 26 Documentation - Runyon Creek Park
- Appendix H – Mitigation Monitoring

**LIST OF TABLES**

Table ES-1 Summary of Impacts and Suggested Mitigation Measures ..... ES-6

Table 2-1 Station Characteristics for the Proposed Light Rail Transit Alternative..... 2-8

Table 2-2 Proposed Station Characteristics ..... 2-10

Table 2-3 Capital Cost Estimate for the Proposed Light Rail Transit Alternative..... 2-16

Table 2-4 Bus Operating Plan for the Proposed Light Rail Transit Alternative ..... 2-19

Table 2-5 Traction Power Substations ..... 2-22

Table 2-6 Summary of Operation and Maintenance Cost Inputs ..... 2-23

Table 2-7 Annual Incremental Operating Cost Estimate..... 2-23

  

Table 3-1 Study Area Land Use ..... 3-2

Table 3-2 Churches in the Study Area ..... 3-10

Table 3-3 Major Employers near the Study Area ..... 3-10

Table 3-4 Race and Ethnicity for Project Study Area Population ..... 3-12

Table 3-5 Population Change in Surrounding Areas ..... 3-13

Table 3-6 Population Projections for Dallas County ..... 3-13

Table 3-7 Median Household Income ..... 3-14

Table 3-8 Income Distribution for Households ..... 3-16

Table 3-9 Poverty Populations ..... 3-17

Table 3-10 Population Five Years and Older Who Speak English Less than Very Well ..... 3-18

Table 3-11 Employment by Industry - by Percentage - in the Project Area ..... 3-19

Table 3-12 Means of Transportation to Work for Workers 16 and Over ..... 3-22

Table 3-13 Tenure by Vehicles (American Community Survey 2006-2010) ..... 3-24

Table 3-14 Functional Classification and Lane Configuration of Study Area Roadways ..... 3-25

Table 3-15 Transportation Model Socioeconomic Data ..... 3-27

Table 3-16 Roadway Capacity ..... 3-29

Table 3-17 Existing Transit Service: Description and Frequency (Peak and Off-Peak) ..... 3-30

Table 3-18 Summary of Service Headways for 2011 Existing Rail Network ..... 3-32

Table 3-19 Availability of Pedestrian Facilities ..... 3-33

Table 3-20 Non-Retail Off-Street Parking in the Study Area ..... 3-35

Table 3-21 Designation in City of Dallas’ Thoroughfare Plan ..... 3-37

Table 3-22 National Ambient Air Quality Standards ..... 3-41

Table 3-23 Nearest Active Ozone and Carbon Monoxide Air Monitoring Sites ..... 3-44

Table 3-24 Local Air Monitoring Stations Data Summary ..... 3-46

Table 3-25 Land Use Categories and Metrics for Transit Noise Impact Criteria ..... 3-49

Table 3-26 Summary of Existing Ambient Noise Measurement Results ..... 3-52

Table 3-27 Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact Criteria .... 3-55

Table 3-28 General Rating of Visual Analysis Units ..... 3-59

Table 3-29 Evaluation Rating Definitions ..... 3-59

Table 3-30 Rare, Threatened and Endangered Species of Potential Occurrence ..... 3-83

Table 3-31 Summary of Potential Waters of the U.S. Within the Project Study Area ..... 3-92

Table 3-32 Standard Environmental Records Sources ..... 3-99

Table 3-33 Environmental Records Source Findings ..... 3-105

  

Table 4-1 Transit System Performance Measures - Year 2035 ..... 4-2

Table 4-2 Build Alternative Travel Distances and Time ..... 4-4

Table 4-3	Select Transit Travel Times derived from Regional Travel Demand Model .....	4-5
Table 4-4	Daily LRT Alternative Station Volumes in 2035.....	4-7
Table 4-5	Comparison of the Build Alternative and the Mobility 2035 Rail Scenario .....	4-9
Table 4-6	Regional Home-Based Work Trips – Forecast for 2035 .....	4-10
Table 4-7	Roadway Traffic Volume and LOS .....	4-12
Table 4-8	Proposed Parking and Bus Facilities at LRT Stations .....	4-14
Table 5-1	Station Area Acquisitions .....	5-13
Table 5-2	Alignment and Adjacent Parcels .....	5-19
Table 5-3	Race and Ethnicity for Census Geographies Traversed by the Proposed Project ....	5-23
Table 5-4	2035 Regional Air Quality Analysis (for VMT) .....	5-28
Table 5-5	Noise Impact Assessment For Land Use - Daytime And Nighttime Sensitivity .....	5-32
Table 5-6	Noise Impact Assessment For Institutional Land Use -No Nighttime Sensitivity.....	5-33
Table 5-7	Land Use Category 2 Vibration Impact Assessment .....	5-35
Table 5-8	Land Use Category 3 Vibration Impact Assessment .....	5-35
Table 5-9	General Rating of Visual Analysis Units.....	5-38
Table 5-10	Potential Vegetation Impacts Within Proposed Right-Of-Way .....	5-55
Table 5-11	Physical Properties of Soil Series Found Within the Right-of-way .....	5-58
Table 5-12	Summary of Potential Impacts to Waters of the U.S., Including Wetlands .....	5-61
Table 5-13	Construction Activities and Equipment by Elevation .....	5-73
Table 5-14	Construction Coordination .....	5-75
Table 5-15	Construction-Related Traffic Impacts.....	5-76
Table 5-16	Existing Utility Crossing List .....	5-82
Table 5-17	Required Permits and Authorizations .....	5-84
Table 5-18	Acres of Land Available for Project-Influenced Development within the AOI .....	5-91
Table 5-19	Determination of Resources Included in the Cumulative Effects Analysis.....	5-94
Table 6-1	Summary of Public Involvement Activities.....	6-2
Table 6-2	Summary of Work Group Meetings .....	6-3
Table 6-3	Summary of Stakeholder Meetings.....	6-3
Table 6-4	List of Written and Verbal Comments Received .....	6-6

**LIST OF FIGURES**

Figure ES-1 Proposed Project Alignment.....ES-2

Figure 1-1 Proposed Project Alignment..... 1-2

Figure 1-2 Extended Market Catchment Area ..... 1-4

Figure 2-1 Alternatives Analysis Study Area ..... 2-2

Figure 2-2 Alignment Alternatives for Conceptual Evaluation ..... 2-3

Figure 2-3 Build Alternative – Proposed Horizontal and Vertical Alignment ..... 2-7

Figure 2-4 Ledbetter Station Site Plan – Proposed Improvements ..... 2-9

Figure 2-5 Proposed Camp Wisdom Station Site ..... 2-11

Figure 2-6 Camp Wisdom Station Site Plan ..... 2-12

Figure 2-7 Proposed UNT Dallas Station Site ..... 2-13

Figure 2-8 UNT Dallas Station Site ..... 2-14

Figure 2-9 UNT Dallas Station Site Plan ..... 2-15

Figure 2-9 No-Build Alternative Bus Operating Plan..... 2-17

Figure 2-10 Build Alternative Bus Operating Plan..... 2-18

Figure 2-11 Build Alternative LRT Operating Plan..... 2-21

Figure 3-1 (A) Existing Land Use..... 3-3

Figure 3-1 (B) Existing Land Use..... 3-4

Figure 3-1 (C) Existing Land Use..... 3-5

Figure 3-2 2010 Census Geography ..... 3-11

Figure 3-3 Median Household Income..... 3-15

Figure 3-4 2010 NCTCOG Employment Data ..... 3-21

Figure 3-5 Study Area Roadways ..... 3-26

Figure 3-6 Traffic Survey Zones..... 3-28

Figure 3-7 Existing Transit ..... 3-31

Figure 3-8 Bicycle Routes and Trails..... 3-34

Figure 3-9 Non-Attainment Area ..... 3-42

Figure 3-10 Air Quality Monitoring Stations ..... 3-45

Figure 3-11 Typical A-Weighted Sound Levels ..... 3-48

Figure 3-12 Noise Impact Criteria for Transit Projects..... 3-50

Figure 3-13 Noise and Vibration Site Locations ..... 3-51

Figure 3-14 Typical Levels of Ground-Borne Vibration ..... 3-54

Figure 3-15 Visual Analysis Units ..... 3-57

Figure 3-16 Parks and Recreational Resources ..... 3-75

Figure 3-17 Natural Regions and Biotic Provinces ..... 3-78

Figure 3-18 Vegetation and Natural Resources ..... 3-80

Figure 3-19 Soil Types and Geology ..... 3-88

Figure 3-20 Water Resources..... 3-94

Figure 3-21 (A) Hazardous/Regulated Material Sites..... 3-103

Figure 3-21 (B) Hazardous/Regulated Material Sites..... 3-104

Figure 4-1 Home-based-Work Trip Patterns for Study Area Residents ..... 4-10

Figure 4-2 Distribution Map of Enrolled Students by County..... 4-11

Figure 5-1 (A) Proposed Build Alternative Alignment.....	5-14
Figure 5-1 (B) Proposed Build Alternative Alignment.....	5-15
Figure 5-1 (C) Proposed Build Alternative Alignment.....	5-16
Figure 5-1 (D) Proposed Build Alternative Alignment.....	5-17
Figure 5-1 (E) Proposed Build Alternative Alignment.....	5-18
Figure 5-2 Study Area Minority Population and Household Income.....	5-24
Figure 5-3 Rendering of Proposed Alignment - Magnolia Trace to Camp Wisdom Station ....	5-40
Figure 5-4 Identified Cultural and Historical Resources.....	5-43
Figure 5-5 (A) Vegetation Types within Proposed Right-of-Way.....	5-50
Figure 5-5 (B) Vegetation Types within Proposed Right-of-Way.....	5-51
Figure 5-5 (C) Vegetation Types within Proposed Right-of-Way.....	5-52
Figure 5-5 (D) Vegetation Types within Proposed Right-of-Way.....	5-53
Figure 5-5 (E) Vegetation Types within Proposed Right-of-Way.....	5-54
Figure 5-6 Proposed Water Crossings.....	5-60
Figure 5-7 Area of Influence.....	5-87
Figure 5-8 Land Uses within the Area of Influence.....	5-90
Figure 5-9 Vegetation within the Area of Influence.....	5-98
Figure 6-1 Public Involvement Framework Plan.....	6-1