STATEMENT OF PURPOSE

In 2001, the Dallas Area Rapid Transit (DART) Board of Directors established a policy on Environmental Impact Assessment and Mitigation Monitoring (Resolution No. 010004, Policy IV.07). This policy replaced original Mitigation Policies adopted by the Board on May 22, 1990 (Resolution No. 900081). Administration procedures for this policy include the preparation of a guidance document “Environmental Impact Assessment and Mitigation Guidelines for Transit Projects,” which is to be updated annually.

The purpose of this document is to provide the 2018 update of the regulatory policies and procedures contained within the Environmental Impact Assessment and Mitigation Guidelines for Transit Projects guidance document. These guidelines provide a consistent approach in the consideration of environmental impacts analysis, mitigation, and the development and implementation of a mitigation monitoring program (MMP) for those actions requiring mitigation. This will help to:

- Maintain high environmental document quality;
- Facilitate efficient technical and policy review;
- Create consistency in information development and analysis;
- Expedite approval by the various federal, state, and local agencies having jurisdiction; and
- Ensure that appropriate mitigation is developed and implemented equally for all socioeconomic classes that would be affected by a project.

In addition, this manual is intended to provide up-to-date guidance to DART project planners and designers in the preparation of environmental documents that are required for the development of a variety of transit projects. This manual has been developed with specific consideration of how DART’s transit projects have been planned, designed, and constructed throughout the service area to meet three goals:

1. avoid, minimize, and mitigate impacts;
2. be neighborhood friendly; and
3. enhance the sustainability of communities and neighborhoods.
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<td>AASHTO</td>
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<td>American Standards for Testing and Materials</td>
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<td>best management practices</td>
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<td>National Ambient Air Quality Standards</td>
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<td>Definition</td>
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<td>Polychlorinated Biphenyls</td>
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<td>Pre-construction notification</td>
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<td>parts per million</td>
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<td>PTC</td>
<td>Positive Train Control</td>
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<td>Texas Administrative Code</td>
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<tr>
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<td>Texas Commission of Environmental Quality</td>
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1 INTRODUCTION

1.1 BACKGROUND

The DART Board of Directors approved the DART Mitigation Policies on May 22, 1990 via Resolution No. 900081, Policy IV.07. Under these policies, DART developed a consistent method of assessing potential environmental, social, and economic impacts for DART’s transit projects. Since the adoption of these policies, DART staff has prepared several federal environmental impact statement (EIS) documents and local environmental assessment (LEA) documents. The preparation of an EIS is a requirement for federally-funded projects. There is no federal documentation requirement for locally-funded projects; however, the DART Mitigation Policies call for the preparation of an LEA in order to document the impacts associated with locally-funded projects. DART also serves as technical lead for non-DART funded projects such as City of Dallas Streetcar Projects. The impact assessment and mitigation guidelines described herein are applied to all three types of projects.

Since the first publication of this document, there have been several changes to the accepted method of assessing potential impacts associated with transit and transportation projects. In addition, DART staff has recognized the value in the preparation of these documents for passenger rail projects and is expanding the requirement for all transit facilities developed by the agency, including projects primarily funded through agencies of the U.S. Department of Transportation (USDOT), such as the Federal Transit Administration (FTA), the Federal Highway Administration (FHWA), and the Federal Railroad Administration (FRA). For the purposes of this document, it is assumed that passenger rail means all forms of fixed-guideway rail to include Light Rail Transit (LRT), regional rail, commuter rail, and streetcar unless otherwise noted. Most of the facilities that have been constructed by DART have utilized federal funds and thus have required federal environmental documentation. However, it is recognized that some facilities may only utilize local funds and benefit from the processes identified in the mitigation policies, particularly where interagency coordination is still needed.

1.2 CONSISTENCY WITH FEDERAL, STATE AND LOCAL GUIDANCE

This document provides current guidance for the consistent preparation of environmental documentation and mitigation policies for projects requiring federal approvals and/or funds, as well as those projects that utilize only local funds or do not require federal approvals. This approach allows a decision-making process that integrates and streamlines compliance with all transportation and environmental laws applicable during project development. This document was adopted by DART on January 9, 2001 via Resolution No. 010004, Policy IV.07, which is included in this document as Appendix A.

This manual also considers a range of regulations and guidance at the federal, state, regional, and local levels. Appendix B includes the list of regulatory and guidance documents, including environmental categories to which they apply.

1.3 DOCUMENT ORGANIZATION

The manual contains three chapters. Chapter 1 provides an introduction and outlines how the manual applies to, or fits within, the project development process. In addition, information about implementation of the guidance, applicable projects, as well as the process for updating the manual, can be found in this chapter. The methodology for the assessment of impacts, guidance on the development of appropriate strategies for mitigation, as well as regulations and industry practices that should be considered for the assessment of impacts and development of mitigation for each impact category are presented in Chapter 2. Chapter 3 presents guidance for developing a Mitigation Monitoring Program (MMP). It begins with a discussion of the reasons for the MMP and explains the similarities and differences between the programs for federally-funded and locally-funded projects. The organization and procedures for developing and implementing the program are also included in Chapter 3.
1.4 POLICY IMPLEMENTATION

Environmental objectives and impacts must be considered continually throughout all phases of project development and implementation (planning, project definition, final design, construction, etc.). Social, economic, and environmental issues must be considered equally with engineering, safety, and mobility issues in reaching project decisions. It is DART’s intent to:

- Prepare a Federal document consistent with the National Environmental Policy Act (NEPA) for all projects where federal funding assistance is anticipated.
- Prepare an LEA for all projects that do not anticipate federal funding assistance.
- Provide continuous interaction between the planning, project development, and design/construction processes so that the results of analysis performed during the planning stage, including project purpose and need, alternatives, public input, environmental concerns, and proposed mitigation are brought forward into final design and construction.
- Ensure the integration of NEPA with other environmental review and decision-making requirements. Such a union requires early and effective interagency coordination to ensure adequate definition of the impacted resources, alternatives, public input, environmental concerns, and proposed mitigation are brought forward into final design and construction.
- Use an interdisciplinary approach to identify and analyze the potential impacts of proposed transit projects on both the human and natural environments.
- Ensure that all environmental documents capture and fully describe options to avoid, minimize, and mitigate adverse impacts; and, where possible, enhance both the natural and human environments.
- Ensure that environmental commitments made during planning and project definition, as well as those identified in the environmental documents, are implemented during final design and construction, maintenance, and operations.
- Develop and implement a public involvement program that:
  - Involves affected members of the public, so that affected citizens, especially those who have been under-served or under-represented in past transportation planning activities, have the opportunity to provide input.
  - Encourages active participation by the community to assist in the identification of important local issues that should be considered in the design of the project, and the assessment of impacts and development of alternative mitigation strategies.

This manual will assist in the execution of these policies and be implemented in four steps:

1. Preparation of an appropriate environmental document that identifies potential impacts on environmental quality utilizing the impact assessment methodology outlined in Chapter 2 of this document;
2. Development and evaluation of alternative approaches to mitigation where needed;
3. Selection of and commitment to specific mitigation measures during the planning phase of project development; and
4. Incorporation of the mitigation measures into project design and implementation of the MMP, where applicable.

Each of the steps is discussed in more detail in the following sections.
1.4.1 ENVIRONMENTAL DOCUMENT PREPARATION AND IMPACT ASSESSMENT

Requirements for the preparation of environmental documents vary. The type of transit project being proposed and whether the project will involve federal funds or approvals both impact the requirements. Figure 1 presents a flow chart to assist in determining the type of environmental documentation needed. Additional guidance for documents being prepared for federal or local projects is provided at the end of this section. In addition, graphic depiction of the typical project development process for federal, local and non-rail projects including the environmental process and mitigation monitoring is included in Appendix C.

Although local projects are not subject to the same level of agency review as federal projects, DART has historically employed a process similar to that implemented on a federal level to ensure that all communities within the DART Service Area receive equal treatment with regard to impact analysis and consideration of mitigation. The impact categories listed in Chapter 2 include a broad range of socio-economic, natural, and cultural resources, as well as physical environment issues. All of these categories will be considered for both federal and local projects. Also, the environmental objectives, impact assessment methodology, and guidance for consideration of mitigation contained in this document will guide both federal and local project environmental documentation.

Federal Projects

For federal projects, USDOT environmental guidance documents present three classes of transportation actions requiring different levels of environmental documentation pursuant to NEPA. They include:

Class I – EIS: For actions that significantly affect the environment. Transit projects where DART has completed or is preparing an EIS include:

- South Oak Cliff Corridor Final Environmental Impact Statement (FEIS) (included Central Business District), August 1991;
- North Central Corridor LRT Extension FEIS, April 1997;
- Northwest Corridor LRT Line to Farmers Branch and Carrollton FEIS, October 2003;
- Southeast Corridor LRT Line FEIS, October 2003;
- Northwest Corridor LRT Line to Irving/ Dallas/Fort Worth International Airport (DFW Airport) FEIS, July 2008;
- Cotton Belt Corridor FEIS/Record of Decision (ROD), November 9, 2018.
- Downtown Dallas Transit Study (D2) Alternatives Analysis (AA)/Draft Environmental Impact Statement (DEIS), April 2010; Supplemental DEIS for Dallas CBD Second Light Rail Alignment (D2 Subway), in development.

Class II – Categorical Exclusion (CE): For actions that do not individually or cumulatively have a significant environmental effect and are excluded from the requirement to prepare an EIS or Environmental Assessment (EA). 23 Code of Federal Regulations (CFR) Part 771.118(c) (as amended) and 45 FR 40854 provide a listing of actions that normally fall into this category. Examples of DART-prepared CEs include:

- Central Business District East Transfer Center;
- Central Business District West Transfer Center;
- Lake Ray Hubbard Transit Center;
- Elm-Commerce Bus Transfer Center;
- Lake Highlands LRT Station;
- TRE Valley View Grade Separation and Double Track (FTA and FRA);
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• DART CBD Track Replacement/Enhancement;
• Level Boarding Improvements at Outlying DART LRT Stations,
• The Red and Blue Line Platform Extensions Project, and
• Trinity Railway Express Station Safety Improvements Project (FRA).

Class III – EA: For actions in which the significance of the environmental impact is not clearly established. All actions that are not Class I or II are Class III. All actions in this class require the preparation of an EA to determine the appropriate environmental document required. Some examples of DART projects in this category include:

• South Irving Transit Center;
• West Irving Transit Center;
• Martin Luther King, Jr. Transit Center;
• Orange Line DFW Airport Extension Irving-3 EA – Finding of no significant impact (FONSI) issued October 2011; Re-evaluation accepted April 2012; and
• City of Dallas Streetcar EA (TIGER Grant Project) – FONSI issued July 2011; Re-evaluation accepted February 2012.

The major differences between an EA and an EIS prepared for federal projects are that EAs:

• Have a more general treatment of alternatives;
• Have less-detailed analysis of impacts;
• Do not require formal notice of intent (NOI) or public hearings; and
• Are not typically prepared for major investment-type projects.

However, both EISs and EAs require an analysis of the No-Build Alternative in accordance with NEPA. Additional information on the preparation and processing of these federal documents can be found in 23 CFR Part 771 and 45 FR 40854. The appropriate lead agency will determine which document will be prepared to address each undertaking.

When the lead USDOT agency concludes the NEPA process with a ROD, FONSI, or a CE, it has made a determination of a proposal’s concept, location, and major design features. This is in addition to a comprehensive review of social, economic, and environmental impacts along with mitigation and enhancement.

The Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law on July 6, 2012, and authorizes federal funding for surface transportation programs for two years. MAP-21 accelerates the project delivery by providing steady funding and consolidating certain transit programs to improve efficiency. In addition, MAP-21 targets funding increases for improving the state of good repair, and creates new reporting requirements. MAP-21 projects are subject to FTA NEPA Rule (completed February 7, 2013), which includes new CE lists, early scoping, electronic tools for public involvement, and a revised list of projects typically requiring an EIS. Many smaller programs have been eliminated, but their eligibilities fall under newly created, streamlined programs under MAP-21.

MAP-21 accelerates the project delivery timeline by expediting the delivery of certain transit and highway projects. Not all projects require as much documentation as others, as outlined in 23 CFR §771, which includes the process for creating a CE document.
1.0 Introduction

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April 2019

Figure 1 - Environmental Documentation Flowchart
The Fixing America’s Surface Transportation (FAST) Act (Pub. L. No. 114-94) was signed into law on December 4, 2015. The FAST Act builds on the authorities and requirements in MAP-21 to accelerate the environmental review process for surface transportation projects by institutionalizing best practices and expediting complex infrastructure projects without undermining critical environmental laws or opportunities for public engagement. The FAST Act authorized $305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs.

The most recent legislation related to environmental impacts and related procedures is the final rule which amends FHWA and FTA regulations implementing the NEPA and Section 4(f) requirements. In addition, through this final rule, FRA is joining those regulations, making them FRA’s NEPA and Section 4(f) implementing regulations. The FHWA, FRA and FTA modified the NEPA and Section 4(f) regulations to reflect various provisions of the MAP-21 and the FAST Act. The Agencies have also revised the environmental impact and related procedures regulations to reflect various procedural changes, such as including a new section on combined final EIS/ROD documents, and to improve readability and reflect current practice. This final rule also amends the parks, recreation areas, wildlife and waterfowl refuges, and historic sites regulations to reflect new exceptions created by the FAST Act.

Local Projects

An LEA will be prepared for all locally-funded projects that are likely to produce adverse impacts. For major projects, such as a locally-funded passenger rail line, DART will conduct a full LEA that is similar in scope to the federal process. This will include coordination with the applicable local, state, and federal agencies; public involvement; and a thorough assessment of the potential impacts of all alternatives. Examples of transit projects where DART has prepared an LEA include:

- West Oak Cliff Corridor LEA, June 1990;
- North Central (to Park Lane) LEA, June 1990;
- Northeast Corridor LEA, January 1997;
- DART Rail to Rowlett LEA, May 2007;
- South Oak Cliff Corridor Blue Line Extension LEA, May 2013.

For the Cotton Belt Regional Rail Corridor, DART prepared an alternatives and environmental considerations report (AECR) which included several supporting analyses that are the basis for the FEIS/ROD, completed in November 2018.

For smaller projects that are not likely to have significant environmental impacts, DART will prepare an LEA with the anticipation of a local FONSI. Similar to the federal EA, this process will have a more general treatment of alternatives; less detailed analysis of impacts; and will not require formal NOI or public hearings. DART has prepared LEAs with local FONSIs for the West Irving Commuter Rail Station and the Rowlett Park-and-Ride.

DART does not have an equivalent to the federal CE for its locally-funded projects; however, an environmental study can be utilized to document projects that are unlikely to have impacts on the environment, such as passenger transfer locations. This environmental study should evaluate a broad range of potential impacts. If the environmental study reveals a potential for adverse impacts, then an EA with the anticipation of a FONSI should be considered.

State Projects

In cases where DART plans to implement a project using state funding, DART would complete environmental documentation in accordance with Texas Department of Transportation (TxDOT) guidance. An example of such a project is the City of Dallas Bishop Arts Streetcar Extension Project, which used Texas Mobility Funds. DART is under agreement with the City of Dallas as their technical representative and completed documentation to support a CE.

- Dallas Streetcar Bishop Arts Extension CE, January 2015
- Re-evaluation Consultation Checklist, July 2015
New guidance regarding the TxDOT CE process was updated in September 2018. Regular revisions or updates to the process can be found on TxDOT’s website under their NEPA and Project Development Toolkit. State guidance is included in Appendix B.

1.4.2 DEVELOPMENT OF APPROPRIATE MITIGATION STRATEGIES

Once the environmental impact assessment is completed, mitigation will need to be considered where impacts are likely to occur. Mitigation measures are defined in the Council on Environmental Quality (CEQ) Regulations (40 CFR Part 1508.20 – Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act in five ways:

1) Avoiding the impact completely by not taking a certain action or parts of an action;
2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
5) Compensating for the impact by replacing or providing substitute resources or environments.

Each DART project expresses the unique needs and culture of the community, illustrating community cohesion and preservation techniques, and featuring community mitigation and enhancement measures. As each project is different, both in terms of its nature and the surrounding area affected, mitigation is considered on a case-by-case basis. Where it is determined that mitigation should be provided, alternative approaches are developed and compared during conceptual design. Factors that are considered in the comparison of alternative mitigation measures include:

- Effectiveness of achieving DART’s environmental goals;
- Effects on transit operations;
- Capital costs;
- Operation and maintenance costs;
- New impacts created;
- Compliance with current federal, state, and local environmental protection laws and ordinances; and
- Acceptability to the community and applicable regulatory agencies.

The effectiveness of mitigation depends in large part upon the quality of the mitigation measures themselves. Poorly conceived measures are not only difficult to implement, they are difficult to report and monitor. The following issues should be considered when developing mitigation measures:

- **Certainty**: Avoid using the words "may" or "should" when the intent is to direct some required action. Use "will" or "shall" in this situation. Likewise, avoid measures that are conditioned on feasibility (i.e., required "where feasible") rather than applied directly or at a specified stage in the project. Measures should be written in clear, declarative language. They should specify what is required to be done, how it is to be done, when it must be done, and who is responsible for ensuring its completion.
- **Performance**: Include specific minimum, measurable performance standards in all quantitative measures, and, if possible, contingency plans if the performance standards are not met.
- **Authority**: Indicate which measures are based on some other authority (i.e., zoning code, tree preservation ordinance, etc.). Often the enforceability of these measures, as well as some monitoring or reporting, is dependent on agencies external to DART.
- **Continuity and Consistency**: Integrate mitigation measures with existing policy and regulatory systems, as well as inspection or review schedules. For example, where the mitigation measures are regulatory in nature, they should be designed as
conditions of approval within the context of the zoning, subdivision, or other ordinances. Furthermore, mitigation measures must take applicable local, regional, and state plans and policies into account, as well as be consistent with those policies.

- **Feasibility**: Above all, mitigation measures must be feasible to undertake and complete. These should include consideration of how implementation of each measure is to be reported and monitored.

### 1.4.3 COMMITMENT TO SPECIFIC MITIGATION MEASURES

The environmental analysis and associated community involvement processes will conclude with the adoption of specific mitigation measures. This process begins once the DART Board of Directors selects a preferred alternative based on conceptual design studies, the findings of the federal or local environmental impact assessment, and community input.

The mitigation alternatives developed during conceptual design will be further evaluated and refined during a more detailed design process. Public involvement will play an important role on the level of emphasis to be placed on each evaluation factor as mitigation alternatives are compared and the final mitigation program is formulated.

Once the final decision on mitigation is made, DART will commit to implementing the specific measures. For federal projects, the commitment is included within the Final EIS or Final EA. For local projects, the commitment will be included within the Final LEA.

### 1.4.4 IMPLEMENTATION OF MITIGATION MEASURES

Mitigation measures will be incorporated into project plans within the following areas, as appropriate:

- Final design,
- Project specifications,
- Construction, and
- Operating and maintenance procedures.

An MMP will be developed to establish procedures for monitoring the implementation of DART’s obligations and commitments for mitigating adverse impacts associated with the project. Details of the program can be found in Chapter 3.

### 1.5 PROCESS FOR UPDATING THE GUIDELINES

The federal, state, and local legislation and regulations that govern the process for impact assessment, environmental permitting, and mitigation, as well as standard industry practices, are subject to change. To be useful, a mechanism must be put into place so that the procedures outlined in this guidance reflect those changes.

For this reason, the DART Vice President of Rail Planning, or his or her designated representative, conducts an annual review of this guidance to incorporate changes. This annual review takes into account any significant regulatory or industry practice changes that have occurred. The review takes place in the latter half of each fiscal year. An updated guidance document is made available on DARTnet during the following fiscal year after the review and update. A copy of the guidance is also provided to Rail Program Development File Room (RPDFR) and distributed to key departmental staff.

Appendix D of this document includes a summary of key changes from the prior year. This allows users to understand what changes have been made that may affect the impact assessment and/or mitigation associated with future projects. In accordance with DART Policy IV.07, the guidelines and any subsequent changes will be reviewed with the DART Planning Committee before the guidelines are finalized.

Appendix E of this document includes Mitigation and Betterment examples that DART has used in previous projects.
2 IMPACT ASSESSMENT CATEGORIES

This chapter provides guidance for determining whether the construction and operation of a transit project may have beneficial or adverse impacts. It also includes methodologies for conducting impact assessments. In addition, guidance on the development of appropriate mitigation, as well as background information about applicable regulations and industry practices is provided.

The following resource areas are discussed in detail:

- Acquisition and Displacement
- Social Interaction
- Environmental Justice
- Land Use Planning
- Visual and Aesthetic Quality
- Safety
- Security
- Traffic Flow
- Parking
- Noise and Vibration
- Hazardous/Regulated Materials
- Air Quality
- Water Resources
- Wetlands and Ecosystems
- Parklands
- Historic Resources
- Archaeology
- Cumulative Effects
- Impacts to Airport Property
2.1 ACQUISITION AND DISPLACEMENT

In some instances, the need arises for the displacement of homes, businesses, farm operations, or non-profit organizations as a result of transit projects. New transit facilities, such as park-and-ride lots, may require the acquisition of land and could result in displacements. Many times DART right-of-way (ROW) needs to be expanded for passenger rail operations or other types of transit projects, and property acquisition with or without eminent domain is required. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, provides benefits to homeowners, businesses, community facilities, and farm operators resulting from acquisition. This section provides guidance in determining the extent of acquisition and/or displacement necessary and ensuring that the individuals or businesses displaced are treated in a fair and equitable manner.

2.1.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Minimize displacements required by transit projects.
- Relocate displaced households into housing that is decent, safe, and sanitary; has adequate living space to accommodate the displaced household; and fits the household’s financial limits after decent, safe, and sanitary requirements are met.
- Provide fair and equitable treatment to all persons and organizations affected by the transit project property acquisition.

When is an Impact Likely to Occur?

Impacts are likely if a transit project results in the displacement of homes, businesses, farm operations, and/or non-profit organizations. A factor to consider is the availability of replacement buildings and facilities within the community.

Assessment Methodology

The assessment methodology consists of the following:

Gathering the following information regarding the displacement of homes, businesses, farm operations, and non-profit organizations:

- A general description of the area or neighborhood where displacement would occur.
  - The service area or neighborhood where displacement occurs will be identified, as well as the service areas of community services, neighborhood boundaries, vacancy rates, number of subsidized housing units, and average property values and rents.
- Demographic characteristics including median household income, household size, percent of rented and owner-occupied homes, percent of minorities, and percent of elderly persons.
- Environmental Justice (EJ) issues to be considered if there is a high number of low-income and/or minority persons who would be relocated.
  - See Section 2.3 of this chapter for additional information about EJ concerns.
- The approximate number of individuals, families, businesses, farm operations, and non-profit organizations that would be displaced.
  - A windshield or sidewalk survey (observation) will be used in combination with other data gathered in this assessment to determine the likely relocation requirements of those displaced. For residences, this will focus on housing type and size. For businesses and non-profit organizations, this will include the type of business or organization, specific needs (including building size, parking needs, zoning requirements, access to transit dock space, and special utility requirements), and needs that impact the timing of the displacement (e.g., seasonal operation, weekend move only).
• No intentional disturbance of landowners or tenants will be made during this effort or until a final alignment or site is selected and acquisition is authorized.

Determining the availability of replacement buildings and facilities:

• The likely availability of decent, safe, and sanitary replacement housing within financial means of all households that would be displaced is determined via contacts with real estate brokers, public housing authorities, chambers of commerce, and/or local builders.

• Other major public works projects in the same area that may also require the use of available replacement lands, structures, or facilities.

Farmland Impacts:

• Coordination with the National Resource Conservation Service (NRCS) and, as appropriate, state, and local agriculture agencies where any farmland could be directly or indirectly impacted.
  • If impacts are found, Form AD 1006 (Farmland Conversion Impact Rating) should be processed as appropriate. Where the Land Evaluation and Site Assessment score from Form AD 1006 is 160 points or greater, alternatives to avoid farmland impacts should be discussed.

The findings of the above studies will be presented in the LEA or federal NEPA document as a conceptual relocation plan.

**When Should Mitigation Be Considered?**

Mitigation is appropriate whenever homes, businesses, farm operations, community facilities, and/or non-profit organizations are displaced by a transit project.

**Common Mitigation Techniques**

• Provide assistance to displaced households, businesses, farm operations, and non-profit organizations in finding replacement locations, including maintaining lists of replacement properties.

• Provide payments (subject to upper limits) to households for moving costs, costs incurred when purchasing a dwelling, and supplemental payments to cover higher costs of new housing compared to old.

• Provide payments (subject to upper limits) to businesses and non-profit organizations for moving costs; professional services to plan moves; reimbursement for unexpired licenses, permits, or certifications; replacement of stationary supplies; loss of tangible personal property that cannot be moved; and the cost of searching for a replacement location.

**2.1.2 BACKGROUND**

**Regulating Law and Industry Practice**

DART has adopted a [Real Estate Policy](August 1987, updated October 2000), which is based on the requirements of the [Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970](42 U.S.C. 4601) as amended. They set policies and procedures for property appraisal, property acquisition, relocation, property management, and joint development. Following a decision to acquire property, the DART Real Estate Department will prepare a displacement analysis in which the needs of individual displacees will be documented, and information on relocation entitlements will be provided to displacees. DART will assist those displaced in finding replacement locations. For federally funded and/or other transit projects, the requirements of the [Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970](42 U.S.C. 4601) as amended, must be followed.

DART has adopted [Light Rail Transit System Development Procedures Policy](Resolution No. 010117, August 28, 2001, which
2.0 Impact Assessment Categories

2.0.1 Impact Assessment Categories

Environmental Impact Assessment and Mitigation Guidelines for Transit Projects
Dallas Area Rapid Transit

2-4 April 2019

Outlines procedures under which DART will work with service area cities to implement and operate the DART LRT system. Specifically, Article 4, Acquisition, Use and Ownership of Land and/or Facilities, outlines procedures that DART will follow regarding acquiring land by DART for the City or acquiring land by the City for DART. Also outlined in this resolution, are procedures for the use of joint-owned facilities, DART-owned facilities, and City-owned facilities.

In addition, FTA released the Guidance on the Application of 49 USC 5324(c) to Railroad Right-of-Way Acquisition on April 30, 2009 which established new guidance related to railroad corridor preservation. FTA issued new Final Guidance on the Application of 49 USC 5323 (q) to Corridor Preservation for a Transit Project on October 1, 2012. This guidance establishes corridor preservation that is not limited to railroad ROW.

Regulating Agencies

Each federal funding and licensing agency and the local governmental body receiving funding or licensing is responsible for meeting the requirements of real estate and relocation law.

Applicable Design Criteria, Drawings, and Specifications

Procedures related to relocation and acquisitions are addressed in DART’s Real Estate Policy and in DART’s Light Rail Transit System Development Procedures Policy.

2.2 SOCIAL INTERACTION

For the development and implementation of transit projects, the effect on community character and cohesion is a key consideration.

2.2.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Contribute to community cohesion.
- Contribute to the local economy, where possible, and avoid negative economic impacts.
- Provide for an equitable distribution of costs and benefits and ensure that the project does not have a disproportionately high and adverse impact on low-income or minority persons. Refer to Section 2.3 for additional EJ information.

When is an Impact Likely to Occur?

Determination of an impact on social interaction is somewhat qualitative. The input of the public, municipal planners and other local officials is critical in determining whether a project will have an impact. The following potential indicators are useful tools to assist in the evaluation of whether a project will have a positive or adverse impact on social interaction.

- Whether there exists an acceptable degree of support for the transit project from the local community and municipal planning agencies.
- Whether there would be a physical or social split of any neighborhoods.
- Whether social isolation would occur, such as isolating a portion of an ethnic group or neighborhood.
- Whether there would be a separation of residences from community facilities.
- Whether neighborhood or community access is increased or disrupted.
2.0 Impact Assessment Categories

- Whether the project would create a new community focal point or reinforce an existing or planned focal point, thus encouraging community cohesion.

- Whether displacement of businesses or residences would alter the stability of a neighborhood or community, or the social or economic character of such an area.

- Whether the project would introduce substantial noise, air quality, visual, traffic, or other transit-generated intrusions into a community.
  - See the other sections of Chapter 2, which address each of these concerns in more detail.

- Whether the project would result in a disproportionately high and adverse impact on low-income, minority, or elderly populations, as well as people with disabilities.
  - Section 2.3 of this document provides additional guidance regarding impacts on low-income and minority populations.

Assessment Methodology

The assessment methodology is a three-step process including:

- Identification of the following characteristics of the existing neighborhoods and communities:
  - Boundaries of the neighborhoods and communities surrounding the project.
  - Demographic characteristics to provide a comparison of both the project area and the surrounding communities as a whole, such as:
    - Total population;
    - Total households;
    - Persons per household;
    - Racial and ethnic composition;
    - Age composition;
    - Gender composition;
    - Household income;
    - Percentage of project area population with disabilities;
    - Number of households with no access to a vehicle; and
    - Forecasts of population growth.

- Numbers, types, and locations of community facilities in the project area including schools, community centers, health care facilities, parks, and cultural facilities and the boundaries of their service areas.

- Existing community focal points and centers of activity, such as community centers, churches or other religious facilities, shopping, and schools.

- Current circulation patterns for pedestrians, bicycles, and motorized vehicles.

- Types and numbers of displaced residences, businesses, and employees.
  - Acquisitions and displacements are discussed in more detail in Section 2.1 of this document.

- Evaluation of impacts in terms of those defined in When is an Impact Likely to Occur? using the data collected for the neighborhoods and the community.

- Development of alternative mitigation strategies for those cases where mitigation should be considered (see guidance below):
  - Coordination with municipal planning agencies and community representatives is key in the identification, comparison, and selection of appropriate mitigation.

When Should Mitigation Be Considered?

Mitigation may be appropriate when any of the following conditions occur.
Impact Assessment Categories

The project is opposed by a substantial portion of the neighborhood or community population or by municipal planning agencies. Many times this opposition is related to a specific impact that can be mitigated.

- Physical or psychological barriers are introduced that segment a neighborhood or ethnic group.
- Pedestrian, bicycle, or motor vehicle circulation patterns would be disrupted or access to centers of activity or community services would be reduced.
- Substantial noise, air quality, visual, traffic, or other transit-generated intrusions occur.
- A minority, low-income, or elderly population or persons with disabilities are disproportionately high and adversely impacted by the distribution of costs and benefits of the project.

Common Mitigation Techniques

The specific type of mitigation that could be applied is dependent on the characteristics of the particular neighborhood or community that is affected by the transit project. A wide range of techniques, too numerous to list here, are available. A few examples are provided as follows:

- Select components for the stations or other facilities that complement the surrounding neighborhood or community.
- Link stations or other transit stops with other community services or focal points, such as community colleges, hospitals, and shopping districts.
- Provide landscape screening or design the facilities to blend in with the surrounding environments.
- Relocate displaced residences/businesses within the same community, where possible, to ensure that the community's character remains intact.

2.2.2 BACKGROUND

Regulating Law and Industry Practice

Standard industry practice calls for working closely with community representatives and municipal planning agencies throughout the planning, design, construction, and implementation phases to develop the project so that it is an asset to the community.

According to FTA’s website, Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin in programs and activities receiving Federal financial assistance. Specifically, Title VI provides that “no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.” (42 U.S.C. Section 2000d).

Executive Order 12898 (EO 12898), Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President Clinton on February 11, 1994, goes one step further and requires that federal agencies consider and address disproportionately high adverse environmental effects of proposed federal projects on minority and low-income populations. These issues must be addressed for federal projects being evaluated pursuant to NEPA. Section 2.3 of this document provides additional guidance regarding EJ issues.
DART adopted and issued a Betterments Policy for Residential Areas, Resolution, No. 970217, in 1997. The policy provides enhancements above and beyond the standard mitigation measures or design criteria identified through the planning and preliminary engineering process for transit projects. The policy states that betterments will be considered for residential areas if a majority of the property owners bordering the passenger rail ROW request them. Examples of betterments could include landscaping, artwork, or other visual treatments to enhance the appearance of the project. The target budget for betterments is calculated based on the centerline of the project area and an amount not to exceed $70/linear foot in 1997 dollars increasing 4% per year for inflation (unless otherwise directed by DART Finance). The current dollar amount is $147.00/linear foot in 2018 dollars. Recommendations for betterments are based on input from affected property owners, reasonableness, maintainability, and technical feasibility.

In addition, DART adopted the Light Rail Transit System Development Procedures Policy, Resolution No. 010117, in 2001. This resolution provides guidance for when DART and the service area cities agree that DART shall construct a betterment to city facilities.

**Regulating Agencies**
- Municipal governments
- USDOT
- U.S. Environmental Protection Agency (EPA)

**Applicable Design Criteria, Drawings, and Specifications**
The situation of each community and neighborhood will be addressed individually.

### 2.3 ENVIRONMENTAL JUSTICE

According to FTA, over the past two decades, there has been increasing concern over environmental impacts on minority and low-income populations. Evidence suggests that some communities have faced disproportionately high and adverse human health and environmental effects. This concern builds upon Title VI of the Civil Rights Act of 1964 (42 U.S.C 2000d), which prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance. EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations requires that federal agencies consider and address disproportionately high adverse effects of proposed federal projects on minority and low-income populations. The EO is designed to focus federal attention on the environmental and human health conditions in minority and low-income communities with the goal of achieving EJ. EO 12898 is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment.

Populations with Limited English Proficiency (LEP) are also of concern during the NEPA process. FTA's Office of Civil Rights states that "Individuals who do not speak English as their primary language and who have a limited ability to read, write, speak, or understand English can be limited English proficient; or Households where no one over age 14 speaks English well." EO 13166 on Limited-English Proficiency helps ensure outreach to non-English-speaking populations as a component of the public involvement and environmental compliance process. An LEP assessment is typically included as a separate discussion in the EJ section of an environmental impact assessment since LEP populations are often also EJ populations.
2.3.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Ensure that new investments and changes in transit facilities, services, maintenance, and vehicle replacement deliver equitable levels of service and benefits to minority and low-income populations.

- Avoid, minimize, and/or mitigate disproportionately high and adverse effects on minority and low-income populations.

- Enhance public involvement activities to identify and address the needs of minority and low-income populations in making transportation decisions.

When is an Impact Likely to Occur?

The USDOT’s Order 5610.2(a) Actions to Address EJ in Minority Populations and Low-Income Populations (May 2012) defines a disproportionately high and adverse effect as an adverse impact that is:

- Predominately borne by a minority population and/or a low-income population, or

- Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

The total individual or cumulative health, environmental, social and economic adverse effects should be evaluated. Therefore, the indicators of potential impacts described in the other sections of this chapter should all be considered in helping to determine whether the impacts on these populations are disproportionately high and adverse.

Inclusion of LEP populations in the public involvement program helps ensure these populations receive full and fair access to public decision making processes in alignment with EJ objectives.

Assessment Methodology

The assessment methodology consists of six steps:

1) Identify the minority and low-income populations in the study area. Recent discussions with FTA indicate that a neighborhood level analysis is more appropriate than using census tract data. Thus, a more detailed level of information should be used to document and analyze EJ impacts. This would be accomplished through utilization of census block or block group data.

2) Evaluate the adverse effects of the various environmental discipline categories discussed in this chapter in terms of whether there will be impacts on minority and low-income populations. The analysis should focus on those impact areas most likely to be of concern including acquisition and displacement; social interaction; land use and development; visual and aesthetic quality; safety; security; traffic flow; noise and vibration; and park lands. However, all of the categories discussed in this chapter should be considered. There should be ample opportunity throughout the environmental process to involve potentially affected parties, individuals, and communities so that all important issues can be identified.

3) Develop alternative mitigation strategies for those cases where mitigation should be considered. Again, public involvement is key to the identification, comparison, and selection of the appropriate mitigation. Include LEP populations in public involvement and provide proper documentation (i.e. prepare public meeting notices in Spanish where relevant and include copies of notices in the environmental document).

4) Evaluate the benefits of the project to minority and low-income populations. The items to consider would include, but are not
necessarily limited to, improved transit mobility, improved access to transit, and transit travel time savings.

5) Make a preliminary determination (FTA will make the final determination on the locally preferred alternative [LPA]) as to whether high and adverse impacts of the transit project fall disproportionately on minority and/or low-income populations. Factors to consider in this determination include:
   a) Adverse impacts;
   b) Mitigation and enhancement measures incorporated into the project; and
   c) Off-setting benefits.

6) After the LPA has been selected and FTA has reviewed the federal environmental document, the alternatives considered, public comments and testimony, and the public involvement process itself, FTA will determine if there are disproportionate impacts. If the impacts of the project fall disproportionately on minority and/or low-income populations, additional mitigation measures, beyond those already identified, may be required.

7) When appropriate, conduct a service and fare equity analysis in accordance with FTA Circular 4702.1B when DART is an FTA direct grant recipient.

When Should Mitigation Be Considered?

Refer to the other applicable environmental impact category discussions in this chapter to determine when mitigation should be considered.

Once the evaluation is completed and all public comments have been received, FTA will determine if the LPA will have disproportionately high adverse environmental effects on minority and low-income populations. If the FTA determines that disproportionately high and adverse impacts will fall on these populations, then additional mitigation measures may need to be developed. If measures cannot be taken to adequately minimize these impacts, then selection of an alternative with less adverse impact may need to be considered.

Common Mitigation Techniques

Refer to the other applicable environmental impact category discussions in this chapter for common mitigation techniques related to each type of impact that could affect minority and/or low-income populations.

2.3.2 BACKGROUND

Regulating Law and Industry Practice

EO 12898 requires that federal agencies consider and address disproportionately high and adverse environmental effects of proposed federal projects on minority populations and low-income populations. In 1997, USDOT issued its final order to comply with EO 12898. It is the policy of USDOT to promote the principles of EJ as embodied in EO 12898 throughout planning and decision-making using the principles of the several regulations listed in Appendix B that are applicable to EJ.

Under the USDOT final rule, planning and programming activities that have the potential to have a disproportionately high and adverse effect on human health or the environment shall include explicit consideration of the effects on minority populations and low-income populations. Procedures to ensure meaningful opportunities for public involvement by members of minority populations and low-income populations must be provided during planning activities, including the identification of potential effects, alternatives, and mitigation measures.

On December 10, 1997, CEQ issued Environmental Justice Guidance under the NEPA. This document provides federal agencies with general guidance about how to ensure effective public participation, determine the affected environment, analyze how the impacts are distributed within the affected community, and develop
appropriate mitigation. The document also states that it does not prescribe to "...any specific format for examining EJ, such as designating a specific chapter or section in an EIS or EA on EJ issues. Agencies should integrate analyses of EJ concerns in an appropriate manner so as to be clear, concise, and comprehensible within the general format suggested by 40 CFR Part 1502.10."

EPA is required under Section 309 of the Clean Air Act to comment on the environmental impacts associated with proposed actions of federal agencies, including actions subject to NEPA's EIS requirements. EPA's review process encompasses the requirement for EPA to ensure that EJ concerns are considered by federal agencies. In July of 1999, EPA issued Final Guidance for Consideration of Environmental Justice in Clean Air Act 309 Reviews. Although this guidance is meant for EPA staff reviewers, it provides insight as to what EPA considers during its review of EJ issues.

EO 12898 applies only to federal projects; however, it is DART's intention to consider the principles set forth in the EO when evaluating the impacts on minority and low-income populations and developing mitigation measures for both federal and local transit projects.

**Regulating Agencies**

- USDOT – FTA
- EPA

**Applicable Design Criteria, Drawings, and Specifications**

The situation of each community and neighborhood will be addressed individually.

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### 2.4 LAND USE PLANNING

It is important that transit facilities be designed, to the extent possible, to be compatible with its existing surroundings and consistent with the local communities' plans for future development.

#### 2.4.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

**Objectives**

- Reinforce community planning and development objectives.
- Integrate transit facilities into the communities that surround them.
- Minimize disruptions and other inconveniences to surrounding land uses during construction.

**When is an Impact Likely to Occur?**

Determination of an impact on land use is somewhat subjective. The input of the public, municipal planners and other local officials is critical in determining whether a project will have an impact. The following potential indicators are useful tools to assist in the evaluation of whether a project will have a positive or adverse impact.

- Whether an acceptable degree of support for the transit project exists from the local community and municipal planning agencies.
- Whether pedestrian, bicycle, and motor vehicle activity generated by the transit facility would be substantially greater than such activity on surrounding land uses under existing conditions and with future development planned for the area.
2.0 Impact Assessment Categories

- Whether the project would reinforce the objectives of local land use, economic development, and community service improvement plans.
- Whether development would be encouraged, development patterns changed, or densities increased in a manner that would be inconsistent with the character of the existing community or its future development plans.
- Whether the project would require zoning changes for implementation.
- Whether the project would require the conversion of substantial parcels of land, thus resulting in considerable changes to existing or planned land uses.
- Whether a substantial reduction or increase of the local tax base would occur.
- Whether the project would induce development and, if so, it should be determined if the secondary impacts on the community would be beneficial or adverse.
- Whether substantial adverse impacts are anticipated during construction. Impacts of the following should be considered: restricted access to businesses and residences; temporary closure of pedestrian or bicycle passageways; temporary disruptions of utility services; and locations of staging sites and haul routes in sensitive areas. Short-term impacts on air quality, traffic flow and circulation patterns, as well as from noise and vibration due to construction activity, should also be considered and are addressed in greater detail in the specific sections of this document.

Assessment Methodology

The assessment methodology consists of a three-step process:

1) Identification of the following characteristics of the study area:
   a) Existing land use and zoning of both the proposed project ROW and the surrounding area.
   b) Quantity of land to be converted to transit use.
   c) Current development plans in the project area and in the community-at-large.
   d) Goals, objectives, policies, and plans for action contained in municipal or neighborhood comprehensive land use, economic development, and community service improvement plans.
   e) Locations of non-conforming uses.
   f) Indication of whether higher density development under existing zoning is allowed and whether the community desires it.

2) Using the data collected for the study area, evaluate impacts in terms of those defined under the subheading When is an Impact Likely to Occur?

3) Development of alternative mitigation strategies for those cases where mitigation may need to be considered (see guidance below). Coordination with municipal planning agencies and community representatives is key in the identification, comparison, and selection of appropriate mitigation.

When Should Mitigation Be Considered?

Mitigation may be appropriate for the following situations:

- A substantial portion of the neighborhood, community population, or municipal planning agency opposes the project.
- Pedestrian, bicycle, or motor vehicle activity generated by the project would be substantially greater than under existing conditions or with the development planned for the area.
- The project involves a change in land use that is incompatible with surrounding land uses.
2.0 Impact Assessment Categories

- The project is not consistent with local plans or zoning and the appropriate agencies or community groups do not favor amendment of those plans.
- The project would result in accelerated development requiring provision of additional infrastructure or other facilities that could necessitate dramatic increases in public expenditures.
- Construction activity results in restricted access to businesses and residences; temporary closure of pedestrian or bicycle passageways; temporary disruptions of utility services; and siting of haul routes or staging areas in or adjacent to sensitive land uses.

Common Mitigation Techniques

The specific type of mitigation that could be applied is dependent on the characteristics of the particular neighborhood or community that is affected by the transit project. A wide range of techniques, too numerous to list here, are available. A few examples are provided as follows:

- Link stations with redevelopment sites.
- Route any additional vehicular, pedestrian, and/or bicycle traffic generated by the project away from the local neighborhoods.
- Build pedestrian overpasses or underpasses at high-volume pedestrian and vehicular traffic locations.
- Provide fencing as needed to keep passengers and others away from potentially dangerous areas such as LRT track.
- Place construction staging areas and haul routes away from sensitive land uses such as neighborhoods, schools, or churches to the extent possible. When this is not possible, submit plans for the staging areas as well as construction schedules for review by DART representatives. Store only necessary materials or equipment at the construction site. Restore staging areas to their original condition as soon as possible once the construction is completed.
- Notify businesses and residences in advance of short-term utility disruptions in service due to transit construction activity.

2.4.2 BACKGROUND

Regulating Law and Industry Practice

Standard industry practice calls for working closely with community representatives and municipal planning agencies throughout the planning, design, construction, and implementation phases to develop a project that will be an asset to the community it serves, and to help support existing municipal land use, economic development, and community service improvement plans. The requirements of municipal zoning law must be met for stations, maintenance facilities, and other fixed facilities. Project work performed is subject to each DART Service Area City’s ordinances. Special district and corridor plans, comprehensive land use, economic development, and community service improvement plans from each city should be evaluated on an individual basis. The City of Dallas published Urban Transit Design Guidelines in April 2017 which should be reviewed for guidance. Links to DART Service Area city websites are in Appendix B. Coordination with each jurisdiction should be done to identify the specific local land use codes and regulations applicable to the transit project. This coordination can also serve to identify TOD opportunities.

DART’s Transit-Oriented Development (TOD) Policy (Resolution No. 150106, October 2015) has replaced the former Joint Development Policy to encourage TOD policies and sustainable communities. DART’s TOD Process and Procedures draft document (October 2015) provides guidance for TOD public/private partnerships.

Regulating Agencies

Municipal governments within the DART Service Area: Addison, Carrollton, Cockrell Hill, Dallas, Farmers Branch, Garland, Glenn Heights, Highland Park, Irving, Plano, Richardson, Rowlett, and University Park.
Applicable Design Criteria, Drawings, and Specifications

The situation of each community and neighborhood will be addressed individually. DART’s Real Estate Policy (revised 2000) and TOD Policy (amended 2015) provide guidance for land use, TOD, and real estate. In addition, DART published a manual entitled Transit-Oriented Development Guidelines, August 2008, promoting TOD around DART transit facilities and is updating the Transit-Oriented Development Process and Procedures (October 2015).

The DART LRT Facilities and Systems Standard Specifications, Revised May 2016, should be consulted for specific measures that must be taken to minimize adverse impacts during construction. The following sections of the specifications may be especially useful: Section 01500, “Temporary Facilities and Services,” Section 01560, “Environmental Protection,” Section 02760, “Maintenance, Support, and Restoration of Existing Utility Facilities,” and Section 02271, “Ditch Lining and Slope Protection.” Also, Chapter 6, “Utilities,” of the DART LRT Project Design Criteria Manual, Volume No. 1 (Facilities Design), February 2003, provides additional guidance about utility service disruption and relocation during construction.

2.5 VISUAL AND AESTHETIC QUALITY

Consideration must be given to how well the transit project components will fit within the visual character of its existing surroundings.

2.5.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Provide a clean, uncluttered appearance system-wide, including such features as poles and signs.
- Seek to minimize discordant contrasts in line, form, color, texture, or scale between the project and its surroundings.
- Complement visual resources of recognized local or regional significance through selection of compatible materials and forms for project components.
- Provide opportunities for involvement by city and/or community representatives in the evaluation of design and material options.
- Select materials that are easily maintained.
- Minimize the blocking of high quality views from existing land uses.
- Avoid shading areas where sunlight is already limited.
- Avoid exposing undesirable views to existing land uses.
- Minimize the creation of direct views into adjacent private places.
- Comply with local ordinances related to glare, lighting, screening, open storage, landscaping, neighborhood protection, and signs.

When is an Impact Likely to Occur?

A series of subjective observations, as outlined below, will be used to assess perceived visual changes introduced by transit projects. The judgment of the general public will play an important role in this process. The severity of the impact can be determined in terms of distance, number of viewers, duration of exposure, and the speed of viewer and/or transit service. An impact on the visual and aesthetic character of the surroundings is likely to occur if:

- Features are lost that are important to existing views.
- Existing views are blocked that are valuable or desirable.
- A change is introduced in line, form, color, texture, lightness, darkness, dominance, scale, diversity, and continuity by transit project components, and whether they complement or conflict with existing visual elements.
2.0 Impact Assessment Categories

- Undesirable views of existing urban features are opened or private spaces exposed, including both the views of transit patrons and the views from wayside land uses.
- The project affects community activities for which the character of their setting or a particular view is important.
- The transit project features do not meet municipal ordinances for lighting, screening, open storage, landscaping, neighborhood protection, and signs.

Assessment Methodology

The following approach, based in part on FHWA’s Guidelines for the Visual Impact Assessment of Highway Projects (January 2015), will be used. The Visual Impact Analysis (VIA) process is carried out in four phases: Establishment, Inventory, Analysis, and Mitigation.

The first step is to determine whether the proposed project has triggered any impacts to the visual resources of the project area, and whether or not a VIA is required for the particular project. If a VIA is required, then determine the level of documentation needed to adequately fulfill the NEPA requirement. Neither NEPA nor the CEQ NEPA regulations prescribe any specific method for evaluating visual impacts, leaving each Federal agency to develop its own approaches tailored—as these guidelines are—to the actions of a particular agency. If there are no noticeable visible changes to visual resources, viewers, or visual quality, a VIA would not be needed.

If a VIA is needed, key views of significant features will be identified by asking:

- What visually distinct features or districts can be identified within the project area and from where can they be seen? Examples include historic structures, parks, shopping malls, etc.
- What visual resources and views are recognized as important to the community or region? Examples include historic districts, monuments, parks, skyline, etc.

The nature and significance of visual impacts will be assessed. The impact measures listed above will be used. Alternative ways to mitigate negative visual impacts will be determined and compared. Alternatives will be evaluated in terms of their effectiveness, constructability, maintainability, and cost.

The public can be involved in the development of a VIA in several ways. The most useful and effective involvement is for the public to establish visual quality preferences for their community or corridor. Frequently, a community’s visual quality preferences have been defined or are implied in legislation, judicial rulings, or just the accumulation of a local visual tradition over time. These preferences may be stated as planning ordinances or building codes. They may be identified as protected places (such as parks and civic spaces) and by formal restrictions. The community’s visual quality preferences might also be implied in its urban character, vernacular architecture, public buildings, open spaces, width of thoroughfares, and other built evidence of a collective aesthetic.

When Should Mitigation Be Considered?

- Project construction requires removal of features that are important to a community’s visual character.
- Transit system features disrupt or block locally or regionally significant views.
- Transit components are to be built that will contrast with the existing setting in terms of introducing:
  - A distracting character or style to a distinctive surrounding environment; and
  - Shading areas where available sunlight is already limited.
  - Dominating existing features.
2.0 Impact Assessment Categories

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- Creating a cluttered appearance.
  - Placement of the project opens up undesirable views or
    opens views from the transit vehicles into spaces that
    were previously considered private.
- A community activity is disrupted by introducing a passenger
  rail line into the activity's views or setting.
- Standard project design features do not conform to
  municipal lighting, screening, open storage, landscaping,
  neighborhood protection, or sign ordinances.

Common Mitigation Techniques
The appropriate approach to mitigation of visual impacts is heavily
dependent on the characteristics of each area through which the
transit project will pass. Potential solutions are dependent upon the
set of problems given the designer. Examples of how particular
visual impacts could be mitigated are summarized below. Examples
of some of these techniques are provided in Appendix E.

- Change horizontal or vertical alignment of the project.
- Break up long horizontal lines of catenary wires with clusters of
trees or closely spaced street trees.
- Block views of private spaces from transit patrons by using a
  fence or freestanding wall.
- Continue landscaping or hardscape features (e.g., walls, paving
  materials, street furniture) that are present on one side of the rail
  ROW on the other side as well, in order to visually connect areas
  divided by a rail line.
- Where space is available (that meets the requirements for safe
  operation), use a landscaped berm, instead of a fence, to
  improve views and/or reduce noise levels.
- When passing through an area of recognized style or character,
such as a historic district, adapt the materials and forms of
project structures in order to complement that style or character.
- Reduce the scale and soften the appearance of a retained fill
grade separation immediately adjacent to a visually significant
area by using landscaped terraces or other architectural
treatments.
- Reduce the quantity of vertical elements (poles) contained in an
  area of closely spaced urban features by using existing utility
  poles or buildings to support the catenary wires.
- Work with neighborhood representatives to select neighborhood
  specific architectural design, color, and landscape
  enhancements that are within project guidelines and construction
  budgets.

2.5.2 BACKGROUND

Regulating Law and Industry Practice
NEPA requires that consideration be given to determine the effects
proposed federal actions or projects are likely to have on the quality
of the human environment. However, there are no state or federal
visual regulatory requirements that apply to DART transit projects.
Municipal governments regulate lighting, screening, open storage,
landscaping, neighborhood protection, and signs through their
zoning ordinances or development codes. These regulations will
affect each municipality in differing ways, ranging from regulating the
entire city to regulating a specific district. All 13 cities within the
DART service area have visual-related requirements in their zoning
ordinances or development codes. The City of Dallas' Urban Transit
Design Guidelines, April 2017, should be reviewed for guidance.

Applicable Design Criteria, Drawings, and Specifications
Visual quality-related criteria are contained in Chapter 19.3
“Landscaping” and Chapter 26 “Lighting” of the DART Light Rail
Transit Project Design Criteria Manual, Volume No. 1 (Facilities
Design), February 2003; DART Architectural Standard Drawings;
and DART Architectural Directive Drawings.
2.6 SAFETY

MAP-21 continues to support the DOT’s aggressive safety agenda improving the safety of the transportation network requires an active, conscious approach to monitoring the transportation system for safety problems and anticipating problems before they occur. Transit projects must be designed to ensure a high level of patron safety as well as allow safe movement of motor vehicles, bicycles, or pedestrians.

2.6.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Reflect the characteristics of the communities through which the transit system passes when establishing operating speeds and when selecting crossing control devices and other safety features.
- Avoid all single point (component) hazards and control all hazards such that an acceptable level of safety is achieved.
- Ensure that no single failure of a dynamic (moving) element will result in a hazard that could produce severe injury or major property damage.
- Implementing positive train control (PTC) systems on all passenger rail, operated within or connected to the national network. PTC is not applicable to LRT operations, which uses a cab signaling system.

When is an Impact Likely to Occur?

Determination of impacts on safety is focused in terms of how the transit project is located with relation to the surrounding community. The following are potential indicators of whether a project may have safety-related concerns:

- Whether the movement of pedestrians and bicycles, particularly movement by children, the elderly, and persons with disabilities, is substantially changed or impeded.
- Whether the project will affect motor vehicle volumes.
- Whether the project will adversely affect places where people congregate such as parks, schools, community centers, and shopping districts.

Assessment Methodology

The assessment consists of the following five steps:

1) An identification of the following community characteristics:
   - Principal locations where pedestrians or bicyclists now cross or use the planned passenger rail ROW or site to reach community services, such as schools, parks, community centers, shopping, or other activity centers; the volumes involved and their characteristics (e.g., age); and the times of day.
   - Places where people congregate, including parks, schools, community centers, and shopping districts, located near the transit project ROW.
   - Alleys, streets, bicycle paths, or other formal travel routes adjacent to the ROW.
   - The traffic volumes on streets that will be crossed at-grade.
   - The accident histories of similar passenger rail systems in Dallas and in other cities, including auto/pedestrian, transit vehicle/pedestrian, auto/auto, and auto/transit vehicle accidents.

2) An identification of the planned system operating characteristics such as transit vehicle frequency by time of day and transit vehicle speed.
2.0 Impact Assessment Categories

3) An identification of the proposed system design characteristics that could influence community safety, which include the sight distance for pedestrians and motor vehicle drivers at at-grade crossings.

4) An evaluation based on system design and operating characteristics, of the potential for changes in pedestrian travel patterns resulting from transit project development. Pedestrian elements that will encourage pedestrians to cross the passenger rail line at controlled crossings will also be identified.

5) Development of crossing control requirements, the need for other safety-related design features, and needed operation plan changes to be determined based on the previous identification and evaluation steps, government regulatory requirements, and industry practice in similar situations. Quiet zone crossings must be considered when developing the design. This will be done in conjunction with appropriate municipal government and school representatives.

6) Develop PTC requirements.

When Should Mitigation Be Considered?

Positive steps to ensure that the safety quality assurance objectives are attained for patrons and the surrounding community should be an integral part of project design and should be developed on a site-specific basis and coordinated with the local community. For passenger rail projects, mitigation should be considered where the rail line would cross existing formal and informal travel routes at grade or where the rail line would be adjacent to places where people congregate. The mitigation measures should be developed in conjunction with municipal and school officials.

Common Mitigation Techniques

Examples of potential mitigation strategies are listed below for crossings, vehicles, subsystems and equipment, as well as emergencies. Photographs of some of these strategies are illustrated in Appendix E.

Crossings

- Provide crossing controls at all crossings. The selection of the type of controls takes into account whether a shared ROW or exclusive ROW is planned; whether a street ROW is to be used; the number of pedestrians and automobiles crossing the planned passenger rail line and their characteristics; sight distance; train speed; and train frequency. Protection can include standard railroad control devices and/or traffic signals. If a quiet zone is implemented at a crossing, additional design components must be included, such as raised medians or quad gates.

- Provide warning signage at streetcar crossing approaches to alert drivers and pedestrians of streetcar crossing; audible warnings may be implemented as warranted.

- Provide underpasses or overpasses for pedestrians at high volume pedestrian locations.

- Use fencing at locations where train operation speed exceeds 45 mph if a high likelihood exists for frequent crossing of the passenger rail ROW between designated crossings.

- Close streets that do not have a demonstrated need for an at-grade crossing.

- Use zigzag fencing (Z-crossing) at exclusive pedestrian/bicycle crossings to force cyclists to slow and pedestrians to look.

- Provide education and/or information sessions for the public through the Speakers Bureau Program. These sessions are used to educate the community about using the DART transit system with a focus on safety issues for children.

Vehicles

- Purchase transit vehicles with good operator visibility.

- Use automatic train protection to prevent trains from entering a “block” already occupied by another train.
2.0 Impact Assessment Categories

Subsystems and Equipment

- Use a “fail safe” philosophy for designs so operation can be safe even after experiencing a failure.
- Use redundant components where this is not possible.
- Isolate hazards so the effect of any hazardous event is contained as close to the source as possible.
- Provide means for verifying safe performance and operation, as well as interlocks, whenever out of sequence operation could cause a critical hazard.

Emergencies

- The DART Transit Police provide information sessions with local police and fire departments regarding safety and security issues, as well as agency responsibilities.
- Provide emergency walkways along aerial and subway segments to permit safe, rapid evacuation of trains and guideways between stations.
- Prepare an emergency plan with municipal police and fire departments, emergency medical services, and other appropriate civil agencies.
- Provide Emergency Vehicle Preemption Equipment (EVPE) and other similar technologies, where appropriate, to ensure priority status for emergency vehicles. EVPE sensors detect rapidly flashing emergency signals to allow preemption, giving priority to traffic in the direction from which the emergency vehicle is approaching.
- Locate alternate routing for emergency vehicles operating out of facilities near at-grade crossings, taking into consideration whether the alternate route will create longer response time than the crossing gate down time.

Stations

- Incorporate design elements that maximize safety to prevent criminal activity in the parking areas and within the transit stations themselves.
  - Utilize Crime Prevention through Environmental Design (CPTED) principles. See Section 2.7 for greater detail.
- Provide adequate lighting to deter crime and assure good vision in the station and parking areas.
- Maintain good sight lines through the station to reduce concealment areas for criminals.
- Separate the circulation patterns of various transportation modes so that the interaction between pedestrian traffic and automobiles or transit vehicles is minimized.
- Provide crossing controls at warranted pedestrian and bicycle crossings.
- Provide frequent random security patrols of the stations and trains.

- Incorporate a “dead man’s” feature that will automatically stop the train if the operator releases the power control because of inattention or health problems.
- Use flame and shatter resistant materials, such as materials with no or low toxicity levels when exposed to heat or flame.
- Provide a two-way emergency communication system between the train operator and passengers.
- Incorporate electromagnetic track brakes for use in emergencies.
- Provide police protection on the vehicles.
- Vehicles that will be operated on track that is on or connected to the national network will have on board PTC equipment as well as wayside equipment.

Subsystems and Equipment

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- Locate alternate routing for emergency vehicles operating out of facilities near at-grade crossings, taking into consideration whether the alternate route will create longer response time than the crossing gate down time.
2.6.2 BACKGROUND

Regulating Law and Industry Practice

Federal, state, and municipal regulating law must be followed. In considering safety in planning and design, the following takes precedence:

- Design for minimum hazard. Seek to eliminate hazards through selection of appropriate safety design concepts.
- Use safety devices. Hazards that cannot be eliminated through design selection are reduced to an acceptable level through the use of appropriate safety devices.
- Use warning devices. When it is not possible to preclude the existence or occurrence of an identified hazard, devices are employed to detect the condition and generate an adequate warning signal.
- Provide special procedures. When the magnitude of the hazard cannot be reduced through design or warning devices, special operating procedures are developed.

The project design and operating procedures must comply with all federal, state, county, and municipal statutory requirements and take into account advisory group safety requirements.

Safety optimization is assured in the design process through continuous participation by safety staff or the safety design review group in the design of each transit project and safety approval prior to release of each stage of design. During design, safety analyses of a project are carried out so hazards can be identified and resolutions incorporated into the design. This includes analysis of subsystems, as well as operation and maintenance hazards. Decisions regarding identified hazards take into account the likely severity of the hazard and its likelihood of occurring. Special in-depth studies are conducted if necessary in special situations. Such studies could include grade crossing policies, emergency evacuation of subways and aerial structures, or sharing ROW use with motor vehicles, railroads, power lines, or gas lines. Emergency plans are developed with local fire departments and other emergency services.

Safety tests are integrated into an overall test program of the project as it is completed. Operation and maintenance procedures are developed. These include safety precautions, warnings, procedural hazard control measures, and procedures for handling emergencies. Operations and maintenance personnel are trained on safety methods and procedures.

At crossings, pedestrian and traffic control devices, including all signs, signals, markings, communication facilities, and illumination devices and their supports, must be consistent with state standards for uniform control devices. In Texas, this is the 2006 Texas Manual on Uniform Traffic Control Devices.

The DART System Security Emergency Preparedness Plan (SSEPP), March 2015, is the basic planning document for comprehensive emergency management actions in the event DART is hit by a disaster or DART is requested to provide support to local governments for their disaster response and recovery efforts. The SSEPP is updated annually and provides for the safety and security of DART employees and patrons during critical incidents.

The SSEPP consists of a basic plan, functional support annexes, which detail general coordination responsibilities and/or actions required during all phases of emergency management, and specific response attachments. Each of the separate annexes identifies and outlines, at a minimum, those actions needed from each of the appropriate departments within each functional support group.

Under the SSEPP, integrated emergency management includes provisions for an ongoing cycle of actions to be taken at each level of management before, during, and after an emergency situation, including:

- Mitigation: Actions, which eliminate or reduce the cause or effects of a disaster, including long-term activities that reduce the effects of unavoidable hazards.
• Preparedness: Actions that focus on planning, training, exercising, and the development and enhancement of response capabilities. Mitigation efforts alone cannot eliminate or prevent disasters. Plans and procedures must be developed, evaluated, and updated to provide a framework for business continuity and an organized and immediate response to an emergency or disaster. Such actions save lives, minimize damage, and facilitate recovery.

• Response: Actions required when an emergency exists or is imminent ensuring prompt, concerted, and coordinated actions of which direction and control is an essential element. Response is the actual provision of emergency services during a crisis. These actions help to reduce casualties and damages and facilitate recovery. Response actions include warning, evacuation, sheltering, and other similar operations.

• Recovery: Actions taken following immediate remedial measures to return the damaged area to a normal level. State and local agencies will administer the provisions of federal and state disaster relief laws to provide for restoration and recovery of vital facilities if required. Disaster relief programs to help restore the personal, social, and economic well-being of private citizens will be administered by non-profit disaster relief and charitable organizations, as well as local, state, and federal disaster relief programs. Recovery is both a short-term and long-term process. Short-term actions seek to restore vital services to the community and provide basic needs such as restoring electrical power, providing potable water, restoring sewage facilities, clearing roads, etc. Long-term recovery focuses on restoring the community to a normal state (i.e., repairing or rebuilding buildings and homes, roads, bridges, etc.). Mitigation measures also can be implemented during the recovery period.

In addition, DART has adopted Regulations and Code of Conduct, Resolution No. 070108 on June 26, 2007. The purpose of this resolution was to approve regulations that apply to the conduct of a person that may adversely affect others using or operating the DART transportation system.

The Rail Safety Improvement Act of 2008 (RSIA) (signed by the President on October 16, 2008, as Public Law 110-432) mandated the widespread installation of PTC systems by December 2015. Congress extended this deadline to December 2020.

Regulating Agencies

• Occupational Safety and Health Administration (OSHA)
• National Transportation Safety Board (NTSB)
• DOT
• State Fire Marshal
• Texas Department of Transportation
• Municipal governments

In addition to the regulating agencies, there are two advisory groups:

• National Fire Protection Association
• American Railway Engineering Association

Applicable Design Criteria, Drawings, and Specifications

Safety and system safety program planning is addressed in several documents as contained in Appendix B.

2.7 SECURITY

This section provides guidance related to security for transit projects.

2.7.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

• Deter criminal activity on the passenger rail and bus system.
• Achieve the perception of a secure transit system for patrons and the adjacent community.
• Optimize protection of property and equipment so as to minimize both the costs of criminal theft and damage, and the cost of protection itself.

**When is an Impact Likely to Occur?**
Potential impact to system security is dependent on the nature and source of threats, and is also based on the crime characteristics of the communities.

**Assessment Methodology**

1) Potential threats to security at stations, at other structures, in parking lots, for equipment, within the transit vehicle, and along the passenger rail lines will be identified. This will be based on discussions with local law enforcement officials, experience with the DART transit system, and the experience of other systems. Threats will be described as the source of the threat and the nature of the threat.

2) Proposed system operating characteristics that could influence security requirements will be identified, including hours of operation, system access policy, fare collection system, and train frequency.

3) The level and characteristics of community activity adjacent to stations, other structures, equipment, and the ROW will be identified.

4) Based on items 1, 2, and 3, the potential location for various types of threats within the system will be identified. Potential consequences (e.g., patron injury, increased potential for crime in adjoining communities, property damage, and property loss) will be also identified.

5) Operating policy, equipment, materials, and design alternatives that address potential threats which are applied system-wide, as well as in unique situations, will be identified and compared in consultation with local law enforcement officials.

**CPTED**
Crime prevention and control, especially in the transit environment, begins with facility and vehicle design. This involves creating and maintaining an environment that will not tolerate criminal activity. This environment is designed and preserved by transit professionals including engineers, architects, planners, managers, operators, and maintenance personnel.

This approach reduces the number of criminal incidents occurring in the system by minimizing both the opportunity and the motivation of the criminal to commit the crime. By manipulating the physical environment to produce effects that deter criminal behavior, transit agencies improve the quality of life in their systems by reducing fear and the incidence of crime. CPTED seeks to prevent certain specified crimes within a well-defined area by manipulating environmental variables based on an assumed relationship between a station, vehicle, or building and its user. To be effective, CPTED requires close cooperation among all levels of transit personnel.

The CPTED theory maintains that crime can be reduced by minimizing the number of available targets, and creating an environment that increases a criminal's perceived risk in attacking a particular target. During design DART should collaborate with the DART Police Department, transit system engineer, and project architect to reflect security considerations in design prior to construction of passenger rail stations. Security design focuses on lights, locks, alarms, fencing, Closed Circuit Television (CCTV) cameras, and landscaping. These CPTED principles are utilized by designers to promote safety and security at facilities.

**When Should Mitigation Be Considered?**
Positive steps should be taken to ensure that quality assurance objectives for security are attained and warranted for all transit
projects. This is particularly important in areas where criminal activity in public areas tends to be higher than average.

**Common Mitigation Techniques**

Mitigation techniques rely on the principals of CPTED to deter vandalism and ensure security for patrons. Some of these elements are listed below. An example of a security technique is shown in Appendix E.

*Facilities Design*

- Design station layouts and planting plans that minimize nooks, corners, and other unused spaces that could be used as a hiding place.
- Provide ROW fencing in areas with high rates of vandalism.
- Design and light parking lots for high visibility from other locations in station areas.
- Provide visibility of public areas from control facilities and offices.
- Select materials that are difficult to vandalize and easy to clean.
- Incorporate door/gate systems for aerial station entrances, and entrances that lead to non-transit authority facilities.
- Obstruct potential offenders by using locks, reinforced materials, or other physical barriers.
- Landscaping near common walkways should not be in excess of three feet in height.
- Designate off-hours waiting areas in locations that are under surveillance.

*Security Systems*

- Incorporate a public address system into stations and vehicles.
- Provide radio communications between staff and control centers.
- Provide telephones and police emergency call units at stations.
- Use intrusion detection alarm systems.
- Use vandal resistant fare collection equipment and money handling via locked coin and bill containers.
- Use key-lock system that resists duplication.
- Spend 60 percent of rail patrol hours on passenger rail vehicles (The mandated coverage of light rail vehicles by uniformed personnel is 91 percent).
- Deploy security personnel either at fixed posts or on patrol, maintaining personnel at all hours of operation.
- Install CCTV surveillance systems on transit vehicles and at ticket vending machines.
- Provide “Blue Light” Police Phones or Public Pay Phones for emergency communication purposes.
- Implement random checks by security personnel to ensure that patrons have paid the correct fare.
- As of March 2012, DART completed installation of closed circuit cameras at all light rail stations; a pilot program for video surveillance on trains was initiated in the summer of 2014.

*Vehicle Design*

- Use materials that are resistant to vandalism and graffiti, and that are easy to clean.
- Use windows that provide between-car visibility.
- Provide a system for direct communication between the patron and the train operator.
- Adopt security-operating procedures that include, but are not limited to, the items listed in “Regulating Law and Industry Practice.”
2.7.2 BACKGROUND

Regulating Law and Industry Practice

The consideration of security is an integral part of project design and operation planning, as is the evaluation of security options in association with local law enforcement agencies.

During design, designers responsible for security should:

- Contribute designs for systems and hardware that will assist security and other operating personnel in deterring criminal activity on the system; and
- Review all other aspects of project design during each phase of the design to ensure that structures, materials, and equipment are inherently resistant to criminal activity.

During operations planning, decisions are made as to:

- The selection of a security force type, and the definition of their responsibilities;
- Security related rules and regulations for other transit authority personnel;
- A strict policy of prosecuting offenders;
- Vandalism clean-up and repair policies; and
- Development of a program of periodic security reviews and assessments.

In addition, under DART’s General Order 02-05 LRT (effective September 17, 2002), procedures are outlined for patrolling DART’s LRT system to ensure that DART Police officers provide the highest practical level of security to the system.

These procedures include:
- Providing a highly visible police presence;
- Monitoring the trains/conducting fare inspections;
- Monitoring the stations;
- Enforcement action on violations; and
- Assisting the public.

In addition, DART has adopted Regulations and Code of Conduct, Resolution No. 070108 on June 26, 2007. The purpose of this resolution was to approve regulations that apply to the conduct of a person that may adversely affect others using or operating the DART transportation system.

Regulating Agencies

FTA and Federal Transportation Security Administration, as well as coordination with local law enforcement agencies

Applicable Design Criteria, Drawings, and Specifications

Security and system security program planning is addressed in the several documents outlined in Appendix B.

2.8 TRAFFIC FLOW

The impact that a proposed mass transit project has on existing and future vehicular traffic is a key issue to be investigated in the environmental impact assessment process. This section provides guidelines to determine the level of impact that a mass transit project, such as fixed guideway passenger rail with its level of operations, has on the surrounding level of vehicular traffic and the alternative mitigation techniques available for consideration. This section also provides guidelines for analyzing traffic impacts for other types of DART facilities, including bus TCs, parking facilities, enhanced bus shelters, etc.

For any considered mass transit project, there are three individual types of traffic impacts that could occur and must be investigated.
They include: (1) impacts on traffic flow of a crossing street of the rail alignment; (2) impacts on surrounding traffic circulation patterns for local and collector streets; and (3) impacts on accessibility to surrounding land uses for occupants, visitors and customers, deliveries, refuse collection, etc.

2.8.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Minimize traffic delay.
- Avoid diversion or attraction of traffic to local streets.
- Avoid the creation of circuitous circulation patterns for local traffic and emergency vehicles.
- Maintain access to adjacent properties.
- Ensure the presence of a fixed guideway passenger rail line does not cause the level of service (LOS) on streets adjacent to the rail line to drop two or more levels or cause the street to have a LOS of “F.”
- Ensure queuing along the at-grade street crossing does not block an adjoining street intersection or the passenger rail alignment intersection.

When is an Impact Likely to Occur?

- For consideration of impacts created by a proposed passenger rail project crossing an existing street at-grade, Article IX “Traffic Mitigation Measures” of the Planning and Development Supplemental Agreement #1 to the DART/City of Dallas Interlocal Agreement outlines the analysis process. In general, an impact is likely to occur when either one of two warrants is exceeded: (1) LOS and (2) queuing.
- For impacts on traffic circulation patterns on local and collector streets, impacts are likely to occur when circulation patterns are affected significantly diverting potential passenger rail patron traffic on to local streets, increasing the travel distance for local traffic traveling to reach thoroughfares and local community services, and increasing the travel distance for emergency services to individual land uses.
- For accessibility, impacts are likely to occur when current access to public and private uses is either partially or completely closed.
- For traffic circulation around and near proposed DART facilities, such as bus TCs, impacts are likely to occur when municipal government criteria are exceeded as projected within the traffic impact assessment (TIA) study.

Assessment Methodology

For traffic flow at at-grade rail crossings, the methodology involves an eight-step process for street grade crossing impact assessment.

1. Identify study corridor at-grade crossings. In conjunction with the appropriate staff of the affected municipality, identify the at-grade crossings in the study corridor to be analyzed as well as nearby intersections within the area of influence of the crossing.
2. Document existing conditions at intersections.
   - Perform selected 15-minute interval, 24-hour counts to establish peak hour K-factors, hourly traffic distributions, and directional distributions.
   - Count intersection turning movements during the AM and PM periods.
   - Gather pertinent geometric and lane configuration data.
3. Document future physical conditions.
   - Document roadway network changes including configurations and freeway ramp modifications.
   - Document programmed intersection improvements.
4. Develop projected traffic for the appropriate design year. AM and PM intersection turning movement will be estimated for each study intersection using the following sources of information:
   - North Central Texas Council of Governments (NCTCOG) projections.
   - City projections.
   - Other reliable studies.
   - Existing traffic patterns and characteristics.
   - Future roadway lane configurations and expected traffic patterns.
   - Other probable trip generating developments not accounted for in projections.
   - Rail station traffic.

5. Specify preliminary operating and physical characteristics of each crossing. Based on the analysis of conditions with and without rail, specify the following physical and operational characteristics of each crossing:
   - Type of train, traffic control, and warning devices.
   - Train movement/traffic signal operation relationships.
   - Physical configuration of crossing.
   - Physical configuration of the nearby intersections.
   - Necessary restrictions and control of traffic movements.
   - Limitations, restrictions, and control of train movements.

6. Analyze traffic conditions without rail.
   - Establish acceptable delay and LOS levels, as well as analysis methodology with appropriate staff of affected municipalities and DART.
   - Conduct intersection capacity analyses of projected conditions in AM and PM peak hours without passenger rail to establish base conditions.

7. Analyze traffic conditions with rail. Assess impact of train operations on traffic flow over the crossing and at nearby intersections. Appropriate analysis techniques, agreed to by the municipalities, will be used to evaluate the following parameters.
   - Vehicular Delay
   - LOS
   - Queuing Impacts

   Based on the analyses, determine if mitigation measures should be considered to alleviate anticipated problems.

8. Make recommendation.

   For traffic circulation, the assessment methodology includes the following steps.

1. Existing local and collector streets will be identified. The location of emergency services, their service areas, and response time requirements will be identified.

2. Based on the location of planned street closures, at-grade crossings, street improvements, and station and other facility entrances, changes in local and collector street circulation will be determined. The assessment will focus on identifying the potential for:
   - Diverting potential passenger rail project patron traffic on to local streets.
   - Increasing the travel distance for local traffic traveling to reach thoroughfares and local community services.
   - Increasing the travel distance from emergency services to individual land uses.

   For impacts on accessibility, the assessment methodology includes the following steps.
1. Current property access points for occupants, visitors and customers, deliveries, refuse collection, repair services, and emergency services will be identified.

2. Engineering plans will be used to identify potential access changes, including new access points, lost access points, and changes in the convenience of existing access.

3. Alternative approaches for restoration of access will be compared.

The assessment methodology for traffic impacts includes the following.

Most municipal governments within the DART Service Area require the development of a standard TIA study for any proposed development within the city’s boundaries. For any proposed DART facility, such as a bus TC, enhanced bus shelter, or park-and-ride facility, a TIA must be prepared. Most cities have guidelines for the preparation of a TIA and the methodology and results they typically require. If, upon completion of the TIA, an impact is identified that is due to the increased level of traffic or revised traffic pattern the DART facility generates, mitigation must be negotiated with that municipality. This mitigation could take many forms, including additional lane capacity, new or modified traffic signals, additional turn lanes, etc.

**When Should Mitigation Be Considered?**

For at-grade street crossings by a proposed passenger rail alignment, mitigation should be initially considered when the LOS along major or minor thoroughfares, or at intersections, is reduced from the No-Build condition by two or more levels or creates a LOS “F.” Grade separation would be implemented if there are no other viable mitigation alternatives.

For circulation impacts, mitigation should be considered when non-local traffic is likely to use local streets to reach stations. Mitigation should also be considered when the travel distance for local traffic traveling to reach thoroughfares and local community services is increased to a point higher than the maximum travel distance now found in the neighborhoods containing the proposed passenger rail project.

Mitigation should be initially considered when inconvenient circulation patterns would cause an unacceptable emergency response time, as defined by the municipal jurisdiction in which the proposed passenger rail project is located.

For impacts on accessibility, mitigation should be initially considered when partial or full public access to adjacent properties is adversely affected. For example, along the downtown transit mall along Pacific Avenue, special access lanes along the mall guideway tracks were constructed to provide access to back-door loading docks to businesses and parking garage entrances.

**Common Mitigation Techniques**

Operational measures to improve traffic flow may include the following.

- Improvement of traffic signing and pavement markings
- Modification of existing traffic signals
- Coordination of signal timing between intersections
- New traffic signals

Geometric measures to improve traffic flow may include the following.

- Free right turn lanes
- New left turn lanes
- Double left turn lanes
- Additional through lanes
- Grade separation
Circulation and accessibility measures could include the following.

- Relocating planned station or other facility entrances
- Closing the thoroughfare connection or redesign the intersection at one end of any local street attracting street traffic

2.8.2 BACKGROUND

Regulating Law and Industry Practice

Within the City of Dallas, the process for evaluating a potential grade crossing is based upon an evaluation of criteria found in Article IX Traffic Mitigation Measures of the Planning and Development Supplemental Agreement #1 to the DART/City of Dallas Inter-local Agreement and amended via Resolution No. 990150, August 1999. In addition, in August 2001, DART adopted The Policy on Light Rail Transit System Development via Resolution No. 010117, which adopted a common set of procedures for DART and its service area cities to follow in implementing the LRT. The criteria for evaluating a grade crossing are: (1) traffic projections; (2) safety; (3) length and dissipation of vehicle queues; (4) automobile delay; (5) LRT delay; (6) changes in LOS; (7) impact on area-wide signal system; (8) cost-effectiveness; and (9) mitigation measures.

In evaluating these criteria, DART has determined that, subject to a determination that other reasonable and effective traffic mitigation measures are not feasible, two specific warrants (queuing impacts and LOS impacts) can effectively measure if a street intersecting a passenger rail line should be grade separated.

Queuing impacts:

If the presence of DART’s passenger rail line causes vehicular traffic on streets adjacent to the rail line to queue through the adjoining intersections or queue through the LRT intersection, a queuing impact may exist. Subject to a determination that other reasonable and effective traffic mitigation measures are not feasible, a grade separation is warranted if the frequency and duration of the queuing impact is deemed significant.

LOS impact:

If the presence of DART’s passenger rail line causes the LOS on streets adjacent to the rail line to drop two or more levels or cause the street to have a LOS of “F,” a LOS impact may exist. Subject to a determination that other reasonable and effective traffic mitigation measures are not feasible, a grade separation is warranted if the frequency or duration of the LOS impact is deemed significant based on the DART grade separation policy.

In the event city staff finds the results of the technical analysis contrary to DART staff recommendations, the parties will obtain a recommendation from a qualified independent consultant mutually selected and compensated by the parties. The findings of the independent consultant shall be the basis for DART/city concurrent recommendations on the matter of whether the grade separation is technically warranted.

On September 9, 1997, the DART Board of Directors adopted Resolution No. 970176 (amended June 16, 1998 via Resolution No. 980149) establishing a grade separation policy and further defining a process for consideration of non-warranted grade separations. The policy addresses three scenarios.

- Non-Warranted Grade Separations: For grade crossings that do not meet grade separation warrants or crossings where other reasonable effective traffic mitigation measures are feasible but the city still desires a grade separation, DART will agree to design and construct the grade separation subject to a determination by DART that there are no physical, environmental, financial, or other constraints that would preclude a grade separation and will contribute a maximum of $1.5 million (in 1998 dollars accordingly adjusted for inflation at the time of construction of the non-warranted separation) toward the incremental cost. The requesting City or others must agree to pay the remainder of the incremental cost prior to DART beginning design on the project.
2.0 Impact Assessment Categories

- Warranted Retrofitted Grade Separations: In the future, following completion of a particular grade crossing, should the construction of a grade separation become necessary in the judgment of the appropriate city and DART staff based on technical considerations, DART will design and construct the grade separation subject to a determination by DART, that other reasonable and effective traffic mitigation measures are not feasible, and there are no physical, environmental, financial, or other constraints that would preclude a grade separation. Funding responsibilities will be agreed to prior to beginning design on the project. This agreement will be effected through an agreement with the entity paying for the crossing. The retrofit portion of the Grade Separation Policy applies to all passenger rail corridors in the DART Transit System Plan.

- Non-Warranted Retrofitted Grade Separations: If in the future, following completion of a particular grade crossing, a city desires a grade separation of a crossing that still fails to meet grade separation warrants, DART will agree to design and construct the grade separation subject to a determination by DART that there are no physical, environmental, financial, or other constraints that would preclude a grade separation and will contribute a maximum of $1.5 million (in 1998 dollars accordingly adjusted for inflation at the time of construction of the non-warranted separation) toward the incremental cost. The requesting City or others must agree to pay the remainder of the incremental cost prior to DART beginning design on the project.

In addition, in August 2001, DART adopted The Light Rail Transit System Development Procedures Policy via Resolution No. 010117, which adopted a common set of procedures for DART and its service area cities to follow in implementing the LRT.

Regulating Agencies

- Municipal governments
- Texas Department of Transportation (TxDOT)

Applicable Design Criteria, Drawings, and Specifications

Traffic impacts from the transit operations are addressed in Chapter 4 of the Dallas Area Rapid Transit Light Rail Project Design Criteria Manual, Volume 1, (Facilities), February 2003. Although these criteria provide design standards for grade separation bridges, traffic signalization, additional roadway lanes, and turn lanes, they are not applicable to development of an environmental impact assessment. Preferred roadway configurations and structural bridge drawings are shown in the DART Facilities Standards Drawings, November 2005. Construction of civil roadway items is addressed in Section 02471, Highway Grade Crossing – Civil Work in the Dallas Area Rapid Transit Light Rail Project Facilities and Systems Standard Specifications, May 2016.

2.9 PARKING

A key issue in the environmental impact assessment process for mass transit projects is the ability to maintain a sufficient parking supply for businesses and residences during construction and operation of a passenger rail project. This section provides guidelines to determine existing parking conditions, future parking demand created by a new DART project, parking impact due to implementation of the passenger rail project and mitigation if required. The guidelines are focused on the application for passenger rail projects, but can also be applied to enhanced bus projects such as TCs and enhanced bus shelters.

2.9.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Avoid diminishing the supply of on-street and off-street parking for businesses and residences along passenger rail project corridor.
• Accurately estimating and constructing the number of parking spaces at DART LRT stations to ensure adequate parking for the transit patrons and deter parking at nearby residential land uses.

When is an Impact Likely to Occur?
Impacts to the level of existing on-street and off-street parking surrounding a proposed DART project is likely to occur when new parking facilities supporting a DART project are not sufficient to meet the demand or if the construction or operation of the project results in removal of existing parking spaces on a temporary or permanent basis.

Assessment Methodology
The assessment methodology includes the following.
1. Existing parking supply and demand will be identified.
2. Parking demand with the passenger rail project will be forecasted taking into account transit patron, employee, and any joint development parking requirements.
3. The number of parking spaces (on-street and off-street) eliminated, replaced, and added will be identified based on engineering plans.
4. It will be assumed that adequate parking will be provided for according to municipal code regulation.
5. If parking can be readily provided for all passenger rail project employees, forecast patron parking demand, and forecast joint development parking demand, it will be assumed that no impact from increased demand will occur and no further analysis of such impacts will be made.
6. If a detailed analysis of parking spaces is required, the timing of use and purpose of existing parking spaces eliminated by displacement, or by passenger rail project patron or employee use, will be determined. The consequences of not providing comparable replacement parking spaces or meeting project generated parking demand will be addressed, including inconvenience to existing parkers, use of existing parking by transit patrons and loss of business. Mitigation alternatives will be compared.

When Should Mitigation Be Considered?
For parking impacts, mitigation is required at any location that the project would displace parking associated with a property resulting in that property no longer meeting the requirements city code, or if the parking provided by the project is not sufficient to meet the project’s parking demand.

Common Mitigation Techniques
• Improve bus service in order to reduce transit patron parking demand.
• Request municipal government to adopt controls for parking off the transit site. This could include time limits on on-street parking, parking decals for residents/tenants, and increased parking ordinance enforcement.
• Increase the supply of parking at adjacent stations beyond what is strictly required in order to shift projected parking demand away from stations where needed parking spaces cannot be readily provided.
• Implement a combination of controls on parking off the transit site and increase supply at adjacent stations.
• Replace displaced parking spaces where feasible.
• Build a parking garage where land costs are high or the extent of displacement required to assemble land for surface parking is great.
• Set up a shared parking arrangement where the timing of peak passenger rail use, joint development, and surrounding land use parking demand does not coincide.
2.9.2 BACKGROUND

Regulating Law and Industry Practice

Municipal zoning and development codes require that adequate parking be provided. Municipal governments must approve losses of on-street parking.

Regulating Agencies

- Municipal governments

Applicable Design Criteria, Drawings, and Specifications

Parking impacts as a result of LRT operations is addressed in Chapter 4 of the Dallas Area Rapid Transit Design Criteria, Volume 1, (Facilities), February 2003. Although these criteria provide design standards for parking requirements and construction, they are not applicable to development of an environmental impact assessment. Preferred parking facility layout configurations are shown in the DART Civil Standard Drawings. Constructions of civil items, such as parking facilities, are addressed in Section 02471 of the Dallas Area Rapid Transit Light Rail Project Facilities and Systems Standard Specifications, May 2016. Wherever possible, sustainability should be considered while addressing parking impacts.

Sustainability could be measured using Leadership in Energy and Environmental Design (LEED™) measures. The LEED™ Green Building Rating System represents the U.S. Green Building Council’s (USGBC) effort to provide a national standard for what constitutes a “green building.” Through its use as a design guideline and third-party certification tool, it aims to improve occupant well-being, environmental performance, and economic returns of buildings using established and innovative practices, standards, and technologies. The measure established by LEED™ most appropriate for use on DART transit projects is Heat Island Effect-Non-Roof. According to the USGBC’s LEED 2009 for New Construction and Major Renovations Version v2009, 2016, the intent of this measure is to “Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.”

This reference guide provides strategies to reduce the heat island effect, which include:

- Provide any of the following: “for 50% of the hardscape (including roads, sidewalks, courtyards, and parking lots)
  - Shade (within five years of occupancy);
  - Paving materials with a Solar Reflectance Index (SRI) of at least 29; and
  - Open grid Pavement System.

- Another option is to “place a minimum of 50% of parking spaces under cover (defined as underground, under deck, under roof, or under a building). Any roof used to shade or cover parking must have an SRI of at least 29.”

2.10 NOISE AND VIBRATION

Noise and vibration are key issues in the environmental impact assessment process for mass transit projects. This section provides guidelines to determine whether noise and vibration generated by transit operations will adversely affect adjacent properties and activities and discusses situations where mitigation of noise and vibration impacts should be considered. The guidelines are intended to apply to all rail projects, including rail rapid transit, LRT, commuter rail, and automated guideway transit, as well as to fixed facilities such as storage and maintenance yards, passenger stations and terminals, parking facilities, and electric substations. The guidelines may also be applied to bus projects operating on local streets or on exclusive busways.

Construction activities associated with transit projects also have the potential to generate noise and vibration complaints in a community, despite the limited time frame over which they take place. Guidance for determining whether noise and vibration generated by transit...
2.0 Impact Assessment Categories

2.10.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Control community noise exposure from transit operations such that the one-hour equivalent noise level ($L_{eq}$) and day-night equivalent sound level ($L_{dn}$) do not exceed the impact criteria defined by the FTA or FHWA.
- Keep noise from fixed facilities at or below maximum permissible municipal levels.
- Keep maximum ground-borne vibration and noise levels from transit operations at or below the impact criteria defined by relevant FTA or FHWA criteria and maximum permissible municipal levels.
- Minimize community exposure to noise and vibration from construction equipment and operations.

When is an Impact Likely to Occur?

- Operational noise impacts are likely to occur when the sound levels from the transit system when compared with the ambient sound levels in the community exceed current FTA or FHWA criteria. For fixed transit facilities, an impact is also likely to occur when the maximum permissible noise levels at the bounding property line are exceeded according to municipal zoning ordinances.
- Ground-borne vibration and noise impacts from transit and highway operations are likely to occur when the levels exceed relevant current FTA or FHWA criteria and the maximum permissible vibration levels at the bounding property line that are established by municipal zoning ordinances.
- Construction noise impacts are likely to occur when the noise levels exceed the Dallas Area Rapid Transit Facilities Standard Specifications, January 2005.
- Vibration impacts from construction activities are likely to occur when the levels exceed the Dallas Area Rapid Transit Facilities Standard Specifications, January 2005 or the affected city code limit for residential zones and for manufacturing zones with vibration-sensitive processes (e.g., semiconductor production).

Assessment Methodology

The FTA guidance manual Transit Noise and Vibration Impact Assessment Manual (September 2018) is the primary document for conducting transit noise and vibration impact assessments for transit projects. The type of transit project must be determined to identify the relevant criteria that are applicable. The FTA criteria should be used for all rail projects (e.g., rail rapid transit, light rail, commuter rail, and automated guideway transit), for bus facility projects with operations on unmodified local streets and highways, as well as for fixed facilities such as storage and maintenance yards, passenger stations and terminals, parking facilities, and substations.

In contrast, for busways and high-occupancy vehicle (HOV) lanes to be integrated within existing highways (e.g., the addition of new lanes or the redesignation of existing lanes on a highway) or a new highway involving both general purpose and dedicated bus/HOV lanes, the FHWA approach should be followed. Included in this approach are recent guidelines for performing a noise analysis, which, according to 70 FR 16710, dated April 1, 2005 (revised May 2, 2005), must use the FHWA Traffic Noise Model (FHWA TNM) described in “FHWA TNM” Report No. FHWA–PD–96–010, including Revision No. 1, dated April 14, 2004, or any other model determined by the FHWA to be consistent with the methodology of the FHWA TNM.

For multi-modal projects that include changes to both transit and highway components, FTA criteria and methods should be used where transit noise sources are dominant and FHWA criteria and
methods should be used where highway noise sources are dominant at all times. If transit and highway noise sources are dominant at different times, both methods should be used to determine impact.

For operational noise and vibration impact assessment, the methodology involves the following steps.

1. **Identification of receivers.** The locations of noise and vibration sensitive land uses that could be affected by transit operations or project-induced motor-vehicle traffic will be identified. Building and site characteristics that influence the degree of noise and vibration sensitivity will also be identified.

2. **Measurement of existing noise and vibration levels.** Noise and vibration measurements will be performed within the study area following relevant FTA and FHWA guidelines and accepted industry procedures (see Regulating Law and Industry Practices for further information). Noise measurements will include both short-term samples taken during appropriate one-hour periods and continuous 24-hour surveys. Vibration measurements will be made to document maximum vibration levels from existing sources and to determine the vibration propagation characteristics of the study area soils. The measurements will be used to characterize the existing noise and vibration environment and to evaluate transit noise and vibration impacts.

3. **Prediction of project noise and vibration.** Projections of the airborne noise, ground-borne vibration and ground-borne noise (where applicable) expected from transit operations will be made for the study area based on design drawings, planned operation characteristics, and forecast traffic volumes using relevant FTA or FHWA guideline methods. These estimates will be made at representative receiver locations identified in the noise and vibration inventory.

4. **Determination of Impacts.** Compare the noise and vibration projections to the relevant FTA or FHWA criteria and applicable municipal standards to determine the existence and severity of potential noise and vibration impacts (see Regulating Law and Industry Practices for more information about the applicable criteria and standards).

5. **Recommendations for Mitigation.** Identify and evaluate alternative strategies for mitigation for those locations where noise and vibration control measures would be necessary. Alternative means could potentially include design modifications, operating restrictions, and alternative track or wayside treatments.

For construction noise and vibration impact assessment, the methodology includes the following steps:

1. **Preparation of a general construction scenario.** The construction scenario should include: the anticipated construction stages, the storage and staging site alternatives, the equipment required by stage and the equipment usage factors.

2. **Identification of sensitive receivers.** The locations of noise and vibration sensitive uses in the vicinity of the proposed construction will be identified. An examination of the areas where construction activities will occur in terms of their relationship to adjoining land uses that are sensitive to noise or vibration should also be conducted.

3. **Assessment of construction noise and vibration.** Projections of noise and vibration levels from construction activities will be made at the closest receivers using relevant FTA or FHWA guideline methods. For noise levels, the maximum A-weighted levels ($L_{\text{max}}$) that could occur for periods of one-hour or less and the equivalent construction noise levels ($L_{\text{eq}}$) for an average 8-hour construction workday will be estimated. The 8-hour $L_{\text{eq}}$ is a single noise level with the same sound energy as the fluctuating level over an entire 8-hour workday. The impact levels will be more strict near noise-sensitive land uses and for nighttime construction (where permitted by municipal zoning ordinances). Noise from individual pieces of construction equipment will be measured in terms of maximum noise levels at a reference distance of 50 feet. Ground-borne vibration from construction activities will be measured in terms of maximum vibration levels.
2.0 Impact Assessment Categories

at 200 feet from the construction site or at the nearest receiver, whichever is closer. Vibration levels will be expressed in terms of the root-mean-square (rms) vibration velocity (in inches per second), and vibration limits will be based on current FTA guidelines and municipal zoning ordinances.

4. Determination of Impact. Compare the projections of construction noise and vibration to DART specifications and applicable municipal standards to evaluate the potential for construction noise and vibration impact. For assessing noise impact, the predicted maximum noise levels (for periods of one hour or less) will be compared to the DART “intermittent” construction noise limits, and the predicted 8-hour $L_{eq}$ will be compared to the DART “continuous” construction noise limits.

5. Recommendations for mitigation. Identify and evaluate alternative mitigation strategies for those locations where noise and vibration control measures would be appropriate. Alternative means could potentially include alternative equipment or construction methods, special operating procedures, temporary noise barriers, and time or day restrictions.

When Should Mitigation Be Considered?

Noise criteria and guidelines for determining the need for noise mitigation for transit operations are included in the FTA guidance manual. The FTA noise criteria are given in terms of outdoor noise exposure according to land use category, and include thresholds for “Severe” and “Moderate” noise impact based on a comparison of project and existing noise levels (or noise exposure increase).

Transit operation noise in the “No Impact” range is not likely to be found annoying. Noise projections in this range are considered acceptable by FTA and mitigation is not required. At the other end, noise projections in the “Severe” range represent the most compelling need for mitigation. Impacts in this range have the greatest adverse impact on the community; thus there is a presumption by FTA that mitigation will be incorporated in the project unless there are truly extenuating circumstances which prevent it. The goal is to gain substantial noise reduction through the use of mitigation measures, not simply to reduce the predicted levels to just below the Severe Impact threshold.

Projected noise levels in the “Moderate” range will also require consideration and adoption of mitigation measures when it is considered reasonable. The range of “Moderate” impact delineates an area where project planners are alerted to the potential for adverse impacts and complaints from the community and must then carefully consider project specifics as well as details concerning the affected properties in determining the need for mitigation. While impacts in this range are not of the same magnitude as “Severe” impacts, mitigation should be considered.

FTA’s guidance on the considerations for providing mitigation for “Moderate” impacts includes the following:

- The number of noise-sensitive sites affected at this level. A row or cluster of residences has a greater need for mitigation than one or several isolated residences.
- The increase over existing noise levels. Since the noise impact criteria are ranges, project noise can vary 5-7 decibels within the band of “Moderate” impact. Project noise levels in the upper range of “Moderate” impact would have the strongest need for mitigation.
- The noise sensitivity of the property. There can be differences in noise sensitivity between similar types of uses, based on location, passive versus active use of parks and other factors.
- Effectiveness of the mitigation measure(s). Typically, the reduction in noise levels must be greater than a defined threshold for a mitigation measure to be considered effective.
- Feasibility of the mitigation measure(s). In some cases it may not be possible to construct mitigation (noise barriers) due to physical or structural limitations or because of safety concerns, especially related to sight lines for pedestrians and vehicles.
2.0 Impact Assessment Categories

- Fairness and equity of the mitigation measure(s). In many cases, small differences in distances or operations can result in small differences in projected noise levels such that impact is not projected at all residences in a row of homes. In such cases, mitigation should be applied to the entire row of residences if possible.

- Existing transportation noise. In areas with high existing noise levels from transportation sources, especially the same type of noise source as the project, the need for mitigation is greater. In this circumstance impacts predicted in the “Moderate” range should be treated as if they were “Severe.”

- Community views. The NEPA compliance process provides the framework for hearing the community’s concerns about a proposed project and then making a good-faith effort to address those concerns. Decisions regarding mitigation should be made only after considering input from the affected public, relevant government agencies, and community organizations.

- Special protection provided by law. Section 4(f) of the USDOT Act and Section 106 of the National Historic Preservation Act come into play frequently during the environmental review of transit projects. Historic properties are only noise-sensitive based on how they are used (including residences, libraries, etc.). However, some historic properties are not noise-sensitive at all. The views of agencies with jurisdiction over these resources must be given careful consideration by FTA and the project sponsor, and their recommendations may influence the decision to adopt noise reduction measures.

- Cost of mitigation. Cost is an important consideration in reaching decisions about noise mitigation measures, especially in the “Moderate” impact range. Guidelines for gauging the reasonableness of the cost for mitigation can be found in state DOT procedures for noise barriers and in airport authority procedures for residential sound insulation programs. Similar to these procedures, FTA assesses the cost effectiveness of mitigation based on the cost per benefited residence. It should be noted, though, that higher costs may be justified depending on the specific set of circumstances applying to a project.

Vibration criteria and guidelines for determining the need for ground-borne vibration and ground-borne noise mitigation for transit operations are included in the FTA guidance. The FTA ground-borne vibration criteria are based on the maximum vibration levels for repeated events of the same source. The criteria are based on the frequency of events, which can vary substantially, depending on the type of transit, and on the sensitivity of the receptor.

In addition, the FTA provides guidance on vibration for transit projects located in corridors with existing vibration sources, such as freight trains. These criteria are based on the existing vibration levels and frequency of events, and a comparison of the project vibration levels to the existing vibration levels.

FTA also provides vibration criteria for highly sensitive locations, such as theaters, recording studios, research facilities, and hospitals. These locations should receive special consideration for mitigation, based on the potential for vibration from transit operations to interfere with the operations at these locations.

DART Mitigation Policy

Based on the above guidance from FTA, DART’s mitigation policy is to mitigate all “Severe” noise impacts and all vibration impacts, where feasible. For “Moderate” noise impacts, DART’s policy is to mitigate impact:

- At locations where the predicted increase in noise over the existing level is three decibels or greater. An increase in noise level of 3 dB is typically the threshold at which the change in Ldn is noticeable by the community. This provides for mitigation of “Moderate” impacts for which a noticeable increase in noise level is projected.

- At locations where the predicted increase in noise over the existing level is less than 3 dB and the location is adjacent to an area with either “Severe” noise impact or “Moderate” noise impact with an increase of 3 dB or greater, and the inclusion of
the adjacent properties would provide a logical and equitable terminus to the mitigation.

- At locations where the existing noise level is 65 dBA Ldn or greater.
- At locations that fall under Section 4(f) and Section 106 that have noise sensitivity, depending on the use of the resource.
- At locations that have special sensitivity to noise.

For DART transit operations in the “Severe” range of noise impact, any proposed mitigation must provide at least 5 dB reduction in project noise, and at a minimum move the “Severe” impact into the “Moderate” impact range. At the “Moderate” impact range, any proposed mitigation must also provide at least 5 dB reduction in project noise, and move the “Moderate” impact into the “No Impact” range. For vibration impacts, any proposed mitigation must provide at least 5 dB reduction in project vibration, and eliminate the impact, where feasible.

If DART proposes not to mitigate any projected “Severe” noise impacts, vibration impacts or “Moderate” noise impacts that meet the policy stated above, DART must demonstrate (“make the case”) that mitigation is not reasonable or feasible. The justification for not mitigating these impacts must be included in the environmental document.

For construction activity, noise or vibration mitigation should be considered, where reasonable and feasible, if applicable noise or vibration limits would be exceeded. Specific noise and vibration limits are contained in Section 01560, “Environmental Protection,” of the Dallas Area Rapid Transit Master Construction Specifications. Additional vibration limits, applicable to sensitive residential and manufacturing zones, are included in the Dallas City Code.

Common Mitigation Techniques

For noise and vibration impacts of transit operations, mitigation measures may involve treatments: (1) at the noise source; (2) along the source-to-receiver propagation path; or (3) at the receiver. Typical noise mitigation techniques are described below. Appendix E contains illustrations of mitigation measures.

- Stringent transit vehicle and equipment noise specifications.
- Rail vehicle treatments (e.g., resilient or damped wheels, vehicle skirts, undercar sound absorption, spin-slide control systems, and on-board lubrication).
- Track treatments (e.g., moveable-point frogs and wayside rail lubricators).
- Enhanced maintenance (e.g., wheel truing and rail grinding).
- Operational restrictions (e.g., lowering vehicle speeds and reducing nighttime operations).
- Installation of wayside sound barriers between transit operations and noise-sensitive land uses.
- Horizontal and vertical alignment modifications.
- Acquisition of buffer zones.
- Improving the sound-insulation characteristics of affected buildings or acquiring the affected properties. Treatments must provide at least a 5 dB reduction in interior noise levels and meet the FTA L_{dn} 45 dBA interior noise criterion.
- Quiet Zones. Where transit operations share the corridor with a freight rail system, the FRA’s Final Rule on the Use of Locomotive Horns at Highway-Rail Grade Crossings, August 2006 (https://www.fra.dot/eLib/details/L02809) should be followed. Rapid transit operations, but not commuter operations, are exempt from the FRA minimum noise levels for vehicle warning devices.

After FRA published its Final Rule, it was clear that four minimum requirements must be met for a quiet zone to be established:
• Signal lights at railroad crossings;
• Gate arms at railroad crossings;
• Power-out indicators; and
• Constant warning.

The LRT system cannot satisfy the constant warning requirement due to return current along the rails resulting from direct current powering the LRT vehicle. Based on research conducted by DART in 2007 after the Final Rule was issued, it was determined that electronic circuitry does not exist that would allow for constant warning time circuit functionality to exist in conjunction with the DART LRT electrified system.

Common vibration mitigation measures are similar to those for noise reduction and include:

• Stringent transit vehicle and equipment specifications.
• Rail vehicle treatments (e.g., wheel flat detector systems).
• Track treatments (e.g., moveable-point frogs, resilient rail fasteners, ballast mats, resiliently-supported ties, and floating track slabs).
• Enhanced maintenance (e.g., wheel truing and rail grinding).
• Operational restrictions (e.g., lowering vehicle speeds).
• Horizontal or vertical alignment modifications.
• Acquisition of buffer zones.
• Building vibration isolation (for new construction).
• Obtaining vibration easements or acquiring the affected properties.

Appropriate construction noise and vibration control requirements. Examples of construction noise and vibration control approaches are as follows:

• Use specially quieted equipment, with efficient mufflers and sound-retardant housings.
• Locate equipment on the construction site as far away from noise-sensitive sites as possible.
• Avoid idling and unnecessary operation of equipment.
• Construct noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.
• Line or cover hoppers, storage bins, and chutes with sound-deadening material.
• Route construction truck traffic away from residential streets, if possible, or select streets with the fewest homes if no alternatives are available.
• Restrict working hours and schedule operations in a manner that will minimize the disturbance of adjoining land uses (e.g., avoiding nighttime activities near residential neighborhoods).
• Use alternative methods (e.g., drilled piles) to avoid impact pile driving near sensitive areas, where geologic conditions permit.
• Use alternative methods (e.g., saw cutting) to avoid impact demolition methods near sensitive areas, where possible.

2.10.2 BACKGROUND

Regulating Law and Industry Practice

The basis for DART’s noise and vibration criteria for transit operations is the criteria recommended by FTA. These criteria are contained in the FTA guidance manual. The provisions of any subsequent revisions to this document will also apply. A revised version of this guidance is expected in 2020.
The FTA noise criteria are based on a comparison of the transit system noise with the outdoor ambient noise from other sources in the community. They incorporate both absolute criteria, which consider activity interference caused by the transit system alone, and relative criteria, which consider annoyance due to the change in noise environment caused by the transit system. The FTA criteria evaluate noise impact on the basis of cumulative, A-weighted noise exposure, in terms of either the $L_{eq}$ or the $L_{dn}$. The one-hour $L_{eq}$ is a single noise level with the same sound energy as the fluctuating level over a one-hour period, and the $L_{dn}$ is a 24-hour $L_{eq}$ with a 10 dBA penalty applied to noise that occurs between 10:00 PM and 7:00 AM to account for heightened sensitivity to noise at night. $L_{dn}$ is applied to residences and other buildings where people normally sleep, and $L_{eq}$ is applied to all other noise-sensitive land use categories.

The FTA criteria for noise impact vary by land use category. Two levels of impact are included in the criteria as follows:

- **Severe**: Severe noise impacts are considered “significant” as this term is used in NEPA and implementing regulations. Noise mitigation will normally be specified for severe impact areas unless there is no practical mitigation measure.

- **Moderate**: In this range, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and numbers of noise-sensitive land uses affected, existing outdoor-to-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels.

The noise impact is assessed on a sliding scale, such that the allowable increase in overall noise exposure above the existing noise exposure due to the transit system decreases as the ambient community noise increases. For example, in residential areas with an ambient $L_{dn}$ of 60 dBA, the criteria limit the noise exposure increase to 2 dB for moderate impact and to 5 dB for severe impact. However, in areas with an ambient $L_{dn}$ of 70 dBA, the increases are limited to 1 dB for moderate impact and to 3 dB for severe impact.

The FHWA noise criteria, contained in the guidance document *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 CFR 772), follow the same general procedures as the FTA criteria. The guidelines incorporate both absolute criteria, when noise levels are unacceptably high; and relative criteria, when a proposed highway project will substantially increase the existing noise exposure. FHWA uses slightly different sound measurement criteria; either the $L_{eq}$ or the noise level exceeded 10% of the time in the noisiest hour of the day ($L_{10}$).

The FHWA makes a distinction between projects for which noise abatement is considered as a feature. Type I projects are proposed federal or federal-aid highway projects for the construction of a new highway or the physical alteration of an existing highway, which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes. Consideration of noise abatement for Type I projects is mandatory if federal-aid funds are to be used and if a traffic noise impact is expected to occur. Type II noise abatement projects are for existing highways as a retrofit feature and noise abatement is voluntary on the part of the individual states, with funds for such projects competing with all of the other construction needs of the state.

Local noise regulations, applicable to DART fixed facilities (e.g., electric substations) are included in Part II of the Dallas City Development Code (Article VI, Section 51A-6.102). These limits are based on zoning district and time of day, and are given in terms of $L_{eq}$ averaged over an 8-minute period of time. The most stringent limits apply to residential districts, with daytime and nighttime limits of 56 dBA and 49 dBA, respectively. A -7 dBA adjustment to the limits is specified for impulsive noises and a +10 dBA adjustment to the limits is permitted for relatively infrequent noises. The code prohibits creating noise levels that exceed the specified limits, or that exceed the background noise level by five (5) dB, whichever is greater.

The FTA vibration criteria are given in terms of maximum ground-borne vibration and noise levels and depend on land use category and the number of vibration events. For ground-borne vibration, impact levels are specified in terms of rms ground vibration...
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velocity levels in decibels that range from 65 VdB to 83 VdB (re 1 micro-inch per second). For ground-borne noise inside buildings, impact levels are specified in terms of A-weighted sound levels that range from 25 dBA to 48 dBA. Criteria are also provided for special vibration-sensitive buildings and vibration sensitive equipment in the form of one-third octave frequency band spectra. These criteria are specified in terms of rms vibration velocity levels that range from 42 VdB to 72 VdB in each one-third octave frequency band.

Local vibration regulations are included in Part II of the Dallas City Development Code (Article VI, Section 51A-6.105). In residential or manufacturing districts, earth-borne vibration limits are specified in terms of ground displacement as a function of frequency. The limits range from 0.0003 inch at frequencies of 40 Hz and above to 0.0010 inch at frequencies of 10 Hz and below. In terms of rms vibration velocity level, the specified limits correspond to values of approximately 84 VdB to 88 VdB or higher. These limits exceed the range of allowable vibration levels included in the FTA criteria.

For construction noise and vibration, the FTA also provides guidelines for prediction, assessment, and control. While the manual includes guideline criteria for construction noise and vibration impact, it recommends that criteria be developed on a project-specific basis, unless local ordinances can be found to apply.

Construction noise and vibration limits that are consistent with the FTA guidelines are included in the Dallas Area Rapid Transit Master Construction Specifications. These specifications include noise limits for daytime and nighttime construction in residential, commercial, and industrial areas. For “intermittent” construction noise, lasting one hour or less, these limits range from 70 dBA to 90 dBA. For “continuous” construction noise, lasting more than one hour, the limits range from 50 dBA to 85 dBA. The specifications also include equipment noise emission limits of 87 dBA to 95 dBA at 50 feet, as well as a ground-borne vibration velocity limit of 0.1 inch per second (rms).

Local noise regulations are also included in Part II of the Dallas City Development Code (Article VI, Section 51A-6.102). These regulations exempt construction/demolition activities regulated by Chapter 30 of the city code. Chapter 30 limits such activities to weekdays between the hours of 7:00 AM and 7:00 PM, Monday through Friday, and between the hours of 8:00 AM and 7:00 PM on Saturdays or legal holidays, in or adjacent to a residential area, unless a permit is obtained. However, because Chapter 30 refers to construction of any “building,” it is not clear whether the time of day restriction applies to transit system construction.

Local construction vibration regulations are included in Part II of the Dallas City Development Code (Article VI, Section 51A-6.105). In residential or manufacturing districts, earth-borne vibration limits are specified in terms of ground displacement as a function of frequency range. The limits range from 0.0003 inch at frequencies of 40 Hz and above to 0.0010 inch at frequencies of 10 Hz and below. In terms of rms vibration velocity, the specified limits correspond to approximately 0.02 inch/sec (rms).

Regulating Agencies

- Municipal government
- FTA
- FHWA
- FRA

Applicable Design Criteria, Drawings, and Specifications

Noise and vibration impacts from transit operations are addressed in Chapter 11 of the DART LRT Project Design Criteria Manual, Volume No. 1 (Facilities Design), January 31, 2003. Although these criteria provide design standards for community, patron, and employee noise and vibration levels, they are not applicable to environmental impact assessment. Aerial noise barriers are shown in the DART Structural Standard Drawings.
Construction noise and vibration issues are addressed in Section 01560, “Environmental Protection,” of the DART Master Construction Specifications.

2.11 HAZARDOUS/REGULATED MATERIALS

“Hazardous materials” is used as a broad term to denote liquid, gaseous, and solid materials and chemicals that exhibit hazardous properties related to ignitability, corrosivity, reactivity, and/or toxicity. Many of these materials, generally those pure substances or mixtures of substances exhibiting a threat to human health and/or the environment, are regulated by governmental agencies in their manufacture, storage, use, and disposal. This section addresses DART’s policies relating to the assessment of the potential presence of hazardous materials at proposed transit project sites, the handling of hazardous/regulated materials, as well as potential encounters with hazardous/regulated materials during construction. Assessment and mitigation requirements can be factored into the purchase price and/or the long-term environmental liability associated with a site, or may assist in the decision whether to purchase a property.

2.11.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Determine the potential for the presence of hazardous/regulated materials on property to be acquired.

- Where the presence of hazardous/regulated materials is known, identify, and in some cases, quantify existing contamination.

- Utilize the potential or known presence of hazardous/regulated materials in determining overall cost and construction impacts on a transit project.

- Provide a mitigation strategy for site cleanup.

When is an Impact Likely to Occur?

Hazardous/regulated material impact on transit projects is primarily dictated by past activities or practices at the site and/or adjacent properties. Secondary potential impact on the project includes the deposition of hazardous materials on the site, or release of such materials from the site, by construction activities.

Past Activities or Practices - Past or current environmental problems at a site may result from above ground liquid spills on or adjacent to the site (i.e., above ground storage tanks, industrial processes, drum storage areas, etc.). Underground chemical storage tanks present the potential for underground releases and site impact. The potential for adverse site impact is generally greater from onsite sources, but migration onto the site from adjacent properties can, and often does, occur. Migration of contamination onto the site can occur from greater distances than just adjacent sources, especially if the groundwater has been impacted at the contamination source, and the groundwater flow direction is towards the site. Hazardous solids contamination occurs primarily from on-site activities, though rainwater runoff and atmospheric drift may allow on-site contamination from off-site sources. Off-site gaseous releases can also contaminate the site due to atmospheric drift. Should there be structures on the project site, then a potential for asbestos and/or lead-based paint (LBP) contamination exists.

The highest risk for contamination results from potentially contaminated facilities located near to or on the transit project site. Examples of high risk sites include landfills or unregulated dump sites, industrial sites with a history of compliance issues, dry cleaners that have used chlorinated solvents and reported leaking underground storage sites located near to or on the project site, especially those that have not attained full regulatory closure status. Modern gas stations and other facilities that are listed as only producing small quantities of hazardous wastes generally represent lower risk among known hazardous materials facilities. Generally, asbestos, LBP, and petroleum-contaminated soil are the most likely forms of contamination encountered.
Construction Activities - DART’s subsequent construction activities also create the potential for hazardous/regulated materials impact. Leakage of petroleum fluids from construction vehicles and the offsite migration of erosion products (soil sediments in stormwater or wind blown dust) offer the greatest potential for impact. There is also a potential to uncover undocumented hazardous/regulated materials during construction. Should the construction activities disturb hazardous materials, then the off-site migration of those materials via stormwater runoff or wind may also become a concern.

Assessment Methodology
An important aspect of any transit project as it relates to hazardous materials is the assessment of potential conditions prior to purchase of property and construction activity.

Phase I ESA and Asbestos and LBP Surveys:
A Phase I Environmental Site Assessment (ESA) should be performed, as a minimum, in accordance with American Standards for Testing and Materials (ASTM) Designation E-1527--13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment, December 2012. DART’s Environmental Compliance Department should be consulted for any additional Phase I ESA requirements above the ASTM standard.

The Phase I ESA consists of an environmental regulatory agency database search and field reconnaissance activity that should be considered an initial screening type investigation. It may indicate areas of potential concern that warrant further study and/or precautionary actions.

Should there be structures present on the specific site to be purchased, constructed upon, and/or demolished, a survey for the presence of asbestos containing materials (ACMs) and LBP may be warranted. If the presence of these materials is confirmed during the survey, mitigation measures can be adopted for and initiated as part of the demolition and construction activities. At a minimum, asbestos surveys should be conducted pursuant to the requirements of the latest revision of the Texas Asbestos Health Protection Rules (TAC 295.31-73). LBP surveys should be conducted according to the Texas Environmental Lead Reduction Rules (TAC 295.-201-220). DART’s Environmental Compliance Department should be consulted for any additional asbestos or LBP survey requirements above the Texas standards.

The Phase I ESA process requires disclosure of “data gaps” or areas where right-of-entry to a property or building was denied, restricted, or sufficient data could not be obtained. Such “data gaps” should be clearly described in any hazardous materials reports. Interviews with current property owners can be an important component of a hazardous materials site assessment.

Phase II ESA:
Based on the results of the Phase I ESA, a modified Phase I ESA (further and more in-depth research) or a Phase II ESA may be warranted. A Phase II ESA is a more invasive investigation generally involving material sampling and testing and often the drilling and sampling of soil borings and/or installation and sampling of groundwater wells. Phase II ESAs should follow the Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process (ASTM E-1903-11). A qualified contractor in accordance with all EPA, Texas Commission on Environmental Quality (TCEQ), and applicable local regulations and requirements should perform the work. DART’s Environmental Compliance Section can be consulted for approved contractors and requirements.

When Should Mitigation Be Considered?
Mitigation should be considered prior to property purchase or when establishing a new property lease agreement. Assuming the project will proceed and mitigation is required, in-depth investigations (Phase II ESAs or beyond, and/or additional ACM and LBP surveys) must be conducted before the final design. The primary focus of these investigations should be in areas where construction activities
Impact Assessment Categories

Mitigation may also need to be considered if unanticipated hazardous/regulated materials are encountered during construction. Construction activities should be ceased, and immediate coordination with DART’s Environmental Compliance Section will need to occur to determine if mitigation is necessary and, if so, the types of measures to be taken.

Common Mitigation Techniques

Common mitigation techniques for soil remediation, groundwater remediation, asbestos and LBP mitigation, and construction dust and stormwater runoff controls are described below. Appendix E contains an example of a mitigation technique.

- Soil Remediation - Soil remediation techniques include excavation and off-site disposal or treatment; vapor extraction; biodegradation; leaching and chemical reaction; vitrification; isolation/containment; and passive measures.

- Groundwater Remediation - Many of the same techniques used in soil remediation can also be used for groundwater. It can be treated by volatilization via tower stripping – similar to vapor extraction, biodegradation, chemical reaction, absorption, isolated or contained (slurry walls or other impermeable barriers), passive measures, or off-site disposal. Volatilization, biodegradation, and chemical reaction can be performed either in-situ, or ex-situ via pump and treat systems. Groundwater contamination poses special concerns due to the ability to spread over larger distances, contaminate soil, and contaminate drinking water supplies. It is also generally more difficult to remediate groundwater contamination than soil contamination.

- Asbestos and LBP - Asbestos mitigation generally involves removal and disposal to an approved disposal site. LBP mitigation can also involve removal and disposal to an approved disposal site. In addition, LBP contamination is sometimes left on the substrate (i.e., piping, metal siding, wood) and is removed during recycle melting of metals or thermal destruction.

- Construction dust and stormwater runoff controls - Construction methods to control stormwater runoff and resultant sediment deposition include: storm water inlet protection, silt fencing, interceptor dikes and swales, sediment traps, and other best management practices (BMP). Periodic wetting down of the construction site generally accomplishes dust control. See Section 2.13, Water Resources, for additional information on storm water requirements.

DART Risk Assessment/Reduction Plans and related mitigation plans will be developed based on the results of the detailed investigations as discussed in the section, Assessment Methodology. Construction health and safety requirements, contamination remediation and disposal procedures, and ACM or LBP management or remediation practices will be evaluated. Detailed site-specific construction health and safety plans, remediation implementation specifications, and cleanup verification work plans will need to be developed. Depending on the results of the previous investigations, an application to TCEQ may be made to enter the Voluntary Cleanup Program (VCP) to obtain environmental site closure or the Innocent Owner/Operator Program (IOP) to obtain an Innocent Owner/Operator Certificate (IOC), which can be used as a redevelopment tool or as a tool to add value to a contaminated property. The handling, treatment, and disposal of all hazardous/regulated materials are to be in full compliance with all federal, state, and local requirements.

Hazardous materials mitigation/remediation is a specialized field and must be performed by appropriately licensed, trained, and knowledgeable persons. Control of construction dust and stormwater runoff controls are standard practices and can be performed by any competent construction contractor. DART will work with approved contractors to implement mitigation measures.
2.11.2 BACKGROUND

Regulating Law and Industry Practice

The basis for DART’s hazardous/regulated materials criteria for transit projects is the standards, guidelines, or regulations of the ASTM, EPA, OSHA, TCEQ, the Texas Department of State Health Services (TDSHS), various local regulations, and common industry practice. The following is a summary of important applicable components of those standards, guidelines, and regulations.

Industry Standards

ASTM - The ASTM publishes standards for a wide variety of engineering and related functions. Included, and a basis to these criteria, is the ASTM Designation E-1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment and ASTM E-1903-11, Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process. This practice covers a process for conducting a Phase II ESA of a parcel of property with respect to the presence or the likely presence of substances including but not limited to those within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (e.g., hazardous substances), pollutants, contaminants, petroleum and petroleum products, and controlled substances and constituents thereof.

Federal Regulations

EPA - A major portion of the regulatory requirements of DART’s environmental impact assessment guidelines for transit projects comes from the EPA. General encompassing legislation are included in Appendix B.

NEPA – EISs and related documentation on federally-funded and/or approved programs; and

OSHA - Regulations that apply to exposure to hazardous materials in all demolition, removal, construction, and emergency response work.

State Regulations

TCEQ - The TCEQ implements many of the EPA programs, and/or has parallel programs that are as stringent or more stringent than the EPA programs. The design and preparation of all monitoring and remediation plans are coordinated with the TCEQ. The TCEQ either coordinates or issues most environmental related permits in the State of Texas. They are the primary contact for any hazardous/regulated materials issues that may occur on transit projects.

TDSHS - The TDSHS regulates asbestos and LBP activities through the Texas Asbestos Health Protection Rules and the Texas Environmental Lead Reduction Rules, respectively.

Local Regulations

Numerous city and/or county entities have regulations that address environmental issues including: (1) spills of hazardous/regulated materials; (2) stormwater management; (3) asbestos abatement; and (4) related issues. In general, these reflect other regulations, but are sometimes more stringent.

Regulating Agencies

- EPA
- OSHA
- TCEQ
- TDSHS
- TxDOT
- Local city and/or county agencies

Applicable Design Criteria, Drawings, and Specifications

The project master construction specifications should state that if unanticipated hazardous/regulated materials are encountered during construction, the construction manager or designee must
immediately cease associated construction activities and immediately notify DART's Environmental Compliance Section.

These and related issues are addressed in the following DART documents:

- Section 01560, "Environmental Protection", Section 02050, "Demolition", and Section 01562, "Soil Erosion and Sediment Control" of the *Dallas Area Rapid Transit Light Rail Project Facilities and Systems Standard Specifications, May 2016*;
- *DART Facilities Standard Drawings*, November 2005; and
- *DART Capital Improvement Program Management Plan, Chapter 11, "Environmental Impact Management."

### 2.12 AIR QUALITY

Air quality standards, mandated by both state and federal laws, are driving forces behind mass transit projects. This section provides guidelines to determine the effects of transit operations on reducing exhaust emissions, which has the potential to enhance air quality. Additionally, this section outlines potential mitigation strategies to reduce sources of emissions. These guidelines are intended to apply to all aspects of the transit system that produce emissions as well as provide guidance for assessing the potential of decreasing emissions due to providing alternative transportation modes.

#### 2.12.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

**Objectives**

- Avoid creating local traffic conditions that produce emissions gasses that exceed National Ambient Air Quality Standards (NAAQS).
- Reduce the creation of vehicular emission gasses from transit-operated projects and equipment.

**When is an Impact Likely to Occur?**

Impacts are likely when a transit project results in:

- Exceedances of the NAAQS.
- Higher emissions in the area with implementation of the project than without it.
- Excessive impacts to air quality are anticipated due to construction vehicles or activities associated with construction. However, these impacts are temporary in nature.

**Assessment Methodology**

Part of the analysis required for air quality is to address regional air quality impacts for conformity to the State Implementation Plan.

- In 2016, FTA published updated guidance to justify federal funding under Section 5309 Capital Investment Grant Program criteria. Part of this assessment involves evaluating the following performance measures as an assessment of environmental benefits for new, federally-funded transit projects: change in pollutant emissions; change in regional energy consumption; and EPA air quality designation for the region. Criteria pollutant and precursor emissions measured include carbon monoxide (CO), particulate matter, nitrogen oxides, and volatile organic compounds. The greenhouse emission measured is carbon dioxide. All of these emissions are estimated based on vehicle miles traveled (VMT). Additional analyses can be conducted to identify localized air quality “hot spots” for CO and respirable particulate matter.
• Mobile Source Air Toxics (MSAT) emissions from motor vehicle movement within the project corridor (project corridor emission burden) will be determined using the EPA’s MOVES2014 which also includes the NONROAD2008 model, allowing for modeling of both on-road and nonroad mobile sources within the MOVES platform. Traffic on thoroughfares and freeways will be taken into account. Traffic volumes for the existing and/or design year will be based on City of Dallas or NCTCOG traffic forecasts. Dallas area climatic factors, cold start/hot start percentages, vehicle age distribution, and anti-tampering program credits will be taken into account.

• TxDOT December 2015 Standard Operating Procedure for Compliance with Conformity Requirements - To document air quality conformity, a report will be generated which compares the modeled CO emissions (including the area’s background CO concentration) of the project to the CO NAAQS in both the project completion year and design year and document one of the following:
  1) That the project’s modeled concentrations of CO emissions (when combined with background concentrations) will not exceed the applicable CO NAAQS in the ETC and design years; or
  2) The project’s modeled concentrations, when combined with background concentrations plus emission reductions from mitigation measures, will be less than the applicable CO NAAQS in the ETC and design years.

• Based on a general construction scenario and the identification of existing land use, population, and natural resource characteristics, all areas where construction activities will occur will be examined in terms of their relationship to adjoining land uses that are sensitive to disturbance from dust and air pollutant emissions.

When Should Mitigation Be Considered?
Mitigation may be appropriate for the following situations:

• When kilograms per day of CO, oxides of nitrogen, and nonmethane hydrocarbon emissions in the project area are greater with the transit project than without it.
• NAAQS for CO concentrations are exceeded at locations where traffic volumes or congestion would increase.
• NAAQS for oxides of nitrogen concentration are exceeded at areas of bus concentrations.

Common Mitigation Techniques
Incorporate air pollutant control requirements into project master specifications. These requirements can specify that construction contractors:

• Use and maintain emission control devices on gasoline and diesel construction equipment.
• Avoid idling and unnecessary operation of equipment.

Since air pollution impacts are generally tied directly to traffic congestion, the techniques described in the Traffic Flow section would apply here as well. An operations plan that minimizes bus queuing and layover times at the point of concentration could resolve impacts from bus concentrations.

2.12.2 BACKGROUND
Regulating Law and Industry Practice
Pollution emissions and concentrations are regulated by the EPA under the requirements of the Clean Air Act (42 USC 7401) and the TCEQ, Office of Air Quality under the requirements of the Texas Clean Air Act as amended (Article 4477-5, Vernon’s Texas Civil Statutes). The EPA has established NAAQS for six air pollutants: ozone, lead, CO, sulfur dioxide, nitrogen dioxide, and respirable particulate matter. The TCEQ Office of Air Quality enforces these standards throughout all parts of Texas (31 TAC Chapter 101, Section 101.21). The NAAQS set maximum acceptable
concentrations in a given time period. As indicated above, they generally are not to be exceeded more than once a year. The standards for CO concentrations are 9 parts per million (ppm) during an eight-hour period and 35 ppm during a one-hour period. The standard for nitrogen dioxide is an annual average of 53 parts per billion (ppb) and 100 ppb during a one-hour period.

State regulations that apply to emissions from the DART vehicle fleet include SB 681 (Section 382.133 of the Health and Safety Code) and Chapters 451-53 of the Texas Transportation Code. These regulations require that DART have a minimum of 50 percent of its qualified fleet vehicles certified as Low Emission Vehicles (LEV) federal regulations require that bus engines meet a more stringent emission standard than the same engine installed in other vehicles. Under the EPA regulated “Urban Bus Retrofit Rebuild Program” (1996), DART must rebuild pre-1993 engines at a lower emission rate than the engines were originally certified.

The EPA has determined that the Dallas area does not meet NAAQS for ozone and is classified as a “moderate non-attainment area” for that pollutant. Ozone is produced when oxides of nitrogen and hydrocarbons in the air are catalyzed by sunlight. Since Dallas is a moderate non-attainment area, a long-term plan for bringing Dallas into compliance with ozone standards has been incorporated into the State Implementation Plan for air quality improvement. Improved transit service is one aspect of the plan. A reduction in oxides of nitrogen and hydrocarbon emissions by automobiles in a passenger rail corridor will contribute to a reduction in Dallas area ozone levels.

It is accepted industry practice to focus impact assessments for transportation projects on changes in motor vehicle related pollution. As indicated by the issues listed above, the introduction of a transit system in a region can reduce the reliance on the automobile to meet travel needs and, as a result, reduce motor vehicle pollution emissions (or burden) corridor-wide. Localized air quality issues may arise, however, from implementation of a transit project. Stations or park-and-ride lots attract new traffic, or at-grade passenger rail crossings can delay traffic movement. If severe congestion were to result, additional emissions could be added to the regional pollution burden and at the specific point of congestion; and NAAQS for acceptable pollutant concentrations could be exceeded.

To address these two impacts on air quality, it is accepted industry practice to address motor vehicle pollution impacts first in terms of changes in corridor-wide CO, oxides of nitrogen, and non-methane hydrocarbons burden or amounts of emissions. Motor vehicle exhaust is a major source for these pollutants. Both decreases in corridor motor vehicle use and any increases in local congestion at station or grade crossings are taken into account. At the localized level (near the source of pollution), it is accepted practice to focus on CO concentrations and determine if the NAAQS for that pollutant are being exceeded. Localized oxides of nitrogen concentrations also may need to be examined where there would be a large concentration of diesel-powered vehicles, such as buses. With normal automobile/truck/bus vehicle mixes, however, oxides of nitrogen concentrations have been found not to be a localized problem. Nonmethane hydrocarbons are addressed only in terms of the effect on the regional air pollution burden since they are of concern only to the extent to which they contribute to regional levels of ozone.

**Regulating Agencies**
- TCEQ, Office of Air Quality
- NCTCOG, Regional Transportation Council
- EPA
- FTA, Section 5309 Capital Investment Grant Criteria
- TxDOT, Environmental Affairs Division

**Applicable Design Criteria, Drawings, and Specifications**
Traffic movement and control-related criteria are contained in Chapter 4, Streets/Highways and Parking and Chapter 5, Traffic Control of the DART Design Criteria (Facilities), Volume 1, February 2003.
2.13 WATER RESOURCES

Mass transit projects have the potential to negatively impact water resources during construction and operation of the system. This section provides guidelines for determining whether the actions associated with transit projects would affect water resources and outlines potential strategies to mitigate adverse impacts.

2.13.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Prevent degradation of surface water and groundwater quality.
- Avoid altering stormwater flow patterns such that resulting quantities would exceed municipal storm sewer and drainage capacities.
- Preserve floodplain capacity and the hydrological capacity of channels and floodways to transport flood waters.
- Avoid the obstruction of existing or future options for water transportation.
- Minimize acres of fill in Waters of the U.S. and comply with U.S. Army Corps of Engineers (USACE) permitting requirements.
- To aid in water conservation, utilize native vegetation beneficial to fish and wildlife for landscaping where feasible.
- Minimize impacts to linear water features and riparian habitat by placing crossings perpendicular to the water feature.

When is an Impact Likely to Occur?

- Impacts on water quality are possible in construction or operational situations that create excessive amounts of sediment load, erosion or surface water runoff. Impacts are also possible when greases, oils, chemicals, and wash water at maintenance facilities cannot be placed in municipal sewers. Impacts on water quantity may occur when there are changes in: storm water drainage patterns and quantity; 100-year flood levels; and/or the hydraulic capacity of existing channels and floodways.
- Impacts on navigation are likely when there is an encroachment on navigational channels or clearances.

Assessment Methodology

The assessment methodologies for determining effects on flooding and drainage, water quality, and navigation are presented below.

Flooding and Drainage:

- Prior to construction of new facilities or modification to existing facilities, a site visit and review of existing maps and/or aerial photographs will be performed to determine storm water drainage patterns. City or county records would be reviewed to identify storm sewer and open drainage capacities as they relate to the project. The potential for change in drainage patterns and runoff quantities will be identified.
- The location and approximate extent of the 100-year floodplain will be determined using the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps or applicable local mapping. If projects are proposed for construction in a floodplain, a document will be prepared detailing: (1) reasons for the project location; (2) alternatives considered; (3) reasons why these alternatives were not practical; and (4) the project’s conformity to municipal floodplain protection standards (i.e., raising project facilities out of the floodplain and not adversely affecting floodwater levels). Consultation with the appropriate local, state, and federal representatives will be done prior to construction in the floodplain.
- The current hydraulic capacity of channels and floodways (in terms of cubic feet per second) will be evaluated based on calculated changes resulting from the transit project. Alternative designs to address reduced hydraulic capacity will be developed until a satisfactory design is available.
2.0 Impact Assessment Categories

Water Quality:

- Surface water bodies on or adjacent to transit project sites will be identified and their existing quality determined. The applicable requirements of the 208 Area-Wide Water Quality Management Plan (AWQMP) and the State Water Conservation District (SWCD) of the Texas State Water Conservation Board will be identified. Techniques for containing project pollutants at maintenance sites will be defined and compared in consultation with municipal, 208 representatives and SWCD State District 5 representatives. Future water quality, both with and without the proposed project, will be estimated and compared to federal, state, and/or local water quality standards.

- The Texas Pollutant Discharge Elimination System (TPDES) is administered by the TCEQ. The new Construction General Permit (TXR150000) became effective March 5, 2018 and authorizes stormwater discharges from construction sites. This permit authorizes stormwater discharges from the construction activities, which may result when pollutants on land are washed into surface waters by rain, snow melt, or similar events. These events are referred to in the regulations as "non-point source discharges."

- Construction sites disturbing less than 1 acre are not required to obtain authorization to discharge stormwater. Construction sites disturbing between 1 and 5 acres are required to develop and implement a Construction Stormwater Pollution Prevention Plan (SW3P), as well as submit a construction site notice to the Municipal Separate Storm Sewer System (MS4) authority (if applicable) and post the construction site notice on-site during construction. Construction sites disturbing more than 5 acres are required to prepare and implement a SW3P and must also submit a NOI to TCEQ prior to construction, and post the construction site notice and NOI on-site during construction. A copy of the NOI must also be submitted to the MS4 authority if applicable.

The Construction General Permit requires that the dischargers institute BMPs at their construction site. BMPs include any management practice, or prohibition of a practice, that is designed to prevent the pollution of a waterway. BMPs are specified for the implementation at a construction site in the SW3P. The SW3P is the primary tool for reducing erosion and sediment loss from a construction site. It must identify potential sources of pollution that may be reasonably expected to affect the quality of stormwater discharges from the construction site. In addition, the SW3P must describe and ensure the implementation of the BMPs used to reduce the pollutants in stormwater that is discharged at the construction site and to assure compliance with the terms and conditions of the permit.

Navigation:

Navigation requirements on the Trinity River are determined in consultation with the U.S. Coast Guard, USACE, and TxDOT. The Trinity River is the only river or creek in the DART service area for which navigation requirements, as defined by the U.S. Coast Guard, apply (pursuant to Section 10 of the Rivers and Harbors Act of 1899.). DART has previously applied, and was granted approval for crossing the Trinity River as part of the construction of the Starter System.

When Should Mitigation be Considered?

- If studies show that the project will: (1) exceed the capacity of storm sewers; (2) encroach on the 100-year floodplain and potential flood levels would increase beyond municipal limits; or (3) reduce the capacity of channels or floodways.

- If testing or feasibility studies show that the project will likely contaminate nearby bodies of water or violate federal, state, or municipal water quality standards.

- If the U.S. Coast Guard indicates that the proposed project would affect navigation improvement plans.

- See also Section 2.14 under the same heading.
2.0 Impact Assessment Categories

Common Mitigation Techniques

Examples of mitigation strategies are listed below for impacts on water quality as well as on navigation. In addition, other examples of common techniques specific to impacts resulting from construction activity or operational sites are provided.

*Stream channel and waterway mitigation*
- Stream bank and bottom protection including rip-rap, gabions, and current deflectors.
- Vegetation plantings, replacement, or enhancement.

*Navigational mitigation*

Meet bridge clearance and span requirements or agree to alter bridge clearance and/or increase spans should navigational plans be implemented.

*Construction site mitigation and pollution prevention*
- Soil erosion and sediment controls including silt fencing, water interceptor dikes and swales, sediment traps, ditch checks, storm sewer inlet protection, pipe slope drains, and water spreaders.
- Post-construction total suspended solids (TSS) removal.
- Stormwater storage in the form of detention or infiltration basins.
- Construction waste disposal (brush, paper, cloth, etc.) on a daily basis.
- Hazardous waste transportation, handling, storage, and use in strict accordance with local, state, federal regulations and manufacturers’ recommendations.
- Sanitary waste collection in portable units by a licensed contractor and disposal at an approved facility in accordance with local and state regulations.
- Control of off-site vehicle tracking of mud, dirt, or rock onto public roadways.
- Minimization of exposure due to vehicle leakage, fueling operations, or minor maintenance including vehicle positioning, drip pans, containment diking, and other appropriate BMPs.

*Operational site mitigation and pollution prevention:*
- Oil/water separators on dedicated drain lines from vehicle wash racks and maintenance bays.
- Hazardous waste transportation, handling, storage, and use in strict accordance with local, state, federal regulations and manufacturers’ recommendations.
- Periodic cleaning of vehicle fueling, parking, or storage areas to minimize contaminated runoff.

2.13.2 BACKGROUND

Regulating Law and Industry Practice

Executive Order 11988, Floodplain Management (3 CFR 117), requires a federal funding or licensing agency to prepare written justification for a project proposed for placement in a floodplain; a statement indicating whether the action conforms to applicable state and local floodplain protection standards; and a list of alternatives considered. In addition, the agency must conduct public review with public notice and identify impacts with measures that need to be taken to minimize impacts.

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) requires a permit be issued for all obstructions or alterations in U.S. navigable waterways. The Texas Parks and Wildlife Code, Chapter 86 regulates the removal of sand, shell, gravel, and mudshell from streams.
Section 408 is also known as Section 14 of the Rivers and Harbors Act of 1899 (33 U.S.C. 408). According to the memorandum “Policy and Procedural Guidance for the Approval of Modification and Alteration of Corp of Engineer Projects”, any proposed modification to an existing USACE project (either federally or locally maintained), that is beyond those modifications required for normal operation and maintenance, requires approval from the USACE under 33 USC 408. The regulation states that there shall be no temporary or permanent alteration, occupation, or use of any public works including but not limited to levees, sea walls, bulkheads, jetties, and dikes for any purpose without the approval of the Chief of Engineers. In order to receive approval the Chief of Engineers must concur that the proposed alteration or permanent occupation is not injurious to public interest and would not impair the usefulness of the federal project.

The following information must be provided with any request for the approval of significant modifications of alterations to a locally or federally maintained USACE project:

- A written request by non-federal interest for approval of the project modifications/alteration.
- A physical and functional description of the existing project.
- A detailed description of the proposed modification.
- A description of any related, ongoing USACE studies/efforts in the watershed.
- A Public Interest Determination.
- Appropriate NEPA documentation.
- Any Administrative Record.
- A discussion of EO 11988 Considerations.
- Technical Analysis:
  - Technical adequacy of the design.
  - Changes in water surface profiles and flow distribution.
- Assessment of anticipated local and system-wide resultant impacts on system integrity.
- Upstream and downstream impacts of the proposed alterations, including potential impacts to existing floodplain management and water control management plans of federal projects within the basin.
- A discussion of residual risk.

Municipal governments control development within flood hazard areas via requirements contained in their zoning ordinances or development codes. These controls are based on those of the Federal Flood Insurance Act of 1968 (42 U.S.C. 4001 et seq.) and the Disaster Mitigation Act of 2000. They prohibit building or filling the regulatory floodway (the way floodwaters travel as they recede). Residences must be elevated and nonresidential buildings must be flood-proofed in designated flood hazard areas outside the floodway (the 100-year floodplain). Utilities must be located and constructed to minimize or eliminate flood damage. The Dallas City Code, Section 51A-5.101, Part II of the Dallas Development Code describes the floodplain regulations, uses and structures permitted, and also set out the conditions for development in the floodplain and/or removal of the “FP” designation by filling, as amended.

In 1991, the Corridor Development Certificate (CDC) process was jointly developed by various federal and state agencies as well as several local municipalities aimed to stabilize flood risk along the Trinity River. Since then, the CDC Manual has been through four revisions, the most recent published in July 2017. The process ensures that any development that occurs in the Trinity River floodplain will not raise flood water levels or reduce flood storage capacity. Under the CDC process, local governments retain ultimate control over floodplain permitting decisions, but other communities along the Trinity River Corridor are given the opportunity to review and comment on projects in their neighbor’s jurisdiction. Under this process, a CDC permit is required to develop land within a specific area of the Trinity floodplain called the Regulatory Zone, which is
similar to the 100-year floodplain. The permit process is regulated by the NCTCOG and USACE.

Section 404 of the Clean Water Act (33 U.S.C. 1344), as amended, requires authorization (Nationwide or Individual Permit, depending on the level of impact) be obtained from the USACE in order to discharge dredge or fill material into waters of the U.S., including wetlands. Typically, if a project impacts a wetland, regardless of size, or greater than 1/10 acre of another water of the U.S., a permit from the USACE is required and a pre-construction notification (PCN) must be prepared, per General Condition 27 of the Nationwide Permitting Program.

State water quality agencies must certify that a dredge or fill project will not cause any long term violations of water quality standards under the requirements of Section 401 of the Clean Water Act (33 U.S.C. 1341). In Texas, the TCEQ is the lead state agency that administers the Section 401 certification program and is responsible for conducting Section 401 certification reviews concurrently with USACE Section 404 permit applications.

Under the requirements of the Clean Water Act, the EPA regulates oil pollution prevention (33 CFR 153) and the NPDES (40 CFR 6, 115, 121-125, 402, and 403), as amended.

The State of Texas has assumed authority to administer the federal NPDES program. The state program, the TPDES, is administered by the TCEQ and regulates the discharge of pollutants and stormwater within the state. Chapter 26 of the Texas Water Code regulates water quality, including the discharge of wastes into waterways, disposal of industrial solid waste, and oil and hazardous substance cleanup. The Texas Surface Water Quality Standards (Title 30, Texas Administrative Code, Chapter 307) establish explicit water quality goals throughout the state.

Where an area designated as principal or sole-source aquifer under Section 1424(e) of the Safe Drinking Water Act may be impacted by a proposed project, early coordination with EPA will assist in identifying potential impacts. The EPA will furnish information on whether any of the alternatives affect the aquifer. This coordination should also identify any potential impacts to the Critical Aquifer Protection Area, if designated, within affected sole-source aquifers. If an alternative is selected which affects the aquifer, a design must be developed to assure, to the satisfaction of EPA, that it will not contaminate the aquifer (40 CFR 149).

The North Central Texas Council of Governments entered into a Memorandum of Agreement (MOA) with USACE, active between October 2011 and December 2016. The MOA enables participating entities to propose projects to be reviewed by USACE staff under the MOA in an expedited manner with funding support for USACE review staff. DART participated in the MOA for the Cotton Belt Corridor and the South Oak Cliff Blue Line extension from Ledbetter Station to the University of North Texas. The MOA has been extended through December 2019.

Regulating Agencies

- USACE (Section 404, Section 408, Section 10, and EO 11988, CDC Process)
- U.S. Coast Guard (Section 9)
- EPA (Section 404 and pollution regulations)
- FEMA and municipal government (flood hazard regulations)
- USDOT (Order 5650.2, Floodplain Management and Protection)
- TCEQ (Texas Water Code, Chapter 26, and Section 401)
- NCTCOG (CDC Process)
Applicable Design Criteria, Drawings, and Specifications

The DART Light Rail Transit Project Design Criteria Manual, Volume No. 1 (Facilities Design), February 2003, provides the following criteria:

Drainage facilities for the system shall be designed so that the proposed improvements will not: (1) increase the flood or inundation hazard to adjacent property; (2) raise the flood level of a drainage way; and (3) reduce the flood storage capacity or impede the movement of floodwater within drainage way.

Drainage facilities shall be designed for a fully developed watershed and existing zoning. If the system alignment crosses a floodplain, alternatives shall be considered to prevent an increase in the flood hazard to adjacent, upstream, or downstream property. Provision of compensatory flood storage is to be considered in each instance where fill reduces the existing flood storage area. When inundation of, or damage to the trackbed resulting from runoffs in excess of the capacities of the existing drainage facilities may occur, consideration shall be given to enlargement of the existing system. Detention storage shall be considered as an alternate to enlargement of an existing system. Where detention is used, a surface detention system, subsurface detention system, or infiltration system may be used. The method selected shall generally be one that is the most cost effective, considering costs of property, facility construction, and facility maintenance.

2.14.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Avoid USACE waters of the U.S., including wetlands.
- Avoid adversely affecting threatened or endangered flora or fauna or their habitat. Minimize impacts to wildlife populations, nesting and foraging habitats, and other high quality wildlife habitat and movement corridors.
- Minimize the loss or disturbance of other ecologically sensitive areas, including woodlands, marshes, lakes, streams, unique landforms and geological formations, and pristine natural areas.
- For federally funded or licensed projects, avoid the use of prime or unique farmlands, as defined by the NRCS.

When is an Impact Likely to Occur?

If wetlands under the jurisdiction of the USACE are affected, the extent of direct (e.g., fill) and the nature of indirect (e.g., changes in drainage patterns, water pollution) impacts are two indicators of the potential significance of the impact. In addition, the ecological value of the wetland, for functions such as flood control, erosion control, water pollution abatement, groundwater recharge, and wildlife habitat, should be taken into consideration when determining the impact significance if:

- Threatened and endangered plant species within natural areas could potentially be disturbed by the transit project or if threatened and endangered wildlife species are likely to utilize these areas;
- Fish and wildlife habitats are disturbed. The extent of disturbance as well as the quality and value of the habitat contrasted against its prevalence in the region are factors that should be considered in determining the significance of the impact. Also, the effect on wildlife movement within wildlife
corridors that are crossed by the transit project is an important factor to consider;

- A federally funded or licensed transit project site or ROW affects prime or unique farmlands, as defined by the NRCS; and/or;

- Other sensitive resources are affected. Soils, hydrology, water quality, and the aesthetics of other ecologically sensitive areas are factors that should be considered. Refer to the appropriate sections of Chapter 2 for additional information about these types of resources.

**Assessment Methodology**

- Field surveys, along with supporting documents, maps, photographs, species lists, and other available information, will be used to determine which resources are present in the proposed project area and what impacts are likely to occur. Investigation of known wetlands will require a field survey to determine the extent of potential impacts and the initiation of planning for appropriate mitigation. Investigation of a suspected wetland will require wetland delineation prior to mitigation planning.

- Proposed projects that may affect known, suspected, or potential federally-listed threatened and endangered species habitat will require a survey for the specific species. Potential impacts on other sensitive natural resources will be assessed during the field survey and review of supporting material.

- For federally-funded or licensed projects, the location of prime and unique farmlands in the project area will be requested from the NRCS.

Consultation with state and federal agencies including the USACE, U.S. Fish and Wildlife Service (USFWS), and TPWD will be initiated as early as possible in the assessment process. For projects with TxDOT involvement, a Tier I assessment would be prepared in accordance with the 2013 TPWD-TxDOT Memorandum of Understanding (MOU), updated 2017, in order to determine whether coordination with TPWD would be required. The Tier I assessment is a screening tool used to determine whether coordination with TPWD would be required. If the Tier I assessment indicates the need for coordination, then a Tier II assessment would be performed. The Tier II assessment is a detailed document that describes the existing environment and project impacts as they relate to biological resources. The Tier II document is submitted to TPWD for review and comment.

- Potential project impacts will be compared to baseline conditions and defined using industry accepted impact measures. Information and recommendations provided by consulting regulatory agencies will be used in assessing impacts and developing mitigation, when required.

- For all of the above-mentioned factors, part of the assessment process will be the development of reasonable alternatives to the proposed project that will reduce impacts, reduce the need for mitigation, or address issues resulting from regulatory agency consultation.

**When Should Mitigation Be Considered?**

While avoidance or minimization of impacts is preferred, the loss, alteration, or other adverse effects to ecologically sensitive areas may necessitate mitigative action. Typically, if a project impacts a wetland, regardless of size, or greater than 1/10 acre of another water of the U.S., a permit from the USACE is required and a pre-construction notification (PCN) must be prepared, per General Condition 27 of the Nationwide Permitting Program. In addition to the PCN, a compensatory mitigation proposal must be prepared to offset permanent losses of waters of the U.S.

For impacts on threatened or endangered species, a Section 7 permit for projects with a federal funding component or a Section 10(a) (1) (B) permit for projects without federal funding would be required through the USFWS in accordance with the Endangered Species Act. Included in the Section 10(a) (1) (B) permit application
is a Habitat Conservation Plan (HCP), which discusses the preferred mitigation strategy for the particular species.

**Common Mitigation Techniques**

Examples of mitigation strategies for wetlands, waters, wildlife, and other sensitive natural resources are provided below. Wetland and water mitigation techniques should be based on the Memorandum of Agreement between the EPA and the USACE concerning the determination of mitigation under the Clean Water Act Section 404(b) (1). Mitigation under Section 404 involves avoidance, minimization, and compensation. DART’s preferred method of compensatory mitigation is wetland banking, or purchase of credits from a private mitigation “bank” (see below). For federal projects that require environmental clearance prior to finalization of a USACE permit, FTA may require DART to propose mitigation to be included in the environmental documentation. Mitigation techniques for losses or “take” of threatened/endangered species and their habitat are based on the Endangered Species Act of 1973 (16 USC 1531).

**Wetlands and/or Waters**

- **Mitigation banking** – This type of mitigation involves purchase of credits from a private “bank.” A mitigation bank is an area that has been restored, created, enhanced, or (in exceptional circumstances) preserved, which is then set aside to compensate for future conversions of waters of the U.S. for development activities. The value of a bank is determined by quantifying the wetland values restored or created in terms of “credits.” This type of mitigation was utilized by DART for the Northwest Corridor to Irving/DFW Airport project.

- **On-site compensatory mitigation** - Compensatory actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands) are undertaken, when practicable, in areas adjacent or contiguous to the discharge site. This type of mitigation was utilized by DART for G-2, where a wetland was created within the DART ROW and within the White Rock Lake recreation area.

**Threatened/Endangered Species**

- Avoiding sensitive habitat.
- Developing an HCP or biological assessment (BA) outlining the preferred mitigation strategy, which can include strategies such as purchasing a conservation easement for the particular species; donating funds to an existing preserve; or funding state or federal research efforts. The scope and amount of mitigation is negotiated with USFWS during the preparation of an HCP/BA.

**Wildlife**

- Providing alternative passageways for wildlife along corridors.
- Designing the project to avoid barriers to wildlife movement and activity, such as steps, unnatural surfaces, and unnecessary lighting.
- Installing barriers, such as fencing, boulders, trenches, and moats to isolate sensitive habitats from human intrusion.

**Migratory Birds**

- Prior to the removal of inactive nests of migratory birds, DART may require that a contractor consult with the USFWS office with local jurisdiction and any appropriate state wildlife agencies to

- Off-site compensatory mitigation - Compensatory actions are undertaken in the same geographic area if practicable (i.e., in close physical proximity and, to the extent possible, the same watershed). This type of mitigation was also utilized by DART for G-2, where three wetlands were created just outside of the DART ROW within the White Rock Lake recreation area.

- In-lieu fee mitigation – This type of mitigation occurs in circumstances where a permittee provides funds to an in-lieu fee sponsor instead of either completing project-specific mitigation or purchasing credits from a mitigation bank. (The Fort Worth USACE district does not currently have an in-lieu fee system.)
2.0 Impact Assessment Categories

Vegetation

- Prohibiting removal, cutting, defacing, injuring or destroying of trees, shrubs, and other vegetation, except in areas indicated for clearing in design plans, without permission of a transit authority or relevant city or county representative. All vegetation removal and landscaping activities will be performed in accordance with local city and/or county tree removal and landscaping ordinances.

- Preservation initiatives include not attaching ropes, cables, or guide wires to trees for anchorage; installing fencing around the drip line of trees to be saved within the construction limits; and not placing soil stockpiles, tools, materials, or equipment within the drip line.

- Allowing the use of herbicides only for specific situations and with the permission of a transit authority or relevant city or county representative.

- Repairing or restoring all trees, vegetation and other landscape features damaged by equipment or operations to their original plans based on an approved repair and restoration plan.

Other sensitive natural resources

- Protecting resources that are to be retained within the transit project site or ROW from damage during construction.

- Operating only within defined project limits.

- Storing only necessary equipment or materials on the construction site.

- Preventing construction debris, excess materials, and rubbish from purposely being allowed to fall into waterways, adjacent banks, or onto highways, including paint spillage. Devices to prevent such occurrences must be provided. Any deposited material must be removed promptly, and a transit authority representative should be notified immediately.

- Controlling soil erosion and sediment discharge on all project property.

- Prohibiting equipment from fording waterways.

- Removing and restoring an area to its original pre-construction condition if temporary bridge structures or culverts are used.

Additional Mitigation Considerations

- Develop additional mitigation plans during the preliminary design phase for protection and restoration of adjacent natural resources that warrant efforts beyond what would be normally included in master construction specifications. The effort would be in conjunction with applicable government regulatory and permitting agencies.

- Prepare an environmental sensitivity handbook or training module that provides contractors and construction managers a guide in the implementation of environmentally sensitive construction practices.

- Monitor contractors as a part of construction management to ensure that natural resources protection specifications and plans, including the regulatory agency permits, are being carried out.

This is a critical consideration when dealing with successfully mitigated impacts and those permitting requirements administered by the USACE. Should DART agree to avoid, enhance, and/or create waters of the U.S. or mitigate for threatened or endangered species,
regulatory agencies charged with protecting and regulating activities within these areas will require conformance or DART may risk civil or criminal penalties. At a minimum the contractors may be served with cease-and-desist orders and certain impacts to construction schedules.

Note that the purchase of wetland and stream mitigation credits from an approved mitigation bank would avoid the need for long-term mitigation monitoring, providing additional certainty in DART’s risk management strategy.

2.14.2 BACKGROUND

Regulating Law and Industry Practice

Section 404 of the Clean Water Act (33 U.S.C. 1344) requires that a federal permit be obtained from the USACE in order to discharge fill or dredge material into waters of the U.S., including wetlands (effective as of March 19, 2007). Typically, if a project impacts a wetland, regardless of size, or greater than 1/10 acre of another water of the U.S., a permit from the USACE is required and a PCN must be prepared, per General Condition 27 of the Nationwide Permitting Program. This law applies to both federally and locally-funded DART transit projects. EO 11990, Protection of Wetlands (3 CFR 121) directs that federal funding or licensing agencies take action “to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.” It further directs that each agency will “to the extent permitted by law, avoid undertaking or providing assistance for new construction located in wetlands” unless “there is no practicable alternative to such construction” and “the proposed action includes all practicable measures to minimize harm to wetlands.”

Federally funded or licensed projects must also meet the requirements of the Endangered Species Act of 1973 (16 USC 1531), the Fish and Wildlife Coordination Act of 1958 (16 USC 662) and the Farmland Protection Policy Act of 1981 (FPPA) (7 USC 4201 et Esq.). The Endangered Species Act of 1973 requires that all federal agencies, in consultation with the Departments of Interior and Commerce, carry out programs for the conservation of endangered and threatened species listed by the Department of the Interior. Where an alternative proposes to control or modify a stream or other body of water in some way, it shall contain evidence of consultation with the USFWS and with the agencies exercising administration over the wildlife resources of the affected area, as required by section 2(a) of the Fish and Wildlife Coordination Act. The FPPA of 1981 requires federal agencies to: (1) identify and take into account the adverse effects of their programs on the preservation of farmland; (2) consider alternative actions, as appropriate, that could reduce such adverse effects; and (3) ensure that their programs are compatible with state and local government and private programs and policies to protect farmland.

According to the Texas Parks and Wildlife Department (TPWD), TPWD regulations “prohibit the taking, possession, transportation, or sale of any of the animal species designated by state law as endangered or threatened without the issuance of a permit. State laws and regulations prohibit commerce in threatened and endangered plants and the collection of listed plant species from public land without a permit issued by TPWD. Laws and regulations pertaining to endangered or threatened animal species are contained in Chapters 67 and 68 of the Texas Parks and Wildlife (TPW) Code and Sections 65.171 - 65.176 of Title 31 of the Texas Administrative Code (T.A.C.). Laws and regulations pertaining to endangered or threatened plant species are contained in Chapter 88 of the TPW Code and Sections 69.01 - 69.9 of the T.A.C.”

The Migratory Bird Treaty Act, 16 U.S.C. §§703 – 712, and its implementing regulations by the USFWS at 50 C.F.R. Part 21 include general permit requirements for taking possession, transportation, sale, purchase, barter, importation, exportation, and banding or marking of migratory birds with some exceptions. Prior to the removal of inactive nests of migratory birds, DART may require that a contractor consult with the USFWS office with local jurisdiction, including any appropriate state wildlife agencies, in the event that a USFWS, including a state, permit may be required for
removal of inactive nests in accordance with the provisions of 50 C.F.R. Part 21.

Project work performed is subject to local tree and landscaping ordinances. Relevant local city ordinances may include, but are not limited to:

**Town of Addison**
- Code of Ordinances, Part II, Chapter 34, Article II, Landscape Preservation and Protection
- Code of Ordinances, Appendix A Zoning Article XXI, Landscaping Regulations

**City of Carrollton**
- Code of Ordinances, Chapter 155, Ordinance No. 2520, Tree Preservation

**City of Dallas**
- City Code, Volume II, Chapter 48, Trees and Shrubs
- Development Code, Chapter 51A Part II, Ordinance No. 19455, as amended: Tree Preservation, Removal and Replacement

**City of Garland**
- Code of Ordinances, Chapter 34, Article 1, Ordinance No. 5731, Tree Preservation

**City of Irving**
- Code of Ordinances, Section 52-35A, Ordinance 7342, Landscaping and Tree Preservation
- City Code, Chapter 33a, Article III, Landscaping Required

**City of Richardson**
- Code of Ordinances, Chapter 22.5, Ordinance No. 3731, adopted Nov. 10, 2008, (Supplement No. 18), Tree Preservation and Conservation

**City of Rowlett**
- City Code, Chapter 98, Vegetation, Article II, Trees

**Regulating Agencies**
- USACE (Section 404, EO 11990)
- USFWS (endangered species/fish and wildlife coordination requirements)
- TPWD
- NRCS (farmland protection)
- USDOT (Order 5660.1A, Preservation of Wetlands)
- EPA (404[b]1 review); Section 401 joint permit review.

**Applicable Design Criteria, Drawings, and Specifications**

The situation of each wetland, other sensitive natural feature, wildlife habitat or movement corridor, threatened or endangered species, and prime and unique farmland will be addressed individually.

**2.15 PARKLANDS**

Transit projects may be built in areas adjacent to or within parklands. However, if the transit project requires the acquisition of parkland or causes significant impacts, such as noise or visual, local, state, and federal agencies must approve the project based on existing laws and regulations. Every effort will be made to avoid or minimize adverse effects on park and recreation lands and facilities.

Publicly-owned recreational resources may be governed by Section 4(f) of the Department of Transportation Act and/or Section 6(f) of the Land and Water Conservation Fund Act depending on the funding source. Public parks are protected by Texas Parks and Wildlife Department Chapter 26 if federal funding does not apply.
2.15.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Use parkland, publicly-owned recreational resources, or wildlife refuges only if there is no feasible or prudent alternative to such use and fully meet the requirements of state, and if applicable, federal parkland protection law.

- Meet the objectives contained in the social interaction and land use planning, visual quality, safety, air quality, noise and vibration, water resources, and wetlands and ecosystems policy statements, taking into account the unique characteristics of the parklands affected and their users.

- If impacts cannot be avoided, limit impacts to *de minimis* impacts; avoid indirect impacts, such as constructive use impacts. *De minimis* impacts on publicly owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not "adversely affect the activities, features and attributes" of the Section 4(f) resource. Constructive use involves impacts to a Section 4(f) resource such that the protected activities, features, and attributes would be substantially impaired.

- Seek to identify and take advantage of opportunities to improve the accessibility of community park and recreation facilities that have a regional service area.

- Work closely with jurisdictions responsible for parklands when developing mitigation measures to minimize harm to parklands.

When is an Impact Likely to Occur?

- When a transit project uses land from a parkland.

- When a transit project creates a substantial negative indirect impact on the use or enjoyment of the parkland because of the proximity of the transit facilities. Indirect impacts could include, but are not necessarily limited to:
  - Reduction or disruption of access to parkland facilities;
  - Severe noise or vibration impacts which reduce the enjoyment of a parkland where a quiet setting is a generally recognized attribute of the park’s significance;
  - Substantial impairment of the visual or aesthetic qualities of the parkland area;
  - Disruption of an ecological area by interfering with access by wildlife or altering their normal circulation patterns; and
  - Creating a safety concern for parkland users because of a transit facility’s location within a park, even though the transit project may not be using parkland.

Assessment Methodology

- The characteristics of park and recreation lands to be taken or which are adjacent to the passenger rail project will be identified by purpose, service area, size, type and location of facilities and equipment, natural features, circulation system, characteristics of activities (e.g., contemplation, open air amphitheaters, league sports, children's play, etc.), characteristics of users, and development plans.

- The agency in charge of the parkland and the manner in which the parkland was originally created will be identified. Funding sources for parkland acquisition or maintenance/updates, and the manner in which the public agency acquired the parkland (e.g., by fee title or through divestiture by another agency) may limit the discretion of the agency having jurisdiction over the parkland as well as DART’s flexibility in mitigating impacts.

- Consultations with parkland owners and managers will be undertaken at an early stage. It is the responsibility of the agency having jurisdiction over the parkland to determine whether the parkland is significant.
2.0 Impact Assessment Categories

- If displacement of parkland is proposed, consultations with the agency having jurisdiction will assist in verifying the important features that may be affected, facilities whose use may be lost or disrupted, future plans for the affected parkland, and the availability of alternate or replacement facilities in the affected parkland or in other parklands.

- If the passenger rail project is adjacent to parklands, changes in accessibility for users, the potential for incompatible visual contrasts, the potential danger to park users of straying into a rail transit ROW, and potential noise, vibration, or air quality intrusions will be determined. The impact assessment methods described in the social interaction and land use planning, visual quality, safety, air quality, and noise and vibration policy statements will be used.

- If significant public parklands are affected, alternatives to that use will be sought and evaluated. For federally-funded projects, Section 4(f) regulations require investigation of all feasible and prudent alternatives to use of the 4(f) resource plus all planning to minimize harm. If the only alternatives available would involve exorbitant cost or would present implementation problems of great magnitude, the reasons for judging those alternatives impractical or imprudent will be clearly documented, including detailed cost estimates, the results of technical feasibility studies, and discussions of unique problems.

- Opportunities to improve accessibility to regional parkland and recreational facilities will be taken into account when selecting station sites.

- If the local agency having jurisdiction over the parkland agrees that the use of parkland does not “adversely affect the activities, features, and attributes” of a Section 4(f) protected resource, de minimis impact criteria may be applied.

- A public hearing, in accordance with Texas Parks and Wildlife Code (Section 26.002), will be held as required.

- Mitigation will be developed in conjunction with national, state and local officials having jurisdiction over affected parklands. The requirements for land and facility replacement made by funding sources will be met.

When Should Mitigation Be Considered?

Mitigation should be considered whenever land from a publicly-owned park, recreational resource, or wildlife refuge will be used, either temporarily or permanently. In addition, mitigation should be considered for parkland whenever indirect impacts such as those defined in the social interaction and land use planning, visual quality, safety, air quality, noise and vibration, water resources, and wetlands and ecosystems require mitigation in accordance with those sections. Section 4(f) mitigation requirements are specific to federally-funded projects.

Common Mitigation Techniques

The most effective mitigation is to explore alternatives that avoid or minimize direct or indirect effects on parklands. This exploration should occur as early in the planning process as possible. A Section 4(f) analysis requires full documentation of all feasible alternatives including avoidance options. If it is not possible to avoid affecting parklands, the following are some mitigation techniques that have been used. Appendix E contains examples of mitigation techniques.

- If parkland must be used, locate transit facilities on the edge of the parkland rather than in the middle to minimize impact. For example, DART has located its Fair Park Station on the Southeast Corridor on the edge of Fair Park.

- If parkland must be used, locate transit facilities adjacent to existing transportation facilities such as existing rail lines or roadways.

- Provide funds for the purchase of replacement lands and facilities to the agencies having jurisdiction over the parklands affected. This may be required under Section 6(f) of the Land
and Water Conservation Fund Act. If equipment and amenities are funded by Section 6(f), then that equipment and those specific amenities would need to be replaced. This may require a stand-alone plan to TPWD.

- Provide replacement property for the converted parkland. Replacement property should be of reasonable equivalent usefulness and location as the property being converted. This method was used to replace park property along Spur 482 on the Irving/DFW Airport Line.
- Use the linear rail ROW jointly with a hiking and biking trail, if the rail ROW is wide enough to safely accommodate both.
- Place a wall, fence, vegetation, or berm between the rail ROW and parklands in places where people congregate or play next to the ROW.
- Select materials and designs for facilities and landscaping that complement the visual character of the park in conjunction with local community representatives or stakeholders.
- When adjacent to parklands providing passive activities, quiet contemplation, or other noise-sensitive uses, use appropriate noise control techniques to mitigate significant increases in noise levels.

2.15.2 BACKGROUND

Regulating Law and Industry Practice

Projects using USDOT funds or requiring a license from its agencies must meet the requirements of Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303). Section 4(f) declares it a national policy to make a special effort to preserve the natural beauty of the countryside, including public parks and recreation land, wildlife and waterfowl refuges, and historic sites. Section 4(f) prohibits the Secretary of Transportation from approving projects which require the use of resources protected under Section 4(f) unless two criteria are met: (1) there is no feasible and prudent alternative to such use; and (2) all possible planning measures to minimize harm have been incorporated into the project. When such resources are affected, the documentation of no feasible or prudent alternative and planning to minimize harm is included in the federal environmental document. For CEs or FONSIs, the Section 4(f) evaluation may be processed as a separate document. It may also be prepared as a separate free-standing document for distribution within USDOT.

In December 2006, Section 6009(a) of SAFETEA-LU was amended to include de minimis impact criteria to Section 4(f) resources. De minimis impacts are different for historic sites than for parks, recreation areas and wildlife and waterfowl refuges. De minimis impacts on publicly owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not "adversely affect the activities, features and attributes" of the Section 4(f) resource. The criteria are outlined in the Guidance for Determining De Minimis Impact to Section 4(f) Resources, December 2006. A de minimis determination can avoid the need for a formal Section 4(f) statement.

MAP-21, passed into law in July 2012, is an update to SAFETEA-LU and mentions Section 4(f) as relevant to the FTA in two specific ways. If a project has "significant impact on properties protected by Section 4(f) of the DOT Act or Section 106 of the National Historic Preservation Act" then the project is considered to involve unusual circumstances and FTA would have to conduct appropriate environmental studies to determine the EA classification is proper. See CFR §771.118 (b)(3).

In addition, MAP-21 provides a Section 4(f) exception for federal lands and construction of transportation facilities on those lands (specifically naming facilities owned and maintained by the National Park Service, U.S. Fish and Wildlife Service, United States Department of Agriculture (USDA) Forest Service, USACE, or the Bureau of Land Management).

On December 4, 2015, the FAST Act was signed into law. Section 1301 (23 U.S.C. 138(c)/49 U.S.C. 303(e)) of the FAST Act requires the Secretary of Transportation to align, to the maximum extent
practicable, Section 4(f) with the NEPA (42 U.S.C. 4321 et seq.) and Section 106 of the NHPA (54 U.S.C. 306108).

Programmatic approaches have been used in transportation legislation including Section 1305 of the MAP-21 and Section 1304(k) of the FAST Act, which promotes the implementation of programmatic approaches.

There are five existing Nationwide Programmatic Section 4(f) evaluations that can be used in place of individual evaluations for certain types of highway projects and specific uses. The primary advantage of a programmatic evaluation is that it saves time. Unlike an individual evaluation, a programmatic evaluation does not require a draft, a comment period, or circulation, because its framework and basic approach has already been circulated and agreed upon by the DOI. Project specific details are then applied to the programmatic to determine whether or not it can be used. Programmatic evaluations are usually approved much faster than individual evaluations.

Despite their differences, programmatic and individual evaluations are similar in their coordination with FHWA and officials with jurisdiction. The legal representative of the agency owning or administering the resource, unless the agency has delegated or relinquished this authority via formal agreement. For historic properties, the official with jurisdiction is the State or Tribal Historic Preservation Officer. Other similarities include the formatting and level of detail and analysis required. It is important to note that programmatic evaluations are not exemptions from Section 4(f) compliance.

Section 6(f) of the Land and Water Conservation Fund Act (Public Law 88-578) requires that recreation land acquired or developed with assistance under this section remain in use exclusively for public outdoor recreation. It may not be converted to other uses without the approval of the National Park Service or its local proxy (TPWD in Texas).

Chapter 26 of the Texas Parks and Wildlife Code is similar to Section 4(f) of the Department of Transportation Act of 1966 in its requirements, except that Section 26.002 of the Texas law requires a public hearing on any taking of public parkland, and there is no constructive use requirements. Chapter 26 applies to all DART rail projects.

**Regulating Agencies**

- National, state, or local agencies having jurisdiction over park lands [Chapter 26, Section 6(f) and Section 4(f)]; and
- USDOT funding or licensing agencies [Section 6(f) and Section 4(f) only].

**Applicable Design Criteria, Drawings, and Specifications**

The situation of each parkland will be addressed individually.

**2.16 HISTORIC RESOURCES**

Transit projects are often built in areas that contain historic properties and cultural resources such as buildings, structures, objects, sites, or districts. When construction or operation affects such resources, the issue is how to protect the integrity of the historic and/or cultural resources while achieving the goals of the project. DART is committed to fulfilling the requirements of the NHPA of 1966 as amended. Section 106 of the Act requires that agencies consider the effects of their actions on historic properties and cultural resources and that they take action to avoid or mitigate adverse effects to such resources. State and local laws also protect historic and cultural resources. The March 2013 CEQ/Executive Office of the President/Advisory Council on Historic Preservation (ACHP), guidance document entitled NEPA and NHPA: A Handbook for Integrating NEPA and Section 106 was consulted for this document.
2.16.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Fully meet all of the requirements of local, state, and federal law protecting historic resources.

- Minimize or avoid adverse effects to historic properties recognized to be of local, state, or national significance by local, state, or federal agencies with responsibilities for identifying such resources.

- Work closely with historic preservation agencies, government entities, and interested parties to develop appropriate mitigation strategies to avoid or minimize adverse effects on historic properties.

When is an Impact Likely to Occur?

- An impact is likely to occur if the project would alter characteristics of the resource that may qualify it for a local, state, or national register. For the purposes of determining effect, alterations to features of a resource's location, setting, or use may be relevant, depending on a resource's significant characteristics, and should be considered.

- A project is likely to have an adverse effect when the effect on the historic property or resource may diminish the integrity of the its location, design, setting, materials, workmanship, feeling, or association.

Assessment Methodology

- An area of potential effect (APE) will be determined and historic properties (i.e., that are or will be over 50 years old at the date of letting for an undertaking) within that APE will be identified based on: (1) a search of lists kept at local, state, and federal agencies with responsibilities for such identification; and (2) a visual survey of the area. The presence of previously identified resources will be confirmed, and previously unidentified resources will be documented. A Texas Historical Commission (THC) Historic Sites Inventory Form or its equivalent will be completed for each resource that is or will be over 50 years old at the date of letting for an undertaking, and has the potential for historical significance.

- Assessment of potential eligibility for local, state, or federal registers will be made by a professional architectural historian in accordance with the procedures that govern such assessments at each level of government. These procedures may include local municipal guidelines (if applicable) and Department of the Interior regulations at 36 CFR 60.4. They will always include the Texas Antiquities Code, Title 13, Section 26.7.

- Appropriate contacts will be made with local interested parties, including local historic groups or Native American groups during both the inventory and evaluation phases to meet both regulatory and planning requirements. For federal projects, the federal lead agency is responsible for coordination with Native American groups.

- Inventory reports will be prepared consisting (at a minimum) of THC forms or their equivalent and photographs. Additional information including context reports will be included as necessary to aid in eligibility determinations. Inventory reports for resources eligible for local and state registers will be submitted to the appropriate local authorities. If federal funding is involved, historic properties that may be eligible for the National Register of Historic Places (NRHP) will be submitted for eligibility determinations to the federal lead agency for submission to the State Historic Preservation Officer (SHPO) in accordance with regulations published by the ACHP at 36 CFR 800.4.

- Effects on historic properties will be determined. An effects report will be prepared that will describe the nature and severity of both construction and operational effects. Opportunities to minimize or avoid adverse effects will be explored throughout the
planning process. Effects information will be shared with members of the DART planning team and other interested parties as appropriate.

- For projects with federal involvement, effects and adverse effects criteria at 36 CFR 800.5 will be applied and documented in an Effects Report prepared by DART. Based on this information, the lead federal agency and the SHPO will consult in accordance with the regulations at 36 CFR 800.6 to reach a consensus on the determination of effects.

**When Should Mitigation Be Considered?**

Mitigation should be considered when an adverse effect is likely to occur. Adverse effects include, but are not necessarily limited to:

- Physical destruction, damage, or alteration of all or part of the resource.

- Isolation of the resource from, or alteration of, the character of its setting when that character contributes to the resource’s historic significance. For example, substantially reducing access to a property or altering elements of its surroundings that frame or enhance the property could adversely change the character of the setting.

- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting. Introducing a new structure that is out of scale or obscures important elements of the historic property would be an adverse effect. Depending on the historic uses of a structure, certain types of noise or noise levels could be adverse. For example, train noise introduced into an area where the historic context has never included trains could be an adverse effect; if noise levels exceeded noise criteria it would be an adverse effect.

- Neglect of a resource resulting in deterioration or destruction. Oftentimes, transit agencies acquire railroad ROW, including railroad structures that are not needed by the transit agency. Bridges, culverts, or signal towers are examples of historic structures that may not be needed by the transit agency and whose lack of maintenance would be an adverse effect.

- Transfer, lease, or sale of a historic property. Transit agencies may wish to dispose of properties that are not needed for the operation of the agency. Such disposals of historic properties without adequate conditions to insure preservation of the resource’s significant historic features would be an adverse effect.

**Common Mitigation Techniques**

The most effective mitigation is to explore alternatives that avoid or minimize adverse effects. This exploration should occur as early in the planning process as possible. If it is not possible to avoid affecting historic properties, the following are mitigation techniques that have been used by DART. **Appendix E** illustrates mitigation techniques.

- Follow the Secretary of the Interior Standards and/or applicable (local) design guidelines to adapt the materials and forms of passenger rail project structures to complement the style or character of adjacent historic properties. For example, the brick paving materials in the West End were selected to complement the brick warehouse structures surrounding the South Oak Cliff rail line.

- Rehabilitate, adapt, and reuse historic properties, such as old trolley facilities, where feasible. For example, Monroe Shops has been rehabilitated to serve as the DART Police Headquarters.

- Adopt operating policies to reduce noise impacts to adjacent historic properties. For example, DART has committed to lower operating speeds in the vicinity of the historic Robert Q. Mills Elementary School in order to reduce noise impacts.

- Design transit infrastructure to minimize impacts to historic settings. For example, the Triple Underpass crossing at Dealy

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*Environmental Impact Assessment and Mitigation Guidelines for Transit Projects*

*Dallas Area Rapid Transit*

*April 2019*
Plaza was designed with a minimum number of poles so that the view of the Triple Underpass would not be cluttered and, therefore, changed in the vicinity of the John F. Kennedy Assassination National Historic Landmark District.

- Align tracks so that important views of character-defining features of historic properties are not obscured or changed. DART aligned the tracks for the South Oak Cliff project behind the Texas School Depository Building and Control Tower #17 in order to minimize effects on these resources.

- Move historic properties to a new location and convey the property to new owners with adequate restrictions or conditions to ensure the preservation of the resource’s significant historic features. DART conveyed Control Tower #19 to the Age of Steam Museum in Fair Park where it was restored and used for interpretive displays.

- Recover unique architectural details of an historic structure that must be demolished and provide adequate curation or reuse of these architectural details. DART preserved a significant portion of the Good-Latimer Underpass prior to its demolition.

- Prepare detailed archival records of an historic property that must be altered or demolished including: a description of the resource’s history; a detailed description of the character-defining features of its exterior, interior, and its site; and photographs, architectural drawings, and sketches. For federally funded projects, these detailed records should be prepared in accordance with the Secretary of the Interior’s requirements for the Historic American Building Survey/Historic American Engineering Record (HABS/HAER). DART performed HAER-level documentation of the Good-Latimer Underpass prior to its demolition.

- Utilize a multi-disciplinary approach to develop innovative solutions to minimize historic resource impacts. Coordination between historians and engineers enabled the design and compliance team for the Union Station to Oak Cliff Dallas Streetcar project to utilize propulsion technology to move the streetcar over the historic Houston Street Viaduct, thereby eliminating the need for Overhead Catenary System (OCS) lines that would have constituted an adverse effect on the NRHP-listed bridge. Eliminating OCS on the bridge resulted in a de minimis determination for the project.

- For the Cotton Belt Project, it was determined that the removal and/or demolition of the historic White Rock Creek Railroad Bridge will be an adverse effect on the historic resource. The bridge will be relocated north of the alignment and is a transportation enhancement that met the requirements of a Section 4(f) exception under 23 CFR 774.13(g).

2.16.2 BACKGROUND

Regulating Law and Industry Practice

Federal Sector

Projects using federal funds or requiring a federal license must meet the requirements of Section 106 of the NHPA (16 U.S.C. 470f), as amended. Section 106 requires that:

“The head of any federal agency having direct or indirect jurisdiction over a proposed federal or federally assisted undertaking in any state and the head of any federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any federal funds on the undertaking or prior to the issuance of any license, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such federal agency shall afford the ACHP established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking.”
Effective August 5, 2004, the Section 106 Regulations (36 CFR Part 800) were amended to include the following:

- To acknowledge the statutory responsibility of SHPOs to cooperate with agencies, local governments, and organizations and individuals to ensure that historic properties are considered in planning;

- To better distinguish the roles of Indian tribes that had assumed the responsibilities of SHPOs on their tribal lands under Section 101(d)(2) of the Act from that of Indian tribes which had not;

- To clarify that the Act requires agency consultation with Indian tribes that attach religious and cultural significance to historic properties regardless of whether the historic properties are located on or off tribal land;

- To better reflect the sovereignty of Indian tribes over their tribal lands;

- To better state the premise of the rule that only an undertaking that presents a type of activity that has the potential to affect historic properties requires review;

- To more clearly state the actions a federal agency must take in making a binding commitment in a NEPA document to carry out measures to avoid, minimize or mitigate adverse effects and thereby use the NEPA process to comply with Section 106 requirements;

- To require ACHP to participate in Section 106 reviews in a manner parallel to SHPOs/THCs; and

- To add ACHP consideration of the views of SHPOs and others consulted when determining whether to approve an exemption from the Section 106 process.

The above adopted changes were primarily modifications to remove operational impediments in the process and clarifications of certain provisions and terms. In addition, a number of technical and informational edits were made throughout the rule.

The determination of National Register eligibility of historic resources, the determination of effect and adverse effect, and the development of the MOA on mitigation are done by the federal agency in coordination with the SHPO. Section 110(f) of the Historic Preservation Act of 1966 states that “prior to the approval of any federal undertaking which may directly and adversely affect any National Historic Landmark, the head of the responsible federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such a landmark, and shall afford the ACHP a reasonable opportunity to comment on the undertaking.” The analysis process is the same as with Section 106, except for increased participation by the ACHP.

Projects using USDOT funds or requiring a license from its agencies must meet the requirements of Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303). Section 4(f) requires, in part, that the Secretary of Transportation not approve any program or project that requires use of resources included in, or eligible for inclusion in, the NRHP unless: (1) there is no feasible or prudent alternative to the use of such land; and (2) that all possible planning has been included to minimize harm to the resource affected. When such resources are affected, the documentation of no feasible or prudent alternative and planning to minimize harm is included in the federal environmental document. For CEs or FONSIs, the Section 4(f) evaluation may be processed as a separate document. It may also be prepared as a separate free-standing document for distribution within USDOT.

According to 23 CFR 771.135(f), 4(f) requirements may not apply to the restoration, rehabilitation, or maintenance of transportation facilities listed in, or eligible for, the National Register if such work would not adversely affect the historic qualities of the resource and if the SHPO and the ACHP concur with the exemption.

In December 2006, Section 6009(a) of SAFETEA-LU was amended to include de minimis impact criteria to Section 4(f) resources.
De minimis impacts are different for historic sites than for parks, recreation areas and wildlife and waterfowl refuges. De minimis impacts related to historic sites are defined as the determination of either "no adverse effect" or "no historic properties affected" in compliance with Section 106 of the NHPA. The criteria are outlined in the Guidance for Determining De Minimis Impact to Section 4(f) Resources, December 2006.

Section 1303 of the FAST Act amended the Section 4(f) statute (at 23 U.S.C. § 138(e) and 49 U.S.C. § 303(g)) to make exempt from Section 4(f) review common post-1945 concrete or steel bridges or culverts (as described in 77 Fed. Reg. 68790 (Nov. 16, 2012)) that are exempt from individual review under Section 106 (54 U.S.C. § 306108).

State and Local Sector

Laws that apply to all DART projects, whether there is a federal involvement or not, are: municipal historic resource overlay district ordinances; for publicly-owned resources, “Protection of Public Parks and Recreation Lands” of the Texas Parks and Wildlife Code (Chapter 26); the Antiquities Code of Texas as contained in Title 9, Chapter 191 of the Texas Natural Resource Code, which establishes the THC as the legal custodian of all cultural resources within the public domain of the State of Texas; Title 14, Part II, Chapter 26 of the Antiquities Code, which establishes the practices and procedures of the THC; and Chapter 22, Title 13, Part 2 of the Texas Administrative Code, Sections 22.1-22.6 concerning discovery, notification, permits for, and requirements related to the removal of unknown and abandoned cemeteries and graves.

The cemetery law was made effective May 20, 2010. Under this law, the authority over cemeteries and the role of the THC regarding review of abatement of cemeteries are defined, responsibility of individuals discovering unknown or abandoned cemeteries is delineated, legal issues associated with the removal of human remains from graves and cemeteries is delineated, and the THC’s formal process of recognizing and preserving cemeteries is defined.

The THC is to be notified when an unknown or abandoned cemetery is discovered, and a Notice of Existence of Cemetery is to be filed with the County Clerk where the cemetery is located within 10 days of discovery. This notice requires that the location of a cemetery be identified, a location map provided, evidence of the cemetery provided, and a legal description of the land occupied by the cemetery given. Further action regarding the cemetery for the purposes of construction or property improvements must be coordinated with the THC.

Under Chapter 211 of the Local Government Code, municipalities are granted zoning authority which allows for “promoting public health, safety… and protecting and preserving places and areas of historical, cultural, or architectural importance and significance.”

Under this state law, many cities establish historic preservation ordinances and programs. The City of Dallas Historic Overlay District Ordinance (Dallas Development Code, Section 51A-4.501) allows the city “to protect, enhance, and perpetuate places and areas which represent distinctive and important elements of the city’s historical cultural, social, economic, archaeological, paleontological, ethnic, political and architectural history...” To that end, properties that are individually designated or located in a historic district or subject to predesignation must first obtain a certificate of appropriateness before any exterior or site alterations can be made as well as demolition and new construction. The guidelines used for reviewing certificates of appropriateness may be the Secretary of the Interior Standards and/or local historic design guidelines. This type of historic overlay regulation is used in many cities including Plano. In Plano, it is “Historic Landmark Preservation Ordinance No. 2007-10.23. The purpose of the Plano program is similar to Dallas’ and includes the certificate of appropriateness process for alteration, demolition, renovation, and restoration of any “heritage resource.”

The City of Dallas Historic Overlay District ordinance (Dallas Development Code, Section 51A-4.501) states that “a person shall not alter a site, or alter, place, construct, maintain, or expand any structure on the site during the predesignation moratorium without
first obtaining a predesignation certificate of appropriateness...” Under this ordinance, the landmark commission will approve the application if it determines that:

- For contributing structures, which is a structure that retains its essential architectural integrity of design and whose architectural style is typical of or integral to a historic district, the application will not adversely affect the character of the site or a structure on the site; and the proposed work is consistent with the regulations contained in this section and the proposed preservation criteria; or
- For noncontributing structures, the proposed work is compatible with the historic overlay district.

The City of Plano also has a “Historic Landmark Preservation Ordinance” Ord. No. 2007-10.23, which in 2007 repealed prior ordinances (Ord. No. 98-2-26, and Ord. No. 98-8-35). The purpose of this ordinance is to:

- Safeguard the city's history and culture by promoting the value and importance reflected in recognizing founders of the city, establishing historic landmarks teaching the evolution of the area and fostering general heritage preservation.
- Protect, enhance, and perpetuate historic resources which represent or reflect distinctive and important elements of the city's cultural, social, economic, political, archaeological and architectural history.
  - Promote the city's heritage by educating and attracting tourists and visitors while providing incidental support and stimulus to business and industry.
  - Promote the city's heritage by encouraging the use of historic resources.
  - Increase historical awareness, including educating the youth of the city, in order to strengthen the culture, prosperity, and welfare of local citizens and visitors to the city.
  - Provide input and advice to the city council regarding matters of heritage preservation.

Under this municipal ordinance, it is considered unlawful to construct, reconstruct, structurally alter, remodel, renovate, restore, demolish, raze, or maintain any heritage resource in violation of the provisions of the article. All work performed pursuant to a certificate of appropriateness issued under the article is to conform to all its requirements. It is the duty of the heritage preservation officer to periodically inspect such work to ensure compliance.

Chapter 26 of the Texas Parks and Wildlife Code is similar to Section 4(f) of the Department of Transportation Act of 1966 in its requirements to protect identified historic properties as well as parklands. The THC, in addition to setting up the state's administration of the federal Historic Preservation Act of 1966, is also responsible for identifying and protecting the integrity of any structure designated as a Recorded Texas Historic Landmark. The Antiquities Code protects State Archaeological Landmarks, which may include structures listed in the National Register as well as other sites, buildings, or locations deemed important to the history and/or prehistory of Texas because of their data potential, uniqueness, integrity, susceptibility to vandalism/looting, or other characteristics.

Regulating Agencies
- The ACHP (for federal projects only)
- THC and SHPO (for federal and locally funded projects)
- County Historical Commissions
- Municipal governments

Applicable Design Criteria, Drawings, and Specifications
The situation of each historic property will be addressed individually.

2.17 ARCHAEOLOGY
Transit projects may occur in areas containing archaeological sites or other cultural resources. When construction affects such sites, the issue is how to protect the integrity of cultural resources while
achieving the goals of the projects. Because its funding structure involves federal monies, DART is responsible for fulfilling the requirements of the NHPA, as amended. Section 106 of this Act requires that agencies consider the effects of their actions on cultural resources, including archaeological sites, and that agencies take action to avoid or mitigate adverse effects to such resources. State and local laws also protect historic properties and cultural resources.

**2.17.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES**

**Objectives**

- Fully meet all of the requirements of state antiquities laws and federal historic preservation laws.
- Avoid disturbance of historic and prehistoric archaeological resources.
- Work closely with state and federal regulatory agencies in the development of a mitigation plan, should the disturbance of archaeological resources be unavoidable.
- Protect from damage and ensure proper treatment of archaeological resources found during construction.

**When is an Impact Likely to Occur?**

Archaeological sites and other historic resources can, depending on the characteristics present, be eligible for inclusion in local or state registers of historic properties or for the NRHP. An impact to archaeological resources may occur any time the activities associated with an undertaking alter the characteristics of an archaeological resource that qualifies it for inclusion in the NRHP. Positive steps to ensure the attainment of quality assurance objectives are warranted whenever an archaeological resource is affected. An adverse impact is likely to occur if a site’s characteristics are altered in such a way that it is no longer eligible for a local, state, or national register of historic properties.

**Assessment Methodology**

To determine the effect of a project or action on archaeological resources:

- DART will locate and/or contract with a qualified archaeologist, as defined in Texas Administrative Code Title 13, Part 2 Chapter 26, Section 5 and Archaeology and Historic Preservation: Secretary of the Interior’s Standards and Guidelines. A list of qualified contract archaeologists is available from the THC or the Council of Texas Archaeologists. The contracted archaeologist will identify the potential for an action to affect archaeological resources.
- The required archaeological antiquities permit will be obtained from the THC, Archaeology Division, by the contracted archaeologist, on behalf of DART.
- Major archives will be consulted to identify known or likely archaeological site locations and, in combination with topographical and geotechnical data, to reconstruct historic settlement patterns. Local preservation and archaeological societies and individuals also will be contacted for any information they may have on likely historic or prehistoric sites. This background search will focus on identifying intact landscapes likely to contain historic and prehistoric remains.
- Field investigations will be conducted to support background research findings and determine which areas contain or may contain archaeological resources, as well as which areas are likely to be void of archaeological resources, particularly due to disturbance by current and past development, and thus require no further evaluation. As appropriate, a limited program of shovel tests, geomorphological studies, and/or soil borings will be used to probe the depth and extent of sites and disturbances.
- Background research and field investigation results will be documented in a survey report and submitted to THC, in its role as SHPO for review and concurrence.
Known and potential archaeological sites that could be affected by project development will be identified based on the archaeological data gathered and the proposed engineering design. For each affected site, the following will be identified:

- The extent of disturbance.
- Testing warranted during the preliminary design.
- Mitigation options (including avoidance).

The findings will be submitted to the THC. For projects where Section 106 of the *Historic Preservation Act of 1966* is applicable, the criteria of effect and criteria of adverse effect, as per Title 36, Part 800 of the CFR, will be applied. The analysis will be done in coordination with the SHPO for each National Register or National Register-eligible site. As per the requirements of Section 106, an Effects Report will be prepared. The findings of the Effects Report will be submitted to the SHPO. If the SHPO disagrees with a finding of “no effect,” then regulations require that the project be considered to have an effect on the cultural properties in question.

In addition, inventory information, along with recommendations on the National Register eligibility of the resources identified, will be assembled into a Determination of Eligibility Report. The report will be submitted to the SHPO with a request for a determination of National Register eligibility for the resources identified.

DART’s Capital Planning and Development Department is ultimately responsible for THC coordination and transferring all required documents to the agency including those for initial coordination, any required Memorandum of Agreements, Determinations of Effect, preliminary engineering and final design documents, final construction documents, and final mitigation design plans.

**When Should Mitigation Be Considered?**

Mitigation should be considered at any time that an adverse effect on archaeological resources is predicted to occur on the basis of the established assessment procedure.

**Common Mitigation Techniques**

- Avoid archaeological resources.
- Protect archaeological resources, if avoidance is impossible.
- Recover, analyze, and house or properly exhibit only those portions of archaeological resources that would be directly disturbed; protect and avoid the remainder, if unaffected by construction.

2.17.2 BACKGROUND

**Regulating Law and Industry Practice**

**Federal Sector**

Projects involving federal funds or requiring a federal license must meet the requirements of Section 106 of the NHPA (16 U.S.C. 470f), as amended. As stated in Section 2.16.2, Section 106 requires that the responsible federal agency take into account the effect of a project on historic properties included in, or eligible for inclusion in, the NRHP. The determination of National Register eligibility of archaeological resources, the determination of effect and adverse effect, and the development of Memoranda of Agreement on mitigation are carried out by the responsible federal agency in coordination with the SHPO. The ACHP is given an opportunity to comment if there is disagreement between the agency and the SHPO or other interested parties concerning the effects of a project.

Projects that will impact any wetland areas must comply with the cultural resource requirements of *Section 404 of the Clean Water Act*. In accordance with this act, the USACE, which administers the permitting requirements of Section 404, is directed to comply with the NHPA, as well as NEPA. Under current practice, all permit areas and occasionally certain lands beyond the boundaries of jurisdictional wetlands are evaluated by the USACE with regard to the need for archaeological investigation. The USACE, on a case-by-case basis, may require that such areas be surveyed or otherwise assessed for the presence of cultural resources.
Projects using USDOT funds or requiring a license from its agencies must meet the requirements of Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303). Section 4(f) requires, in part, that the Secretary of Transportation not approve any program or project that requires use of land containing resources included in, or eligible for inclusion, in the NRHP unless: (1) there is no feasible and prudent alternative to the use of such land; and (2) such a program includes all possible planning to minimize harm to the resource affected. When such resources are affected, the documentation of "no feasible and prudent alternative", and the plan to minimize harm, are included in the federal environmental impact document as an appendix. For CEs or FONSIs, the Section 4(f) evaluation may be processed as a separate document.

State Sector

The Antiquities Code of Texas (Texas Natural Resources Code, Title 9, Chapter 191) protects archaeological sites, historic buildings, shipwrecks, and other locations and objects of historic, archaeological, educational, or scientific interest situated on land owned or controlled by the State of Texas or its political subdivisions (i.e., counties, municipalities, etc.). It focuses on resources potentially eligible for the NRHP and/or for designation as State Archaeological Landmarks (SALs) based on their historic/prehistoric data potential, uniqueness, integrity, susceptibility to vandalism/looting, or other characteristics. Archaeological and historic properties located on or contained in lands purchased by DART for its passenger rail system must be reviewed under the Antiquities Code for eligibility as State Archaeological Landmarks. Typically, NRHP and SAL eligibility evaluations are performed concurrently.

The THC is to be notified if archaeological materials are discovered during construction. THC staff will then issue a statement advising on appropriate treatment.

Under the Antiquities Code, if an EA finds that archaeological resources would be disturbed, an intensive program of survey and site evaluation must be conducted for determination of resource significance and the finalization of treatment plans, if EA findings are confirmed. This work is done under a THC Antiquities Permit. Resource recovery would be done under the same Antiquities Permit. Recovered artifacts must be cleaned, conserved, catalogued, and preserved. Results are reported to the THC, and the artifacts must be appropriately housed or exhibited. All artifacts are the property of the State of Texas.

Indian Tribes

As stated in 34 CFR 800.2(c)(2), the federal government has a unique legal relationship with Indian tribes set forth in the Constitution of the United States, treaties, statutes, and court decisions. DART and the FTA will maintain early and ongoing consultation with Indian tribes with past or present affiliation in the State of Texas. Consultation with Indian tribes shall be performed during the Scoping process, and in a sensitive manner, to ensure that their concerns about historic properties, Native American sites, sacred sites, and Traditional Cultural Properties (TCPs) are addressed for projects with federal involvement.

In order to recognize the unique government-to-government relationship, consultation with Indian tribes shall be performed by an agency official from DART or the FTA. The agency official shall consult with representatives designated or identified by the tribal government.

Under Section 101(d)(6)(b) of the NHPA, should Indian tribes attach a cultural significance to historic or sacred properties off tribal lands, federal agencies are required to consult with the tribes using the Section 106 process, requiring agencies to take into account the effect of a project on cultural resources. The determination of NRHP eligibility of such properties will be assessed. A determination of effect and adverse effect and development of a Memorandum of Agreement on mitigation will be carried out by the federal agency representative, tribal representative, and the SHPO.

Chapter 22, Title 13, Part 2 of the Texas Administrative Code, Sections 22.1-22.6 concerns the discovery, notification, permits for,
and requirements related to the removal of unknown and abandoned cemeteries and graves; this law was made effective May 20, 2010. Under this law, the authority over cemeteries and the role of the THC regarding review of abatement of cemeteries are defined, responsibility of individuals discovering unknown or abandoned cemeteries is delineated, legal issues associated with the removal of human remains from graves and cemeteries is delineated, and the THC’s formal process of recognizing and preserving cemeteries is defined.

The THC is to be notified when an unknown or abandoned cemetery is discovered, and a Notice of Existence of Cemetery is to be filed with the County Clerk where the cemetery is located within 10 days of discovery. This notice requires that the location of a cemetery be identified, a location map provided, evidence of the cemetery provided, and a legal description of the land occupied by the cemetery given. Further action regarding the cemetery for the purposes of construction or property improvements must be coordinated with the THC.

Regulating Agencies

- ACHP (for federal projects only)
- THC in its role as SHPO (for federal and locally funded projects)

Applicable Design Criteria, Drawings, and Specifications

The project master construction specifications should state that if a contractor discovers or accidentally exposes artifacts or other evidence of archaeological, historical, or scientific value during construction, work is to be halted immediately and transit authority representatives are to be notified at once. The find is to be protected and work is not to proceed until the find has been assessed by a qualified archaeologist, and the transit authority has been given notice to proceed by the SHPO.


2.18 CUMULATIVE EFFECTS

This section provides guidance related to the analysis of cumulative effects within the environmental documentation process. The CEQ regulations (40 CFR Parts 1500 - 1508) implementing the procedural provisions of NEPA, as amended (42 U.S.C. 4321 et seq.), define cumulative effects as:

“…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR Part 1508.7).

Based on TxDOT’s Guidance on Preparing Indirect and Cumulative Impact Analyses (2019) and Case Law, “reasonably foreseeable” is defined as an action that is “sufficiently likely to occur that a person of ordinary prudence would take it into account in making a decision.” Reasonably foreseeable actions are probable, not just possible. Reasonably foreseeable actions include, but are not limited to, projects that 1) have been federally approved; 2) are funded, or are pending funding, or 3) “have evidence of active preparation to make a decision on alternatives to the project.”

A cumulative effects analysis must include an assessment of the direct and indirect impacts of the proposed action in addition to an assessment of other past, present, and reasonably foreseeable future actions. Indirect effects are a result of the proposed action but occur later in time and/or farther in distance than the proposed project. An example of an indirect impact would be induced development.
2.18.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- From the early stages of project development, work closely with local, state and federal agencies to identify other past, present and reasonably foreseeable future projects in the area that could affect the environment.

- Focus on truly meaningful effects and the sustainability of resources, ecosystems, and human communities utilizing natural boundaries.

- Document the direct impacts of the project on each impact area in the context of the other identified actions within the geographic area.

- Conduct an assessment of indirect effects that are closely linked with the project’s direct effects within a geographic Area of Influence (AOI).

- Conduct an assessment of cumulative effects within Resource Study Areas (RSAs) for those resources likely to experience direct and indirect effects.

When is an Impact Likely to Occur?

Each project is constructed within an environment that includes other local, state, federal, and private projects. The question to be answered is whether the proposed project would result in substantial adverse indirect or cumulative effects.

Assessment Methodology

Transit projects contribute to cumulative effects on the environment. The purpose of cumulative effects analysis is to ensure that federal decisions consider the full range of consequences of proposed actions.

Analyzing cumulative effects is an integral part of the NEPA process and should be a part of the process at each phase of environmental analysis, which include (1) scoping, (2) describing the affected environment, and (3) determining the environmental consequences.

Within the guidance entitled *Considering Cumulative Effects under the National Environmental Policy Act*, CEQ, January 1997, there are eleven steps in assessing cumulative impacts. These steps are divided below within the context of the steps in the environmental analysis process.

Scoping

- Identify the potentially significant cumulative effects issues associated with the proposed action and define the assessment goals.

- Establish the geographic scope for the analysis.

- Establish the time frame for the analysis.

- Identify other actions (past, present and reasonably foreseeable) affecting the resources, ecosystems, and human communities of concern.

TxDOT's *Guidance on Preparing Indirect and Cumulative Impact Analyses* provides some examples of reasonably foreseeable actions. The following are actions that would be considered reasonably foreseeable and should be included in a cumulative impacts analysis:

- A project is located in a local or regional comprehensive land use plan

- A subdivision plat which has been filed with the local government, county, or other plat-approving agency

- Population/development trends which are identified in local or regional comprehensive land use plans

- Planned transportation improvements by city or county governments
2.0 Impact Assessment Categories

Local or regional infrastructure projects that could impact resources (schools, hospitals, etc.)

*Describing the affected environment*

- Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stresses.
- Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
- Define a baseline condition for the resources, ecosystems, and human communities.

*Determining Environmental Consequences*

- Identify the important cause and effect relationships between project activities and resources, ecosystems, and human communities.
- Determine the magnitude and significance of cumulative impacts utilizing the categories of “substantial” and “significant” as defined below.
- Substantial: “of ample or considerable amount, quantity, size, etc. Substantial impacts are those that are noteworthy...Substantial impacts are notable, but may not be significant.”
- Significance: “the extent to which an action will cause adverse environmental effects in excess of those created by existing uses in the affected area and the absolute quantitative adverse environmental effects of the action itself, including the cumulative harm that results.”
- Modify or add alternatives to avoid, minimize, or mitigate significant cumulative impacts.
- Monitor the cumulative effects of the selected alternative and adapt management.

After determining the cumulative effects of the project, the environmental documentation should include the projects considered in the surrounding geographic area, and an individual assessment for each impact category. The environmental document “should include information on the results of the [cumulative analysis], any assumptions used, as well as any analytical methods used... [The reader] “should be able to determine not only what [was] concluded, but how and why [those conclusions were made]” (Guidance on Preparing Indirect and Cumulative Impact Analyses, TxDOT, 2019).

*When Should Mitigation Be Considered?*

Mitigation should be determined and executed within the assessment of each environmental impact category. According to TxDOT’s guidance, recommendation for regional approaches to mitigation can be suggested in an environmental document even if DART would not necessarily be the implementing agency.

2.18.2 BACKGROUND

*Regulating Law and Industry Practice*

There is no specific regulation as to the methodology that should be used for cumulative analysis. The guidance listed above by CEQ 1997 provides a framework which assists environmental analysts when conducting cumulative effects analyses. USDOT has adopted this guidance as the most up to date for this impact category.

TxDOT prepared a guidance document for projects in Texas. It is a step-wise process commonly used in environmental documentation for roadway projects: Guidance on Preparing Indirect and Cumulative Impacts Assessments (September 2010).

In 2011, American Association of State Highway and Transportation Officials (AASHTO) Practitioners Handbook – 12 was published highlighting the following key tasks for conducting indirect impact analysis:

*Environmental Impact Assessment and Mitigation Guidelines for Transit Projects*

Dallas Area Rapid Transit

April 2019
2.0 Impact Assessment Categories

1) Assess the Potential for Increased Accessibility
2) Assess the Potential for Induced Growth
3) Assess the Potential for Impacts on Sensitive Resources
4) Assess the Potential Minimization and Mitigation Measures

For cumulative impact analysis, according to AASHTO’s recent guidance, there are five key questions that must be addressed.

These are:

1) Describe Resource Conditions and Trends
2) Summarize Effects of the Proposed Action on Key Resources
3) Describe Other Actions and Their Effects on Key Resources
4) Estimate Combined Effects on Key Resources
5) Consider Minimization and Mitigation

The extent to which cumulative impacts assessment is conducted is dependent on the extent to which the proposed project would result in direct impacts, then subsequently indirect and cumulative impacts.

The EPA issued draft guidance on February 18, 2010 for considering greenhouse gas (GHG) emissions and climate change in NEPA documentation. The memo, entitled Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions, addresses ways to assess and disclose adverse direct, indirect, and cumulative GHG emissions and climate change impacts of proposed actions. While the process of analyzing cumulative effects remains the same, this memo places specific emphasis on including an assessment of GHG emissions and climate change cumulative impacts in NEPA documents.

Regulating Agencies

- USDOT
- EPA

In addition, Guidance on Preparing Indirect and Cumulative Impact Analyses highlights case law that influences cumulative analysis processes. Some of the important cases include:

- Sierra Club v. Sigler, 695 F.2d 957 (5th Cir. 1983) and Chelsea Neighborhood Association v. U.S. Postal Service, 516 F.2d 378 (2nd Cir. 1975): Projects using future economic benefits from induced growth/development to promote the project must also analyze the impacts of that future development.

- Carmel-by-the-Sea v. USDOT, 123 F.3d 1142, 1160 (9th Cir. 1997): Cumulative analysis must be provided in the NEPA document in sufficient detail to be “useful to the decision-maker in deciding whether, or how, to alter the program to lessen cumulative impacts.”

- Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372, 1379-80 (9th Cir. 1998): “To consider cumulative effects, some quantified or detailed information is required. General statements about ‘possible’ effects and ‘some risk’ do not constitute a ‘hard look’ absent a justification regarding why more definitive information could not be provided.”

- In Karst Environmental Education and Protection, Inc v. FHWA 2011 U.S. Dist. LEXIS 126925, November 2, 2011 the court noted: “Ultimately it is not the court’s role to substitute [its] judgment of the environmental impact for the judgment of the agency, once the agency has adequately studied the issue” citing Crounse Corp. v. Interstate Commerce Comm’n, 781 F.2d 1176, 1193 (6th Cir. 1986). The court stated that once the agency has taken a hard look at the environmental consequences of the action, the court should end its inquiry and uphold the FEIS, (The court found for FHWA and upheld their FEIS.)

- The important judicial opinion in Fritiofson v. Alexander provides: “the CEQ regulations [indicate] that a meaningful cumulative-effects study must identify: (1) the area in which effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions—past, proposed, and reasonably foreseeable—that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate. Fritiofson v. Alexander, 772 F.2d 1225 (5th Cir. 1985). The Fritiofson decision was echoed in the 5th Circuit Court decision from August 2012 (Sierra Club v. U.S. Army
2.19 IMPACTS TO AIRPORT PROPERTY

This section provides guidance related to the analysis of impacts to airport property. The guidelines are intended to apply to all transit projects that may affect airports or Federal Aviation Administration (FAA) systems, services or facilities. If the proposed transit project is located on airport property, a modification to the airport’s Airport Layout Plan (ALP) is required which is a federal action triggering a review in accordance with the NEPA. Application of these guidelines should be coordinated with the FAA. For EAs, the FAA will be a cooperating agency responsible for the review of the document; however, depending on the scope of the project, the FAA may decide to be the lead agency. If an EIS is required, the FAA will not only be the lead agency, but will procure the consultant team that will complete the EIS.

2.19.1 GUIDANCE FOR IMPACT ASSESSMENT AND DEVELOPMENT OF MITIGATION STRATEGIES

Objectives

- Avoid impacts to FAA systems, services, or facilities.
- Minimize use of airport property.
- Due to possible grant assurances on airport property, avoid, if possible, a release of airport property to the transit agency.
- Foster airport support for the transit project.
- Integrate transit facilities into the ALP.
- Ensure compatibility with airport’s capital improvement program and airport development master/action plan.

When is an Impact Likely to Occur?

In general, environmental documentation prepared for transit projects addresses most airport impacts. Evaluation of impacts to airport property is required when:

- A transit project is within a Runway Protection Zone (RPZ);
- A transit project is in the vicinity of or could have possible interference with FAA systems services and facilities; or
- A transit project uses airport property.

Assessment Methodology

- Upon consultation, FAA may require the preparation of an Airspace Study or Math Modeling Study to address the effects of the project on FAA systems or services.
- Following FAA EA Guidance, environmental documentation prepared for projects using airport property must address the following resource categories:
  - Air Quality and Construction Air Quality Impacts
  - Coastal Barriers
  - Coastal Zones
  - Compatible Land Use
  - Section 4(f)/Section 6(f)
  - Farmlands
  - Fish, Wildlife and Plants
  - Floodplains
  - Hazardous Materials
  - Historical, Architectural, Archaeological, and Cultural
  - Light Emissions and Visual Effects
  - Natural Resources and Energy Supply
  - Noise/Vibration
  - Socioeconomic EJ and Children’s Health and Safety Risks
  - Solid Waste
  - Water Quality
  - Wetlands
  - Wild and Scenic Rivers
When Should Mitigation Be Considered?

- Upon completion of an Airspace Study or Math Modeling Study, DART will consult with FAA and the airport to determine appropriate mitigation, if any.
- Each of the resource categories listed above is generally analyzed through DART’s environmental documentation process and in compliance with FAA Order 5050.4B, FAA Order 1050.1F, and the Environmental Desk Reference for Airport Actions published by the FAA Office of Airport Planning and Programming Airports Planning and Environmental Division in October 2007. Any impacts/mitigation identified through this process will be addressed in DART’s environmental document.
- FAA may place greater emphasis than FTA on certain impacts; therefore, the FAA should be consulted when developing mitigation on airport property.
- The airport should be consulted to ensure compatibility with airport’s capital improvement program and airport master/action plan. The airport may recommend mitigation.

Common Mitigation Techniques

- Mitigation for impacts to FAA systems or services could include changing the vertical profile, avoidance alternatives or placing of lighting to alert air traffic. The FAA may suggest additional mitigation methods.
- Potential mitigation for impacts to the specific resource categories listed above is identified throughout this document.
- To ensure compatibility with airport’s capital improvement program and airport master/action plan, transit facility design will be coordinated with the airport.
- Due to the uniqueness of airport operations, all mitigation should be coordinated with the airport and FAA. For instance, DART policy encourages the planting of fruit and nut bearing trees that may be attractive to birds, while airports do not try to attract birds, which represent a safety risk to aircraft.

2.19.2 Background

Regulating Law and Industry Practice

The FAA focuses its efforts on those issues and subject areas related to airport planning and potential effects of the project on the airport. FAA guidance on federal actions as it relates to evaluating environmental impacts can be found in FAA Order 1050.1F, CHG 1, Environmental Impacts: Policy and Procedures (2015); FAA Order 5050.4B, the National Environmental Policy Act Implementing Instructions for Airport Actions (2006); and the Federal Aviation Agency Environmental Desk Reference for Airport Actions (2007).

In addition, any environmental document should be prepared according to laws relating to the preparation or written reports submitted to the FAA for aviation programs and airport safety relative to construction of facilities including:

- Air Commerce and Safety, 49 U.S. Code 40114, as amended
- Airport Development and Noise, 49 U.S. Code 47101, as amended
- Federal Aviation Act (1958), as amended
- FAA Reauthorization Act of 2018, signed into law (P.L. 115-254)

Regulating Agencies

- FAA
- Airport Authority or Municipality
- USDOT

Applicable Design Criteria, Drawings, and Specifications

- Individual airport design standards
3 MITIGATION MONITORING PROGRAM

3.1 BACKGROUND

Whenever a proposed project results in potentially adverse environmental impacts, measures must be taken which will minimize or avoid that impact. Where impacts cannot be avoided or minimized, mitigation may be required. These mitigation measures may require additional project elements, revised locations, additional activities, modified operations, or other commitments. Where such measures are identified and committed by DART during project planning, a program for monitoring or reporting on the project's compliance with those measures is established.

The MMP is designed to guide transportation planners, project managers, project engineers, and environmental specialists, as well as neighborhood and community leaders and others, in the implementation of mitigation measures identified in the appropriate environmental document. The MMP provides DART with a tool to finalize and monitor the implementation of mitigation measures in order to minimize impacts on the surrounding community.

3.2 PURPOSE OF THE MITIGATION MONITORING PROGRAM

The purpose of the MMP is fourfold:

1) To specify recommended mitigation measures identified during the project development process and ensure that the appropriate mitigation treatments are incorporated into the final design process;

2) To monitor the implementation of the mitigation measures as the project proceeds through the final design process, construction, and the first year of operation;

3) To resolve issues identified during the environmental process that are contingent upon the outcome of the design as it progresses through the more detailed stages of development; and

4) To report on progress towards implementation of mitigation measures to responsible parties.

3.3 RESPONSIBILITY

The responsibility for the oversight and implementation of the program varies depending on whether the project involves federal or local funding. Regardless, a specific MMP is created for each project in addition to the overall procedural program.

3.3.1 FEDERAL PROJECTS

For all federally-funded projects, FTA maintains oversight of the project as the lead agency and is responsible for ensuring that the mitigation measure is carried out. However, DART, as the implementing agency, has the ultimate responsibility for all aspects of the day-to-day implementation of the mitigation and monitoring.

3.3.2 STATE PROJECTS

DART is responsible for all aspects of mitigation on state-funded projects. Mitigation monitoring is complete for the Dallas Streetcar Bishop Arts Extension project which opened in August 2016.

3.3.3 LOCAL PROJECTS

DART is also responsible for all aspects of mitigation on locally-funded projects. The mitigation program, based on the results of an LEA, is the primary commitment to the public that significant adverse impacts will be addressed. DART has completed monitoring the mitigation efforts on several local projects. Mitigation monitoring for the South Oak Cliff Blue Line Extension is complete, as this project opened for operation in October 2016.
3.4 DOCUMENTATION, ORGANIZATION, AND PROCEDURES

A monitoring and reporting program's effectiveness depends in large part upon the quality of the mitigation measures themselves. Poorly drafted measures are not only difficult to implement; they are difficult to report on and monitor. Chapter 1 provides guidance on the development of appropriate mitigation strategies.

Mitigation monitoring is composed of two activities: mitigation management and reporting. The following sections outline the organization and procedures of DART’s MMP.

3.4.1 MITIGATION MANAGEMENT

Mitigation management consists of designing the monitoring program and overseeing the day-to-day activities of the program.

Preparation and Timing

The task of designing MMP’s is the responsibility of DART. Although DART may delegate this work, the agency maintains the ultimate responsibility for ensuring the adequacy of the program. The contents and complexity of the program may vary based on:

1. the characteristics of the project being approved;
2. the environmental effects being mitigated; and
3. the nature of the mitigation measures themselves.

The MMP is formulated at the end of the environmental documentation process. At this stage, the project has been defined with sufficient detail to allow the identification of significant adverse impacts. However, sometimes the final design process may create changes that have not been previously considered, as well as opportunities to mitigate impacts in ways not previously conceived.

The MMP should be organized in a manner that is specific to each project. For example, LRT projects could be organized by line section, while smaller projects may be organized by specific impact area. Each mitigation measure identified during the environmental process of project development should be assigned a unique tracking number. Figure 2 illustrates an example of the type of information that should be tracked for the MMP.

As shown in Figure 2, the following items should be summarized for each mitigation measure:

- Mitigation Measure – outlines the mitigation commitment, any outstanding issues, and necessary background information;
- Issue – identifies the general issue/impact area being addressed by the mitigation measure (e.g., safety);
- Reference – indicates the page or section of the source environmental document that specifies the mitigation measure;
- Responsibility and Timing – identifies the individual, group, or agency responsible for the implementation of the mitigation measure and the anticipated completion of the implementation; and
- Status – describes the current reporting period status of the mitigation measure.

These components may be combined in a checklist, matrix, or other representation of the required mitigation measures or revisions, any related conditions of approval, the persons or agencies responsible for ensuring their completion, and the responsible person's or agency representative's affirmation of completion. In some cases, where mitigation will occur in stages during the project, or a mitigation measure contains more than one part, preparing a checklist for each mitigation measure may be an effective approach. DART has successfully demonstrated this process on several projects.
### 1.1.1.1.1 G3-6 Mitigation Measure

Conduct additional historic resource surveys near the proposed grade separation structure over Jupiter Road and Forest Lane to confirm that no resources are present in the extended APE.

**Issue:** Cultural Resources.

**Reference:** Final LEA Section 3.4 (p. 3-24).

**Responsibility:** DART Planning and Development (under review by the General Planning Consultant) – January 1997.

**Status:** A supplemental historic survey was conducted in January 1997 in the area of the proposed grade separation over Jupiter Road and Forest Lane. This survey confirmed that there are no additional resources in this area. No additional mitigation is necessary.

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### Monitoring

"Monitoring" can be described as a continuous, ongoing process of project oversight. Monitoring, rather than simply reporting, is suited to projects with complex mitigation measures, such as wetlands restoration or archaeological protection. In some cases, monitoring may exceed the experience or expertise of the DART staff to oversee the mitigation. Also, some measures may require implementation over a period of time or careful implementation to assure compliance.

A program for monitoring the implementation of mitigation measures should contain at least the following components.

- A list of the mitigation measures or revisions and related conditions of approval which have been adopted for the project by DART.
- A schedule for regularly checking on the project's compliance with the mitigation measures or project revisions and related conditions of approval, including progress toward meeting specified standards, if any. The MMP may set out the stages of the project at which each mitigation measure must be implemented.
- A means of recording compliance at the time of each check.
- A statement assigning responsibility for monitoring implementation of the mitigation measures and related conditions of approval to specific persons or agencies, public or private.
- If monitoring duties are contracted to private individuals or firms, provisions for ensuring that monitoring reflects the independent judgment of DART. Such provisions might include requiring the submittal of regular progress reports to DART. Regardless of whether monitoring is performed by DART or a contractor, DART retains the ultimate legal responsibility for satisfying the mitigation requirements.
- If applicable, provisions for funding monitoring activities.
- Provisions for responding to a failure to comply with any required mitigation measure (including conditions of approval). This might include "stop work" authority, permit revocation proceedings, or civil enforcement procedures. This can also include administrative appeal procedures.

Project monitors, whether agency staff or contract personnel, should be given clear, written guidance regarding the mitigation measures to be monitored and reported on. Furthermore, when compliance is
achieved, there should be a clear "sign off" by the appropriate agency to ensure that this compliance is documented. This "sign off" documentation should be reported in the quarterly project MMP update and attached to the document if appropriate.

In addition to quarterly MMP updates, monitoring and tracking compliance of mitigation can be done using worksheets or checklists. The type of tool used depends on the complexity of the mitigation measure. Worksheets can be used to express: (1) impact being mitigated; (2) mitigation measure for that impact; (3) implementer; (4) monitoring frequency; (5) monitoring requirements; (6) frequency of monitoring or reporting; (7) standards for completion or compliance; and (8) verification of compliance. When the program is a relatively simple one, a checklist rather than a worksheet may suffice to guide inspections, record findings, and certify compliance.

### 3.4.2 REPORTING

"Reporting" is defined as a written review of mitigation activities that is presented to the appropriate approval body by DART Capital Planning staff. The reporting requirements under the MMP are similar for both federal and local projects.

**Requirements**

Quarterly mitigation monitoring status reports of the MMP are provided to the FTA and their project management oversight consultant (PMOC) for review if the project is federally funded, or prepared for the project files if locally funded. Quarterly updates are also posted on DARTnet, making them available to DART staff and the DART Board of Directors for information. These quarterly reports provide the status of the implementation of the mitigation measures for the current reporting period and indicate what actions, if any, must be undertaken in order to complete or finalize the mitigation measure. These quarterly reports will be provided through final design and construction at a minimum. If mitigation measures are complete upon initiation of revenue service, the MMP may be closed. However, if there are operations related measures the MMP updates should continue until the issue is closed.

### 3.4.3 DOCUMENTING CHANGES IN MITIGATION

The MMP is a dynamic process. As further design details and operating plans are developed, mitigation measures may be expanded, modified, or determined unnecessary. This section provides guidance for documenting changes in mitigation for both federal and local projects. **Figure 3** demonstrates the federal and local process for addressing changes in project design as adopted by DART and the FTA.

**Federal**

Once the NEPA environmental document has been approved (i.e., ROD issued for a FEIS; FONSI issued for an EA; or a CE approved), DART is to initiate efforts to design, construct, and operate the proposed transit project. The information contained in the NEPA document guides final design efforts. However, variations in project design may occur due to new or updated information, or other circumstances that preclude strict adherence to the preliminary design commitments.

Oftentimes, it is necessary to update the MMP to reflect any new mitigation measures required or elimination of current measures no longer needed due to changes in project definition. The process illustrated in **Figure 3** will ensure that the proper environmental documentation is prepared with proposed project changes as part of the ongoing coordination efforts with the FTA.

Throughout the final design and the mitigation monitoring process, changes in project design that vary from that assessed in the FEIS, EA, or CE are evaluated by DART staff. If the change is insignificant, DART prepares a letter for the project file and provides a copy to the FTA. If substantial changes to the project design occur during the final design process, DART submits an Environmental Study to the FTA. The study describes the design modification, any related environmental impacts, and associated changes in mitigation. Based on information contained in the study, the FTA may require that additional environmental analyses be conducted, approve the changes as presented in the environmental study, or determine that no additional documentation is required. In some cases, a Service Plan Amendment may be required; therefore, DART Board action...
would be necessary. This method for documenting significant changes in the project has been utilized by DART on several projects.

Local

The DART Board of Directors is the oversight body for all locally-funded projects. Therefore, any changes in mitigation as a result of changes in final design should be documented, reported to, and approved by the DART Board, if necessary.

Throughout the final design and the mitigation monitoring process, changes in project design that vary from that included in the LEA are evaluated by DART staff. If the change is insignificant, DART prepares a letter for the project file and documents the change in the mitigation monitoring report. If substantial changes to the project design occur during the final design process, DART prepares an environmental study for the project file, documenting the change in the mitigation monitoring report, and may warrant DART Board approval. Depending on the magnitude of the changes and their impacts, DART staff may recommend additional environmental analyses. This process would conclude with a determination that no additional documentation, proposed new mitigation, or a modification to the MMP via a supplemental EA is required.

The environmental study describes the design modification, any related environmental impacts, and resulting changes in mitigation. Significant changes in design and their associated mitigation measures may require approval, by majority vote, of the DART Board. In some cases, a Service Plan Amendment may be required.

3.5 POST IMPLEMENTATION IMPACT ASSESSMENT AND MITIGATION

While DART strives to assess all potential impacts during the environmental review process, there may be cases after operations commence where a potential impact is identified by the community. In most cases the potential impact was evaluated during the environmental process and no impact requiring mitigation was found. While these issues can fall into a range of impact categories, the most common complaints relate to noise. For example, a resident may claim that noise levels are higher than expected and they may request mitigation. With 93 miles of rail in operation as of January 2019 and super light rail vehicles (SLRVs) in operation throughout the entire system, there may be issues raised over time regarding perceived impacts. It is DART’s responsibility to assess each situation to determine if there is a legitimate issue and to take steps to assess the situation to determine if mitigation is required.

The purpose of this section is to document a process by which DART staff will assess a potential impact and determine mitigation needs. In most cases a complaint is first made to DART Community Engagement, Government Relations, or Customer Service. Community Engagement will be the primary contact to track issue resolution and communicate with the resident or business. Other DART departments are brought in based on the type of complaint. While the process shown in Figure 4 is specific to noise and/or vibration issues, a similar process would be followed for other issues. As shown, maintenance will always be contacted first to determine if it is a temporary issue related to a vehicle or track. If not, then Capital Planning will make an assessment as to the potential impact and any necessary analyses or mitigation. Should mitigation be required, Rail Program Development will coordinate design and implementation.

It should be noted that if a complaint at a noise sensitive location is received but the receiver did not exist at the time of the EA/EIS then it is the responsibility of the landowner to implement any desired mitigation. Furthermore, if the technical analysis shows no impact but disagreement continues then management and/or DART Board policy direction will be sought, particularly if expenditure of funds would be necessary.
Figure 3 – Process for Documenting Changes in Mitigation

Project Change during Final Design

- Federal Project
  - Is change substantial/significant?
    - No
      - DART prepares letter for project file and/or documents the change through the MMP; copy to FTA
    - Yes
      - Does change involve a Service Plan Amendment?
        - Yes
          - DART staff makes determination
        - No
          - Document Changes in MMP Report

- Local Project
  - Is change substantial/significant?
    - Yes
      - DART prepares letter for project file and/or documents changes in MMP Report
    - No
      - DART prepares letter for project file
Community Engagement gathers detailed information regarding complaint.

Does potential impact need to be reassessed?
1. Was there a borderline impact previously identified?
2. Are there changed conditions?
   1. Trackwork changed
   2. New vehicle (yes)
   3. New operating plan (headway, consist)

Capital Planning
Was an impact assessment conducted during planning/design?

CP conducts impact assessment and prepares tech memo with recommendation.

No Impact

YES – impact requiring mitigation

YES – report back to Community Engagement

Community Engagement

Assigned to Community Engagement representative

Maintenance
Is it a track or vehicle issue?

YES – report back to Community Engagement

Community Engagement reports back to complainant on finding, timeframe for resolution

Complaint Received by DART (Any Department)

Community Engagement requests CP assessment

CP – Capital Planning
RPD – Rail Program Development

Figure 4 - Post Implementation Impact Complaint Process
Environmental Impact Assessment and Mitigation Guidelines for Transit Projects
Dallas Area Rapid Transit
April 2019
RESOLUTION

of the

DALLAS AREA RAPID TRANSIT
(Executive Committee)

Environmental Impact Assessment and Mitigation Monitoring Policy
for Transit Projects

WHEREAS, on May 22, 1990 (Resolution No. 900081), the Board adopted a Transit Mitigation Policy (No. IV.07); and

WHEREAS, it is recommended to replace the current Mitigation Policy with a broad statement in support of environmental analysis and to reference an "Environmental Impact Assessment and Mitigation Guidelines for Transit Projects" document which will be updated periodically and will cover all DART rail, high occupancy vehicle (HOV) lanes, and bus facility projects.

NOW, THEREFORE, BE IT RESOLVED by the Dallas Area Rapid Transit Board of Directors that the current Mitigation Policy for Transit Projects (No. IV.07) is rescinded and replaced as shown in Exhibit 1.

Huey Harrison
Secretary

Jesse Oliver
Chairman

APPROVED AS TO FORM:

DART Counsel

Roger Snoble
President/Executive Director

ATTEST:

January 9, 2001
Date
Environmental Impact Assessment and Mitigation Monitoring Policy for Transit Projects

DATE ISSUED: January 9, 2001
Resolution No. 010004
Amended by Resolutions:
Policy No. IV.07

To establish a policy on Environmental Impact Assessment and Mitigation Monitoring.

Section 1: General Statement

A. Establishment of Purpose

The policies herein replace Board Resolution No. 900081, dated May 22, 1990 (Policy IV.07). It is the policy of this Board that the Authority shall adopt a consistent approach in assessing environmental impact for the major actions associated with the development of all transit facilities (the "Major Actions") and commit to a mitigation monitoring program to ensure solutions to adverse environmental impacts are achieved in accordance with all applicable laws.

Section 2: Administration

A. Operations Guidelines and Procedures

1. The President/Executive Director or his designee is authorized to prepare "Environmental Impact Assessment and Mitigation Guidelines for Transit Projects" in conformity with these policies for the operation of the Authority.

2. At least annually, the President/Executive Director shall cause to be prepared and maintained a periodic review of all on-going environmental mitigation programs to ensure that the guidelines and procedures are in compliance with all applicable laws and agency guidance documents. The guidelines and any subsequent changes will be reviewed with the Planning Committee before the guidelines are updated.

Section 3: Environmental Impact Assessment

A. It is the policy of the Board that the authority shall consider environmental impacts associated with its major actions and issue an environmental determination for such major actions.

B. The Authority's process for environmental impact assessment shall be consistent for all major actions, regardless of funding source.

Section 4: Mitigation Monitoring

It is the policy of this Board that the Authority shall adopt as a part of the guidelines and procedures a mitigation monitoring program to ensure that mitigation of adverse environmental impacts identified during the environmental impact assessment process for major actions is achieved.

Section 5: Conformity with Applicable Laws

It is the policy of the Board that the Authority shall conform with all applicable federal, state, and local laws, ordinances, rules and regulations, including agency guidance documents, advisory circulars, reports and handbooks, during the development and implementation of major actions.
GUIDANCE AND REGULATIONS REFERENCE LIST

Impact Assessment

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## GUIDANCE AND REGULATIONS REFERENCE LIST

### Impact Assessment

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<th>Social Infrastructure</th>
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### STATE GUIDANCE

<p>| Texas Asbestos Health Protection Rules | X | X | | | | | | | | | | | | | | | [<a href="http://dshs.state.tx.us/ast">http://dshs.state.tx.us/ast</a> asbestos/rules.shtml](<a href="http://dshs.state.tx.us/ast">http://dshs.state.tx.us/ast</a> asbestos/rules.shtml) |
| Texas Pollution Discharge Elimination System | X | X | | | | | | | | | | | | | | | <a href="https://www.tceq.texas.gov/permitting/wastewater/pretreatment/fpdes_definition.html">https://www.tceq.texas.gov/permitting/wastewater/pretreatment/fpdes_definition.html</a> |
| Texas State Soil and Water Conservation Board | X | | | | | | | | | | | | | | | <a href="http://www.tsswcb.texas.gov">http://www.tsswcb.texas.gov</a> |
| Texas Department of Health | X | X | | | | | | | | | | | | | | | <a href="http://www.dshs.state.tx.us">http://www.dshs.state.tx.us</a> |
| Texas Commission on Environmental Quality TCEQ | X | | X | X | | | | | | | | | | | | <a href="https://www.tceq.texas.gov">https://www.tceq.texas.gov</a> |
| Texas Parks and Wildlife Code | X | X | | | | | | | | | | | | | | | <a href="http://www.statutes.legis.state.tx.us/?link=PW">http://www.statutes.legis.state.tx.us/?link=PW</a> |
| Texas Historical Commission | X | X | | | | | | | | | | | | | | | <a href="http://www.thc.state.tx.us/project-review/">http://www.thc.state.tx.us/project-review/</a> |</p>
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**LOCAL/REGIONAL GUIDANCE**

- Corridor Development Certificate Process for the Trinity River Watershed
  - [North Central Texas Council of Governments](http://www.nctcog.org)
  - [City of Carrollton Codes of Ordinances](https://www.cityofcarrollton.com/departments/departments-a-f/building-inspection/my-development/ordinances-codes)
  - [Dallas City Development Code](http://www.amlegal.com/codes/client/dallas_tx/)
  - [Dallas/Fort Worth International Airport](http://www.dfwairport.com/development/index.php)
  - [City of Dallas Urban Transit Design Guidelines](http://www.addisontx.gov)
  - [City of Carrollton, Texas](http://www.cityofcarrollton.com)
  - [City of Cockrell Hill, Texas](http://www.cockrell-hill.tx.us)
  - [City of Dallas, Texas](http://dallascityhall.com/Pages/default.aspx)
  - [City of Farmers Branch, Texas](http://www.farmersbranchtx.gov/)
  - [City of Garland, Texas](http://www.garlandtx.gov)
  - [City of Glenn Heights, Texas](http://www.glennheights.txs.gov)
  - [City of Highland Park, Texas](http://www.highp.org)
  - [City of Irving, Texas](http://www.ci.irving.tx.us)
  - [City of Plano, Texas](http://www.plano.gov)
  - [City of Richardson, Texas](http://www.ci.rowlett.tx.us)
  - [City of University Park, Texas](http://www.uplex.org)

**SERVICE AREA CITY RESOURCES**

- [Town of Addison, Texas](http://www.addison22tx.gov)
- [City of Carrollton, Texas](http://www.cityofcarrollton.com)
- [City of Cockrell Hill, Texas](http://www.cockrell-hill.tx.us)
- [City of Dallas, Texas](http://dallascityhall.com/Pages/default.aspx)
- [City of Farmers Branch, Texas](http://www.farmersbranchtx.gov/)
- [City of Garland, Texas](http://www.garland22tx.gov)
- [City of Glenn Heights, Texas](http://www.glennheights22tx.gov)
- [City of Highland Park, Texas](http://www.highp.org)
- [City of Irving, Texas](http://www.ci.irving.tx.us)
- [City of Plano, Texas](http://www.plano.gov)
- [City of Richardson, Texas](http://www.ci.rowlett.tx.us)
- [City of University Park, Texas](http://www.uplex.org)
APPENDIX D  SUMMARY OF CHANGES FROM PREVIOUS YEAR
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<th>Section</th>
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<tr>
<td>Footer</td>
<td>Changed date to April 2019.</td>
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<tr>
<td>Statement of Purpose</td>
<td>Revised from 2016 to 2019.</td>
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<tr>
<td>Acronym List</td>
<td>Added Alternatives Analysis (AA), Alternatives and Environmental Considerations Report (AECR), American Association of State Highway and Transportation Officials (AASHTO), Area of Potential Effect (APE), Carbon Monoxide (CO), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Historic American Building/Historic American Engineering Record (HABS/HAER), Memorandum of Agreement (MOA), National Transportation Safety Board (NTSB), Memorandum of Understanding (MOU), State Archaeological Landmark (SAL), Texas Administrative Code (TAC), Total suspended solids (TSS), U.S. Department of Agriculture (USDA), U.S. Fish and Wildlife Service (USFWS), United States Code (USC), and Visual Impact Analysis (VIA).</td>
</tr>
<tr>
<td>1.4.1 Environmental Document Preparation and Impact Assessment</td>
<td>Changed Cotton Belt Corridor EIS to Final EIS/ROD completed November 9, 2018, in Federal Project list. Added information on the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America’s Surface Transportation (FAST) Act.</td>
</tr>
<tr>
<td>Local Projects</td>
<td>Updated language for Cotton Belt Regional Rail Corridor Project</td>
</tr>
<tr>
<td>State Projects</td>
<td>Updated paragraph on TXDOT CE process to reflect updated guidance in September 2018.</td>
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<tr>
<td>2.2.2 Background</td>
<td>Updated cost for linear foot betterments to 2018 dollars (revised to $147.00).</td>
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<tr>
<td>2.4.2 Regulating Law and Industry Practice</td>
<td>Added reference to the City of Dallas’ Urban Transit Design Guidelines published in April 2017.</td>
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<tr>
<td>2.4.2 Applicable Design Criteria, Drawings, and Specifications</td>
<td>Updated DART Facilities Standard Specifications, Revised January 2005 to &quot;DART LRT Facilities and Systems Standard Specifications, Revised May 2016&quot;. Updated titles of Sections 0150 and 02271.</td>
</tr>
<tr>
<td>2.5.2 Regulating Law and Industry Practice</td>
<td>Added &quot;The City of Dallas’ Urban Transit Design Guidelines, April 2017, should be reviewed for guidance.&quot;</td>
</tr>
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<td>2.5.2 Background - Applicable Design Criteria, Drawings, and Specifications</td>
<td>Changed Chapter for Landscaping in DART LRT Project Design Criteria Manual from 19.2 to 19.3.</td>
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<tr>
<td>2.8.2 Background - Applicable Design Criteria, Drawings, and Specifications</td>
<td>Updated DART Facilities Standard Specifications, Revised January 2005 to &quot;DART LRT Facilities and Systems Standard Specifications, Revised May 2016&quot;.</td>
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<tr>
<td>2.10 NOISE AND VIBRATION</td>
<td>Updated section for consistency with new version of the FTA Transit Noise and Vibration Impact Assessment Manual (September 2018).</td>
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<tr>
<td>2.11.2 Background - Applicable Design Criteria, Drawings, and Specifications</td>
<td>Updated DART Facilities Standard Specifications, Revised January 2005 to &quot;DART LRT Facilities and Systems Standard Specifications, Revised May 2016&quot;.</td>
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<tr>
<td>2.12.1 Assessment Methodology</td>
<td>Updated &quot;TxDOT August 2014 Air Quality Toolkit&quot; to &quot;TxDOT December 2015 Standard Operating Procedure for Complying with Conformity Requirements.&quot;</td>
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<td>2.13.1 Assessment Methodology</td>
<td>Updated the new Construction General Permit (TXR150000) to effective date of March 5, 2018.</td>
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<tr>
<td>2.13.2 Regulating Law and Industry Practice</td>
<td>Updated the CDC Manual's most recent publish date to July 2017.</td>
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<tr>
<td>2.14.1 When is an Impact Likely to Occur?</td>
<td>Added &quot;updated 2017, to the TPWD-TxDOT Memorandum of Understanding (MOU).&quot;</td>
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<tr>
<td>2.15.2 Regulating Law and Industry Practice</td>
<td>Added to Chapter 26 discussion that there is also no constructive use requirement as in Section 4(f). Added information on programmatic approaches in transportation legislation including Section 1305 of the MAP-21 and Section 1304(k) of the FAST Act.</td>
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<tr>
<td>2.16.1 Guidance for Impact Guidance for Impact Assessment and Development of Mitigation Strategies</td>
<td>Updated to include information on the Cotton Belt Project, which included relocation of the historic White Rock Creek Railroad Bridge. The bridge will be relocated north of the alignment and is a transportation enhancement that met the requirements of a Section 4(f) exception under 23 CFR 774.13(g).</td>
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<tr>
<td>2.17.2 Background - Applicable Design Criteria, Drawings, and Specifications</td>
<td>Updated DART Master Construction Specification to &quot;DART LRT Facilities and Systems Standard Specifications, Revised May 2016&quot;.</td>
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<td>3.5 Post Implementation Impact Assessment and Mitigation</td>
<td>Updated 93 miles of rail in operation as of &quot;January 2017&quot; to &quot;January 2019.&quot;</td>
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APPENDIX E  MITIGATION AND BETTERMENT EXAMPLES
Historic Resources

One of Traveling Man pieces “Waiting on the Train”, leaning against the 1930 Piece of Deep Ellum Tunnel

Deep Ellum Historic Tunnel Removed for Construction
Historic Resources

The White Rock Creek Bridge Bridge has been in service since 1910, when it was constructed by the Missouri, Kansas and Texas Railroad Company. It was one of the first bridges built for the railroad line. The bridge was later used by the Kansas City Southern Railway.

The bridge was later renumbered to 500410. In 1938, the bridge was reconstructed and renumbered to 500417. In 1969, the bridge was reconstructed again and renumbered to 500418. The bridge was again reconstructed in 1974 and renumbered to 500419.

The bridge was later renumbered to 500420. In 1980, the bridge was reconstructed again and renumbered to 500421. The bridge was again reconstructed in 1988 and renumbered to 500422.

In 2010, the bridge was reconstructed again and renumbered to 500423. The bridge was again reconstructed in 2013 and renumbered to 500424.
**Historic Resources**

Fair Park Station was designed to replicate historic trolley station in Southeast Corridor

Restored Carrollton Railroad Depot. The depot was relocated and restored for potential use in Downtown Carrollton TOD
Hazardous/Regulated Materials

Clean Up of Tire Dump Site discovered during construction on South Oak Cliff Blue Line Extension
Noise and Vibration

Noise Wall in Southeast Corridor

Lubricating Machine along Good Latimer to address wheel squeal around curve
Noise and Vibration

Noise Wall along bus lane at Hampton Station in South Oak Cliff Corridor

Noise Wall on aerial structure over Northside Dr. in Northwest Corridor
Safety

Z-Crossing at W. Illinois Ave in West Oak Cliff Corridor

Pedestrian Gate installed with crossing gates at Lynn Haven in South Oak Cliff Corridor
Safety and Security

Pedestrian Underpass under Greenville Ave. at Arapaho Station in North Central Corridor

Lighting and Cameras at LRT Stations

Pedestrian bridge over TRE/Freight corridor provides controlled Access from Market Center Station to Market Center Complex in the Northwest Corridor
Parkland

Downtown Plano Station designed to complement Haggard Park in North Central Corridor

Chapter 26 documentation was included in the Final EA for SOC-3 to document mitigation associated with a Mass Transit Easement through Runyon Creek Park
Traffic

Intersection Improvement at Gilford St./Denton Dr.
in Northwest Corridor

Grade Separation at Royal Lane
in Northwest Corridor
Visual and Aesthetics

Trees Planting at Dexham Rd in Northeast Corridor to screen adjacent residences

Visual screening for apartments adjacent to Spring Valley Station in the North Central Corridor
Visual and Aesthetics

Landscaping in Lake Highlands in Northeast Corridor

Visual screening for residential area adjacent to rail in the South Oak Cliff Corridor
Betterments

Additional Visual Screening in Northeast Corridor