REEVALUATION

OF THE
FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR
IH 10 WEST: FROM TAYLOR STREET TO FM 1489

HARRIS, FORT BEND, AND WALLER COUNTIES

Prepared For:
U.S. Department of Transportation
Federal Highway Administration
Texas Department of Transportation
Houston District

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ES.0 EXECUTIVE SUMMARY

ES.1 SYNOPSIS

This document is a reevaluation of the Final Environmental Impact Statement (FEIS) prepared for Interstate Highway (IH) 10 West from Taylor Street to Farm-to-Market (FM) 1489 in Harris, Fort Bend and Waller counties, Texas. The proposed project length is 35.6 miles. This reevaluation addresses: the use of four Managed Lanes (ML) to be operated as a Toll Facility in the center of IH 10 between State Highway (SH) 6 and IH 610, the addition of elevated Beltway 8 frontage road lanes adjacent to the Beltway 8 mainlanes through the IH 10 interchange, various minor design and operational refinements, and certain issues developed in more detail since the Record of Decision (ROD). The Houston District Office of the Texas Department of Transportation (TxDOT) completed the FEIS in November 2001. The project received a ROD from the Federal Highway Administration (FHWA) on January 14, 2002 and a reissued ROD on August 30, 2002. Further information on the reissued ROD and the background of the proposed IH 10 West project is contained in Section 1.

ES.2 PURPOSE OF THIS REEVALUATION

The purpose of this reevaluation is to update the approved FEIS. This reevaluation identifies and evaluates refinements in design, proposed operations, and any environmental consequences of those refinements since the previously approved ROD. This reevaluation also identifies and evaluates certain issues developed in more detail since the issuance of the ROD relating to noise, air quality, and drainage.

ES.2.1 DESIGN AND OPERATIONAL REFINEMENTS AS A RESULT OF DETAILED DESIGN EFFORT

The proposed project identified in the approved FEIS provides for two ML in both directions between SH 6 and IH 610, one concurrent High Occupancy Vehicle (HOV) lane, in each direction, between SH 99 (the Grand Parkway) and SH 6, and the addition of one through general-purpose Single Occupancy Vehicle (SOV) lane in each direction between the City of

Katy, Texas and IH 610 with auxiliary lanes to provide lane balance at major interchanges (the Grand Parkway, SH 6, Beltway 8, and IH 610). The HOV lanes will transition to the mainlanes between IH 610 and Washington Avenue. The proposed roadway will follow the existing IH 10 West roadway alignment encompassing the existing parallel Union Pacific Railroad (UPRR) right-of-way (ROW), which is now mostly-owned by TxDOT, and the Old Katy Road ROW between SH 6 and Campbell Road.

Design and operations of the proposed project as described in the approved FEIS has changed in certain areas since the issuance of the ROD. The current design and operational refinements include the following:

1. Operation of a Toll Facility utilizing the four ML/Special Use Lanes (SUL) located in the center of IH 10 West between SH 6 and IH 610 and relocation of the access ramp (Tee ramp) for the Metropolitan Transit Authority of Harris County, Texas (METRO) bus service at the METRO Addicks Park & Ride (A detailed report of the Toll Facility design and operation is contained in Appendix A);
2. Addition of eight new detention basins and refinements to eight previously proposed detention basins;
3. Construction of elevated Beltway 8 through-frontage road lanes alongside the Beltway 8 mainlanes through the IH 10 interchange;
4. Changing previously-designed culverted creek crossings to bridge crossings to minimize impacts to wetlands and other waters of the U.S.;
5. Redesign of bridge structures to accommodate potential future light rail within the IH 10 West corridor;
6. Relocation of a water main, located between Eldridge Road and Beltway 8 on the north side of IH 10. The water main acquisition and relocation will be the responsibility of the City of Houston;
7. Realignment of South Creek Drive at the intersection of South Creek and Barker Springs Drive;
8. Acquisition of minor amounts of additional ROW (corner clips) for minor curb cuts for Americans with Disabilities Act (ADA) access;

9. Additional high mast lighting areas proposed for safety purposes;
10. Other minor design refinements.

The design and operational refinements were evaluated for social, economic, and environmental impacts as discussed within this reevaluation. This reevaluation demonstrates the refinements in design and operations do not change the conclusions of the approved FEIS.

ES.2.2 ISSUES DEVELOPED IN MORE DETAIL SINCE THE ROD

Since the final issuance of the ROD on August 30, 2002, three primary issues about the proposed IH 10 West project have been developed in more detail: 1) noise impacts, 2) air quality impacts, and 3) drainage impacts. The issues were evaluated for social, economic, and environmental impacts as discussed below in Sections 7., 8., and 9., respectively. This reevaluation demonstrates that the further development of these issues since the issuance of the ROD does not change, but rather confirms the selection of the preferred alternative and the conclusions of the approved FEIS. A detailed table listing all public involvement for the proposed IH 10 West project is contained in Appendix B.

ES.3 CONSTRUCTION SCHEDULE

Construction has not begun on the proposed IH 10 West project. The proposed project will be constructed in phases. The current letting (contracting) schedule for each phase of the proposed project is listed in Section 3. A project generally goes to construction approximately two months after the letting date. The construction of the proposed project may involve continuous 24 hours, seven-days a week operations, which would shorten the length of the construction schedule.

ES.4 DESIGN AND OPERATIONAL REFINEMENTS

Project design and operational planning has been underway since issuance of the ROD on August 30, 2002. As a result of the detailed design process, the project design and operations,

as described in the approved FEIS, have been refined and changed in certain areas. The current design and operational refinements are briefly described below and are described in detail in Exhibit 1.

ES.4.1 TOLL ROAD ACCESS AND CONTROL FACILITIES

Operation of the Toll Facility utilizing four ML/SUL will require relocation of the METRO access ramp and the establishment of electronic toll areas.

ES.4.1.1 Tee Ramp East of SH 6

In addition to utilizing the MLs located in the center of IH 10 West, between SH 6 and IH 610, as a Toll Facility, the design of the elevated ramp to the METRO Addicks Park & Ride has been revised from the FEIS to provide access to the Park & Ride facility as well as to Park Row Boulevard. The environmental consequences associated with the ROW acquisition and construction of the Tee ramp at the METRO Addicks Park & Ride are not considered substantial and are addressed in the Toll Facility report, which is contained in Appendix A.

ES.4.1.2 Electronic Toll Areas

Electronic toll areas will be used in toll collection locations. The toll areas will be fully electronic and will build upon the electronic toll collection system currently operated by Harris County known as EZ-TAG.

ES.4.2 REFINEMENT OF DETENTION BASIN DESIGN

There are 16 detention basins proposed within the IH 10 West project limits, eight of which are new detention basins not identified in the FEIS. The eight new detention basins and refinements to the eight detention basins described in the approved FEIS are required to detain storm water runoff and mitigate potential increases in runoff rates resulting from the proposed project. The additions and refinements will also aid in reducing flooding potential and improving water quality within the proposed project area.

ES.4.3 BELTWAY 8 ELEVATED THROUGH FRONTAGE LANES

The northbound and southbound Beltway 8 frontage roads have been designed to include elevated frontage roads through the IH 10/Beltway 8 interchange along with the at-grade frontage roads. These elevated frontage roads will provide additional traffic relief for through traffic. No additional ROW is necessary for this design refinement.

ES.4.4 CONVERSION OF BRIDGES TO CULVERTS TO AVOID WETLANDS IMPACTS

Crossings of Mason Creek tributary and Turkey Creek, located within the proposed project area, will involve a design change from culverts to bridges. The water crossings, including the proposed design revisions, have been reviewed by the United States Army Corps of Engineers (USACE). The design revisions are part of the project design efforts to avoid or minimize impacts to waters of the U.S. The design change, from culverts to bridges, will eliminate some construction and permanent impacts to Mason Creek tributary and Turkey Creek. The impact on waters of the U.S., including wetlands, is discussed in detail in Section 10.4 and Section 10.5.7.

ES.4.5 ACCOMMODATIONS FOR POTENTIAL FUTURE LIGHT RAIL

A Memorandum of Understanding (MOU) has been developed among TxDOT, Harris County, and METRO to address certain applicable operational aspects of the proposed Toll Facility. The MOU was signed by the State, Harris County, and METRO in September 2002 and is contained in Appendix A. One of the elements of the MOU is that METRO has the right to provide future light rail transit in the highway corridor. The TxDOT is adding provisions into the current highway construction plan to facilitate this potential future operation in the median of the highway and the redesign of bridge structures to accommodate potential future light rail as well as providing cathodic protection for the bridges within the proposed IH 10 West corridor.

ES.4.6 RELOCATIONS OF UTILITY INFRASTRUCTURE

A major sewer line and separate trunk water main, located between Eldridge Road and Beltway

8 on the north side of IH 10, will be relocated to the streets north of Old Katy Road as part of this proposed project. The property acquisition and relocation is the responsibility of the City of Houston.

ES.4.7 REALIGNMENT OF SOUTH CREEK DRIVE

The realignment of the existing South Creek Drive will be required for the safety of large (18-wheeled) delivery trucks turning east onto Barker Springs Road. The additional ROW necessary to accomplish this design refinement totals 0.34-acre.

ES.4.8 ACCOMMODATIONS FOR AMERICANS WITH DISABILITIES ACT

Approximately one acre of additional ROW is required for the minor curb cuts at various locations necessary to provide for ADA access to meet the requirements of the Texas Department of Licensing and Regulations, ADA. There will be no displacements as a result of this proposed design refinement.

ES.4.9 ACCOMMODATIONS FOR HIGH MAST LIGHTING

High mast lighting was discussed in the FEIS; however, the locations were not known at the time of the FEIS. Through detailed design it has been determined that 227 high mast lighting locations will be needed. Of these, 24 high mast lighting locations will require additional ROW. The additional ROW required for the 24 high mast lighting areas totals 0.34-acre and is needed for safety purposes. No displacements will occur as a result of the additional ROW acquisition.

ES.4.10 OTHER MINOR DESIGN AND OPERATIONAL REFINEMENTS

Other minor design and operational refinements are proposed for this project. These refinements are engineering refinements and will have no effect on the proposed alignment or alternatives or social, economic, or environmental impacts. This category of design and operational refinements will include, but is not limited to, items such as refining the

Bingle/Voss intersection design by reducing the existing intersection curvature to provide a more perpendicular intersection to IH 10 and revising ramp designs.

A sliver of proposed ROW will be required at the IH 10/IH 610 interchange. The additional ROW is required for proposed IH 610 direct connectors "J" and "D" at the IH 10/IH 610 interchange (See Exhibit 1). The additional ROW is METRO property located adjacent to the METRO Northwest Transit Center and will be donated by METRO for TxDOT's use in the proposed IH 10 West project. There will be no cost involved in the donation of property and no displacements associated with the additional ROW. The proposed ROW totals approximately 0.18-acre.

ES.4.11 CONSIDERATION OF OTHER PROJECT DOCUMENTATION - SH 6 NORTH AND SOUTH OF IH 10 CATEGORICAL EXCLUSION

A TxDOT project to upgrade SH 6 from south of Memorial Drive to north of Park Row Boulevard in Harris County, Texas has the potential to impact the FEIS. However, a Categorical Exclusion (CE) was conducted for SH 6 within the subject project limits. While approval of the CE is anticipated, final approval has not been received at this time. Approval of the CE will indicate no impact to the FEIS.

ES.5 STATUS OF ROW ACQUISITION

Since the issuance of the ROD, acquisition of the ROW proposed in the FEIS has progressed and additional ROW acquisition has been proposed to accommodate design refinements after the ROD.

ES. 5.1 STATUS OF FEIS ROW ACQUISITION

The ROW acquisition for the proposed IH 10 West project is currently in progress and it is the responsibility of TxDOT to acquire the ROW required. As of November 2002, TxDOT has acquired 48 of the required 417 parcels necessary for the proposed project implementation. Some of these parcels were acquired prior to the issuance of the ROD, utilizing Right of Way Acquisition Advanced Acquisition procedures, commonly known as "Hardship Acquisitions and Protective Buying". Hardship Acquisitions are those acquisitions, which occur at the owner's request to alleviate a particular hardship to the owner. This does not include hardship due solely to an inability to sell the property. Protective Buying is early acquisition to prevent imminent parcel development that will materially increase ROW costs, or which might tend to limit the choice of highway alternatives. Parcels acquired under Protective Buying must be needed for the proposed transportation project. A more detailed discussion of the status of the FEIS ROW acquisition is contained in Section 5.1.

ES. 5.2 PROPOSED DESIGN REFINEMENTS REQUIRING ADDITIONAL ROW ACQUISITION

A total of approximately 20.52 acres of additional ROW is required as a result of the proposed design refinements. A more detailed discussion of the status of the proposed design refinements ROW acquisition is contained in Section 5.2.

ES.6 ALTERNATIVES ANALYSIS

The design for the proposed IH 10 West corridor that was presented at the IH 10 Public Hearing, and subsequently approved for further development by FHWA, was developed through a two-phase process. The first phase was the Major Investment Study (MIS), which considered a wide range of modal alternatives, including various combinations of SOV and transit options. The recommendations from the MIS provided a basis for the second phase of the alternatives analysis process. This was the Design Alternatives Analysis developed in conjunction with the Draft Environmental Impact Statement (DEIS).

A major element of the proposed IH 10 West corridor MIS was the development of a broad range of transportation alternatives, modes of transportation, and various design options that were applicable to the study goals and objectives. The MIS was designed to evaluate the transportation needs of the corridor and provide an opportunity for TxDOT and other agencies/stakeholders (County, City, METRO, the Harris County Toll Road Authority (HCTRA), the Villages, etc.) involved to identify the most reasonable, efficient, and effective transportation option(s). The purpose of the MIS was to identify what transportation improvements, or combination thereof, were needed to provide acceptable access and mobility within the proposed IH 10 West corridor. These identifications were made within the context of the resources available and with full knowledge of the consequences of the improvements, both positive and negative.

ES.6.1 INCORPORATION OF THE TOLL FACILITY INTO MANAGED LANES

The recommendations from the MIS for the proposed IH 10 West project included the development of high transit High Occupancy Vehicle-Special Use Lanes (HOV-SUL). The SULs were designated for implementation in the most congested portion of the IH 10 West corridor from SH 6 to the IH 610 Loop. The term SUL was later refined to ML to better describe the operational flexibility envisioned for the facility. This component of the recommended modal alternative always considered the use of tolls as a way to manage the facility. The use of a variable toll schedule to regulate demand is a viable strategy to ensure a high level of operation is maintained on the ML throughout the day.

The TxDOT, FHWA and Harris County are developing an agreement for HCTRA to operate the ML as a Toll Facility, while allowing transit vehicles throughout the day and HOVs during peak hours to use the facility at no charge. The involvement of HCTRA in the development of the project is consistent with the recommendations of the MIS.

ES.6.2 CONSIDERATION OF RAIL ALTERNATIVES

Although, during the timeframe of the MIS process, a regional rail system was not part of the METRO Better Bus Plan or the METRO 2020 Long-Range Plan, a rail alternative was included in the MIS to evaluate its potential to attract ridership and thereby satisfy the transit demand in the corridor. The guidelines for a MIS will not allow for the assumption of the development of a regional rail system without a firm commitment by the local transit provider. It was concluded that due to the lack of connectivity and continuity, the rail transit alternative would not attract enough ridership to justify its high capital and operational cost. METRO is currently conducting an assessment of a high capacity transit implementation plan as a part of their comprehensive transit plan. At the request of METRO, design refinements to accommodate a future potential light rail facility have been included in the design plans for the corridor.

ES.6.3 ASSUMPTIONS USED FOR NO-BUILD

The demographics and land use that were a basis for analysis of all MIS alternatives were based on the Houston-Galveston 2022 Metropolitan Transportation Plan (MTP). This plan assumed nominal widening of the IH 10 West corridor as well as improvements to the arterial network in the western suburbs. The FEIS analysis of the no-build alternative was used as a basis for comparison of the various build scenarios, with the realization that the no-build alternative would not be able to satisfy the goals and objectives established early in the study process.

Because new development in the urban and near suburban portions of the corridor continues to stabilize, and because substantial new commercial and residential development activity continues to accelerate in the outlying suburbs, the no-build alternative would not satisfy the corridor's need for improved mobility and increased safety.

ES.6.4 CONSIDERATION OF DEVELOPMENT OF IH 10 BELOW GRADE

The possibility of situating various components of the freeway facility below grade was a design alternative that was considered in the early stages of the schematic development process. This alternative was considered because it might have been able to reduce overall noise impacts in the corridor; however, the physical constraints related to this alternative

required its elimination from further consideration. A more detailed discussion of this alternative is contained in Section 6.4.

ES.6.5 CLARIFICATION AND CONSISTENCY OF ELEMENTS OF THE PREFERRED ALTERNATIVE

Upon completion of the MIS process and the adoption of the MIS recommendations by the regional Metropolitan Planning Organization (MPO), TxDOT began the Design Alternatives Analysis process to determine the best way to implement the MIS recommendations with a minimum of environmental impacts. The portion of the corridor that would require extensive purchase of additional ROW was the primary focus of the alternatives analysis. It was determined that the Combined Alternative, calling for the purchase of ROW from the north side of IH 10 in some locations and the purchase of ROW from the south side of IH 10 in other locations, would result in the minimum total adverse environmental impacts for the project. In addition, two components of the MIS recommendations were deferred for later development. These are the development of a two-lane HOV between IH 610 and Taylor Street and the mainlane widening of IH 10 between Brookshire and the Brazos River. The deferrals of these elements are discussed below. The Houston Major Thoroughfare Plan was followed regarding planning for meeting and matching the future expansion of the local highway system.

ES.6.5.1 Deferral of HOV Development from IH 610 to Taylor Street

The recommended design concept and scope (Alternative V-2) from the IH 10 West MIS included a two-lane, two-way HOV lane from IH 610 to downtown Houston. Initially, this design concept and scope was carried into the environmental process for the IH 10 West corridor. However, in the late 1990's, TxDOT and METRO completed a major rehabilitation project on IH 10 from IH 610 to downtown Houston. This project included the development of an elevated HOV structure between Taylor Street and downtown Houston. Because the elevated HOV lanes correspond with the recommendations of the MIS, TxDOT proposed no further improvements from Taylor Street to downtown in the foreseeable future. For this reason, the eastern limit of the IH 10 DEIS was set at Taylor Street instead of downtown Houston as described in the MIS.

After the DEIS was issued on November 2000, TxDOT initiated a preliminary schematic design of the preferred alternative to evaluate the design and construction issues. The recent reconstruction project described above complied with the MIS recommendation for five mainlanes in each direction between IH 610 and Taylor Street. The TxDOT determined that to develop the recommended two-lane, two-way HOV lane at-grade in this section of IH 10 would require either numerous design exceptions, such as narrow lanes and little or no inside shoulders, or the further extensive reconstruction of that section.

The TxDOT consequently determined that extensive reconstruction of this section of IH 10 was not feasible. The TxDOT suggested the existing highway cross section to be restriped to include continuous non-barrier separated HOV (or diamond) lanes. The TxDOT submitted design exception requests to the FHWA for reduced lane width and minimal inside shoulder widths to accommodate the proposed HOV lane. The FHWA determined that these exceptions could produce undesirable operational conditions and the FHWA Division Office declined to approve the design exceptions for this section.

The Houston District Office of TxDOT requested that the Houston-Galveston Area Council (H-GAC) (the regional MPO) review the travel demand model to evaluate the need for a HOV in this segment of IH 10. It was determined that a deferral of the development of a HOV between IH 610 and Taylor Street would not have a detrimental impact on the operation of the freeway or the other portions of the HOV/ML system and, therefore, currently is not needed. The development of the HOV segment from east of IH 610 to Taylor Street has been deferred to a later date, as needed, to satisfy traffic demand. When the HOV is considered for development in the future, a separate environmental investigation will be conducted to evaluate design alternatives and their associated environmental impacts.

The TxDOT is continuing development of continuous frontage roads from IH 610 to Taylor Street. The project is currently undergoing design.

ES.6.5.2 Deferral of Freeway Widening from Brookshire to Brazos River

The MIS recommendations called for the development of six mainlanes from Brookshire to the Brazos River; however, the Brazos River is not a logical terminus for the transition from six to

four mainlanes. Coordination with the Yoakum District Office of TxDOT to determine a logical terminus of the six mainlane section and further environmental documentation will be required to develop this portion of the MIS recommendations. The development of the six-mainlane segment from the Brazos River to FM 1489 has been deferred to a later date, as needed to satisfy traffic demand.

ES.7 TRAFFIC NOISE ANALYSIS

The FEIS noise analysis was reevaluated to account for changes in traffic and design as a result of the proposed Toll Facility as well as the proposed elevation of the additional Beltway 8 frontage road through lanes. For a more detailed noise barrier analysis, numerous receivers were modeled in addition to the 121 originally modeled. Public input from noise abatement workshops during the noise modeling process resulted in additional receivers being modeled. A total of 347 additional receiver locations (for a total of 468) were modeled to represent the land use activity areas adjacent to, and near, the proposed project that might be impacted by traffic noise and that may potentially benefit from feasible and reasonable noise abatement. The modeling indicates that the proposed project will result in a traffic noise impact at 435 of the 468 receiver locations. However, it also indicates that noise levels at 325 receiver locations will decrease from existing noise levels, will not change from existing noise levels, or represents an increase that is not perceptible or barely perceptible. The data resulting from this analysis is contained in Appendix C.

ES.7.1 NOISE ABATEMENT ANALYSIS

The following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise barriers. Before any abatement measure can be incorporated into the project, the measures must be both feasible and reasonable. In order to be feasible, the measure should reduce noise levels by at least five dBA at receivers; and to be reasonable the measure should not exceed $25,000 for each benefited receiver. The construction of noise barriers was determined to be the only feasible and reasonable abatement measure for this project.

A total of 23 noise barriers were modeled along the proposed IH 10 West corridor. Of the 23 noise barriers modeled, 15 are considered feasible and reasonable and will be incorporated into the proposed project. Nine of the 15 noise barriers proposed were originally proposed in the approved FEIS.

The results from the data generated from the 468 locations modeled indicate that noise levels overall are expected to be improved or reduced from current levels after the construction of the proposed project, including the 15 proposed noise barriers. In particular, the data showed that over the next 20 years:

1. 58 locations (12%) are expected to experience a 1 to 5 dBA decrease in traffic noise levels;
2. 57 locations (12%) are expected to experience no increase in traffic noise levels;
3. 211 locations (45%) are expected to experience an imperceptible (1 to 2 dBA) or barely perceptible (3 dBA) increase in traffic noise levels;
4. 134 locations (29%) are expected to experience a 4 to 7 dBA increase in traffic noise levels;
5. Eight locations (2%) are expected to experience an 8 dBA or greater increase in traffic noise levels.

A more detailed discussion of the noise abatement measures is contained in Section 7.1 and a table outlining the 15 noise barriers proposed is contained in Section 11.3. In addition, the location of each of the 15 noise barriers proposed and the 468 receivers modeled are contained in Exhibit 1, the revised project schematics.

In August of 2002, TxDOT conducted two noise workshops presenting the preliminary results of the detailed noise analysis. The meetings were conducted in an open house format with wall-mounted schematics showing the proposed action, noise receivers, and noise barriers proposed at the time of the workshop. Comments were solicited from attendees regarding design of proposed barriers and if the barriers as proposed were desired. All comments were

taken into consideration in the design of the proposed noise barriers and whether or not noise barriers were desired where proposed. The comments are on file at the Houston District Office of TxDOT.

ES.8 AIR QUALITY ANALYSIS

The original air quality analysis was reevaluated to account for changes in traffic and design as a result of the proposed Toll Facility as well as the proposed elevation of the additional Beltway 8 frontage road through lanes and issues relating to air quality developed in more detail since the issuance of the ROD.

ES.8.1 IH 10 PROJECT IS IN CONFORMING TIP AND SIP

The State of Texas, in coordination with the Houston-Galveston area, has developed and submitted a State Implementation Plan (SIP) to the Environmental Protection Agency (EPA) demonstrating this area will attain the ozone standard by the year 2007. The SIP sets budgets and actions for sources of emissions such as transportation (on and off road), industry (refiners, industrial plants, etc.), and area wide sources (bakeries, dry cleaners, gas stations). The emissions from transportation, both existing and future, are required to be equal to or less than the budgets set in the SIP. As determined by the U.S. Department of Transportation (DOT), the current Houston-Galveston 2022 MTP and 2002-2004 Transportation Improvement Program (TIP) conforms to the transportation budget and actions (transportation control measures) within the SIP. The proposed project is, as required by the EPA conformity regulations, part of the conforming 2022 MTP and 2002-2004 TIP.

ES.8.1.1 The Region is in Non-attainment for Ozone Only

Six pollutants are of concern with regards to air quality in urban areas including: ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, particulates (PM_{10}), and lead. The Houston-Galveston area (Harris County and the surrounding seven counties) is in non-attainment only for ozone. Ozone is created when volatile organic compounds (VOC) and nitrogen oxides (NO_x) react with sunlight to create ground level ozone. Automobiles and industrial activities are sources of VOC and NO_x. Because pollutant emissions from these sources quickly mix

into the regional air shed and rarely concentrate locally, ozone is a regional problem rather than a local or corridor problem, such as in the IH 10 West corridor.

ES.8.1.2 EPA Has Not Established Benchmarks for Analyzing the Possible Health Effects of Fine Particulate Matter

The EPA Transportation Conformity Rule requires that transportation plans, programs and projects conform to the purpose of the SIP in air quality non-attainment and maintenance areas. To date, the EPA has not designated non-attainment areas for fine particulate matter or $PM_{2.5}$. Section 305 of the National Highway System Designation Act of 1995 specifically amended the Clean Air Act limiting the applicability of the transportation conformity provisions to non-attainment and maintenance areas. Thus, conformity requirements do not apply in areas that have not been designated as non-attainment areas for specific pollutants. Moreover, because the EPA has not determined whether $PM_{2.5}$ non-attainment areas will be addressed at the regional scale as ozone is currently or by other methods, possible $PM_{2.5}$ standards cannot currently be anticipated at the project level. For these reasons, $PM_{2.5}$ analysis does not provide a meaningful benchmark for evaluating the environmental impacts of this project.

ES.8.2 RESULTS OF CARBON MONOXIDE AIR QUALITY ANALYSIS PERFORMED IN COMPLIANCE WITH APPLICABLE EPA REGULATIONS

A project level air quality analysis for carbon monoxide (CO) was performed for the proposed IH 10 West corridor and the results were included in the approved FEIS. The air quality analysis resulted in no air quality impacts as a result of implementation of the proposed project.

In this reevaluation, TxDOT conducted an air quality analysis for the proposed design refinements, including the Toll Facility. Those design refinements, along with issues developed in more detail since the ROD with regard to air quality along the proposed project, prompted additional air quality analysis that evaluated the CO concentrations for the Estimated Time of Completion (ETC) of the proposed IH10 West project and for 20 years beyond the Estimated Time of Completion (ETC+20). For the purposes of this re-evaluation, ETC has

been determined to be the year 2009 and ETC+20 is the year 2029. The traffic changes resulting from the proposed Toll Facility have been included in this air quality analysis.

Additionally, CO air quality modeling was performed for three different locations along the project corridor. The locations are: 1) the IH 10/Beltway 8 interchange, 2) IH 10 in the area of two schools located in the vicinity of Echo Lane, and 3) the IH 10/IH 610 interchange, including the Awty School. The two schools in the vicinity of Echo Lane are Spring Branch Middle School and Memorial High School; both are considered sensitive receptors in addition to the Awty School. Echo Lane is designated as Blalock Road north of IH 10. The two major interchanges were modeled due to their high levels of traffic and since they are considered worse case scenarios for the length of the IH 10 West corridor. With the exception of the three schools, all receptors were placed on the proposed ROW line in order to model the worse case scenario. The modeling evaluated traffic volumes for the ETC and ETC+20 with environmental conditions that yield the worse possible conditions including 12 different wind angles at each receptor with the highest CO concentrations noted and recorded for each receptor.

Based on the results of the original and subsequent air quality analysis, there will be no violations of the EPA CO air quality standards as a result of implementation of the proposed project. The detailed air quality analysis is contained in Section 8.

ES.9 DRAINAGE AND WATER QUALITY

Since the issuance of the ROD, issues relating to drainage and water quality have been developed in more detail, including: 1) runoff impacts, 2) floodplains impacts, 3) detention ponds, 4) 100-year sheet flow impacts, and 5) coordination with local drainage master plans.

ES.9.1 RUNOFF IMPACTS

Drainage studies performed throughout the IH 10 West corridor identified all existing storm water outfall locations, such as bayous, creeks, ditches, and existing storm sewer systems. At each outfall, peak flow rates for the 100-year flood and other flood events were computed for existing and proposed project conditions. Proposed flow rates include influences from

additional pavement surface and drainage system improvements planned within proposed IH 10 West ROW. The studies developed storm water mitigation facility designs that limit runoff rates from the proposed project into existing outfalls to no more than existing runoff rates in those outfalls.

ES.9.2 FLOODWAY AND FLOODPLAINS IMPACTS

As discussed above, proposed storm water mitigation facilities will meet zero impact requirements on the floodway and floodplain elevations established by the Harris County Flood Control District (HCFCD). Components of proposed storm water mitigation facilities include accommodations in the design of cross-drainage culverts and bridges that will minimize changes in floodway and floodplain water surface elevations. At several cross-drainage locations, existing cross-drainage culvert and bridge sizes are not changed in the proposed design. For other locations, where proposed cross-drainage culvert sizes or bridge openings differ from existing structures, either flow restrictors or detention basins will be provided.

ES.9.3 ADDITIONAL DETENTION BASINS RESULTING FROM DETAILED DESIGN PROCESS

Since completion of the November 2001 FEIS, six additional drainage studies were conducted for a total of 15 drainage studies conducted for different segments of the proposed IH 10 West project. Recommendations from these studies and additional reviews of earlier studies resulted in the proposal of eight additional detention basin locations, for a total of 16 detention basins within the proposed IH 10 West project. The eight additional basins were proposed as development progressed on the proposed IH 10 West project. Through the final design process, alternative mitigation plans were developed to accommodate project constraints more clearly identified during the initial development phase. A more detailed discussion of drainage is contained in Section 9. All of the recommendations from these additional studies will be incorporated into the final design.

ES.9.4 100-YEAR SHEET FLOW IMPACTS

The quantity and direction of 100-year flood flows was evaluated, based on accepted engineering practice, for existing and proposed project conditions to determine the potential for adverse impacts on adjacent properties. As necessary, proposed roadway profiles and drainage system components were adjusted during design to maintain existing 100-year flood flows and drainage patterns, to the extent practicable, and to ensure no change in relation to existing conditions.

ES.9.5 COORDINATION WITH LOCAL DRAINAGE MASTER PLANS

As a part of the planning of improvements for the proposed IH 10 West project, consideration was given to all available documents and other unpublished information relating to the criteria, conditions, and plans for drainage and flood protection through three small cities located immediately south the IH 10 West corridor. These cities include Hedwig Village, Piney Point Village, and Bunker Hill Village. Together, these cities are commonly referred to as the "Villages". Because of their relatively small size, the Villages have traditionally not undertaken comprehensive drainage and flood protection plans. The extent of drainage and flood protection planning undertaken in the Villages has generally been restricted to drainage improvements completed as a part of roadway improvement projects. However, beginning in the late 1990s, the HCFCD provided planning services and technical information for the Villages and the surrounding area, in an effort to improve drainage and flood protection in this heavily populated area.

In recent years, many of the roadway improvement projects undertaken in the Villages area have been accompanied by a hydrologic and hydraulic analysis of the project impacts on downstream areas. Several of these impact and mitigation studies were carefully reviewed in conjunction with the impact and mitigation study performed for the proposed IH 10 West project. The involvement of a common consultant in all of these projects helped to ensure consistency and compatibility of study data, assumptions, methods, and results for ultimate review and concurrence from the HCFCD.

The Villages have reviewed the additional engineering studies prepared for the highway corridor.

ES.10 OTHER ENVIRONMENTAL CATEGORIES EVALUATED

This reevaluation provides further documentation of all other environmental categories evaluated in the approved FEIS and examines the importance of potential effects to the environment from the proposed design refinements and issues developed in further detail since the ROD was issued. A detailed discussion of each environmental category and the effect of the proposed design refinements are presented in Section 10.

ES.11 AVOIDANCE, MINIMIZATION, AND MITIGATION

Since the issuance of the ROD, the avoidance, minimization and mitigation strategies proposed in the FEIS have been further refined and developed.

ES.11.1 BENEFICIAL LANDSCAPING

The undertaking in the FEIS that the landscaping design of the proposed project will emphasize the use of native plants, where practicable, in accordance with the guidelines for beneficial landscape design remains valid for all the proposed design refinements discussed in this reevaluation.

ES.11.2 HAZARDOUS MATERIALS

The undertaking in the FEIS that those sites within the existing and proposed ROW that pose a potential hazardous materials impact will be further investigated prior to construction during the ROW acquisition process remains valid for all proposed design refinements identified in this reevaluation. Mitigation for possible hazardous materials within the existing and proposed ROW will also occur during the ROW acquisition process. Older houses and buildings will be inspected for asbestos and other hazardous materials before demolition. Any contaminated buildings will be cleaned up according to federal and State regulatory standards prior to demolition.

ES.11.3 NOISE

The reevaluation of the traffic noise analysis discussed above indicates that the proposed project will result in noise impacts and that 15 noise barriers are both feasible and reasonable and are proposed for incorporation into the project. Taken together, these 15 noise barriers will stretch a total of 17,186 linear feet or about 3.25 miles along this project. Table 7, contained in Section 11.3, lists the proposed noise barriers, which include all of the noise barriers that were proposed in the approved FEIS as well as additional noise barriers that resulted from this reevaluation. More importantly, as noted above in Section ES.7.1, the traffic noise analysis also indicates that noise levels overall are expected to be improved or reduced from current levels after the construction of the proposed project, including the 15 proposed noise barriers.

ES.11.4 WATERS OF THE U.S., INCLUDING WETLANDS

The conclusion in the FEIS that any potential impacts to jurisdictional wetlands will be mitigated according to USACE direction remains valid. When possible, potential mitigation sites may include the proposed detention facilities. No additional impacts to waters of the U.S., including wetlands were identified as a result of the proposed design refinements.

ES.11.5 CULTURAL RESOURCES

The only identified cultural resource that merits avoidance, minimization, or mitigation is the Oscar Abstein Cemetery. The cemetery is believed to contain two to four graves and cannot be avoided. A plan has been developed to excavate and reinter the graves at another cemetery. The plan was developed in compliance with the State Historic Preservation Officer (SHPO) Historic Cemetery Guidelines and the Texas Health and Safety Code. The plan has been submitted to SHPO and awaits their concurrence. After the SHPO's concurrence is received, the plan will be submitted to the Attorney General's office to seek the approval of the county court of law. Upon receipt of the court's approval, the graves will be excavated in accordance

with the plan and reinterred in the Washington Glenwood Cemetery located west of Sawyer Road and east of Montrose Boulevard.

ES.12 SECTION 4 (F) STATEMENT

The conclusion that two park properties, located in the Spring Valley area, will be impacted by the proposed project remains valid. A Section 4 (f) Statement is appended to the approved FEIS. There are no additional impacts to Section 4(f) properties as a result of implementation of the refinements to the proposed project.

ES.13 CONCLUSION

The environmental documentation for this proposed project has been reviewed, and it has been determined that the proposed design refinements and proposed Toll Facility operation have no effects that would warrant additional analysis. The TxDOT will seek input on this reevaluation from the public in the form of a public meeting, which will be conducted once notice to proceed is received from the FHWA.

Since no effects have resulted from the evaluation of the assessed areas, as a result of the proposed design refinements and proposed Toll Facility operations further, analysis of the FEIS or this reevaluation is not warranted.

1. SYNOPSIS

This document is a reevaluation of the FEIS prepared for IH 10 West from Taylor Street to FM 1489 in Harris, Fort Bend and Waller counties, Texas. The proposed project length is 35.6 miles. This reevaluation considers the use of four ML to be operated as a Toll Facility in the center of IH 10 between SH 6 and IH 610, the addition of elevated Beltway 8 frontage road lanes adjacent to the Beltway 8 mainlanes through the IH 10 interchange, and various minor design refinements. The Houston District Office of TxDOT completed the FEIS in November 2001. The project received a ROD from the FHWA on January 14, 2002 and a reissued ROD on August 30, 2002.

The FHWA Texas Division Office originally approved the ROD for the FEIS and Final Section 4(f) Statement on January 14, 2002. In the January 14, 2002 ROD, the FHWA described the proposed action of the preferred alternative from the FEIS and incorrectly referred to Section 2.2.5 (Category V: Major Emphasis of Transit) of the FEIS. Section 2.2 (Corridor-Wide Conceptual Alternatives) describes the MIS, which was the major corridor planning effort along IH 10 that preceded the FEIS process. Section 2.2.5 describes the recommended design concept and scope from the study that was approved by the H-GAC - Houston MPO for inclusion into the MTP. Section 2.2.5 does not match the proposed action from Section 1.0 (Purpose and Need for the Proposed Action) of the FEIS. In order to avoid confusion with various entities and the public, the FHWA withdrew the January 14, 2002 ROD on August 30, 2002. On the same day, the Division Office issued a new ROD for the FEIS (from Taylor Street to FM 1489).

This reevaluation uses the IH 10 FEIS (*Final Environmental Impact Statement, IH 10 West from Taylor Street to Farm to Market (FM) 1489, Harris, Fort Bend, and Waller Counties, Texas, Volume 1 of 2 and Volume 2 of 2, November 2001*) prepared by TxDOT and approved by FHWA as its basis. All statements, studies, and conclusions made in the FEIS have been examined and analyzed as to their current validity in light of the proposed design refinements.

1.1 BACKGROUND

The FEIS examined the social, economic, and environmental impacts for the proposed IH 10 West improvements within the above-mentioned limits. The recommendation from the MIS, which began in March 1995, identified Alternative V-2 as the Locally Preferred Alternative (LPA) based on the evaluation process of the MIS. Alternative V-2 consists of a major emphasis on transit and moderate increases in SOV capacity. Following the recommendations of the MIS Steering Committee (an interagency committee), Alternative V-2 was presented to the public as the Draft LPA at a series of public open houses and meetings July 8, 9, and 10, 1997.

Alternative V-2 provides two ML/SUL in both directions between SH 6 and IH 610, one concurrent HOV lane, in each direction, between SH 99 (Grand Parkway) and SH 6, and the addition of one through SOV general-purpose lane in each direction between the City of Katy, Texas and IH 610 with auxiliary lanes to provide lane balance at major interchanges (the Grand Parkway, SH 6, Beltway 8, and IH 610). The alternative would bring the existing freeway up to current TxDOT and FHWA design standards and provide continuous frontage roads throughout most of the corridor. The Draft LPA was approved by the MPO on October 10, 1997, and incorporated into the MTP.

The recommended design concept and scope (Alternative V-2) from the IH 10 West MIS included a two-lane, two-way HOV or ML from IH 610 to downtown Houston. Initially, this design concept and scope was carried into the environmental process for the proposed IH 10 West corridor. As the limits for the DEIS covered only Taylor Street, the two-lane, two-way HOV was studied only from IH 610 to Taylor Street (The HOV between Taylor Street to downtown Houston was constructed at that time).

After the DEIS was issued in November 2000, TxDOT initiated a preliminary schematic design of the preferred alternative to ascertain the design and construction issues. The IH 610 to Taylor Street section of IH 10 had recently been reconstructed to five lanes in each direction. From this design effort, TxDOT determined that to place the two-lane, two-way HOV lane would require either numerous design exceptions such as little or no inside shoulders or another extensive reconstruction of that section.

Based on the above information, the FHWA Division Office decided not to approve the design exceptions for that section and agreed to delete the HOV from further consideration in December 2000. In review of the travel demand model with the MPO, it was determined that the HOV between IH 610 and Taylor Street, while desirable as a continuous facility to downtown, did not have an impact on capacity of the freeway or on the operation of the HOV lane.

Once the LPA was selected, it was necessary to examine alternative alignments for the improvements within the corridor. A variety of alignments were studied in order to select an alternative that would implement the preferred modal alternative (LPA) with the least environmental, social, and economic impacts. To that end, three different alignments were developed and analyzed for impacts. The three alignments were the All North Alternative (acquiring all necessary ROW from the north side of IH 10), the All South Alternative (acquiring all necessary ROW from the south side of IH 10), and the Combined Alternative (acquiring all necessary ROW from the north and/or south side of IH 10 in order to minimize impacts). The No-Build Alternative and the Transportation System /Transportation Demand Management (TSM/TDM) Alternative were also evaluated. The evaluation of the three alignments and the No-Build and TSM/TDM alternatives was based on economic, social, and environmental impacts. The impacts were evaluated by criteria that were applicable to that category of impacts.

After considering the impacts of the three alignment alternatives, the more-centrally-located Combined Alternative was selected as the Preferred Alignment Alternative. This alternative would avoid impacts to all gravesites located adjacent to the existing ROW (versus 3,300 gravesite impacts with the All North Alternative and 259 gravesite impacts with the All South Alternative).

In summary, the approved FEIS identified the proposed action for the construction of the IH 10 roadway as consisting of two MLs in both directions between SH6 and IH 610 and one concurrent HOV lane, in each direction, between the Grand Parkway and SH 6. The proposed

action would also include the addition of one through, general-purpose SOV lane in each direction between the City of Katy, Texas and IH 610 and auxiliary lanes to provide lane balance at major interchanges (the Grand Parkway, SH 6, Beltway 8 and IH 610). The proposed roadway would follow the existing IH 10 West alignment encompassing the existing parallel UPRR ROW, which is now mostly-owned by TxDOT, and the Old Katy Road ROW between SH 6 and Campbell Road.

In addition, the proposed action would bring the existing freeway up to current TxDOT and FHWA design standards, thereby increasing safety, and provide continuous frontage roads throughout most of the corridor. It would also provide for pedestrian and bicycle improvements associated with the included roadway improvements. Alternative V-2 would preserve the maximum flexibility for future modification of the ML/SUL in the center of the freeway to meet future needs within the corridor, including conversion to a fixed guideway facility (light rail), automated busway, or other future transit alternative. This alternative would provide for a major increase in the ML/SUL capacity while also providing a modest increase in the SOV capacity between IH 610 and City of Katy, Texas.

1.1.1 Public Involvement

The tables located in Appendix B (Public Involvement), identify the on-going public involvement throughout the MIS and in the later stages of the development of the proposed IH 10 West project. Additional public involvement in the form of a public meeting will be held to solicit comments on this reevaluation.

2. PURPOSE OF THIS REEVALUATION

The purpose of this reevaluation is to update the approved FEIS, which received a ROD on August 30, 2002. This reevaluation identifies and evaluates refinements that have occurred in design, proposed operations, and any environmental consequences of those refinements since the previously approved ROD. This reevaluation also identifies and evaluates certain issues developed in more detail since the ROD relating to noise, air quality, and drainage.

2.1 DESIGN AND OPERATIONAL REFINEMENTS AS A RESULT OF DETAILED DESIGN EFFORT

Design and operation of the proposed project as described in the approved FEIS have been refined in certain areas since the issuance of the ROD. The current design and operational refinements include the following:

1. Operation of a Toll Facility utilizing the four ML/SUL located in the center of IH 10 West between SH 6 and IH 610 and relocation of the access ramp (Tee ramp) for the METRO bus service at METRO Addicks Park & Ride;
2. Addition of eight new detention basins and refinements to eight previously proposed detention basins;
3. Construction of elevated Beltway 8 through-frontage road lanes alongside the Beltway 8 mainlanes through the IH 10 interchange;
4. Changing previously-designed culverted creek crossings to bridge crossings to minimize impacts to wetlands and other waters of the U.S.;
5. Redesign of bridge structures to accommodate potential future light rail within the IH 10 West corridor;
6. Relocation of a water main, located between Eldridge Road and Beltway 8 on the north side of IH 10. The water main acquisition and relocation will be the responsibility of the City of Houston;
7. Realignment of South Creek Drive at the intersection of South Creek and Barker Springs Drive;
8. Acquisition of minor amounts of additional ROW (corner clips) for minor curb cuts for ADA access;
9. Additional high mast lighting areas proposed for safety purposes;
10. Other minor design refinements.

The design and operational refinements were evaluated for social, economic, and environmental impacts. This reevaluation demonstrates the refinements in design and operations do not change the conclusions of the approved FEIS, which received a ROD on August 30, 2002.

2.2 ISSUES DEVELOPED IN MORE DETAIL SINCE THE ROD

Since the time of the issuance of the ROD on August 30, 2002, three primary issues about the proposed IH 10 West project have been developed in more detail: 1) noise impacts, 2) air quality impacts, and 3) drainage impacts. The issues developed in more detail since the ROD was signed were evaluated for social, economic, and environmental impacts. This reevaluation demonstrates that the further development of these issues since the issuance of the ROD does not change, but rather confirms the selection of the preferred alternative and the conclusions of the approved FEIS.

3. CONSTRUCTION SCHEDULE

Construction has not begun on the proposed IH 10 West project. The proposed project will be constructed in phases. A project generally goes to construction approximately two months after the letting date. The current letting (contracting) schedule for each phase of the proposed project is listed below:

- May 2003 From East of Peek Road to East of Fry Road (3.2 miles);
- May 2003 From East of Fry Road to West of SH 6 (3.7 miles);
- July 2003 From Fort Bend County Line to East of Peek Road (2.9 miles);
- July 2003 From East of Silber Road to East of IH 610 (1. 1miles);
- June 2004 East of Kirkwood Drive to East of Beltway 8 and Beltway 8 Direct Connectors (2.0 miles);
- December 2004 West of SH 6 to East of Eldridge Road (2.3 miles);
- December 2004 East of Eldridge Road to East of Kirkwood Drive (1.8 miles);
- February 2005 East of Beltway 8 to East of Campbell Road (2.6 miles);
- February 2005 East of Campbell Road to East of Silber Road (2.5 miles);

- 2006 East of IH 610 to West of Washington Avenue (0.53 miles).

Segments of the proposed IH 10 West project located from West of Washington Avenue to Taylor Street (2.5 miles-construction of continuous frontage roads), FM 359 to the Waller-Fort Bend County Line (CL) (5.8 miles), and the Fort Bend CL to the Fort Bend-Harris CL (2.2 miles) are in various stages of development and are not funded for construction at this time. The segment of roadway between FM 1489 to FM 359 has an estimated construction date beyond the Long Range Plan.

The construction of the proposed IH 10 West project will involve continuous, 24 hours, seven-days a week operations, which will shorten the length of the construction schedule.

4. DESIGN AND OPERATIONAL REFINEMENTS

Project design and operational planning have been on-going processes since the issuance of the ROD. Design and operations of the proposed project as described in the approved FEIS has been refined in certain areas. The current design and operational refinements are listed in Section 2.1 and are described in detail in Exhibit 1. The estimated construction cost of the proposed project currently totals approximately $1.2 billion. The estimated construction cost of the proposed design refinements totals approximately $34.2 million.

4.1 TOLL ROAD ACCESS AND CONTROL FACILITIES

Operation of the Toll Facility utilizing four ML/SUL will require relocation of the METRO access ramp and the establishment of electronic toll areas.

4.1.1 Tee Ramp East of SH 6

A separate report was prepared for the proposed Toll Facility and METRO Addicks Park & Ride access ramp relocation project. This report is dated December 2002 and is contained in Appendix A (Toll Facility Report).

In addition to utilizing the MLs located in the center of IH 10 West, between SH 6 and IH 610, as a Toll Facility, the design of the elevated ramp to METRO Addicks Park & Ride has been

revised from the FEIS to provide access to the Park & Ride facility as well as to Park Row Boulevard. The environmental consequences associated with the ROW acquisition and construction of the Tee ramp at the METRO Addicks Park & Ride are not considered substantial and are addressed in the Toll Facility report, which is contained in Appendix A.

4.1.2 Electronic Toll Areas

Electronic toll areas will be used in the toll collection locations. The toll areas will be fully electronic and will build upon the electronic toll collection system currently operated by Harris County known as EZ-TAG.

4.2 REFINEMENT OF DETENTION BASIN DESIGN

A total of 15 drainage studies were conducted for the proposed project. Detention basins are a form of mitigation that could limit storm water runoff rates from the proposed project into existing outfalls to no more than the existing runoff rates into those outfalls. Utilization of detention basins was undertaken in the approved FEIS; however, design refinements to the proposed detention basins have occurred since the FEIS was written and the ROD was signed. The refinements are described below in Table 1 and are contained in Exhibit 1. Further detail on the drainage studies performed for this proposed project contained in Section 9.

TABLE 1: DETENTION BASINS

Basin Number	Basin Location	In Revised Schematic	In FEIS	*Acres in Revised Schematic	Acres in FEIS	Refinement in Acreage	Within Existing ROW	Outside Existing ROW
0	East of Fry Road-South of IH 10	Yes	Yes	4.3	**Not Noted	None	Yes	
1A	West of Barker-Cypress-South of IH 10	Yes	Yes	11.3	11.3	None		Yes
1B	East of Barker-Cypress-South of IH 10	Yes	Yes	3.1	3.1	None		Yes

Basin Number	Basin Location	In Revised Schematic	In FEIS	*Acres in Revised Schematic	Acres in FEIS	Refinement in Acreage	Within Existing ROW	Outside Existing ROW
1C-NEW	IH 10 at Pin Oak	Yes	No	4.0	N/A	+ 4.0	Yes	
1D	East of Mason Road-South of IH 10	Yes	Yes	3.7	3.3	+ 0.4	Yes	
1E-NEW	West of Park Ten Road-South of IH 10	Yes	No	6.3	N/A	+ 6.3		Yes
1F-NEW	Under Proposed SH 6 Bridge South of IH 10	Yes	No	0.8	N/A	+ 0.8	Yes	
2	West of Langham Creek-North of IH 10	Yes	Yes	7.6	7.3	+ 0.3		Yes
3	At Turkey Creek South of IH 10	Yes	Yes	5.4	3.0	+ 2.4		Yes
3A-NEW	West of Beltway 8-North of IH 10	Yes	No	7.5	N/A	+ 7.5		Yes
4	West of Beltway 8-South of IH 10	Yes	Yes	13.5	12.0	+ 1.5		Yes
5	West of Wirt Road-North of IH 10	Yes	Yes	4.5	8.7	- 4.2		Yes
6-NEW	East of Antoine Drive-South of IH 10	Yes	No	3.0	N/A	+ 3.0		Yes
7-NEW	At the IH 610 Interchange with IH 10-NW Basin	Yes	No	0.6	N/A	+ 0.6	Yes	
8-NEW	At the IH 610 Interchange with IH 10-NE Basin	Yes	No	3.0	N/A	+ 3.0	Yes	
9-NEW	At the IH 610 Interchange with IH 10-SE Basin	Yes	No	0.8	N/A	+ 0.8	Yes	

* Acreage amounts located within the table are approximate in size

** Detention basin location was shown in the FEIS, but its size in acres was not noted.

As indicated in Table 1, there are now 16 detention basins planned in connection with the project, eight of which are newly planned basins not discussed in the FEIS. The increase in the project's total detention basin acreage from the total acreage described in the approved FEIS totals 26.4 acres; however, much of the additional detention basin acreage will be situated within the existing ROW. Of the 26.4 acres, only 16.8 acres will be in additional ROW. The 16.8 acres of additional ROW is necessary to accommodate three of the newly planned detention basins (basins designated: 1E, 3A, and 6). The remaining 9.6 acres of the project's

total detention basin acres will accommodate newly planned basins situated within the existing ROW (basins designated: 0, 1C, 1D, 1F, 7, 8, and 9). There is also an increase of 4.6 additional acres of ROW necessary for three detention basins described in the approved FEIS (basins designated: 1D, 2, 3, and 4), and a reduction of 4.2 acres for a basin also noted in the approved FEIS (basin designated: 5). The eight newly planned detention basins and the changes in sizing of the detention basins described in the approved FEIS are required to detain storm water runoff and mitigate potential increases in runoff rates resulting from the proposed project. The detention basin design will provide flood protection and improve water quality within the proposed project area.

Two displacements are associated with the new detention basin located north of IH 10 and west of Beltway 8 (number 3A). These displacements are two abandoned warehouses within the proposed detention basin area. The TxDOT is responsible for this acquisition/relocation.

4.3 BELTWAY 8 ELEVATED THROUGH FRONTAGE LANES

The configuration of the Beltway 8 interchange frontage roads remains essentially the same as conditionally approved in the January 2000 schematic, with the difference that the northbound and southbound Beltway 8 frontage roads have additional elevated frontage roads proposed through the IH 10/Beltway 8 interchange (See Exhibit 2). These elevated through lane frontage road alignments are approximately the same as the north and south at-grade frontage roads. The profile of the elevated frontage road through lanes is approximately the same as the profile of the Beltway 8 mainlanes. These elevated through lane frontage road will provide additional traffic relief through the interchange.

4.4 CONVERSION OF BRIDGES TO CULVERTS TO AVOID WETLAND IMPACTS

Crossings of Mason Creek tributary and Turkey Creek, located within the proposed project area, will involve a design change from culverts to bridges. The water crossings, including the proposed design revisions, have been reviewed by the USACE. The design revisions are part of the proposed project design efforts to avoid or minimize impacts to waters of the U.S. The design change, from culverts to bridges, will eliminate some construction and permanent

impacts to Mason Creek tributary and Turkey Creek. Impact on waters of the U.S., including wetlands, is discussed in detail in Section 10.4 and Section 10.5.7.

4.5 ACCOMMODATIONS FOR FUTURE LIGHT RAIL

A Memorandum of Understanding (MOU) has been developed among TxDOT, Harris County, and METRO to address certain applicable operational aspects of the proposed Toll Facility. The MOU was signed by the State, Harris County, and METRO in September 2002 and is included in Appendix A. One of the elements of the MOU is that METRO has the right to provide future light rail transit in the highway corridor. The TxDOT is adding provisions into the current highway construction plan to facilitate this potential future operation in the median of the highway and the redesign of bridge structures to accommodate potential future light rail as well as providing cathodic protection for the bridges within the proposed IH 10 West corridor. The implementation of light rail transit may require the State to reimburse the County for certain capital expenditures.

4.6 RELOCATIONS OF UTILITY INFRASTRUCTURE

A major sewer line and separate trunk water main, located between Eldridge Road and Beltway 8 on the north side of IH 10, will be relocated to the streets north of Old Katy Road as part of this proposed project. The property acquisition and relocation is the responsibility of the City of Houston.

4.7 REALIGNMENT OF SOUTH CREEK DRIVE

The realignment of the existing South Creek Drive will be required for the safety of large (18-wheeled) delivery trucks turning east onto Barker Springs Road (See Exhibit 1). The revised design will improve the safety for delivery trucks to turn at this location to deliver goods to the Star Furniture east of South Creek Drive. Widening the intersection, through the realignment of South Creek Drive, will allow for an improved turning movement. The additional ROW necessary to accomplish this design refinement totals 0.34-acre.

4.8 ACCOMMODATIONS FOR AMERICANS WITH DISABILITIES ACT

Approximately one acre of additional ROW is required for the minor curb cuts at various locations necessary to provide for ADA access to meet the requirements of the Texas Department of Licensing and Regulations, ADA. There will be no displacements as a result of this proposed design refinement.

4.9 ACCOMODATIONS FOR HIGH MAST LIGHTING

High mast lighting was discussed in the FEIS; however, the locations were not known at the time of the FEIS. Through detailed design it has been determined that 227 high mast lighting locations will be needed. Of these, 24 high mast lighting locations will require additional ROW. The remaining 203 high mast lighting locations are within the existing and proposed ROW. No displacements will occur as a result of this proposed design refinement.

The additional ROW required for safety purposes for the 24 high mast lighting areas totals 0.34-acre. The small (approximately 25-foot by 25-foot) areas necessary for each of the lights will provide room for construction and future maintenance of the light. The alternative to acquiring additional ROW would have been to locate the high mast lights in the narrow outer areas of the existing and proposed ROW. This option would have created a dangerous situation during routine maintenance, where the large diameter ring of lights would have been lowered over a travel lane.

4.10 OTHER MINOR DESIGN AND OPERATIONAL REFINEMENTS

Other minor design and operational refinements are proposed for this project. These refinements are engineering refinements and will have no effect on the proposed alignment or alternatives or social, economic, or environmental impacts. This category of design and operational refinements will include, but is not limited to, items such as refining the Bingle/Voss intersection design by reducing the existing intersection curvature to provide a more perpendicular intersection to IH 10 and revising ramp designs.

A sliver of proposed ROW will be required at the IH 10/IH 610 interchange. The additional ROW is required for proposed IH 610 direct connectors "J" and "D" at the IH 10/IH 610 interchange (See Exhibit 1). The additional ROW is METRO property located adjacent to the METRO Northwest Transit Center and will be donated by METRO for TxDOT's use in the proposed IH 10 West project. There will be no cost involved in the donation of property and no displacements associated with the additional ROW. The proposed ROW totals approximately 0.18-acre.

4.11 CONSIDERATION OF OTHER PROJECT DOCUMENTATION – SH 6 NORTH AND SOUTH OF IH 10 CATERGORICAL EXCLUSION

A TxDOT project to upgrade SH 6 from south of Memorial Drive to north of Park Row Boulevard in Harris County, Texas has the potential to impact the FEIS. However, a CE was conducted for SH 6 within the subject project limits. While approval of the CE is anticipated, final approval has not been received at this time. Approval of the CE will indicate no impact to the FEIS.

5. STATUS OF ROW ACQUISITION

Since the issuance of the ROD, acquisition of the ROW proposed in the FEIS has progressed and additional ROW acquisition has been proposed to accommodate design refinements after the ROD.

5.1 STATUS OF FEIS ROW ACQUISITION

The ROW acquisition for the IH 10 West project is currently in progress and is the responsibility of TxDOT with the exception of the relocated METRO Addicks Park & Ride access ramp and City of Houston utility relocation.

As of November 2002, TxDOT has acquired 48 of the required 417 parcels necessary for the proposed project implementation. Some of these parcels were acquired prior to the issuance of the ROD, utilizing Right of Way Acquisition Advanced Acquisition procedures, commonly known as "Hardship Acquisitions and Protective Buying". Hardship Acquisitions are those

acquisitions, which occur at the owner's request to alleviate a particular hardship to the owner. This does not include hardship due solely to an inability to sell the property. Protective Buying is early acquisition to prevent imminent parcel development that will materially increase ROW costs, or which might tend to limit the choice of highway alternatives. Parcels acquired under Protective Buying must be needed for the proposed transportation project.

The 48 parcels acquired thus far include 44 residential homes within the Spring Valley area, which is located on the north side of IH 10 from Wirt Road to Blalock Road, two residential homes within the Taylor Street area, which is located approximately one-mile west of downtown Houston, between Studemont Drive and Houston Avenue, the YMCA, which is located north of IH 10 at Voss Road, and one detention basin. The ROW acquisition and relocation program has been and will be carried out in accordance with the Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended.

The proposed roadway will follow the existing IH 10 West alignment encompassing the existing parallel UPRR ROW, which is now mostly-owned by TxDOT, and the Old Katy Road ROW between SH 6 and Campbell Road.

During the TxDOT acquisition of the UPRR ROW, 13 parcels were not owned by UPRR and, therefore, were only acquired by TxDOT as easements (limited ownership). The TxDOT is now acquiring these 13 parcels through ownership rather than easement. All 13 parcels are within the 100-foot UPRR ROW (now mostly-owned by TxDOT) and total 43.22 acres. The changes in ownership of the 43.22 acres of ROW does not affect the FEIS, as the entire UPRR ROW was investigated for social, economic, and environmental impacts during the preparation of the approved FEIS.

5.2 PROPOSED DESIGN REFINEMENTS REQUIRING ADDITIONAL ROW ACQUISITION

A total of approximately 20.52 acres of additional ROW is required as a result of the proposed design refinements. The following is detailed information on the additional ROW to be acquired.

Approximately two acres of additional ROW will be required as part of the Toll Facility design refinements. These two acres of additional ROW will be needed for the relocation of an elevated access ramp to facilitate the METRO bus access to the METRO Addicks Park & Ride and the Toll Facility. The two acres of additional ROW is located in the area of the Addicks METRO Park & Ride. One business, American Landscapers Supply, will need to be relocated as a result of the proposed access ramp. American Landscapers Supply is a wholesale nursery operation. The HCTRA will be responsible for the ROW acquisition/relocation.

Approximately 0.34 acre of additional ROW is necessary for the realignment of South Creek Drive. The realignment of this street is required for the safe turning movements of large delivery trucks onto Barker Springs Road. The realignment consists of a maximum of approximately 35 feet of additional ROW (a corner clip) on the east side of South Creek Drive and a maximum of approximately 62 feet of additional ROW on the west side. There are no displacements associated with this ROW acquisition/relocation; however, there is a sign for the Park 10 business park located within this corner clip.

Approximately 0.34 acre of additional ROW is necessary for high mast lighting required within the proposed project. There are 227 high mast lighting locations. Of these, 24 high mast lighting locations will require additional ROW. Each high mast lighting location is approximately a 25-foot by 25-foot square. The remaining 203 high mast lighting locations are within the existing ROW.

There are 16 detention basins proposed within the proposed project limits. Of these, eight detention basins are not included in the approved FEIS and have been added to the project as a part of the detailed design study. Of the eight detention basins not included in the approved FEIS, four are within the existing IH 10 ROW and one is within the existing SH 6 ROW, which is part of this proposed project. Of the three remaining new detention basins, approximately 16.84 acres of additional ROW is required. Two displacements are associated with this ROW acquisition. These displacements are two abandoned warehouses within the proposed detention basin area located north of IH 10 and west of Beltway 8. The TxDOT will

be responsible for the ROW acquisition/relocation. A more detailed discussion of the 16 detention basins is contained in Section 4.2.

Approximately one acre of additional ROW is required for the curb cuts necessary to provide for ADA access. There will be no displacements associated with this ROW acquisition. The TxDOT will be responsible for the ROW acquisition.

A sliver of proposed ROW will be required at the IH 10/IH 610 interchange. The additional ROW is required for proposed IH 610 direct connectors "J" and "D" at the IH 10/IH 610 interchange. Direct connector "J" travels south from United States (US) 290 to the west onto IH 10. Director connector "D" travels north from IH 610 to the west onto IH 10. The additional ROW is METRO property located adjacent to the METRO Northwest Transit Center and will be donated by METRO for TxDOT's use in the proposed IH 10 project. There will be no cost involved in the donation of property and no displacements are associated with the additional ROW. The proposed ROW and temporary easement totals approximately 0.18 acre.

A water main, located between Eldridge Road and Beltway 8 on the north side of IH 10, will be relocated to the streets north of Old Katy Road as part of this proposed project. The property acquisition and relocation is the responsibility of the City of Houston.

6. ALTERNATIVES ANALYSIS

The design for the proposed IH 10 West corridor that was presented at the IH 10 Public Hearing, and subsequently approved for further development by FHWA, was developed through a two-phase process. The first phase was the MIS, which considered a wide range of modal alternatives, including various combinations of SOV and transit options. The recommendations from the MIS provided a basis for the second phase of the alternatives analysis process. This was the Design Alternatives Analysis developed in conjunction with the DEIS.

A major element of the proposed IH 10 West corridor MIS was the development of a broad range of transportation alternatives, modes of transportation, and various design options that

were applicable to the study goals and objectives. The MIS was designed to evaluate the transportation needs of the corridor and provide an opportunity for TxDOT and other agencies/stakeholders (County, City, METRO, HCTRA, the Villages, etc.) involved to identify the most reasonable, efficient, and effective transportation option(s). The purpose of the MIS was to identify what transportation improvements, or combination thereof, were needed to provide acceptable access and mobility within the proposed IH 10 West corridor. These identifications were made within the context of the resources available and with full knowledge of the consequences of the improvements, both positive and negative.

6.1 INCORPORATION OF THE TOLL FACILITY INTO MANAGED LANES

The recommendations from the MIS for the proposed IH 10 West project included the development of high transit HOV-SUL. The SUL were designated for implementation in the most congested portion of the corridor from SH 6 to the IH 610 Loop. The term SUL was later refined to ML to better describe the operational flexibility envisioned for the facility. This component of the recommended modal alternative always considered the use of tolls as a way to manage the facility. The use of a variable toll schedule to regulate demand is a viable strategy to ensure a high level of operation is maintained on the ML throughout the day.

The TxDOT, FHWA and Harris County are developing an agreement for HCTRA to operate the MLs as a Toll Facility, while allowing transit vehicles throughout the day and HOVs during peak hours to use the facility at no charge. The involvement of HCTRA in the development of the project is consistent with the recommendations of the MIS. A copy of the Toll Facility report is contained in Appendix A.

6.2 CONSIDERATION OF RAIL ALTERNATIVES

Although during the timeframe of the MIS process, a regional rail system was not part of the METRO Better Bus Plan or the METRO 2020 Long-Range Plan, a rail alternative was included in the MIS to evaluate its potential to attract ridership and thereby satisfy the transit demand in the corridor. The guidelines for a MIS will not allow for the assumption of the

development of a regional rail system without a firm commitment by the local transit provider. It was concluded that due to the lack of connectivity and continuity, the rail transit alternative would not attract enough ridership to justify its high capital and operational cost. In recent years, METRO has indicated that they may be able to support a light rail line along the IH 10 West corridor as a part of their comprehensive transportation plan. Therefore, design refinements to accommodate a future potential light rail facility have been included in the design plans for the corridor.

6.3 ASSUMPTIONS USED FOR NO-BUILD

The demographics and land use that was a basis for analysis of all MIS alternatives were based on the Houston-Galveston 2022 MTP. This plan assumed nominal widening of the IH 10 West corridor as well as improvements to the arterial network in the western suburbs. The FEIS analysis of the no-build alternative was used as a basis for comparison of the various build scenarios, with the realization that the no-build alternative would not be able to satisfy the goals and objectives established early in the study process.

Because new development in the urban and near suburban portions of the corridor continues to stabilize, and because substantial new commercial and residential development activity continues to accelerate in the outlying suburbs, the no-build alternative would not satisfy the corridor's need for improved mobility and increased safety.

6.4 CONSIDERATION OF DEVELOPMENT OF IH 10 BELOW GRADE

The schematic development process for IH 10 began in January 1998, after the completion of the MIS for the IH 10 West corridor. The purpose of the schematic development process is to evaluate physical design alternatives for the implementation of the adopted modal alternatives from the MIS. The evaluation of the various design alternatives was based on: 1) to satisfy all components of the MIS recommendations, 2) to meet established design criteria for a freeway corridor, and 3) to minimize natural and social environmental impacts.

One design alternative that was considered in the early stages of the schematic development process was the possibility of situating various components of the freeway facility below

grade. This alternative was considered because it might have been able to reduce overall noise impacts in the corridor; however, the physical constraints related to this alternative required its elimination from further consideration.

The primary constraint that resulted in the elimination of the depressed alternative was the inability to manage the extremely large volume of storm water runoff that crosses IH 10 in the Buffalo Bayou watershed. Between Beltway 8 and the IH 610 Loop, there are ten stream crossings that convey storm water runoff across IH 10. These crossings drain approximately 9,100 acres of land north of IH 10.

Interstate Highway mainlanes are typically designed to remain operational during a 100-year storm event. If the freeway were to be situated below grade, extreme mitigation measures would be needed to reduce the chance of freeway flooding during heavy rainfall events. These measures typically have needed to be in the form of very large detention facilities on the north side of IH 10, which would have required a very large area to construct the detention basins. The land that would be required for this magnitude of detention is not available in this area; therefore this alternative was eliminated from further consideration.

6.5 CLARIFICATION AND CONSISTENCY OF ELEMENTS OF THE PREFERRED ALTERNATIVE

Upon completion of the MIS process and the adoption of the MIS recommendations by the MPO, TxDOT began the Design Alternatives Analysis process to determine the best way to implement the MIS recommendations with a minimum of environmental impacts. The portion of the corridor that will require extensive purchase of additional ROW was the primary focus of the alternatives analysis. It was determined that the Combined Alternative, calling for the purchase of ROW from the north side of IH 10 in some locations and the purchase of ROW from the south side of IH 10 in other locations, will result in the minimum total adverse environmental impacts for the project. In addition, two components of the MIS recommendations were deferred for later development. These are the development of a two-lane HOV between IH 610 and Taylor Street and the mainlane widening of IH 10 between Brookshire and the Brazos River. The deferrals of these elements are discussed below. The

Houston Major Thoroughfare Plan was followed regarding planning for meeting and matching the future expansion of the local highway system.

6.5.1 Deferral of HOV Development from IH 610 to Taylor Street

The recommended design concept and scope (Alternative V-2) from the IH 10 West MIS included a two-lane, two-way HOV lane from IH 610 to downtown Houston. Initially, this design concept and scope was carried into the environmental process for the IH 10 West corridor. However, in the late 1990's, TxDOT and METRO completed a maintenance and rehabilitation project on IH 10 from IH 610 to downtown Houston. This project included the development of an elevated HOV structure between Taylor Street and downtown Houston. Because the elevated HOV lanes correspond with the recommendations of the MIS, TxDOT proposed no further improvements from Taylor Street to downtown in the foreseeable future. For this reason, the eastern limit of the IH 10 DEIS was set at Taylor Street instead of downtown Houston as described in the MIS.

After the DEIS was issued on November 2000, TxDOT initiated a preliminary schematic design of the preferred alternative to evaluate the design and construction issues. The recent reconstruction project described above complied with the MIS recommendation for five mainlanes in each direction between IH 610 and Taylor Street. The TxDOT determined that to develop the recommended two-lane, two-way HOV lane at-grade in this section of IH 10 would have required either numerous design exceptions such as narrow lanes and little or no inside shoulders, or extensive further reconstruction of that section.

The TxDOT consequently determined that extensive reconstruction of this section of IH 10 was not feasible. The TxDOT suggested the existing highway cross section to be restriped to include continuous non-barrier separated HOV (or diamond) lanes. The TxDOT submitted design exception requests to the FHWA for reduced lane width and minimal inside shoulder widths. The FHWA determined that the exceptions could produce undesirable operational conditions and the FHWA Division Office declined to approve the design exceptions for this section.

The Houston District Office of TxDOT requested that the H-GAC (the regional MPO) review the travel demand model to evaluate the need for a HOV in this segment of IH 10. It was determined that a deferral of the development of a HOV between IH 610 and Taylor Street will not have a detrimental impact on the operation of the freeway or the other portions of the HOV/ML system. The development of the HOV segment from east of IH 610 to Taylor Street has been deferred to a later date, as needed to satisfy traffic demand. When the HOV is considered for development in the future, a separate environmental investigation will be conducted to evaluate design alternatives and their associated environmental impacts.

The TxDOT is continuing development of continuous frontage roads from IH 610 to Taylor Street. The project is currently undergoing design.

6.5.2 Deferral of Freeway Widening from Brookshire to Brazos River

The MIS recommendations called for the development of six mainlanes from Brookshire to the Brazos River; however, the Brazos River is not a logical terminus for the transition from six to four mainlanes. Coordination with the Yoakum District Office of TxDOT to determine a logical terminus of the six mainlane section and further environmental documentation will be required to develop this portion of the MIS recommendations. The development of the six-mainlane segment from the Brazos River to FM 1489 has been deferred to a later date, as needed to satisfy traffic demand.

7. TRAFFIC NOISE ANALYSIS

A noise analysis was performed as part of the FEIS. Noise impact contours for the Noise Abatement Criteria (NAC) for Categories B and C (66 and 71 dBA, respectively) were modeled. Noise impacts to all receivers were estimated using the resulting noise contours. A total of 1,386 receivers (941 residences and 445 commercial businesses) were identified as being within the noise contours for the combined alternative, and therefore potentially impacted. Although not all of the 1,386 receivers were actually modeled, they were accounted for in the FEIS noise analysis and summarized in a table in the FEIS.

A total of 121 noise receivers were modeled in the FEIS. Of these, 117 were found to have

noise impacts. Noise barriers were modeled as part of the FEIS to mitigate the proposed noise impacts of the 117 receivers. Of the proposed barriers modeled between SH 6 and IH 610, nine were identified as feasible and reasonable. During the development of the FEIS, the FHWA required a more detailed noise analysis be performed.

The traffic noise analysis was also reevaluated to account for refinements in the traffic and the design as a result of the proposed Toll Facility as well as the proposed elevation of the additional Beltway 8 frontage road through lanes. For a more detailed noise barrier analysis, numerous receivers were modeled in addition to the 121 originally modeled. Public input from noise abatement workshops during the modeling process resulted in even more receivers being modeled. A total of 347 additional receiver locations (for a total of 468) were modeled to represent the land use activity areas adjacent to, and near, the proposed project that might be impacted by traffic noise and that may potentially benefit from feasible and reasonable noise abatement. Additionally, the detailed noise analysis modeled structural and safety barriers located alongside the project lanes. Although the safety and structural barriers are not put in place specifically to reduce noise levels, they do have an effect on the noise levels found at adjacent receivers.

In August of 2002, TxDOT conducted two noise workshops presenting the preliminary results of the detailed noise analysis. The meetings were conducted in an open house format with wall-mounted schematics showing the proposed action, as well as noise receivers, and noise barriers proposed at the time of the workshop. Comments were solicited from attendees regarding design of proposed barriers and if the barriers as proposed were desired. All comments were taken into consideration in the design of the proposed noise barriers and whether or not noise barriers were desired where proposed. The comments are on file at the Houston District Office of TxDOT.

The following discussion pertains to the detailed noise analysis, which conforms to FHWA Regulation 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise," and TxDOT's 1996 "Guidelines for Analysis and Abatement of Highway Traffic Noise".

The analysis was performed in accordance with analyses performed for similar projects throughout the Houston District.

As described in the approved FEIS, which received a ROD from the FHWA, sound from highway traffic is generated primarily from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dBA." Table 2 illustrates some common sound/noise levels in dBA.

TABLE 2: COMMON SOUND/NOISE LEVELS

Outdoor	DBA	Indoor
Pneumatic hammer	100	Subway Train
Gas lawn mower at 3 feet		
	90	Food blender at 3 feet
Downtown (large city)	80	Garbage disposal at 3 feet
Lawn mower at 100 feet	70	Vacuum cleaner at 10 feet
		Normal speech at 3 feet
Air conditioning unit	60	Clothes dryer at 3 feet
Babbling brook		Large business office
Quiet urban (daytime)	50	Dishwasher (next room)

Quiet urban (nighttime)	40	Library

Also, because traffic noise levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "L_{eq}".

The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise;
- Determination of existing noise levels;
- Prediction of future noise levels;
- Identification of possible noise impacts;
- Consideration and evaluation of measures to reduce noise impacts.

The FHWA has established the NAC for various land use activity areas that are used as one of two means to determine when a traffic noise impact will occur. The NAC are reflected on Table 3.

TABLE 3: FHWA NOISE ABATEMENT CRITERIA

Activity Category	DBA L_{eq}	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 (exterior)	Developed lands, properties or activities not included in categories A or B above.
D	--	Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

NOTE: Primary consideration is given to exterior areas (Category A, B or C) where frequent human activity occurs. However, interior areas (Category E) are used if exterior areas are physically shielded from the roadway, or if there is little or no human activity in exterior areas adjacent to the roadway.

A noise impact occurs when either the absolute or relative criterion is met:

- Absolute criterion: the predicted noise level at a receiver approaches, equals or exceeds the NAC. "Approach" is defined as one dBA below the NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dBA or above.

- Relative criterion: the predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal or exceed the NAC. "Substantially exceeds" is defined as more than 10 dBA. For example: a noise impact will occur at a Category B residence if the existing level is 54 dBA and the predicted level is 65 dBA (11 dBA increase).

Increases in noise levels of 0 to 2 dBA are generally not perceptible to the typical human ear. Increases in noise levels of 3 dBA are generally barely perceptible to the typical human ear.

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels for the proposed IH 10 West project. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Existing and predicted traffic noise levels were modeled at 404 Category B, 43 Category C, and 21 Category E receiver locations for a total of 468 receivers (See Appendix C). The

receivers represent the land use activity areas adjacent to and near the proposed project that might be impacted by traffic noise and that may potentially benefit from feasible and reasonable noise abatement measures. In some areas, representative land use activity areas were modeled instead of modeling every land use activity area present. Two criteria were used in choosing representative land use activity areas to model. Representative land use activity areas were chosen either for their proximity to the ROW or from land use activity areas equally distant from the ROW. All residential land use activity areas located adjacent to or near the ROW were modeled. Second and third row residences were modeled on a case-by-case basis in association with potentially feasible and reasonable noise abatement measures.

The specific location of the receiver within a land use activity area depended upon the type of receiver. Category B and C receivers, areas of frequent outdoor use (field verified as necessary) were modeled. Category E receivers were modeled at interior locations closest to the ROW. Receivers modeled for the noise analysis were divided into groups according to their location along the proposed project as follows: AR: from Taylor Street to IH 610; BR: from IH 610 to Beltway 8; CR: from Beltway 8 to SH 6; DR: from SH 6 to Grand Parkway (SH 99); and, ER: from SH 99 to FM 1489 (See Appendix C for detailed results of the noise modeling).

7.1 NOISE ABATEMENT ANALYSIS

The noise abatement analysis indicates that the proposed project will result in a traffic noise impact at 435 of the 468 receiver locations. However, the analysis also indicates that noise levels at 325 receiver locations will decrease from existing noise levels, will not change from existing noise levels, or represents an increase that is not perceptible or barely perceptible.

Before any abatement measure can be incorporated into the project, it must be both feasible and reasonable. In order to be feasible, the measure should reduce noise levels by at least five dBA at receivers; and to be reasonable it should not exceed $25,000 for each benefited receiver.

The noise abatement measures discussed in detail below were considered individually: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped

property to act as a buffer zone and the construction of noise barriers.

- Traffic management: Control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dBA per five mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

- Alteration of horizontal and/or vertical alignments: Any further alteration of the existing alignment, beyond that currently proposed, would displace more existing businesses and residences, require more additional right of way and not be cost effective/reasonable.

- Buffer zone: The acquisition of sufficient undeveloped land adjacent to the highway project to preclude future development that could be impacted by highway traffic noise would not be cost effective/reasonable.

- Noise barriers: This is the most commonly used noise abatement measure. Ultimately, the construction of noise barriers was determined to be the only feasible and reasonable noise abatement measure for this project.

A total of 23 noise barriers were modeled along the IH 10 West corridor. Noise barriers modeled in numerous areas would severely restrict access to a majority of activity areas adjacent to IH 10 West. Numerous gaps in these noise barrier locations would rectify the access requirements but would render the noise barrier ineffective (unfeasible). Additionally, these noise barriers could have a detrimental impact on nearby businesses by restricting views and access by potential customers. Also, some of these noise barrier locations would not be cost effective for an individual receiver. Finally, in some locations, the noise barrier was determined unfeasible because of the distance between the barrier and the receivers, or the noise barrier and the roadway, or the relative elevations of the roadways, barriers, and receivers studied.

Multiple barrier designs were modeled in association with areas in which the initial barrier design modeled was not feasible and reasonable. However, for the following receivers, no configuration modeled was feasible and reasonable: Receivers AR 1 – AR 151, BR 1 – BR 1D, BR 3, BR 4, BR 19, BR 20, BR 37, BR41, BR 55 – BR 60, BR 93, BR 95, BR 96, BR 106 – BR 108, CR 1 – CR 5, CR 20, CR 21, CR 23 – CR 37, DR 2 – DR 14, and ER 1 – ER 12.

A noise barrier was determined to be feasible for Receiver DR 1. However, the analysis indicated that this noise barrier was not reasonable, exceeding the limit of $25,000 for each benefited receiver.

Noise barriers were determined to be feasible and reasonable for BR 2 – BR 2I, BR 5 – BR 18, BR 20B - BR 36, BR 38 – BR 40C, BR 42 – BR 54D, BR 60B – BR 92G, BR 93B – BR 94L, BR 97 - BR 105, CR 6 – CR 19G, CR 20B – CR 20G, and CR 22, and are proposed for incorporation into the proposed project All of the noise barriers identified in the FEIS are included in these results. The proposed noise barriers are listed in Table 7 (contained in Section 11.3), and shown on Exhibit 1. Table 7 includes all of the noise barriers that were proposed in the approved FEIS as well as additional noise barriers that resulted from this reevaluation. At several locations, the presence of a noise barrier will reduce noise levels at the associated receivers below the level presently found.

On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.

A copy of this traffic noise analysis will be on file at the Houston District Office of TxDOT and be available to local officials for their review to ensure, to the maximum extent possible, future developments for which they are responsible are planned, designed and programmed in a manner that will avoid traffic noise impacts.

8. AIR QUALITY ANALYSIS

The original air quality analysis was reevaluated to account for changes in traffic and design as a result of the proposed Toll Facility as well as the proposed elevation of the additional Beltway 8 frontage road through lanes and issues relating to air quality developed in more detail since the issuance of the ROD.

8.1 IH 10 PROJECT IS IN CONFORMING TIP AND SIP

The State of Texas, in coordination with the Houston-Galveston area, has developed and submitted a SIP to the EPA demonstrating this area will attain the ozone standard by the year 2007. The SIP sets budgets and actions for sources of emissions such as transportation (on and off road), industry (refiners, industrial plants, etc.), and area wide sources (bakeries, dry cleaners, gas stations). The emissions from transportation, both existing and future, are required to be equal to or less than the budgets set in the SIP. As determined by the U.S. DOT, the current Houston-Galveston 2022 MTP and 2002-2004 TIP conforms to the transportation budget and actions (transportation control measures) within the SIP. The proposed project is, as required by the EPA conformity regulations, part of the conforming 2022 MTP and 2002-2004 TIP.

8.1.1 The Region is in Non-attainment for Ozone Only

Six pollutants are of concern with regards to air quality in urban areas including: ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, particulates (PM_{10}), and lead. The Houston-Galveston area (Harris County and the surrounding seven counties) is in non-attainment only for ozone. Ozone is created when VOC and NO_x react with sunlight to create ground level ozone. Automobiles and industrial activities are sources of VOC and NO_x. Because pollutant emissions from these sources quickly mix into the regional air shed and rarely concentrate locally, ozone is a regional problem rather than a local or corridor problem, such as in the IH 10 West corridor.

8.1.2 EPA Has Not Established Benchmarks for Analyzing the Possible Health Effects of Fine Particulate Matter

The EPA Transportation Conformity Rule requires that transportation plans, programs and projects conform to the purpose of the SIP in air quality non-attainment and maintenance areas.

To date, the EPA has not designated non-attainment areas for fine particulate matter or $PM_{2.5}$. Section 305 of the National Highway System Designation Act of 1995 specifically amended the Clean Air Act limiting the applicability of the transportation conformity provisions to non-attainment and maintenance areas. Thus, conformity requirements do not apply in areas that have not been designated as non-attainment areas for specific pollutants. Moreover, because the EPA has not determined whether $PM_{2.5}$ non-attainment areas will be addressed at the regional scale (as ozone is currently) or by other methods, possible $PM_{2.5}$ standards cannot currently be anticipated at the project level. For these reasons, $PM_{2.5}$ analysis does not provide a meaningful benchmark for evaluating the environmental impacts of this project.

8.2 RESULTS OF CARBON MONOXIDE AIR QUALITY ANALYSIS PERFORMED IN COMPLIANCE WITH APPLICABLE EPA REGULATIONS

An air quality analysis was performed for the proposed IH 10 West corridor and the results were included in the approved FEIS. The air quality analysis resulted in no air quality impacts as a result of implementation of the proposed project

In this reevaluation, TxDOT conducted an air quality analysis for the proposed design refinements, including the Toll Facility. Those design refinements, along with issues developed in more detail since the ROD with regard to air quality along the proposed project, prompted additional air quality analysis that evaluated the CO concentrations for the ETC of the proposed IH 10 West project and the ETC+20. For the purposes of this reevaluation, ETC has been determined to be the year 2009 and ETC+20 is the year 2029. The traffic changes resulting from the proposed Toll Facility have been included in this air quality analysis.

Additionally, air quality modeling was performed for three different locations along the project corridor. The locations are: 1) the IH 10/Beltway 8 interchange, 2) IH 10 in the area of two schools located in the vicinity of Echo Lane, and 3) IH 10/IH 610 interchange, including the Awty School. The two schools in the vicinity of Echo Lane are Spring Branch Middle School and Memorial High School; both are considered sensitive receptors in addition to the Awty School. Echo Lane is designated as Blalock Road north of IH 10. The two major interchanges

were modeled due to their high levels of traffic and since they are considered worse case scenarios for the length of the IH 10 West corridor. With the exception of the three schools, all receptors were placed on the proposed ROW line in order to model the worse case scenario. The modeling evaluated traffic volumes for the ETC and ETC+20 with environmental conditions that yield the worse possible conditions including 12 different wind angles at each receptor with the highest CO concentrations noted and recorded for each receptor.

Air quality receptors are contained in Exhibit 1. The acronym AML contained in Exhibit 1 refers to Air Modeling Location. Included in Tables 4 and 5 below are all air quality-modeling results for the locations mentioned above for the proposed IH 10 West project for traffic volumes for the years 2009 and 2029. Based on the results shown in the tables below, there are no impacts to air quality as a result of the proposed project.

TABLE 4: CARBON MONOXIDE CONCENTRATIONS ETC (2009)

LOCATION	1 HOUR CO (PPM) STANDARD 35 PPM	1 HOUR PERCENT NAAQS	8 HOUR CO (PPM) STANDARD 9 PPM	8 HOUR PERCENT NAAQS
IH 610-AML 1	10.8	30.9%	6.6	73.3%
IH 610-AML 2	12.3	35.1%	7.5	83.3%
IH 610-AML 3	7.3	20.9%	4.9	54.4%
IH 610-AML 4	9.0	25.7%	5.5	61.1%
IH 610-AML 5	10.6	30.3%	6.5	72.2%
IH 610-AML 6	7.7	22.0%	4.6	51.1%
IH 610-AML 7	9.2	26.3%	5.3	68.9%
IH 610-AML 8	9.7	27.7%	5.2	57.8%
IH 610-AML 9	7.8	22.3%	4.9	54.4%
IH 610-AML 10	8.3	23.7%	4.9	54.4%
IH 610-AML 11	8.4	24.0%	5.3	58.9%
IH 610-AML 12	12.1	34.6%	7.2	80.0%
IH 610-AML 13	9.4	26.9%	5.6	62.2%
IH 610-AML 14	8.5	24.3%	5.5	61.1%
IH 610-AML 15	7.9	22.6%	4.3	47.8%
IH 610-AML 16	11.8	33.7%	7.1	78.9%
Awty School-AML 17	7.2	20.6%	4.1	45.6%
Spring Branch Middle	6.9	19.7%	5.9	65.6%

LOCATION	1 HOUR CO (PPM) STANDARD 35 PPM	1 HOUR PERCENT NAAQS	8 HOUR CO (PPM) STANDARD 9 PPM	8 HOUR PERCENT NAAQS
School/AML 18				
Memorial High School AML 19	5.8	16.6%	5.1	56.7%
Beltway 8-AML 20	6.7	19.1%	4.4	48.9%
Beltway 8-AML 21	7.0	20.0%	4.3	47.8%
Beltway 8-AML 22	6.8	19.4%	4.1	45.6%
Beltway 8-AML 23	5.5	15.7%	3.4	37.8%
Beltway 8-AML 24	6.4	18.3%	3.8	42.2%
Beltway 8-AML 25	7.0	20.0%	4.6	51.1%
Beltway 8-AML 26	7.3	20.9%	4.5	50.0%
Beltway 8-AML 27	8.1	23.1%	5.0	55.6%
Beltway 8-AML 28	8.5	24.3%	5.2	57.8%
Beltway 8-AML 29	7.5	21.4%	4.6	51.1%
Beltway 8-AML 30	7.6	21.7%	4.7	52.2%
Beltway 8-AML 31	6.2	17.7%	3.6	40.0%
Beltway 8-AML 32	6.2	17.7%	3.7	41.1%
Beltway 8-AML 33	7.0	20.0%	4.4	48.9%
Beltway 8-AML 34	7.2	20.6%	4.6	51.1%
Beltway 8-AML 35	8.6	24.6%	5.4	60.0%

Analysis includes a 1-hour background concentration of 4.5 ppm and an 8-hour background concentration of 2.8 ppm. The CO concentrations and percentages of the NAAQS for each quadrant at IH 610 and Beltway 8 are the highest concentration of four receivers located in each quadrant.

TABLE 5: CARBON MONOXIDE CONCENTRATIONS
ETC +20 Years (2029)

LOCATION	1 HOUR CO (PPM) STANDARD 35 PPM	1 HOUR PERCENT NAAQS	8 HOUR CO (PPM) STANDARD 9 PPM	8 HOUR PERCENT NAAQS
IH 610-AML 1	12.3	35.1%	7.8	86.7%
IH 610-AML 2	14.1	40.3%	8.6	95.6%
IH 610-AML 3	8.5	24.3%	5.3	58.9%
IH 610-AML 4	10.2	29.1%	6.4	71.1%
IH 610-AML 5	11.8	33.7%	7.3	81.1%
IH 610-AML 6	8.4	24.0%	5.1	56.7%
IH 610-AML 7	10.3	29.4%	5.9	65.6%
IH 610-AML 8	10.9	31.1%	5.7	63.3%
IH 610-AML 9	8.7	24.9%	5.3	58.9%
IH 610-AML 10	9.7	27.7%	5.9	65.6%
IH 610-AML 11	10.2	29.1%	5.5	61.1%
IH 610-AML 12	14.2	40.6%	8.4	93.3%
IH 610-AML 13	10.5	30.0%	6.5	72.2%
IH 610-AML 14	9.5	27.1%	6.0	66.7%

LOCATION	1 HOUR CO (PPM) STANDARD 35 PPM	1 HOUR PERCENT NAAQS	8 HOUR CO (PPM) STANDARD 9 PPM	8 HOUR PERCENT NAAQS
IH 610-AML 15	8.3	23.7%	4.9	54.4%
IH 610-AML 16	13.8	39.4%	8.4	93.3%
Awty School-AML 17	7.7	22.0%	4.2	46.7%
Spring Branch Middle School/AML 18	7.6	21.7%	4.6	51.1%
Memorial High School AML 19	6.0	17.1%	3.5	38.9%
Beltway 8-AML 20	7.4	21.1%	4.5	50.0%
Beltway 8-AML 21	8.0	22.9%	4.7	52.2%
Beltway 8-AML 22	7.5	21.4%	4.5	50.0%
Beltway 8-AML 23	5.7	16.3%	3.5	38.9%
Beltway 8-AML 24	7.0	20.0%	4.2	46.7%
Beltway 8-AML 25	7.8	22.3%	4.9	54.4%
Beltway 8-AML 26	8.2	23.4%	5.2	57.8%
Beltway 8-AML 27	8.9	25.4%	5.7	63.3%
Beltway 8-AML 28	9.2	26.3%	5.8	64.4%
Beltway 8-AML 29	8.2	23.4%	5.2	57.8%
Beltway 8-AML 30	8.2	23.4%	5.3	58.9%
Beltway 8-AML 31	6.7	19.1%	4.0	44.4%
Beltway 8-AML 32	6.6	18.9%	3.9	43.3%
Beltway 8-AML 33	7.8	22.3%	5.0	55.6%
Beltway 8-AML 34	7.9	22.6%	5.0	55.6%
Beltway 8-AML 35	10.0	28.6%	6.1	67.8%

Analysis includes a 1-hour background concentration of 4.5 ppm and an 8-hour background concentration of 2.8 ppm. The CO concentrations and percentages of the NAAQS for each quadrant at IH 610 and Beltway 8 are the highest concentration of four receivers located in each quadrant.

9. DRAINAGE AND WATER QUALITY

Since the issuance of the ROD, issues relating to drainage and water quality have been developed in more detail, including: 1) runoff impacts, 2) floodplains impacts, 3) detention basins, 4) 100-year sheet flow impacts, and 5) coordination with local drainage master plans.

9.1 RUNOFF IMPACTS

The conclusion in the approved FEIS that the public water supply quality and quantity impacts from additional impermeable surface runoff are considered not substantial remains valid. This conclusion pertains to the entire project design, including all design refinements mentioned in

this reevaluation. Proper design and construction procedures are identified in the approved FEIS (i.e., ensuring construction equipment refueling, maintenance, and wash down areas contain catch basins for runoff, and eliminating non-point source pollutant loads associated with such activities), remain valid, and also apply to the proposed design refinements.

The changes to the existing eight detention basins identified in the FEIS and the addition of eight proposed detention basins as a result of design refinements, are required to detain storm water runoff and mitigate potential increases in runoff rates resulting from the proposed project. The additions and refinements will also aid in reducing flooding and improving water quality within the proposed project area.

On September 14, 1998, the EPA authorized the Texas Commission on Environmental Quality (TCEQ-formerly the Texas Natural Resource Conservation Commission-TNRCC) to implement its Texas Pollutant Discharge Elimination System (TPDES) program. The TPDES is the state program to carry out the National Pollutant Discharge Elimination System (NPDES), a federal regulatory program to control discharges of pollutants to surface waters of the United States (40 Code of Federal Regulations (CFR) 122.26). On December 8, 1999, the EPA released Phase II regulations of the NPDES stormwater program in the Federal Register (EPA, 2000). The Phase II regulations expanded the existing requirements under the General Permit of Construction Activities to include permitting for construction sites that disturb one to five acres. The current NPDES program, Phase I, regulates construction sites that disturb five or more acres. Construction activities that require a NPDES permit will also require preparation of a Notice of Intent (NOI) and the preparation and implementation of a Storm Water Pollution Prevention Plan (SW3P). The EPA Region 6, which has jurisdiction over the proposed project area, will continue to issue and administer Storm Water General Permits until the expiration of the Construction General Permit in July 2003 (EPA, 2000). The proposed project, including design refinements, will disturb more than five acres; therefore an NOI and SW3P will be prepared and the SW3P implemented.

In addition, pursuant to the federal requirements, all projects initiated after October 1, 2001, for new development (on parcels over five acres or larger) and significant redevelopment (on parcels five acres or larger that refinement of the impervious surface is of one or more acres) in

the City of Houston and the unincorporated areas of Harris County are subject to local stormwater quality permitting requirements. This permitting program is required for the Municipal Separate Storm Sewer System (MS4) permit that the City of Houston, Harris County, HCFCD, and TxDOT are implementing as mandated by EPA regulations. The Storm Water Quality (SWQ) permit requires the development and submission of a Storm Water Quality Management Plan (SWQMP) in accordance with guidance provided by the City of Houston, Harris County, and HCFCD. The SWQMP must describe the site drainage characteristics and the Best Management Practices (BMPs) that will be put in place to limit increases in the discharge of pollutants in stormwater from redevelopment. The MS4 permit requirements also include temporary construction stormwater quality controls.

As stated in the approved FEIS, in order to comply with the TCEQ 401 Water Quality Certification Conditions for the Nationwide Permits (NWP), at least one BMP from each the following three categories of onsite water quality management must be used on the proposed project. The three categories include erosion control, post-construction total suspended solids (TSS) control, and sedimentation control. Examples of BMPs for each of the three categories includes temporary vegetation, blankets and matting, mulch, sod, sand bag berms, silt fencing, rock berms, sediment basins, retention/irrigation systems, extended detention basins, wet basins, and vegetation filter strips. Specific BMPs from each category will be determined during the detailed phase and implemented within the proposed project.

9.2 FLOODWAY AND FLOODPLAINS IMPACTS

There will be no changes in impacts to water quality as a result of the operation of the four MLs as a Toll Facility. The METRO Addicks Park & Ride is not located in a 100-year or 500-year floodplain and no surface water features are present within the ROW acquisition area. Water quality conditions along the Toll Facility are similar to those described by the FEIS. The NPDES permit requirements and BMPs for erosion and sedimentation control during construction are contained in the Toll Facility report contained in Appendix A.

As discussed in the approved FEIS, some segments of existing IH 10 are located within the designated 100-year or 500-year floodplain. According to the Federal Emergency Management Agency's (FEMA) most current Flood Insurance Rate Maps, approximately

21,130 feet of the proposed project is located within the 100-year floodplain and approximately 3,380 additional feet is located within the 500-year floodplain.

Of the eight additional detention basins, all eight are located in Zone X, which is located outside of the 500-year floodplain. The South Creek/Barker Springs intersection is also located outside of the 500-year floodplain. There will be no change in floodplain impacts from the addition of the elevated Beltway 8 through frontage road lanes or the refinement from culverts to bridges at Mason Creek tributary or Turkey Creek. The high mast lighting areas, approximately 0.34-acre, and the ADA access, approximately one acre, will be constructed at various locations throughout the proposed project. These areas may be located within the 100-year or 500-year floodplain but are not considered substantial due to the minor amount of additional ROW required at the various locations.

As stated in the approved FEIS, the proposed project will not increase the base flood elevation to a level, which will violate applicable floodplain regulations and ordinances. The hydraulic design for this project will be in accordance with current TxDOT and FHWA policies and standards. The proposed highway facility will permit the conveyance of the 100-year flood, inundation of the highway being acceptable, without causing major damage to the highway or other property. Harris, Fort Bend and Waller counties as well as the cities of Houston, Hilshire Village, Spring Valley, Hunters Creek Village, Hedwig Village, Katy, and Brookshire are all participants in the National Flood Insurance Program.

9.3 ADDITIONAL DETENTION BASINS RESULTING FROM DETAILED DESIGN PROCESS

The refinement of the proposed project design has allowed for a more detailed discussion of drainage issues within the project corridor. As stated previously, a total of 15 drainage studies were conducted for the proposed project. Of these studies, four original studies were completed during early project development. Subsequently, 11 additional studies were conducted to evaluate areas of the corridor not covered in original studies and to provide alternative mitigation to accommodate project constraints identified as design and ROW acquisition progressed.

As of November 2001, all four original studies and five of the additional studies were either complete or had progressed to submission of a preliminary report. Recommendations from these nine studies and other preliminary drainage evaluations resulted in the eight detention basin locations cited in the FEIS.

Since completion of the FEIS, the other six additional drainage studies were conducted. Recommendations from these studies and additional reviews of earlier studies resulted in the proposal of eight additional detention basin locations, for a total of 16 detention basins within the proposed IH 10 West project. The eight additional basins were proposed as development progressed on the proposed IH 10 West project. Through the final design process, alternative mitigation plans were developed to accommodate project constraints more clearly identified during the initial development phase and ROW acquisition.

The following sections describe the drainage studies in more detail. All of the recommendations from these additional studies will be incorporated into the final design.

9.3.1 Original Drainage Studies

During development of the roadway schematic for the proposed IH 10 West project, TxDOT conducted several drainage studies related to IH 10 and the connecting segments of SH 6 and IH 610 within project limits. The following are brief discussions of scope, limits, and outcomes of these studies.

Katy-Fort Bend Road to West of Fry Road

A drainage study titled "*Comprehensive Drainage Study for Proposed IH 10 Roadway Improvements, from West of Fry Rd. to Katy-Fort Bend Road"* was prepared for this section of roadway. The report, dated September 1998, included a drainage impact analysis and preliminary drainage design for IH 10 within stated limits. The study was limited to the portion of IH 10 draining to Mason Creek and its tributaries. The following recommendations are included in the study:

- Detention basin alternatives at Mason Road and bridge waterway controls at Mason Creek to mitigate potential increases in storm water runoff rates into Mason Creek;
- Preliminary storm drain trunk line sizes and outfall locations.

The study scope did not include final mitigation analysis of a detention alternative selected by TxDOT.

Fry Road to IH 610

A drainage study titled "*IH 10 From West Loop 610 to Fry Road Drainage Report*" was prepared for this section of roadway. The report, dated May 1999, documented study results of potential drainage impacts and preliminary drainage system sizes for IH 10 from Fry Road to IH 610. The study included analyses of detention basin options and other drainage mitigation features approved by TxDOT. The study recommended detention basin locations and configurations necessary to mitigate potential increases in storm water runoff from the proposed project. The study also provided preliminary storm drain trunk line sizes and cross drainage culvert sizes.

The original drainage mitigation recommendations by outfall were as follows:

- Barker Ditch (W170-00-00) - a detention basin located west of Cypress Run Boulevard between Fry Road and Barker Cypress Road at the upper end of the Barker Ditch system;
- Langham Creek (U100-00-00) - a detention basin located adjacent to the east bank of Langham Creek and south of IH 10;
- Turkey Creek (W167-00-00) - a detention basin located adjacent to the west bank of Turkey Creek and south of IH 10;
- Rummel Creek (W156-00-00) - a detention basin located adjacent to the east bank of Rummel Creek and south of IH 10;
- W151-00-00 (Witte Road System) - available detention volume within a regional detention basin owned by others, several blocks north of IH 10 on the W151-00-00 system;

- Hunters Branch, Briar Branch - a diversion storm sewer along the north side of the IH 10 ROW from Campbell Road to Briar Branch, and then from Briar Branch to Spring Branch;
- Spring Branch (W140-00-00) - a detention basin located about 2,500 feet upstream of IH 10 along the west bank of Spring Branch;
- W138-00-00 (Tributary of Buffalo Bayou) - oversized storm drain trunk lines to provide storm water detention within the proposed IH 10 drainage system and restricted outfall pipes into W138-00-00;
- W137-00-00 (Tributary of Buffalo Bayou) - oversized storm drain trunk lines to provide storm water detention within the proposed IH 10 drainage system and restricted outfall pipes into W137-00-00.

East of IH 610 to Patterson Street

Drainage studies were also prepared for IH 10 between IH 610 and White Oak Bayou to determine solutions to frequent flooding problems within this existing segment of IH 10, which includes the east end of the proposed IH 10 West project. As such, these studies were not drainage impact and mitigation studies directly associated with the freeway expansion project, except that some of the recommendations will be constructed with the proposed IH 10 West project. The results were documented in two reports; 1) "*Drainage Design Study for IH 10 Cross Drainage Siphon (0.7 mi. East of IH 610)*", dated January 2001, and 2) "*Drainage Design Study for IH 10 Depressed Mainlanes from U.P.R.R. to Patterson Street*", dated October 2001. The following recommendations are included in the study:

- Pump station size and configuration at the south end of the existing 7-foot by 7-foot box culvert siphon crossing west of the UPRR underpass;
- Other drainage system recommendations to restore cross drainage at the siphon location into an existing ditch outfall south of IH 10 in Memorial Park;
- Pump station size and configuration at the drainage system outfall east of Patterson Street at the outfall channel to White Oak Bayou;
- Other drainage system and roadway construction recommendations to alleviate severe flooding problems within the depressed freeway mainlanes between Washington Avenue and Patterson Street.

SH 6 Outfalls at IH 10

A drainage impact and mitigation study for SH 6 outside the IH 10 ROW was prepared. The report is titled "*SH 6 at IH 10 - Drainage Report Impact and Mitigation Analysis*" and is dated March 2001. The TxDOT approved this report and submitted it to the General Engineering Consultant (GEC) for implementation of the recommendations. The following recommendations are included in the study:

- The proposed mitigation north of IH 10 consists of oversized storm drains and restrictors;
- South of IH 10, a detention basin is proposed under the south end of the SH 6 mainlane bridge, along with restrictors on the storm drain system outfall;
- Enlarged roadside ditches are proposed for the south end of the SH 6 limits.

9.3.2 Additional Drainage Studies

As development progressed on the proposed IH 10 West project, the need for additional drainage studies to supplement the guidance provided in the original studies was identified. The additional studies analyzed corridor areas not covered in the original studies and provided alternative mitigation plans to accommodate project constraints more clearly identified during the initial design and ROW acquisition. The following are brief discussions of the scope, limits, and outcomes of these additional studies.

Pin Oak Road to Katy-Fort Bend Road

The portion of the project west of Katy-Fort Bend Road was not covered in the original drainage studies. An additional drainage study to determine potential drainage impacts and mitigation requirements for this area was prepared and documented in a draft report titled "*Impact Analysis and Mitigation Report, IH 10 Section 10 West of Katy Fort Bend Road, Harris County, Texas*". The report is dated May 2002. Refinements to the report are pending and a final report is expected in December 2002. The following recommendations are included in the preliminary study:

- A storm sewer outfall pipe along the westbound frontage road taking drainage west of US 90 toward Pin Oak Road;
- A proposed detention basin in northwest quadrant of the Pin Oak Road interchange between the existing westbound mainlanes and frontage road to mitigate potential increases in storm water runoff;
- An outfall storm sewer pipe from the detention basin at Pin Oak Road, along the existing westbound frontage road of IH 10, toward Cane Island Bayou.

Mason Creek (T101-00-00)

A drainage mitigation study was performed to implement TxDOT's approved recommendations in the original September 1998 study (as stated previously, "*Comprehensive Drainage Study for Proposed IH 10 Roadway Improvements, from West of Fry Rd. to Katy-Fort Bend Road")*. Results of the study were documented in a report titled "*Mason Creek Drainage Study*" that was delivered to TxDOT in April 2002. The TxDOT approved the final report in June 2002. The following recommendations are included in the study:

- A detention basin at Mason Road, as recommended;
- Revised operation of the Mason Road detention basin to function as an off-line system utilizing Mason Creek backwater through the proposed storm sewer;
- No control structure in Mason Creek, as previously suggested;

Barker Ditch (W170-00-00)

The original study (as stated previously, *IH 10 From West Loop 610 to Fry Road Drainage Report*) recommended a detention basin, located west of Cypress Run, between Fry Road and Barker Cypress Road, to mitigate potential runoff increases from the project between Fry Road and SH 6. The outfall for this area is Barker Ditch (W170-00-00). Barker Ditch parallels the south side of IH 10 between Barker Cypress Road and SH 6, then outfalls into Buffalo Bayou just upstream of SH 6, south of IH 10. An additional drainage study for the systems contributing to the Barker Ditch (W170-00-00) was prepared for the following reasons:

- The original study did not consider the drainage area east of Westgreen Road and west of Fry Road that also contributes to the Barker Ditch system;

- The location of the detention basin was adjusted slightly from that proposed originally;
- Additional detention basin areas were provided within the existing ROW at Fry Road and Barker Cypress Road;
- Preliminary plan development revealed the need to optimize storm drain trunk line sizes and profiles between Barker Cypress and SH 6 to consider the influence of the original detention basin and additional basins at Fry Road and Barker Cypress Road;
- Backwater from Barker Ditch affected potential flood levels along the eastbound frontage road, requiring combined hydraulic modeling of Barker Ditch with the proposed IH 10 drainage system;
- Proposed storm drain system depths necessitated channel improvements to IH 10 outfall channels into Barker Ditch, requiring additional impact and mitigation analysis to avoid runoff increases into Buffalo Bayou at the end of Barker Ditch.

The additional drainage study report titled "*Barker Ditch (W170-00-00) Drainage Impact Mitigation Analysis*" was provided to TxDOT in September 2002. The report recommendations included:

- Optimized detention basin sizes and configurations for the detention basin located west of Cypress Run, the detention basin located at the Barker Cypress intersection, and the proposed detention basin located at Fry Road;
- New detention basin located east of Park Ten along 'Outfall C', one of the drainage outfall channels from IH 10 to Barker Ditch;
- Channel improvements and lining to 'Outfall D';
- Flow restrictors and optimized storm drain trunk line sizes for much of the proposed IH 10 drainage system from Fry Road to SH 6.

Langham Creek (U100-00-00)

The original study (as stated previously, *IH 10 From West Loop 610 to Fry Road Drainage Report*) recommended a detention basin, located east of Langham Creek and south of IH 10, between SH 6 and Eldridge, to mitigate potential runoff increases from the proposed project into Langham Creek. Further investigations determined the proposed site for the detention

basin to be unsuitable; therefore, an additional drainage study was necessary for the systems contributing to Langham Creek.

A preliminary report of the additional study findings was prepared and submitted to TxDOT in June 2001. The study recommended a proposed surface detention basin to be located on a four-acre site north of the IH 10 ROW approximately 600 feet west of Langham Creek. The proposed basin will store 23 acre-feet of storm water and will connect to the IH 10 storm drain on the north side. The remaining storm drain trunk lines from the southwest quadrant and from the east will drain to Langham Creek unrestricted.

During review of the preliminary report, it was determined that the study should be revised to include enough detention volume in the proposed basin to mitigate improvements to Park Row Boulevard; planned by the City of Houston between SH 6 and Eldridge Road. The total detention requirements were estimated to increase to approximately 7.6 acres. The report is currently being revised to provide final mitigation analysis of the adjusted detention basin size. A final report is expected in early 2003.

Rummel Creek (W156-00-00)

The original study (as stated previously, *IH 10 From West Loop 610 to Fry Road Drainage Report*) recommended a detention basin, located west and south of the Beltway 8 interchange, and a pump station within the interchange. These features were to accommodate proposed drainage and mitigation requirements for the project area draining to Rummel Creek (W156-00-00) and the Rummel Creek Tributary (W156-02-00).

Early in development, the need for an additional drainage study of the Beltway 8 interchange was determined to provide more flood protection for the depressed frontage roads. The additional study was prepared for TxDOT to determine additional mitigation requirements for the project on the W156-00-00 drainage system (Rummel Creek). After review of a draft report, the final drainage impact analysis report was submitted for review in November 2002. The study recommended the following:

- Enlargement of the detention basin located west and south of the Beltway 8 interchange;
- Minimum roadway grade or berm elevations to minimize overflow from upstream areas into the Beltway 8 interchange depression;
- Channel improvements and lining for the north end of the Rummel Creek channel north of IH 10;
- An additional 7.5-acre detention basin adjacent to north side of IH 10 and west side of Rummel Creek;
- Drainage system trunk line and cross culvert sizes.

The TxDOT approved the preliminary recommendations and requested that a final study be performed to provide detailed hydraulic evaluation and sizing of these mitigation features to support continued project plan development.

W151-00-00 Witte Road System

The original study (as stated previously, *IH 10 From West Loop 610 to Fry Road Drainage Report*) recommended utilization of available detention volume within a regional detention basin owned by others along the W151-00-00 drainage system north of the IH 10 project area. During early project plan development, TxDOT requested an additional study be performed to determine alternative means of mitigation without involving the use of private property. The study results are summarized in the report, "*Drainage Impact Mitigation Study –W151-00-00 Watershed*", dated April 2002. The study recommended the following:

- Subsurface detention chambers (box sewers) parallel to proposed storm drain trunk lines under the IH 10 frontage roads;
- Restrictors on the proposed cross drainage structure at Witte Road.

The TxDOT approved the W151-00-00 report recommendations and project plans are now being developed.

Briar Branch/Spring Branch (W140-00-00)

The original study (as stated previously, *IH 10 From West Loop 610 to Fry Road Drainage Report*) recommended a diversion storm sewer along the north side of the IH 10 ROW from Campbell Road to Briar Branch, and from Briar Branch to Spring Branch. It also recommended a detention basin, located some distance north of IH 10 along the west bank of Spring Branch. During early project plan development; TxDOT requested an additional study be performed to re-evaluate the diversion pipe, considering that it will double as the main storm drain trunk line along the north side of IH 10 between Campbell Road and Spring Branch. Also, TxDOT proposed a different location for the detention basin, immediately adjacent to the north ROW of IH 10 on both sides of Spring Branch.

A final report was submitted in August 2001. The findings determined that the detention basin, located some distance north of IH 10 along the west bank of Spring Branch, only required the area along the west bank of Spring Branch and the north ROW of IH 10.

W138-00-00 (Tributary of Buffalo Bayou)

The original study (as stated previously, *IH 10 From West Loop 610 to Fry Road Drainage Report*) recommended detention in oversized storm drain lines with restricted outfall pipes, all under proposed IH 10. During project plan development, TxDOT directed that the storm drain system and detention storage for W138-00-00 be extended and expanded to accommodate IH 10 runoff previously intended to drain into the west side of the adjacent W137-00-00 system. The W137-00-00 channel has insufficient capacity downstream of IH 10.

A drainage feasibility and mitigation study was performed to evaluate detention requirements for the expansion of the W138-00-00 storm drain system to accommodate the additional flows from the W137-00-00 system. The preliminary results were submitted in August 2002 and recommended the following:

- Large, oversized storm drain conduits under IH 10 throughout the portion of the project contributing to W138-00-00 and extending east to near the west edge of the W137-00-00 cross culvert;

- Additional surface detention basins adjacent to both sides of the W138-00-00 channel along the downstream side of IH 10 that receive inflow from the oversized storm drain lines under IH 10;
- Restrictors to the flow exiting the detention basins into W138-00-00 that facilitate detention storage within the basins and the oversized storm drain lines;
- No refinement in size of the existing cross culvert for W138-00-00;
- Erosion protection in the W138-00-00 channel downstream of IH 10 to protect against high velocity flows exiting the cross culvert.

W137-00-00 (Tributary of Buffalo Bayou)

The original study (as stated previously, *IH 10 From West Loop 610 to Fry Road Drainage Report*) recommended detention in oversized storm drain trunk lines with restricted outfall pipes, all within IH 10 ROW. During project plan development, TxDOT directed that the storm drain system and detention storage within the IH 610 interchange be extended and expanded to accommodate IH 10 runoff previously intended to drain into the east side of the W137-00-00 system. The W137-00-00 channel has insufficient capacity downstream of IH 10.

A drainage feasibility and mitigation study was performed to evaluate detention requirements for the expansion of the IH 610 interchange storm drain system to accommodate the additional flows from the east side of the W137-00-00 system. This study effort was combined with the supplemental drainage study of the IH 610 interchange drainage system described in the next section.

IH 610 Outfall to Buffalo Bayou

The existing 108-inch reinforced concrete pipe drainage outfall for the IH 10/IH 610 interchange runs along and under IH 610 from IH 10 to Buffalo Bayou. Preliminary design evaluations determined that this pipe lacked sufficient capacity to keep design flood levels below the proposed low point of IH 10 within the IH 610 interchange.

An additional drainage study was performed to determine mitigation facilities necessary to accommodate the limited capacity of the outfall system and additional flows from the W137-00-00 system described above. The results were summarized in a preliminary report titled

"*Drainage Study - IH 10 at IH 610 Interchange"*, dated June 2002. Key recommendations in the report included:

- Detention basins in the northwest, northeast, and southeast quadrants of the IH 10/IH 610 interchange;
- The northeast basin will receive inflow from the section of the IH 10 mainlanes below the flood level of the 108-inch reinforced concrete pipe (RCP) outfall system, but will connect to the 108-inch RCP system through a flex-valve structure that prevents backflow.

After TxDOT review and approval of the preliminary study recommendations, the report recommendations were implemented into project plan development. The preliminary report is currently being revised to accommodate TxDOT review comments and to reflect consistency with final design.

IH 10 Outfall to White Oak Bayou

The original studies and reports on this outfall (as seen previously, 1) "*Drainage Design Study for IH 10 Cross Drainage Siphon (0.7 mi. East of IH 610)*", dated January 2001, and 2) "*Drainage Design Study for IH 10 Depressed Mainlanes from U.P.R.R. to Patterson Street*", dated October 2001) recommended pump stations and drainage system improvements to alleviate frequent flooding problems of the UPRR underpass and the IH 10 depressed section east of Washington Avenue. The TxDOT is currently developing project plan development to provide the remedial measures recommended in the study.

An additional study was performed to determine potential drainage impacts and mitigation requirements for White Oak Bayou from implementation of the original report recommendations. The results of the impact analysis and conceptual mitigation requirements were documented in a report titled "*White Oak Bayou Overflow to IH 10 Drainage Study, IH-10: From the UPRR Underpass to East of Patterson Street*". The TxDOT is currently reviewing the report.

9.3.3 Influence of Tropical Storm Allison

In June 2001, Tropical Storm Allison brought unusually heavy rainfall amounts to the Houston area. The east end of the IH 10 West project corridor from IH 610 to Taylor Street encountered significant inundation from the extreme flood event that occurred.

Based on observed flood levels, minor adjustments were made to drainage study recommendations contained in the previously cited report, "*Drainage Design Study for IH 10 Depressed Mainlanes from U.P.R.R. to Patterson Street*", dated October 2001. This report was substantially complete when Allison occurred, and was submitted in draft form a month later.

Within the IH 610 interchange, observations of flood levels from Allison confirmed preliminary drainage evaluations related to the existing 108-inch RCP outfall along IH 610 and expedited the performance of the drainage study described previously and documented in the report, "*Drainage Study - IH 10 at IH 610 Interchange"*, dated June 2002.

West of the IH 610 interchange, no important data was derived from the Tropical Storm Allison event to influence project drainage studies or design.

9.4 100-YEAR SHEET FLOW IMPACTS

The quantity and direction of 100-year flood flows was evaluated, based on accepted engineering practices, for existing and proposed project conditions to determine the potential for adverse impacts on adjacent properties. As necessary, proposed roadway profiles and drainage system components were adjusted during design to maintain existing 100-year flood flows and drainage patterns, to the extent practicable, and to ensure no change in relation to existing conditions.

9.5 COORDINATION WITH LOCAL DRAINAGE MASTER PLANS

As a part of the planning of improvements for the proposed IH 10 West project, consideration was given to all available documents and other unpublished information relating to the criteria,

conditions, and plans for drainage and flood protection through three small cities located immediately south of the IH 10 West corridor. These cities include Hedwig Village, Piney Point Village, and Bunker Hill Village (Together, these cities are commonly referred to as the "Villages". Because of their relatively small size, the Villages have traditionally not undertaken comprehensive drainage and flood projection plans. The extent of drainage and flood protection planning undertaken in the Villages has generally been restricted to drainage improvements completed as a part of roadway improvement projects. However, beginning in the late 1990s, the HCFCD provided planning services and technical information for the Villages and the surrounding area, in an effort to improve drainage and flood protection in this heavily populated area.

In recent years, many of the roadway improvement projects undertaken in the Villages area have been accompanied by a hydrologic and hydraulic analysis of the project impacts on downstream areas. Several of these impact and mitigation studies were carefully reviewed in conjunction with the impact and mitigation study performed for the proposed 10 West project. In fact, most of these impact and mitigation studies were performed by the same consultant employed by TxDOT in conjunction with the proposed IH 10 West impact and mitigation analysis. In addition, this same consultant was also employed by the HCFCD in conjunction with the planning and technical services provided to the Villages as described above. The involvement of a common consultant in all of these projects helped to ensure consistency and compatibility of study data, assumptions, methods, and results for ultimate review and concurrence from the HCFCD.

The Villages have reviewed the supplemental engineering studies prepared for the highway corridor.

10. OTHER ENVIRONMENTAL CATERGORIES EVALUATED

This reevaluation provides further documentation of all other environmental categories evaluated in the approved FEIS and examines the importance of potential effects to the

environment from the proposed design refinements and issues developed in further detail since the ROD was issued.

10.1 LAND USE

The evaluation of impacts to land use of the proposed project described in the approved FEIS remains valid. As stated in the approved FEIS, the proposed project is not anticipated to change regional land use patterns. The IH 10 West corridor is already developed as a primary transportation artery and land use in the area has evolved and should continue to evolve accordingly. Therefore, the conversion of the MLs to a Toll Facility, the addition of the METRO Addicks Park & Ride access ramp, the elevation of the Beltway 8 frontage roads, and the various other design refinements, will not affect the adjacent land use patterns in the future as identified in the approved FEIS.

10.2 FARMLAND IMPACTS

The evaluation of impacts to farmland of the proposed project described in the approved FEIS remains valid. By definition, the majority of the IH 10 project vicinity is classified as urban. The exception to this urban classification is Segment 5, which is located from the City of Katy to FM 1489. Therefore, only minimal amounts of prime farmland will be impacted by the proposed IH 10 West project. This analysis continues to be valid as the only design refinements within Segment 5 are two high mast lighting areas and the proposed detention pond within the existing ROW located at the IH 10/Pin Oak interchange.

The Farmland Conversion Impact Rating Form SCS-CPA-106 for Corridor Type Projects completed for the IH 10 West project totaled only 30 points. The maximum points possible for the Relative Value of Farmland (completed by the National Resources Conservation Service (NRCS)) is 100. Therefore, the total combined score will be less than 160 points. The Farmland Protection Policy Act (FPPA) states that sites receiving a total score of less than 160 points need not be given further consideration for protection and no additional sites need to be evaluated. A copy of Form SCS-CPA-106 is appended to the approved FEIS.

10.3 SOCIOECONOMIC IMPACTS

10.3.1 Impacts to Neighborhoods/Community Cohesion

METRO Access Ramp/Toll Facility

The METRO Addicks Park & Ride access ramp relocation project will not bisect an established neighborhood or subdivision or isolate a residential segment, nor will it restrict access to any existing public or community services, businesses, commercial areas, or employment centers. No long-term adverse impacts to neighborhoods or community cohesion will result from the implementation of the proposed access ramp relocation project. In addition, there will be no changes in impacts from the approved FEIS to neighborhoods or community cohesion as a result of the construction and operation of the four MLs as a Toll Facility.

Additional Elevated Beltway 8 Frontage Road Lanes

There will be no adverse impacts on neighborhoods and community cohesion from the implementation of additional elevated Beltway 8 frontage road lanes through the IH 10/Beltway 8 interchange as no additional ROW is required and the through frontage road lanes follow the existing alignment as seen in the approved FEIS.

South Creek Drive

There will be no adverse impacts on neighborhoods and community cohesion from the realignment of the existing South Creek Drive. The South Creek/Barker Springs intersection is located on the corner of the Park 10 business park. South Creek Drive will be widened by a maximum of 35 feet (corner clip) to the east and a maximum of 62 feet to the west. There will be no displacements as a result of this design refinement.

Other Design Refinements

There will be no adverse impacts on neighborhoods and community cohesion from the detention basins, conversion of the culverts at Mason Creek tributary and Turkey Creek to bridges, or the ADA access ramps. Conversely, the ADA access ramps will add to

neighborhood and community cohesion by providing pedestrian access to all persons within the proposed project area.

10.3.2 Impacts to Social Groups: Environmental Justice Considerations Pursuant to Executive Order 12898

Executive Order 12898 entitled, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to identify and address, as appropriate, any adverse and disproportionate impacts of their programs, policies, and activities on the health or environment of minority and low-income populations (Federal Register, Vol. 59, Number 32, February 16, 1994). A minority population is defined as a group of people and/or a community experiencing common conditions of exposure or impact that consists of persons classified by the U.S. Bureau of Census as Negro/Black/African-American; Hispanic; Asian or Pacific Islander; American Indian; Eskimo, or Aleut; or other non-white persons. According to the U.S. Bureau of the Census, a low-income population is defined as a group of people and/or a community that, as a whole, lives below the national poverty level (e.g., the average poverty level threshold for a family of four people living in the 48 contiguous states and D.C. in 2001 was a total annual income of $17,650). Disproportionate environmental impacts from the exposure to an environmental hazard occur when the risk to a minority population or low-income population exceeds the risk to the general population.

METRO Access Ramp/Toll Facility

The proposed Toll Facility will occupy the approximate width or cross-section and pavement width of the IH 10 West improvements as described in the FEIS for the project. As such, the toll facility will not require additional ROW or utility adjustments from adjacent neighborhoods beyond those described in the FEIS, Therefore, the impacts from the toll facility should not differ from those described in the FEIS for those adjacent neighborhoods including those identified with high minority and or low income populations.

The proposed IH 10 West project will increase the number of SOV lanes from three to four lanes, increase the frontage road lanes from two to three, provide auxiliary lanes at intersections for traffic smoothing and lane balance, and provide continuous frontage roads

throughout the project length. These improvements on the mainlanes will increase capacity for the entire corridor, improve traffic flow, decrease travel times, reduce accidents and peak congestion periods thus providing a more dependable commuter trip. The expanded continuous frontage roads will smooth traffic flow on the frontage roads, provide easier access to services and business along IH 10 West, and provide a bypass for vehicles during incidents on the freeway. These added capacity benefits would be available to all segments of the traveling public including minorities and low-income populations.

The Toll Facility will provide two lanes in each direction 24 hours per day; seven days per week as compared to the current one lane facility, which is open five hours, inbound toward downtown in the morning, and six hours outbound in the afternoon. Single Occupancy Vehicles and cars with two passengers will be charged a toll to use the facility, which will vary by time of day and congestion. High Occupancy Vehicles with three or more passengers (HOV3) will continue to operate toll-free from 6:00 a.m. to 11:00 a.m. eastbound and from 2:00 p.m. to 8:00 p.m. westbound. Vans with at least three occupants are classified as HOV3 vehicles. The METRO bus service will remain available on IH 10 West from the METRO Addicks Park & Ride to downtown. The METRO bus service will expand service to operate within the Toll Facility on a toll-free basis, 24 hours per day, seven days a week. The Toll Facility will by agreement, maintain a high level service or traffic flow which will ensure dependable commute trips for SOV, HOV and transit users. The additional lane in each direction for HOV3 and transit use will increase bus-operating speeds, increase schedule reliability, reverse commute, and as shown in the past, increase transit use. This increased use of transit plus use of the facility by SOVs will reduce demand and improve mobility on the IH 10 West mainlanes.

Overall, the transit and HOV3+ users, including minority and low income populations, will have significant benefits in terms of reliable, shorter commute times and return trips through the high level of service necessary to operate the toll road. The community, including minority and low-income populations, that uses the mainlane of the freeway will also experience increased benefits from the increase number of freeway and frontage road lanes and those SOV vehicles that will use the toll lanes.

Except for the approximate two acres of additional ROW required for the proposed METRO Addicks Park & Ride access ramp relocation project, there are no substantial refinements to the project alignment or preferred transit alternative since the FEIS was completed and the ROD was signed; therefore, there will be no other changes in impacts related to environmental justice issues as a result of the operation of the four MLs as a Toll Facility.

With regard to Executive Order 13045 (*Protection of Children from Environmental Health Risks and Safety Risks*), there may be short-term localized effects to air quality (e.g., increase in dust) levels in the area immediately surrounding the project site during construction; however, these effects will be temporary. Measures to control dust will be considered and incorporated into the final project design and construction specifications. In addition, there will be no changes in impacts related to the health and safety of children as a result of the construction and operation of the four MLs as a Toll Facility. In the long-term, air quality and traffic safety in the area will improve since traffic congestion within the proposed project limits will be reduced.

Additional Elevated Beltway 8 Frontage Road Lanes

There will be no adverse impacts to minorities and low-income populations (Executive Orders 12898 and 13045) from the implementation of the additional Beltway 8 through frontage road lanes as no additional ROW is required and the elevated frontage road lanes follow the existing alignment as seen in the approved FEIS. There is no impact to air quality as a result of the additional elevated Beltway 8 through frontage road lanes. There will be a slight increase in noise levels to several adjacent receivers as result of the additional elevated Beltway 8 through frontage road lanes; however, all of these receivers were already identified as impacted in the approved FEIS. Noise abatement for these receivers was modeled and no noise abatement measures were determined to be feasible and reasonable; therefore noise abatement is not proposed. A more detailed discussion on noise and air quality is contained in Sections 7 and 8, respectively.

South Creek Drive

There will be no adverse impacts to minorities and low-income populations (Executive Orders 12898 and 13045) from the realignment of the existing South Creek Drive. The South Creek/Barker Springs intersection is located on the corner of the Park 10 business park.

Other Design Refinements

There will be no adverse impacts to minorities and low-income populations (Executive Orders 12898 and 13045) from the detention basins, conversion of Mason Creek tributary and Turkey Creek from culverts to bridges, or ADA access ramps. Although two displacements/relocations will result from implementation of one detention basin, these buildings are two abandoned warehouses. Numerous detention basins and drainage easements currently exist along IH 10 within the proposed project area. These detention basins and drainage easements will aid in improved water quality entering the various tributaries and streams along the IH 10 West project and will also aid in reducing any potential flooding.

10.3.3 Impacts to Various Community or Public Resources

METRO Access Ramp/Toll Facility

There will be no impacts to community or public resources as a result of the proposed access ramp relocation project. In addition, there will be no changes in impacts to community or public resources as a result of the operation of the four MLs as a Toll Facility.

Additional Elevated Beltway 8 Frontage Roads

There will be no adverse impacts on community or public resources from the implementation of additional elevated Beltway 8 through frontage road lanes as no additional ROW is required and the through frontage roads follow the existing alignment as seen in the approved FEIS. Also, there will be no adverse visual or aesthetic impacts to communities as the Beltway 8 currently dominates the existing landscape.

South Creek Drive

There will be no adverse impacts on community or public resources from the realignment of the existing South Creek Drive. The South Creek/Barker Springs intersection is located on the corner of the Park 10 business park.

Other Design Refinements

There will be no adverse impacts on community or public resources from the detention basins, conversion of the Mason Creek tributary and Turkey Creek from culverts to bridges, or the ADA access ramps.

10.3.4 Impacts to Traffic and Public Safety

METRO Access Ramp/Toll Facility

The operation of the four MLs as a Toll Facility will benefit the traveling public by reducing traffic congestion, thereby improving traffic safety. By leveraging the resources of TxDOT and other entities, the proposed IH 10 West project becomes enhanced by allocating the necessary funds for reconstruction and accelerating the overall construction schedule. An accelerated proposed IH 10 West project construction schedule will benefit travelers on IH 10 West by reducing the total construction period and associated traffic delays. Mobility for local and regional travelers will be enhanced by use of the Toll Facility, which will operate as express lanes throughout the congested West Houston area. The toll rate will be set at levels that will keep the ML traffic moving at the posted speed limit at all times. As a result of users electing to travel in the Toll Facility, traffic congestion along IH 10 West will decrease and demand will be reduced for the general-purpose SOV lanes thereby improving mobility for local, regional, and intrastate users of the toll-free general-purpose SOV lanes.

Additional Elevated Beltway 8 Frontage Road Lanes

There will be no adverse impacts on traffic and public safety from the implementation of the additional elevated Beltway 8 through frontage road lanes as no additional ROW is required and the additional through frontage roads follow the existing alignment as seen in the approved FEIS. Conversely, improvements to traffic and public safety and travel patterns and accessibility will occur as a result of the proposed additional through frontage roads. The congestion will be reduced and public safety improved at the Beltway 8/IH 10 interchange since 60 percent of the Beltway 8 frontage road traffic is currently moving through the

interchange. This will alleviate the traffic from stopping at the signalized intersections of the depressed Beltway 8/IH 10 frontage roads. The proposed Beltway 8 through frontage road lanes will improve travel patterns and accessibility by not allowing this traffic to travel through the signalized intersection. The existing depressed Beltway 8 frontage road lanes will remain in place to allow existing Beltway 8 traffic turning movements onto IH 10.

South Creek Drive

There will be no adverse impacts on traffic and public safety from the realignment of the existing South Creek Drive. The South Creek/Barker Springs intersection is located on the corner of the Park 10 business park. Conversely, impacts on traffic and public safety will be enhanced. Currently, large (18-wheeled) delivery trucks turning east onto Barker Springs Road cannot safely make the turn at this location to deliver goods to the Star Furniture east of South Creek Drive. Widening the intersection, through the realignment of South Creek Drive, will allow for this turning movement, thereby, creating a safer intersection for all motorists.

Other Design Refinements

There will be no adverse impacts on traffic and public safety from the addition of detention basins, conversion of Mason Creek tributary and Turkey Creek from culverts to bridges, or the ADA access ramps. Public safety will be enhanced by the addition of the ADA access ramps.

10.4 WETLAND IMPACTS

Wetlands determinations were conducted for the entire IH 10 West project. The USACE conducted verifications of these wetlands determinations, with the exception of two areas. The two areas are located from FM 1489 to FM 1463 and from IH 610 to Taylor Street. These areas were excluded from verification because USACE verifications are only valid for five years and these two areas will not be constructed for more than five years. The TxDOT and USACE will address the permitting process/verifications on these two areas at a later date. The jurisdictional waters identified in the FEIS within these two areas are Buffalo Bayou, Snake Creek, and White Oak Bayou. The following discusses the results of the wetlands determinations/verifications.

The proposed IH 10 West project traverses nine jurisdictional waters of the U.S., according to the United States Geological Survey (USGS) 7.5 Minute Topographic Quadrangle maps (three within FM 1463 to SH 6 and six within SH 6 to Washington Avenue), onsite determinations, and USACE verifications. All are waters of the U.S., as defined in 33 CFR 328.3 and are therefore subject to Section 404 of the CWA. The following information is a summary of the two-wetland determination reports submitted to the USACE by TxDOT on August 28, 2002 and October 4, 2002. The complete documents are on file at the TxDOT Houston District Office.

Table 6 and Exhibit 1 identify the locations of the waters of the U.S. that the USACE has verified. Table 6 also indicates whether or not the water of the U.S. appears on the USGS map or National Wetland Inventory (NWI) map, is mapped as a hydric soil in the Soil Survey, is within the 100-year floodplain, and has adjacent wetlands.

TABLE 6: LIST OF WATERS OF THE U.S. AND ASSOCIATED WETLANDS

STATION NUMBER	NAME	USGS MAP	NWI MAP	MAPPED HYDRIC SOIL	100-YEAR FLOOD	WETLANDS OBSERVED
From FM 1463 to SH 6						
STA 704+00	Cane Island Branch-Buffalo Bayou	Yes	Yes	Yes	Yes	No (concrete)
STA 967+00	Mason Creek	Yes	Yes	Yes	Yes	Yes
STA 994+00	Mason Creek Tributary	Yes	Yes	Yes	No	Yes

From SH 6 to Washington Avenue						
STA 1358+00	Langham Creek	Yes	Yes	Yes	Yes	No
STA 1402+00	Turkey Creek	Yes	Yes	Yes	Yes	No
STA 1544+00	Rummel Creek	Yes	No	No	No	No (concrete)
STA 1753+00	Briar Branch and Tributary	Yes	No	Yes	Yes	No
STA 1795+00	Spring Branch	Yes	Yes	Yes	Yes	No
STA 1833+00	Buffalo Bayou Tributary	Yes	Yes	No	No	No

The wetland determinations performed for the proposed project resulted in the identification of fringe wetlands around two waters of the U.S., Mason Creek and Mason Creek tributary. All nine waterways are considered waters of the U.S. as defined in 33 CFR 328.3 and are therefore, subject to Section 404 of the CWA. Each of the nine waters of the U.S. meets the definition of a single and complete project as currently defined in 33 CFR 330.

10.4.1 Wetlands Impacts at the Mason Creek Crossing

The proposed work to occur within Mason Creek and Cane Island Branch of Buffalo Bayou will be the replacement of the existing bridges with a mainlane bridge, two ramp bridges, and two frontage road bridges at each location. A temporary haul road will be constructed but not within the area of the water of the U.S. No impacts, below the ordinary high water mark or within the fringe wetland areas, from construction or construction equipment, will occur. No permanent impacts will occur within the waters of the U.S. area. The temporary impacts will occur from the incidental fallback that might occur during construction work (i.e. debris falling within the water of U.S. due to construction activity).

10.4.2 Wetlands Impacts at the Mason Creek Tributary Crossing

The proposed work to occur within Mason Creek tributary will be the removal of the three box culverts and one pipe culvert and the new construction of a new bridge spanning the entire water of the U.S. No impacts, below the ordinary high water mark or within the fringe wetland areas, from construction or construction equipment will occur. No permanent impacts will occur within the water of the U.S. area. The temporary impacts will occur with the incidental fallback that might occur during construction work (i.e. debris falling within the water of U.S. due to construction activity).

10.4.3 Wetlands Impacts at the Toll Facility/Tee Ramp

A Preliminary Jurisdictional Determination (PJD) was conducted for the additional ROW that is required for the proposed METRO Addicks Park & Ride access ramp relocation project. The PJD revealed that no wetlands occur within the proposed project ROW. The PJD was sent to the USACE for verification and a response, dated November 20, 2002, was received. A copy of the PJD and the USACE response letter are contained in Appendix A. The USACE has stated that the subject tract does not contain any waters of the U.S., including wetlands, subject to USACE regulation under Section 404 of the Clean Water Act (CWA). A Department of the Army permit is not required for the construction of the METRO Addicks Park & Ride access ramp relocation project (determination file number D-13938).

10.4.4 Wetlands Permitting/Mitigation

The TxDOT, with the approval of FHWA and USACE, has divided the proposed IH 10 West project, from FM 1489 to Taylor Street, into two separate sections for the wetlands permitting process under Section 404 of the CWA. The project limits for the first section are from FM 1489 to SH 6. The project limits for the second section are from SH 6 to Taylor Street.

The TxDOT has utilized avoidance and minimization techniques at all water crossings along the proposed project. These techniques include proposing to remove the existing culverts at Mason Creek tributary and Turkey Creek. The culverts will be replaced by spanning each crossing with bridges for complete avoidance of impacts at these waters of the U.S. Additional techniques include minimal construction at the other water crossings and involve replacement of old existing culverts with new culverts. The construction at all the water crossings will qualify under the Nationwide Permitting (NWP) program. All appropriate permits will be acquired prior to the letting.

On August 23, 2002, a Preconstruction Notification (PCN) was submitted to the USACE for the three water crossings west of SH 6 (Mason Creek, Cane Island Branch of Buffalo Bayou, and Mason Creek tributary). The USACE indicated that a NWP is not required for temporary impacts resulting from potential incidental fallback associated with construction. However, no written response from the USACE has been received at this time. According to NWP General

Condition number 13, the 45-day response time has been exceeded and TxDOT may proceed with construction for these three crossings. The PCN is contained in Appendix D-Coordination Letters.

On October 30, 2002, a meeting was held at the USACE Galveston District to discuss the permitting process for the waters of the U.S. east of SH 6. The meeting resulted in the USACE concurring that TxDOT could submit a PCN for the crossing of waters of the U.S. east of SH 6 (provided all terms and conditions of the NWP are complied with) with the understanding that final approval lies with the USACE.

Sampling points were taken at all sixteen detention basin sites and no additional jurisdictional waters or wetlands were found. The detention basins are discussed further in Section 4.2.

As described above in Section 9, BMPs will be utilized within the proposed project in order to comply with the TCEQ 401 Water Quality Certification Conditions for the NWPs. Examples of BMPs to be utilized within the proposed project include temporary vegetation, blankets and matting, mulch, sod, sand bag berms, silt fencing, rock berms, sediment basins, retention/irrigation systems, extended detention basins, wet basins, and vegetative filter strips. Specific BMPs from each category will be determined during the detailed phase and implemented within the proposed project.

10.5 WATER BODY MODIFICATION; VEGETATION AND WILDLIFE IMPACTS

10.5.1 Coastal Zone Management Plan

The conclusion in the approved FEIS that the proposed project lies outside of the jurisdictional boundary of the Coastal Zone Management Plan remains valid. The proposed METRO Addicks Park & Ride access ramp relocation project and the proposed Toll Facility are located outside of the Coastal Zone Management Boundary, thus there will be no impacts to the Coastal Management Zone.

10.5.2 Vegetation

According to the Texas Parks and Wildlife Department (TPWD) Vegetation Types of Texas, (1984), the proposed project area is within the Urban and Crops regions of Texas, with a very small area of Pecan-Elm Forest region.

The existing ROW is grassland maintained by mowing. Bermudagrass (*Cynodon dactylon*), Southern crabgrass (*Digitaria ciliaris*), Johnsongrass (*Sorghum halepense*), Bahiagrass (*Paspalum notatum*), Dallisgrass (*Paspalum dilatatum*), Smutgrass (*Sporobolus indicus*), Ryegrass (*Lolium perenne*), Rescuegrass (*Bromus uniloides*), Japanese brome (*Bromus japonicus*), bluestems (*Dichanthium* spp.), Texas wintergrass (*Stipa leucotricha*) and Silver bluestem (*Bothriochloa laguroides*) are dominate species within the existing ROW.

Many areas within and adjacent to the IH 10 West corridor have vegetation limited to lawn and garden species typical of urban landscapes with these established as vegetated islands surrounded by pavement. Areas within and adjacent to the IH 10 West corridor also contained agricultural fields and pastures or commercial buildings, parking lots and their associated landscape features.

A survey was done for woodland habitat along the proposed project corridor and the results and impacts are discussed in the approved FEIS. The conclusion that impacts to native tree vegetation will be low in comparison to the surrounding landscape remains valid. Eight of the proposed 16 detention basins were addressed in the approved FEIS. The remaining eight detention basins are addressed below along with the Toll Facility and other design refinements, which require additional ROW. Design refinements not requiring additional ROW are not discussed as these areas are covered in the approved FEIS.

Toll Facility

The vegetation within the existing METRO Addicks Park & Ride ROW consists primarily of maintained grasses within parking lot medians. A wholesale plant nursery (American Landscapers Supply) is located within the proposed ROW. The vegetation in this area has been cleared and the area consists of potted plants placed on an improved surface. Therefore, no substantial impacts to vegetation will be anticipated.

The northeast portion of the ROW consists of herbaceous and woody vegetation. Approximately one acre of trees and grasses will be removed during construction. Native herbaceous vegetation will be planted upon completion of the METRO Addicks Park & Ride access ramp relocation project. The access ramp relocation project site is small in comparison to the remaining undeveloped areas in the vicinity of the project area (i.e., Addicks and Barker Reservoirs), and will not represent a significant loss of habitat or species diversity.

South Creek Drive

The additional ROW required for the South Creek Drive realignment totals 0.34 acre. Vegetation on the east side of South Creek Drive consists primarily of St. Augustinegrass (*Stenotaphrum secundatum*) and staggler daisy (*Calyptocarpus vialis*). There are no trees within this portion of additional ROW. Vegetation on the west side of South Creek Drive consists primarily of Johnsongrass (*Sorghum halepense*), southern dewberry (*Rubus trivialis*), and Vaseygrass (*Paspalum urvillei*). The only tree within this portion of additional ROW is one Chinese elm (*Ulmus parvifolia*) with a diameter at breast height (dbh) of 19 inches. The Chinese Elm is an introduced tree species. Photographs of this location are contained in Appendix E (Photographs).

High Mast Lighting

The additional ROW required for 24 of the 227 high mast lighting locations totals 0.34-acre. The remaining 203 high mast lighting locations are located within the existing and proposed ROW. Of the 24-high mast lighting locations within additional ROW, eight are located within parking lots or commercial property proposed for acquisition in the approved FEIS. Of the remaining 16 locations, four contain urban landscaping adjacent to commercial businesses. Of the remaining 12 locations, five contain grass that is mown. Of the remaining seven locations, one area has been cleared for development; one area is located adjacent to the fence line at the proposed detention basin west of Beltway 8; four areas are grassy fields consisting primarily of Chinese privet (*Ligustrum sinense*), Johnsongrass (*Sorghum halepense*), Kleberg bluestem (*Dichanthium annulatum*), Goosegrass *(Eleusine indica*), Vaseygrass (*Paspalum urvillei*), Dallisgrass (*Paspalum dilatatum*), Canada golden-rod (*Solidago canadensis*), and weedy

species; and one area is located at a man-made drainage easement between two restaurants. Typical photographs of the high mast lighting are contained in Appendix E.

Detention Basins

There are eight additional detention basins proposed as part of the design refinements for the proposed IH 10 West project. The following identifies the vegetation inventory at each detention basin. Photographs of the detention basins are contained in Appendix E.

1) IH 10/Pin Oak Interchange

A detention basin is proposed north of IH 10 and east of Pin Oak Road. The size of this proposed detention basin is 4 acres, none (0-acre) that is considered wooded. As stated above, this proposed detention basin will be located within the existing IH 10/Pin Oak interchange, which consists of grasses and weedy species. There are no trees within this area.

2) West of Park Ten

A detention basin is proposed south of IH 10 and west of Park Ten. The size of this proposed detention basin is 6.3 acres with approximately 2.8 acres of the 6.3 acres considered wooded. The trees located within this detention basin consist primarily of Chinese tallow-tree (*Sapium sebiferum*) and Texas sugarberry (*Celtis laevigata*) with a dbh range of six to 13 inches, a height ranging between 10-20 feet, and a canopy cover of 70 percent.

The remaining trees with less than six inches dbh and saplings include: Texas sugarberry (*Celtis laevigata*). The remaining vegetation consists primarily of Chinese privet (*Ligustrum sinense*), Yaupon (*Ilex vomitoria*), Indian sea-oats (*Chasmanthium latifolium*), Carolina coral-beads (*Cocculus carolinus*), southern dewberry (*Rubus trivialis*), Japanese honeysuckle (*Lonicera japonica*), peppervine (*Ampelopsis arborea*), Dallisgrass (*Paspalum dilatatum*), great ragweed (*Ambrosia trifida*), and Canada golden-rod (*Solidago canadensis*).

3) Under Proposed SH 6 Bridge

A detention basin is proposed under the proposed bridge to be located within the current mainlanes of SH 6 south of IH 10. The size of this proposed detention basin is 0.8-acre, none (0-acre) of which is considered wooded. As stated above, this proposed detention basin will be located within the existing SH 6 ROW, which is within a highly urbanized, commercial

development area. There are no trees within this area, other than urban landscaping. The vegetation within this proposed detention basin consists primarily of several patches of mown grass and urban landscaping.

4) West of Beltway 8

A detention basin is proposed north of IH 10 and west of Beltway 8. The size of this proposed detention basin is 7.5 acres and approximately 1.3 acres of the 7.5 acres is considered wooded. This proposed detention pond consists primarily of commercial development containing two abandoned warehouse buildings and parking lots within the proposed site.

The trees located within the 1.3-acre wooded area consist of American elm (*Ulmus americana*), Green ash (*Fraxinus pennsylvanica*), Texas sugarberry (*Celtis laevigata*), and Eastern red cedar (*Juniperus virginiana*) with a dbh range of six to 13 inches; Willow oak (*Quercus phellos*), Water oak (*Quercus nigra*), American elm, Texas sugarberry, and Arizona ash (*Fraxinus velutina*), with a dbh range of 14-18 inches; Water oak, Post oak (*Quercus stellata*), Pecan (*Carya illinoensis*), and Arizona ash with a dbh range of 19-24 inches; and Post oak and Arizona ash with a dbh range of 25-30 inches. The canopy cover is approximately 80 percent and the trees range in height from 30 to 50 feet. The trees in this area are cultivated.

The remaining trees with less than six inches dbh and saplings include: Texas sugarberry (*Celtis laevigata*), American elm (*Ulmus americana*), Green ash (*Fraxinus pennsylvanica*), and Common persimmon (*Diospyros virginiana*). The remaining vegetation consists primarily of Red mulberry (*Morus rubra*), White mulberry (*Morus alba*), Canada golden-rod (*Solidago canadensis*), lantana (*Lantana sp.*), southern dewberry (*Rubus trivialis*), peppervine (*Ampelopsis arborea*), poison ivy (*Toxicodendron radicans*), Brazilian vervain (*Verbena brasiliensis*), common sunflower (*Helianthus annuus*), muscadine grape (*Vitis rotundifolia*), Vaseygrass (*Paspalum urvillei*), Johnsongrass (*Sorghum halepense*), purple passion-flower *(Passiflora edulis*), and white snake-root (*Eupatorium rugosum*).

5) East of Antoine

A detention basin is proposed south of IH 10 and east of Antoine Drive. The size of this proposed detention basin is 3.0 acres. Approximately 0.58-acre of the 3.0-acre site is a highly

vegetated unnamed tributary of Buffalo Bayou. This proposed detention basin consists primarily of commercial development. The tributary of Buffalo Bayou is located between two commercial properties, which comprise the majority of the proposed detention basin. The two commercial properties are 1) National Tire and Battery, and 2) the Wellesley Inn and Suites hotel. The only trees within this proposed detention basin, other than urban landscaping, exist along the side banks of the tributary within the proposed ROW. The few trees that do exist are Loblolly pine (*Pinus taeda*). The remaining vegetation within the tributary includes Red mulberry (*Morus rubra*), great ragweed (*Ambrosia trifida*), naked-spike ragweed (*Ambrosia psilostachya*), American elderberry (*Sambucus canadensis*), southern dewberry (*Rubus trivialis*), trumpet creeper (*Campsis radicans*), common reed (*Phragmites australis*) and summer grape (*Vitis aestivalis*).

6) IH 610-Northeast Quadrant

A detention basin is proposed in the northeast quadrant of the IH 10/IH 610 interchange. The size of this proposed detention basin is 3 acres and approximately 2.3 acres of the 3-acre site is considered wooded. The trees located within this proposed detention basin consist primarily of Loblolly pine (*Pinus taeda*), with a dbh range of six to 13 inches, and Water oak (*Quercus nigra*), with a dbh range of 14 to 18 inches. The trees in this proposed detention basin have a height ranging between 10-15 feet and a canopy cover of 30 percent. This proposed detention basin is located within the existing ROW of the IH 10/IH 610 interchange and TxDOT and Trees for Houston have planted the trees.

The remaining trees with less than six inches dbh and saplings include: Chinese tallow-tree (*Sapium sebiferum*), Southern red oak (*Quercus falcata*), Pecan (*Carya illinoensis*), Loblolly pine (*Pinus taeda*), Texas sugarberry (*Celtis laevigata*), and Crape myrtle (*Lagerstroemia indica*). The remaining vegetation consists primarily of Red mulberry (*Morus rubra*), eastern false-willow (*Baccharis halimifolia*), Chinese privet (*Ligustrum sinense*), Canada golden-rod (*Solidago canadensis*), lantana (*Lantana sp.*), poison ivy (*Toxicodendron radicans*), southern dewberry (*Rubus trivialis*), and Japanese honeysuckle (*Lonicera japonica*).

7) IH 610-Southeast Quadrant

A detention basin is proposed in the southeast quadrant of the IH 10/IH 610 interchange. The size of this proposed detention basin is 0.8-acre, with approximately 0.6-acre of the 0.8-acre site considered wooded. The vegetation within this proposed detention basin consists of trees with a height ranging between 10-15 feet and a canopy cover of 20 percent. There are no trees within this plot that are over 5 inches dbh. This proposed detention basin is located within the existing ROW of the IH 10/IH 610 interchange and TxDOT and Trees for Houston have planted the trees.

The vegetation within this plot consists primarily of the following trees with less than six inches dbh and saplings: Southern red oak (*Quercus falcata*), Live oak (*Quercus virginiana*), Loblolly pine (*Pinus taeda*), Texas sugarberry (*Celtis laevigata*), and Bald cypress (*Taxodium distichum*). The remaining vegetation consists primarily of Red mulberry (*Morus rubra*), Yaupon (*Ilex vomitoria*), eastern false-willow (*Baccharis halimifolia*), Canada golden-rod (*Solidago canadensis*), lantana (*Lantana sp.*), southern dewberry (*Rubus trivialis*), naked-spike ragweed (*Ambrosia psilostachya*), and Kleberg bluestem (*Dichanthium annulatum*).

8) IH 610-Northwest Quadrant

A detention basin is proposed in the northwest quadrant of the IH 10/IH 610 interchange. The size of this proposed detention basin is 0.64-acre. The entire 0.64-acre site is considered wooded. The trees located within this proposed detention basin consist primarily of Loblolly pine (*Pinus taeda*) with a dbh range of six to 13 inches, a height ranging between 20-25 feet, and a canopy cover of 60 percent. This proposed detention basin is located within the existing ROW of the IH 10/IH 610 interchange and TxDOT and Trees for Houston have planted the trees.

The remaining trees with less than six inches dbh and saplings include: Texas sugarberry (*Celtis laevigata*), Southern red oak (*Quercus falcata*), Southern catalpa (*Catalpa bignonioides*), and Loblolly pine (*Pinus taeda*). The remaining vegetation consists primarily of Red mulberry (*Morus rubra*), southern dewberry (*Rubus trivialis*), Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), and Indian sea-oats (*Chasmanthium latifolium*).

ADA Access

This proposed design refinement totals 1.0-acre and is located from Fort Bend County Line to the IH 610. A tree inventory was not prepared as very minor amounts of ROW (corner clips) are being utilized at various intersections within this area. The vegetation within these corner clips consists primarily of grasses and weedy species. A few trees are located within these corner clip areas; however, these trees are urban landscape plantings adjacent to the existing streets and commercial businesses. No mitigation is proposed for these areas. Photographs typical of the ADA access areas are contained in Appendix E.

Impacts to native tree vegetation will be low in comparison to the surrounding landscape. No mitigation is proposed for the areas listed above.

10.5.3 Beneficial Landscaping Design

The undertaking in the approved FEIS that the landscaping design will be conducted in accordance with the Executive Memorandum of April 24, 1994 and the EPA guidelines to promote the use of environmentally beneficial landscaping practices and design remains valid. This landscaping undertaking pertains to the entire project design, including all design refinements mentioned in this reevaluation.

10.5.4 Invasive Species

The undertaking in the approved FEIS that the proposed project will be in accordance with Executive Order 13112 on invasive species remains valid. This invasive species undertaking pertains to the entire project design, including all design refinements mentioned in this reevaluation.

10.5.5 Wildlife

Construction of the METRO Addicks Park & Ride access ramp relocation project will lead to the loss of a small portion of the onsite wildlife habitat. The vegetation within the undeveloped portion of the proposed ROW will provide cover for use by numerous species of birds, including neotropical migrants and mammals tolerant to human disturbance (e.g., opossums and raccoons). The use of regionally native plants in landscaping will provide limited habitats

for wildlife tolerant of human disturbance. Species well adapted to urbanization, such as House Sparrows (*Passer domesticus*), Starlings (*Sturnus vulgaris*), Grackles, and Purple Martins (*Progne subis*) will likely move into the area of new development. Since the undeveloped portion of the ROW is small in comparison to surrounding areas and offers marginal habitat, minimal impacts are expected to occur. In addition, there will be no changes in impacts to wildlife as a result of the operation of the four MLs as a Toll Facility.

The approved FEIS states that minimal impacts to wildlife are expected but undoubtedly a few urban mammals live in the streambeds or the riparian zones. In the western end of the study area where the area is more rural, greater disturbances to wildlife species will be expected. However, since the ROW acquisition on the western end (FM 1489 to SH 6) is very small, the impacts to wildlife are expected to be minor. The majority of additional ROW is comprised from three new detention basins (approximately 16.84 acres). Of these three detention basins, none are located west of Katy, considered the western and more rural end of the proposed project. The realignment of South Creek Drive totals only 0.34 acre and is primarily grasses and weedy species with one Chinese elm and a few crape myrtle trees adjacent to a business park, the high mast lighting areas total only 0.34 acre and consist of 24 areas of 25-foot by 25-foot square sections located within the additional ROW throughout the length of the proposed project, and the ADA access areas total only one acre and are also located throughout the proposed project length. Given the above-mentioned facts, the conclusion of no substantial impact in the approved FEIS remains valid.

10.5.6 Migratory Bird Treaty Act

The undertaking in the approved FEIS that the proposed project will be in accordance with the Migratory Bird Treaty Act (MBTA) remains valid. This migratory bird undertaking pertains to the entire project design, including all design refinements mentioned in this reevaluation.

10.5.7 Waters of the United States

No water of the U.S. occurs within the proposed ROW of the METRO Addicks Park & Ride access ramp relocation project. Thus, there will be no impacts to waters of the U.S. as a result

of the construction of the proposed access ramp. In addition, there will be no changes in impacts to waters of the U.S. as a result of the operation of the four MLs as a Toll Facility.

Wetlands determinations were conducted for the entire IH 10 West project. The USACE conducted verifications of these wetlands determinations, with the exception of two areas. The two areas are located from FM 1489 to FM 1463 and from IH 610 to Taylor Street. These areas were excluded from verification because USACE verifications are only valid for five years and these two areas will not be constructed for more than five years. The TxDOT and USACE will address the permitting process/verifications on these two areas at a later date. The jurisdictional waters identified in the FEIS within these two areas are Buffalo Bayou, Snake Creek, and White Oak Bayou. The following discusses the results of the wetlands determinations/verifications.

The proposed IH 10 West project traverses nine jurisdictional waters of the U.S., according to the United States Geological Survey (USGS) 7.5 Minute Topographic Quadrangle maps (three within FM 1463 to SH 6 and six within SH 6 to Washington Avenue), onsite determinations, and USACE verifications. All are waters of the U.S., as defined in 33 CFR 328.3 and are therefore subject to Section 404 of the CWA.

The FEIS identifies jurisdictional waters as qualifying for authorization under the NWP program, which remains valid. Table 6 (Section 10.4) identifies the locations of the waters of the U.S. within the two sections mentioned previously. These waters are also contained in Exhibit 1.

10.5.8 Essential Fish Habitat

The proposed METRO Addicks Park & Ride access ramp relocation project and the Toll Facility will not impact any waters that are tidally influenced; therefore, the project is not subject to the Magnuson-Stevens Fishery Conservation and Management Act and will not impact any essential fish habitat, as defined by 16 United States Code (USC) 1802.

Since the proposed design refinements mentioned in this reevaluation lie outside tidally influenced waters, the conclusion in the approved FEIS that there will be no impacts to essential fish habitat remains valid for all design refinements mentioned in this reevaluation.

10.6 THREATENED AND ENDANGERED SPECIES

According to the approved FEIS, no threatened or endangered species or species of concern (SOC) were found during the proposed IH 10 West project surveys. Thus, the FEIS concluded that the proposed IH 10 West project would not affect any threatened or endangered species or SOC. The TPWD Annotated County List of Rare Species and the United States Fish and Wildlife Service (USFWS) Federally Listed Species and SOC lists that were used for the proposed IH 10 West project surveys are contained in Appendix 3 of the approved FEIS. During the FEIS process, coordination with the USFWS indicated the presence of the endangered Texas prairie dawn (*Hymenoxys texana*) near IH 10 in Barker and Addicks Reservoirs. However, the ROW to be acquired in that vicinity had already been surveyed by TxDOT personnel with previous experience searching for this species. The ROW was already disturbed, and there was no suitable habitat found for Texas prairie dawn.

The most recent TPWD Annotated County List of Rare Species dated December 10, 2002 and the USFWS Federally Listed Species and SOC lists, dated December 23, 2002 were compared to the lists located in Appendix 3 of the approved FEIS. The USFWS now lists the Houston machaeranthera, listed in Appendix 3 of the approved FEIS, as the Houston daisy (*Machaeranthera =*{*Rayjacksonia*}* aurea*). Since the time of the ROD, the following threatened species and SOC have been listed since the FEIS: Louisiana black bear (*Ursus americanus luteolus*), sharpnose shiner (*Notropis oxyrhynchus*), and giant sharpstem umbrella-sedge (*Cyperus cephalanthus*).

The Louisiana Black Bear (*Ursus americanus luteolus*) is listed by TPWD for Harris, Fort Bend and Waller counties. According to TPWD, the species is listed as threatened under federal and state status. The bear is listed as a possible transient, utilizing bottomland hardwoods and large tracts of inaccessible forested areas as habitat.

The Sharpnose Shiner (*Notropis oxyrhynchus*) is federally listed by USFWS as a candidate species for Fort Bend and Waller counties. The native range of the sharpnose shiner is the Brazos River and lower portions of large tributaries. Non-indigenous occurrences have been recorded from the Colorado River drainage of Texas near Austin. The sharpnose shiner is also known from the upper Red River.

The Giant Sharpstem Umbrella-Sedge (*Cyperus cephalanthus*) is federally listed by USFWS as a SOC for Harris County. The range for the plant species in the U.S. is Texas and Louisiana. The habitat for this native perennial is low marshy places.

No known threatened or endangered species or SOC, or known habitat, occurs within the proposed METRO Addicks Park & Ride access ramp relocation project ROW. Thus, there will be no impacts to these species as a result of the construction of the proposed access ramp relocation project. In addition, there have been no significant changes to the project alignment or preferred transit alternative since the FEIS was completed and the ROD was signed; therefore, there will be no changes in impacts to threatened or endangered species as a result of the operation of the four MLs as a Toll Facility.

All additional ROW areas were surveyed for the threatened and endangered species and SOC on the lists from the approved FEIS and the additional species listed above. The additional ROW areas include the South Creek Drive realignment, the high mast lighting areas within the additional ROW areas, the eight additional detention basins, and the ADA access areas. Photographs of these additional ROW areas are contained in Appendix E.

As described in Section 10.5.2, the South Creek Drive realignment, the high mast lighting areas within additional ROW, and the ADA access areas all are dominated by concrete, grasses and weedy vegetation. The high mast lighting areas and the ADA access areas are both located directly adjacent to the existing IH 10 facility and consist of very minor amounts of additional ROW: a total of 0.34-acre at the 24 high mast lighting locations and a total of one acre from SH 6 to IH 610 for ADA access. The South Creek/Barker Springs intersection is located at the Park 10 business park and totals only 0.34-acre. Since these areas consist of primarily

concrete, grasses and weedy vegetation and are situated directly adjacent to IH 10 and commercial developments, none of the these areas are considered to contain suitable habitat for the threatened and endangered species and SOC noted in the approved FEIS or the additional species noted above and no observation of any species were spotted during field investigations.

Of the eight additional detention basins, the three detention basins at the IH 10/IH 610 interchange, the detention basin under the proposed SH 6 Bridge, and the detention basin located at IH 10 at Pin Oak are all within the existing ROW. All of these locations are highly developed urban areas. The existing ROW was surveyed during the preparation of the FEIS, and none of these areas were considered to contain suitable habitat for the threatened and endangered species and SOC noted in the approved FEIS. The existing ROW does not contain suitable habitat for the additional species noted above and no observation of the species were spotted during field investigations.

There are three remaining detention basins outside of the existing ROW. These detention basins are located west of Park Ten, west of Beltway 8, and east of Antoine.

West of Park Ten

This proposed detention basin is located adjacent to and south of the IH 10 frontage road and west of Park Ten. The proposed basin is situated between commercial properties and totals 6.32 acres. The area is dominated primarily by Chinese tallow-tree (*Sapium sebiferum*) and Texas sugarberry (C*eltis laevigata*). This proposed detention basin is highly vegetated and contains no barren areas or mima mounds (preferred habitat for Texas prairie dawn). There are no bottomland hardwoods, rivers, or low marshy areas within this area. This proposed detention basin is not considered to contain suitable habitat for the threatened and endangered species and SOC noted in the approved FEIS or the additional species noted above and no observation of any species were spotted during field investigations.

West of Beltway 8

This proposed detention basin is located west of Beltway 8 and north of the IH 10 frontage road. This detention basin is primarily commercial development containing two abandoned warehouse buildings and parking lots within the proposed site, which totals 7.52 acres. A wooded area does exist within this site. The wooded area totals approximately 1.27 acres of the 7.52 acres. The wooded area contains no barren areas or mima mounds, bottomland hardwoods, rivers, or low marshy areas. This area is not considered to contain suitable habitat for the threatened and endangered species and SOC noted in the approved FEIS or the additional species noted above and no observation of any species were spotted during field investigations.

East of Antoine

This proposed detention basin is located east of Antoine Drive and adjacent to and south of the IH 10 frontage road. This proposed detention basin consists primarily of commercial development and totals three acres. The proposed detention basin will be constructed in an area currently occupied by a National Tire and Battery store and The Wellesley Inn and Suites hotel. These ROW acquisitions were accounted for in the approved FEIS. An unnamed tributary of Buffalo Bayou is located between the National Tire and Battery and the Wellesley Inn and Suites hotel. The only trees along this tributary within the proposed ROW are a few loblolly pines (*Pinus taeda*). The remaining vegetation consists primarily of woody vines, weeds, and shrubs.

Although this detention basin was not proposed at the time of the FEIS, this area, including the tributary, located between the two commercial properties, was surveyed for threatened and endangered species and SOC during the preparation of the approved FEIS. At the time of the FEIS this area, the National Tire and Battery site, the Wellesley Inn and Suites site and a portion of the tributary were within the proposed ROW. Although, the proposed ROW has increased in this area to include the proposed detention basin, the survey from the approved FEIS remains valid. The vegetation along and within the tributary is consistent from the IH 10 frontage road to Memorial Drive, which is located south of (beyond) the limits of the new ROW. As stated previously, no threatened and endangered species and SOC were found. This area is highly vegetated and contains no barren areas or mima mounds, is not located near a

larger tributary or the Brazos River, and contains no low marshy areas. Conversely, the slopes of this tributary are very steep. This proposed detention basin area is not considered as to contain suitable habitat for the threatened and endangered species and SOC noted in the approved FEIS or the additional species noted above and no observation of any species were spotted during field investigations.

10.7 IMPACTS TO CULTURAL RESOURCES

The only cultural resource that will be affected by the proposed project is the Oscar Abstein Cemetery. In accordance with state law, a plan to remove the burials at this location and rebury them at another cemetery in Houston, known as the Washington Glenwood Cemetery, has been developed and is under review by the SHPO. In the event that other unanticipated cultural materials are encountered during construction, work in the immediate area will cease and the SHPO will be contacted.

10.7.1 Archeological Resources

It is unlikely that archeological remains will be intact within the ROW of the proposed METRO access ramp, due to the level of adjacent development and previous site grading and construction activities within the proposed ROW. In addition, there will be no changes in impacts to archeological resources as a result of the operation of the four MLs as a Toll Facility. In the event that archeological resources are located within the project limits, either prior to or during construction, work in the immediate area will cease and the SHPO will be contacted.

The various small refinements to the proposed design of the IH 10 improvements, including the Toll Facility and the additional detention basins, will result in the disturbance of approximately 20.52 additional acres. All but two of these are in areas that have very low probability for the presence of intact archeological sites. The two that are in areas that could have potential for intact archeological sites were inspected by a TxDOT staff archeologist. These two new location areas are the proposed 0.34 acres at South Creek Drive and the 6.32 acres at detention basin 1E, located west of Park Ten Boulevard and south of IH 10. Based on surface inspection these two areas have been previously disturbed and do not contain intact archeological sites.

All of these new locations have been coordinated with the SHPO and the SHPO concurs that they do not contain archeological historic properties.

10.7.2 Historic Structures

Approximately two acres of additional ROW are required for the proposed METRO Addicks Park & Ride access ramp relocation project. As a result, coordination with the Harris County Historical Commission has been initiated. No response has been received at this time. In addition, there will be no changes in impacts to historic resources as a result of the operation of the four MLs as a Toll Facility. In the event that historical resources are located within the project limits, either prior to or during construction, work in the immediate area will cease and the SHPO will be contacted.

The conclusion in the approved FEIS that no property will be taken from the six identified properties identified within the proposed project's Area of Potential Effect (APE) and that coordination between TxDOT and the SHPO resulted in a determination that the proposed project will have no adverse effect on any of the listed or eligible properties remains valid. The conclusion in the approved FEIS that there are no Official State Historical Markers of any type within the APE of the proposed project also remains valid.

The approved FEIS noted that the proposed project will avoid impacts to all gravesites other than two probable cemeteries: the Oscar Abstein Cemetery and the Old Pioneer Cemetery. Both are within the proposed ROW and cannot be avoided. The TxDOT archeologists investigated the probable cemetery known as the Old Pioneer Cemetery in August 2002. Their investigations revealed that this was not the location of a cemetery, but rather were the remains of a late 20th century billboard. That work was coordinated with the SHPO, and the SHPO concurred that no cemetery was present at that location. The TxDOT conducted archival investigations related to the Oscar Abstein Cemetery and determined that up to four graves are present at that location. No next of kin were identified. A plan to excavate and reinter the graves prior to construction has been developed. The plan was developed to be in compliance with the SHPO's Historic Cemetery Guidelines and the Texas Health and Safety Code.

There are 20.52 acres of new ROW required for this project as a result of design refinements that have not been studied for the presence of historic-age resources. A review of the National Register of Historic Places (NRHP) and the Recorded Texas Historic Landmarks (RTHL) will be conducted to determine if historically significant properties have been previously documented within the APE. A site visit will be conducted to determine if there are previously unrecorded historic-age properties within the expanded APE, which for this project was determined to be 300 feet beyond the proposed right of way. In accordance with the Programmatic Agreement between FHWA, the Texas Historical Commission (THC), the Advisory Council on Historic Preservation, and TxDOT and the MOU between TxDOT and THC, TxDOT will consult with the SHPO regarding the eligibility of any historic-age properties identified during the survey. If the properties are found to be eligible for listing in the National Register, consultation will continue with the SHPO regarding the project's potential to affect significant sites. All coordination letters are contained in Appendix D.

10.8 HAZARDOUS MATERIALS

The proposed METRO Addicks Park & Ride access ramp relocation project will not be impacted by hazardous materials issues, based on the regulatory database research. In addition, there will be no changes in impacts related to hazardous materials as a result of the operation of the four MLs as a Toll Facility.

As identified in the approved FEIS, the hazardous materials investigations were conducted according to American Society for Testing and Materials E 1527-97 (ASTM) standards. The following databases within ASTM standards (0.25 mile, 0.5 mile, or 1.0 mile) and on either side of the IH 10 Corridor were evaluated:

1. EPA National Priorities List (NPL) (1.0 mile);
2. EPA Resource Conservation and Recovery Act (RCRA) Treatment, Storage or Disposal (TSD) (1.0 mile);
3. EPA RCRA Violators (0.25 mile);
4. EPA Comprehensive Environmental Response, Compensation and Liability Act (CERCLIS) (0.5 mile);

5. EPA Emergency Response Notification System (ERNS) (0.25 mile);
6. EPA (No Further Remedial Action Planned (NFRAP) Sites (0.5 mile);
7. State Superfund Sites (1.0 mile);
8. TNRCC Registered Storage Tank (RST) Facilities (0.25 mile);
9. TNRCC Leaking RST (LRST) Facilities (0.5mile);
10. TNRCC Spill Response List (0.25 mile);
11. State Solid Waste Registration (Landfills) List (0.5 mile);
12. Voluntary Clean up Program (VCP) (0.25 mile).

The approved FEIS identifies that only those sites located within and/or immediately adjacent (300 feet) to the proposed IH 10 West project's existing or proposed ROW required further detailed evaluation.

All proposed design refinements requiring additional ROW, the realignment of South Creek Drive, the high mast lighting areas within additional ROW, the eight additional detention basins, and the ADA access areas, all are located within the one-mile search radius; furthermore, all areas are located within the 300-foot area identified previously as needing further evaluation. Therefore, the hazardous materials evaluations identified in the FEIS remain valid.

The FEIS concludes that the proposed project will impact 131 permitted and non-regulated hazardous waste sites. There are 13 plugged, active, or dry hole oil or gas wells located within 500 feet of the proposed ROW. All of the sites are located within segments 4 and 5, where only limited amounts of ROW are necessary for the proposed improvements. Of the previously mentioned design refinements requiring additional ROW, only two high mast lighting areas and the detention basin located within the existing ROW at IH 10/Pin Oak are located within Segments 4 and 5 (SH 6 to Katy and Katy to FM 1489, respectively). No further hazardous materials investigations are recommended as a result of the proposed design refinements identified in this reevaluation.

10.9 VISUAL AND AESTHETIC QUALITIES

In December 2000, the Houston District Office of TxDOT adopted the Green Ribbon Project Report "Design Guidelines for the Construction of Highways, Streets & Bridges" and commenced incorporating the recommended highway aesthetics into the planning and design of the Katy Freeway Program (IH 10 West). This provides for design continuity and consistency that share a common aesthetic characteristic reflecting the regional characteristic of the corridor and offers opportunities for community involvement to enhance the corridor. The "Horizontal Theme" outlined in the Green Ribbon Project Report was adopted for implementation for the IH 10 West project.

The recommendations will influence such things as the bridge, wall, surface pavement, signage, and landscaping designs. From the planning recommendations, detailed design guidelines will be established to further define the type of surface treatments (shapes, sizes, colors) to blend and provide consistency of such things as the structure types to be used for the highway overpass bridges, with the overhead sign bridges, to the patterns to be used on the proposed retaining walls.

The goal is to add certain architectural improvements to the planned highway, so that the highway will become more of an asset to the communities that will be crossed. In addition, the local communities will be encouraged to adopt the chosen theme and enhance properties adjacent to the highway.

The proposed project will introduce a new visual element in the immediate area. However, IH 10 West is an existing transportation corridor with a high level of adjacent commercial development. Most land uses in the vicinity have developed to be compatible with the freeway. There is an existing ramp from IH 10 West to the METRO Addicks Park & Ride that is similar to the proposed ramp; therefore, visual and aesthetic impacts will be similar to existing conditions. The proposed access ramp relocation project conforms to the urban setting that exists in the vicinity of IH 10. Operation of the four MLs as a Toll Facility will require the construction and operation of toll areas at three locations. These toll areas will include overhead support structures, EZ-TAG automated readers (three in each direction) and pole-mounted cameras. The toll areas will be constructed within sections of IH 10 West that contain

a high level of adjacent commercial development. Visual impacts to the surrounding METRO Addicks Park & Ride access ramp relocation project and MLs as Toll Facility areas will be minimal.

The conclusion in the approved FEIS that the proposed IH 10 West project may have minimal impacts on visual quality and aesthetics from the highway, but may increase the amount of viewer exposure by increasing capacity remains valid.

The proposed design refinements mentioned within this reevaluation will not alter the visual quality and aesthetics within the proposed project area. The additional elevated Beltway 8 through frontage road lanes is approximately the same as the north and south at-grade frontage roads. The profile of the additional through frontage road lanes is approximately the same as the profile of the Beltway 8 mainlanes. The realignment of South Creek Drive will not alter the visual quality or aesthetics as this area is currently a business park and only 0.34 acre of ROW is required. That high mast lighting areas may cause disruptions to adjacent neighborhoods by creating unacceptable light levels at night was considered in the approved FEIS. The proposed detention basins will not have an adverse impact on visual quality or aesthetics, as the basins will be earthen structures and not concrete lined. The crossings of Mason Creek tributary and Turkey Creek, which are being converted from culverts to bridges, and the ADA access areas will also have no adverse affect on visual quality or aesthetics.

10.10 ENERGY REQUIREMENTS

Transportation-related energy is usually separated into two main categories: 1) direct energy, which is the fuel consumed by vehicles traveling on the road, and 2) indirect energy, which is the energy associated with the operation, construction, and maintenance of the road or related transportation facility. The proposed access ramp relocation project will not have an effect on direct energy. Energy in the form of various fossil fuels, electricity, and natural gas will be required during construction of the proposed ramp project. Long-term operation and maintenance activities will also consume energy resources, similar to existing conditions. However, energy requirements for the proposed ramp project will have a negligible impact on the energy

requirements of the overall region. In addition, there will be no changes in impacts to energy requirements as a result of the operation of the four MLs as a Toll Facility.

The conclusion in the approved FEIS that the overall amount of energy resources saved by the proposed project over its design life, due to improved traffic flow in the corridor, is expected to at least compensate for the energy resources required for its construction and maintenance remains valid. This conclusion pertains to the entire project design, including all design refinements mentioned in this reevaluation.

10.11 BICYCLE AND PEDESTRIAN FACILITIES

There are no sidewalks or designated bicycle lanes located along the frontage road or Old Katy Road in the immediate vicinity of the METRO Addicks Park & Ride. There will be no impacts to bicycle or pedestrian facilities as a result of the proposed ramp project. In addition, there will be no changes in impacts to bicycle and pedestrian facilities as a result of the operation of the four MLs as a Toll Facility.

The undertaking in the approved FEIS that throughout the length of the proposed project, continuous five-foot wide sidewalks will be provided, where roads are proposed remains valid. The undertaking that TxDOT will review and evaluate the City of Houston Regional Bikeway Plan, Local City Bicycle and Pedestrian Plans in accordance with the American Association of State Highway and Transportation Officials (AASHTO), the Clean Air Act Amendments of 1990 (CAAA), ADA, and the Transportation Equity Act for the 21st Century (TEA-21) guidelines and regulations in consideration to include bicycle and pedestrian elements within the proposed project remains valid. It will be TxDOT's objective to include bicycle and pedestrian facilities where connectivity to existing and proposed plans have been approved by the local jurisdiction and included in the MPO TIP. There will be no changes in the bicycle and pedestrian facilities proposed in the FEIS as a result of the proposed design refinements, other than the inclusion of the ADA access areas.

10.12 CONSTRUCTION PHASE IMPACTS

There will be air emissions generated during construction, excavation and pavement demolition activities associated with construction of the Toll Facility and the METRO Addicks Park & Ride access ramp relocation project. Construction impacts will be temporary and localized. Measures to control dust will be considered and incorporated into the final project design and construction specifications. The TxDOT evaluated the noise impacts for the proposed design refinements, including the Toll Facility and the construction impacts are discussed below. There are no surface waters located within the proposed METRO Addicks Park & Ride access ramp relocation project ROW. Since the total area of the proposed project will disturb more than five acres of land, an EPA NPDES general permit and a NOI will be required. The construction contractor will develop an SW3P to address the proposed ramp project, and measures will be taken to prevent or correct erosion that may develop during construction. Construction of the proposed ramp will be combined with construction of the proposed improvements to IH 10, which are discussed in the approved FEIS. In addition, there will be no changes in traffic impacts during construction as a result of the operation of the four MLs as a Toll Facility.

The conclusion in the approved FEIS with regard to construction impacts remains valid. The proposed design refinements will not alter the validity of the discussion on construction impacts; therefore, this conclusion pertains to the entire project design, including all design refinements mentioned in this reevaluation. As stated in the approved FEIS, ingress and egress to any affected private, commercial, or retail establishments will be maintained throughout the construction period. In addition, since construction of the proposed project may include continuous 24-hours, seven-days a week operations, construction of the proposed noise abatement barriers prior to construction of the roadway will be considered and implemented, if possible. This will aid in alleviating any above normal noise levels during the construction period. The 24-hours, seven-days a week operations will also shorten the length of the construction schedule, thereby, reducing the duration of construction noise within the proposed project.

10.13 SECONDARY AND CUMULATIVE IMPACTS

10.13.1 Secondary Impacts

The evaluation of whether or not the proposed project will yield secondary impacts generally focuses on the consideration of several factors as follows:

- The potential for population in-migration to fill project-related employment opportunities which in turn could induce residential development;

- The potential for increased localized demands for goods and services at levels sufficient to induce commercial development;

- The potential for the inducement of peripheral development should the proposed project extend public infrastructure and other improvements to areas presently devoid of these improvements;

- The potential for inducement of peripheral growth should the proposed project remove an obstacle for growth through a reclassification of the land use designations of the project site, i.e. general plan designation.

Toll Facility/Tee Ramp

There are no substantial changes resulting from the Toll Facility to the project alignment or preferred transit alternative since the FEIS was completed and the ROD was signed; therefore, there will be no change in secondary impacts as a result of the operation of the four MLs as a Toll Facility.

Socio-Economic Environment

In the long-term, property tax revenues within Harris County will slightly decrease since the property that will be acquired will not be taxed. Harris County encompasses more than 1.1 million acres; the acreage that will be acquired represents less than 0.001 percent of the total County land area. No substantial impact to county property tax revenues will be anticipated as a result of the implementation of the proposed ramp project. There will be no other secondary impacts to the socioeconomic environment as a result of the operation of the proposed access ramp relocation project. In addition, there will be no changes in secondary

impacts to the socio-economic environment as a result of the operation of the four MLs as a Toll Facility.

There will be no changes in secondary impacts to the natural environment as a result of the operation of the four MLs as a Toll Facility.

Secondary Impacts to Other Design Refinements

The conclusion in the approved FEIS that there will be minimal impacts to Segments 1-3 (Taylor Street to IH 610, IH 610 to Beltway 8, and Beltway 8 to SH 6, respectively) and that the proposed IH 10 project has the potential for secondary impacts to Segments 4 and 5 (SH 6 to Katy and Katy to FM 1489, respectively) remains valid.

The proposed design refinements will not involve changes to the following areas identified in the approved FEIS:

- The potential for population in-migration to fill project-related employment opportunities which in turn could induce residential development;
- The potential for increased localized demands for goods and services at levels sufficient to induce commercial development;
- The potential for the inducement of peripheral development should the proposed project extend public infrastructure and other improvements to areas presently devoid of these improvements;
- The potential for inducement of peripheral growth should the proposed project remove an obstacle for growth through a reclassification of the land use designations of the project site, i.e. general plan designation;
- The Social Environment;
- The Natural Environment;

- Neighborhood Cohesion/Quality;
- Access to Community Facilities and Services;
- Public Health and Safety.

The proposed elevated Beltway 8 frontage roads are located within Segment 3 and are considered to have minimal secondary impacts, as the proposed elevated frontage roads will follow the existing Beltway 8 alignment and relieve congestion at the depressed IH 10/Beltway 8 frontage road intersection.

The realignment of South Creek Drive is located in Segment 4 and requires minimal ROW acquisition (0.34 acre) within the Park 10 business park; therefore no secondary impacts are anticipated.

The high mast lighting areas are located within Segments 2 through 5, require minimal ROW acquisition (0.34 acre for 24 locations) and were discussed in the approved FEIS; therefore, no changes to the secondary impacts from the FEIS in regard to high mast lighting will occur.
The eight additional detention basins are located in Segments 2 through 5 and will aid in the reduction of flooding within the proposed project area as well as aid in water quality prior to the roadway runoff entering the various creeks and tributaries within the proposed project area; therefore, minimal secondary impacts are anticipated.

Turkey Creek is located in Segment 3 and Mason Creek tributary is located in Segment 4. There will be no secondary impacts from the redesign of the culverts to bridges.

The ADA access areas are located in Segments 2 and 3. There will be no secondary impacts, as the ADA access will provide improved pedestrian access within the proposed project.

10.13.2 Cumulative Impacts

Cumulative impacts are those refinements to the physical, biological, and socio-economic environments that will result from the combination of construction, operation, and associated impacts resulting from the proposed action when added to other past, present, and reasonably foreseeable actions. Past projects, or those implemented or built before 2002, can be considered part of the existing conditions environment baseline presented in this reevaluation. Included within the concept of past projects are all maintenance activities, land development projects, and other actions that occurred before detailed analysis began on this reevaluation.

Cumulative Impacts of Toll Facility/Tee Ramp

There will be no changes in cumulative impacts as a result of the construction of the proposed METRO Addicks Park & Ride access ramp relocation project or operation of the four MLs as a Toll Facility.

Cumulative Impacts of Other Design Refinements

The conclusion in the approved FEIS that major impacts to Segments 1-3 (Taylor Street to IH 610, IH 610 to Beltway 8, and Beltway 8 to SH 6, respectively) are not anticipated and that major impacts may be anticipated to Segments 4 and 5 (SH 6 to Katy and Katy to FM 1489, respectively) remains valid. The proposed design refinements, elevated Beltway 8 frontage roads (Segment 3); the realignment of South Creek Drive (Segment 4); high mast lighting (Segments 2 through 5); the addition of eight detention basins (Segments 2 through 5); changes from culverts to bridges at Turkey Creek (Segment 3) and Mason Creek tributary (Segment 4); and the addition of ADA access areas (Segments 2 and 3); are not considered substantial and will not alter the conclusion mentioned above and in the approved FEIS.

10.14 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term commitments will include labor, capital, and fossil fuels that result directly from construction activities and indirectly from the provision of services to the site during construction. Physical systems will be modified due to the effects of the construction. The

necessity for infrastructure will exert a long-term impact on the environment of the area of the site, but no impact on the area-wide environment. In the long-term, the entire surrounding community will benefit from the implementation of the Toll Facility. Benefits of the Toll Facility include an accelerated IH 10 West reconstruction schedule, which will reduce the total construction period and associated traffic delays; improved mobility within the project area and along IH 10; decreased traffic congestion; reduced long-term traffic delays; improved air quality; and fewer traffic accidents. As a result of users electing to travel in the Toll Facility, demand is reduced for the general-purpose SOV lanes thereby improving mobility for local, regional, and intrastate users of the toll-free general-purpose lanes. In the long-term, air quality and traffic safety in the area will improve since traffic congestion within the project limits will be reduced.

The conclusion in the approved FEIS that the proposed project will involve short-term impacts, such as business and resident disruptions, local traffic congestion, and access problems due to construction operations remains valid. However, traffic growth, congestion delays, increasing accident rates and the need for additional evacuation routes from the coastal region make these improvements substantial. The proposed project is consistent with state and local plans, programs, and policies to improve the overall access to the area over the long-term. Thus, the short-term impacts are consistent with the maintenance and enhancement of long-term productivity for the state and the local area. The proposed project will involve no short-term construction impacts and will also do nothing to maintain or enhance long-term productivity.

10.15 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Construction, maintenance, and operation of the proposed ramp and Toll Facility will require the commitment of various resources. These resources include the commitment of labor, capital, energy, biological resources, building materials, and land resources. Short-term commitments of labor, capital, and fossil fuels will result directly from construction of the facilities, and indirectly from the provisions of services to the site during construction. Long-term commitments of resources will result directly from maintenance and operation of

the facilities. Building materials will also be long-term commitments. Since the proposed use of the land is for roadway facilities, the commitment of land resources is long-term.

The conclusion in the approved FEIS that irreversible and irretrievable commitments of resources will be outweighed based upon the belief that citizens will benefit from an improved transportation system remains valid. These benefits include improved mobility and access, increased safety, and time savings.

11. AVOIDANCE, MINIMIZATION AND MITIGATION

Since the issuance of the ROD, the avoidance, minimization and mitigation strategies proposed in the FEIS have been further refined and developed.

11.1 BENEFICIAL LANDSCAPING

The undertaking in the FEIS that the landscaping design of the proposed project will emphasize the use of native plants, where practicable, in accordance with the guidelines for beneficial landscape design remains valid for all the proposed design refinements mentioned in this reevaluation. Care will be taken to salvage native plants on the project site for replanting where possible. When salvageable plants are not available, commercially grown plants will be substituted. Steps will be taken in the design process to minimize impact to the natural habitat and prevent pollution by reducing the need for fertilizers or pesticides. Trimmings from plants in the landscaping will be recycled for mulch, and the resulting mulch used to reduce runoff and increase water use efficiency.

11.2 HAZARDOUS MATERIALS

The construction contractor will take appropriate measures to prevent, minimize, and control hazardous materials spills in the construction areas. Removal and disposal of all materials by the contractor will be in compliance with applicable federal and state laws, with no degradation of ambient water quality.

The undertaking in the FEIS that those sites within the existing and proposed ROW that pose a potential hazardous materials impact will be further investigated prior to construction during the ROW acquisition process remains valid for all proposed design refinements mentioned in this reevaluation. Mitigation for possible hazardous materials within the existing and proposed ROW will also occur during the ROW acquisition process. Older houses and buildings will be inspected for asbestos and other hazardous materials before demolition. Any contaminated buildings will be cleaned up according to federal and State regulatory standards prior to demolition.

11.3 NOISE

The reevaluation of the traffic noise analysis indicates that the proposed project will result in noise impacts and that noise barriers were determined to be both feasible and reasonable and are proposed for incorporation into the proposed project. Table 7 lists the 15 proposed noise barriers, which includes all of the noise barriers that were proposed in the approved FEIS as well as additional noise barriers that resulted from this reevaluation. The noise barrier locations are also contained in Exhibit 1.

Any subsequent design refinements may require an additional reevaluation of the proposed noise barriers. The final decision to construct the proposed noise barriers will be made upon completion of the project design and the public involvement process.

TABLE 7: PROPOSED NOISE BARRIERS

Barrier Number	Location
4	South side of IH 10; east of Kirkwood Drive
5	North side of IH 10; at west Forest Drive
6	North side of IH 10; east of Kirkwood Drive
7	North side of IH 10; east of Gessner Road
9	North side of IH 10; from Adkin Road to Voss Road
10	North side of IH 10; from Voss Road to Bingle Road
11A	South side of IH 10; west of Voss Road to Briar Branch
11B	South side of IH 10; Hunter's Creek to Hickory Hollow
12	South side of IH 10; west of Chimney Rock Drive
13	North side of IH 10; Spring Branch to east of Wirt Road

14	South side of IH 10; west of Chimney Rock Drive
15	South side of IH 10; southeast corner of Chimney Rock Dr. (Saddlebrook)
16B	South side of IH 10; International Boulevard to Antoine Drive
17B	South side of IH 10; Antoine Drive to west of Silber Road
18	South side of IH 10; east of Silber Road

11.4 WATERS OF THE U.S., INCLUDING WETLANDS

The proposed Toll Facility, including the METRO Addicks Park & Ride access ramp relocation project will not impact jurisdictional waters of the U.S., including wetlands (USACE 2002). Since this is the case, avoidance, minimization and mitigation are not required for wetlands resources.

The conclusion in the FEIS that any potential impacts to jurisdictional wetlands will be mitigated according to USACE direction remains valid. When possible, potential mitigation sites may include the proposed detention facilities.

11.5 CULTURAL RESOURCES

In the event that historical or archeological resources are located within the project limits, prior to or during construction of the METRO Addicks Park & Ride access ramp, work in the immediate area will cease and the SHPO will be contacted. There will be no impact to historic or archeological resources.

The only identified cultural resource that merits avoidance, minimization, or mitigation is the Oscar Abstein Cemetery. The cemetery is believed to contain two to four graves and cannot be avoided. A plan has been developed to excavate and reinter the graves at another cemetery. The plan was developed in compliance with the SHPO's Historic Cemetery Guidelines and the Texas Health and Safety Code. The plan has been submitted to the SHPO and awaits their concurrence. After the SHPO's concurrence is received, the plan will be submitted to Attorney General's office to seek the approval of the county court of law. Upon receipt of the court's approval, the graves will be excavated in accordance with the plan and reinterred in the Washington Glenwood Cemetery in Houston.

In the event that other unanticipated cultural materials are found during construction, work will cease in the immediate area of the find, and TxDOT archeological staff will be contacted to initiate accidental discovery procedures under the provisions of the Programmatic Agreement signed by TxDOT, the SHPO, FHWA, and the Advisory Council on Historic Preservation, and in conformance with TxDOT's Emergency Discovery Guidelines.

12. SECTION 4(F) STATEMENT

As noted in the approved FEIS, two properties designated as public parkland will be acquired as a result of the proposed project. The two unnamed parkland properties are located within the City of Spring Valley, Texas, on the north side of IH 10 and at the intersection of IH 10 and Bingle Road. A Section 4(f) statement was prepared and is appended to the approved FEIS. Based on the considerations mentioned in the Section 4(f) statement, there is no feasible and prudent alternative to the use of land from the developed and undeveloped parklands in the City of Spring Valley, Texas, and the proposed project includes all possible planning to minimize harm to the Section 4(f) properties resulting from such use.

In addition, the frontage roads from Studemont Drive to Taylor Street included in the approved FEIS have been eliminated from the proposed project design. The elimination of these frontage roads avoids impacts to White Oak Bayou/Stude Park. As a result, there will be no impacts to this Section 4(f) property as a result of implementation of the proposed project. No impacts to Section 4(f) properties will occur as a result of the design and operational refinements to the proposed project.

13. CONCLUSION

The environmental documentation for this proposed project has been reviewed, and it has been determined that the proposed design and operational refinements and proposed Toll Facility operation have no effects that would warrant additional analysis. The TxDOT will seek input on this reevaluation from the public in the form of a public meeting, which will be conducted once notice to proceed is received from the FHWA.

Since no effects have resulted from the evaluation of the assessed areas as a result of the proposed design and operational refinements and proposed Toll Facility operations, further analysis of the FEIS or this reevaluation is not warranted.