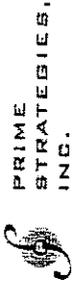


# *Where are we?*

## Building Blocks for the City's Locally Preferred Alternative



SH-121T

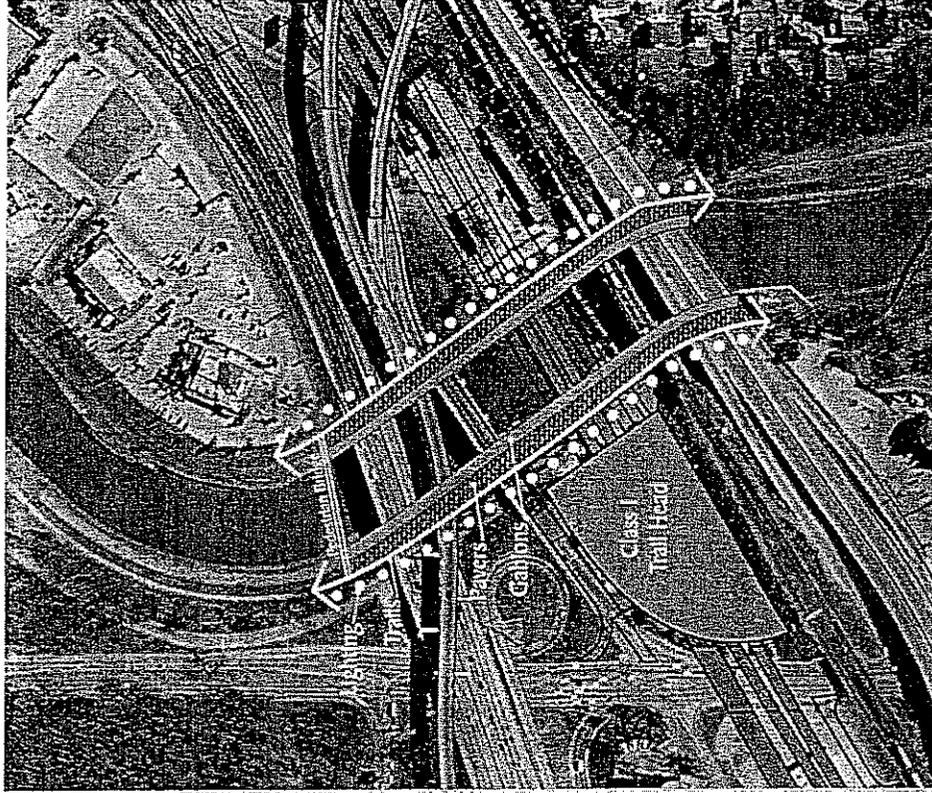




## ***Emerging Consensus***

- Trinity River Vision Mitigation/Enhancement Program
- PDT buffers where possible (no taking of existing homes or businesses)
- 100-foot Median where feasible
- Split roadway profiles—separate lanes where possible
- \$8 M for enhancements plus NTTA's estimated \$4 M
- Finalize and execute agreement ("MOU") among project partners for process to create Corridor Enhancement/Mitigation Master Plan

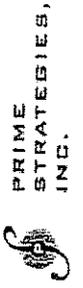
# Trinity River Master Plan Vision IH-30/University



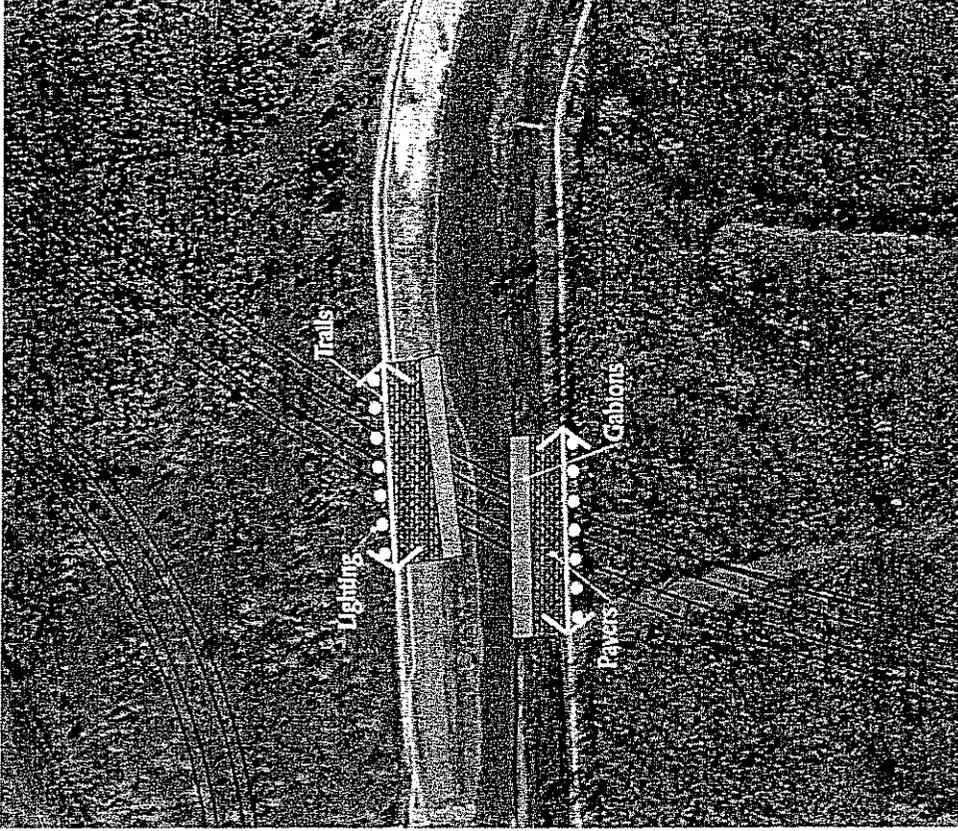
University and I-30:  
River and Trail Improvements



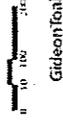
SH-121T



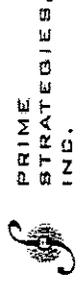
# Trinity River Master Plan Vision Near Bryant Irvin

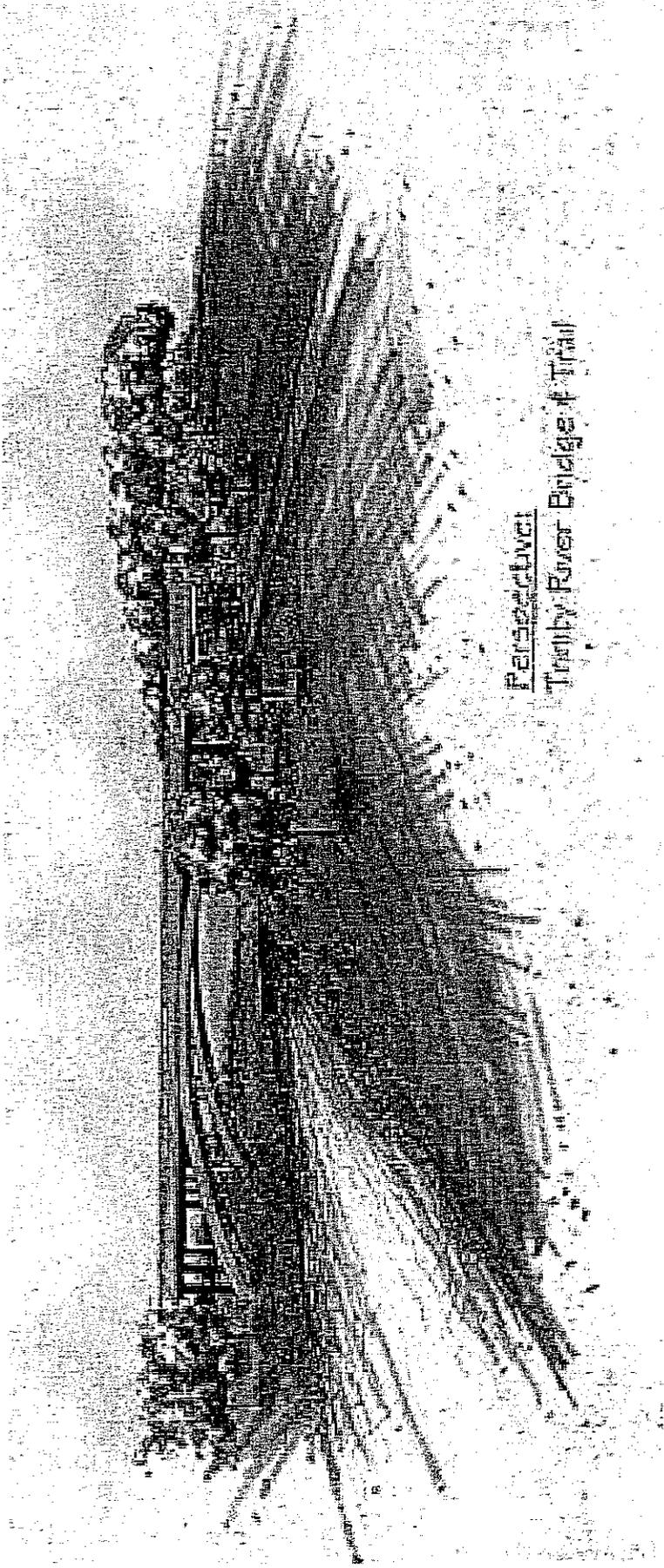


Crossing Near Bryant Irvin:  
River and Trail Improvements



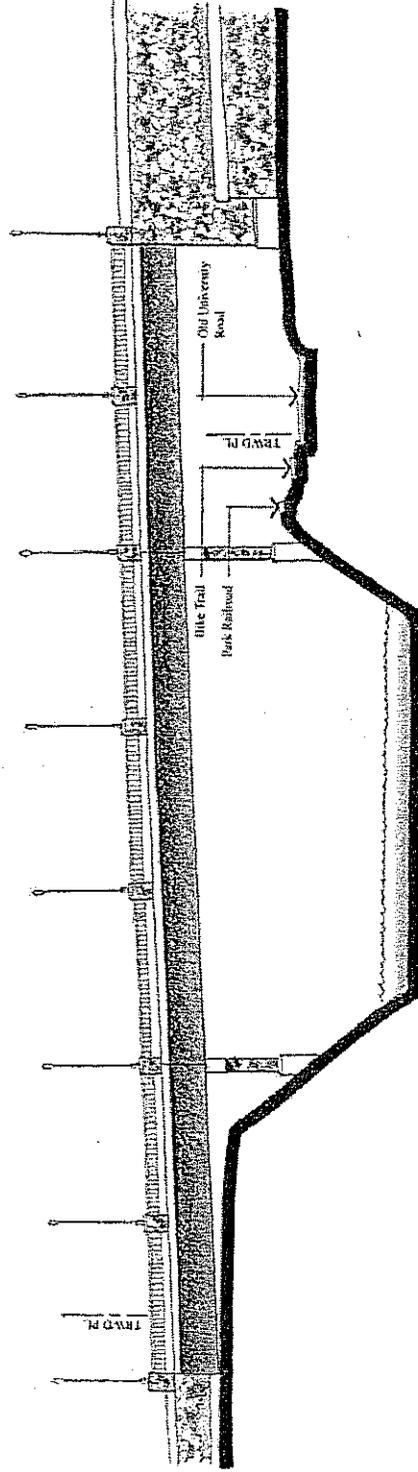
SH-121T





Periscope  
Tribby River Bridge # 1111

# NTTA Bridge Design Alternative



Steel I-Beam Bridge

January 10, 2003

Horizontal Scale in Feet 0 10 20 30 40

Vertical Scale in Feet 0 10 20

SH 121 T - Crossing at the Clear Fork of the Trinity River  
near University Drive

**Carter Burgess**

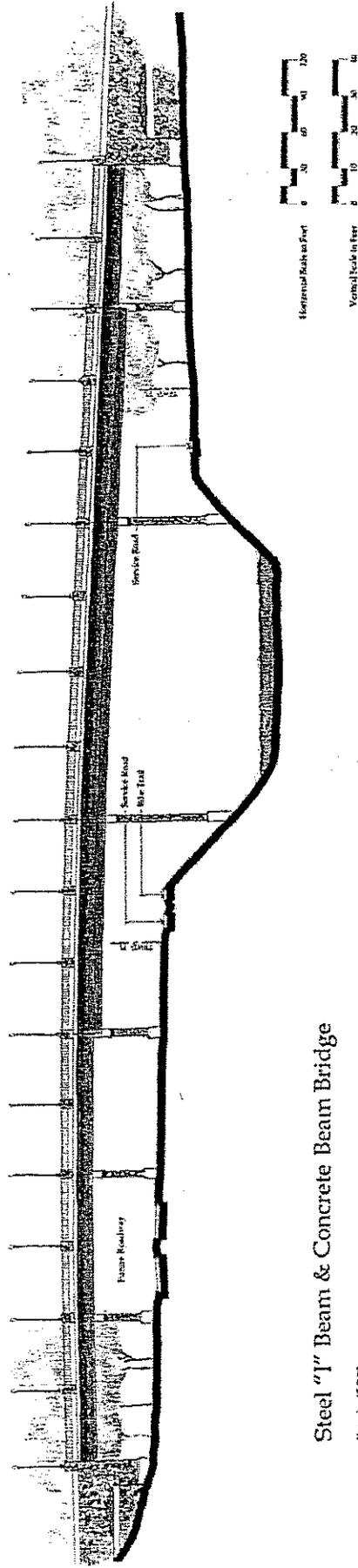


SH-121T



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INC.

# NTTA Bridge Design Alternative



Steel "I" Beam & Concrete Beam Bridge

December 17, 2010

SH 121 T - Crossing at the Clear Fork of the Trinity River

Cartier Burgess

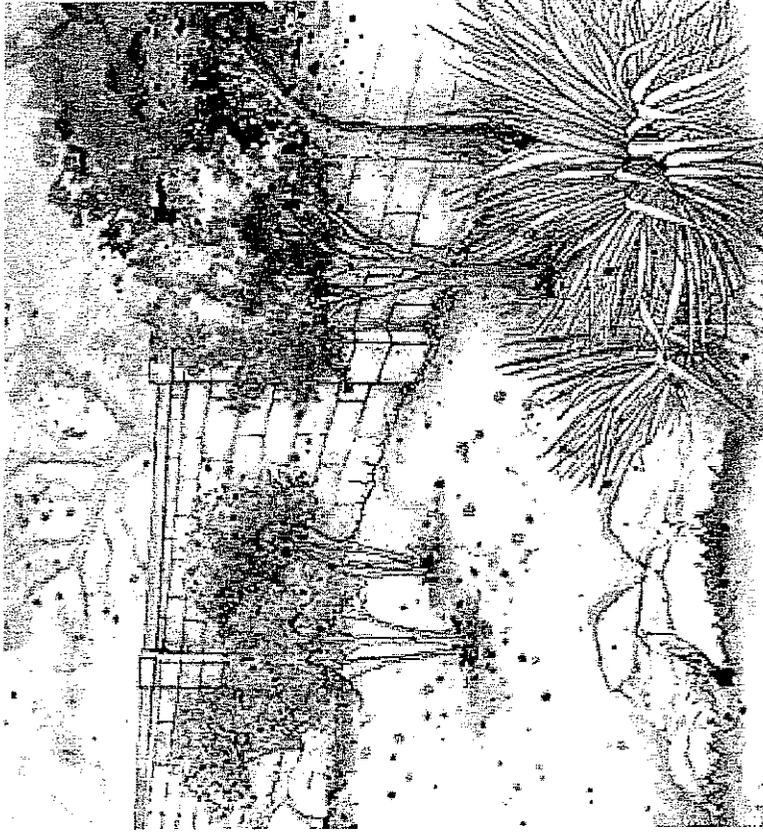


SH-121T

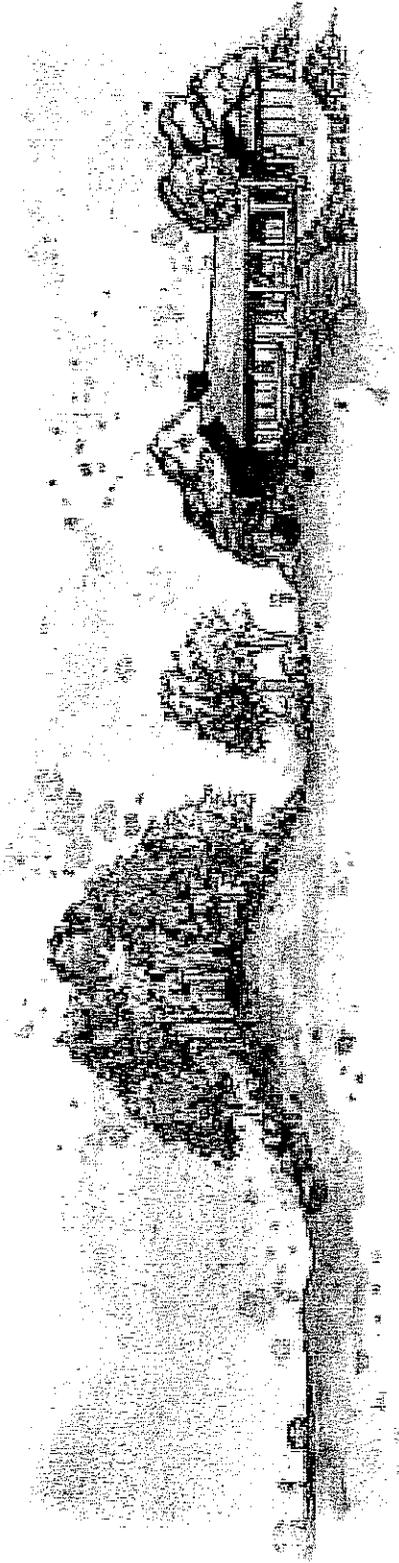


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# Landscaped Buffers



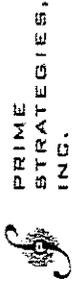
# Berm Buffers



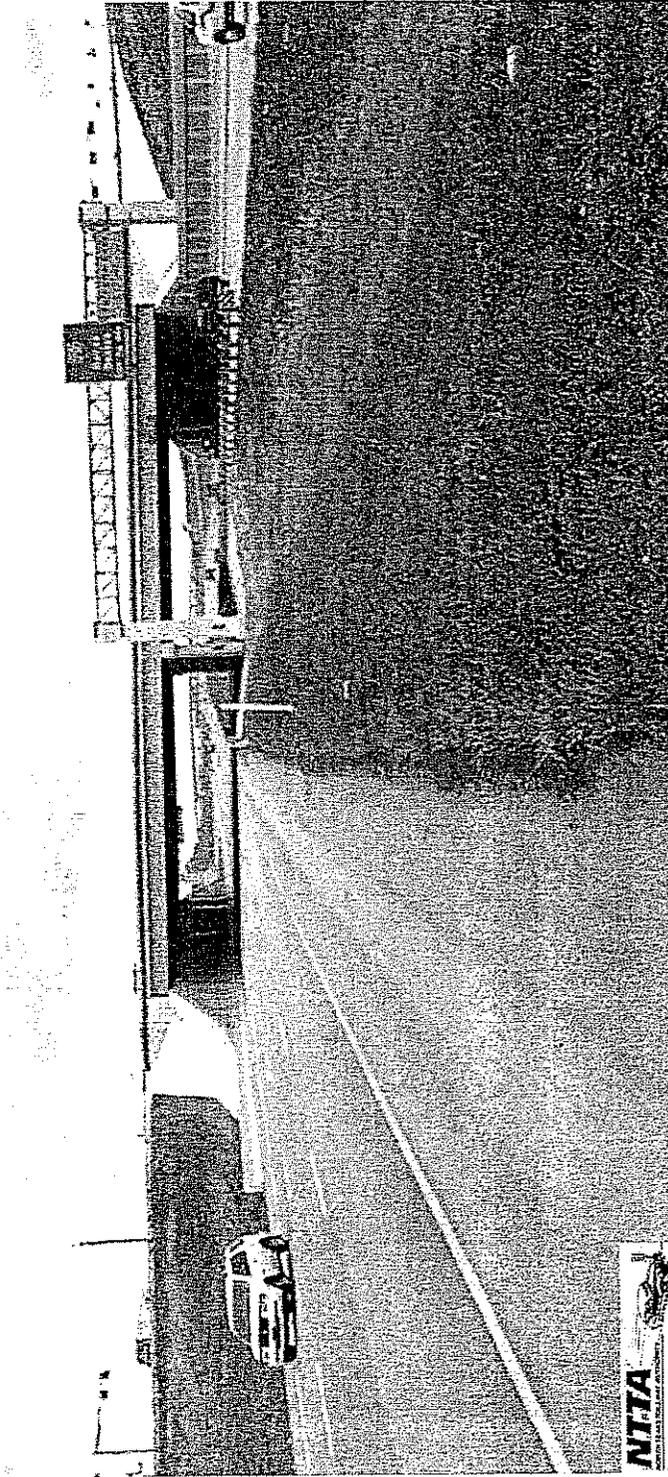
# Berm & Wall Buffers



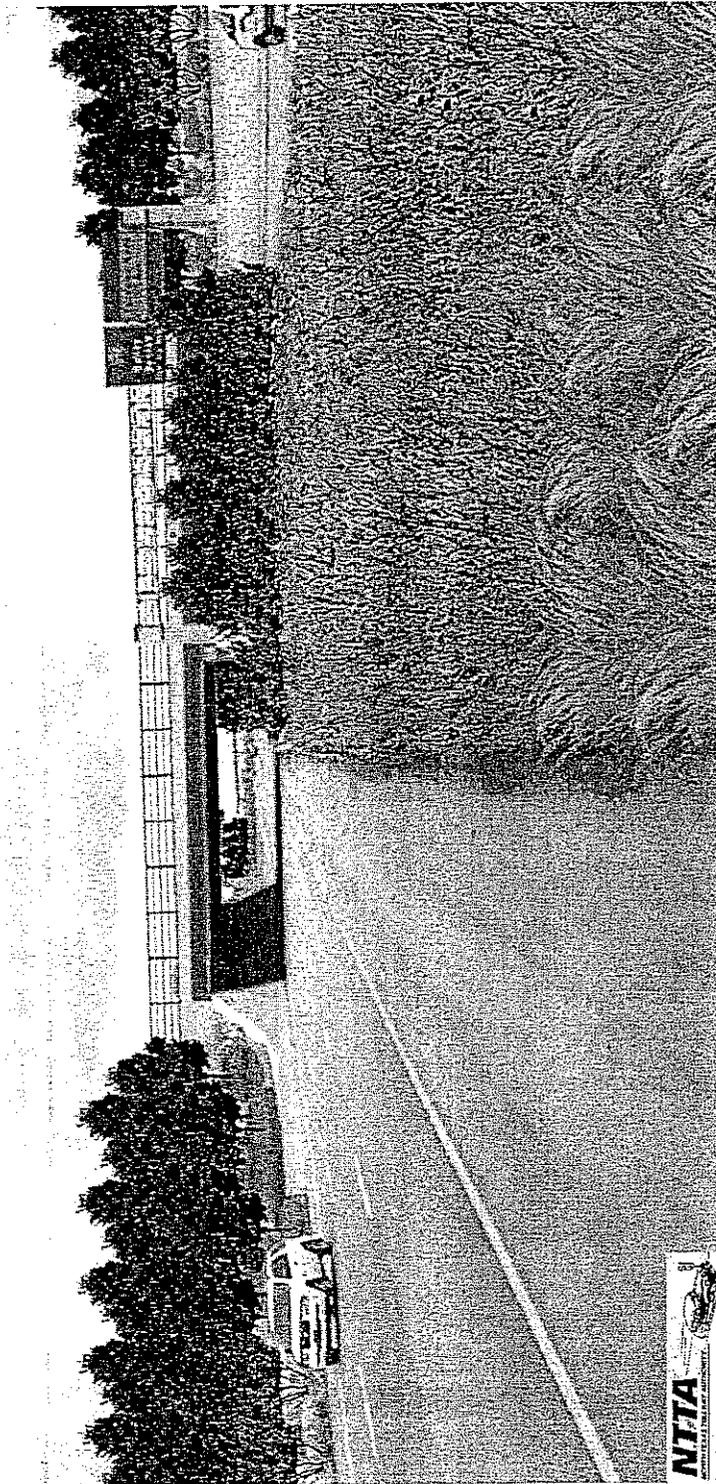
SH-121T



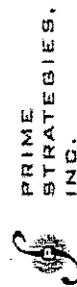
# Proposed NTTA Landscaping Before



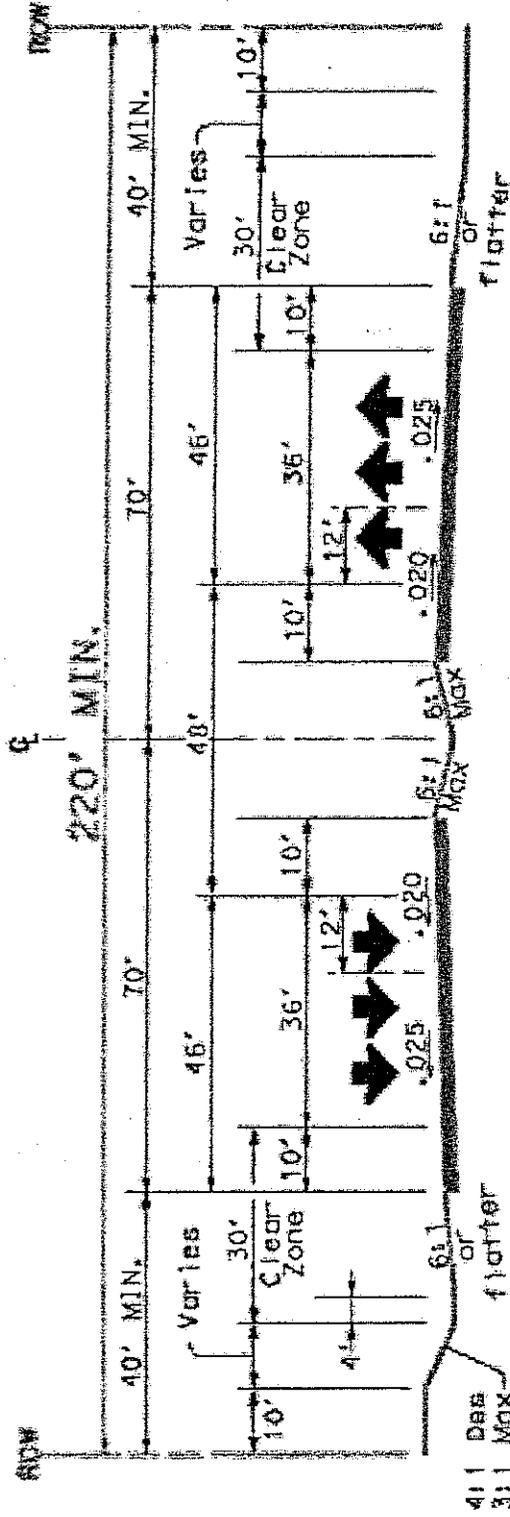
# Proposed NTTA Landscaping After



SH-121T



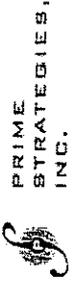
# Typical Tollway Cross-Section



Typical Section  
 Current Construction – 2 Lanes  
 Ultimate Construction – 3 Lanes  
 (No Median Widening or Buffers)

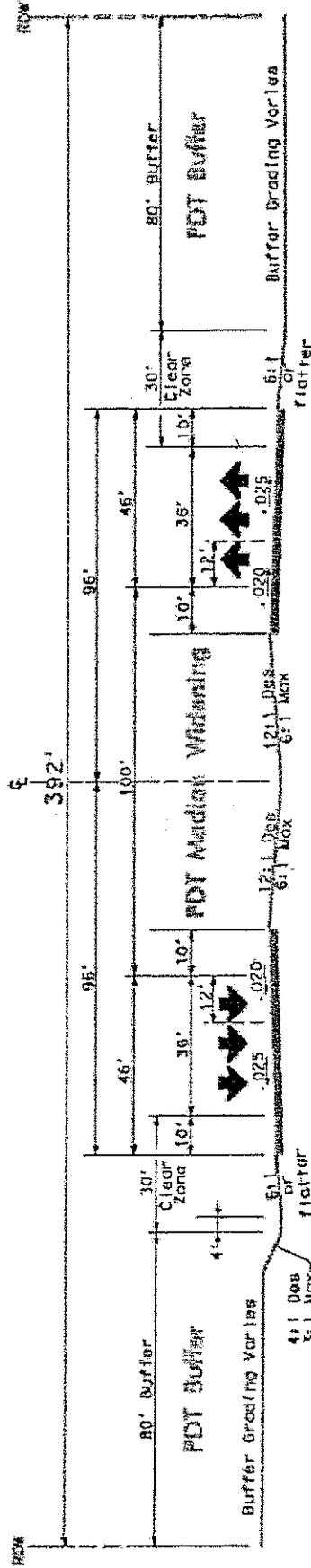


SH-121T



# Alt. A and Alt. C Cross-Section

PDT proposed 160' buffer (80' on each side) for entire project.



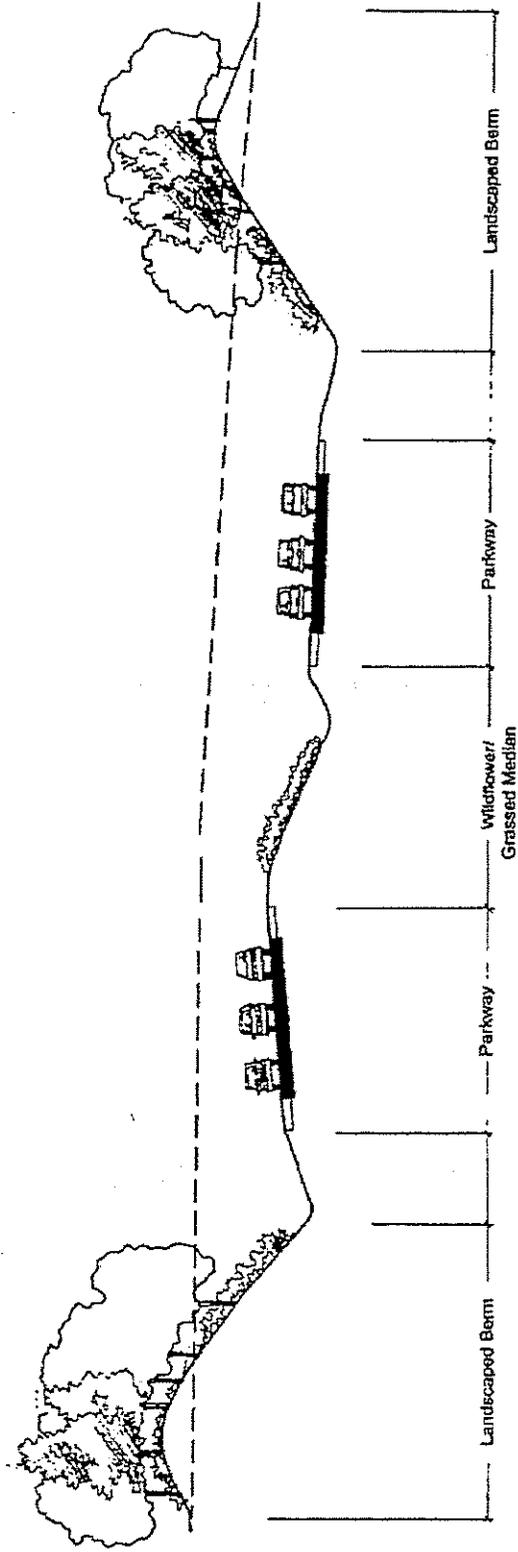
Typical Section  
 Current Construction - 2 Lanes  
 Ultimate Construction - 3 Lanes  
 (Includes PDT Median Widening and Buffers)



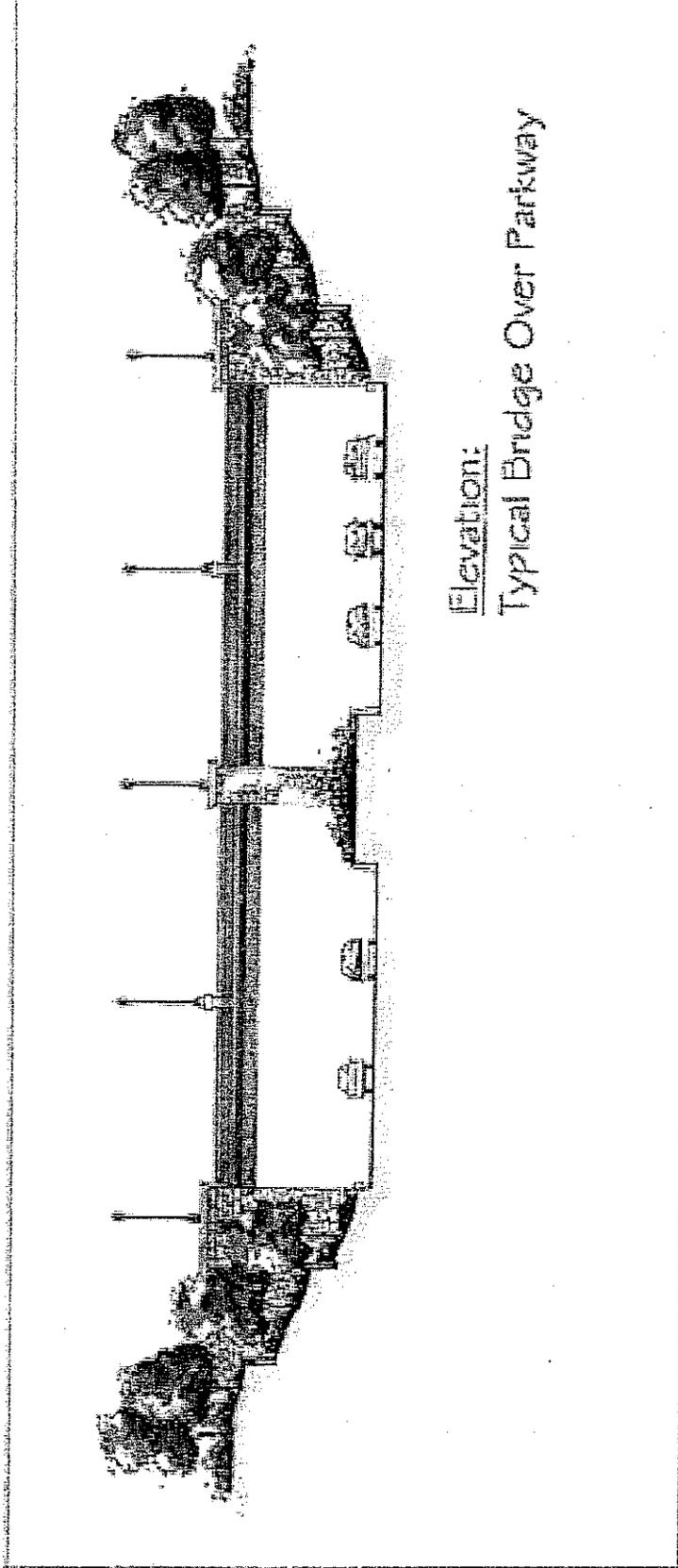
SH-121T



Figure IV-1 Split Profile Design (Cross Section)

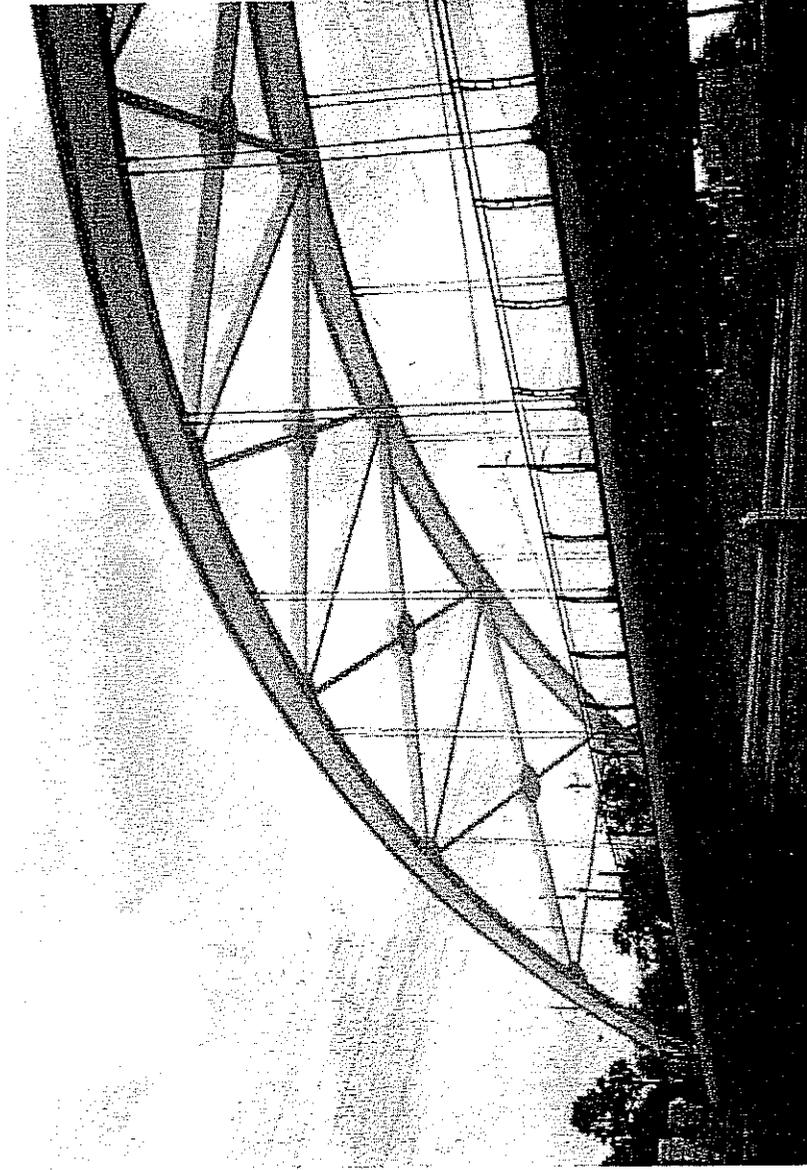


# PDT Local Road Bridge Alternative

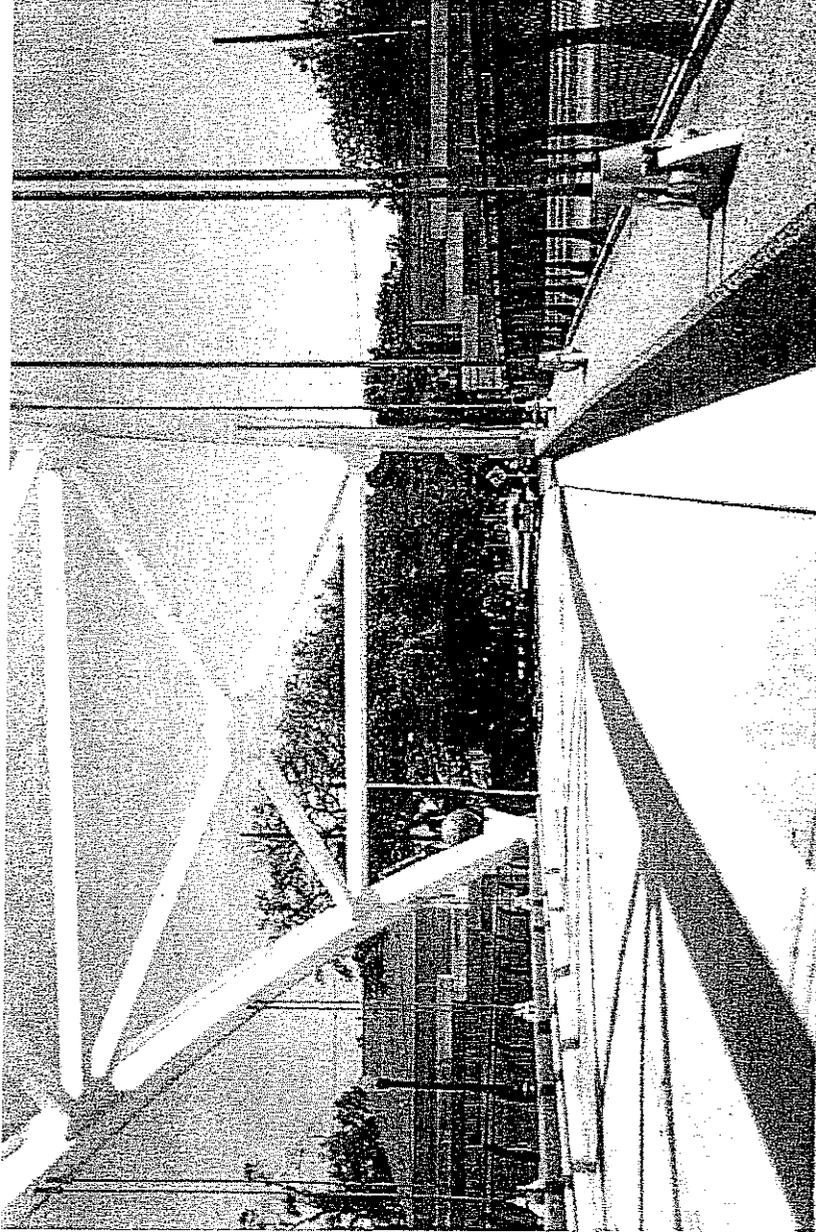


Elevation:  
Typical Bridge Over Parkway

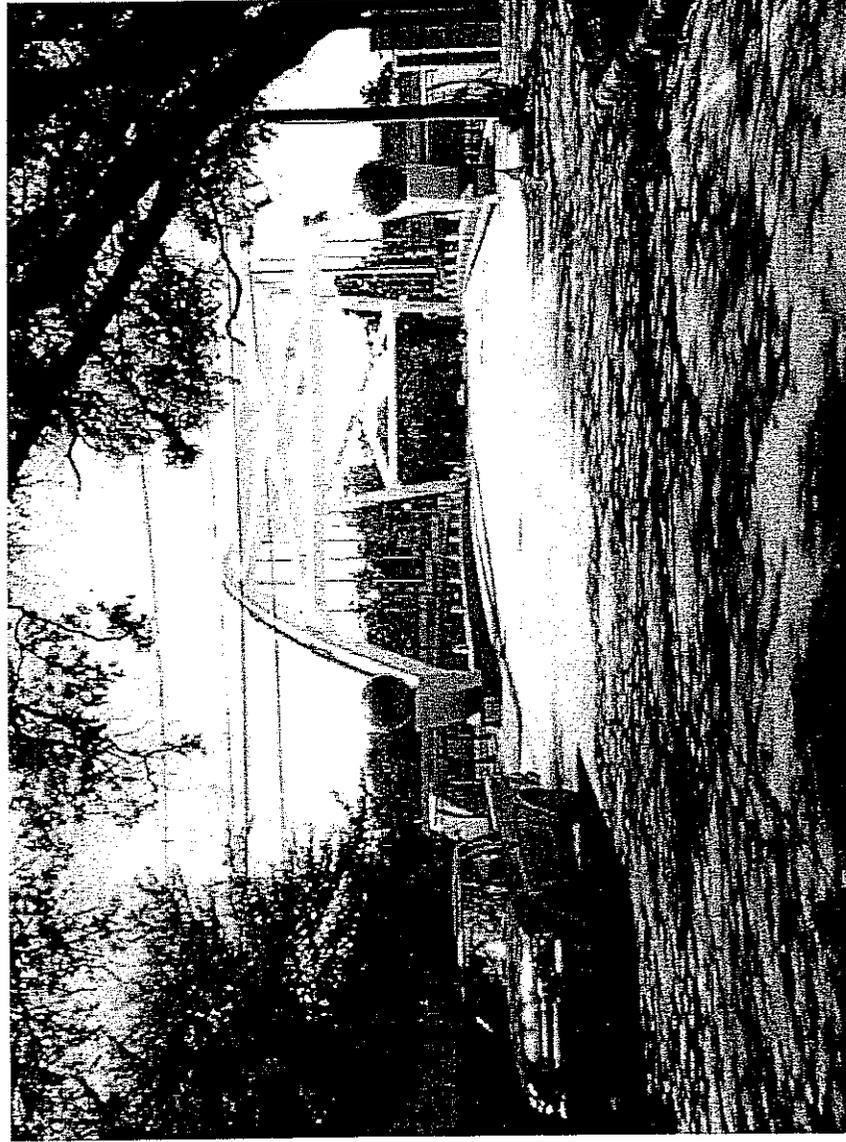
# I-59 in Houston Local Bridge



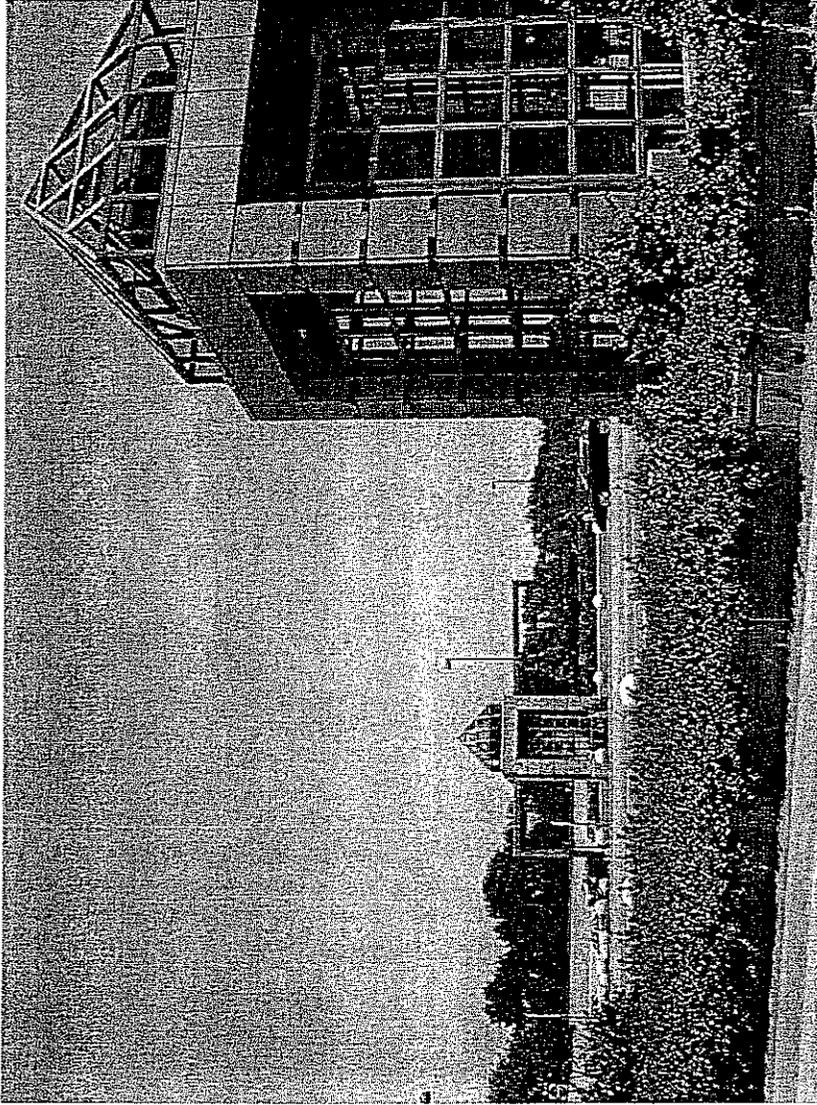
# I-59 Local Bridge Main Lane



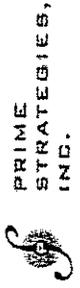
# I-59 Local Bridge Neighborhood Gateway



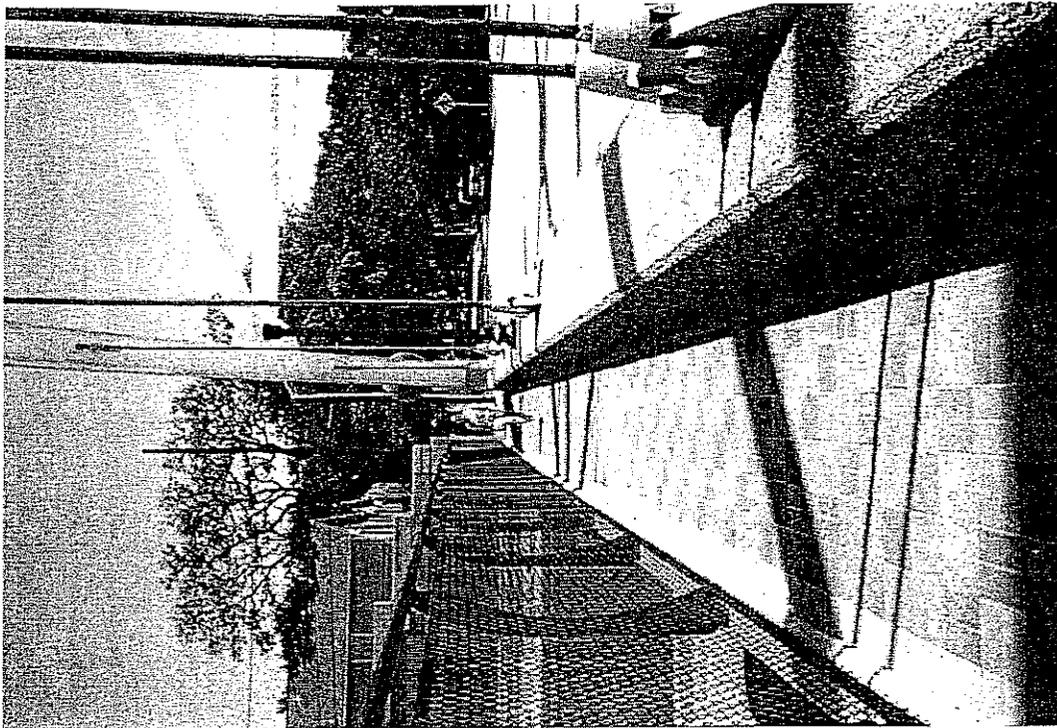
# Central Expressway Local Road Gateway



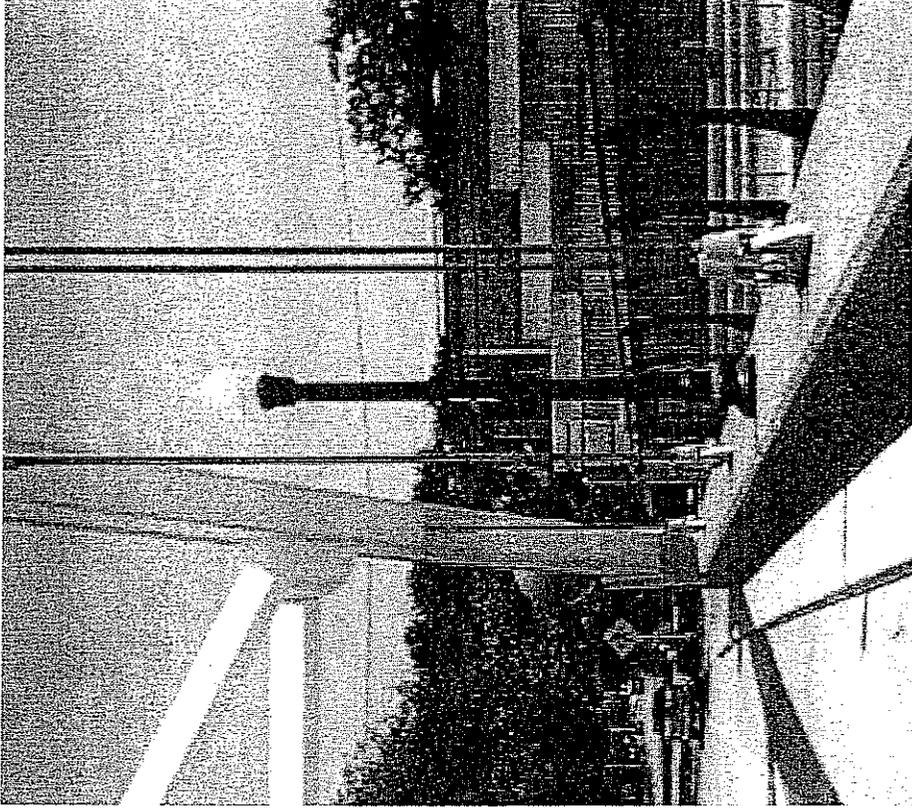
SH-121T



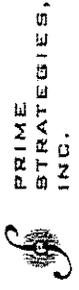
# I-59 Bridge Sidewalk



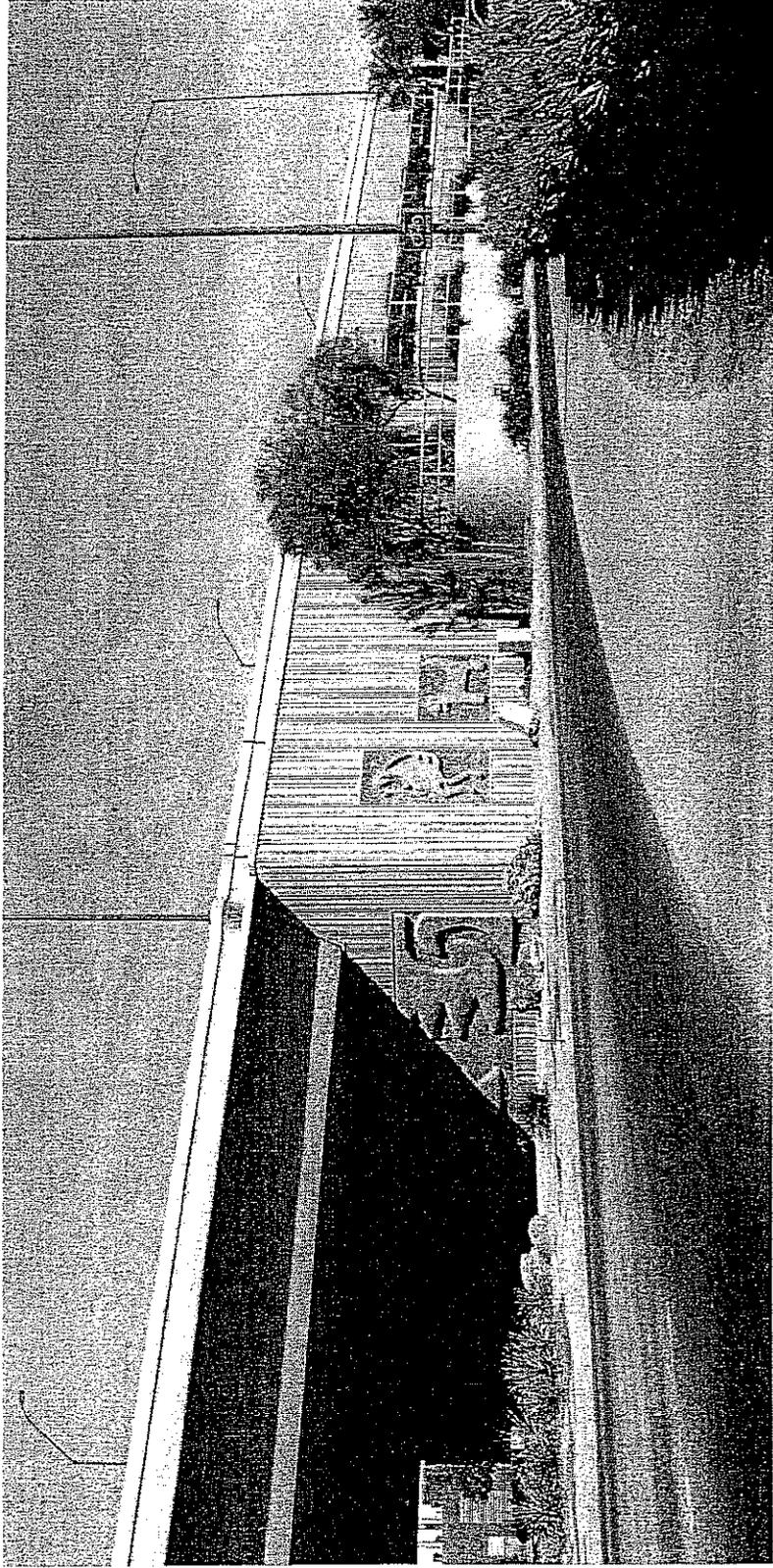
# I-59 Bridge Lighting



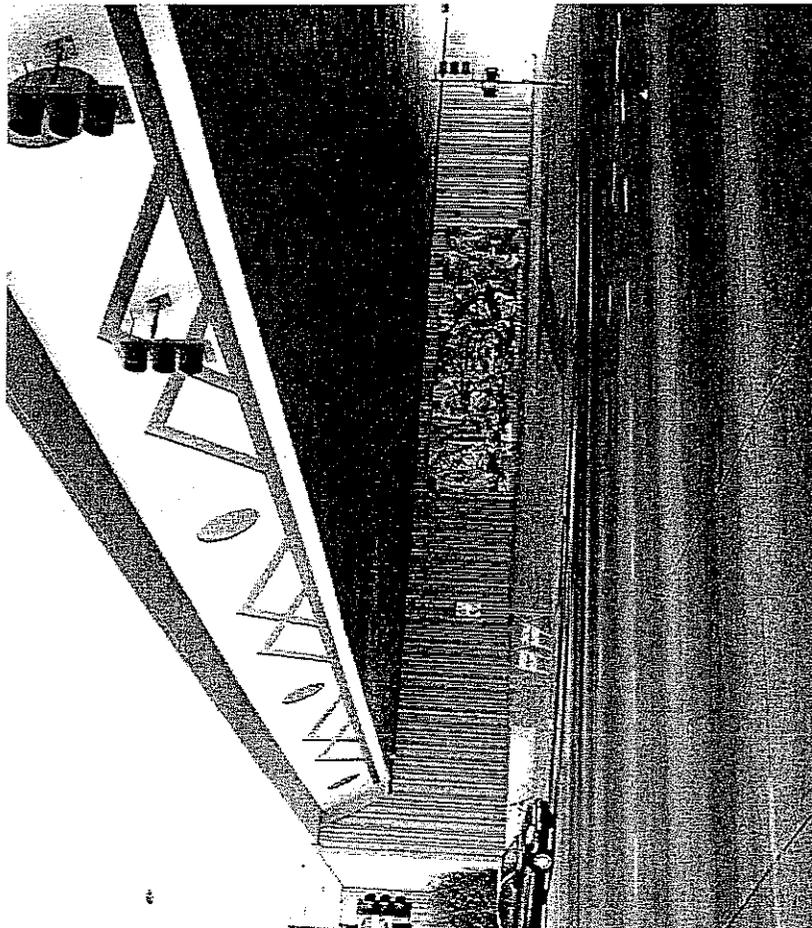
SH-121T



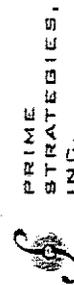
# Squaw Peak Parkway Architectural Enhancements



# Squaw Peak Parkway Enhancements



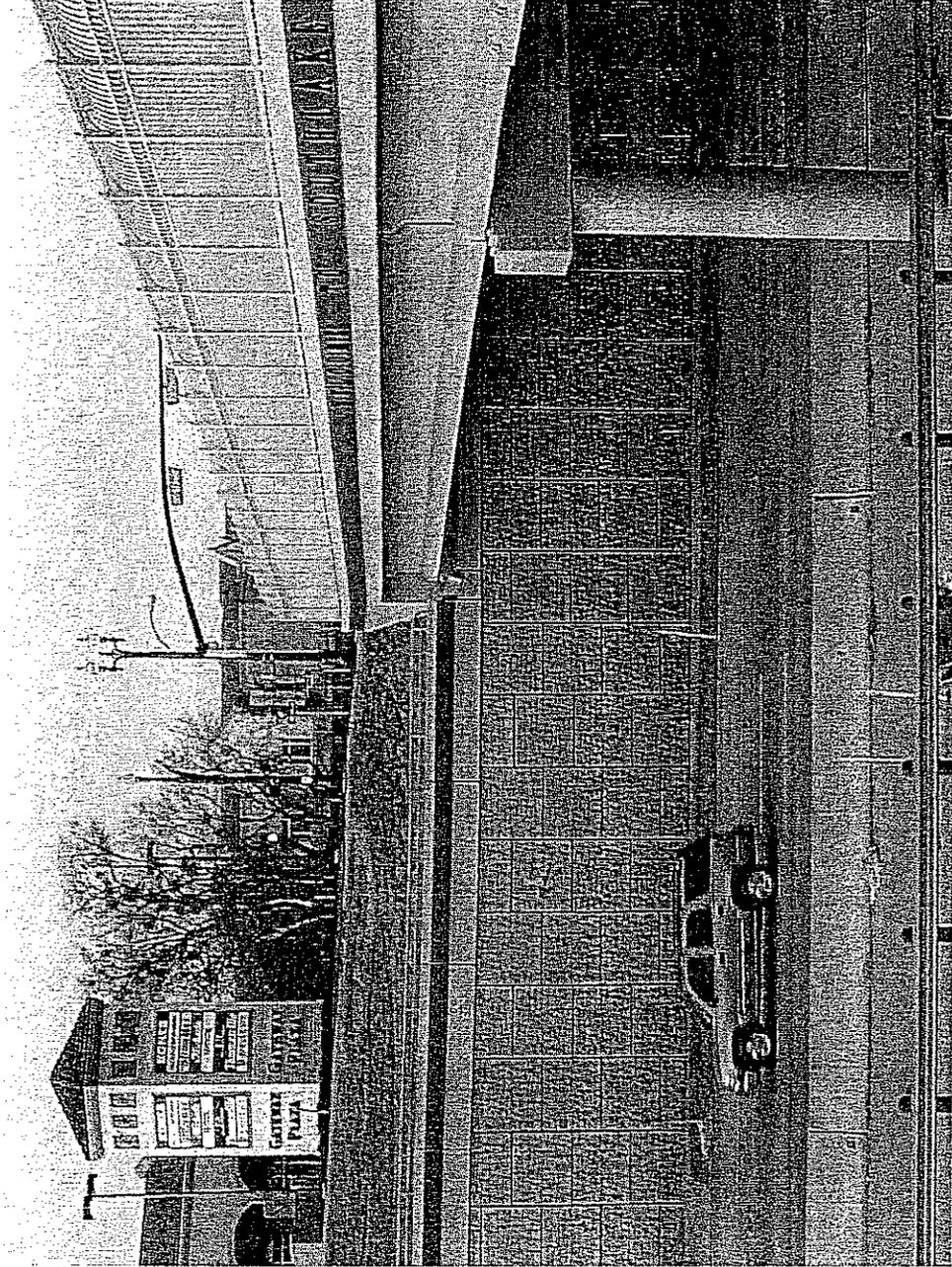
SH-121T



# Westlake Blvd. Crossing at SH-114



# Southlake Boulevard at SH-114

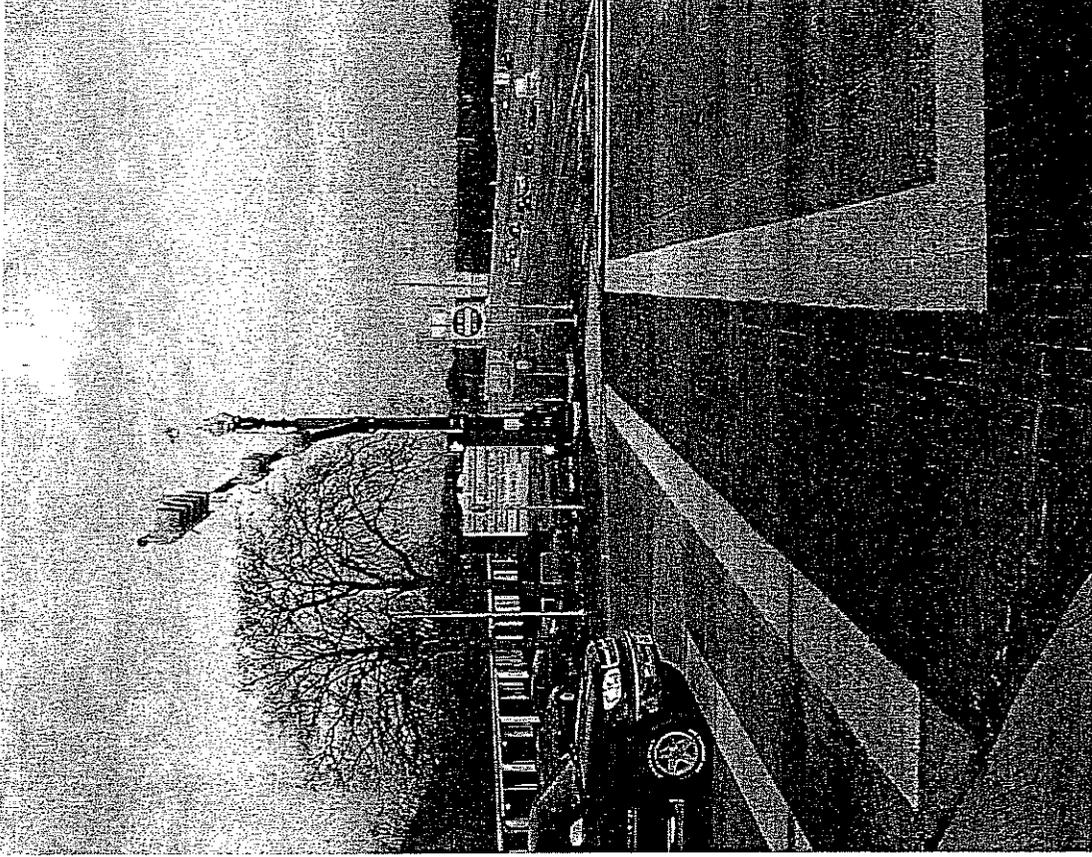


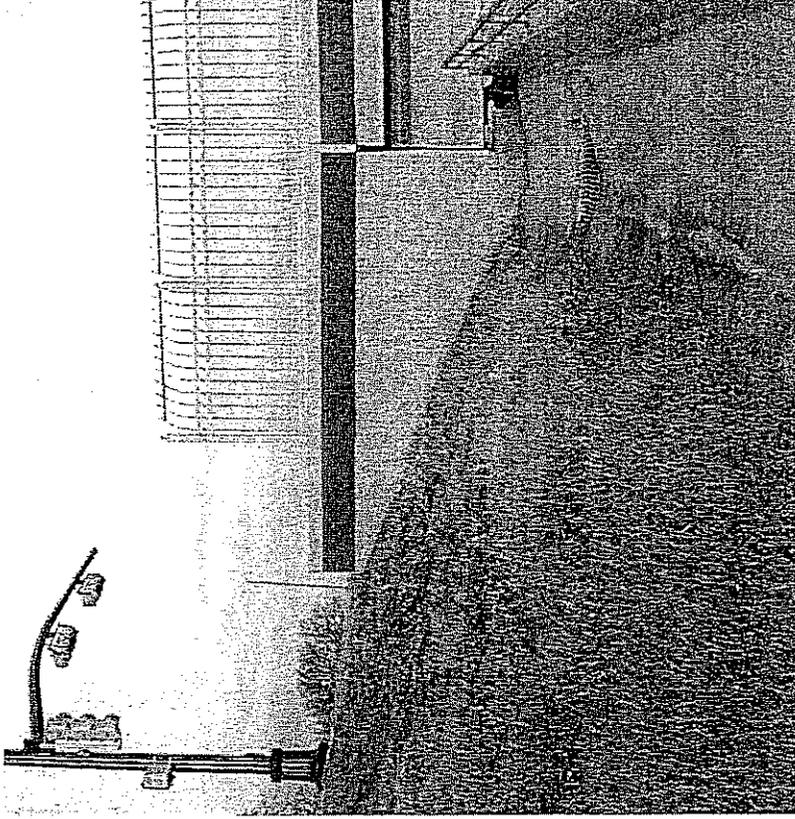
**FORT WORTH**

SH-121T

  
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INC.

# Southlake Blvd. Gateway





**FORT WORTH**  

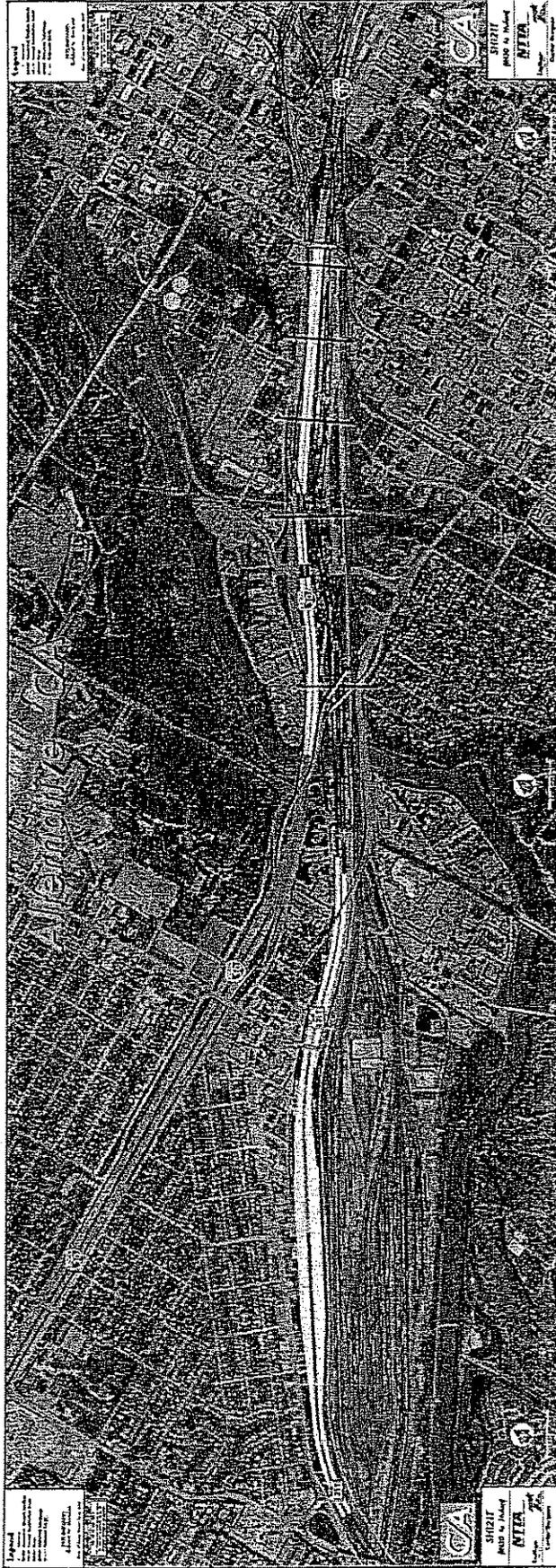

SH-121T

  
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STRATEGIES,  
INC.

## ***Emerging Consensus Cont.***

- C/A Combo at IH-30
- IH-30 Interchange Limits west of University
- Shift SH-121T at Stonegate north towards the RR Yard
- Phase construction of Stonegate and Oakbend Trail
- Direct-Connection Ramps at IH-20
- IH-20 Interchange Limits South of Overton Ridge Blvd.
- Do not rebuild Overton Ridge or Dutch Branch

# C/A Combo at IH-30



SH-121T



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# Mobility and Funding

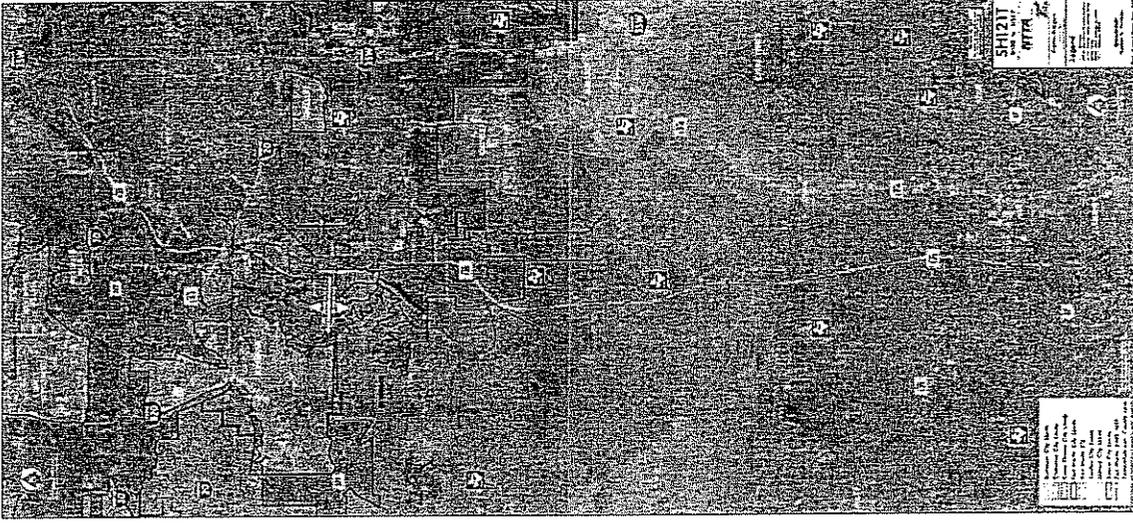


SH-121T



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# City Limits/ETJ



SH-121T



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## ***PDT Project Cost***

- In April of 2002, Council was provided an estimate of probable cost for the PDT (Alternative "A") project scope of \$130 M.

- ROW	\$92.2 M
- Utility Construction	\$10.8 M
- Construction	\$19.0 M
- Enhancements	\$ <u>8.0 M</u>
	\$130.0 M

## ***City Cost Responsibilities***

- The “Tri-party” Agreement with NTTA and TxDOT specified the City’s financial obligations:
  - Provide ROW
  - Relocate City Utilities
  - Provide City Utility Service to NTTA
  - Provide Stormwater Drainage
  
- City Base Cost  $\approx$  \$54 - \$67 M

# Additional City Cost Items

<u>Item</u>	<u>Probable Cost</u>
<ul style="list-style-type: none"> <li>• Buffers (40%/60% undeveloped – developed)</li> </ul>	\$4.0 M - \$7.0 M
<ul style="list-style-type: none"> <li>• Landscaping, Lighting, and Architectural Enhancements</li> </ul>	\$8.0 M
<ul style="list-style-type: none"> <li>• Bellaire Drive</li> </ul>	\$9.5 M
<ul style="list-style-type: none"> <li>• Reconstruction of Existing Streets (Overton Ridge Blvd. and Dutch Branch Rd.)</li> </ul>	\$5.1 M
<ul style="list-style-type: none"> <li>• Defer Construction of New Arterial Tie-ins for E/W Arterial Mobility</li> </ul>	<u>\$5.4 M</u> \$32.0 M - \$35.0 M

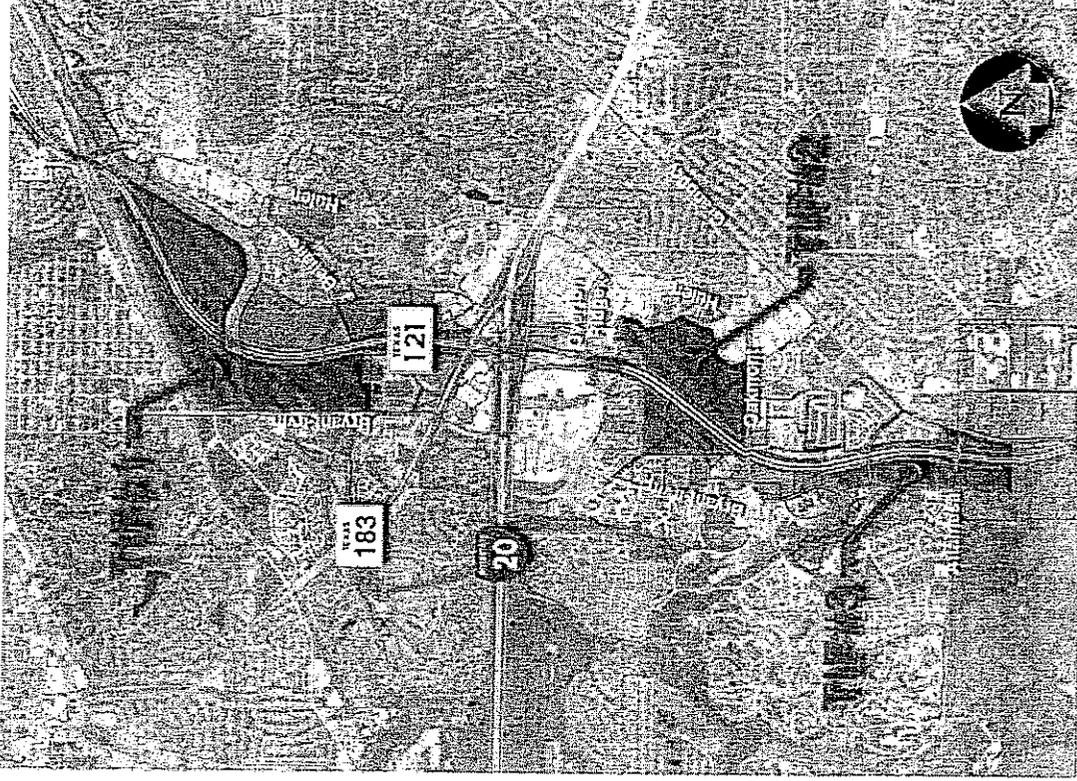
# Economic Development Opportunities



SH-121T



# Potential TIF Boundaries



SH-121T



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# Draft Environmental Impact Statement



SH-121T



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Texas Department of Transportation  
Fort Worth District

FHWV-121-12-0001  
DRAFT ENVIRONMENTAL IMPACT STATEMENT

State Highway 121  
from Interstate Highway 30 to FM 1187  
in Tarrant County

CSJ 0504 02 008

CSJ 0504 02 013

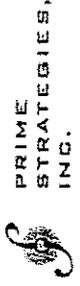
Submitted Pursuant to 42 U.S.C. 4332(d)(2)(c)

by the  
US Department of Transportation  
Federal Highway Administration  
Texas Department of Transportation  
North Texas Tollway Authority  
&  
Cooperating Agency  
US Environmental Protection Agency

December 2002



SH-121T



## ***Issues/Comments***

- Limited Documentation of Public Involvement
- Supplemental Noise Analysis Needed
- Incorporation of Trinity River Master Plan Vision
- Realignment of SH-121T/Stonegate north of Trinity River
- Lighting Impacts
- “But not limited to...”; however, all comments due Mar. 7

## ***Public Involvement***

- The City has undertaken extensive public involvement
- As a partner with NTTA and TxDOT, the City has taken special care to facilitate meaningful input from a context sensitive design perspective due to SH-121T traversing an urban environment.
- Accordingly, the DEIS should better document:
  - Peer Review Team Process
  - Citizens' Advisory Committee Efforts
  - Project Development Team Work and Report

## **Noise – Sunset Terrace**

- Sunset Terrace Neighborhood is in the limits between the terminus of SH-121T and the recently reconstructed IH-30 interchange.
- TxDOT has agreed to supplement its noise analysis adjacent to the neighborhood and to conduct a new projection of future noise impacts.

## Noise – Park Palisades/Hulen Bend Estates

- It appears that the noise analysis in the area of the Park Palisades and Hulen Bend Estates Neighborhoods was undertaken before a substantial number of homes were developed in those subdivisions.
- Accordingly, the noise analysis should be updated to take into consideration the potential noise impacts on the homes recently developed.

## *Trinity River Master Plan*

- The DEIS has concluded that there are no 'Section 4f' impacts on the Trinity River or its Trails System where spanned by future SH-121T.
- Nevertheless, it is critical that TxDOT and NTTA work with the City, Streams & Valleys, Inc., and the Tarrant Regional Water District to lessen the impacts of the bridge spans over the river and to best leverage regional investments in the Trinity River Master Plan Vision.
- Normal practice when crossing rivers and trails is to rebuild to equal or better current standards.

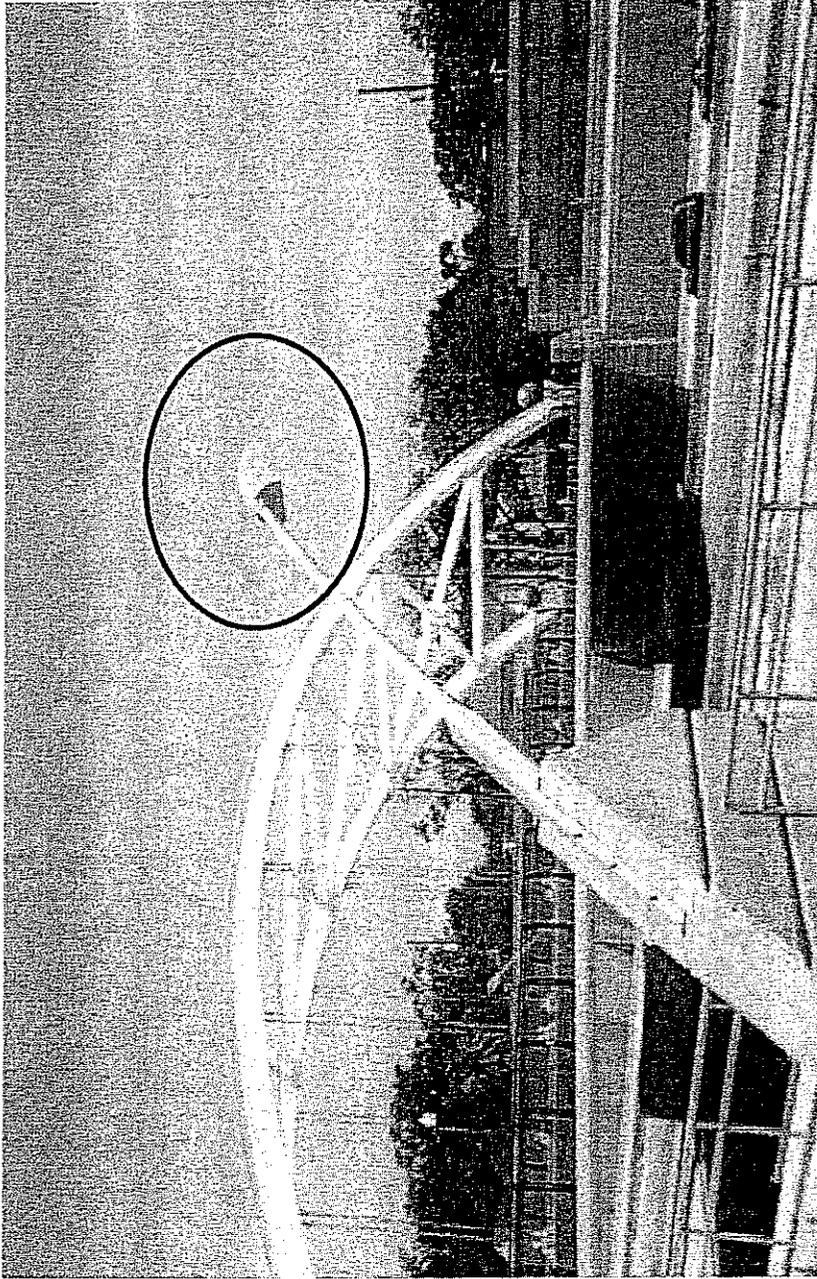
## ***Realignment of SH-121T/Stonegate***

Recommend that NTTA realign SH-121T northward between the rail yard and the power line easement, and the City realign the future Stonegate south of SH-121T.

## *Lighting*

- FHWA does not require analysis of light impacts.
- However, the City understands that TxDOT and NTTA are willing to entertain lighting impacts and consider certain strategies to lessen those impacts.
- The City desires that TxDOT consider alternatives to high-mast lighting in the IH-30/IH-20 area as it is reconstructed in order to minimize impacts on adjacent development.
- Similarly, as the tollway portion of SH-121T traverses developed areas and areas that will develop and urbanize in the future, the City desires that NTTA consider utilizing directional lighting and low-mast lighting where feasible.

# I-59 Low Mast Lighting



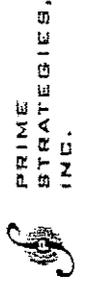
The City has heard concerns about possible impacts on:

- Sunset Terrace Neighborhood
- St. Paul Lutheran Church
- Mistletoe Heights/Berkley Place Neighborhoods
- Vickery Street Businesses
- Overton Woods Neighborhood
- Country Day School
- Hulen Bend Neighborhood
- Park Palisades Neighborhood
- Quail Ridge Neighborhood
- And Other Locations

# Status Report of Nimrod Long



SH-121T



## ***Review of Parkway Design Status***

- In DEIS, PDT Goals and Features are not stated clearly as design guidelines for Southwest Parkway.
- Tri-Party Agreement: “Design Standards—intent of the parties that the project design incorporate a high degree of aesthetic and urban design standards to the extent reasonably possible.”
- What Improvements must be paid for and what can be done within the City’s \$8 million budget in addition to the NTTA \$4 million landscape budget?

## ***Bottom Line of Parkway Design Status***

- Long and circuitous process.
- Detailed design information is not yet available.
- Difficult for the layperson to follow/read plans.
- City of Fort Worth should have professional design and engineering firms review plans at each step as they progress.
- Public must stay actively involved throughout Design and Construction Process, and then they must monitor thereafter to assure proper maintenance.
- Hire one outside landscape architectural firm to design and provide continuity throughout process and corridor.
- Overall, since the PDT process, some excellent design ideas have surfaced and progress is being made.

## ***PDT Public Participation Process***

The PDT clearly stated the principal and goals of the neighborhood leaders and citizens:

- Fit SH-121T harmoniously with the land—follow land forms
- Incorporate park-like landscaping
- Fort Worth inspired architectural treatment of structures
- Recess Southwest Parkway below city streets

## ***Roadway Features to Achieve Goals***

- (+) Vary medians width for buffer between roadways. (48'-100')
- (+) Split profile of roadway
- (+) Expanded buffer of native trees where possible
- (-) Minimize width of pavement by using stabilized shoulder
- (+) Minimal use of frontage roads
- (+) Strict signage controls/prohibition of billboards
- (+) Attractive architectural elements as proposed
- (?) A 60 mph design speed with a 55 mph posted speed.
- (+) Design should enhance Trinity River Park
- (+) Strengthen pedestrian connections between destinations

## ***I-30 Interchange***

- (+) Main issues resolved: elevated ramp to Forest Park eliminated
- (+) Incorporated/Improved PDT design adjacent to Sunset Terrace
- (+) Pedestrian Bridge crossing Trinity River (Streams & Valleys)
- (+) Create trailhead and positive environment under bridge
- (?) Rosedale Ramp Structures could be gateway to SH-121T
- (?) Lighting/Noise impacts should be considered for neighborhoods
- (-) Effective landscaping can ameliorate expansive interchange



## ***Toll Facility Linear Park Opportunity***

- (+) Pedestrian connection to Trinity River, Cultural District and Downtown
- (?) Provides valuable Neighborhood Amenity to Alamo Heights
- (?) Visual buffer for Neighborhood
- (?) Timeless Ft. Worth inspired architectural treatment for NTTA buildings
- (?) Reduce number of lanes to reflect use of electronic toll tags
- (?) Widen toll area median width to soften wide roadway expanse



## **SH-121T/Stonegate Shift Towards Railroad**

- (+) Relocation towards RR greatly enhances future development potential
- (+) Entire area would have positive relationship to Trinity River Park
- (+) Tremendous potential as a quality high density mixed-use infill
- (+) Stonegate/SH-121T trailhead excellent idea

## ***I-20 Interchange Area and South***

- (+) Surrounding Commercial, office and multi-family residential are generally compatible with interchange.
- (?) Bold expanses of trees with wildflower meadows are an Ideal Landscape Treatment.
- (+) Ramps should not act as typical frontage roads.
- (+) Overton Ridge Boulevard/Dutch Branch Road: expense required to lower roadways not cost effective.
- (+) Oakbend Trail, Oakmont Boulevard and Dirks Road: agree with recessed parkway--Keep Parkway at lowest grade possible to protect neighborhoods.
- (+) Rolling vertical road alignment south provides for attractive parkway

# Bellaire

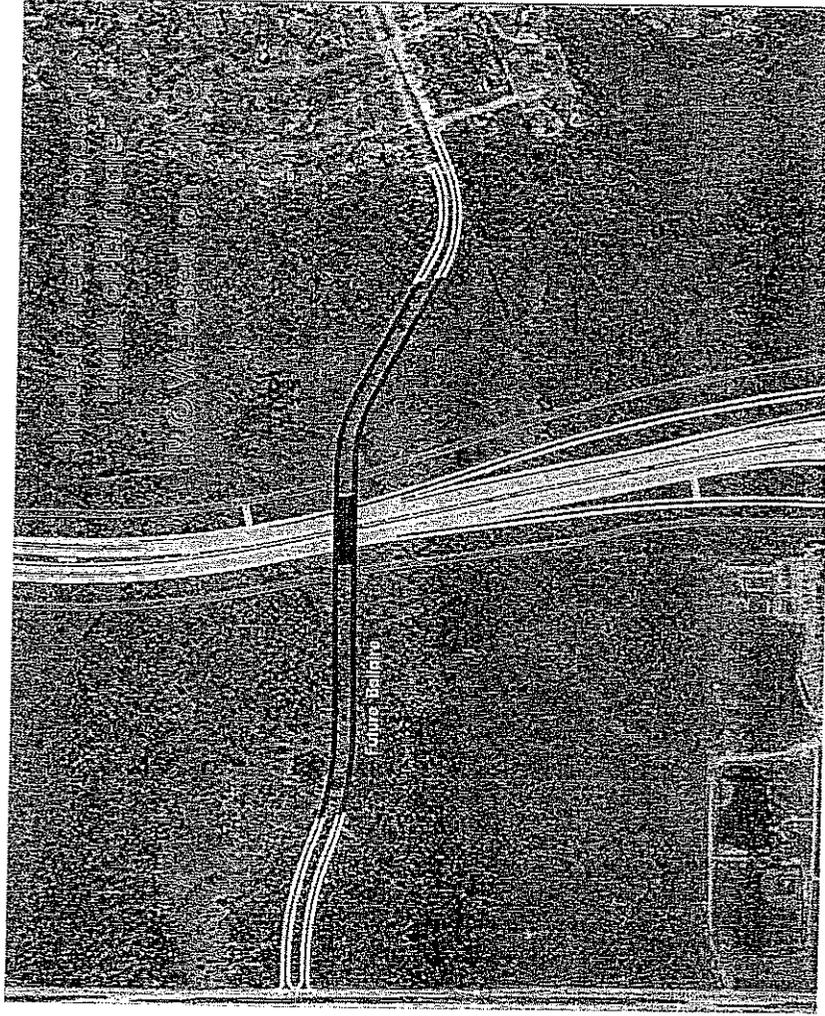


SH-121T

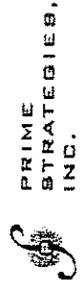


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# Bellaire Over

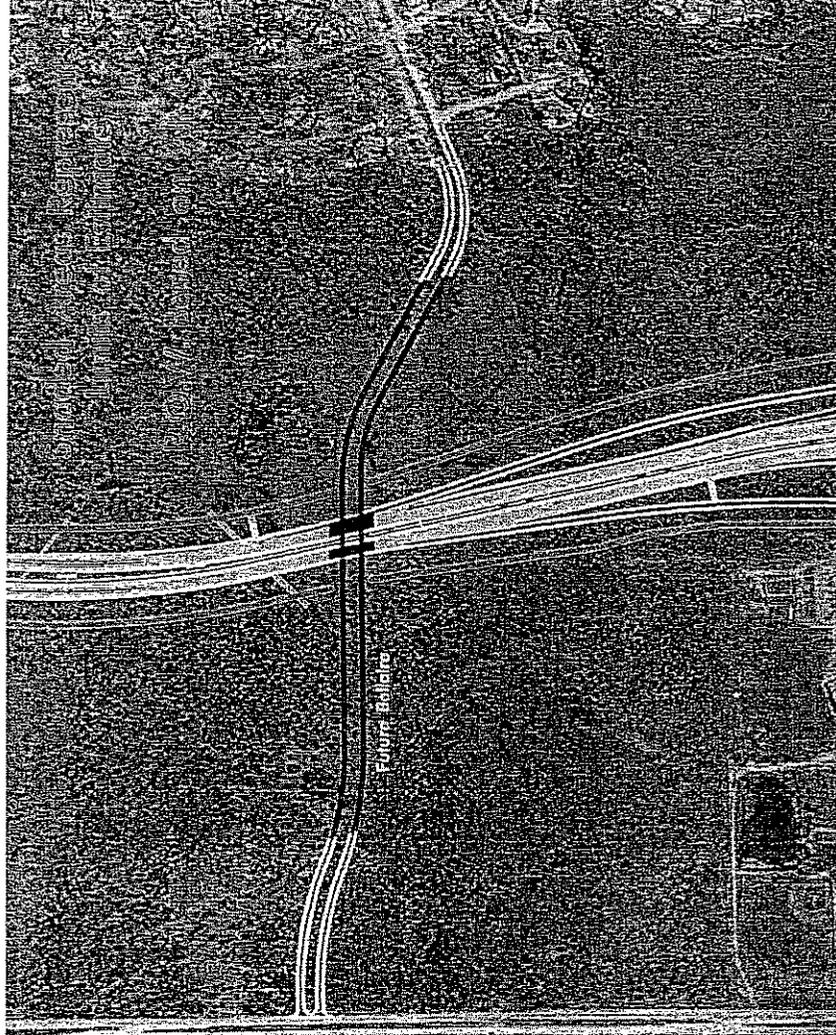


SH-121T

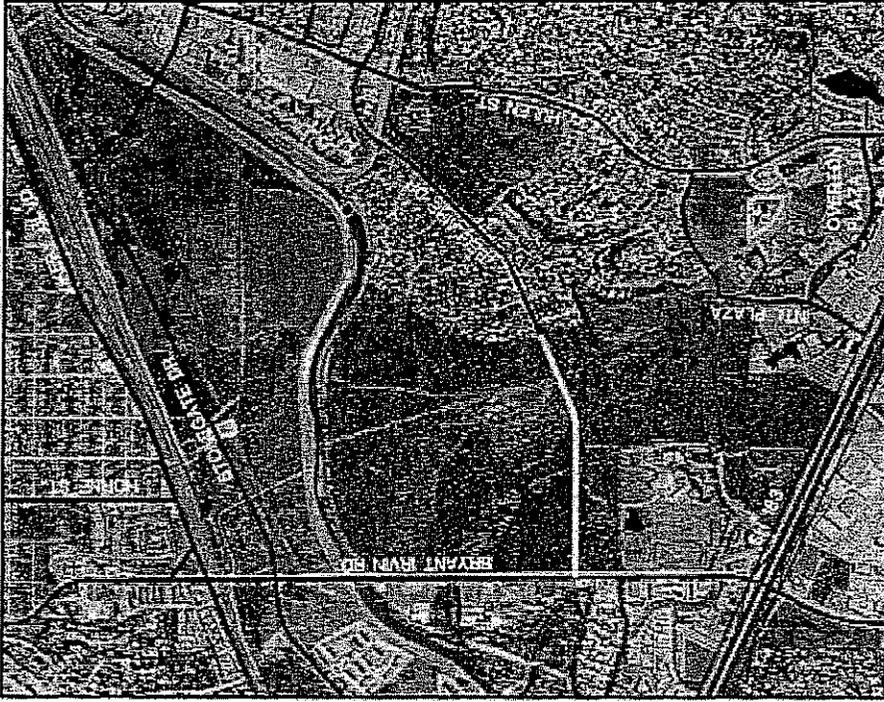


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STRATEGIES,  
INC.

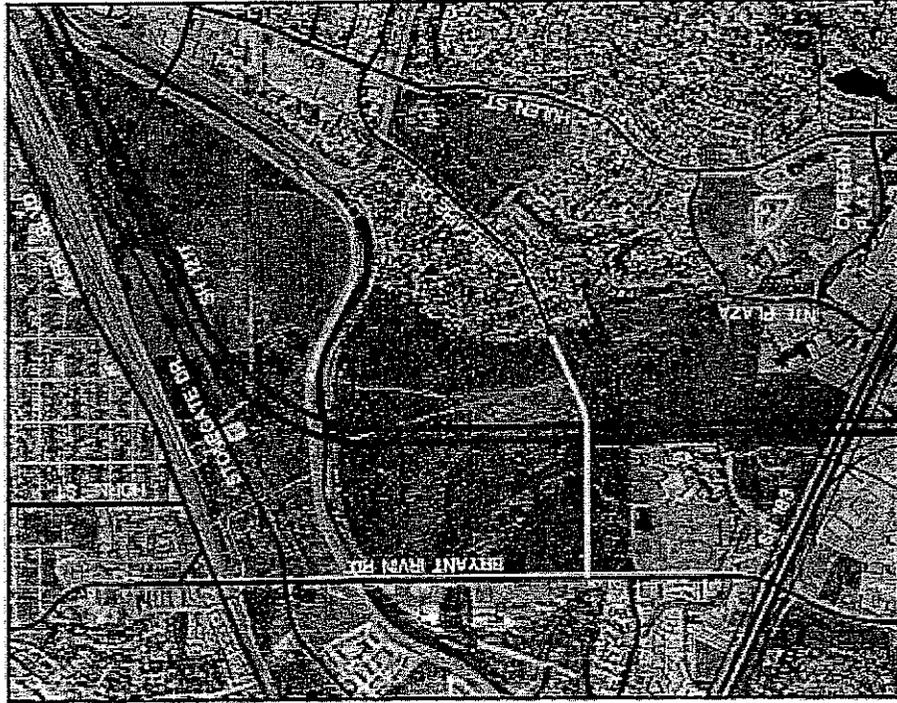
# Bellaire Under



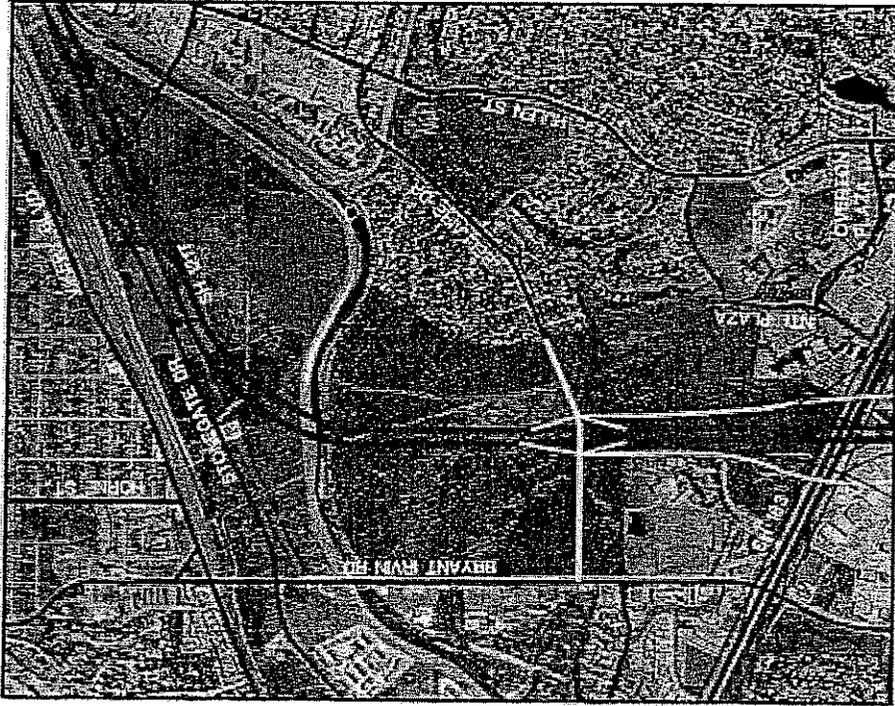
BELLAIRE TRAFFIC STUDY  
ALIGNMENT ALTERNATIVES  
NO BUILD ALTERNATIVE



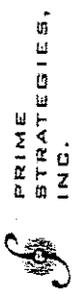
BELLAIRE TRAFFIC STUDY  
ALIGNMENT ALTERNATIVES  
NO INTERCHANGE AT BELLAIRE



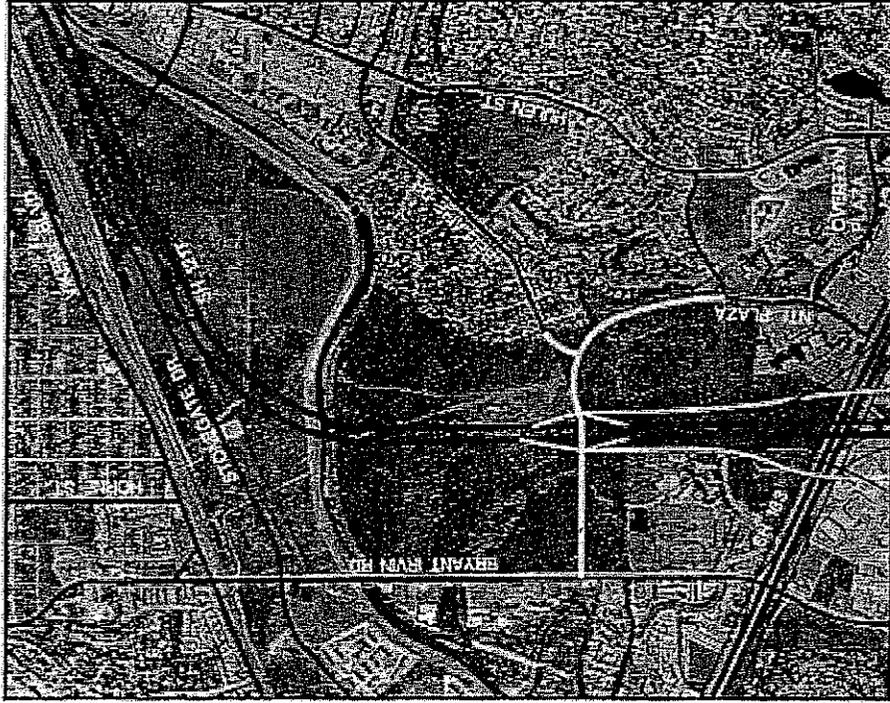
BELLAIRE TRAFFIC STUDY  
ALIGNMENT ALTERNATIVES  
BELLAIRE INTERCHANGE ONLY



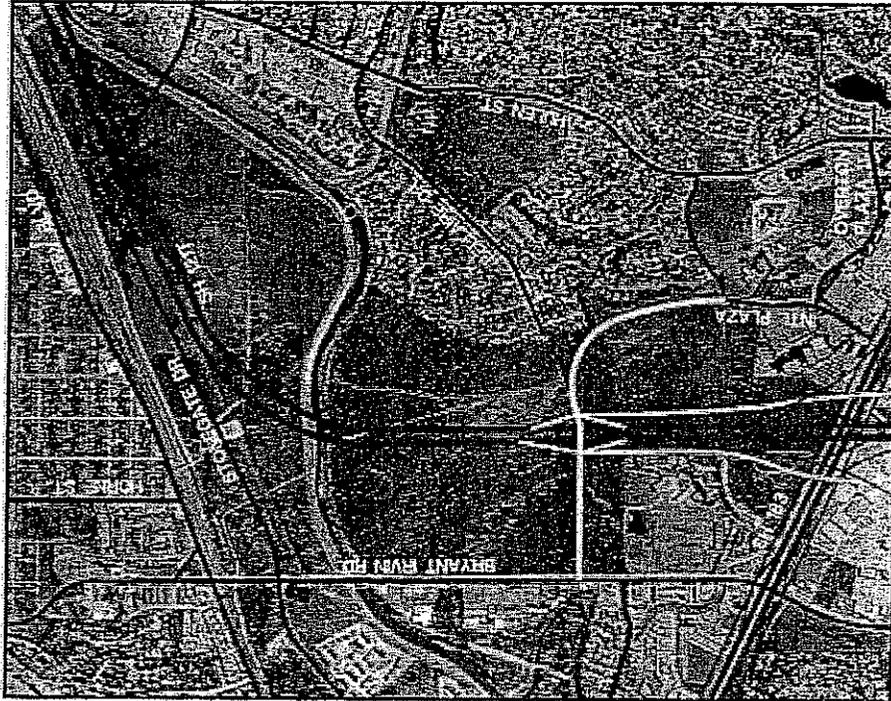
SH-121T



BELLAIRE TRAFFIC STUDY  
ALIGNMENT ALTERNATIVES  
INTERCHANGE INTERNATIONAL  
WITH BELLAIRE EXTENSION



BELLAIRE TRAFFIC STUDY  
ALIGNMENT ALTERNATIVES  
INTERNATIONAL INTERCHANGE ONLY

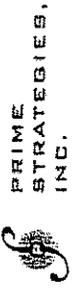


# ***Bellaire Area Traffic Study***

Public Presentation of Results  
City Council  
Tuesday, February 4, 2003



SH-121T



## ***Nimrod Long's Assessment of Bellaire Area***

- (+) Idea of cul-de-sac of Bellaire Boulevard and expanding residential development to Parkway and River is great Urban Design.
- (+) Extension of Arborlawn provides important east west connectivity and allows buildings of interchange with minimal adverse impact on neighborhood.
- (+) New Roadway Concept allows for mixed-use development on west side of parkway and on west side of Arborlawn.
- (?) Plan should accommodate pedestrian link to Trinity River Park Trails (pedestrian bridge) and walkways to commercial areas and schools.
- (?) Proper land use transition and buffers must be in place to not adversely impact Overton View Court and Briarhaven Rd.
- (?) Parkway should go under Interchange to reduce negative impact on residential development and to Country Day School.

## ***Bottom Line of Parkway Design Status***

- Long and circuitous process.
- Detailed design information is not yet available.
- Difficult for the layperson to follow/read plans.
- City of Fort Worth should have professional design and engineering firms review plans at each step as they progress.
- Public must stay actively involved throughout Design and Construction Process, and then they must monitor thereafter to assure proper maintenance.
- Hire one outside landscape architectural firm to design and provide continuity throughout process and corridor.
- Overall, since the PDT process, some excellent design ideas have surfaced and progress is being made.

## ***Next Steps***

- Feb. 4 -- Bellaire Traffic Study Council Briefing
- Feb. 11 – City Public Hearing
- Feb. 13 – TxDOT Public Hearing on DEIS for Johnson County
- Feb. 18 – City Council Consideration of Recommended LPA
- Feb. 25 – TxDOT Public Hearing on DEIS for Tarrant County
- Mar. 7 – All Comments Due to TxDOT on DEIS



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May 1, 2003

Maribel Chavez, P.E., District Engineer  
Texas Department of Transportation  
PO Box 6868  
Fort Worth, TX 76115

**Re: Highway 121 Draft EIS, FHWA-TX-EIS-99-05-D**

Dear Ms. Chavez:

On behalf of I-CARE, we submit the following comments on the draft environmental impact statement (DEIS) for the above-referenced project (Project). This letter sets forth our primary substantive concerns. We have attached a document containing additional comments of a more technical nature.

### OVERVIEW

The Project has been the subject of lengthy and intensive public participation. During this public process, the Texas Department of Transportation (TXDOT) and the North Texas Tollway Authority (NTTA) made numerous statements and commitments that provided I-CARE and the community at large with assurance that the Project was being modified to address the many significant issues we collectively have raised. On February 3, 2003 you stated at the joint Citizens Advisory Committee (CAC)/Project Development Team (PDT) meeting: "I think that we have an opportunity, particularly at 30 and the University and Trinity River area, to design a beautiful facility, one that should compliment the area." (Full transcript attached.) I-CARE wholeheartedly appreciates and endorses such statements. However, the DEIS neither meets such lofty aspirations nor reflects the intensive public process of the past few years.

The failure of the DEIS to document and respond to public participation is a procedural failing under the National Environmental Policy Act (NEPA). Much more importantly, it undermines the working relationship the agencies have established with I-CARE and the

Oregon  
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California  
Utah  
Idaho



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community at large through many prior discussions. For that reason, I-CARE is compelled to submit for the record the following exhaustive comments on the DEIS.

We sincerely hope our comments will trigger a rapid effort to revise the DEIS. In particular, the purpose and need for the Project should be to construct an urban parkway that is not just a needed transportation amenity for the city of Fort Worth but also a reflection of its civic pride. The DEIS also should be based on clear description, evaluation and comparison of real Project alternatives that meet the purpose of the Project and incorporate the intensive discussions of the past few years. The alternatives should be described and analyzed with enough detail (including figures, diagrams and supporting graphics to convey the nuances between the complex build alternatives) to allow public and governmental reviewers to evaluate and compare them.

As you know, I-CARE strongly believes that once the DEIS is supplemented in this fashion it will clearly show that there is one Project alternative that best meets the purpose and need for the Project while minimizing impacts to the natural and human environment: the Locally Preferred Alternative adopted by the Fort Worth City Council (Resolution 2923) on February 25, 2003. I-CARE supports that alternative. We believe TXDOT and NTTA also support this alternative, and the current DEIS must be revised to reflect this support and document it adequately under the requirements of NEPA.

We look forward to working with TXDOT, NTTA, and the City of Fort Worth to develop the NEPA documentation necessary to support the best Project alternative. We are excited to positively contribute to the future corridor advisory activities and to detail the best project alternative in appropriate schematic plans. This process will help assure the Project's community support and speed it toward construction.

## **LEGAL COMMENTS**

### **1.0 Improper Focus**

NEPA requires TXDOT and NTTA to take a "hard look" at the environmental impacts of reasonable Project alternatives. It is impossible to take a hard look at anything if your vision is not focused. The primary deficiency in the DEIS is a lack of focus on the key Project issues that have been identified in the lengthy public process.



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The descriptions and analyses of Project alternatives A through D are performed at a level that at best are characteristic of a corridor alignment EIS. This analytic focus is inappropriate for the Project because there has been no real dispute about the corridor alignment. The real alternatives for this project are choices of project concept, design and engineering, and these alternatives have real consequences in terms of impacts to the human and natural environment. Because the DEIS does not describe a reasonable spectrum of build alternatives and then present them in sufficient detail, it is impossible to evaluate their relative impacts. The DEIS therefore does not constitute sufficient documentation supporting TXDOT and NTTA's selection of any alternative over any other alternative.

Applicable Federal Highway Administration (FHWA) guidance clearly states that:

“[d]evelopment of more detailed design for some aspects ... of one or more alternatives may be necessary during preparation of the draft and final EIS in order to evaluate impacts of mitigation measures or to address issues raised by other agencies or the public.” FHWA, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, section V.E.

Pursuant to such guidance, the DEIS must be focused at a level commensurate with the intensive, multi-party dialogue of the past few years. The DEIS must especially incorporate the work of the City-sponsored Southwest Parkway Transportation Design Study (TDS), a public conceptual design product authored by the Project Development Team (PDT) with broad citizen involvement. In light of the Southwest Parkway TDS, TXDOT and NTTA cannot credibly say they have met the “hard look” duty under NEPA unless the DEIS carefully evaluates the relative impacts of a typical “urban highway facility” (DEIS, page III-30) versus parkway designs such as those developed by the PDT, acknowledged by TXDOT in developing alternative C, and adopted as the locally preferred option by the Fort Worth City Council.

Frankly, because that issue has been the focus of the public process at least since 1994 and the subject of enormous City and privately sponsored efforts, it is disheartening to I-CARE that the DEIS does not clearly analyze and resolve it.

## **2.0 Incorrect Statement of Purpose and Need**

The statement of Purpose and Need in an EIS is essential because it drives the scope of reasonable alternatives that must be analyzed. If the statement is defective, the document likely



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will not analyze a proper spectrum of alternatives and the selected alternative will not be adequately documented.

The DEIS contains 34 pages nominally discussing purpose and need, however, the discussion centers around general corridor alignment issues of a radial freeway component first documented in 1962. As the land adjacent to the corridor has developed and subsequent City actions eliminated the "north section" alignment portions, the focus of the project shifted from alignment-based to the impacts of the specific build alternatives within one specific alignment. However, the DEIS remains focused on justifying the alignment without addressing the key project issues that are relevant since the project terminus became IH-30. Critical community issues and discussions since 1994 have focused on build alternative issues (frontage roads, interchange locations, cross section, etc) rather than alignment issues since there is only one practical alignment.

The DEIS is deficient in not containing a clear and concise statement of the purpose and need for this Project and evaluating community and stakeholder-raised build alternative impacts. Most of the material presented could be supportive of any transportation improvement project in the greater Metroplex area. There is little discussion of the specific needs for a transportation link between Hwy 30 and FM 1187 and no real discussion of the context-sensitivity required for the portions of such a link that run directly through established urban areas of Fort Worth.

In particular, the DEIS statement of purpose and need gives inadequate guidance to formulate and choose between various Project alternatives. The statement should, but does not, clearly state the Project purpose that has been forged through heated public discussion into a tool to distinguish the City of Fort Worth and reflect its civic pride: namely, to build an urban parkway connecting Hwy 30 and FM 1187 with engineering and design features that make it sensitive to the neighborhoods through which it passes. We had thought this was established in 1994, refined in the PDT process and plan adopted on January 2001 by City Council resolution 2693 and ratified when the City Council adopted a locally preferred alternative. In light of this history, the purpose of the Project should be to deliver the needed transportation infrastructure in a way that minimizes impacts on these neighborhoods and provides to them an aesthetic benefit where possible.

### **3.0 Inadequate Alternatives Analysis**

Many Federal courts have called analysis of reasonable project alternatives the "heart" of the NEPA process. An EIS is not sufficient if it does not contain a reasonable scope of



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alternatives, described and analyzed at an appropriate level of detail. Both the proponent agencies and the public at large must be able to assess those real alternatives that meet the Project's purpose and need, and choose among them on the basis of their relative impacts on the human and natural environment. That is what taking a "hard look" under NEPA is all about.

Alternatives B and D in the DEIS are woefully stale. They do not reflect the very thorough, productive discussions that have occurred over the past few years. Only Alternatives A and C contain features and themes of a contemporary urban parkway. However, the DEIS description and supporting figures provide no insights as to the key design components of each build alternative. Further, the DEIS remains focused on the weak and obsolete discussions of the broader corridor need. These discussions, rooted in 1962 proposals to justify a radial freeway segment are irrelevant and do not respond to the contemporary issues identified by the Project's Citizen Advisory Committee (CAC) and later documented graphically by the city-sponsored design process that resulted in the Southwest Parkway TDS.

TXDOT and NTTA have made significant progress in their understanding of community consensus for a facility that integrates features and themes of a parkway-type corridor. This is most evident in their developing Alternative C (building on the foundation of Alternative A) as a plan that addresses documented opposition of Alternatives B and D. I-CARE appreciates the gesture and intent to address community issues, however the DEIS is sorely inadequate to represent and document the impacts of community-driven corridor solutions. Clearly, the DEIS is a carry over from documentation efforts of the mid-1990s. Most of the DEIS is based on information that in many cases is outdated (e.g., 1990 census data and 1992 peak hour traffic volumes). In sum, the alternatives in the DEIS give I-CARE the uncomfortable impression that while some representatives of TXDOT and NTTA were out talking with the public and agreeing to significant project modifications, others were busily drafting the DEIS based on a pre-determined, narrow set of alternatives that disregard TXDOT and NTTA's stated understanding of community concerns. This documentation approach represents a disregard for the integrity of the NEPA process and is disrespectful to the citizens and stakeholders who have contributed so much time and effort to developing community-based solutions.

As mentioned above, the most fundamental problem with the alternatives is that they do not allow a reasoned evaluation of the relative impacts of a typical urban freeway (Alternatives B and D) on the one hand and a carefully-designed parkway (Alternatives A and C) on the other. I-CARE does not see it as an impossible or even unduly burdensome task to adequately characterize such alternatives and to assess their relative impacts on the human and natural



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environment. However, to achieve this goal and to comply with the requirements of NEPA it will be necessary to characterize the Project alternatives at a level of detail appropriate to an agency decision between significantly different build alternatives that all occupy essentially the same corridor. The difference between alternatives in this case involves engineering and design features such as the split plan and profile and wider median developed in the PDT process, which was an integral part of Alternative A. In addition, Alternative A, at the direction of the PDT members fundamentally called for a facility that was “lower, slower, and greener.” This resulted in the cross streets under Alternative A going over the Parkway where ever possible to reduce visual and noise impacts.

Of the four build alternatives, only Alternative A and its post-PDT derivative, Alternative C contain features and themes noted as required mitigations for the new roadway. Alternatives B and D contain no such mitigations. And while Alternative C has been verbally described by TXDOT, NTTA, and the City as a “compromise” between the community-desired Alternative A and the reality of physical constraints and built up right-of-way, there is no way to discern the qualities of Alternative C.

The DEIS does not contain, to our surprise, any design drawings whatsoever of the design concepts presented to the public and project stakeholders in the numerous meetings of the PDT process and post-PDT discussions. Further, the DEIS text is misleading and factually incorrect in stating on page III-43 that Alternative B is “identical” to Alternative A. Alternative B does not have a split plan and profile and the Parkway would pass over virtually all cross roads. The lack of adequate figures, maps, and other supporting graphics make it impossible for a citizen, stakeholder, or reviewing agency to objectively review and compare alternatives.

#### **4.0 Deficient Environmental Impact Analyses**

Many of the specific impact analyses are not sufficient under NEPA. Further, the analyses appear to rely heavily on promised mitigation measures, but the measures are not specifically described. These issues are addressed in turn below.

##### **4.1 Noise**

The noise analysis in the DEIS has been completed at a level which would be appropriate for a location-level EIS but which is not helpful in comparing the several build alternatives that occupy essentially the same corridor. This coarse evaluation must be refined to better reflect



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contemporary development and traffic volumes and patterns. For example, no site-specific analyses were performed at the Sunset Terrace neighborhood near IH-30 and Summit Avenue. In addition, the DEIS states (page V-82) the noise analyses were based on 1992 traffic volumes and patterns. This data is invalid and does not reflect the significant changes in traffic patterns from the removal of the downtown IH-30 "overhead", changes in the traffic circulation patterns (removal of Ballinger Street Bridge and realignment of the Summit Avenue overcrossing), or intense development along the corridor.

In addition, the noise analyses do not consider the very unique but significant contributions of the variations of the specific Build Alternatives. For example, the direct connect ramps of Alternatives B and D would have a significantly different footprint and noise impacts compared to Alternatives A and C. In addition, the vertical profile of Alternative A and C is fundamentally different (with the highway passing under most cross streets) than Alternatives B and D. A legally sufficient EIS for the Project must consider the specific physical differences between alternatives so citizens and reviewing agencies can adequately evaluate the comparative impacts. Given the significant changes in regional development, roadway networks, and adjacent development along the project corridor, the noise analyses must be revised to reflect current conditions.

#### 4.2 Visual

While Section V of the DEIS addresses "Environmental Consequences," there is no analysis or discussion related to a visual assessment and the visual impacts of the Build Alternatives. The FHWA Guidance states that when the potential for visual impacts exists,

*"the draft EIS should identify the impacts to the existing visual resource, the relationship of the impacts to potential viewers of the project, as well as measures to avoid, minimize or reduce the adverse impacts. When there is potential for visual quality impacts, the draft EIS should explain the consideration given to design quality, art, and architecture in the project planning."*  
Guidance, Section V.G (emphasis added.)

The proposed Parkway will pass through or near a number of community and public spaces (e.g., Trinity River Parkway and the Country Day School). In Alternatives B and D, the Parkway would pass over each of the cross streets. These alternatives will become a significant



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physical feature in the visual landscape, especially in contrast to high quality habitat areas adjacent to the proposed Parkway. Alternatives A and C have the Parkway pass under most of the cross streets and therefore have significantly less visual impact on adjacent properties. In addition, the wider median of Alternatives A and C at the Trinity River Parkway will minimize the loss of natural light and therefore mitigate vegetative loss along the Trinity River while improving the experience for trail users. The revised EIS should include a summary and comparison of visual impacts along the entire corridor, to appropriately assess community impacts of each Build Alternative.

I-CARE looks forward to working closely with TXDOT, NTTA, and the City in considering mitigations for visual impacts to offset the Parkway's construction.

#### **4.3 Wetlands**

Section V of the DEIS presents the findings related to the Clean Water Act, Section 404 permits and wetlands analyses. The DEIS states 1992 National Wetlands Inventory (NWI) maps, aerial photography, and visual inspection of the proposed alignments were used to document jurisdictional waters of the United States and wetlands impacts (Page V 96). Like the 1992 traffic volumes used in the noise analyses, I-CARE requests the DEIS consider the most current information and supplement visual inspection of mapping with contemporary field reconnaissance along the entire corridor.

The DEIS inadequately describes wetlands and quality habitat areas on streams within the Rall Ranch property near Dutch Branch Road. For example, the DEIS states there are two jurisdictional waters of the United States impacted while an independent wetland delineation determined there are a total of nine jurisdictional waters of the U.S., including five reaches of intermittent streams, and all or portions of four contiguous wetland habitats located on the Rall Ranch that would be directly or indirectly impacted by the proposed Parkway construction. The Rall Ranch Delineation also indicates two additional contiguous wetlands that are located on the Rall Ranch adjacent to, but outside of, the proposed ROW, which may also be impacted. I-CARE is disturbed by the large discrepancy in this analysis and is surprised this would not have been noted.

Such lacks of key data and analysis make it impossible, in our view, for reviewing agencies and members of the public to make an informed decision between the various Build Alternatives.



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#### 4.4 Section 4(f) and NHPA section 106 Impacts

The discussion of historic property impacts and comparison of alternatives is a gaping hole in the DEIS. The affected environment section (pages IV-24-26) misses the identification of Sunset Terrace and Mistletoe Heights districts entirely. These two districts should be described and identified as potentially eligible here, consistent with supporting documentation provided in Appendix E. The discussion on 4(f) impacts (pages V-34-36) should refer to the two historic districts, report on the correspondence with the SHPO, and address the issues of light, noise and traffic impacts (for the preferred alternative. The two districts are clearly eligible under 4(f) and the DEIS text ignores these issues entirely.

The historic section starting on page V-139 does not refer to the Sunset Terrace neighborhood at all. This should be included, and the impacts discussed. The discussion of Mistletoe Heights says that the district will be indirectly impacted, and yet does not describe how. Since the DEIS does not adequately describe the impacts of each Build Alternative, we are unclear how the public or reviewing agencies could make meaningful decisions regarding any of the Build Alternatives. The DEIS should discuss impacts included in the agency coordination letter handled, including possible mitigations. Residents from Sunset Terrace and Mistletoe Heights have been active participants in the project's CAC and City PDT processes. At all times the representatives from these neighborhoods have consistently stated the need for an adequate review of impacts. The DEIS text ignores the residents consistent message through out the public involvement stages. The significant deficiency in assessing historical property impacts is a fundamental flaw of the NEPA process. I-CARE will be monitoring how the DEIS omissions are remedied and expect the revised EIS to be more comprehensive in its assessment and proposed mitigations.

Similarly, the DEIS (page V-35) minimizes and oversimplifies impacts to the Trinity River Parkway. Since the DEIS has been published, TXDOT and Steams and Valleys, Inc. have had productive discussions that acknowledge the flaws in the DEIS and look forward to conceptual mitigations. We applaud these efforts and support these concept plans. We also will expect the revised EIS to include appropriate documentation of the true impacts to historic and publicly owned park facilities along the corridor and identify appropriate mitigations.



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#### 4.5 Mitigation Analysis

As stated above, NEPA requires federal agencies to take a hard look at the environmental impacts of project alternatives before making any choice among them. Comments 4.1 to 4.4 relate to deficiencies in the descriptions of various project impacts, and show how those deficiencies make it impossible to make a genuine comparison between the project alternatives. The most important comparison—the ultimate one—is of the alternatives *as mitigated*. Given the DEIS in its present state, that too is impossible.

Presumably in some cases the same mitigation measure would apply to all four alternatives, whereas in other cases there are mitigation measures unique to each alternative. Pursuant to FHWA's own Guidance, section V.G., mitigation measures "normally should be investigated in appropriate detail for each reasonable alternative so they can be identified in the draft EIS." The DEIS must present a detailed discussion of mitigation measures and functions for each alternative, so that the agencies can ultimately make their choices based on a complete understanding of the impacts of each alternative, as mitigated. Furthermore, good practice calls for creating a matrix showing all proposed mitigation features on one axis, and the four alternatives on the other, so that the reader can have a unified mitigation list and instantly see which mitigation measures are connected to which alternatives. The DEIS does not contain any such discussion of mitigation.

If mitigation is not discussed, it is assumed that the full impact will result from an alternative. As a result, if it is not clear where mitigation will be implemented, and the differences in impacts associated with each alternative is clear, the comparison of alternatives will be imbalanced. In most sections of Chapter 5, the impacts are generalized, and if mitigation is mentioned at all, it too is generalized for all build alternatives.

In particular, impacts along the Trinity River (median widths) and at the Country Day School (roadway profile) are different for different alternatives and the impacts could be mitigated in different ways. The DEIS does not provide any basis for making these important choices. Nor does it analyze many noise issues, much less present possible mitigation for noise impacts. I-CARE feels these deficiencies make it impossible to provide meaningful feedback at this stage.



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## 5.0 Inadequate Cumulative Impact Analysis

Federal courts have invalidated EIS documents when they do not contain a sufficient analysis of how project impacts will accumulate with, or even amplify, the impacts of other existing or proposed projects. The very brief cumulative impacts section in the DEIS does not pass muster under established legal tests.

As an example, the DEIS does not adequately consider cumulative impacts at the project's northern terminus, in the Sunset Terrace area. The IH-30 and IH-35 projects are nearing completion. These projects have resulted in insignificant changes in traffic, noise and glare for local residents. Sunset Terrace Neighborhood has been at the edge of these past projects and is once again at the project limit for the Southwest Parkway. Noise modeling may have been insufficient for the earlier project, and high-mast lights were installed all along this stretch of IH-30. Problems at Sunset Terrace have been deemed important enough that the PDT recommended re-analyzing noise and glare issues, potentially changing features or incorporating mitigation measures, as part of the present project. The PDT recognized that this project's connection to the previous one will exacerbate an already-problematic situation—essentially the definition of a cumulative impact. Nonetheless, the DEIS does not contain any discussion of current noise and glare impacts at Sunset Terrace, the likely exacerbation of such impacts by the proposed project, and possible mitigation measures. Agency coordination letters in the DEIS and presentations by TXDOT have acknowledged the need for supplemental noise analyses and a removal of high mast lighting. I-CARE supports these future activities but once again, is dismayed by the lack of effort and appropriate documentation in the DEIS.

Changes on City roadways caused by recent improvement projects on IH-30 and IH-35 have resulted in significant changes in local circulation and have resulted in concentrated traffic flows on Summit Avenue near and around IH-30. Changes on IH-30 by removing the "overhead" have required roadway realignments and removals, such as the Ballinger Street Bridge. While we are unsure if prior environmental documentation efforts addressed these impacts, we are positive the DEIS does not address the cumulative impacts of these past closures combined with proposed roadway changes near Sunset Terrace. The proposed Parkway ramp and frontage road configuration at Summit Avenue near Sunset Terrace will once again change travel patterns in this area. The proposed closing of 15<sup>th</sup> Street under IH-30 will further reduce



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route choices while concentrating traffic flow in and around the Sunset Terrace neighborhood. The cumulative impacts of these changes must be considered in the revised EIS.

## **6.0 Failure to Justify Project Termini**

NEPA does not allow a federal agency to “segment” a project in order to consider its environmental impacts in a piecemeal fashion. A highway project in particular must demonstrate that it connects “logical termini” and has not been shortened simply to simplify NEPA analysis or divide and conquer real environmental issues. One way to show that logical termini have been selected is to prove that the project would be built as a self-standing unit and that it meets the statement of purpose and need without having to rely on other, future projects.

In the present case, the lack of information in the DEIS makes it impossible to tell if logical termini have been selected. The Project History chapter is convoluted and confusing. However, it reflects a continuous change of project termini over the years, associated with each Notice of Intent and updates. From the descriptions, it is difficult to understand the project termini and in some cases, the DEIS is inconsistent. Page V-9 states the northern terminus is “west of Summit Avenue” and yet Page V-22 says Summit Avenue is the terminus. In other locations, the project terminus is simply stated as “IH-30.” Given the nature of impacts to historic properties, NEPA requires a consistently defined logical terminus.

The most significant defect relative to project termini is the lack of traffic analysis. The lack of existing and forecast traffic data (volumes and analysis results) makes it impossible to tell if this project will meet the stated purpose, or if the purpose will be frustrated by traffic bottlenecks just beyond the selected termini. This issue is particularly evident at the northern terminus, where the project connects to the just-completed section of IH-30. The number of lanes under the reconstructed Summit Avenue overpass permanently constrains the capacity of IH-30 and the SH 121 connections. The IH-30 and IH-35 projects may be near completion, but they were planned 15 years ago and may already be close to capacity or unable to serve new volumes from the Southwest Parkway. It does not appear to us that it will be possible to get all SH 121 traffic under the Summit Avenue bridge without significant delays.

If true, this suggests that the chosen northern terminus is not logical. Because of the lack of traffic analysis in the DEIS, we cannot confirm whether this is the case. More importantly, neither can TXDOT or NTTA. Accordingly, to be legally sufficient the revised EIS should include sufficient traffic volume and analyses summary information to verify the appropriate



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project termini are being considered and that this proposed project does not meet a bottleneck. We look forward to reviewing the traffic analysis results that support acceptable forecast traffic operations on the IH-30 mainline, ramp merge/diverge areas, and weaving sections associated with the proposed Parkway.

### CONCLUSION

Although I-CARE has identified significant defects in the DEIS, we believe the solution is quite straightforward and that it reflects what we take to be the community consensus and the current agency viewpoint. In particular there are just a few steps necessary to develop a successful EIS:

- Revise the Statement of Purpose and Need to make clear that the project purpose is to construct a “lower, slower and greener” urban parkway with features and themes that enhance the civic pride of Fort Worth and the experience of its citizens;
- Separate out and minimize the alignment-level discussion, since there are no significant choices at this level;
- Flesh out the description of build alternatives (providing details such as design drawings and examples of key features and treatments), focusing on the ability of each alternative to meet the revised Statement of Purpose and Need suggested above;
- Expand the analysis of environmental impacts of each alternative, and include a more comprehensive discussion of mitigation as it plays into the impacts analysis;
- Develop a more consistent comparison of the environmental impacts of the four alternatives; and
- Include a more detailed consideration of cumulative impacts and propose mitigation measures as appropriate.

I-CARE also strongly believes the agencies should implement revisions to the DEIS via a working partnership with the City of Fort Worth and involved citizens. The needed revisions to the DEIS should be developed in consultation with Fort Worth’s Citizen’s Advisory Group (CAG) established consistent with Point 7 of Resolution 2923 of the Fort Worth City Council adopted on February 25, 2003. Working closely with this CAG will ensure that the project alternatives advanced in the EIS are reflective of the actual community dialogue that has been intensively developed over the past few years.



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I-CARE has been encouraged by recent discussions with, and public presentations by, TXDOT and NTTA officials. But we have come to the stage of the process when commitments must be and put into writing. The foregoing comments are intended to provide a roadmap to the proper documentation of a project that will benefit the community, minimize opposition and survive any legal challenge. Please accept them in that spirit.

Very truly yours,

Peter D. Mostow

PDM:chb

Encls.

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**HIGHWAY 121 DRAFT EIS**  
**Supplemental Comments of I-CARE, Appendix 1**

This document sets forth page-by-page comments and questions designed to assist TXDOT and NTTA with preparation of a revised EIS.

**PAGE-BY PAGE DEIS COMMENTS**

<u>Page</u>	<u>Paragraph</u>	<u>Summary</u>
i	¶ 2	“Additional improvements north of I-30” have been taken out of the proposed action and should not be referenced unless a full cumulative impact analysis is included.
v	¶ 1	Future evaluation needed for 2 <sup>nd</sup> phase. Why isn’t the ultimate plan for build-out considered fully in the DEIS? Why aren’t there cumulative impacts of a project plus build-out considered?
v	¶ 3	What O-D studies have been prepared to qualify trip types? How do they relate to “Regional traffic needs”? This automatically implies a Bellaire interchange.
vi	¶ 1	Why wasn’t a “no-build” alternative observed reasonable?
vi	¶ 2	Aesthetic call out “during construction” implies no issues later. Yet no reasons (Parkway vs. Freeway) are described.
viii	¶ 2	Aesthetic treatments and mitigations are significant unresolved issues.
viii	¶ 3	Individual wetland and habitat areas should be evaluated for regulatory review. Is there a list of known wetlands?

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**I PROJECT HISTORY**

I-16	¶ 2	This toll discussion and segments is critical and should have a supporting exhibit for clarity.
I-16	¶ 3	The NOI is over four years old. Does this exceed its shelf life?
I-17	¶ 1	“Earlier traffic analyses” for Forest Park Ramps – What analyses are meant and are they still current?
I-17	¶ 2	<u>Confusing</u> “This plan removed the direct connections”...“However, ... direct connections were retained.”

- I-18 ¶ 1 & 2 Discussion of PDT results focuses on “AIR1” and makes no reference to “features and themes” of the corridor project. Pending the review of safety issues, the City endorsed these conceptual themes.
  - I-19 ¶ 1 This is a biased statement and conclusion. Alternative C was not as thoroughly evaluated and includes numerous safety and operational deficiencies the compromise (C/A combination) also has issues.
  - I-19 ¶ 1 This paragraph should differentiate between the I-30 Interchange specific alternatives and corridor – long alternatives.
- 

## II PURPOSE AND NEED

- II-5 ¶ 1 The purpose and need statement is extremely broad and focuses on the entire Metroplex. 121 will have an impact on regional travel. Only ¶ 2 P II-2 discusses city of Fort Worth specifically. What are defined SW corridor needs and trends?
- II-5 ¶ 1 Exhibits II-1, 2 and 3 are generalized to Metroplex level analyses. Fort Worth is at the edge of projected congestion on a regional level. There is no specific SW Fort Worth discussion. What are specific trends?
- II-6-20 The TDM and TSM discussion is generic, refers to greater Metroplex. This discussion does not support purpose and need of the corridor.
- II-19-20 ¶ 2 & 5 All the previous discussion is interesting information but does not support project purpose and need. ¶ 5 notes the need to reduce congestion and need for SOV lanes => Yet the 121 corridor is a specific SOV facility. The corridor is independent of the strategies and still not adequately documented in the purpose and need.
- II-20 ¶ 2 The section concludes the project is justified with no nexus to prior discussion. STH 121 is an SOV facility and in fact could be interpreted as inconsistent with objective to minimize SOV needs.
- II-20 ¶ 2 121 does not appreciably improve non-auto use. While it is a link in the Regional System, it is an SOV facility. This does nothing to support the project purpose and need. Be specific to SW Fort Worth needs.
- II-27 ¶ 1 Where is the supporting documentation for findings of LOS F operations at named streets? What type of failure is occurring link or mode? Demonstrates that there have been considered and are inadequate.

- II-28 ¶ 3 This is a generic statement that could apply to any project. The DEIS should present documentations of project specific locations versus generic to support project purpose and need.
- II-28 Exhibit II-6 and II-7 Depict I-30 configurations that are no longer valid. 1994 and 1996 traffic data (used in 2002 analysis) are stale.
- III-33 ¶ 1 Conclusion is generic and so far, hasn't been supported or adequately proven.
- II-33 "Funding and Legislation" section is informative but does nothing to support the purpose and need.

### III ALTERNATIVES

- III-14 Point 7 As early as 1984 City Council recognized the need for "special design elements." This DEIS should specifically address how this current project meets those recommendations.
- III-15 The 1987 study had limited alignment changes – this DEIS should address project specific Build Alternatives, not alignment issues.
- II-27 ¶ 2 1993 SH121 Task Force refined extent of alignment.
- III-27 ¶ 3 First reference to Alternative D. Alternative D is shown in Exhibit III-7, but is a small segment. Is Alternative D just that segment?
- This is a key breakdown in the discussion from a corridor/alignment discussion to specific of potential Build Alternatives. However, there are no diagrams that show a plan of alternatives. A, B, C and D.
- III-28 ¶ 2 This discussion minimizes the findings of the PDT. Discussion focuses on AIR1 (Alt A) but does not capture any essence of Parkway. As NTTA is proud of its facilities, this should be clarified. Separate corridor and I-30 issues.
- III-29 ¶ 1 References to Frontage Roads is generic and non-descriptive. State specific locations while differentiating between AASHTO designated Ramps, Frontage Roads, or Collector distributed roads. Without specific description and lack of Alternatives (A, B, C and D) public and reviewing agencies cannot assess the environmental impacts.
- III-29/30 The alignment discussion is generalized to a single description that is

insufficient to evaluate specific impacts. Alts A and C have some varied plans and profiles that reflect addressing specific public needs.

The discussion of interchange has been summarized to “variances” of several interchanges. A key issue of PDT outcome has been reduced to “aesthetic components” that can be combined.

Pursuant to FHWA guidance for a project like this one, the Aesthetic Components are critical issues at a concept level and must be Integral to the project.

III-30 Alternative A references a “Park like” facility and states that such design concepts are atypical for an urban highway – We agree. This is not an urban highway; it is a Parkway, an NTTA facility.

III-30 Alternative A Description – This discussion is value-laden and subjective. It minimizes the results of the PDT process to yielding an alternative that “includes design concepts not usually proposed for an urban highway facility.” Since before the PDT process, TXDOT, NTTA, and the City have stated the SH 121 facility was not going to be a typical urban freeway, such as I-30 and I-20.

Discussion that “Plan concepts unique to this alternative” are in direct conflict with TXDOT, NTTA public statements and presentation materials that depict Alt C as having most of the features of Alt A.

Discussions that “Connections to future and existing roadways were minimized to address the PDT’s perceived idea that this alternative would generate additional traffic on the local roadway network” is value laden and inaccurate. Only the Bellaire interchange ramps connections were debated. This is not an accurate portrayal of the alternative, and therefore provides insufficient information for evaluating and selecting a preferred alternative.

TXDOT, NTTA, NCTCOG were members of the PDT. Therefore, if these agencies also had a “perceived idea,” it must have had some merit and should have been adequately considered in comparing impacts of alternatives.

Ex. III-8→ III-30 There is no “comparative” analysis, as stated on page III-30, just a description. Since the NEPA process is to compare the impacts of each alternative (including the no-build) this is a significant flaw.

Ex. III-8 **STONEGATE:** In Alt A, 121 would pass under Stonegate. Alts B, C, D, 121 would pass over Stonegate. Since Stonegate is a phased addition, why not save money now by not building bridges and keep 121 down?

- Ex. III-8 IH 20/183: Text should note fully directional interchange violates AASHTO criteria for weaving on the main line and inconsistency in ramp sequencing.
- Ex. III-8 DIRKS RD: Currently proposed as half-diamond in alternatives. Are future ramps being considered? If so, what environmental review will occur. There are potential stream and water quality issue. Are there cumulative impacts?
- Ex. III-9 These figures and text from Ex. III-9 are insufficient for agencies and the public to understand the Build Alternatives. As such, it is impossible to adequately assess potential impacts of any alternative let alone chose between what is being said by TXDOT/NTTA/CFW and is being depicted in this important document.
- Exhibit III-9 needs to have specific locational reference points for each Build Alternative. Generic typical sections are meaningless to all reviewers.
- Ex. III-9 There is no indication of “Parkway” characteristics, features and themes. There is nothing that differentiates the urban freeway of Alt D with Parkway of Alt A.
- Additional discussion should focus on specific design concept treatments to manage speed including possible changes between travel way and shoulder, possible use of geotextile reinforced shoulders, and roadside design equipment. These details should be referenced and noted as being resolved in schematic planning efforts.

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**Note:** Exhibit III-9 began after page III-30 and before III-43, hence the gap in page numbers.

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- III-43 ¶ 1 There is no description of the A1R1 interchange concept at I-30, even though it was the controversy over the I-30 interchange that led to the PDT development and outreach. This plan (and Alt B and Alt C) has unique impacts. Whether the A1R1 plan was ultimately chosen or not, this further demonstrates the lack of information available for reviewers to make, informed decisions.

Text discusses various median width without noting the locations. Without noting the locations, there is no way for a reviewer to compare alternatives and their impacts.

- III-43 Alternative B Description – This description is technically and factually incorrect. Such a description is misleading and prevents an adequate

comparison of alternatives to select a preferred alternative.

At first alternative B is described as “similar” to alternative A, then it is described as “identical” in the next sentence. Alternative B does not have a split plan and profile, as provided in alternative A. This is a fundamental engineering component that must be differentiated to compare and evaluate alternatives.

III-43 (cont.) Alternative B does not follow the same profile as alternative A and therefore has unique impacts to the community. Specifically the profile for alternative B goes over virtually all cross streets creating significant visual and physical impacts.

III-43 Alternative C Description – This description is inadequate to provide a meaningful comparison of Alternatives. TXDOT and NTTA have publicly stated and provided documentation depicting how and where alternative C is the same as alternative A. This description provides no comparison or discussion that leads a reviewer to understand that relationship or to differentiate this alternative from either A or B.

While there is no information to differentiate the Alternatives on the north section (from Dirks Road to I-30) there is information on an alignment variation south of McPherson Road. The document notes this deviation without clarifying in Alts A and B key features or alignment elements for this segment.

The document states, “The recommended alternative for the proposed SH 121T project is Alternative C.” While TXDOT likely was referring to the alignment variation noted on Alt C, this demonstrates the DEIS focus on “corridor” issues. The document is inadequate to address build-alternative impacts between the alignment alternatives.

III-44 Alternative D Description – While there are no figures or exhibits depicting the specific components of Alt D, Alt B (the “Modified Design”) was derived by eliminating some ramp connections and eliminating continuous frontage roads. The description does not include a specific reference to Alt D’s including frontage roads, which were a significant community concern.

As with the other alternatives descriptions, there is insufficient information or exhibits to understand the particular features of this alternative and make a comparison of impacts.

III-44 ¶ 3 This sentence is inaccurate and misleading. The essence of the assessment of Community Impacts is based upon the intrusiveness and disruption of the new freeway facility. The long project history (page I-16-18) and controversy

since 1998 is based specifically on the unique impacts of Alt D and Alt B. Alt A was derived as a means to mitigate the negative community impacts of Alts B and D. Therefore, the DEIS misleads the reviewer into mistakenly understanding that all alternatives can equally mitigate publicly identified community impacts.

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## V ENVIRONMENTAL CONSEQUENCES

- V-9            The description of the northern project terminus is inconsistent in the DEIS. In addition, traffic analysis of terminus area is critical to decide if project limits have been correctly established.
  
- V-13          The DEIS should describe impacts on Harold Park and Cobb-Barney House, including mitigation if necessary.
  
- V-34          Need 4(f) discussion of Sunset Terrace neighborhood.
  
- V-82          Peak hour data from 1992 is stale, given current traffic patterns.
  
- V-185        Cumulative impacts discussion needs to focus on impacts of multiple projects on Sunset Terrace and Mistletoe Heights neighborhoods.

SH-121T Fort Worth PDT/CAC Meeting February 3, 2003Selected Transcript:Mike Weaver

Thank you Mayor. It is interesting for forty years we have talked about the roads and now we are on a sprint the last four weeks. What I want to start with tonight is the Mayor used the sequence over the last eight or nine months the City Council working without partners and a lot of you in this group have tried to start addressing the issues that were still remaining after the PDT and some things that happened with the DDISD. What I would like to do is walk through those items that we heard from Council. There have been some specific actions taken by Council. There have been other things that have evolved in discussion with individual members and their discussion with folks that are in this room tonight that we will try to go through.

I think the first thing to go back a little bit in time, back when many of you were at the public meetings that were held the end of May. When Alternative C came out, it was a refinement of review of the PDT process you all heard today. And, as this map pointed out, C was very close to A. About 90% of the way there we kept a lot of the features that PDT and the City of Fort Worth were asking for in the process.

Some of those things that came out in what we have been seeing over the last four to five months is a support of the Trinity River program. We had very good meetings over the last 30 days to try to bring that together with our partners to address those issues and those were very important things that we talked about and they continue to be.

Alternative C provided for PDT buffers. The difference between A and C - we didn't buy houses, didn't buy apartments, didn't buy buildings. The alignment allowed for the extra 80 foot buffer. The same thing was true with the 100 foot margin that is in alternative C. NTTA and TXDOT agreed to look at the split profiles and how that might work and to allow the road to be separated. Again, an important feature of the parkway program. The 8 million dollars that you recommended - while there were discussions with Council about what we might take out and what we might put back, I've not heard one council member say we are going to cut that 8 million dollars. Since you all met, NTTA, and you will hear from Gary Ingram tonight, have an aggressive landscape program that may now bring about another \$500,000 a mile to the 1.1 \_\_\_ dollars. The council also instructed us in June as to one of your concerns about the concern that most of you are hearing is how do you make this happen. We have sent over to NTTA, and their legal staff is reviewing it, a memorandum of understanding that will commemorate this process and would provide a process from now until the time the road is open where the city and TXDOT and NTTA would be fully involved in

looking at all the issues that you will hear us talk about a little bit more in a minute. These are just some slides that the Streams and Valleys provided to the City and our partners a couple of weeks ago to begin to address what happens over the river at University.

This is down in the Clear Fork crossing that is Cass Edward's property. All these are things that make a lot of sense and we'll try to figure out how to incorporate those into the final recommendation that the council will make on the 18<sup>th</sup>.

You've seen this before, this is the picture of the Nimrod crew that is part of the PDT for that same \_\_\_ river. These are some bridge designs that NTTA and the TXDOT have shared with the River Authority and also Streams & Valleys. These are some options for what they envision that bridge might look like. As you can see, they've done a pretty good job of what it might look like and allowed for an area where there would still be room to put the trail in underneath the structure. This is the one further down at Clear Fork where there is a much longer span that allows for a location for a trailhead and some other improvements that again overall \_\_\_ have to do.

People have asked what does a wall look like – a noise wall or a visual wall. These are some real quick images of what types of native landscaping might be done with a wall. This is a berm with just landscaping and this is a berm with a wall landscaping. These are all combinations of things that we have been talking to neighborhood groups all up and down the corridor, Country Day and others where it would be the types of things that the City might want to do or whatever is required by TXDOT and NTTA.

Gary is going to go into this in a lot more detail in a minute. NTTA has done a great job over the last year or two in developing a program for what their roads look like. This is over on the George Bush right now. This is what it looks like today. This is what they hope it will look like when they get through replanting it over the next year. We'll go back to the cross section. If you recall there was a lot of discussion about a minimum section, a smaller median, a very small parkway section on the outside. What the PDT did and what is now included in Alternative C throughout the entire floor of the \_\_\_\_\_ are the 8-foot bumpers on the side and the 100-foot median in the middle.

This is another profile that some people have asked what does this mean? This is basically letting the road not meet completions all the way across. Again, we had an agreement in principal with our people who will build the road to tie to that where we can.

This is another shot out of the PDT that you recall and I think if you look back at the NTTA bridge, while it may not be as pretty as Nimrod's drawing, it basically is the same design not having the open section but more the parkway commons.

So again, they are already doing a lot of the things that you all want to see on this road, they are already doing on other projects.

These are some examples of mitigation bridges that TXDOT has built. A lot of people don't trust TXDOT. Over the last four or five years, TXDOT has made huge strides in working with communities and neighborhoods to try and do things with financial participation and even if it takes some times mitigation.

This next series of shots are all local streets that go over the Southwest Freeway in Houston – a 12 lane freeway with a HOV lane in the middle. These are kind of fake cable stay bridges, two lanes, bikeways and in a second we will show you what feature into the neighborhoods.

You can see here this is just a two lane street, the freeway is down below. This is the type of monumentation that the City of Dallas helped fund on North Central Expressway and heavy landscaping and some monumentation that the North Central Expressway east of those interchanges are kind of a theme to go into neighborhood parks and other area.

This is back to the bridges in Houston again where you have the separated bike/sidewalk which is a nice feature and doesn't cost much more money. And, again, these are just special lighting for different \_\_\_ lighting. One reason for going through these will be to talk to people. Everyone wants to know what are you going to do with the \$8 million, what makes this look like a parkway. Well we don't really know yet, we haven't defined the final design. It's a memo of understanding about what these images have been made and talk around the community has begun to give people and the Council an idea of what types of things we might be able to do with our partners.

This is a project in Arizona where we are working with Native American tribes and the project was, they were allowed to do murals underneath and old Indian markings on the bridge. Again, just not real expensive to do. Go back to that slide for a second. This is another thing I know the PDT has talked about was not having the traditional bridge that we see here with the open girders but to have a closed structure underneath. This is a very good example of a closed structure like that.

This is a bridge I know many of you have seen. This was recently built, in the Town of Trophy Club and the Town of Westlake on State Highway 114. The Town of Westlake and some area developers working with TXDOT spent about \$400,000 to change the character of the bridge, to go to this railing system and to go with some different lighting fixtures.

This is the interest of Southlake. A brand new bridge on 114 at Southlake Boulevard and the City helped fund the decorative railing in the interest of the community. This is a very inexpensive way of getting a different texture on the

rock walls. This is something TXDOT does now almost routinely. It shouldn't have to cost any extra to have TXDOT build something like that. Some of the City's money in the Southlake area went to intersection improvements and may be something the City wants to do working with PDT. Again unique light fixtures. Did real nice work on the lighting. Maybe 50% lighter. This is a good example of again where the City spent a little extra money and got creative.

This particular bridge on this side is that bridge right down there. This was the old TXDOT bridge, this was what the City was able to work on – different lighting fixture, landscapings, the concrete flume, the closing of the ends instead of being open. Again, just small details like that, that can be done in working with our partners.

The next set of items that we focus on are trying to groom down some of the construction aspects of 121 with the council. It's something called the CA \_\_\_\_\_. In a minute Carter Burgess will make a presentation about what that is. When you finished your work on Alternative A, TXDOT reviewed that and came up with Alternative C. Some people liked parts of A, some people liked parts of C. The Council hired Carter Burgess as a separate contractor to come back and try to blend those two together. You will see that tonight and I've heard from Council that both of our partners have now supported this to move forward with the CA \_\_\_\_\_. An important part of that was, it helped fix the limits of who paid for what and there is already some debate about where that would be and if the City of Fort Worth built the interchange, the limits moving out to University, actually saves the City some money from having to buy from Monihan and the lumber company and some other things.

There has been a lot of discussions since summertime and we have had additional design work done to look at moving 121 over next to the railroad tracks and I know that PDT debated that issue and talked about it. We think it makes sense and will have to work with NTTA to figure out how that will fit and how that could work. That could probably be beneficial long term in that area. Base construction at Stonegate and Oakland Trail in November will be presented to Council with a variety of cost issues. We talked about these two roads which are really developer roads and when they would be built and how they would be built. The phase-in to Stonegate only pertains to the piece between 121 and Bryant Irvine. All the cost numbers today and the city's budget assume that the city will build a road from Hulen to tie into the 121 interchange. Oakland Trail is the future city street that has a crossover over 121 with no interchange. The land is not even inside the city limits right now. And, so what we heard from Council is that maybe we should go spend 5 or 6 or 17 million dollars building those roads right now. The direct connection ramp at 1-20 – those were an issue with the redefined and TXDOT has worked on and NTTA on lowering all of that. Those ramps could be built in and lower the interchange about four levels. Again, that allowed us to fix the point of where the City's obligation of right of way stopped and started. So now TXDOT limits of the interchange go to the point almost

north of Bellaire Boulevard and south to south of Overton Ridge Trail. And then the last item we heard in looking at one of your recommendations was the private \_\_\_ at Dutch Branch and Overton Ridge to lower the 121 main \_\_\_ a few feet. Looking at the cost of that and what we heard again after formal action on this, it is probably not cost effective to do that.

I'm going to stop right now and let Darrell Thompson of Carter Burgess come up and give a little more detail about this because this is a pretty significant change from what you all wanted a couple of years ago and they may not want to do that and we'll be back in just a second.

### Nimrod

I'm going to do three things – One, I'm going to comment on the status of the design and where it has gone in the last couple of years. Then, I'm going to review the elements of the parkway design which the PDT and the public involvement process now completed the work. And then the last thing I'm going to do is to start downtown and then I'm just going to go all the way to Dirks Road and talk about changes that have been made and the progress that has been made and what's positive and what's negative and what's still unresolved.

In the DEIS the features of the design elements we talked about with PDT were not clearly stated. The tri-party agreement calls for design standards ten of the parties that the project incorporates or a high degree of aesthetic and urban design elements to the extent reasonably possible. At this point what is reasonably possible has not been determined and it is going to take a process to mesh that out. And, the last thing that is kind of a key point is this \$8 million the city has budgeted and the \$4 million the NTTA has had – what improvements will these pay for exactly and how much of this that everybody wants to do can actually be accomplished and that is unknown at this time. The bottom line on this is that this is a long process and has already been going on for years. The detail design information is not yet available. It is very difficult for a layperson to read the plans and to know what is happening. It is even difficult for everybody to read but it is complicated plans. I feel that the City of Fort Worth should continue to have people look at the plans along the way and to make comments and to work on refinements. Even more important is the public must stay actively involved. This is a long process and it usually wears everybody out. But, you have got to be involved through the design, you've got to be involved through the construction process to make sure that you get quality construction of landscape and hardscape elements. And then after the project is finished, the maintenance and the landscaping is critical, especially in the first couple years.

One thing we recommended is that they hire one landscape architectural firm to do the entire project, both the DOT, the improvements that the City makes and also the toll authority. The bottom of this I say is that overall, since the PDT process, I am excited about some of the ideas that have come forth; things that

we didn't think about which are very dramatic improvements of the plan. So, I think progress is being made. The PDT process - what we heard clearly was that the neighborhood had certain goals about what this parkway should be. It has been called a parkway and that was maybe the first mistake that was made. The idea that it is a parkway that it is attractive is important. 121 should fit harmoniously with the land and should follow land forms. It should incorporate park-like plants and it should utilize Fort Worth inspired architectural elements through the bridges, through the buildings and the retaining walls using materials that you will see throughout this evening. And, that whenever possible, the parkway should be recessed below city streets so that the impact would be minimized. So the features to achieve these goals, and I've got plusses and minuses, and I doubt if you can all see them and that's why I'm standing back here, because I can't see them if I get further back. But, varying medians, that's a plus; everybody is in agreement that the medians should vary. The split profile is a plus; everybody has agreed that that is possible and you can split the profile. What it does is it breaks the scale of the roadway. If the roadway is on the same level it wide expands its level and that is a huge impact. If you split it, it appears small. The expanded proffers. I think the decisions that have been made about the buffers are logical, narrow when construction of new buildings is taking place is something we would also agree to.

Here is a minus – it says minimize the pavement by using stabilize shoulder. On the inside of the lanes shown now, there is a 12 or 10 foot shoulder. In a lot of areas that you see on interstates there is maybe a 3-foot shoulder with a stabilized dirt shoulder or gravel shoulder. If you can do that and narrow the road some, it is going to look better and function at a good level. Already, and it is a positive, there has been a minimal use of frontage roads and PDT recommendations are to move forward. Another plus would be the recommended signage controls and the prohibition of billboards. The city's signage ordinance does that. Another plus is that everybody is in agreement about the architectural elements and taking on the character of the City with the unique Fort Worth.

The 60 MPH designed speed and 55 MPH posted speed, I don't know what the result of that recommendation has been at this time.

And, this design should enhance the Trinity River Park. What it has the opportunity to do is create linkages that are not there now. East/West connections across this expanse will connect neighborhoods and connect these neighborhoods to the property to be annexed across the river in a number of places where there are no crossings now so it can strengthen the overall Trinity River Park if things are done properly.

The other thing that it does, is strengthen pedestrian connections by the design of these bridges with pedestrian crosswalks. Of course, the City has to tie into those so they go somewhere.

Starting downtown, the main issue that we were called in for was the elevated overpass connecting the Forest Park. The elevated ramp has been eliminated. I think the design they have come up is incredible. The PDT design around Sunset Terrace I think has the least impact that it could have in that area. The idea of a pedestrian bridge that crosses under the Trinity River that ties into the Heights neighborhood, Mistletoe Heights, I think is the next \_\_\_\_\_, so that neighborhood can utilize some of the park improvements that are done along the Trinity River.

One idea that I have is that the Rosedale ramps and the Trinity River bridge could be the gateway to the parkway. That is where the parkway begins and the character from I-30 changes in that where you go under the Rosedale bridges, go across the Trinity bridge and now you are on the parkway. And that is kind of the way that TXDOT and the division has also been laid out. I agree that questions still exist about lighting and noise impacts of the roadway. I think this needs to be studied further. The last thing is on the PDT recommendation where we show extensive landscaping in this area from I-30 all the way across this area to the railroad, I haven't counted the lanes recently, but there must be 16 to 20 lanes of traffic, maybe more than that. It is a huge expanse of paving and roadway system, it is an interchange that is compressed into a smaller area than normal, but there is still a foot in the plan here, there is still enormous areas, probably 40% of the overall area and can be graded and can be landscaped and by doing that, you can soften the impact of all this road and get a little separation between these areas.

The toll facility, there is a linear park opportunity along this area, where next to Alamo Heights, a lot of those business are being taken in the widening of this area with the roadway going through. There is anywhere from 100 to 200 feet that is left over off the street and next to the neighborhood. The linear park could connect the neighborhood to the Trinity River and Trails there to the Cultural District if done properly and it could provide valuable neighborhood amenity for Alcoa Heights and it will add visual buffer as well from the toll area to the neighborhood.

We talked about the architectural treatment. One of the things that still appears to be prevalent in this area is that the number of lanes is I think 16 or 14. There are a lot of lanes here and it would be from what I hear the use of electronic toll tags it may be that you can narrow that down and make it more efficient. The narrower you can get that pavement gutter also, possibly the median between the two different directions wider and landscaped; it would also soften this expanse and \_\_\_\_\_. This shows the tollbooth area here, it shows this large area that is kind of leftover in the long neighborhood. The neighborhood right in this area. The linear park here that links back and across this bridge and over to the river here, the river where it bleeds down through here to the Trinity River Park and over to the downtown and over to the cultural district. You can make a loop

along the river and come back this way. This is a great opportunity to strengthen this neighborhood and urban neighborhood that is desperately needed.

At Stonegate there is an idea of shifting of the road/parkway toward the railroad. This relocation of the roadway will greatly improve the development here and potential of this area and gives a larger area that is adjacent to the river and the \_\_\_\_\_ is that this allows for the new roadway to go under the bridge at the Trinity River and if a trailhead could exist there that could provide access to the park. So, I think that this is one of the great ideas that we didn't come up with and moving the roadway against the railroad instead of cutting through the middle of this property greatly enhances the design.

The I-20 interchange area south of that, popular use at the I-20 interchange and bridges and such are generally compatible with the surrounding land uses which are predominantly commercial. Landscaping with these bold expanses of trees and wild flowers, I think would be ideal for this area. And, the ramps should not add typical frontage roads, they should have limited access to the surrounding properties.

South of I-20, the Overton Ridge Blvd. And Dutch Branch Road, the new extension requires we lower those 6 feet. The benefits and costs are not (tape ends)

### Maribel Chavez

Good evening. My name is Maribel Chavez and I am the District Engineer for the Fort Worth District of TXDOT. If you can't hear me just holler at me and I will try to be a little bit louder. I have been with the Fort Worth District for about a year now so with respect to the history with this project I am certainly a short timer and I guess to join Mark and Robert as far as being relatively new to this project and to this history I guess I will tell you in not only reading the history that is captured in the draft DEIS and also in reading through some of the correspondence that we have on record we may set a record. This may be the project that has the longest longevity with respect to highway projects. When it comes to major transportation projects it is customary for them to take a long time – but 40 years? This one may be it – this one may set a record for Texas yet.

Let me just tell you briefly where we are in the process. We have come to probably the most critical stage in the \_\_\_\_\_ process – the National Environmental Policy Act. We have prepared and even though we do have three full and equal partners which is TXDOT, NTTA and the City of Fort Worth, TXDOT is the lead with respect to preparing the DEIS. We did submit that to Federal Highways Administration and they in turn upon their review have allowed its release. It was released for publication and for public consumption on January 10. From the 10<sup>th</sup>

they required 45 days for it to be out to the public and then we have also set the public hearing date which is the 25<sup>th</sup> of this month. Then we will allow ten days from that public hearing in which to continue to accept written comments.

What happens from the Public Hearing and at the Public Hearing? Let me tell you briefly what you see as far as the Public Hearing for those of you who are not familiar with public hearings for draft DEIS's. We will give a project overview, you will see some presentations with respect to the various alternatives that have been reviewed.

You will also hear an explanation of what the state and federal right of way acquisition process is and then we will open it up to public comments. It will all be a formal public hearing and it will be formally transcribed and we will have court reporters there to take public comment for those folks that want to speak, of course they are more than welcome. Those that want to provide written comment; we will certainly have court reporters there so that they can accurately capture what their comments are. What will happen is that every comment that is made, whether it is verbal or written, will be compiled and then it is our responsibility to address all those comments. It will all be compiled according to the final environmental impact statement.

Let me tell you that the public comment is the most important part for all of the various state and federal regulatory agencies that will have some say and some role in this transportation project and they will all rely very strongly on what the public comment is and how the sponsoring agency addresses that comment.

This will all then be submitted back again to the Federal Highway Administration. They will look, they and in consultation with many of their regulatory partners, US Army Corps of Engineers, the Department of Interior, US Fish and Wildlife and the Environmental Protection Agency. In consultation with them, they will review what has been compiled, what has been addressed and then they will make the final determination as to whether or not this project is cleared environmentally. They will issue a record of decision. The timeline on that really will depend on how much and the extent of the public comment that is received at the public hearing depending on how much comment, the complexity of that comment, how we are able to address those comments, how the various state and regulatory agencies feel that those comments are addressed. You really never know, it just depends on the comments on how long that process may take. Perhaps by the end of this year, perhaps we will be submitting the final EIS and submitting that to federal highways. And, again, depending on the various issues it may take the federal highways I would say a minimum of three months then to issue a record of decision as to whether or not this project is environmentally clear. And, it is then, when environmental clearance has been secured, if it is secured, it is only then, that we can begin the design process. It is only then that we can formally begin all of the commitments for the various design elements that obviously need to be incorporated into this project.

I can tell you that in the short time that I have been associated with this project, in the discussions that I have had with the Tarrant Regional Water District and with the Streams & Valleys, the issues and concerns that they have raised are reasonable, they are valid, they are the type of design elements that I think should be in the final project. I think that we recently reviewed a letter in fact that the Streams & Valleys submitted to the City of Fort Worth and while we haven't completely \_\_\_\_, I can tell you just on the surface, the design elements that they have raised are doable type of design elements. I think that TXDOT has an incredible opportunity to do right by the citizens of Fort Worth. I think that we have an opportunity, particularly at 30 and the University and Trinity River area, to design a beautiful facility, one that should compliment the area. I can tell you personally as an engineer, I think that this would be \_\_\_\_ and I think my old English teacher would probably whop me if I said that this has got to be the funniest project that I think we will be working on in this area, if indeed it does happen.

I think that all of the things that you have heard tonight and the things we've been hearing from the water district, from Streams & Valleys, I think that these are the type of issues and concerns and comments that you need to come to a public hearing with. You need to make those a matter of public record and then you need to hold all of us accountable for what you have come forward to. This is your project, that is as simple as I can put it. It is not TXDOT's project, it is not NTTA's project and it is not even the City of Fort Worth's project. It is the citizens of this area, it is your project. So you need to step up, you need to make your voices and your comments and your concerns be heard and as I said, you need to hold us accountable for what your concerns are. That is pretty much what I have to say.

#### Maribel

I think and I tried to explain this when we met at the Water District we are not changing our position that we feel differently about the 4F issue. We, and it is stated in the draft DEIS, we have not changed our position with respect to the 4F issue.

That does not mean that we don't acknowledge that there are opportunities for us to work and also for us to do the right thing. As I stated, in reviewing the letter that the City received from Streams & Valleys, I can tell you and this is without having gone into a whole lot of detail in that review, but the elements that were identified and for the most part they are the same things that you (tape ends)

And our opinions and I think that at a very um, at an appropriate stage and I don't believe it is now, but I also don't think it is inappropriate for us to make the comment to make the pledge that should we have an opportunity to design, if there is environmental clearance granted to this project, that these things can be

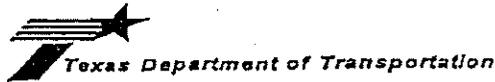
incorporated in the design. I think that when we review some of those comments that were made to the City, I think we will be able to provide you some language that I hope will make you feel more comfortable so that you can then hold us accountable when we start designing and say that you have a right to be at the table when we are designing and I think all of that is doable. I think the elements that were identified are appropriate in that environment. That we will be, again, if we build the project that should be there.

Nimrod (?)

And I appreciate that and I think we want progress. Just one question we just want to make sure that we are not totally in the enhancements and if the cost of this project until we go on that is one of the enhancements that is cut. I know you know that but I just wanted to acknowledge and thank you for the comments and hopefully you continue to make progress.

Maribel:

And, I guess to try to explain what I am trying to say is that some of those elements, obviously like riverbank protections really we would have to coordinate and work with the Water District to determine and they, and obviously the Corps of Engineers, will have a large role in determining what that type of protection would be. It would be inappropriate for me based on right now to say well it should be \_\_\_\_ protection it should be \_\_\_\_\_. It ought to be what those governing and jurisdictional bodies deem is the best, is the appropriate type of protection. And, that is what we will have to do. It is what we should do. And they will be the ones that also help us determine what the limits of that type of protection should be. It is their jurisdiction, so they will be the ones for the most part working with us in trying to determine what those limits should be and where they should be. And obviously because they are for the most part the owners of that property, they will also be the ones that will have to work with us in determining for instance a pedestrian bridge, where should that be, where will it have the least amount of impact and where will it be the most useful. It shouldn't be up to us to say this is where we ought to put it. It should be those governing bodies that help us determine where the best place is.



STATE HIGHWAY 121  
 From IH 30 to FM 1187  
 Tarrant County  
 Public Hearing  
 April 22, 2003

The Texas Department of Transportation (TxDOT) actively seeks your comments on this proposed project. Your comments are always welcome and will be given serious consideration during the remainder of project development. Written comments may be submitted to the District Office using this form or by letter postmarked by May 2, 2003. Written and verbal comments will become part of the project record and will be included in the written summary and analysis of the public hearing. Thank you for your comments.

OFFICIAL COMMENTS:

Please opt for the Adoption of Alternative C/A. This plan for the new SH121 section has no negative impact on Hangman's House of Horrors. We have been in business for 15 years and each year we raise nearly a half million dollars for charity to stay here in Tarrant County. Our charity organization aids over 7500 local citizens with Multiple Sclerosis. We are the 18<sup>th</sup> largest event in Tarrant County. Over 30000 patrons visit

Mail to:

Mrs. Maribel P. Chavez, P.E.  
 Texas Department of Transportation  
 P.O. box 6868  
 Fort Worth, Texas 76115-6868

Fax to:

817-370-6787

**BY MAY 2, 2003**

Name

Alicia Nelms

Address

4638 Glenview Ct  
 NR Hills, TX 76180

Phone

817-595-9798

us each year. We make a difference in Tarrant County. We provide fun and support for Fort Worth locals. Please do not take that away by deciding Against plan "Alternate C/A."

Thank you.

RECEIVED  
MAY 01 2003

April 23, 2003

Ms. Maribel Chavez, PE  
District Engineer  
Texas Department of Transportation  
PO Box 6868  
Fort Worth, Texas 76115

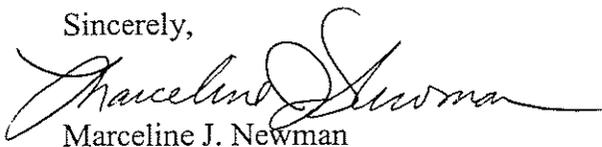
Dear Ms. Chavez,

I am writing as a concerned citizen of the City of Fort Worth in support of the SH 121T project. I live at 11301 Northpointe Court in West Fort Worth. I have lived and worked in southwest Fort Worth for over 20 years. I have seen traffic and development expand exponentially in the southwest quadrant of town and have seen my travel times increase from 10 minutes to 45 minutes during the afternoon commute along Bryant Irvin Road.

I wholeheartedly support TxDOT and NTTA's efforts to advance the development of the project. I do not see the need to add extensive landscape improvements and additional right-of-way buffers that will benefit a few select property owners at the expense of the rest of the taxpayers of the City of Fort Worth. I cannot see the logic in spending between \$65 and \$100 million dollars for extensive aesthetic amenities during times of fiscal shortfalls. As stewards of the taxpayers money, I feel TxDOT and NTTA have developed a prudent, financially feasible design and should move forward with it.

Thank you for your efforts to move this project forward. Those of us who live, work and conduct business on the southwest side of Fort Worth look forward to the successful completion of the Public Involvement process and the beginning of construction soon.

Sincerely,

  
Marceline J. Newman



**STATE HIGHWAY 121**  
From IH 30 to FM 1187  
Tarrant County  
Public Hearing  
April 22, 2003

*The Texas Department of Transportation (TxDOT) actively seeks your comments on this proposed project. Your comments are always welcome and will be given serious consideration during the remainder of project development. Written comments may be submitted to the District Office using this form or by letter postmarked by May 2, 2003. Written and verbal comments will become part of the project record and will be included in the written summary and analysis of the public hearing. Thank you for your comments.*

**OFFICIAL COMMENTS:**

*see attached*

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Name MARK U. OPPENHEIMER  
Address 8424 Whippoorwill Dr  
Ft. Worth TX 76123  
Phone 817-808-6698

# Mark V. Oppenheimer

8424 Whippoorwill Drive  
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(817) 294-5558  
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April 22, 2003

Texas Department of Transportation  
Fort Worth District  
McCart at Interstate 20  
Fort Worth TX 76133

Re: Draft Environmental Impact Statement FHWA-TX-EIS-99-05-D  
SH 121 T from IH 30 to FM 1187 Tarrant County

To whom it may concern:

After reading the Draft Environmental Impact Statement and following the various public informational meetings relating to this highway, I do want to speak in opposition to this highway for several reasons. My concerns certainly were not properly addressed in the DEIS statement. Those concerns are as follows:

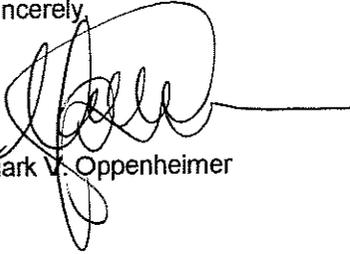
- With the current state of the economy, do we the citizens of Fort Worth and Tarrant County have to bear the brunt of the costs of this highway which will not improve the economics of our city and county? It will seemingly benefit Cleburne and its residents, not the citizens of Fort Worth.
- The DEIS does not detail measures of alleviating what is commonly known as urban Sprawl. Fort Worth was recently rated the 10<sup>th</sup> worst city, out of 83, for urban sprawl which means people drive more, breathe more polluted air, face a greater risk of car fatalities, have to own more cars, and walk and use transit less. Also, it leads more to the deterioration of the inner city, which, I must say, Fort Worth cannot afford... I have attached two articles which deal with this issue. Also, it should be understood that the EPA is concerned with this problem and should be dealt with in any DEIS. Here the statement does not deal with this issue at all.
- I am particularly concerned with the proposed alignment of the highway after it dissects Dirks Road and proceeds south, especially the area between Granbury Road (Columbus Trail) and Reisinger Road. The current layout seems to be Route C as depicted as a yellow line in Exhibit III-1, dated 1973. The highway will then obliterate an established stream and wetlands area, commonly known as Summer Creek. This creek serves as the sole release for all the drainage for the numerous homes and streets that have proliferated between Hulen and Summer Creek. The DEIS makes no comment about these wetlands, nor makes any provision for them. In fact, there is no logical reason to take this easterly turn following Dirks Road when the highway could have proceed directly south without doing any damage to the environment. I strongly urge that Route A (the Blue line) in the 1973 map be considered as the official site. The Department may argue that they need to bypass the electrical station on Columbus Trail, while at the same time cross the rail lines at a proper angle. Taking the Blue route in the 1973 map would accomplish both without damage to the environment.
- Lastly, no study was performed considering other Raptor birds that live in the area in question. I dare say mention the DEIS considered only one Raptor in its study, the bald eagle. As we all know, there are other raptors [eagles, falcons, vultures and owls] that inhabit this area. A highway as proposed would devastate this natural habitat. While living in this area, I have personally seen falcons, owls, vultures, and other types of eagles. The DEIS should do a better study of the animals and birds that live in the area.

April 22, 2003

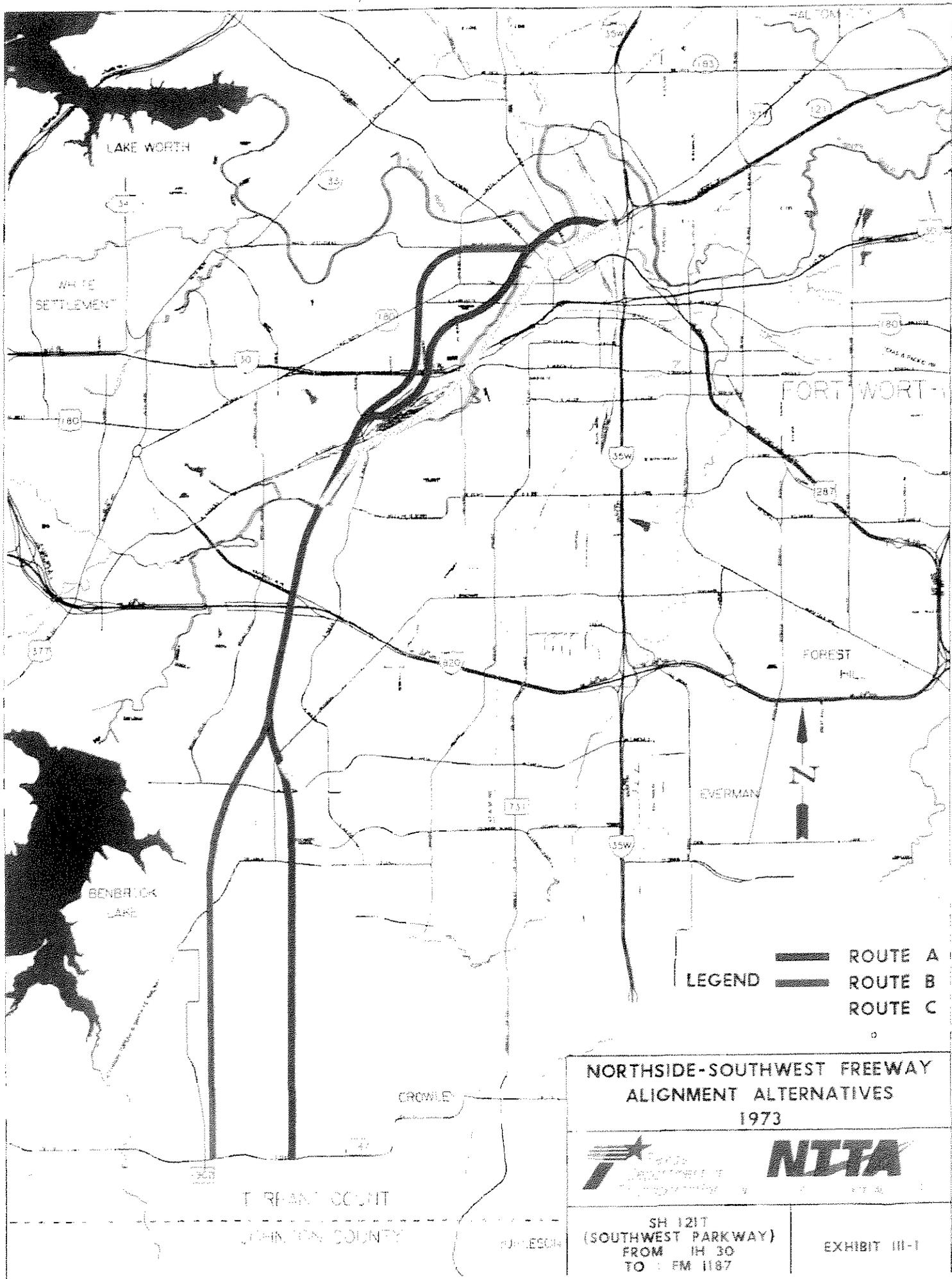
- Lastly, I do believe one industry existed in Cleburne which was the building of railroad cars. Wouldn't it wiser to build passenger cars and allow those who need to come to Fort Worth to be transported as commuters? It would certainly be better for the environment. The line exists. Why not use it?

I do hope the City and State take my concerns seriously and incorporate what may be necessary to negate my concerns.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark V. Oppenheimer', with a long horizontal line extending to the right.

Mark V. Oppenheimer



LAKE WORTH

WHITE SETTLEMENT

FORT WORTH

FOREST HILL

EVERMAN

BENBRICK LAKE

CROWLE

TARRANT COUNTY

JOHNSON COUNTY

LEGEND

- ROUTE A
- ROUTE B
- ROUTE C

**NORTHSIDE-SOUTHWEST FREEWAY  
ALIGNMENT ALTERNATIVES  
1973**

**NITA**

SH 121T  
(SOUTHWEST PARKWAY)  
FROM IH 30  
TO FM 1187

EXHIBIT III-1



from the December 04, 2002 edition - <http://www.csmonitor.com/2002/1204/p15s01-lihc.html>

## Planned growth vs. sprawl: the best and worst cities

**In a sprawling area, families drive 40 miles more daily than those who live in cities with less sprawl**

By Ross Atkin | Staff writer of The Christian Science Monitor

How does your community rate on the "sprawl meter"? If you live in New York, San Francisco, or Honolulu, your city has a low sprawl rating. But San Bernardino, Calif.; Atlanta; and Knoxville, Tenn., are among the 10 areas with the most sprawl.

According to Smart Growth America, the advocacy group that ranked 83 major metropolitan areas, sprawl is unplanned urban growth that happens outside the existing infrastructure.

The group recently released a comprehensive assessment of sprawl and its impacts. The project took three years to complete and ranks cities in four major categories: by residential density, by how well they incorporate a mix of homes, jobs, and services; by the strength of their downtowns and town centers; and by how interconnected their streets are.

The amount of land that's built upon isn't the point; the way it's used is.

In Omaha, for instance, which ranked sixth in the least-sprawling ratings, there's room to spread out, and the city does (it has a below-average residential density). But it scores well with its active, vibrant downtown and smaller commercial districts, and for its mix of housing, shopping, and offices.

No development pattern is inherently good or bad, the study's authors explain. It all depends on the consequences.

"In sprawling places, people drive more, breathe more polluted air, face a greater risk of car fatalities, have to own more cars, and walk and use transit less," says Don Chen, executive director of Smart Growth America and a co-author of the report.

In the most sprawling metropolitan areas, he adds, a family of four can be expected to drive 40 more miles per day than a family in a low-sprawl area.

In Riverside-San Bernardino, a bedroom community near Los Angeles, several factors contributed to its being ranked the most sprawling place in the country:

- More than 66 percent of its population lives at least 10 miles from a central business district.

- It's not very pedestrian-friendly. More than 70 percent of its blocks are larger than traditional urban size.
- Less than 1 percent of its population lives where there's enough density to be effectively served by mass transit.

Fortunately, cities that are poster children for sprawl can change the course of their development.

Reid Ewing, a coauthor of the report, says that Riverside-San Bernardino needs more dynamic centers of commerce and public activity.

But that won't necessarily happen quickly. "You have projects that start down the pipeline and need two, three, five years to do the design, start the entitlement process, and get the needed approvals," explains Michael Pawlukiewicz of the Urban Land Institute. "It's the old story of [taking time] to turn the battleship around."

And even when the spirit is willing, the building climate may not be.

There are often barriers to building more densely. Community policies and personal preferences can interfere with such common antisprawl techniques as placing homes closer together; using a mix of homes, shops, and workplaces; and building on unused or underused properties in already-developed neighborhoods.

"We want to remove those barriers," says Gary Garczynski, president of the National Association of Home Builders, "but you just can't ignore people's preferences for lower-density development."

New York and Jersey City, N.J., are ranked as the nation's least sprawling cities. But this doesn't necessarily make them the most attractive places to live for the many people who favor a house and yard in the suburbs.

Mr. Garczynski knows that home buyers vote with their pocketbooks - they go where they can get the most house for the least amount of money, and this often means looking at the edge of cities, where new sprawl is generated.

To avoid sprawl while providing the affordable housing that homebuyers want, Garczynski advocates comprehensive planning. And that requires participation and compromise by community members with diverse interests and views.

His company is a charter member of a Washington, D.C.-area planning coalition that brings together builders, activists, and environmentalists. "We agree on things we can support, and that establishes a level of trust and respect," Garczynski says. "We build on common interests before tackling the tough development issues. That's what has to be done, but it doesn't happen overnight; it's long-term."

Officials in Omaha, Neb., realize that keeping the city's high ranking could be a challenge. Steve Jensen, the city's assistant planning director, told the Omaha World-Herald that "we could slip in the future unless we are careful."

Still, the big question might not be what Omaha does, but what planners in neighboring jurisdictions and the region decide to do.

Which region of the US needs to do the most planning? According to the report, it's the South. After Riverside-San Bernardino, the next most sprawling metropolitan areas are

Greensboro/Winston-Salem/High Point, N.C.; Raleigh/Durham, N.C.; Atlanta; and Greenville/Spartanburg, S.C.

Authors of the report chalk up the South's sprawl tendencies to two factors: the absence, in many cases, of topographic restraints, such as mountains, lakes, and rivers, which naturally contain growth; and the lack of planning and zoning that encourage denser development.

In Atlanta's case, part of the challenge has been a preexisting network of country roads. "Developers find it pretty easy, quick, and cheap to go out to where the next road is rather than to build a denser street pattern closer to the existing metro area," says Rolf Pendall, a third author of the sprawl report.

In future studies, the team intends to look at the impact of sprawl on racial segregation, the decline of central cities, the loss of open space, and public health.

For now, in the interest of encouraging more compact, but not high-rise neighborhoods, they offer these policy recommendations:

1. Reinvest in neglected communities and promote more housing opportunities.
2. Rehabilitate abandoned properties.
3. Encourage new development and redevelopment within the existing urban area.
4. Create and nurture mixed-use centers of activity, in some cases rezoning to permit multifamily housing in and around jobs-rich mini-cities on the edge of larger cities.
5. Support growth-management strategies, including preservation of prime farmland and sensitive environmental lands, forests, and other green spaces, in conjunction with careful planning for development in designated areas.
6. Craft policies that favor nonautomotive forms of transportation and maintain existing streets and highways in preference to building new ones.

#### **Areas with the most sprawl**

1. Riverside-San Bernardino, Calif.
2. Greensboro-Winston-Salem- High Point, N.C.
3. Raleigh-Durham, N.C.
4. Atlanta
5. Greenville-Spartanburg, S.C.
6. West Palm Beach-Boca Raton-Delray Beach, Fla.
7. Bridgeport-Stamford-Norwalk Danbury, Conn.
8. Knoxville, Tenn.
9. Oxnard-Ventura, Calif.
10. Fort Worth-Arlington, Texas

#### **Cities with the least sprawl**

1. New York
2. Jersey City, N.J.
3. Providence
4. San Francisco
5. Honolulu

6. Omaha, Neb.
7. Boston
8. Portland, Ore.
9. Miami
10. New Orleans

Source: Smart Growth America

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**DO HIGHWAYS MATTER?**

**EVIDENCE AND POLICY IMPLICATIONS OF  
HIGHWAYS' INFLUENCE ON  
METROPOLITAN DEVELOPMENT**

Marlon G. Boarnet

Departments of Urban and Regional Planning and Economics  
and Institute of Transportation Studies  
University of California, Irvine

Andrew F. Haughwout

Federal Reserve Bank of New York

A Discussion Paper Prepared for  
The Brookings Institution Center on Urban and Metropolitan Policy

August 2000

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## ACKNOWLEDGEMENTS

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## ABOUT THE AUTHORS

Marlon G. Boarnet is an Associate Professor of Urban and Regional Planning and Economics and a research associate of the Institute of Transportation Studies at University of California, Irvine. Boarnet earned his Ph.D. from Princeton University in 1992. His research interests include the economic and urban development impacts of highway infrastructure, the links between urban design and travel behavior, and the determinants of population and employment growth patterns within metropolitan areas. Boarnet serves on the editorial boards of the *Journal of Regional Science* and *Papers in Regional Science*.

Andrew F. Haughwout is an economist in the Domestic Research Function of the Federal Reserve Bank New York. Prior to joining the Fed, Haughwout taught at Princeton's Woodrow Wilson School of Public and International Affairs. His interests include public finance and urban and regional economics and political economy. He earned his Ph.D., from the University of Pennsylvania in 1993. Haughwout is associate editor, *Journal of Regional Science* and *International Regional Science Review*; and member, board of directors, University Transportation Research Center (Region II).

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*The views expressed in this discussion paper are those of the authors and are not necessarily those of the trustees, officers, or staff members of The Brookings Institution*

## **ABSTRACT**

Growing concerns about traffic congestion and rapid suburban expansion (also known as sprawl) have reignited interest in the ways in which highway spending affects metropolitan growth patterns. This discussion paper extracts the best evidence to date on how highway investments distribute growth and economic activity across metropolitan areas. The paper also offers ideas on how transportation financing and policies can better respond to the various costs and benefits of highway projects in a region.

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# DO HIGHWAYS MATTER? EVIDENCE AND POLICY IMPLICATIONS OF HIGHWAYS' INFLUENCE ON METROPOLITAN DEVELOPMENT

## I. INTRODUCTION

Highways and urban growth. The two seem inextricably linked, and certainly in popular and scholarly debate much attention is given to the way that highways shape urban development. But the link between road building and metropolitan growth is extraordinarily complex and common assumptions on both sides of the political spectrum are often overly simplistic. Some claim that the problems of central cities can be confidently attributed to suburban highway programs while others deny that any such link exists. A balanced policy perspective most certainly lies in the middle. More importantly, a balanced policy perspective requires an understanding of theory and evidence that, while often complex, points in a consistent direction.

This paper critically reviews the evidence on how highways are linked to metropolitan development and makes policy recommendations that suggest the need to rethink the way we finance and program highways in this country.

The analysis proceeds in four steps:

**First**, we summarize the policy research context for this debate;

**Second**, we summarize recent theory and empirical evidence on how highways influence urban growth. An up-to-date assessment of this question is the linchpin of any policy analysis that seeks to link federal highway programs to problems that are by-products of metropolitan growth patterns;

**Third**, we reformulate some of the policy questions that are popular in this area, emphasizing that questions of economic efficiency, the geography of urban development, and the institutional structure of regional transportation agencies have been overlooked too often;

**Fourth**, we develop policy recommendations based on our assessment of theory and evidence, and on the need to give increased attention efficiency, geography, and political institutions.

**Overall, we conclude that changes in metropolitan location patterns are induced by highways, and these changes are not, on net, costless. A rational highway investment plan should account for the effects on location that highways induce.** Land price, population or employment growth benefits that appear in one part of a metropolitan area may come at the expense of even larger costs elsewhere. The difficulty is that the way in which we make and finance our highway investment decisions does not induce rational consideration of all these effects.

We recommend an increased role for representative regional decision-making bodies with both the vision and the authority to balance the competing transportation demands of various metro area constituencies. Such bodies would ideally design policy so as to maximize the regional, rather than local, advantages that transportation policies offer. Although traditionally advisory and research organizations, metropolitan planning organizations (MPOs) are well positioned to fulfill the regional role that is necessary in highway governance and finance. Yet to do that, MPOs must complete the transition, started by earlier federal legislation, from advisory bodies to full highway financing, planning, and programming authorities. To be sure, such a transition faces political obstacles, but federal policy can be used to encourage and guide this policy change.

Overall, we conclude that federal highway policy should be oriented toward more efficiently funding and managing the nation's road infrastructure. In urban areas, that requires that the federal government, among other things, empower metropolitan authorities.

## II. A BRIEF INTELLECTUAL HISTORY OF THE ARGUMENT ABOUT HIGHWAYS AND GROWTH

The debate on the link between highways and urban development has long focused on two policy problems: central city decline and suburban sprawl. Central cities often have larger per capita public expenditures and higher per capita tax burdens than suburban municipalities. The cause of such fiscal stress is complex (e.g., Ladd and Yinger, 1989; Bradbury, Downs, and Small, 1982; Peterson, 1981), but regardless of the cause, central city fiscal distress is typically exacerbated when upper-income residents and tax-generating firms flee to what are often lower-tax suburbs. To the extent that suburban highways facilitate this, they are implicated in the minds of many with the problem of central city fiscal distress. Related problems, such as the concentration of poor persons who are left behind in the flight to the suburbs, are also sometimes attributed to suburban highway building programs.

Changing the focus to outlying portions of metropolitan areas, there are heated debates about the costs, benefits, and even the definition of urban sprawl. Many in the policy and planning communities claim that far-flung suburban growth requires expensive extensions of utilities and public services, wastes often underused central city land and infrastructure, and brings traffic congestion and air quality problems from increased driving (e.g., Burchell, 1998; Real Estate Research Corporation, 1974.) These costs may fall disproportionately on those least able to avoid them (Persky & Wiewel, 1998). Others argue that suburban residential development is desired by persons who prefer low-density living on the metropolitan fringe so the concern about sprawl, more properly stated, is a concern that the costs of particular development patterns outweigh the benefits.

The concerns about central city decline and suburban sprawl are two sides of the same coin. Both concerns reflect the idea that metropolitan areas are excessively decentralized in ways that draw tax and economic resources out of the central city while requiring additional infrastructure investments, land, and driving (with attendant congestion and air quality impacts). The broad question of whether United States cities should be more or less centralized and related questions about the costs and benefits of urban sprawl are controversial (e.g. the exchange between Ewing, 1997 and Gordon and Richardson, 1997). We mention these issues not to suggest that American urban areas ought to be more centralized, but to emphasize the perceived links to highway policy. The question of how highway policy enters the debate thus becomes a question of whether highways contribute to the decentralization of urban areas and if so, whether that influence is, on net, beneficial or harmful.

Phrased differently, the key factual point is the "chicken and egg" question of whether suburban highways facilitate (or even cause) the decentralization of metropolitan areas, or whether outlying highways simply serve growth that would have otherwise occurred. This is not a new question by any means. Four decades ago, informed opinion was divided in ways that still characterize the current debate. On one side are those who believe that highways shape urban growth and decentralization, and on the other side are those who believe that the influence of highways is not large and that other factors are more responsible for the decentralization of urban areas.

In 1960, Daniel Patrick Moynihan, then a university professor (and later, as a United States Senator, a co-sponsor of major transportation legislation) argued that there was a link between, according to the title of his article, "New Roads and Urban Chaos." Moynihan wrote, "Highways determine land use, which is another way of saying they settle the future of the areas in which they are built." Moynihan saw the then-fledgling Interstate Highway System as a great engine of urban decentralization. In his words, "For good or ill, the location of the interstate arterials would, more than any other factor, determine how this [projected urban] growth would take place." Elsewhere in the same article, Moynihan makes it clear that

he thinks the effect on urban areas would be negative. Without proper planning (which he complained was largely absent at the time) interstate highways would eviscerate downtowns, drawing persons, shopping, and employment to the suburbs while dividing and disrupting older urban neighborhoods (Moynihan, 1960, p. 19).

But there were other voices in the debate. John Meyer, a transportation scholar at Harvard University, wrote in 1968 that, "The financial problems of city governments are almost certainly more attributable to over-reliance on property taxes and, at least in some states, to inadequate urban representation in state legislatures than to urban transportation choices." (Meyer 1968, p. 52) In 1970, John Kain, also of Harvard University, wrote that, "... research indicates that the postwar pattern of residential development is as much, or possibly even more, a cause of rapid growth of car ownership as the converse." Arguing that the automobile is only one of several factors that contribute to metropolitan decentralization, Kain states, "Cheap credit, favorable mortgage loan terms, accumulations of savings, rapid family formation, the postwar baby boom, favorable tax treatment, a strong preference for home ownership, and the suburbanization of an ever larger number of jobs must all be regarded as important causes of the suburban boom." (Kain 1970, p. 77).

In 1993, Peter Mieszkowski and Edwin S. Mills returned to a similar theme in summarizing the research evidence on the determinants of suburbanization. They asked whether metropolitan areas decentralize as part of a natural evolution that is a response to technological changes and market forces, or whether suburbanization is driven by a flight from the blight of central cities. This is not precisely the same as debating whether highways cause urban decentralization because highway infrastructure could facilitate either evolutionary decentralization or a flight from downtown blight. Yet Mieszkowski and Mills' distinction is informative because the opponents of suburban highways usually couch their argument in terms of the fiscal and social ills that are part of what Mieszkowski and Mills classify as flight from blight. In the maddening habit of social scientists, Mieszkowski and Mills (1993, p. 144) claim that both the "natural evolution" and the "flight from blight" explanation of suburbanization are important.

In many ways we are still where the debate started some forty years ago. The link between highways and metropolitan development is complex, and different persons draw different conclusions from often-similar evidence. In this paper, we argue that there is a way out of this policy morass - but two questions must be answered. First, what can objectively be said about the influence of highway infrastructure on metropolitan development? Second, if highways do influence urban growth and vitality, and thus are part of what Moynihan (1970, pp. 8-9) called the federal government's hidden urban policy, what reforms are suggested by both theory and evidence? We turn first to the factual question of the link between highways and metropolitan growth.

### III. HIGHWAYS AND METROPOLITAN GROWTH

#### A. Theory

Economic theory suggests that highway improvements will have effects on urban growth by changing both intra- and inter-metropolitan accessibility. Much of the theoretical apparatus for examining the intrametropolitan effect of transportation investments is rooted in "monocentric" models of urban land use. In these models, jobs are assumed to be concentrated in a single central business district (CBD), and persons live in residential communities that surround the CBD. Land values drop with distance from the CBD to reflect the increased cost of commuting from distant locations into the jobs in the city center. (For summaries of monocentric urban location models, see, e.g., Alonso, 1964 or Fujita, 1989.) New highways that link the outlying residential areas to the CBD lower the cost of commuting into the employment concentration in the center of the city. This increases land values in the suburban fringe while reducing the "accessibility premium" that central locations had previously enjoyed. The urban area will grow geographically as commuters can live farther from work without increasing their travel budgets. Densities will fall as the premium for the densely developed locations near the CBD is reduced. In short, in monocentric models, transportation improvements are associated with decentralization and deconcentration of the population of the urban area. (For a more detailed discussion of these results, see, e.g., Fujita, 1989.)

While this broad interpretation of the link between transportation and urban development is accepted at its simplest level within much of the urban literature, there are considerable complications that the monocentric model does not address. The most obvious difficulty is that modern metropolitan areas are far from monocentric. While the assumption that jobs are located only in a central business district might be a reasonable depiction of early eighteenth century American cities<sup>1</sup>, both anecdotal and scholarly evidence have clearly documented that modern cities are now characterized by multiple employment centers (e.g. Garreau, 1991; Small and Giuliano, 1991). This immediately leads to the need to explain not only residential location, but also how firms choose to locate within metropolitan areas and how firm location is influenced by transportation accessibility.

Like households, firms that value the use of a particular transportation mode will have incentives to cluster near access points to that system. For example, the Interstate Highway System offers low transportation cost for moving goods and passengers over long distances (so-called "line haul" benefits) and interchanges in that system are thus valuable locations that will command high land prices and foster dense job development (Hoover 1975). This is consistent with the evolution of urban employment locations, which were originally concentrated near points of access to waterway transportation, then increasingly at rail junctions near the fringes of central cities and finally have clustered around highway interchanges on the edges of metropolitan areas (Jackson 1985; Cronon 1991; Garreau 1991).

Clustering to gain transportation access is a special case of a more general phenomenon that helps explain the geographic concentration of firms within and across metropolitan areas. The existence of "agglomeration economies" implies that firms are more efficient when they locate in close proximity to each other. Some of these benefits are transportation-related. Firms that produce for regional or national markets may cluster near points of access to the inter-metropolitan transportation system. Retail businesses may share a customer base that values the convenience of shopping in a small

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<sup>1</sup> See, for example, Jackson's (1985) descriptions of the "walking city"; Pred (1966) includes some fascinating maps of job locations and journeys to work in New York during the first half of the 19th century.

geographic area. Firms may also cluster if they produce for each other: the growing prevalence of "just-in-time" inventory techniques provides incentives for suppliers and their buyers to locate together (Doeringer & Terkla 1995). Geographically concentrated firms may also provide each other with industry-specific information about markets, production processes or suppliers that translates into higher productivity and profits. Quigley (1998) contains a recent review of the literature on these agglomeration economies.

Further complicating the relationship between highway investments and metropolitan development patterns is the fact that transportation costs may play an important role in determining the overall level of regional growth, as well as its intra-metropolitan distribution. Often, those in favor of transportation improvements argue that they will improve the productivity of an entire region. A new highway system can theoretically provide a large enough boost to a region's economic development that the central city will grow in spite of increased pressure for decentralization created by the same highway.

Transportation infrastructure can provide a region with a potentially important advantage in the inter-regional competition for firms and economic development. Regions that are far from sources of raw materials can nonetheless attract development if their transportation systems allow delivery of these inputs at low cost. Examples from American history underline this point. In the nineteenth century, the development of canals and railroads provided significant advantages to the locations they served, allowing city businesses to simultaneously locate near their markets while keeping raw material transportation costs acceptably low. The rapid growth of New York in the first half of the nineteenth century and Chicago in the second half would not have been possible without the development of canals (for New York) and railroads (for both cities) -and the benefits of these transportation systems may be quite widespread. The completion of the Erie Canal, for example, contributed powerfully to the growth of Albany, Buffalo and Rochester - all located at junctions along its length. At the same time, the development of this transportation network helped New York to rise relative to its primary competitor, Philadelphia, which tried unsuccessfully to construct a series of canals connecting the Schuylkill to the Ohio River basin during the early part of the nineteenth century. Similarly, the interstate highway system allows produce to be rapidly transported from fertile regions to markets. Thus a key benefit of an interregional transportation network is its ability to foster the relative growth of those places that are accessible to the network.

However, in spite of this history, the interaction of transportation and regional development is complex. By limiting the geographic area that can be served from any particular point in space, transport cost provides the impetus for the development of small-scale industries that serve the local market. For these firms (and their employees), transport cost reductions may lead to a loss of customers as larger firms in other regions are able to penetrate the local market. In the theoretical models of Krugman (1993) and Walz (1996), reductions in transportation costs lead to growth in developed regions but decline in regions whose industries operate at less than efficient scale.

The bottom line is that there is no single bottom line. For some industries (especially high cost producers in small markets) transportation cost reductions will eliminate the barriers that protect them from outside competition, eroding their markets. For others (especially industries that already operate efficiently at a relatively large scale), improved access opens up new markets and allows costs to be reduced.

Of course, as touched upon above, the distinction between inter- and intra-regional transportation networks is applicable only in theory. In practice, the very same highway investments that reduce long-distance transportation costs may

also be used for intra-urban transportation. The building of the interstate highway system reduced the cost of transporting goods from region to region while simultaneously altering the geography of accessibility within metropolitan areas. The complex nature of highway systems means that theory alone cannot untangle the effects of a particular investment. We must turn to empirical evidence to assess how the conflicting theoretical effects actually play out.

## **B. Empirical Evidence**

Despite the ambiguity of some of the theoretical results, most models predict a link between improvements in transportation access and increases in land prices and development densities nearby. A fundamental empirical question, then, is whether transportation access influences land prices and development densities in the way that theory predicts. Some studies have examined whether land near highways sells for a higher price which reflects, at least in part, the value of the transportation access provided by the highway. Other studies have examined how highways influence population and employment growth patterns within urban areas. Both groups of studies are often intrametropolitan in their geographical focus. After reviewing the evidence on the influence of highways on land prices and growth patterns, we will turn to literature that suggests that the traditional view has overlooked the important possibility that highways influence the spatial distribution of urban growth. A focus on the way that highways influence the spatial distribution of urban growth helps illuminate policy issues related to highways and urban development.

### **1. Evidence on Land Prices and Highway Access**

Giuliano (1989) reviewed the literature on land use and transportation and Huang (1994) reviewed the narrower literature on land prices and transportation infrastructure. Both agree that studies of land prices and highways yield results that vary depending on when the study was conducted. The early studies, from the 1950s and 1960s, usually showed large land price increases near major highway projects. The later studies, from the 1970s and (less often) the 1980s, typically showed smaller and often statistically insignificant land price effects from highway projects. The early studies typically examined the first limited access or interstate highway built in an urban area.<sup>2</sup> Giuliano (1989) and Huang (1994) both argue that the first link in a metropolitan highway system is likely to bring large improvements in transportation access and thus, based on the theory summarized above, large increases in land prices near the project. As more highways are built, and the metropolitan highway network matures, the incremental effect on accessibility from new or improved highways decreases, thus accounting for a smaller change in land prices due to any access premium.

Giuliano (1989, p. 151), interpreting this and other evidence on land use and transportation concludes, "Transport cost is a much less important factor (in locational decision-making) than location theory predicts." She bases that conclusion partly on the good metropolitan-wide accessibility provided by mature urban highway systems and partly on changes in production relations, economic structure, and metropolitan development that, in Giuliano's view, reduce the value of within-metropolitan area transportation access. While the character of the influence of transportation on land use changes as a highway system matures, we suggest that the view that transportation access is less important now than in the past is incomplete.

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<sup>2</sup> In these early studies, land value increases near highways were usually compared with land value changes in other similar parcels distant from the project. This is not too different from the logic of later studies, although the statistical approach used to choose similar parcels far from highways in early studies was often less sophisticated than in later studies.

New evidence suggests that metropolitan highway projects still influence land use in the way that theory predicts. The important difference between the new evidence and earlier studies is that the geographic scale of the land use effect appears to be somewhat smaller. A new highway or improvement might importantly reduce travel times in the immediate vicinity of the project, even if the resulting changes in metropolitan-wide transportation accessibility are small. Hence, the land use effects of modern highway projects likely operate over a very fine geographic scale, rather close to the project.

Voith (1993), in a study of the determinants of house sales prices in Montgomery County, Pa. (a suburb of Philadelphia) from 1970 to 1988, found that homes in locations with lower highway travel time to the Philadelphia central business district had higher sales prices, other things being equal. The study further found that the value of highway access increased during the 1980s. Ryan (1997), in a study of office and industrial property rents in San Diego, found that better highway access, measured by distance from a property to the nearest freeway on-ramp, is consistently associated with higher office rents, controlling for other characteristics of the property. Both of these analyses used site-specific information that provides substantially more geographic detail than many earlier studies.

## **2. Evidence on Highway Access and Intrametropolitan Population and Employment Growth**

Several recent studies have examined the determinants of population and employment changes in census tracts or similarly small geographic units within a metropolitan area. The advantage of these studies is their fine geographic scale.<sup>3</sup> Much previous research examined the influence of highways on growth in central cities and suburban rings (e.g. Payne-Maxie, 1980), a level of detail substantially more coarse than the geographic scale used in the research described below. In New Jersey, Boarnet (1994a and 1994b) used municipalities. New Jersey municipalities are quite small, such that the geographic scale of municipalities in New Jersey is comparable to the scale of census tracts.<sup>4</sup> The studies of tract or (for New Jersey) municipality data yield a consistent relationship between population and employment change and highway location. Highway access positively influences tract or municipal employment levels in the northern half of New Jersey (Boarnet 1994a and 1994b), Orange County, California (Boarnet, 1996; Geho, 1998), the Atlanta metropolitan area (Bollinger and Ihlanfeldt, 1997), South Carolina and parts of North Carolina and Georgia (Henry, et. al, 1997), and strictly within South Carolina (Singletary, et. al., 1995). These studies use data from both the 1970s (Boarnet, 1996) and the 1980s (Boarnet 1994a and 1994b; Bollinger and Ihlanfeldt, 1997; Geho, 1998; Henry, et. al., 1997; Singletary, et. al., 1995). Some of these studies restricted their attention to employment changes, but in the studies that also examined population (Boarnet 1994a; Bollinger and Ihlanfeldt, 1997; Geho, 1998; Henry, et. al., 1997), highways were also shown to be associated with larger levels of tract or municipal population growth.

These studies, combined with the recent evidence on highways and land prices, suggest that highway access is still an important determinant of fine-grained geographic variation in intrametropolitan growth patterns. This leads to another question: is growth near highways, in part, growth that otherwise would have gone elsewhere in the metropolitan area? Several studies hint at the existence of these intrametropolitan shifts.

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<sup>3</sup> As an example, the median census tract size in the Boarnet (1996) study of Orange County, California was less than one square mile. Census tracts are based in part on population, and so tract sizes are larger in less densely settled parts of a metropolitan area.

<sup>4</sup> The median size of the New Jersey municipalities used in Boarnet (1994a and 1994b) was four square miles.

### 3. *Highways and the Spatial Character of Urban Development*

Stephanedes and Eagle, in a time series study of Minnesota counties, found a positive association between highway expenditures and employment in counties that are regional employment centers, and a negative association between highway expenditures and employment in what they classified as "next-to-urban" counties.<sup>5</sup> They concluded that, "... while certain areas are likely to gain from improved roads, others are likely to lose and the statewide effect may not be significant." (Stephanedes and Eagle 1987, p. 77)

Rephann and Isserman (1994) echoed Stephanedes and Eagle's findings in a later study. Rephann and Isserman conducted a quasi-experimental study of employment, income growth, and population change in two groups of counties – those with and without interstate highway improvements in the 1963 through 1975 time period. Rephann and Isserman found that counties with some prior urbanization (specifically, counties with cities of 25,000 persons or larger) appeared to benefit from interstate highway projects, but other more rural counties showed much smaller or, for some variables, no impact from the highway projects. Combined with Stephanedes and Eagle's (1987) results, the research suggests that the land use effect of highways differs in ways that are related to the urban character of particular locations.

Two studies by Haughwout (1999a, 1999b) explore the effect of highway investments on the distribution of activities within urban areas. Haughwout (1999a) finds that increases in state highway stocks reduce house values in both the city and suburbs of large metropolitan areas. Since (by definition) the majority of an urban area's housing units are located in its most densely developed areas, this means that new highways tend to reduce the accessibility premium that central locations enjoy. In Haughwout (1999b), state highway investments are shown to foster the decentralization of employment growth from dense to less dense counties

To interpret these findings, we draw on the concept of negative spillovers. For our purposes, a negative spillover is defined as a negative economic consequence experienced distant from a highway project. If highways enhance the economy of nearby areas, while at the same time reducing economic activity in distant places, we call the reduction in economic activity at distant locales a negative spillover. This implies that highway projects built in one jurisdiction might be associated with, in addition to any local benefits, reductions in economic activity that spill over, or extend beyond, the jurisdiction that contains the project.

More intuitively, we might say that highway projects affect the geographic location of economic activity by advantaging some places while causing firms and persons to shift their location choices away from other places. If, as the studies of Stephanedes and Eagle (1987) and Rephann and Isserman (1994) suggest, relatively urbanized counties benefit more from highway projects, it is not unreasonable to suspect that some of that benefit comes at the expense of less urbanized counties. Haughwout's studies (1999a, 1999b) suggest that the fringes of urban areas benefit at the expense of the center. Other evidence on spillovers comes from the extensive literature on production function studies of public infrastructure.

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<sup>5</sup> More formally, Stephanedes and Eagle (1997) examined whether highway expenditures "Granger cause" county employment changes. This is a statistical technique that examines whether highway expenditures are statistically associated with later employment changes, rather than employment changes being associated with later highway expenditures. Stephanedes and Eagle (1987) found evidence that highway expenditures "Granger caused" employment changes in the regional employment centers.

Production function studies look for links between private sector economic output or productivity and the stock of public infrastructure.<sup>6</sup> Most studies in this literature use data from U.S. states or time series data for the entire United States. (See, e.g., the summaries in Gramlich, 1994 or Boarnet, 1997.) The evidence suggests that when studies correct for important statistical difficulties, there is little or no link between public infrastructure (or, for those studies that examine it, highway infrastructure) and economic output or productivity. Yet the level of geographic detail – states or nations – is coarse compared to the land price and intrametropolitan growth studies discussed above. To get more fine geographic detail, Boarnet (1998) fit a production function on data for California counties from 1969 through 1988.

When explicitly testing for negative cross-county spillovers from street and highway infrastructure, Boarnet (1998) found that street and highway stocks are associated both with output increases in the same county and output decreases in other, similarly urbanized counties. This is consistent with the evidence from Stephanedes and Eagle (1987) and Rephann and Isserman (1994) that the effect of highways varies across geography.

**In sum, the evidence suggests that highways influence land prices, population, and employment changes near the project, and that the land use effects are likely at the expense of losses elsewhere.** Yet the question that we started with was subtly different – do highways contribute to suburban growth at the expense of central cities? The evidence that highways influence land use, especially near a project, suggests that highways can be an important factor in shaping and channeling the growth of urban areas. But that is different from saying highways cause or even contribute to urban decentralization.

Much of the debate on highways and suburbanization has asked to what extent highways lead to the decentralization of urban areas, or, conversely, whether United States urban areas would be more centralized had the Interstate Highway program not been so ambitiously funded. The evidence on this question suggests, as Mieszkowski and Mills (1993) concluded, that transportation access is only one of several factors that led to the decentralization of United States metropolitan areas. (For similar evidence and conclusions, see also Giuliano and Small, 1993.) Believing that highways are the sole or even the most important cause of suburbanization ignores important evidence that suburbanization is driven by a broad range of influences.

Yet given that metropolitan areas are decentralizing for reasons that might be unrelated to transportation, highways certainly have the potential to influence the geographic character of that decentralization. The evidence discussed above, especially the census tract population and employment studies, suggests that highways can be conduits for decentralization, helping to channel urban growth in some places rather than others. Furthermore, the evidence on negative spillovers suggests that locations that gain due to highway access do so in part at the expense of other locations. Highway projects confer economic advantages on some places and the relative pattern of comparative advantage can be expected to, and appears to, influence the location of economic activity and growth within and across metropolitan areas.<sup>7</sup> Highways are,

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<sup>6</sup> Street and highway capital is approximately a third of the public infrastructure owned by states and the federal government in the United States (Gramlich, 1994), and some studies examine highway infrastructure as distinct from all infrastructure. The results hardly vary depending on whether the study examined all public capital or only street and highway infrastructure.

<sup>7</sup> The limited spatial scale of many modern highway projects, which is suggested by rather consistent recent empirical evidence, leads us to conclude that many of the spatial impacts of highways will be within metropolitan areas. This is part of the motivation for our later focus on policy initiatives within metropolitan areas.

as Moynihan claimed years ago, part of the federal government's "hidden" urban policy. Highway construction is more than concrete and cars -- it also influences the ways metropolitan areas grow. This has implications for policy but to understand those implications, one must focus on several often overlooked issues related to highways and metropolitan development.

#### IV. NEGLECTED POLICY ISSUES

As mentioned, the evidence suggests that metropolitan highway investments can (and do) act as conduits for growth, influencing where new firm and household growth occurs within a metropolitan area. In broad terms, this pattern is likely to favor suburban places over central cities. An important question is what effect such a redistribution of economic activity will have on social welfare.

Highway investments, like other public programs, are justified on economic efficiency grounds only if they improve social welfare, which itself is comprised of the well-being of the individuals who make up society. This implies that highway investments should pass a benefit-cost test – those investments should generate more social benefits than costs, and ideally (for social welfare maximization) the investments should generate a larger surplus of benefits minus costs than alternative uses of the money. Thus both the benefits and costs of highway projects need to be accurately measured, which is a complex task. We focus mostly on measuring how highways influence individual well being (highway benefits), because that is often more confusing and thus a more likely source of serious errors than measuring project costs.<sup>8</sup>

Transportation economists have traditionally argued that public assessment of the benefits of highway programs should be restricted to road user benefits – the value of travel time savings, safety improvements, and other reductions in the cost of travel (e.g. Forkenbrock and Foster, 1990; Mohring, 1976). The argument is that other benefits, such as reductions in consumer prices that result from cheaper transport costs or increases in land value that result from improved accessibility, are simply transfers of road user benefits to other persons. Thus to count both road user and transfer benefits would “double count” benefits (Mohring, 1961, 1976, 1993, Mohring and Harwitz, 1962).<sup>9</sup> That point is well taken, but the transfer benefits, even if they flow directly from road user benefits, are often highly visible and some discussion of the transfer benefits is important, if for no other reason than that such benefits are often drawn into the policy debate. Even more importantly, ignoring transfer benefits obscures some of the more important and obvious location-specific impacts of highway programs. Those location-specific impacts, including some of the economic and land use impacts summarized in Section III, are often part of the political debate about particular highway projects, and the location-specific impacts are also a key source of inefficiencies in highway finance.

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<sup>8</sup> We do not mean to imply that measuring highway costs is easy. Both accurately projecting dollar value highway costs and assessing how those relate to the opportunity cost of the resources can be difficult. Yet both are technical problems which, however difficult, have been often discussed (e.g. Gramlich, 1991), and we see little need to add to that discussion. Measuring external costs of highway projects can be more complex, but with the exception of links to metropolitan development, external costs are not discussed here as that would complicate matters without much changing the thrust of our argument.

<sup>9</sup> Jara-Diaz (1987) notes that, in cases of imperfect competition, road user benefits might not exactly equal the social benefits of transportation projects. While this raises the prospect of a potentially important shortcoming in the traditional maxim to focus only on road user benefits, we still believe the focus on road user benefits is technically sound, even if short-sighted for the reasons mentioned above. The analytical errors that can result if one counts both road user and transfer benefits can be large (see the discussion in Boarnet, 1997 or Forkenbrock and Foster, 1990), and we suspect that any errors created by focusing only on road user benefits in cases of imperfect competition would be smaller. Overall we conclude that, in an ageographic sense, a focus on only road user benefits is usually acceptable. The difficulty with using only road user benefits to evaluate projects is that it obscures the geographic shifts, discussed below, that are important sources of inefficiency in the current system of highway finance. Of course, one could argue that the geographic shifts discussed below the result of a form of imperfect competition. We prefer not to use that language and to focus on geographic rather than market structure effects, as the former leads more clearly to policy implications that relate to metropolitan growth patterns.

At first glance, it may appear that redistributions of activities from one place to another are zero-sum: the winners (possibly often suburbanites and their governments) gain exactly as much as the losers lose. If this is true, then evaluations of the social welfare effects of highway investments will be based on distributional considerations. Equity may be an argument in the social welfare function, and we may choose to avoid policies that transfer welfare from city to suburban residents on the grounds that they are inequitable. However, such judgements are inherently subjective and prior to resorting to what will surely be contentious grounds for policy making, it is worthwhile to determine whether a redistribution of activity from city to suburb is indeed zero-sum.

It turns out that there are substantial and growing reasons to believe that the spatial distribution of activity is an important determinant of total growth. In a series of papers, Voith (1992, 1993, 1998) has uncovered evidence of strong and increasing connections between city and suburban growth. Other authors have confirmed this general finding, and Brooks and Summers (1997) show that the direction of causality in the relationship runs from central city to suburb. That is, when the city's growth is robust, the entire region is more prosperous than it would be without strong city growth. This leads to the possibility that highways, by influencing the spatial character of metropolitan development, influence growth and social welfare in ways that are not readily apparent.

The literature on the productivity benefits of agglomeration (e.g. Ciccone and Hall, 1996; Ihlanfeldt, 1995) implies that the spatial concentration of producers leads to higher productivity and higher incomes to owners of land, labor and capital. For any particular firm, the incentive to locate in a dense agglomeration of activities will presumably decline with transportation cost; improved accessibility reduces the value of central locations, since employees and inputs may be drawn from a greater distance. The firm considers only its private costs and benefits, and ignores the effects of its decision on other businesses. A decentralizing firm loses the benefits of agglomeration, but this is only part of the cost to society since other firms lose the benefit of proximity to the moving firm. That is, a firm's location decision process ignores the fact that its presence in a dense agglomeration is beneficial to other firms. If agglomeration effects are important, then transportation improvements may lead to excessive job decentralization from society's point of view. The potential for reduced agglomeration benefits is an important, but rarely discussed, social cost of improvements in highway infrastructure. Haughwout's (1999b) finding that state highway investments reduce the relative density of a state's core counties, for example, suggests that state highway investments may indirectly undermine economic growth.

An analogous case may be made for household locations. Sociologists and, more recently, economists have found evidence that the characteristics of an individual's neighbors can affect a person's well-being (Wilson 1987; Case and Katz 1991, Cutler and Glaeser 1997). In these studies, an individual's residence in a racially segregated or extremely poor neighborhood is associated with a variety of unhappy social and economic effects. If high-skill individuals consider only their own welfare and not the potentially beneficial effects that their presence in an integrated urban neighborhood can have, then their decision to move to an ethnically or economically homogenous suburb may have negative social effects. Again, improvements in transportation that foster the segregation of income groups and races may generate social costs that must be accounted for when evaluating the investment.

Finally, the distance of employees from their jobs may have social effects as well. Of much interest among planners is the effect of automobile commutes on congestion, the environment and energy use. At least the first two of these are classic unpriced negative externalities, but the evidence suggests that decentralization has contributed little to increased commute times (Gordon and Richardson, 1994; Gordon, Richardson, and Jun, 1991). Labor economists, meanwhile, have emphasized

“spatial mismatch” - the idea that low skill job creation within metropolitan areas tends to take place far from the residences of low-skill workers, making it difficult for employees to reach them (Hhlanfeldt 1997). To the extent that improvements in the highway system induce relocations that worsen these problems, they generate social costs that ought to be considered as part of the decision process.

Taken together, these factors suggest that changes in metropolitan location patterns induced by highways are not, on net, costless and that a rational highway investment plan should account for the effects on location that highways induce. Land price, population or employment growth benefits that appear in one part of a metropolitan area may come at the expense of even larger costs elsewhere. The difficulty, as we discuss in the next section, is that the way in which we make and finance our highway investment decisions does not induce rational consideration of all these effects.

## V. POLICY IMPLICATIONS

### A. Highway Finance and Economic Efficiency

Given the discussion in the previous section, there are two economic efficiency issues that must be addressed -- the *cross-subsidies* that are endemic across different localities in the current system of highway finance, and the potential for *negative spatial externalities* from highways that are most often built in suburban portions of metropolitan areas. Consider first the problem of cross-subsidies.

There are many reasons to conclude that highways are often paid with funds that come from outside of the area that will benefit from the project. The evidence summarized in Section III suggests that modern highway projects typically bring localized benefits, often for only a part of a metropolitan area or region. Further, the evidence implies that much of the economic impact of highways is to shift activity across the landscape, suggesting that some local benefits are, in part, at the expense of other places that might lose economic activity as a result of a highway project. Add to this the fact that many highway projects are financed in large part by state and federal funding, and the highway system takes on the appearance of a patchwork of local benefits purchased with state and federal money. If local decisions and preferences dominate, this raises the potential that localities will argue for a project that might produce benefits in excess of the local funds expended, but that might also produce benefits which fall short of the total cost once state and federal funds are included.

Ideally, the area that benefits from a project would pay the cost, since that would encourage a more complete consideration of costs and benefits. As things currently stand, local governments can often export a large share of the cost of projects to states and the federal government, in effect buying local gains with money that comes from other cities, regions, and states. This can lead to a systematic bias toward too much highway construction -- too much in the sense that projects which do not produce social benefits that exceed social costs nevertheless get built.

As an example of this problem, consider a rail transit analogy. Donald Pickrell, of the United States Department of Transportation's Volpe Research Center, published the results of an analysis of cost and ridership forecasts for eight rail transit systems built during the 1970s and 1980s. Pickrell (1992) reports that initial travel demand estimates for seven of the eight systems exceeded actual travel in the early years of system operation. Pickrell (1992) further documents that actual construction costs exceeded estimated costs in seven of the eight systems. Operating costs similarly exceeded forecasts for most of the systems. Overall, in the eight cities examined, rail transit system project analysis displayed a strong trend toward an overly optimistic assessment of system benefits, while underestimating costs.<sup>10</sup> Pickrell (1992) concludes that a primary reason for this poor project analysis is that the systems he examined were built with large shares of state and federal funds. In short, localities did not bear the full cost of their own faulty analysis and were able to export the cost of analytical "mistakes" to other regions. The lesson is not so much an indictment of rail transit planning as an example of the potential inefficiency in financing local benefits with state and federal money. We are not aware of similar studies for highway projects, but the geographic mismatch between often localized highway benefits and large state and federal funding

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<sup>10</sup> Pickrell (1992) analyzed the accuracy of forecasts that "... were available to decision makers at the time they chose among alternative projects." These forecasts were often from planning phases rather than preliminary engineering phases of a project and some persons have contended that an analysis of the accuracy of forecasts should give more weight to later, more detailed, estimates. Yet for our purposes the early estimates (because they are often influential in both rail transit and highway project decisions) are more important, and examining the accuracy of those early forecasts can give insight into the efficiency of the infrastructure spending and allocation process.

responsibility creates the potential for poor assessment of highway projects in a manner analogous to what Pickrell (1992) describes for rail transit.

There are two broad solutions to this problem. Policy-makers can either require careful benefit-cost analyses of all projects, or funding shares can be changed to bring local incentives more in line with social goals. While either would be desirable, we suggest that reforming highway finance has more promise.

Benefit-cost analysis has been advocated for highway projects for years. In 1977, the American Association of State Highway and Transportation Officials published a guide on conducting benefit-cost analysis for highway and other transportation projects (AASHTO, 1977). Other textbooks, research reports, and publications discuss the importance of analyzing highway projects using benefit-cost techniques (Friedlander, 1963; Mohring, 1976; Weisbrod and Weisbrod, 1997). Yet, as long as localities are able to purchase local benefits with state and federal funds, local governments have incentives to overstate highway project benefits and understate costs, in a fashion similar to what Pickrell (1992) documents for the rail transit projects he examined.

The current system of highway finance provides large pools of money to states and localities for highway programs. In federal fiscal year 1996, federal transportation grants to state and local governments were 34% of all federal grants, excluding grants for health (mostly Medicaid) and income support. Of the transportation grants, over two-thirds were for the federal aid highway system. Both proportions have remained roughly constant since the mid-1980s (United States Office of Management and Budget, 1997, Table 9-2, p. 196). The implication is that highway money is a large pool of the federal funding available to states and cities, and that local governments will behave in ways consistent with obtaining that money. If highway projects are required to pass a benefit-cost test, the risk is that local governments will be tempted to tilt the analysis in ways that helps them garner more funds.

In short, better benefit-cost analysis of highway projects, while important and desirable, faces an uphill battle as long as local governments have incentives to influence the analysis to obtain projects built in part with state and federal funds. Instead of attempting to cajole local governments into ignoring their own interests for the greater regional, state, or national good, we discuss in the next section how highway finance might be reformed to require that projects be financed by the area of benefit. A policy that requires such a geographic correspondence between areas of benefit and areas of funding responsibility can help reduce the regional cross-subsidies inherent in the current system. In a simple world, requiring that highways be financed by a mix of intergovernmental funds that exactly reflects how project benefits accrue across different jurisdictions would go a long way toward ensuring more economically efficient highway policies. Yet there is a complication that makes highway policy not so simple.

Highways bring spatial externalities. Spatial externalities exist when the geographic pattern of activities affects households or firms in ways that are not fully mediated even by well functioning, otherwise competitive markets. As discussed above, suburban highway projects might weaken agglomeration benefits in central cities, isolate poor residents in ways that are socially undesirable, and possibly worsen air quality or (although the evidence here is weaker) traffic congestion problems.<sup>11</sup> Because all of these are external to any one local jurisdiction, a policy of matching local benefits and

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<sup>11</sup> The evidence on air quality and spatial externalities is also thin. Does suburban highway construction worsen air quality problems? There is little conclusive evidence here, but one possible link is provided by emerging evidence on induced travel. Recent studies (Hansen and Huang, 1997; Noland, 1999) suggest that highway construction leads to overall increases in vehicle miles of travel. If that leads to, on

local costs would still not incorporate the external costs of highway building. Even if local governments paid the full dollar value cost of local highway benefits, the external effects of highway construction described above could lead to, on net, a highway program that is too large from the broader perspective of an entire metropolitan area or region.

Overall, we conclude that highway finance should be guided by a principal that local benefits should be purchased with local funds, combined with attention to the often negative within-region external costs of highway projects.<sup>12</sup> Yet for decades United States highway finance has been based on the opposite principal; funds are provided largely by states and the federal government, and external effects (when discussed at all) are typically assumed to be the positive external benefits associated with enhancing the performance of a network. Highway finance in the United States is still predicated on the idea that the system confers broad national and regional benefits, while the evidence summarized in Section III suggests a pattern of local benefits. Highway finance should change to be more consistent with this evidence. The change would have two pieces – matching local benefits and local funding responsibilities, and incorporating spatial externalities into the decision-making process.

### ***1. Matching the Benefiting Geographic Area with Highway Funding Responsibility***

This step requires an assessment of what locations benefit from highway projects. This is difficult because the evidence on the geographic variation in benefits from highways is aggregate and is difficult to apply to a specific project. Lacking better information, one might proxy the geographic area of project benefits by the geographic lengths of trips served by a project. Transportation planning software can be used to infer, at least for commuting trips, the distribution of trip lengths served by a particular project, and projects that serve longer trip lengths might be judged to have benefits that accrue over larger areas. One would also want to adjust this to reflect the value of freight shipments that use a particular highway, and the distribution of origins and destinations of that freight. Such information exists both for freight and commuting, and transportation planners should begin to examine how to better use that information to estimate how highway project benefits are distributed across different geographic areas. Focusing more on long-term research, there is also a need to refine our knowledge of spillovers to better link those effects to specific projects and to better identify areas of loss and gain.

Yet even without clear project-specific information on spillover benefits, it is possible to develop some rules of thumb to guide highway finance. The evidence in Section III suggests that as the highway system in the United States has matured, highway benefits have become increasingly local. To catch up with this change, highway finance should also become increasingly local. The state and federal role in highway finance is a legacy of an earlier era when highway investments likely generated broad national benefits. Some of that funding responsibility ought to be shifted to local governments, not, as has been suggested, in ways that simply return gasoline tax revenues to the collecting jurisdictions, but

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net, lower air quality, the fact that air quality is a regional issue implies that local jurisdictions will not fully appreciate and act on the air quality impacts of highway construction decisions.

<sup>12</sup> Traditionally, highway finance has focused on positive cross-regional externalities. Because a highway project in one location can enhance the performance of the overall network, areas distant from the project can benefit nevertheless. This is the more traditional formulation of how highway benefits spill over to distant regions, and it is one of the motivations for the large federal funding shares used to construct the Interstate Highway System. For a discussion of these positive spillovers in the context of, e.g., all public infrastructure, see Munnell (1992). We focus here on negative cross-region externalities because the evidence suggests that cross-state positive spillovers from highway capital are somewhat unimportant (Holtz-Eakin and Schwartz, 1995), and that within-state negative spillovers can be potentially as important as positive spillovers (Boarnet, 1998).

in the much more specific sense that local governments will bear lead financial responsibility for highway projects that bring predominantly local benefits. Conversely, projects with large state or national importance should be funded by proportionately large state and federal shares. For additional discussion of this idea, see Boarnet (1997, 1999).

## **2. *Incorporating Spatial Externalities into the Decision-Making Process***

The second step in highway finance reform should incorporate within-region spatial externalities in the decision-making process. Yet there is little solid evidence that can be used to quantify how a specific highway project might weaken central city agglomeration economies, isolate poverty populations, or worsen air quality, even if the theoretical link (especially for agglomeration and concentrated poverty) is highly plausible. For that reason, we suggest that the best start toward incorporating spatial externalities is to ensure that those issues are at least aired. Local, state, and federal practice should increasingly require a discussion of possible external effects, even if the magnitude of harm cannot be quantified. For now, the best approach to the external costs of agglomeration, social isolation of central cities, and other externalities associated with urban development patterns might be to put those issues, almost always ignored, on the agenda for public discussion. This bears more on process and governance than on funding arrangements. Highway finance reform is certainly important, but changing governance and political procedures to better address within-region external costs is also vital. We discuss those issues below.

### **B. *Governance, Highways, and Economic Efficiency***

The possibility of within-metropolitan area external costs and the localized nature of many highway benefits suggests that the regional level is the best one for highway financing, programming, and planning. In the wake of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), regional transportation planning bodies have grown in importance and are often well positioned to internalize the spatial externalities of highway-building discussed above.

Large metropolitan areas have long recognized that transportation investments are very likely to have consequences that do not respect jurisdictional boundaries. This realization has resulted in the establishment of both regional public transit authorities and metropolitan planning organizations (MPOs) for the purposes of planning road improvements. In both ISTEA and TEA 21 (the Transportation Equity Act for the 21<sup>st</sup> Century, enacted in 1998), metropolitan areas with populations over 50,000 are required to plan transportation investments on a regional basis. These federal acts aimed to give MPOs powers that would put them on a more equal footing with state DOTs, including authority over prioritizing highway (and other transportation) projects within each region. MPOs are instructed to use a list of criteria to evaluate projects, including controlling many of the region-wide externalities discussed above, like air pollution, energy consumption and the relationship between transportation and land use.

In principal, the statutorily important role of MPOs would seem to make them an ideal vehicle for maximizing the efficiency with which urban transportation investments are made. These bodies, with their presumed interest in benefits and costs in all parts of the region, can balance the net effect of projects on the region as a whole, offering an escape from both the too parochial perspective of local governments and the too expansive responsibilities of state DOTs. MPOs should be able to rationally plan and prioritize the allocation of available transportation investment funds, leading to intra-metropolitan investment efficiency. However, there are several reasons to be concerned about the ability of MPOs to act in this way:

*First* and foremost is the structure of the organizations themselves. MPOs are composed of representatives of local governments, and in many cases they follow a “one government / one vote” decision making rule. Since central cities tend to have significantly larger populations than individual suburban jurisdictions, this structure leads to an underrepresentation of central cities and certain other areas -- particularly unincorporated places. (Lewis 1998 contains an excellent review of and data on the structure of California MPOs.)

This organizational structure is very likely to lead to inefficiency in the allocation of transportation funding. If the benefits of new investments are localized while the costs are spread throughout the MPO's jurisdiction, then each locality will want to obtain as many projects as possible. In these circumstances, overrepresentation of particular areas will lead to too much investment in those areas, and too little in areas with less political clout on the MPO board.<sup>13</sup>

The *second* problem involves the size of the investment pool to be allocated. In theory, the overall level of highway investment ought to be in the purview of the regional body, but in practice the total amount is given by state and federal decisions. Prior to ISTEA, MPOs tended to generate “wish lists” of projects that more than exhausted available funding. State DOTs were then able to pick and choose from these lists, giving them the real decision making power. However, under current law only those projects that have a reasonable prospect of being funded may be included in transportation improvement programs (TIPs). MPOs may thus be forced to forego including projects that, while of relatively low priority within the region, might still provide positive net benefits beyond the region. On the other hand, the existence of a pool of funding may be difficult to ignore, and projects that have negative net benefits within the region may get funded, particularly if MPO officials believe that a failure to spend all the funds made available to them will lead to reductions in funding (and influence) in the future.

The institutional structure of MPOs combines with the significant extra-regional funding of transportation projects to provide incentives for local areas to essentially compete to get projects into the TIP, with over-represented jurisdictions winning the competition more frequently than is optimal. As each locality seeks to maximize its own advantage, overall regional welfare can become a secondary consideration, if it is considered at all. It should be noted that while many votes on MPO boards are unanimous, this cannot be taken as reliable evidence that there is little or no competition for funds. First, the board relies heavily on reports and technical analyses authored by staffs who themselves are appointed by boards and can anticipate their reactions (Lewis 1998). In addition, unanimity on proposals that generally provide only localized benefits may be evidence of “log-rolling” politics, in which policy makers agree to support each other's projects. Underrepresented areas could find themselves with relatively little influence to trade in this process, and emerge with concomitantly few projects. For example, on a per capita basis, a “one government/one vote” MPO structure would typically cause central city residents to be under-represented on a per capita basis. So even if central cities could form coalitions with other jurisdictions to get their projects into the TIP, it is possible that the resources flowing to the central city will still not be commensurate with that city's population relative to the metropolitan area.

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<sup>13</sup> If land prices reflect the value of highway investments, then apportionment of MPO votes would ideally be made on the basis of land area. For example, a rule that one acre is one vote on the MPO board would lead to decisions made on the basis of their effect on the region's aggregate value of land, a proxy for their effects on regional welfare. Such a scheme, while possible in theory, requires that the effects of highway investments be completely capitalized into land prices, that the electorate recognize the link between land price changes and highway projects, and that persons vote based on the intensity of their harm, so that small parcels with large benefits or costs would be appropriately weighted in any vote. While all are plausible to some extent, none seem likely in the complete sense needed for this scheme to yield an efficient outcome. For that reason, we do not recommend or further explore that voting arrangement here.