R. SCOTT WHEELER
MAYOR

TOWN OF ADDISON, TEXAS

Post Office Box 9010, Addison, Texas 75001-9010 (972) 450-7026 Fax (972) 450-7043
E-mail: swheeler@ci.addison.tx.us

June 24, 2003

The Honorable John Cornyn
United States Senate
517 Hart Senate Building
Washington, DC 20510

Dear Senator Cornyn:

This is to express my concern over a proposal that may come before the Senate Finance Committee that will shift almost all of the motor fuel tax money that currently goes to mass transit, toward support for federal highway programs.

The Town of Addison is a member city of the Dallas Area Rapid Transit System and we have been waiting patiently for urban passenger rail transit to serve our Town. This proposal that would cut funds for mass transit would certainly further delay many transit projects, not only in our system, but all across the country.

Accordingly, we ask that you take whatever steps appropriate to oppose this measure and any such change in transit financing.

Please feel free to contact me should you have any questions about this request.

Sincerely,

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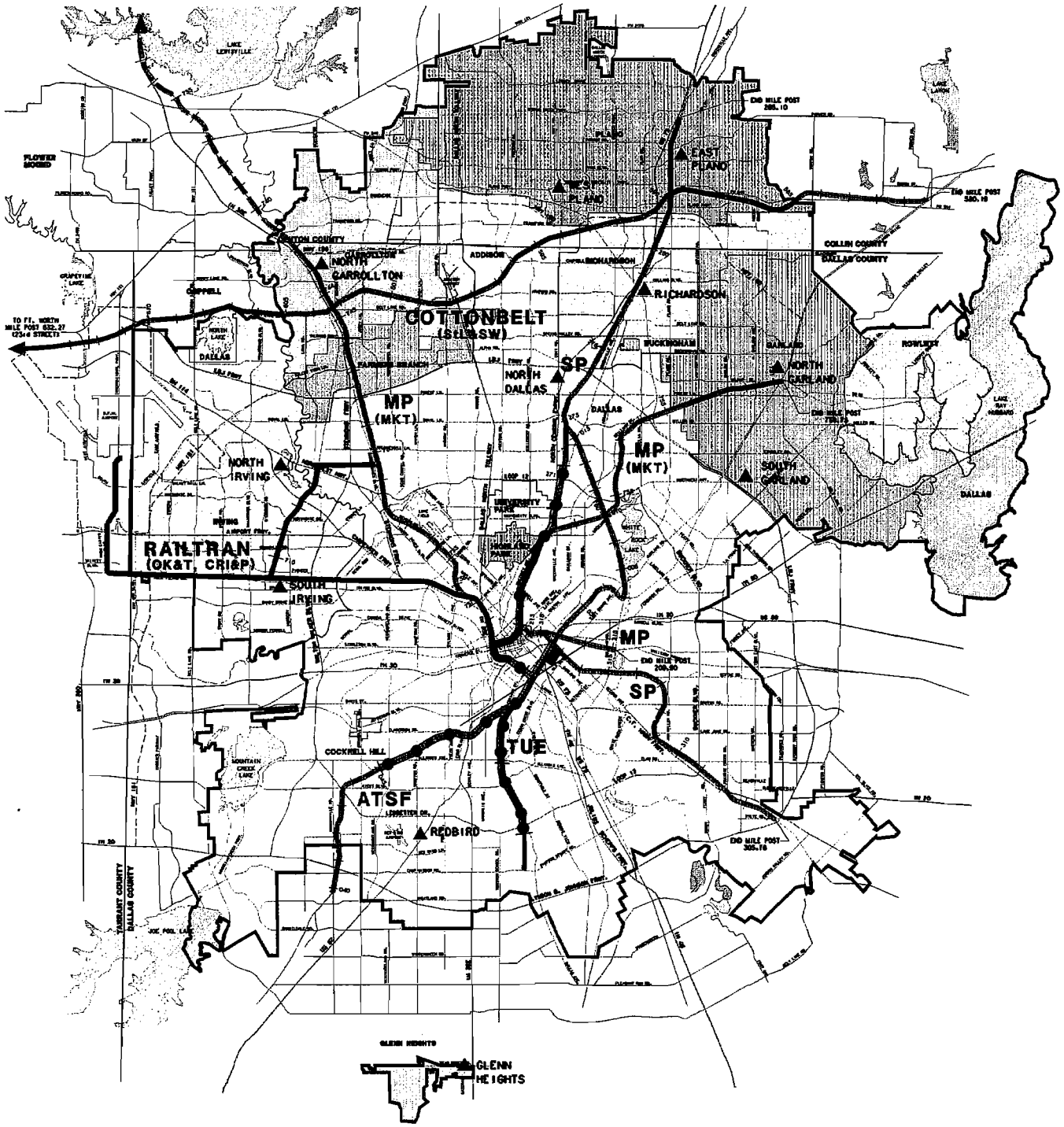
RIGHT-OF-WAY ACQUISITION

DART SERVICE AREA



LEGEND

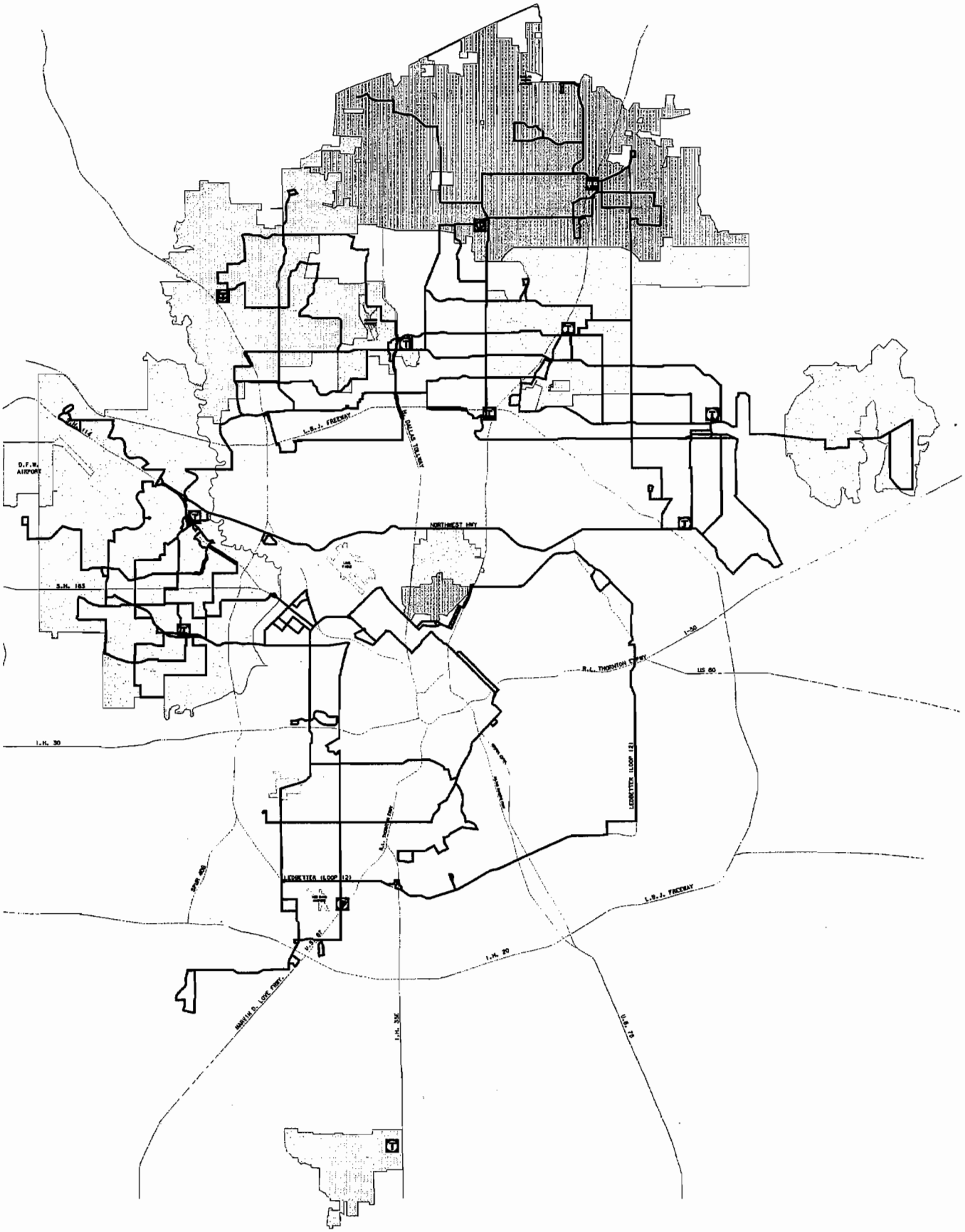
- R.O.W. ACQUIRED BY DART
- R.O.W. WITH PURCHASE OPTION
- R.O.W. TO BE ACQUIRED
- RAILTRAN R.O.W.
- LRT STARTER SYSTEM
- TRANSIT CENTER

DRAWN BY
DART CADD
DEPARTMENT

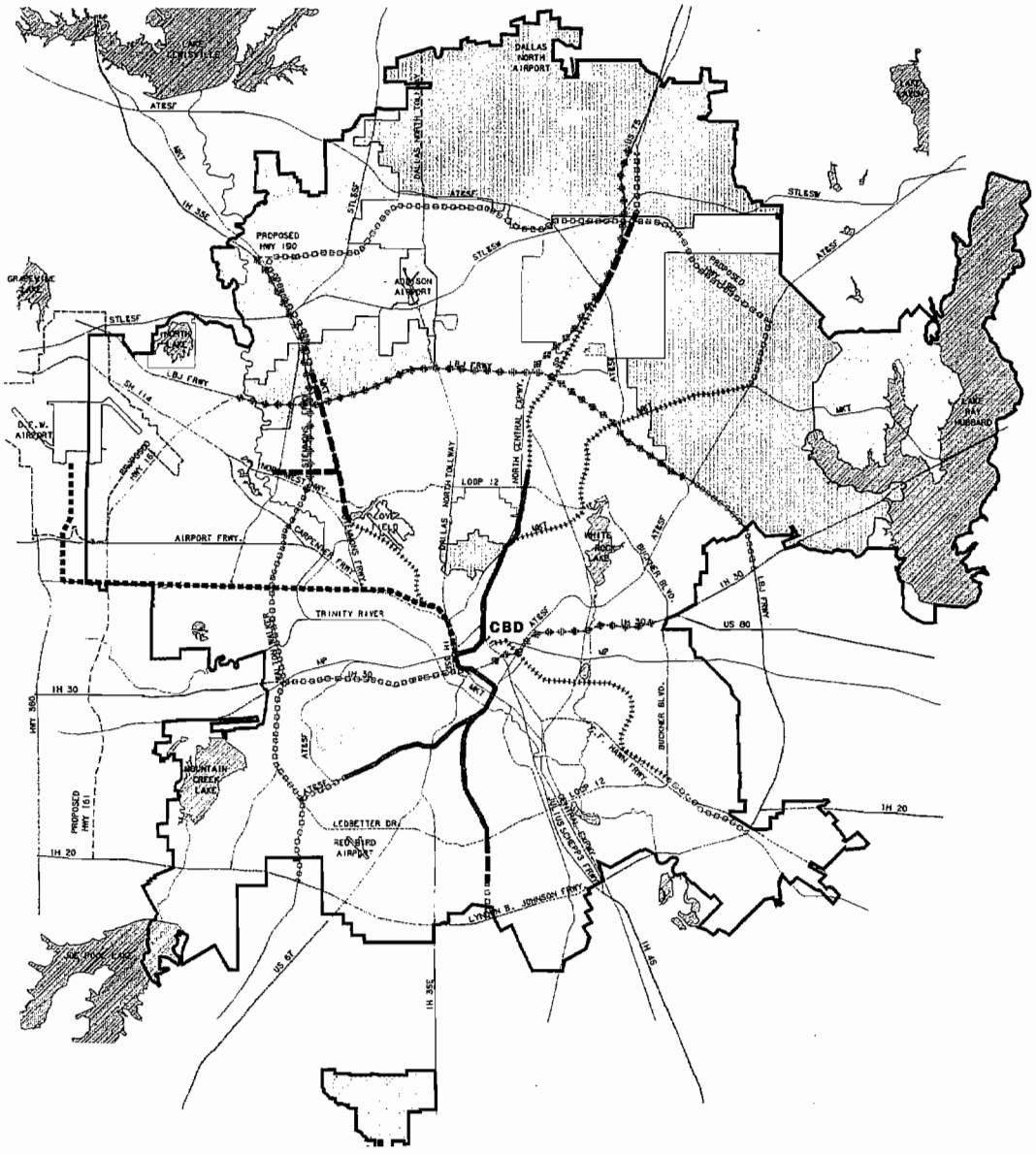
CAES

DART

1992 NON CBD BUS ROUTES



TRANSIT SYSTEM PLAN
DART SERVICE AREA



LEGEND

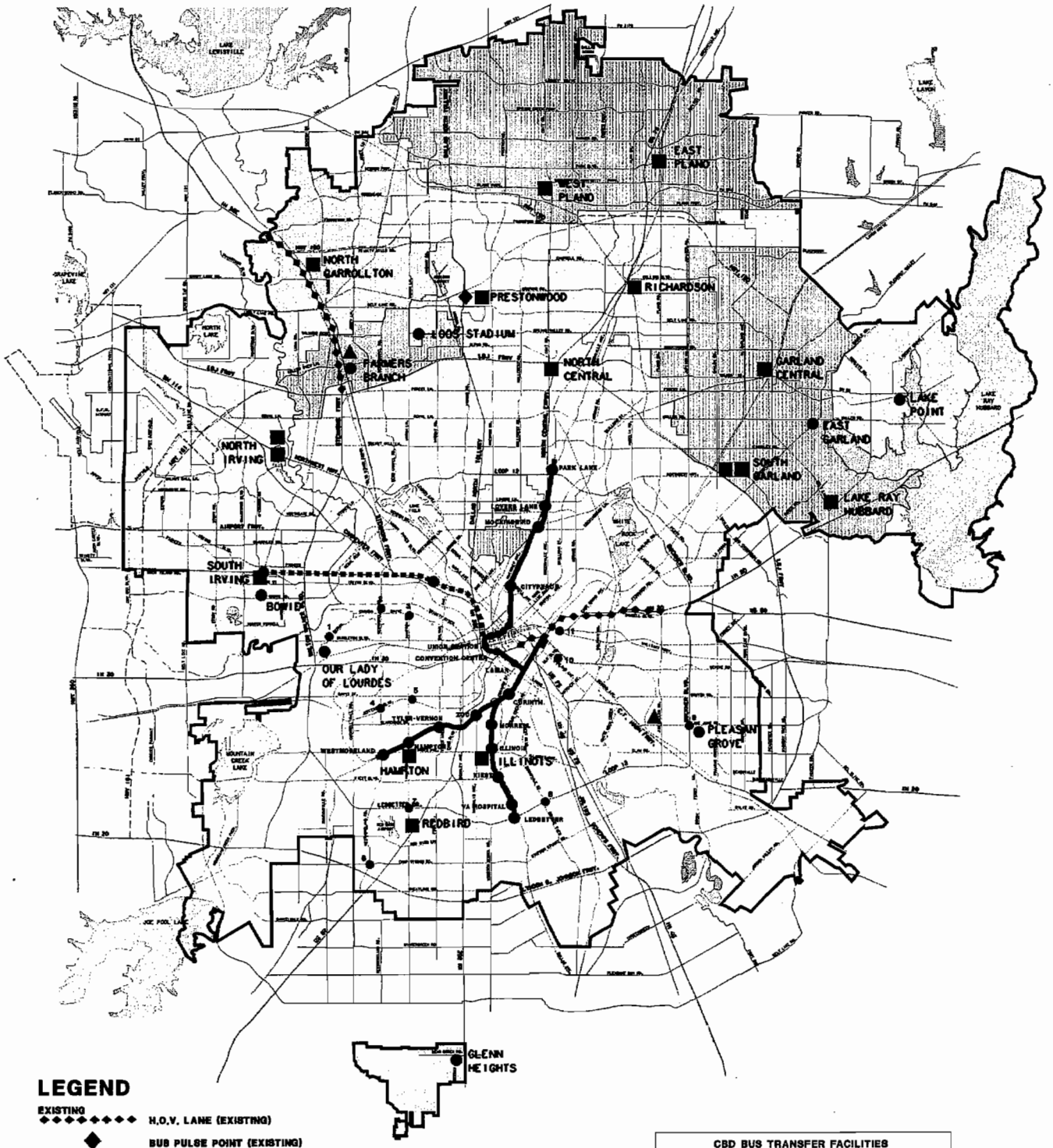
- COMMUTER RAIL LINE (1990 - 1996) PART OF STARTER SYSTEM
- H.O.V. TRANSITWAY (1990 - 2010)
- LIGHT RAIL STARTER SYSTEM (1990 - 1996)
- LIGHT RAIL TRANSIT SYSTEM (1997 - 2010)
- LIGHT RAIL EXTENSIONS (POST 2010)
- SYSTEM EXPANSION

DRAWN BY
DART CADD
DEPARTMENT

CAES

EXISTING & PROPOSED DART TRANSIT FACILITIES

THROUGH 1996



LEGEND

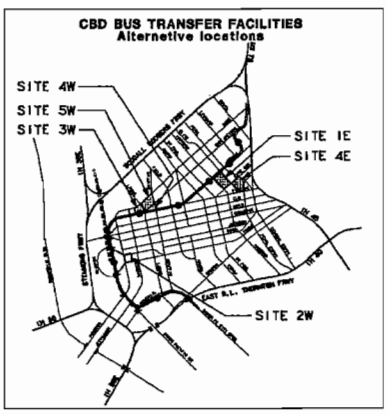
EXISTING

- H.O.V. LANE (EXISTING)
- BUS PULSE POINT (EXISTING)
- BUS TRANSIT CENTER (EXISTING)
- BUS PARK & RIDE (EXISTING)

PROPOSED

- LRT STARTER SYSTEM & STATIONS (UNDER DEVELOPMENT)
- COMMUTER RAIL & STATIONS (UNDER DEVELOPMENT)
- H.O.V. LANE (UNDER DEVELOPMENT)
- BUS TRANSIT CENTER (UNDER DEVELOPMENT)
- BUS TRANSIT CENTER/PARK & RIDE/PULSE POINT (UNDER STUDY)
- BUS PASSENGER TRANSFER LOCATION (UNDER STUDY)

1 SINGLETON BLVD AT BERNAL
2 TORONTO AT WESTMORELAND
3 SINGLETON BLVD AT HAMPTON ROAD
4 JEFFERSON BLVD AT WESTMORELAND ROAD
5 JEFFERSON BLVD/DAVIS STREET AT HAMPTON
6 CAMP WISDOM ROAD AT WESTMORELAND ROAD
7 LEDBETTER DRIVE AT HAMPTON ROAD
8 LEDBETTER DRIVE AT BONNIE VIEW ROAD
9 LAKE JUNE ROAD AT BUCKNER BLVD
10 MARTIN L. KING, JR. BLVD AT OAKLAND
11 EXPOSITION AT PARRY



SUBURBAN TRANSIT ALTERNATIVES

1. **Remain a part of DART and work for regionalism**

2. **Suburban cities withdraw and deal with individual transit needs through budget (ad valorem).**

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1. STAY WITH DART

- **How do we achieve the ability to function regionally?**
  - **Appointed vs. Elected Board**
  - **Eminent Domain?**
  - **Will Dallas ever respect the suburbs as partners?**

- **Light Rail program will cost more and scheduled extensions will slip. Budget constraints will prevent expansion of the Bus system unless rail program schedule is extended even more.**

- **Is access/mobility to downtown Dallas important to the economic future of the suburbs?**

2. INDIVIDUAL CITIES DEAL WITH TRANSIT NEEDS

ADVANTAGE

- No MTA Tax on sales
- Tailored program to needs

DISADVANTAGE

- Funded through property taxes
- Less coordinated with other cities

3. FORM SUBURBAN TRANSIT AUTHORITY

- MTA Tax: $82,489,000 collected from suburbs in FY91
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- Cottonbelt Commuter Rail possible to DFW (need operating rights)
- Other capital projects affordable (HOVs, Local Assistance)

SUBURBAN TRANSIT ALTERNATIVE
Concept Financial Plan

	1993	1994	1995	1996	1997	1998	1999	2000
Sources of Funds								
Sales Tax	$82,489,000	$85,788,560	$89,220,102	$92,788,906	$96,500,463	$100,360,481	$104,374,901	$108,549,897
Fare Box	$5,000,000	$5,000,000	$5,000,000	$5,500,000	$5,500,000	$5,500,000	$6,050,000	$6,050,000
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Operating Expenses	$4,000,000	$4,160,000	$5,826,400	$6,059,456	$6,301,834	$6,553,908	$6,816,064	$7,088,706
Bus Operating Expense	$20,000,000	$21,400,000	$22,898,000	$24,500,860	$26,215,920	$28,051,035	$30,014,607	$32,115,630
Bus & Van Replacement	$4,000,000	$4,160,000	$4,326,400	$4,499,456	$4,679,434	$4,866,612	$5,061,276	$5,263,727
Capital Planning	$3,000,000	$3,120,000	$3,244,800	$3,374,592	$3,509,576	$3,649,959	$3,795,957	$3,947,795
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Cottonbelt Commuter Rail	$20,000,000	$30,000,000	$30,000,000	$30,000,000				
Maintenance Facility	$18,000,000							
Total Uses of Funds	$69,000,000	$62,840,000	$66,295,600	$68,434,364	$40,706,764	$43,121,513	$45,687,904	$48,415,858
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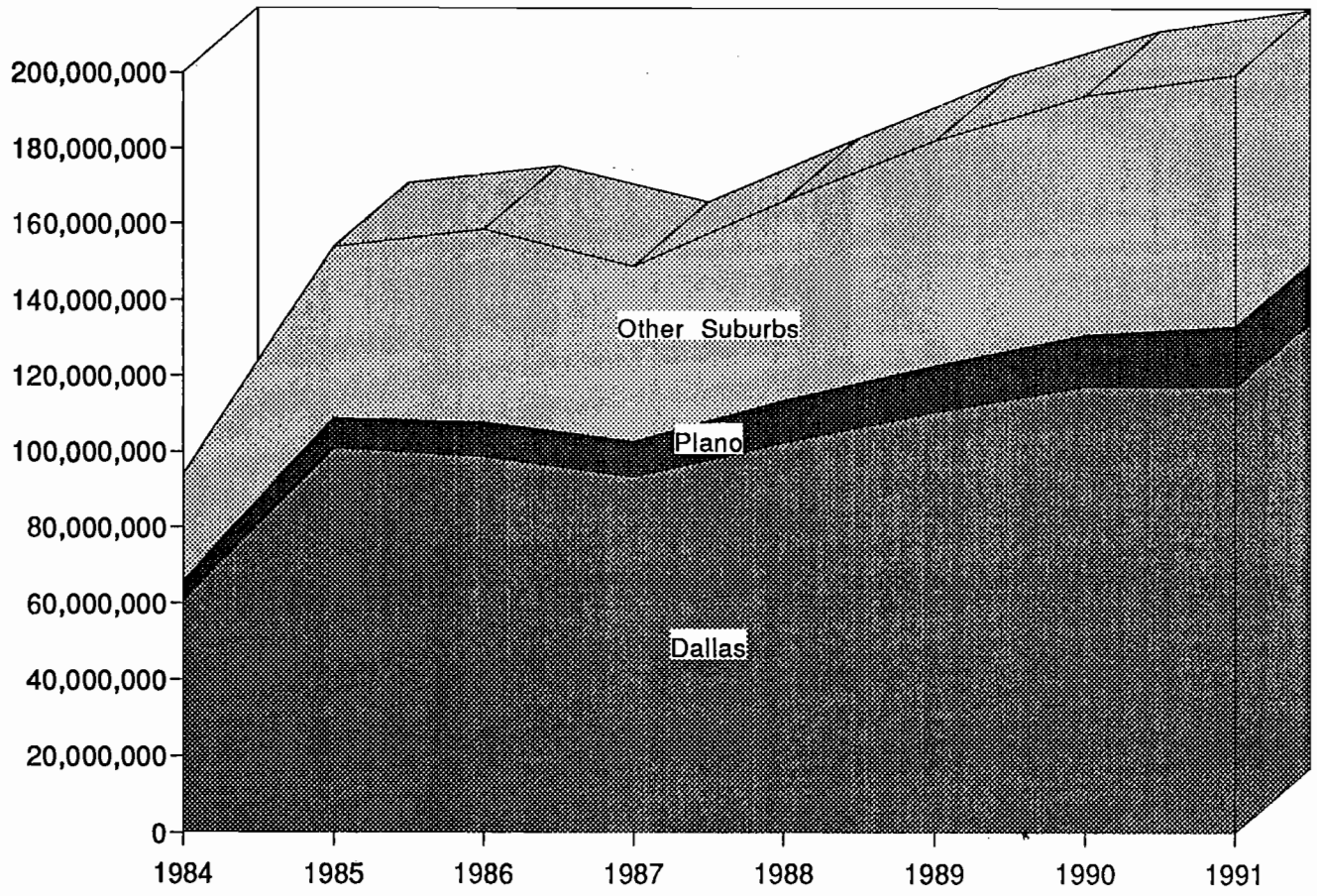
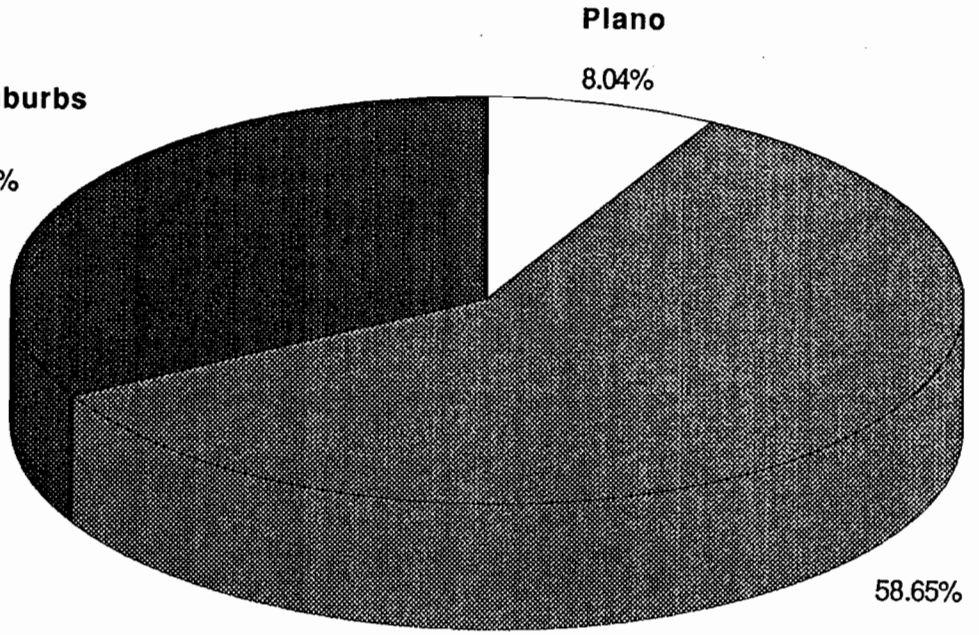
DART Sales Tax Trends



DART
FY91 Sales Tax Collections



DALLAS - $117 M
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Population, Sales Tax Collections, & Per Capita Sales Tax
Comparison between 1986 and 1991
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	86 Population	FY86 Sales Tax	'86 Per Capita	1990 Census	FY91 Sales Tax	'91 Per Capita
Dallas	941,700	$98,853,564	$104.97	1,006,877	$117,012,000	$116.21
Garland	174,550	$8,217,740	$47.08	180,650	$10,174,000	$56.32
Irving	141,600	$12,567,386	$88.75	155,037	$19,730,000	$127.26
Plano	108,000	$9,074,009	$84.02	128,713	$16,046,000	$124.66
Carrollton	68,450	$5,829,522	$85.16	82,169	$8,572,000	$104.32
Richardson	74,250	$8,249,877	$111.11	74,840	$11,915,000	$159.21
Farmers Bran	24,400	$9,378,478	$384.36	24,250	$7,319,000	$301.81
Addison	9,550	$3,384,778	$354.43	8,783	$5,320,000	$605.72
Univ Park	22,550	$1,051,876	$46.65	22,259	$1,519,000	$68.24
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Rowlett	15,200	$534,665	$35.18	23,260	$639,000	$27.47
Coppell	10,500	$332,877	$31.70	0	$0	$0.00
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Cockrell Hill	3,050	$76,627	$25.12	3,746	$64,000	$17.08
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Total	1,618,703	$158,622,983	$97.99	1,723,989	$199,501,000	$115.72

DART SYSTEM ELEMENTS

BACKGROUND

Shortly after being established in 1983, DART began implementing the original Service Plan with the initiation of express buses to downtown Dallas. These express buses started from leased parking lots owned by churches, shopping centers and movie theaters.

Since then, there have been seven permanent transit centers built with another four currently under development. Over 100 buses and vans operating on 27 routes travel between these transit centers each weekday. These suburban local and crosstown routes carried over 3 million passengers last year.

While establishing the basic level of transit service in cities that previously had no transit service was a high priority, work was also underway to develop a system of high capacity transit projects for the long term. The latest blueprint for these long range high capacity projects was approved by the DART Board of Directors in 1989. The DART Transit System Plan was developed following extensive community involvement and technical analysis, with emphasis on cost effectiveness.

Listed below are elements of the existing system or Transit System Plan components. Maps depicting these components are attached.

TRANSIT CENTERS - Located throughout the DART service area, these facilities serve as collection points for passengers to access express buses to downtown Dallas and as transfer points for local and crosstown bus riders. Several of these facilities will also transition into park and rides for the high occupancy vehicle (HOV) lane system and/or rail stations.

BUS NETWORK - By establishing these transit centers, DART has been able to provide a grid bus route network in the northern tier of DART-member cities. This permits travel across the region without going through downtown Dallas. In 1983 there were two non-CBD routes, today there are 34 non-CBD routes with plans that could add another nine. As the bus network is modified to provide feeder service to the rail system there is the

companion benefit of enhancing crosstown travel. DART Service Planning is studying expanding the grid network into Dallas with rail stations and transit centers serving as the focal points.

THOROUGHFARE IMPROVEMENTS - There are three programs that target arterials that should be rebuilt and/or widened to provide improved transit service.

HIGH OCCUPANCY VEHICLE LANES - There are three intermediate action and three permanent high occupancy vehicle (HOV) lanes in the DART System Plan. The six HOV's are in the following stages of development:

Intermediate

1. East R.L. Thornton - opened in 1991.

2. Stemmons (north of LBJ) - will open in 1994.

3. LBJ - due to the relatively high cost and short operational life (between completion of this intermediate project and starting reconstruction of LBJ) this project is no longer in the Financial Plan.

Permanent

1. LBJ - the HOV is a component of the reconstructed LBJ Freeway that is scheduled as an early construction item, opening in 2003.

2. North Central (north of LBJ) - the median of this recently rebuilt freeway was designed for simple conversion to an HOV when demand warrants. As part of the LBJ HOV project, direct connections to this North Central HOV will be built.

3. Stemmons (north and south of LBJ) - this project will greatly improve mobility through the highly congested Stemmons/LBJ interchange. It will be designed to provide through trips on Stemmons as well as direct connections with the LBJ HOV.

COMMUTER RAIL - Using self-propelled vehicles, rail service to Irving is scheduled to be open in 1994, pending agreements with the cities of Dallas and Fort Worth. Future extension to D/FW International Airport is in the Transit System Plan.

LIGHT RAIL - The first 20 miles, termed the Starter System, are within the Dallas city limits. The first extensions are scheduled to Richardson, along the former Southern Pacific right-of-way and to Garland along the former Union Pacific right-of-way. The Alternatives Analysis/Draft Environmental Impact Statement, scheduled to start in the fall of 1992, will begin the development process for the North Central light rail line extension into Richardson. This extension will provide rail service to the high employment areas in north Dallas, Richardson and Plano.

RIGHT-OF-WAY PRESERVATION - DART has secured over 150 miles of linear right-of-way to preserve it for transit purposes. Among the purchases is the former Cotton Belt Railroad right-of-way which extends across the northern tier of DART-member cities.

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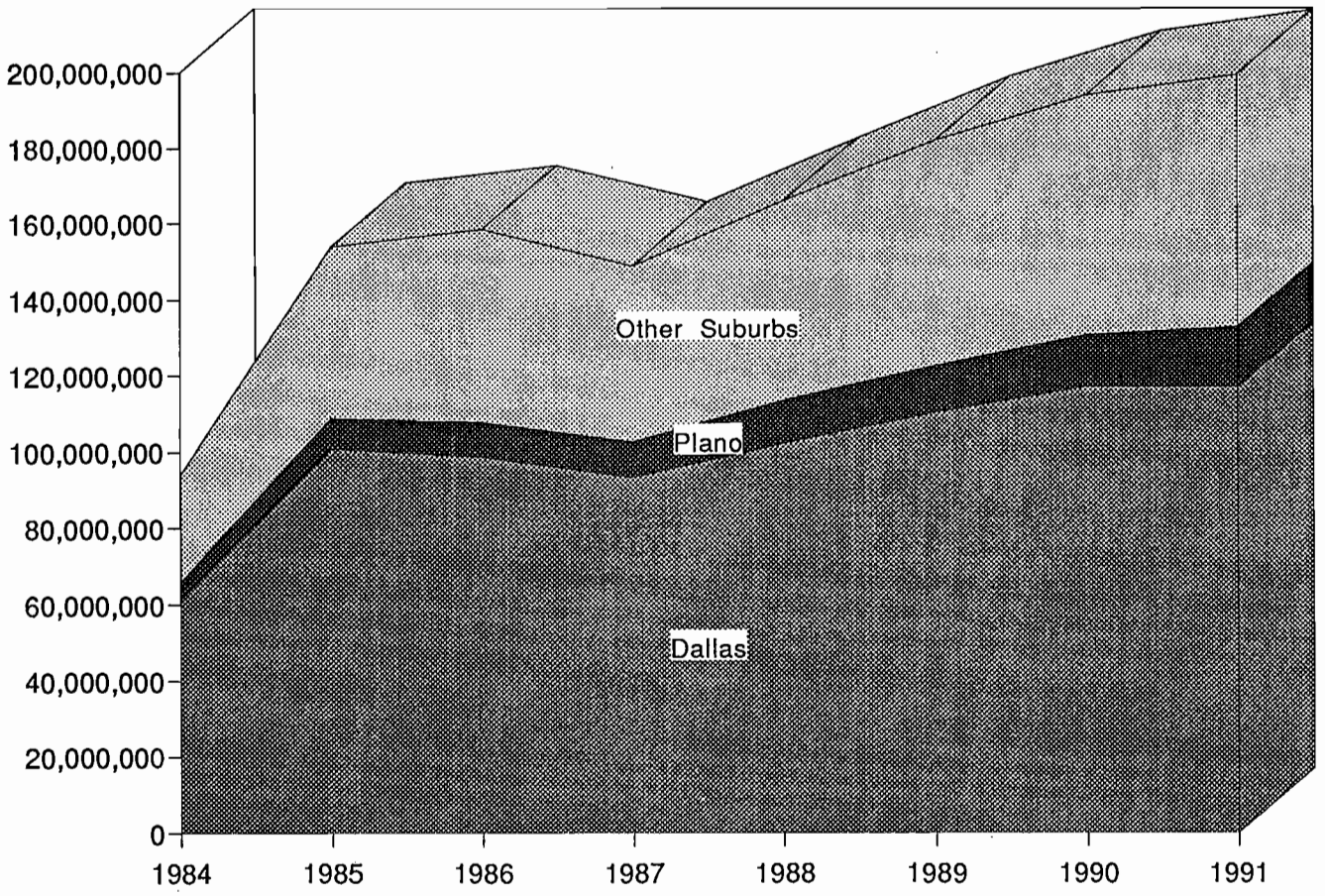

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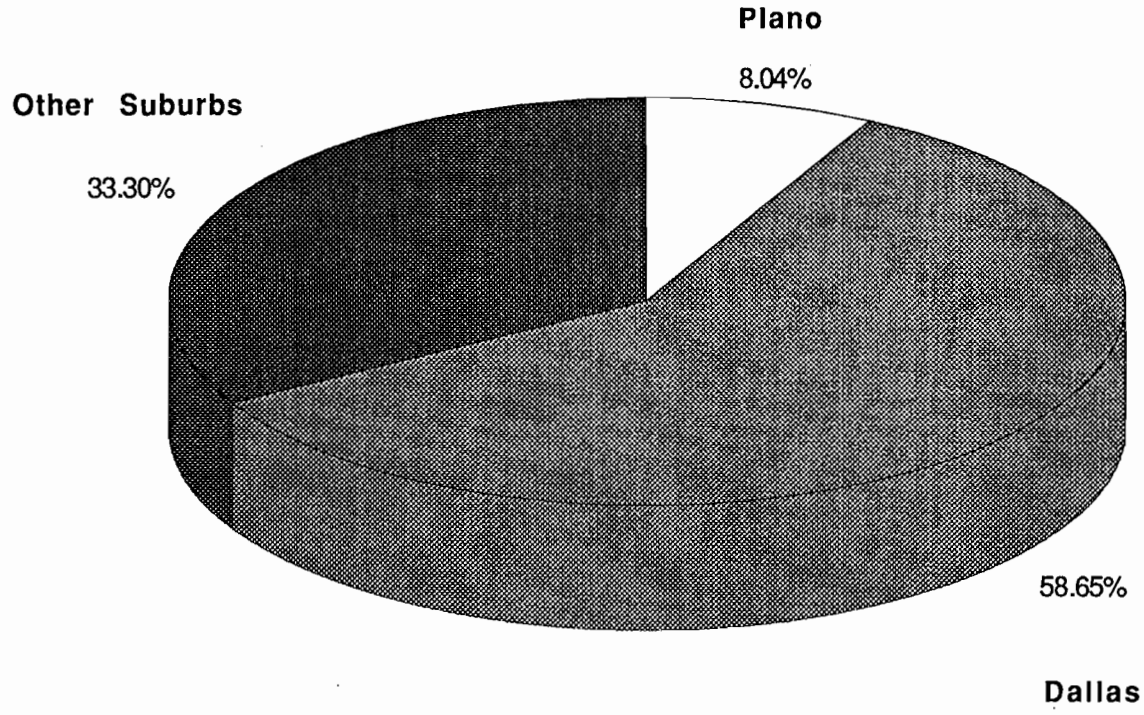

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FILE

MOBILITY 2010 UPDATE
GOALS

1. ISTEA Requirements/Guidelines
2. Financially Constrained Plan
3. Public and Agency Involvement
4. Mobility and Access
5. Economic Growth/Land Use Compatibility
6. Multi-Modal/Congestion Management Alternatives
7. Right-Way Preservation
8. Innovative Financing/Additional Funding Needs
9. Environmental, Economic, and Social Benefits
10. Guide Expenditure of Transportation Funds
11. Inventory and Maintain Needs Plan

MOBILITY 2010 PLAN UPDATE
ISTEA REQUIREMENTS

Extend Plan to Metropolitan Area Boundary

Develop a Financially Constrained Plan

Include Transportation Enhancement Component

Address Intermodal and Multi-modal Needs

Account for Maintenance Costs

Meet Air Quality Conformity/SIP Requirements

Consider ISTEA's 15 Factors

MOBILITY 2010 PLAN UPDATE
ADDITIONAL NEEDS

Expand Congestion Management Component

Refine Plan Recommendations by Mode

Develop Consistency with TIP

Improve on Cost Information

Increase Public Involvement

Provide Design Year Volumes

MOBILITY 2010 PLAN UPDATE
ADDRESSING THE FINANCIAL SHORTFALL

Implement a Multi-modal Management Approach

Fund only Cost-Effective Capital Improvements

Pursue Dallas-Fort Worth Share of State and Federal Discretionary Funds

Develop Incentives for Local Government and Private Sector Participation

Advance Additional Funding Options

MOBILITY 2010 PLAN UPDATE
ADDITIONAL FUNDING OPTIONS

Tollroad Construction

Peak-Period Pricing

Motor Fuel Taxes

Motor Vehicle Registration Fees

Truck Weight Taxes

Impact Fees (Chapter 395)

1994 PROJECT DEVELOPMENT PLAN - TxDOT

National Highway System - Category 3A Funding Summary

($ millions)

Level of Authority	Fort Worth District	Dallas District
III	$ 83.99	$ 4.50
II	187.45	900.98
I	1,075.03	333.80
Hold	520.93	269.33
	$1,867.40	$1,508.61

Source: TxDOT, 1994 PDP
September 1993

DRAFT
TxDOT District 18 – 2010 Funding Outlook – Base Case
(Millions Current Year Dollar)

Funding Category		10 Year Total Within MAB	10 Year for Capacity	10 Year for Main. & Other	17 Year Total Within MAB	Amount for Capacity	Amount for Safety, Main. & Other
1	Interstate Construction	0	0	0	0	0	0
2	Interstate Maintenance (HOV)	156	0	156	265	0	265
3A	NHS Mobility	538	538	0	915	915	0
3B	Texas Trunk	95	95	0	161	161	0
3C	NHS Rehabilitation	27	0	27	45	0	45
3D	NHS Traffic Management	0	0	0	0	0	0
3E	NHS Miscellaneous	8	8	0	14	14	0
4A*	STP–Safety	58	0	58	99	0	99
4B*	STP–Enhancements	58	0	58	99	0	99
4C	STP–MM	289	289	0	491	491	0
4D	STP–UM	32	32	0	54	54	0
4E	STP–RM	24	24	0	40	40	0
4F	State Rehabilitation	88	0	88	149	0	149
4G*	STP–Railroad Grade Cross	16	0	16	27	27	0
5	CMAQ	288	0	288	490	0	490
6A	On–System Bridge	117	117	0	198	198	0
6B	Off–System Bridge	20	20	0	34	0	34
7	Preventive Maintenance	61	0	61	104	0	104
8	State F.M.	9	9	0	15	15	0
9*	State Park Roads	8	8	0	14	0	14
10*	Rehab of Signs & Signals	32	0	32	55	0	55
11	State Funded Discretionary	21	21	0	36	36	0
12*	Commission Strategic Prior	139	139	0	236	236	0
13	State Funded Mobility	361	361	0	614	614	0
14	State Rehabilitation	23	0	23	39	0	39
15	Federal Demonstration	0	0	0	0	0	0
16*	Miscellaneous	29	29	0	49	49	0
17	PASS Metro Match	30	30	0	30	30	0
18	PASS	115	115	0	115	115	0
	District 18 Total	2642	1835	807	4388	2995	1393

Source: NCTCOG in consultation with TxDOT – Assumes TxDOT Funding to Remain at Current Levels

MOBILITY 2010 UPDATE REVENUE FORECAST

Available Funding ($ millions)

Mode/Scenario	Current Funding Levels	Moderate Growth
Roadway		
District 2 Capacity	$1,336	$2,567
District 18 Capacity	$2,995	$3,977
Capacity Subtotal	$4,331	$6,544
Transit		
Section 3	$ 794	$1,802
Section 9	$ 334	$ 480
Capacity Subtotal	$1,128	$2,282
Capacity Total	$5,459	$8,826

MOBILITY 2010 UPDATE REVENUE FORECAST

AVAILABLE FUNDING ($ millions)

Mode \ Scenario	Current Funding Levels*	Moderate Growth**
Roadway		
District 2		
Capacity	$1,336	$2,567
Safety, Maintenance & Other	$900	$1,712
District 18		
Capacity	$2,995	$3,977
Safety, Maintenance & Other	$1,393	$1,871
Capacity Subtotal	$4,331	$6,544
Transit		
Section 3	$794	$1,802
Section 9	$334	$480
Capacity Subtotal	$1,128	$2,282
Capacity Total	$5,459	$8,826

Assumptions
**** Moderate Growth Scenario**

Gas Tax (cents/gallon) (future scenarios will assume gas tax increases)

Year	Total Federal	Highway Fund	Transit Fund	Total State	Highway Fund
1994	18.3	10.0	1.5	20	15
1996	18.3	12.0	2.0	20	15
2010	18.3	12.0	2.0	20	15

- Texas averages a 94% return on federal gas tax

Growth

- 1% annual increase in gasoline sales
- 2% annual increase in vehicle registrations
- General Fund support for federal mass transportation continues at current level ($)

Revenue Distribution

- TxDOT District 2 maintains a 9% share of TxDOT funding
- TxDOT District 18 maintains a 16% share of TxDOT funding
- Current proportions of construction and maintenance expenditures are maintained
- Current proportions of FTA Section 9 is maintained and Section 3 proportion is doubled due to aggressive regional effort

Inflation

- Inflation effects will be added in future scenarios

Assumptions
*** Status Quo Scenario**

Gas Tax

- o No real increase in revenue due to gas tax increase
- o Texas averages a 94% return on federal gas tax

Growth

- o No real growth is assumed
- o Funding levels remain essentialy the same as today

Revenue Distribution

- o TxDOT District 2 maintains a 9% share of TxDOT funding
- o TxDOT District 18 maintains a 16% share of TxDOT funding
- o Current proportions of construction and maintenance expenditures are maintained
- o Current proportions of FTA Sections 3 and 9 are maintained

Inflation

- o Inflation effects will be added in future scenarios

SUMMARY OF HIGH OCCUPANCY VEHICLE AND RAIL WARRANTS

Freeway Rehabilitation Costs[1]	$15.6 M/Center Line Mile
Freeway (at grade)	$2.5 M/Lane Mile
Freeway (elevated)	$3.5 M/Lane Mile
HOV Lane (at grade)	$5.0 M/Lane Mile
HOV Lane (elevated)	$7.0 M/Lane Mile
ROW	$1.56 M/Lane Mile

[1] $2.6 M/Lane Mile x 6-Lane Facility = $15.6 M/Center Line Mile

Ratio of HOV Costs/Freeway Costs = 1.0

General HOV Warrant:

1,900 Persons per Lane x 1.14 AO = 2,166 x 1.0 = 2,200 Persons/Peak Hour/Peak Direction

Freeway Costs with Rehabilitation	$23.72 M
Commuter Rail	$ 5.0 M (Ratio 0.2)
Lower Cost Light Rail	$15.0 M (Ratio 0.6)
Light Rail Extension	$25.0 M (Ratio 1.1)

General Rail Warrant (2,200 x Ratio):

Commuter Rail	2,750 Weekday;	440 Peak Hour/Peak Direction
Lower Cost Light Rail	8,250 Weekday;	1,320 Peak Hour/Peak Direction
Light Rail Extension	15,125 Weekday;	2,420 Peak Hour/Peak Direction

MOBILITY 2010 PLAN UPDATE
AVERAGE RAIL LINK VOLUMES BY SEGMENT

SEGMENT NUMBER	MODE	RAIL LINE	SEGMENT DESCRIPTION FROM	SEGMENT DESCRIPTION TO	LIGHT RAIL DAILY RIDERS	LIGHT RAIL PK HR RIDERS	COMMUTER RAIL DAILY RIDERS	COMMUTER RAIL PK HR RIDERS	COMMENTS
1	Light Rail Starter	CBD Transit Mall	Houston	Ross	45,000	7,515	N/A	N/A	Committed Light Rail
2	Light Rail Starter	South/West Oak Cliff	Houston	Clarendon (Split)	33,200	5,544	N/A	N/A	Committed Light Rail
3	Light Rail Starter	West Oak Cliff	Clarendon (Split)	Tyler St.	13,800	2,305	N/A	N/A	Committed Light Rail
4	Light Rail Starter	West Oak Cliff	Tyler St.	Illinois Ave.	7,700	1,286	N/A	N/A	Committed Light Rail
5	Light Rail Starter	South Oak Cliff	Clarendon (Split)	Kiest Blvd.	11,300	1,887	N/A	N/A	Committed Light Rail
6	Light Rail Starter	South Oak Cliff	Kiest Blvd.	Loop 12	5,500	919	N/A	N/A	Committed Light Rail
7	Light Rail Starter	North Central	Ross	Mockingbird	41,900	6,997	N/A	N/A	Committed Light Rail
8	Light Rail Starter	North Central	Mockingbird	Park Lane	32,500	5,428	N/A	N/A	Committed Light Rail
9	Light Rail Ext.	South Oak Cliff	Loop 12	Camp Wisdom	200	33	N/A	N/A	Light Rail Local Funds
10	Light Rail Ext.	Pleasant Grove	Ross (Transit Mall)	Dolphin Rd.	8,600	1,436	N/A	N/A	~~Initial Light Rail~~ Staged LCLR
11	Light Rail Ext.	Pleasant Grove	Dolphin Rd.	Elam Rd.	4,300	718	N/A	N/A	Staged Low Cost Light Rail
12	Comm./Lrt. Ext.	Garland	Mockingbird Lane	IH 635	8,000	1,336	2,500	400	Staged Low Cost Light Rail/Commuter Rail
13	Comm./Lrt. Ext.	Garland	IH 635	Walnut St.	4,300	718	2,300	368	Staged Low Cost Light Rail/Commuter Rail
14	Light Rail Ext.	North Central	Park lane	IH 635	26,100	4,359	N/A	N/A	Light Rail/Staged Low Cost Light Rail
15	Light Rail Ext.	North Central	IH 635	~~Interurban~~ St. Arapaho	16,700	2,789	N/A	N/A	Light Rail/Staged Low Cost Light Rail
16	Light Rail Ext.	North Central	~~Interurban~~ St. Arapaho	FM 544	9,200	1,536	N/A	N/A	Light Rail/Staged Low Cost Light Rail
17	Commuter Rail	Cottonbelt	FM544 (Plano)	Dallas North Tollway	N/A	N/A	2,900	464	Commuter Rail
18	Commuter Rail	Cottonbelt	Dallas North Tollway	IH 35 E	N/A	N/A	2,400	384	Commuter Rail
19	Commuter Rail	Cottonbelt	IH 35 E	D/FW Airport	N/A	N/A	500	80	Future Commuter Rail Extension
20	Comm./Lrt. Ext.	Stemmons	Union Station	Love Field	10,000	1,670	6,300	1,008	Staged Low Cost Light Rail/Commuter Rail
21	Comm./Lrt. Ext.	Stemmons (Las Colinas)	Walnut Hill	O'Connor Blvd.	2,900	484	2,700	432	Staged Low Cost Light Rail/Commuter Rail
22	Comm./Lrt. Ext.	Stemmons	Love Field	IH 635	4,700	785	4,400	704	Staged Low Cost Light Rail/Commuter Rail
23	Comm./Lrt. Ext.	Stemmons	IH 635	Dickerson Blvd./SH190	3,000	501	4,000	640	Staged Low Cost Light Rail/Commuter Rail
24	Commuter Rail	Railtran	Fort Worth CBD	Centreport Station	N/A	N/A	4,000	640	Commuter Rail
25	Commuter Rail	Railtran	Centerport Station	S. Irving Station	N/A	N/A	6,700	1,072	Commuter Rail
26	Commuter Rail	Railtran	S. Irving Station	Dallas CBD	N/A	N/A	7,100	1,136	Commuter Rail
27	Commuter Rail	Railtran	Centerport Station	D/FW Airport	N/A	N/A	1,000	160	Future Commuter Rail Extension

Source: NCTCOG 9/17/93

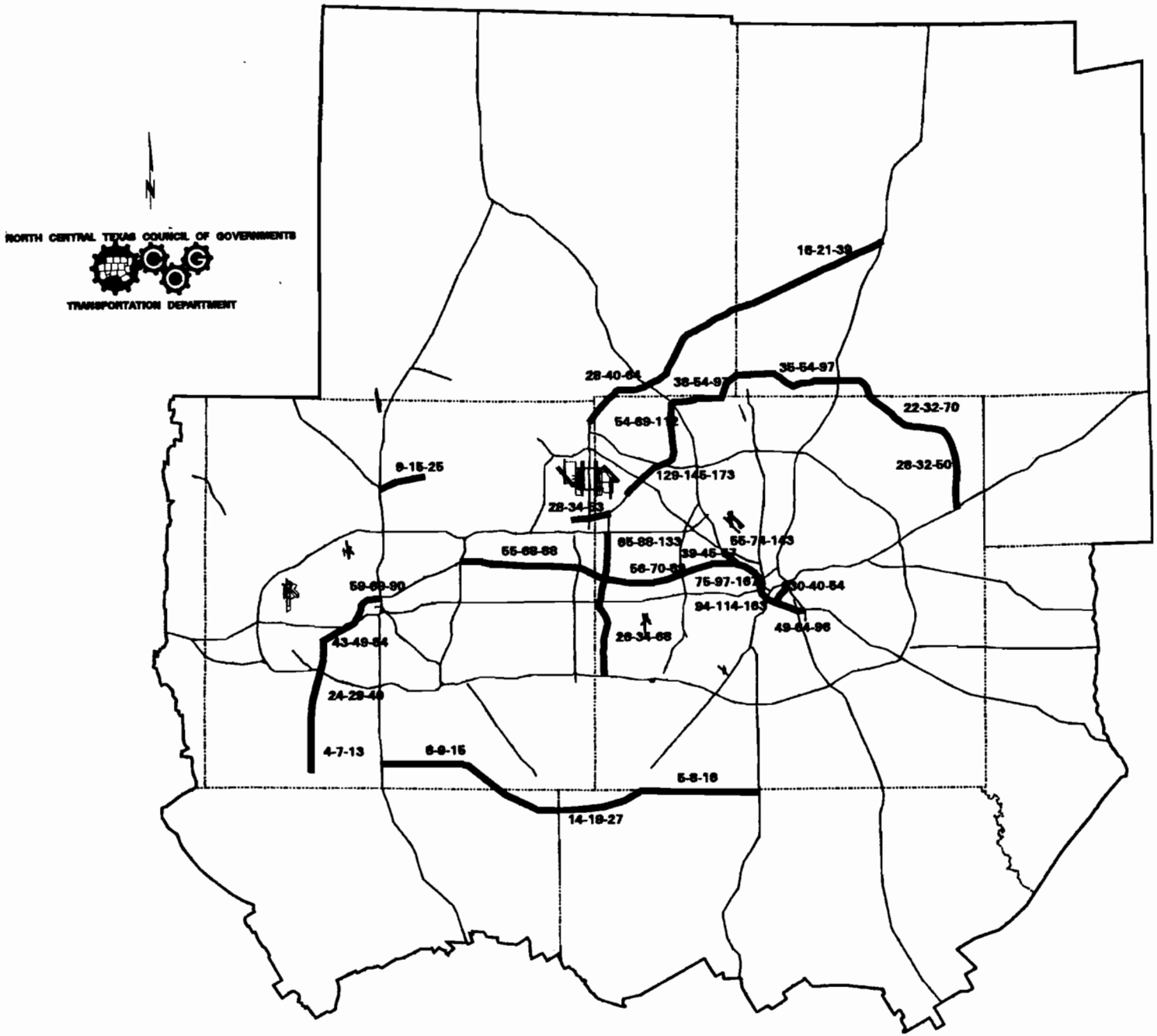
TOLL ROAD ANALYSIS *

LIMITS	FRTG (Y/N)	VOLUME (1000'S)			PERCENT VOLUME RETAINED	LANES	TOTAL COST (1)	REVENUE / ANNUAL COST (2)	
		FREE	$0.08	$0.12			(MIL)	$0.08	$0.12
WEST FORK TRINITY									
IH820 – SH360	N	88	68	55	77%	4	$161	1.53	1.87
SH360 – SH161	N	77	60	49	78%	4	$74	1.36	1.66
SH161 – LP12	N	89	70	56	80%	4	$131	1.60	1.80
LP12 – TRNTY PKY	N	57	45	39	79%	4	$134	1.02	1.30
TRINITY PARKWAY									
IH35E – W. FORK	N	143	74	55	51%	10	$10	0.66	0.75
W. FORK – IH30	N	167	97	75	58%	10	$60	0.92	1.08
IH30 – SANTE FE	N	163	114	94	70%	8	$21	1.30	1.58
SANTE FE – US75	N	96	64	49	67%	6	$42	0.97	1.10
SH 190									
IH35E – DNT	Y/N	97	54	38	56%	6	$111	0.82	0.85
DNT – US75	Y/N	97	54	35	46%	6	$180	0.81	0.79
US75 – SH78	Y	70	32	22	46%	6	$102	0.48	0.49
SH78 – IH30	N	50	32	28	63%	4	$180	0.72	0.95
N. TAR PKWY									
IH35W – US377	N	25	15	9	60%	4	$50	0.34	0.29
SH 121									
INT.PKY–FM2281	Y	64	40	28	62%	4	$99	0.89	0.95
FM2281 – US75	Y	39	21	16	56%	4	$228	0.50	0.56
SH 121 (S.W.FRWY)									
IH35W – IH30	N	90	69	59	74%	8	$60	0.82	1.05
IH30 – IH20	Y/N	84	49	43	66%	6	$56	0.73	1.10
IH20 – S.S. RD	Y/N	40	29	24	64%	4	$38	0.65	0.81
S.S. RD–FM1187	Y/N	13	7	4	53%	4	$75	0.16	0.14
SH 161									
BELTLINE – IH635	Y	173	145	129	84%	10	$34	1.31	1.75
IH635 – IH35E	N	112	69	54	62%	6	$74	1.04	1.20
SH183 – IH30	Y	133	88	65	66%	8	$111	1.04	1.15
IH30 – IH20	Y	68	34	26	49%	4	$69	0.75	0.86
SANTE FE BYPASS									
IH35E – IH30	N	54	40	30	55%	4	$15	0.90	1.01
S. LOOP 9									
IH35W – US287	N	15	9	6	58%	4	$383	0.20	0.19
US287 – US67	N	27	19	14	71%	4	$530	0.43	0.48
US67 – IH35E	N	16	8	5	49%	4	$70	0.18	0.18
E–W CONNECTOR									
SH360 – SH161	N	53	34	28	63%	6	$75	0.51	0.63

1) Based on average cost of $4.00 million per lane mile
2) Annual revenue based on 300 days of operation
   Costs obtained by assuming 6% discount rate for 40 years
* Existing plus committed network – 1993 TIP

Source: NCTCOG, 1993

MOBILITY 2010 PLAN UPDATE
TOLL ROAD ANALYSIS



MOBILITY 2010 PLAN UPDATE

Congestion Management Planning Strategies

Begin Comprehensive Congestion Management Data Collection System

Develop Regional Congestion Management Plan/System

Conduct Rail/HOV AA Studies at Regular Intervals

Conduct Freeway and Design Studies Integrated with AA Process

MOBILITY 2010 PLAN UPDATE

Congestion Management Implementation Strategies

Implementation through the Transportation Improvement Program

Establishment of Transportation Management Associations

Expansion of Traffic Management Teams

Voluntary Employer/Employee Programs

Implementation of Policies and Programs Through TxDOT, Transit Authorities and Local Governments

MPO Coordination of Programs

Sub-Area Focus Planning and Implementation

MOBILITY 2010 PLAN UPDATE

Performance Evaluation

Performance Measure	Base System	Congestion Management System	Percent Change*
Vehicle Miles of Travel	121.56 million	119.99 million	-1.29%
Vehicle Hours of Travel	5.00 million	4.80 million	-4.00%
Average Loaded Speed	25.74 mph	26.23 mph	+1.90%
Veh Hrs of Traffic Control Delay	0.34 million	0.25 million	-26.82%
Veh Hrs of Congestion Delay	2.13 million	2.02 million	-5.16 %
Total Veh Hrs of Delay	2.47 million	2.27 million	-8.10%

* Total Annual Benefits = $464 million
Benefit/Cost = 8

MOBILITY 2010 PLAN UPDATE

Congestion Management Strategies	Annual Congestion Benefits	Annual Costs
Traffic Signal Improvements	$187 million	$3.3 million
Intersection Improvements	$365 million	$7.5 million
Freeway Incident Detection/Response		
Surveillance and Response	$ 50 million	$ 11 million
Motorist Assistance Program	$ 200 million	$ 12 million
Employer Trip Reduction Program	$ 97 million	$ 1 million
Vanpool Program	$ 33 million	$4.3 million
Park-N-Ride Facilities	$ 22 million	$ 3 million
TOTAL	$954 million	$42.1 million

Mayor's Meeting
DART Update

April 22, 1994

Attendance

City	Mayor	City Manager
Addison	Rich Beckert, Mayor	Ron Whitehead, City Manager
Carrollton	Milburn Gravely, Mayor	Dan Johnson, City Manager
Cockrell Hill	Tony Hinojosa, Mayor Charles Slayton and Richard Perez, Councilmembers	
Farmers Branch	Calla Davis, Mayor Pro Tem	Richard Escalante, City Manager
Garland	Bob Smith, Mayor	Jeff Muzzy, ACM
Highland Park	Bob Wilbur, Mayor Pro Tem	George Patterson, City Manager
Irving	Morris Parrish, Councilmember	Steve McCullough, City Manager
Plano	James Muns, Mayor	Tom Muehlenbeck, City Manager James McCarley, ACM
Richardson	Gary Slagel, Mayor	Jerry Hiebert, ACM
Rowlett	Mike McCallum, Mayor	Mike Gibson, City Manager
University Park	Barbara Hitzelberger, Mayor	Bob Livingston, City Manager

The meeting began at 10:30 a.m. with Mayor Slagel stating that the purpose was to have a general discussion about the present status and impressions of DART. Mayor Slagel offered a positive review of the meeting that had occurred between Roger Snoble and the Richardson Council. He suggested that the meeting should focus on the upcoming DART Service Plan revisions, the status of transportation planning throughout the region and a review of how DART could best play a role in the near term. Overall, the discussion was very positive regarding DART's performance over the past 12 months. The following is an account of those discussions and a summary of the actions from the meeting.

General Feedback

Mayor Muns indicated that with the revised Service Plan in the works, DART needs to make something happen in the next two years or it would be difficult to forestall a pull-out election in Plano. He also stated that Plano had asked DART for information about

pulling out of DART. They had been told that it would cost Plano $51 million. Plano questions the validity of those numbers, but in any event it would take 2 years for Plano to withdraw. James McCarley indicated that DART should consider extending funding of the LAP program. Tom Muehlenbeck indicated that it may be wise for suburbs to have a "back-up plan" for providing transportation services should there be a rash of withdrawal elections in 1996.

Dan Johnson indicated that at the recent DRMC meeting Snoble was asked about the New Vision Plan and commuter rail issues. Snoble's responses did not seem to indicate that they are looking at a financially constrained plan, as does the New Vision Plan. It is hard to determine whether financial problems are the fault of DART, Dallas or both. He indicated that the new Board seemed to be doing a better job.

Richard Escalante indicated that they had a good meeting with Snoble, but that he doesn't seem to be a proponent for low cost rail extension, such as the single track method. Farmers Branch feels that immediate service of some type is very important.

Councilmember Morris Parrish indicated that Irving is moderately pleased with progress on their commuter rail, although service will take 18 months to begin after the agreements are signed, and they are not yet signed.

Mayor Smith indicated that Garland had a positive meeting with Roger Snoble, but that Snoble indicated that Dallas is "ready to go it alone" if suburbs withdraw from DART.

A brief discussion of DART's fare box recovery proposals followed. It was the general consensus that this is an operational issue and should be resolved by DART management and board and not suburban action.

There was also a discussion about the new Board configuration and the appointment process of representatives by cities who shared representatives. The consensus was that the present process is working well, so long as a regional perspective is maintained.

There was the feeling that the DART LAP funds have done a great deal of good for the region and should be better publicized by DART.

Mobility 2010 Plan

Mayor Slagel reviewed in some detail the NCTCOG 2010 Mobility Plan, and its provisions for rail, HOV and highway extensions. The consensus of the group was that any revised DART Service Plan should closely resemble the NCTCOG Plan. There was positive discussion regarding the potential of the Cotton Belt both providing service to the airports as well as linking the major employment centers. Both Mayors Muns and Slagel stated that their cities look favorably on stopping the Central light rail line at LBJ in favor of using the available dollars to develop that commuter rail corridor.

Bus Service

A poll was taken regarding the impact and importance of current bus service. It was felt that DART bus service is an important element in addressing our current and future air quality issues. All felt that bus service is important to both their residential citizens and corporate citizens as an effective method of importing and exporting workers. All cities

have developed a dependence on the express service. In most cases, the use of the bus system for internal service was felt to be marginal. The consensus of the group was that DART should do a better job of matching equipment and routes with actual need. It was felt that the public still takes issue with DART's bus service primarily due to the 50 passenger busses carrying 4 or 5 riders

Conclusions and Actions

In conclusion, the members agreed that the following issues were of utmost importance and should be addressed;

- Mayors should have the opportunity to review the DART staff concepts for the revised System Plan before it is presented to and approved by the DART Board. Once made public, it will be more difficult to make changes than if there is input to a Draft Plan. Mayor Slagel will pursue setting such a meeting.
- All cities will communicate to their DART representatives their desires to have the revised DART service plan conform to the 2010 COG plan. Mayor Slagel had COG deliver information about the 2010 COG Mobility Plan to each of the Mayors for their discussions. Each city will pursue this separately.
- All cities will communicate to their DART representatives the need to provide visible service progress by 1996, an issue which is crucial to DART's continued viability. Suburban cities will also make it very clear that they are willing to trade high cost services at some distant time in the future for lower cost solutions in the next couple of years. Each city will pursue this separately.
- A request would be made to DART for a review of their financial staff's projections for Dallas supporting DART without funding from the suburbs. Mayor Slagel will make the request.
- A request would be made to DART to review their analysis of the legal and financial implications to each member city in the event of a 1996 withdrawal. Mayor Slagel will make the request.
- A "what if" review would be conducted to determine how bus service could be provided to any suburb that may be faced with a 1996 withdrawal. City Manager Muehlenbeck will lead the review effort.

The meeting adjourned at Noon.

jnh
5/6/94
n:mmyrdart

DART
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

September 8, 1994

Honorable Rich Beckert
Mayor
Town of Addison
P.O. Box 144
Addison, TX 75001

FAX #960-7684

Dear Mayor Beckert:

On Tuesday, September 6, 1994, we faxed a copy of a staff analysis on the financial impact on a member city that elects to withdraw from DART. The Board discussed this analysis on Tuesday and intends to continue discussions on September 13, 1994. We will forward a final copy of this analysis to you after the Board completes it's review.

Sincerely,

Kathy Ingle

Kathy Ingle
Chair

KI:stg

c: Ron Whitehead, City Manager
Board of Directors
Roger Snoble

FAX Transmission

From: Kathy Ingle DART
Questions? Call 749-3347
Fax 749-3651 , 214/960-7684

To: Mayor Rich Beckert/City Manager, Ron Whitehead
Company: Town of Addison ,
Address:
Date: September 6, 1994
Time: 1:59 PM Pages: 19 (including this one)

Message:

Attached is a copy of a paper prepared by DART staff in response to your request regarding the withdrawal of member cities from DART. Due to the importance of this subject to the member cities and since it is being discussed by the Board today, we felt it was important to fax you a copy of the preliminary draft today.

Since this is being reviewed by the Board, there could be changes made. We will mail you a final version on Friday after the Board has reviewed the paper.

Kathy Ingle
Chairman

Attachment

DRAFT
Financial Considerations Regarding the Withdrawal of a Member City from DART
September 6, 1994

Introduction and Purpose

The purpose of this report is to:

1. Summarize when and how a member city can elect to withdraw from DART;
2. Estimate the financial impact of a withdrawal decision; and
3. Address how the various debt scenarios in DART's Draft FY 1995 Financial Plan affect a member city's financial obligation if they choose to withdraw.

Please note that the projected amounts and financial liabilities described in this memorandum are to facilitate discussion of withdrawal issues and not meant to commit the Agency to any predetermined position or calculation methodology. The calculation of a member city's obligation per DART's enabling legislation is subject to Board policy decisions and legal considerations.

Withdrawal Options for Member Cities per 1118y

The withdrawal of a member city is addressed in DART's enabling legislation; specifically in Section 9A, Article 1118y, Vernon's Annotated Texas Civil Statutes, as amended. (See Attachment #1)

Initiation of Withdrawal - There are two methods to initiate a withdrawal election from DART. First, the governing body of the unit of election (i.e. city council) may call an election for withdrawal. Second, any qualified voter of a member city may request an official petition for withdrawal from the city secretary. The petition must be signed by not less than 8% of the registered voters in that unit of election and returned to the city secretary within 60 days. If the petition is judged to be valid, the city shall have an election for withdrawal.

Timing of Elections - A withdrawal election can only occur during the calendar year of 1996 or every six years thereafter (2002, 2008, 2014, etc.). If called, the election is to be held on the first uniform election date following the expiration of 45 days after the election is called. If the election is called, the proposition stated in the ballot shall read: "Shall the Dallas Area Rapid Transit be continued in _____ (the name of city)." The election shall be held at the regular precincts and voting places in accordance to the Texas Election Code. If the majority of the qualified voters in the city vote in favor of the proposition, DART will continue in that city. **If the proposition fails, then as of the midnight that the election returns are canvassed, all public transportation services provided by DART would terminate and the financial obligations of the authority attributable to that city would cease to accrue.**

Financial Impact on a Withdrawing City

The withdrawal of a unit of election under DART's legislation is subject to the requirements of the United States and Texas constitutions prohibiting the impairment of contracts. Therefore, DART's statute requires continued collection of sales taxes in a "unit of election" (i.e. member city) until the "financial obligation" of that member city is reduced to zero. The statute defines the computation to calculate a member city's financial obligation. Each member city is responsible for its share of DART's general financial obligation, plus that city's specific financial obligation, less that city's share of DART's unencumbered assets. A DART staff estimate of each city's projected liability is included in Attachment 2.

DART's general obligation is allocated to member cities based on the ratio of population of that member city to the total population of the DART Service Area. A summary of each city's population percentage is included in Attachment 3. The general obligation is composed of the following elements.

(a) "The current obligations of the authority authorized in the current budget and contracted for by the authority;"

(b) "The amount of contractual obligations outstanding at that time for capital or other expenditures in the current or subsequent years, the payment of which has not been made or provided for from the proceeds of notes, bonds, or other obligations;"

(c) "All amounts due and to become due in the current and subsequent years on all notes, bonds, or other securities or obligations for debt issued by the authority and outstanding;"

(d) "The amount required by the authority to be reserved for all years to comply with financial covenants made with lenders, bond or note holders, or other creditors or contractors;" and

(e) "Any additional amount, which may include an amount for contingent liabilities, determined by the executive committee to be the amount necessary for the full and timely payment of the current and continuing obligations of the authority, to avoid a default or impairment of those obligations."

A member city's specific obligation is defined as "any additional amount determined by the executive committee [i.e. Board] to be necessary and appropriate to allocate to the member city because of current and continuing obligations of the authority that relate specifically to that member city" plus "the amount of cost incurred by the authority for any capital improvements transferred to the city, if any."

The "unencumbered assets of the authority consist of cash, cash deposits, certificates of deposit, and bonds, stocks, and other negotiable securities," that are not pledged for repayment of existing contractual or debt obligations. These assets are prorated to each member city based on the

average of that city's population percentage and percentage of total sales taxes collected by DART. Please refer to Attachment 3 for a summary of sales tax percentages for each member city.

General Obligation and Unencumbered Assets

The following chart summarizes DART's estimated general liability and unencumbered assets as of March 31, 1994 and September 30, 1996. **The following DART staff estimates are based on current information. The actual general obligations and unencumbered assets in 1996 will vary depending on actual contract commitments, debt outstanding, and contingent liabilities at the time of a withdrawal election. In addition, the DART Board will have to make several policy decisions in order to finalize the obligation calculation in the event that a city elects to withdraw from DART.**

Estimated General Obligation and Unencumbered Assets (Note 1) (In Millions)	3/31/94	9/30/96
Total General Obligation		
(a) Budgeted and contracted	$75.4	$90.9
(b) Capital and other contractual obligations	447.8	188.2
(c) Debt outstanding	20.5	275.0
(d) Debt reserves	0.0	0.0
(e) Contingent and other liabilities	107.2	107.7
Total General Obligation	**$650.9**	**$661.8**
Total Unencumbered Assets	**$248.2**	**$133.0**

Note 1 - The above DART staff estimates are based on current information. The actual general obligations and unencumbered assets in 1996 will vary depending on actual contract commitments, debt outstanding, and contingent liabilities at the time of a withdrawal election. In addition, the DART Board will have to make several policy decisions in order to finalize the obligation calculation in the event that a city elects to withdraw from DART. (9/6/94).

The March 31, 1994 amounts for lines (a) and (b) are estimated contract commitments. We did not perform a detailed compilation of all existing contractual liabilities; however, the majority of line (b) is related to known commitments for light rail, commuter rail, and bus projects, and multi-year contracts for suburban bus and paratransit operations. Line (b) has been reduced by the amount of Federal participation in these contracts (e.g. $160 million on the LRT segment). The $20.5 million of debt outstanding on line (c) relates to the corporate headquarters note. Line (e) is based on actual general ledger liabilities at March 31, 1994, plus the unfunded pension liability of $18.1 million. Total unencumbered assets are based on cash, cash reserves, and investments per the general ledger at March 31, 1994.

The September 30, 1996 amounts are based on projected assets, liabilities, and contractual commitments in the Draft FY 1995 Financial Plan. We have assumed the "Series of Five Year Notes" option which projects $275 million of debt. Under this option, DART would repay the corporate headquarters note ($20.5 million) and unfunded pension liability ($18.1 million).

The major difference in general obligation amounts between today and 1996 is the transfer of funds from contractual obligations (line b) to debt (line c) and the reduction in unencumbered assets. DART intends to use cash on hand and issue debt to pay for existing contract commitments.

Specific Obligations

DART's enabling legislation requires obligations specific to a member city to be allocated 100% to that city. An example of a specific obligation would be the repayment of Federal funds for a transit center that was no longer going to be used for transit purposes because of the withdrawal of a member city. This concept may also apply to repayment of Federal funds for buses, fixed guideway, and equipment that were no longer necessary due to the withdrawal of one or more member cities. For the purposes of this report, we only address specific obligations for the repayment of Federal funds on capital facilities (i.e. transit centers) located in the respective cities. Attachment 4 highlights all capital facility costs and associated Federal funds by member city. Dallas has been excluded from this computation since it is unrealistic to assume that the central city would withdraw from the Agency.

If a member city elects to withdraw from DART, it has two options with respect to the capital facilities located within the city limits.

> **Option 1** - A withdrawing city has 30 days to claim a transit center, or any other real estate (excluding right-of-way) or capital improvement located within the city. If the facility was built with Federal funds and the city intends to use the facility for mass transit, then the grant must be transferred to the withdrawing city. If the city does not intend to use the facility for mass transit purposes, then the grant must be repaid. In both cases, the city must reimburse DART for its share of the capital cost of the facility. Notwithstanding the above, DART may make a statutory finding that it has a continuing need for the facility. In this case, DART has the right to use the facility for 15 years or the remaining amortization period of the Federal grant, whichever is longer. Under this option, DART would have the obligation to pay all operating and maintenance costs of the facility. If DART continues to use the facility for mass transit purposes, the Federal grants would not have to be repaid.
>
> **Option 2** - If the withdrawing city does not want the facility, then it remains with DART, regardless of whether DART has a continuing need for the facility. If DART has a continuing need for the facility, the Federal grant would not have to be repaid. If DART does not have a continuing need for the facility, then the grant

would have to be repaid. In this case, the member city would be liable for the unamortized portion of the outstanding Federal grants relating to the transit center.

For purposes of calculating specific obligations included in Attachment 2, we have assumed Option 2: (i.e. member cities do not elect to take title to the facility and that DART does not exercise its option to continue to use the facility for mass transit purposes). Under this option, the member city would only be responsible for repaying the unamortized portion of the outstanding Federal grant.

Repayment Assumptions

Attachment 2 summarizes the estimated length of time that sales taxes would need to be collected in a member city to repay that city's net obligation. This required us to make assumptions and project sales tax collections for each member city. This is difficult to predict accurately because of the reduction in the sales tax base beginning January 1, 1995. We cannot be sure what the impact of this change will be on a state-wide or regional basis, let alone on an individual city basis. DART's FY 1995 Budget assumes a 7% reduction on a regional basis. For purposes of the payback period included in Attachment 2, we have assumed that each member city will continue to contribute the same percentage of DART's total sales tax collections as they contributed in FY 1993 and FY 1994. A summary of historical and projected sales tax collections by city are included in Attachment 5. Readers of this report should be aware of this limitation and may want to adjust the estimated payback period for their own sales tax projections.

Impact of Debt on a Withdrawing City

The Draft FY 1995 Financial Plan includes three different financing options. **Under all three scenarios, short-term debt issued in 1995 and 1996 are necessary to complete the Starter System and repay existing contract commitments.** DART staff has recommended a commercial paper program to provide flexibility to borrow funds only when needed for capital expenditures. In addition, commercial paper does not require DART to maintain additional debt reserves that would add to the general obligation computation shown above (line d). The following chart summarizes projected debt outstanding at September 30, 1996 under each option. Please refer to the Draft FY 1995 Financial Plan for more detail on these debt options.

Debt Option	Amount O/S at 9/30/96 (in millions)
Debt Limited to Five Years	$229.1
Series of Five Year Notes	275.0
Long Term Bonds	280.0

Debt outstanding under the Debt Limited to Five Years option is composed of $209 million of short-term notes and the $20.5 million note on the corporate headquarters. Under the Series of Five Year Notes and Long Term Bonds options, the corporate headquarters note and the $18.1

million pension liability are repaid in 1995. If DART chooses the Debt Limited to Five Years option, the general obligation computation above would be reduced by $27.8 million. This equates to a reduction of approximately one-tenth of one year from each member city's payback calculation shown in Attachment 2. If this option is chosen, the trade-off is that the Garland, Richardson, and Plano light rail lines will be delayed approximately 4 years.

It is important to note that under any of the financing options discussed above, the issuance of commercial paper in FY 1995 and FY 1996 does not have a material impact on a member city's financial obligation because that obligation already exists today. This is apparent by comparing lines (b) and (c) on the General Liability chart on page 3. DART currently has over $447 million of outstanding contractual commitments that must be repaid. By the end of FY 1996, this commitment will be reduced to approximately $188 million through the payment of cash on hand and the issuance of debt.

The additional debt issuances after 1996 are currently scheduled after the withdrawal elections and are therefore not anticipated to impact a member city's financial obligation in 1996. These issuances are proposed in the Series of Five Year Notes and Long Term Bonds options to continue build-out of the light rail system to Garland and Richardson by 2001 and Plano by 2002.

Conclusion

The withdrawal of a unit of election under DART's enabling legislation is subject to the requirements of the United States and Texas Constitutions prohibiting the impairment of contracts. Therefore, member cities are responsible for DART's existing contract commitments that exceed $447 million as of March 31, 1994. The issuance of debt in FY 1995 and FY 1996 as projected in the Draft FY 1995 Financial Plan will not significantly impact a member city's financial obligation in FY 1996 because the debt will be issued to pay for existing contract liabilities. Debt issuances after 1996 are projected to be scheduled after the withdrawal elections and are not anticipated to impact a member city's financial obligation in 1996.

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(g) If the votes cast are such that the authority ceases to exist in its entirety, the executive committee shall enter an order so declaring and file a certified copy of the order with the State Highways and Public Transportation Commission and the comptroller of public accounts, and the authority shall be dissolved.

(h) The cost of the confirmation election shall be paid by the creating entity or entities.

(i) If the election results in the confirmation of an authority, the authority shall, within the limits confirmed, be authorized to function in accordance with the terms of this Act, and the executive committee may levy and collect the proposed tax within those limits. In no event shall the tax authorized under this Act be levied in any unit of election which has failed to confirm the authority.

(j) If the continued existence of an authority is not confirmed by election within three years after the effective date of the resolution(s) or order(s) initiating the process to create the authority, the authority ceases to exist on the expiration of the three years.

(k), (l) Repealed by Acts 1985, 69th Leg., ch. 101, s 4, eff. May 13, 1985.

Withdrawals From Authority

Sec. 9A. (a) A unit of election may withdraw from an authority created under this Act only in accordance with this section. An attempt to withdraw from an authority in a manner other than that provided by this section is void.

(b) Subject to other provisions of this section, the governing body of a unit of election may on its own initiative call an election in the unit of election and submit to the voters of the unit of election the proposition prescribed by Subsection (f) of this section. An election ordered under this subsection for a unit of election located in an authority consisting of one subregion governed by a subregional board created under Section 6 of this Act is not held if the governing body rescinds the order and notice of the election before the 45th day before election day. The governing body shall promptly give notice of the rescission in the same manner as the notice of election given under Subsection (e) of this section.

(c) On receipt of a petition under Subsection (g) of this section, the governing body of a unit of election shall examine the petition. If the governing body determines that the petition conforms with the requirements of this section, the governing body, subject to the other provisions of this section, shall call an election in the unit of election and submit to the voters of the unit of election the proposition prescribed by Subsection (f) of this section. The governing body may call and hold public hearings and may conduct or order any investigations the governing body considers appropriate in making the determination under this subsection. The governing body's determination is conclusive

of all issues involved. If the governing body determines that the petition conforms to the requirements of this section, the governing body shall call an election. If the governing body determines that the petition does not conform to the requirements of this section, the governing body shall reject the petition and may not call an election. A petition rejected under this subsection is void and may not be used in connection with any subsequent petitioning process.

(d)(1) An election for withdrawal in a unit of election under this section, whether by governing body initiative or by petition, may not be called more frequently than once during:

(A) the 12-month period immediately following the date of the election creating the authority; or

(B) each 12-month period thereafter.

(2) Notwithstanding Subdivision (1) of this subsection, if the unit of election is located in a subregion governed by a subregional board created under Section 6 of this Act, an election for withdrawal of the unit of election under this section, whether by governing body initiative or by petition, may be held not more frequently than once during:

(A) each calendar year before January 1, 1992;

(B) the calendar year of 1996; or

(C) every sixth calendar year after 1996.

(e) An election called under this section shall be held on the first uniform election date for that type of election under the Election Code following the expiration of 12 calendar months after the date the election is called, except that if the unit of election is located in a subregion governed by a subregional board created under Section 6 of this Act, the election shall be held on the first uniform election date for that type of election under the Election Code following the expiration of 45 days after the date the election is called. Immediately on calling an election, the governing body of the unit of election shall give notice of the election to the executive committee, the State Department of Highways and Public Transportation, and the comptroller of public accounts.

(f) In an election called under this section, the governing body of the unit of election shall submit the following proposition:

"Shall the (name of authority) be continued in (name of unit of election)?"

The election shall be held in the regular precincts and at the regular voting places of the unit of election in accordance with the Texas Election Code. The governing body of the unit of election shall canvass the returns of the election at the earliest practicable date after the election. If a majority of the qualified voters voting at the election votes in favor of the proposition, the authority shall continue in the unit of election. If a majority of the qualified voters voting at the election votes against the proposition, the authority ceases to exist in

the unit of election at midnight on the date the election returns are canvassed, and the financial obligations of the authority attributable to the unit of election cease to accrue at that time.

(g) A person who is a qualified voter of a unit of election may apply to and obtain from the city or town secretary or other clerk or administrator of the unit of election official numbered and properly authenticated petitions for withdrawal prepared by the city or town official in accordance with this subsection, in an amount requested by the person. Not more than one petition may be outstanding at any one time. The secretary, clerk, or administrator shall authenticate and deliver additional sheets to the person as requested during the period for obtaining signatures. To be valid, a petition must contain the signatures of not less than 20 percent of the registered voters of the unit of election, as listed on the official voter registration lists of the county or counties in which the unit of election is located, except that if the unit of election is located in a subregion governed by a subregional board created under Section 6 of this Act, the petition must contain the signatures of not less than eight percent of the registered voters of the unit of election. The petition must be filed with the secretary, clerk, or administrator of the unit of election on or before the 60th day after the date the person received the first sheets of the petition. The secretary, clerk, or administrator shall examine the petition and file a report to the governing body of the unit of election stating whether, in the opinion of the secretary, clerk, or administrator, the petition conforms to the requirements of this section. On receipt of the report, the governing body shall conduct its examination as required by Subsection (c) of this section. In the event a petition is determined not to conform to the requirements of this section, a sheet of signatures that is a part of the petition containing valid signatures may not be used in connection with any subsequent petitioning process.

(h)(1) Except as provided by Subdivision (2) of this subsection, the petition may consist of multiple sheets, each of which must be authenticated by the secretary, clerk, or administrator. Each sheet shall be headed with a statement in all capital letters regarding the nature of the petition as follows:

"THIS PETITION IS TO REQUIRE AN ELECTION TO BE HELD IN (name of the unit of election) TO DISSOLVE (name of authority) IN (name of the unit of election) SUBJECT TO THE CONTINUED COLLECTION OF SALES TAXES FOR THE PERIOD REQUIRED BY LAW."

An affidavit of the person who circulated each sheet shall be affixed or printed on each sheet in the following form and substance, and the affidavit shall be executed before a notary public:

TX CIV ST Art. 1118y
PAGE 14

"STATE OF TEXAS
COUNTY OF _____

I, _____, affirm that I personally witnessed each signer affix his or her signature, the date of signing, his or her voter registration number, and his or her residence address and zip code to this page of this petition for the dissolution of (name of authority) in the (name of unit of election). I affirm to the best of my knowledge and belief that each signature is the genuine signature of the person whose name is signed and that the date entered next to each signature is the date the signature was affixed to this page.

_____

Sworn to and subscribed before me this the _____ day of ___, 19_____.

(SEAL)

_____
Notary Public, State of Texas"

Each sheet of a petition shall be submitted at the same time and within the period specified in Subsection (g) of this section. Each person signing a petition must sign the petition in person in ink or indelible pencil and must personally enter beside his or her signature his or her current residence address and zip code, his or her correct voter registration number, and the date of signing. Any signature not accompanied correctly by all of the information required by this subsection is void and may not be counted in determining the validity of the petition.

(2) If the unit of election is located in a subregion having a principal city with a population larger than 800,000, the petition may consist of multiple sheets, each of which must be authenticated by the secretary, clerk, or administrator. Each sheet shall be headed with a statement in all capital letters regarding the nature of the petition as follows:

"THIS PETITION IS TO REQUIRE AN ELECTION TO BE HELD IN (name of the unit of election) TO DISSOLVE (name of authority) IN (name of the unit of election) SUBJECT TO THE CONTINUED COLLECTION OF SALES TAXES FOR THE PERIOD REQUIRED BY LAW."

An affidavit of the person who circulated each sheet shall be affixed or printed on each sheet in the following form and substance, and the affidavit shall be executed before a notary public:

"STATE OF TEXAS
COUNTY OF _____

I, _____, affirm that I personally witnessed each signer affix his or her signature to this page of this petition for the dissolution of (name of authority) in the (name of unit of election). I affirm to the best of my knowledge and belief that each signature is the genuine signature of the person whose name is signed and that the date entered next to each signature is the date the signature was affixed to this page. I further affirm that I have verified that the signer is a registered voter and that the registration number on the petition is correct.

_____

Sworn to and subscribed before me this the _____ day of ___, 19_____.

(SEAL)

_____
Notary Public, State of Texas"

Each sheet of a petition shall be submitted at the same time and within the period specified in Subsection (g) of this section. Each person signing a petition must sign the petition in person in ink or indelible pencil and must enter or have entered beside his or her signature his or her current residence address and zip code, his or her correct voter registration number, and the date of signing. Any signature not accompanied correctly by all of the information required by this subsection is void and may not be counted in determining the validity of the petition.

(i) On the effective date of the withdrawal of a unit of election from an authority created under this Act, all public transportation services provided by the authority to the unit of election shall cease. The withdrawal, however, does not affect any existing or future rights of the authority to proceed through the corporate limits of the unit of election to continue uninterrupted service to other units of election that have not withdrawn or that become a part of the authority in the future. In a unit of election that withdraws from an authority consisting of one subregion governed by a subregional board created under Section 6 of this Act, title to all real estate and improvements thereto, except a right-of-way or an improvement to a right-of-way, made by the authority within the boundaries of the unit of election shall vest in the unit of election if the unit of election acts within 30 days of the effective date of the election by resolution to claim said real estate and improvements. In the event that the real estate and improvements are

within 30 days of the effective date of the election determined by the authority to be necessary to the continuation of service to remaining units of election, the authority may retain the use of said real estate and improvements for a period not to exceed 15 years or the duration of the authority's remaining federal grant obligation for the facility, whichever is greater. If the authority retains the use, the authority shall be responsible for all operation and maintenance costs of the facility.

(j)(1) The withdrawal of a unit of election under this section is subject to the requirements of the constitutions of the United States of America and this state prohibiting the impairment of contracts. Except as provided by Subdivision (2) of this subsection, taxes shall continue to be collected in the unit of election until an amount of taxes equal to the total financial obligations of the unit of election to the authority has been collected. To determine the amount of the total financial obligations of the unit of election, the executive committee shall compute, as of the date of withdrawal, the total of: (1) the current obligations of the authority authorized in the current budget and contracted for by the authority; (2) the amount of contractual obligations outstanding at that time for capital or other expenditures in the current or subsequent years, the payment of which has not been made or provided for from the proceeds of notes, bonds, or other obligations; (3) all amounts due and to become due in the current and subsequent years on all notes, bonds, or other securities or obligations for debt issued by the authority and outstanding; (4) the amount required by the authority to be reserved for all years to comply with financial covenants made with lenders, bond or note holders, or other creditors or contractors; (5) any additional amount, which may include an amount for contingent liabilities, determined by the executive committee to be the amount necessary for the full and timely payment of the current and continuing obligations of the authority, to avoid a default or impairment of those obligations; and (6) any additional amount determined by the executive committee to be necessary and appropriate to allocate to the unit of election because of current and continuing financial obligations of the authority that relate specifically to the unit of election. The unit of election's share of the financial obligations of the authority under the first five computations required by this subsection shall be in the same ratio that the population of the unit of election has to the total population of the authority, according to the most recent and available population data of an agency of the federal government, as determined by the executive committee. The unit of election's total financial obligation is the sum of the first five computations required by this subsection plus the amount allocated directly to the unit of election under the last computation required by this subsection. The executive committee shall certify to the governing body of the unit of election and to the comptroller of public accounts the amount of the total financial obligation of the unit of election. The comptroller of

public accounts shall continue to collect taxes in the unit of election until an aggregate amount equal to the total financial obligation of the unit of election has been collected and actually paid to the authority. After that amount has been collected, the comptroller of public accounts shall discontinue collecting in the unit of election the taxes imposed under this Act.

(2) The withdrawal of a unit of election from a regional transportation authority consisting of one subregion governed by a subregional board created under Section 6 of this Act is subject to the requirements of the constitutions of the United States of America and this state prohibiting the impairment of contracts. Taxes shall continue to be collected in the unit of election until an amount of taxes equal to the total financial obligations of the unit of election to the authority has been collected. Except as provided by Subsection (1) of this section, to determine the amount of the total financial obligations of the unit of election, the executive committee shall compute, as of the date of withdrawal, the total of: (1) the current obligations of the authority authorized in the current budget and contracted for by the authority; (2) the amount of contractual obligations outstanding at that time for capital or other expenditures in the current or subsequent years, the payment of which has not been made or provided for from the proceeds of notes, bonds, or other obligations; (3) all amounts due and to become due in the current and subsequent years on all notes, bonds, or other securities or obligations for debt issued by the authority and outstanding; (4) the amount required by the authority to be reserved for all years to comply with financial covenants made with lenders, bond or note holders, or other creditors or contractors; (5) any additional amount, which may include an amount for contingent liabilities, determined by the executive committee to be the amount necessary for the full and timely payment of the current and continuing obligations of the authority, to avoid a default or impairment of those obligations; and (6) any additional amount determined by the executive committee to be necessary and appropriate to allocate to the unit of election because of current and continuing financial obligations of the authority that relate specifically to the unit of election. The unit of election's share of the financial obligations of the authority under the first five computations required by this subsection shall be in the same ratio that the population of the unit of election has to the total population of the authority, according to the most recent and available population data of an agency of the federal government, as determined by the executive committee. The unit of election's total financial obligation is the sum of the first five computations required by this subsection plus the amount allocated directly to the unit of election under the last computation required by this subsection, plus the amount of the cost incurred by the authority for any capital improvements transferred to the unit of election under Subsection (i) of this section and less the unit of election's share, not to exceed the sum of the seven computations

required by this subsection, of the total amount of the unencumbered assets of the authority that consist of cash, cash deposits, certificates of deposit, and bonds, stocks, and other negotiable securities. The unit of election's share of those assets is determined by the executive committee as an amount equal to the authority's total unencumbered assets described by this subdivision, multiplied by the average of the following:

(A) the population of the unit of election divided by the population of all units of election of the authority; and

(B) the total sales tax contributed by the unit of election to the authority divided by the total sales tax contributed to the authority by all units of election of the authority.

(k) The executive committee shall certify to the governing body of the unit of election and to the comptroller of public accounts the amount of the total financial obligation of the unit of election. The comptroller of public accounts shall continue to collect taxes in the unit of election until an aggregate amount equal to the total financial obligation of the unit of election has been collected and actually paid to the authority. After that amount has been collected, the comptroller of public accounts shall discontinue collecting in the unit of election the taxes imposed under this Act.

(l) A unit of election that is located in an authority consisting of one subregion governed by a subregional board created under Section 6 of this Act and that withdraws before January 1, 1992, is not obligated to the authority for any financial obligation remaining after making the computations required by Subsection (j) of this section.

Powers of the Authority

Sec. 10. (a) The authority when created and confirmed shall constitute a public body corporate and politic, exercising public and essential governmental functions, having all the powers necessary or convenient to carry out and effectuate the purposes and provisions of this Act, including but not limited to the following powers granted in this section.

(b) The authority shall have perpetual succession.

(c) The authority may sue and be sued in all courts of competent jurisdiction and may institute and prosecute suits without giving security for costs and may appeal from a judgment or judgments without giving supersedeas or cost bond.

(d) The authority may acquire by grant, purchase, gift, devise, lease, or otherwise and may hold, use, sell, lease, or dispose of real and personal property of every kind and nature whatsoever and licenses, patents, rights, and interests necessary, convenient, or useful for the full exercise of any of its powers pursuant to the provisions of this Act.

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Attachment #2
Projected Financial Obligation of Member Cities (Note 4)
at March 31, 1994 and September 30, 1996

9/6/94

Member City	March 31, 1994					September30, 1996				
	General Obligation	Specific Obligation	Less Assets	Total Obligation	Repayment in Years	General Obligation	Specific Obligation	Less Assets	Total Obligation	Repayment in Years
Addison	$3,316	$0	$(3,832)	$(516)	0.0	$3,372	$2,422	$(2,053)	$3,741	0.5
Buckingham	39	0	(63)	(24)	0.0	39	0	(34)	5	0.3
Carrollton	31,024	1,635	(11,144)	21,515	1.8	31,544	1,499	(5,970)	27,073	2.0
Cockrell Hill	1,414	0	(317)	1,097	14.0	1,438	0	(170)	1,268	13.9
Farmers Branch	9,156	0	(6,472)	2,684	0.3	9,309	220	(3,467)	6,062	0.7
Garland	68,208	8,071	(19,424)	56,855	4.7	69,350	7,694	(10,406)	66,638	4.8
Glenn Heights	1,723	529	(350)	1,902	25.4	1,752	496	(187)	2,061	27.5
Highland Park	3,300	0	(1,231)	2,069	1.9	3,355	0	(659)	2,696	2.1
Irving	58,537	6,669	(22,635)	42,571	1.7	59,517	6,460	(12,126)	53,851	1.9
Plano	48,598	5,771	(18,275)	36,094	1.6	49,412	5,433	(9,790)	45,055	1.8
Richardson	28,257	5,227	(12,202)	21,282	1.7	28,730	5,000	(6,537)	27,193	1.9
Rowlett	8,782	0	(2,099)	6,683	6.1	8,929	0	(1,124)	7,805	6.2
University Park	8,404	0	(2,555)	5,849	3.4	8,545	0	(1,369)	7,176	3.6
Subtotal	$270,758	$27,902	$(100,599)	$198,061	n/a	$275,292	$29,224	$(53,892)	$250,624	n/a
Dallas	380,164	n/a	(147,572)	n/a	n/a	386,530	n/a	(79,059)	n/a	n/a
Total	$650,922	n/a	$(248,171)	n/a	n/a	$661,822	n/a	$(132,951)	n/a	n/a

Note 1 - General obligations are based on total DART general obligations times the population percentage shown in Attachment 3.
Note 2 - Specific obligations are based on information in Attachment 4.
Note 3 - Asset share is based on total unencumbered assets times average of population and sales tax percentage (see Attachment 3).
Note 4 -These projections are DART staff's estimates based on information available today. The actual general obligations and unencumbered assets in 1996 will vary depending on actual contract commitments, debt outstanding, and contingent liabilities at the time of a withdrawal election. In addition, the DART Board of Directors will have to make many policy decisions in order to ascertain a member city's financial obligation, if that city elects to withdraw from DART

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Attachment #3

Percentage of Population and Sales Taxes By Member City

Member City	Population Percent (1)	Sales Tax Percent (2)	Average (3)
Addison	0.51%	2.58%	1.55%
Buckingham	0.01%	0.04%	0.03%
Carrollton	4.77%	4.21%	4.49%
Cockrell Hill	0.22%	0.04%	0.13%
Dallas	58.40%	60.52%	59.46%
Farmers Branch	1.40%	3.81%	2.61%
Garland	10.48%	5.18%	7.83%
Glenn Heights	0.26%	0.02%	0.14%
Highland Park	0.51%	0.49%	0.50%
Irving	8.99%	9.25%	9.12%
Plano	7.47%	7.26%	7.37%
Richardson	4.34%	5.49%	4.92%
Rowlett	1.35%	0.34%	0.85%
University Park	1.29%	0.77%	1.03%
Total	100.00%	100.00%	100.00%

Note 1 Population percentages based on 1990 Census Data. DART's general liability is distributed to member cities based on population.

Note 2 Sales tax percentages are based on actual member city collections from 1984 through 1994 as reported to DART by the State Comptrollers Office.

Note 3 DART's unencumbered assets are allocated to member cities based on the average of population and sales taxes.

Attachment 4
Summary of Specific Obligations
(000's)

City/Asset	3/31/94 Cost	3/31/94 Federal Funds	9/30/96 Cost	9/30/96 Federal Funds
Addison				
Addison Transit Center	$0	$0	$6,078	$2,422
Addison Total	**$0**	**$0**	**$6,078**	**$2,422**
Carrollton				
Carrollton Transit Center	6,563	1,635	6,563	1,499
Carrollton Total	**$6,563**	**$1,635**	**$6,563**	**$1,499**
Farmers Branch				
Farmers Branch Park & Ride	0	0	500	220
Farmers Branch Total	**$0**	**$0**	**$500**	**$220**
Garland				
Central Garland Transit Center	3,553	1,696	3,553	1,555
South Garland Transit Center	6,145	4,105	6,145	3,970
Lake Ray Hubbard Trans. Ctr. (WIP)	3,577	2,270	3,577	2,169
Garland Total	**$13,275**	**$8,071**	**$13,275**	**$7,694**
Glenn Heights				
Glenn Heights Transit Center	1,468	529	1,468	496
Glenn Heights Total	**$1,468**	**$529**	**$1,468**	**$496**
Irving				
North Irving Transit Center	8,066	5,646	8,066	5,522
South Irving Transit Center	2,674	1,023	2,674	938
Irving Total	**$10,740**	**$6,669**	**$10,740**	**$6,460**
Plano				
Plano Transit Center	7,221	1,883	7,221	1,726
East Plano Transit Center	7,281	3,888	7,281	3,707
Plano Total	**$14,502**	**$5,771**	**$14,502**	**$5,433**
Richardson				
Richardson Transit Center	8,725	5,227	8,725	5,000
Richardson Total	**$8,725**	**$5,227**	**$8,725**	**$5,000**

Note: There are no captial costs for Buckingham, Cockrell Hill, Highland Park, Rowlett, or University Park.

Dallas Area Rapid Transit
Sales Tax Collections & Forecasts (in 000's)

Tentative and Preliminary
For Discussion Purposes Only

Attachment 5

DART SALES TAX COLLECTIONS BY CITY (January 1984 thru March 1994)

FISCAL YEAR	DART TOTAL	ADDISON	BUCKINGHAM	CARROLLTON	COCKRELL HILL	COPPELL	DALLAS	FARMERS BRANCH	FLOWER MOUND	GARLAND	GLENN HEIGHTS	HIGHLAND PARK	IRVING	PLANO	RICHARDSON	ROWLETT	UNIVERSITY PARK
1984	$93,889	$2,146	$0	$3,241	$46	$157	$61,243	$3,526	$94	$5,587	$14	$454	$6,720	$4,632	$4,956	$273	$801
1985	$154,028	$3,640	$0	$5,290	$71	$251	$101,033	$5,066	$179	$7,832	$19	$656	$11,902	$8,117	$8,284	$511	$1,178
1986	$158,623	$3,385	$0	$5,630	$77	$333	$98,854	$9,378	$212	$8,218	$26	$833	$12,567	$9,074	$8,250	$535	$1,052
1987	$148,875	$3,261	$1	$5,632	$71	$283	$93,401	$5,626	$209	$7,853	$24	$655	$13,083	$9,501	$7,506	$478	$1,091
1988	$165,941	$4,018	$3	$6,493	$77	$358	$102,280	$6,265	$246	$8,985	$27	$871	$14,299	$11,361	$8,704	$547	$1,409
1989	$182,288	$5,133	$19	$7,434	$81	$462	$110,496	$6,974	$207	$9,599	$30	$931	$16,678	$12,225	$9,950	$562	$1,507
1990	$194,131	$5,278	$127	$8,258	$86	$0	$117,192	$7,246	$0	$9,663	$35	$948	$18,746	$13,681	$10,514	$611	$1,546
1991	$199,494	$5,304	$222	$8,528	$63	$0	$116,696	$7,018	$0	$10,119	$40	$933	$19,995	$16,171	$11,947	$667	$1,591
1992	$201,686	$5,382	$179	$9,254	$52	$0	$116,677	$7,175	$0	$10,239	$40	$943	$20,286	$16,753	$12,312	$701	$1,493
1993	$218,477	$6,365	$177	$11,056	$52	$0	$124,679	$7,301	$0	$10,901	$41	$1,111	$22,085	$20,047	$12,042	$867	$1,574
1994*	$118,553	$3,354	$91	$6,041	$27	$0	$66,259	$4,243	$0	$5,665	$21	$552	$13,180	$11,544	$6,213	$524	$838
TOTAL	$1,835,986	$47,265	$819	$77,256	$703	$1,843	$1,109,411	$69,819	$1,148	$94,659	$317	$8,689	$169,520	$133,106	$100,677	$6,275	$14,078

*Figures are through March 1994 only.
This report was prepared by Treasury 5-16-94.

SALES TAX COLLECTIONS - HISTORIC & FY93/FY94 COMBINED

	FY83-3/94 Total	Historic %	93/94 Total	93/94 %
Addison	$47,265	2.579%	$12,900	2.870%
Buckingham	619	0.045%	$355	0.079%
Carrollton	77,256	4.215%	$22,827	5.079%
Cockrell Hill	703	0.038%	$105	0.023%
Dallas	1,109,411	60.524%	$253,984	56.507%
Farmers Branch	69,619	3.809%	$15,589	3.464%
Garland	94,659	5.175%	$21,840	4.881%
Glenn Heights	317	0.017%	$82	0.018%
Highland Park	8,689	0.485%	$2,187	0.487%
Irving	169,520	9.248%	$47,746	10.623%
Plano	133,106	7.262%	$42,540	9.464%
Richardson	100,677	5.492%	$24,149	5.373%
Rowlett	6,275	0.342%	$1,887	0.420%
University Park	14,078	0.768%	$3,207	0.713%
	$1,832,995	100.000%	$449,477	100.000%
Coppell	$1,843			
Flower Mound	$1,148			
TOTA	$1,835,986			

Tentative and Preliminary
For Discussion Purposes Only

SALES TAX REVENUE (forecast using FY93/94 %'s)

FY	SALES TAX FORECAST	2.870% ADDISON	0.079% BUCKINGHAM	5.079% CARROLLTON	0.023% COCKRELL HILL	56.507% DALLAS	3.464% FARMERS BRANCH	4.881% GARLAND	0.018% GLENN HEIGHTS	0.487% HIGHLAND PARK	10.623% IRVING	9.464% PLANO	5.373% RICHARDSON	0.420% ROWLETT	0.713% UNIVERSITY PARK
1994	$231,000	$6,535	$178	$11,771	$53	$129,105	$8,268	$11,039	$41	$1,076	$25,681	$22,493	$12,106	$1,020	$1,633
1995	231,000	$6,630	$182	$11,732	$54	$130,530	$8,001	$11,275	$42	$1,124	$24,538	$21,863	$12,411	$970	$1,648
1996	237,500	$6,816	$187	$12,062	$55	$134,203	$8,226	$11,593	$43	$1,156	$25,229	$22,478	$12,760	$997	$1,694
1997	252,800	$7,255	$199	$12,839	$59	$142,849	$8,758	$12,340	$46	$1,230	$26,854	$23,926	$13,582	$1,061	$1,804
1998	269,500	$7,735	$213	$13,687	$63	$152,285	$9,335	$13,155	$49	$1,312	$28,628	$25,506	$14,479	$1,131	$1,923
1999	287,400	$8,248	$227	$14,596	$67	$162,400	$9,955	$14,026	$52	$1,399	$30,529	$27,201	$15,441	$1,207	$2,050
2000	306,400	$8,794	$242	$15,561	$72	$173,136	$10,613	$14,958	$56	$1,491	$32,548	$28,999	$16,462	$1,286	$2,186
2001	326,500	$9,371	$258	$16,582	$76	$184,494	$11,309	$15,937	$59	$1,589	$34,683	$30,901	$17,542	$1,371	$2,329
2002	347,900	$9,985	$274	$17,668	$81	$196,587	$12,050	$16,982	$63	$1,693	$36,956	$32,926	$18,691	$1,460	$2,482
2003	370,500	$10,633	$292	$18,816	$87	$209,357	$12,833	$18,085	$67	$1,803	$39,357	$35,065	$19,908	$1,555	$2,643
2004	394,500	$11,322	$311	$20,035	$92	$222,919	$13,664	$19,256	$72	$1,920	$41,906	$37,337	$21,195	$1,656	$2,815
2005	419,700	$12,045	$331	$21,315	$98	$237,158	$14,537	$20,486	$76	$2,043	$44,583	$39,722	$22,549	$1,762	$2,994
2006	446,400	$12,812	$352	$22,671	$104	$252,246	$15,462	$21,789	$81	$2,172	$47,419	$42,249	$23,983	$1,874	$3,185
2007	474,500	$13,618	$374	$24,098	$111	$268,124	$16,435	$23,161	$86	$2,309	$50,404	$44,908	$25,493	$1,992	$3,385
2008	504,100	$14,468	$398	$25,601	$118	$284,850	$17,461	$24,606	$92	$2,453	$53,548	$47,710	$27,083	$2,116	$3,597
2009	535,300	$15,363	$422	$27,186	$125	$302,480	$18,541	$26,129	$97	$2,605	$56,863	$50,683	$28,760	$2,247	$3,819
	$5,635,000	$161,629	$4,441	$286,217	$1,315	$3,182,725	$195,447	$274,617	$1,025	$27,375	$599,725	$533,947	$302,442	$23,706	$40,169

Corridor Planning Study

NORTH CENTRAL CORRIDOR

NORTH OF PARK LANE

Evaluation of Alternatives
April • 1994

U.S. Department of Transportation
Federal Transit Administration
Dallas Area Rapid Transit

This Corridor Planning Study
is a cooperative effort of the

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION

and

DALLAS AREA RAPID TRANSIT

assisted by

BARTON-ASCHMAN ASSOCIATES, INC.

in association with

ICF Kaiser Engineers, Inc.
Carter and Burgess, Inc.
GSW and Associates, Inc..
Sasaki Associates, Inc.
John S. Chase, FAIA, Architects, Inc.
Urban Analytics
LKC Consulting
Dikita Engineering
Cynthia A. Weatherby Consulting
Metrocount
North Central Texas Council of Governments

CORRIDOR PLANNING STUDY

NORTH CENTRAL CORRIDOR
North of Park Lane

EVALUATION OF ALTERNATIVES REPORT

UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION

DALLAS AREA RAPID TRANSIT

April, 1994

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EXECUTIVE SUMMARY

1.1 Project Background

Organized in 1983, Dallas Area Rapid Transit (DART) consists of 14 member cities in Dallas, Denton, and Collin Counties, forming a 700 square mile service area. In June 1989, the DART Board of Directors adopted a Transit System Plan with 66 miles of light rail transit (LRT), 37 miles of high-occupancy-vehicle (HOV) facilities and 18 miles of commuter rail. Construction has begun on DART's first 20 miles of the LRT "Starter System." DART's LRT Starter System is divided into three "lines" with a Central Business District (CBD) transitway mall (Figure S-1).

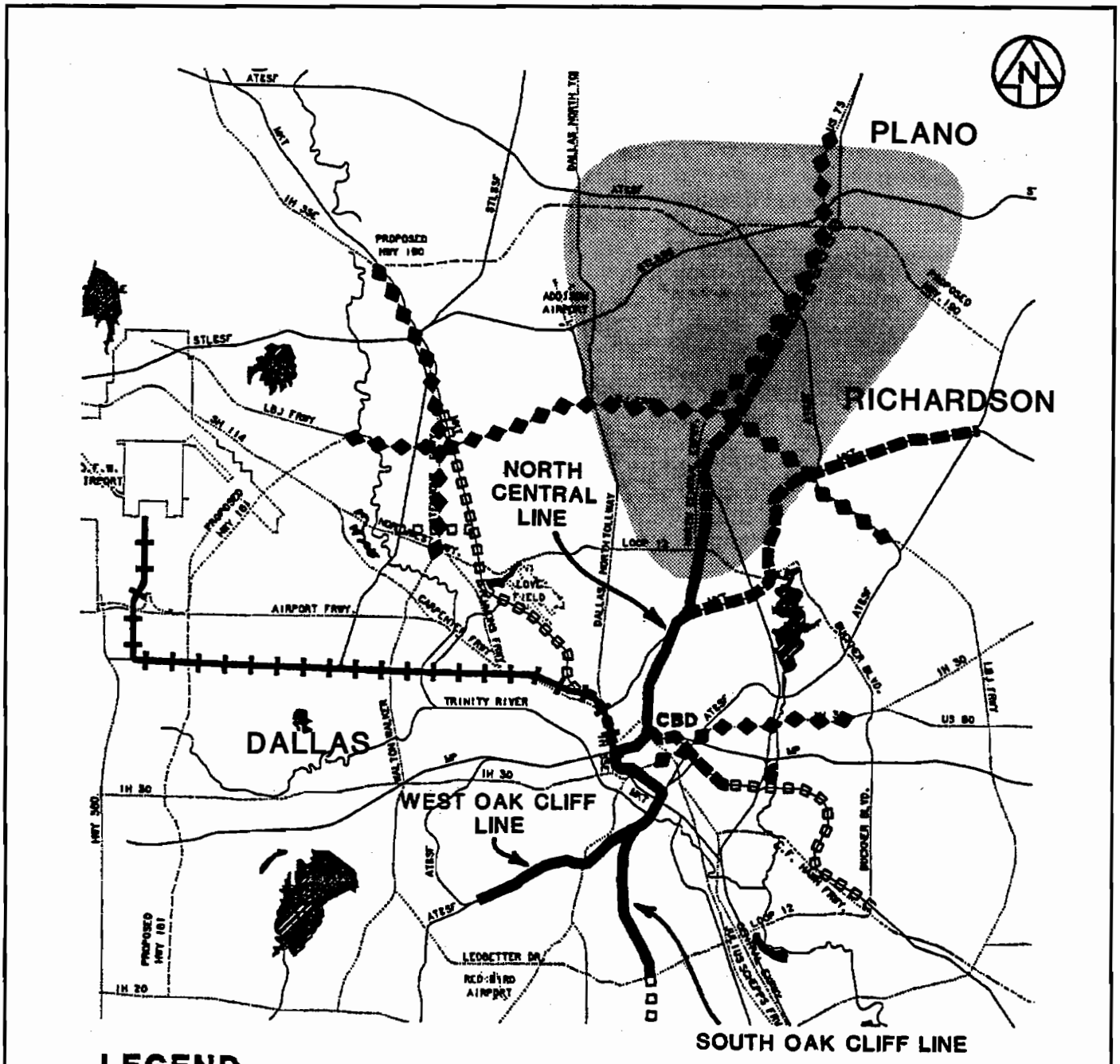
- The **South Oak Cliff Line** will connect Ledbetter Road to the CBD.
- The **West Oak Cliff Line** will be constructed from Westmoreland Road to just south of the Trinity River bridge near Corinth Street where it will join the South Oak Cliff Line and enter the CBD.
- The **North Central Line** will connect Park Lane in the northeast to the CBD.
- In the **Dallas CBD**, LRT service from/to these three lines will operate on a transitway mall to be constructed along Bryan Street and Pacific Avenue.

The Fixed Guideway Implementation Schedule, also adopted by the Board as part of the Transit System Plan, calls for DART's LRT Starter System to be completed in 1996.

Beyond development and adoption of the Transit System Plan and implementation of the LRT Starter System, DART has set additional priorities for development of the plan's elements. The resolution adopting the Transit System Plan calls for the concurrent implementation of LRT service in the North Central Corridor, north of Park Lane and the Northeast (Garland) Corridor by the year 2001. The DART Board of Directors adopted a subsequent resolution March 24, 1992, selecting the North Central Corridor, north of Park Lane, as the priority corridor for extending the LRT Starter System. DART intends to seek a capital grant from the Federal Transit Administration (FTA) to assist in funding an extension of the LRT Starter System. Studies of needed improvements to support the funding grant application and meet requirements of the National Environmental Policy Act (NEPA) are being prepared for the North Central Corridor, north of Park Lane, and the Northeast Corridor.

Alternative transportation improvements for the North Central Corridor, north of Park Lane (referred to hereinafter as the "Study

TRANSIT SYSTEM PLAN



SOURCE: Scoping Information, October, 1992.

Figure S-1

Corridor") are the subject of this report. The Study Corridor is a loosely defined geographic area that represents the travelshed for most trips that would use the alternative transportation improvements being considered (refer to Figure S-1). The North Central Line of DART's LRT Starter System, when completed in 1996, will extend to an interim terminal station at Park Lane. Continuing planning and engineering studies are focused on the Study Corridor, which extends north from Park Lane and includes portions of three cities: Dallas, Richardson, and Plano.

In the Fall of 1992, the DART Board, in cooperation with the Metropolitan Planning Organization (MPO) and FTA, initiated a study officially designated as the "North Central Corridor, north of Park Lane, Alternatives Analysis/Draft Environmental Impact Statement (AA/DEIS)." The purpose of DART's the AA/DEIS study was to provide a basis for selecting the most appropriate transit improvement for the Study Corridor. Subsequent to initiation of the AA/DEIS study, the U.S. Congress passed and the President signed into law the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA).[1] This Federal legislation caused FTA, in cooperation with the Federal Highway Administration (FHWA), to change the manner in which the project development process unfolds.

In response to the passage of ISTEA, FTA and FHWA recently promulgated Joint Planning Regulations "governing the development of statewide plans and programs."[2] Implementation of these regulations is intended to "ensure the adequacy of statewide and metropolitan (emphasis added) transportation planning and programming and the eligibility of metropolitan areas and State for Federal highway and transit funds."[3] The new regulations have changed FTA's project development process for major transportation investment projects, especially transit projects being developed under the sponsorship of FTA. The new regulations establish a framework for performing "major investment (corridor or subarea) studies, [which] shall be undertaken to develop or refine the [local transportation] plan and lead to decisions by the MPO, in cooperation with participating agencies, on the design concept and scope of the investment."[4]

The work activities relating to the AA/DEIS study, which narrowly focused on transit solutions, have been revised in response to

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1 Public Law 102-240, 105 Statute 1914.

2 "Statewide Planning; Metropolitan Planning," Final Rules, 23 CFR Part 450, Federal Highway Administration (FHWA) and 49 CFR Part 613, Federal Transit Administration (FTA), Federal Register, Vol. 58, No. 207, Thursday, October 28, 1993, p. 58040.

3 Ibid.

4 Ibid.

changes in Federal policy regarding the planning and programming of major transportation investment projects. The new "Corridor Planning Study" focuses on evaluating multimodal transportation solutions for the Study Corridor. The reorientation of the study focus means temporarily suspending preparation of the AA/DEIS document in favor of a more direct, but less detailed "Evaluation of Alternatives Report," which identifies key trade-offs among potential modal solutions. Draft and Final EIS documents will be prepared subsequent to this activity, during Preliminary Engineering (PE) of the LPA.

This Evaluation of Alternatives Report is intended to assist community decision-makers in the selection of a "Locally Preferred Alternative" (LPA) for the Study Corridor. It is intended to (1) provide adequate understanding of the purpose for a major investment in transportation improvements in the Study Corridor and (2) establish the need for proposed improvements. This report contains descriptions or definitions of the alternatives being considered and provides a comparison of the trade-offs among alternatives, focusing on similarities, differences, and affected interests.

The selection of the LPA will include definition of the design concept and scope of the proposed investment. The LPA will be advanced to Preliminary Engineering for more detailed definition, examination, and analysis. Physical, operating, environmental, and cost aspects of the LPA will be examined in detail during the Preliminary Engineering phase. Detailed environmental studies, including the identification of mitigation measures, will be fully documented as Preliminary Engineering and preparation of the DEIS and Final EIS proceeds. All aspects of the transportation infrastructure in the Study Corridor will be reviewed.

1.2 Purpose And Need

The Study Corridor currently is served by two major freeways, an extensive grid system of streets and arterials, and a bus system that operates daily in mixed traffic on city streets. Despite the existing transportation infrastructure and planned improvements (particularly, widening US 75 and the addition of HOV lanes on US 75 and IH 635), significant traffic congestion is anticipated to occur in the Study Corridor between now and the year 2010. Major increases in traffic are projected between now and 2010 along US 75, the major north-south freeway in this radial travel corridor. The expected traffic increase reflects projected growth in residential, commercial, and industrial development throughout the Study Corridor, especially in the cities of Richardson and Plano. In addition, congestion delays are anticipated on many of the arterials. Most arterials are expected to operate at traffic levels of service (LOS) E or F by the year 2010.

The above-described transportation system characteristics and improvement plans form the basis for examination of a number of problems that represent the underlying need for consideration of additional transportation improvements in the Study Corridor. These problems are highlighted below.

- **Peak Hour Congestion Increases Travel Times and Delays on Study Corridor Freeways and Arterial Roads**

  Even with the improvements contained in the TIP, certain sections of freeways and arterials still will experience unacceptable levels of congestion (LOS E or worse).

- **Limitations of Existing DART Bus System Reduce Opportunities to Meet Travel Demands of Existing and Prospective Ridership, Especially Reverse-commute Trips to Employment Centers in Study Corridor**

  Limitations on the existing DART bus system creates an inequity in the distribution of service. Most of the metropolitan area's major employment centers are located either inside or north of the Dallas CBD. Limited accessibility to employment centers in the Study Corridor reduces employment opportunities for workers living in the south portion of the larger North Central Corridor as well as other portions of the DART Service Area.

- **Existing Land Use Development Prevents Most Major Roadway Facilities in Study Corridor from being Widened**

  When the freeway and arterial widening projects identified in the TIP are completed, there will be almost no vacant ROW available for further roadway expansion.

- **Unacceptable Air Quality**

  The level of ozone (O_3), carbon monoxide (CO), nitrous oxides (NO_x), and hydrocarbon (HC) pollutants is expected to be reduced in the Study Corridor through a combination of planned transportation improvements and technological advances in the reduction of vehicle emissions.

The specific transportation problems outlined above indicate the need to effect transportation improvements to (1) meet anticipated demand of the traveling public in the Study Corridor and (2) ameliorate other travel-related problems. Therefore, major transportation investments in the Study Corridor are necessary to:

- Improve Mobility;
- Reduce Traffic Congestion; and
- Increase People-Carrying Capacity.

1.3 Description Of Alternatives

Alternatives being considered for implementation in the Study Corridor include a No-Build Alternative, a Transportation Systems Management (TSM) Alternative, and two LRT alternatives.

1.3.1 No-Build Alternative

The No-Build Alternative includes only those facilities and services in the Study Corridor that either already exist or are included in the 1992 Transportation Improvement Plan (TIP) and committed for construction. Major transit capital improvements programmed for the Study Corridor under the No-Build Alternative are shown in Figure S-2. Programmed improvements include:

- A one way, reversible HOV lane on the North Central Expressway (US 75) from Parker Road to the LBJ Freeway (IH 635);
- Two way, concurrent operation HOV lanes on the LBJ Freeway from Valley View Lane (proposed SH 161) to East R.L. Thornton Freeway (IH 30);
- The North Central Line of DART's 20-mile LRT Starter System to Park Lane.

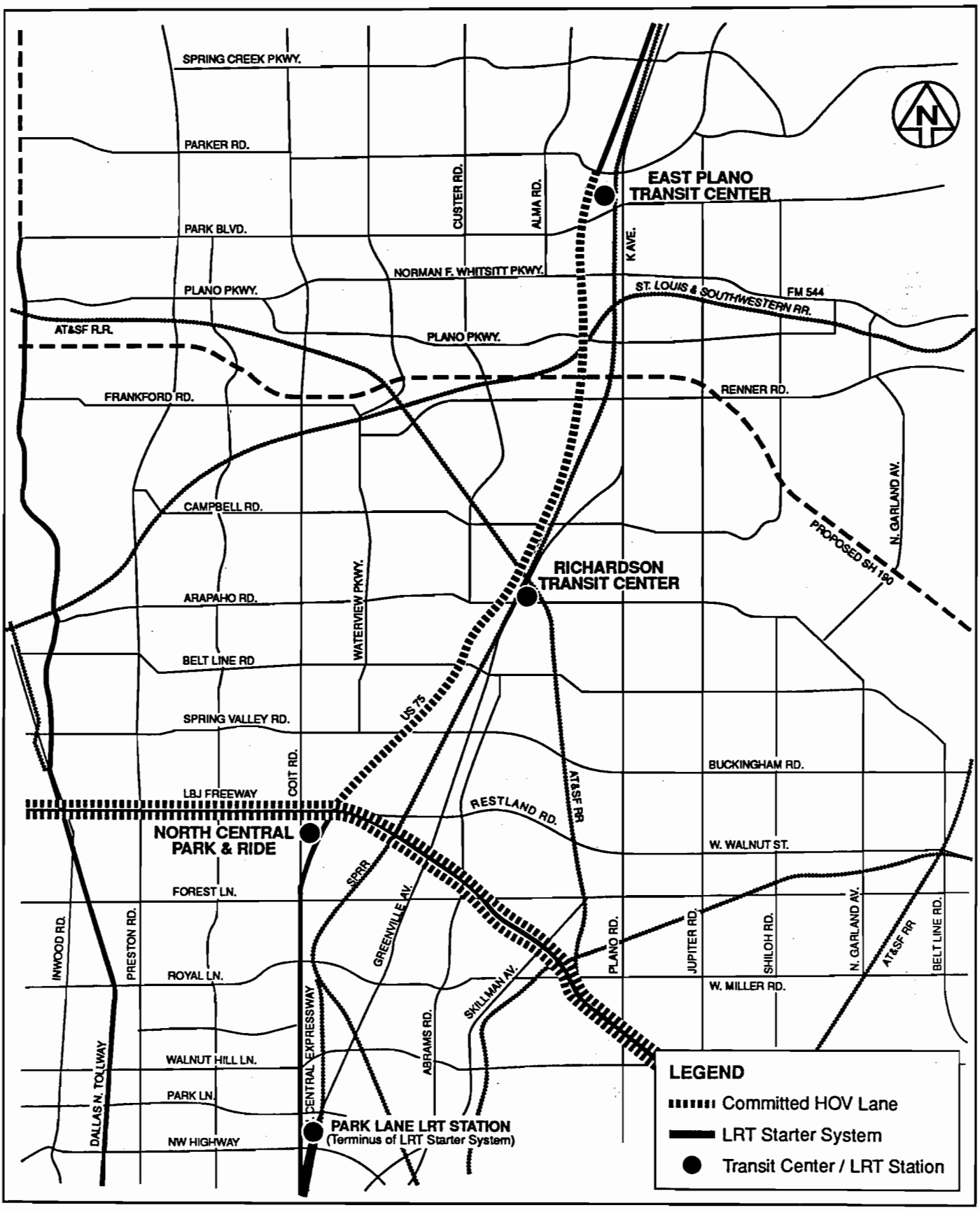
The definition of the No-Build Alternative includes: express bus service; local, feeder, and crosstown bus service; and rail transit services (commuter and LRT) already committed to by the DART Board of Directors. The bus operating plan for the No-Build Alternative in the Study Corridor assumes that the current level of bus transit service will increase as the population increases. Committed DART projects outside the Study Corridor include the other lines of the LRT Starter System and commuter rail from Union Station in Dallas to the transit centers at South Irving and Dallas/Fort Worth (D/FW) International Airport. This overall definition of transit services, as well as the committed highway network, are held constant among all the alternatives.

1.3.2 TSM Alternative

The TSM Alternative represents an alternative that seeks to accomplish two objectives. The first is to enhance, to the greatest degree practicable, existing and available transit services in the Study Corridor. The second is to augment programmed improvements to maximize the operational capabilities and efficiency of regular bus and express bus services now in place.

Two TSM alternatives initially were defined. The TSM-NC HOV Alternative called for constructing two-way concurrent flow HOV facility in the median of the North Central Expressway (US 75) south of LBJ Freeway. The two HOV lanes would augment the HOV lane

NO-BUILD ALTERNATIVE



Source: Definition of Alternatives, March 1994.

Figure S-2

programmed for construction on US 75 north of LBJ Freeway and on LBJ Freeway. The TSM-SP HOV Alternative, in contrast, called for construction of a two-way, concurrent flow HOV facility within the DART/SPRR ROW. This facility would have originated at the LRT Park Lane Station and terminate at the East Plano Transit Center near Parker Road. The initial screening of these alternatives led to the definition of less ambitious TSM objectives and a TSM Alternative without additional major HOV lanes/facilities south of LBJ Freeway.

The TSM Alternative defined for evaluation builds on the reversible HOV lane committed for construction in US 75 north of the LBJ Freeway (Figure S-3). Bus access to the North Central Park-and-Ride facility, south of LBJ Freeway, would be improved. Further, bus ramps, providing direct access to the US 75 HOV lane, would be constructed at three transit center locations:

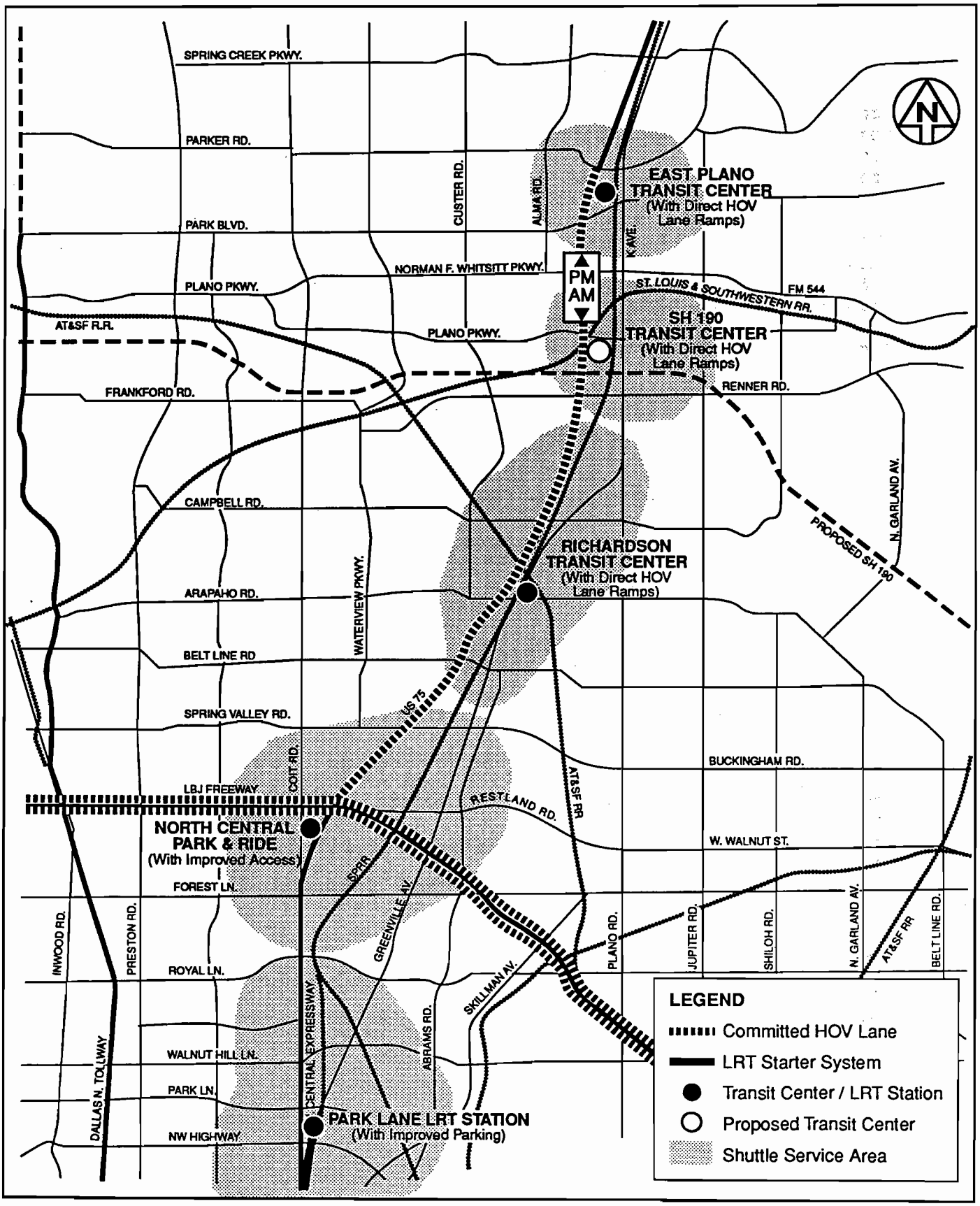
- North of Arapaho Road near the Richardson Transit Center;
- South of SH 190 near a proposed SH 190 Transit Center; and
- North of Park Boulevard at the East Plano Transit Center.

These new ramps would permit express buses to enter and exit the US 75 HOV lane and support expansion of express bus service in the Study Corridor. The additional express bus service would provide direct access to/from downtown Dallas for patrons using the transit centers.

The TSM Alternative also calls for new or enhanced user facilities. These facilities would include: a new transit center to be located near the proposed SH 190 Freeway; improvement of the existing transit center at the North Central P&R facility; and expansion of the Park Lane Station park-and-ride facility to permanently accommodate "end-of-the-line" parking. The Park Lane Station currently is designed only to serve interim demand, on the assumption that the LRT North Central Line will be extended north of Park Lane.

The 2010 bus operating plan assumed for the TSM Alternative includes all local, radial limited, crosstown, and circulator service included in and as defined for the No-Build Alternative. The proposed new bus access ramps to the US 75 HOV lane would be constructed in lieu of extending the LRT North Central Line north of Park Lane. This would provide more efficient access for express bus service in the Study Corridor. In addition, the TSM Alternative assumes initiation of seven additional express routes (for a total of nine in the Study Corridor) and bus circulator routes.

TSM ALTERNATIVE



Source: Definition of Alternatives, March 1994.

Figure S-3

1.3.3 LRT Alternatives

Two LRT alternatives have been defined to satisfy travel needs in the Study Corridor. Each represents an extension of the North Central Line of the LRT Starter System (beginning at the Park Lane Station) within the Southern Pacific Railroad (SPRR) right-of-way (ROW) recently purchased by DART (DART/SPRR ROW). Definition of the LRT alternatives also acknowledges the potential future development of an HOV facility within the DART/SPRR ROW in addition to LRT facilities. And, each includes the committed and programmed improvements to the existing bus transit and roadway system described for the No-Build Alternative. Some aspects of the bus transit system would vary between alternatives, reflecting the availability of rapid (i.e., LRT) transit services.

1.3.3.1 LRT/Parker Road Alternative

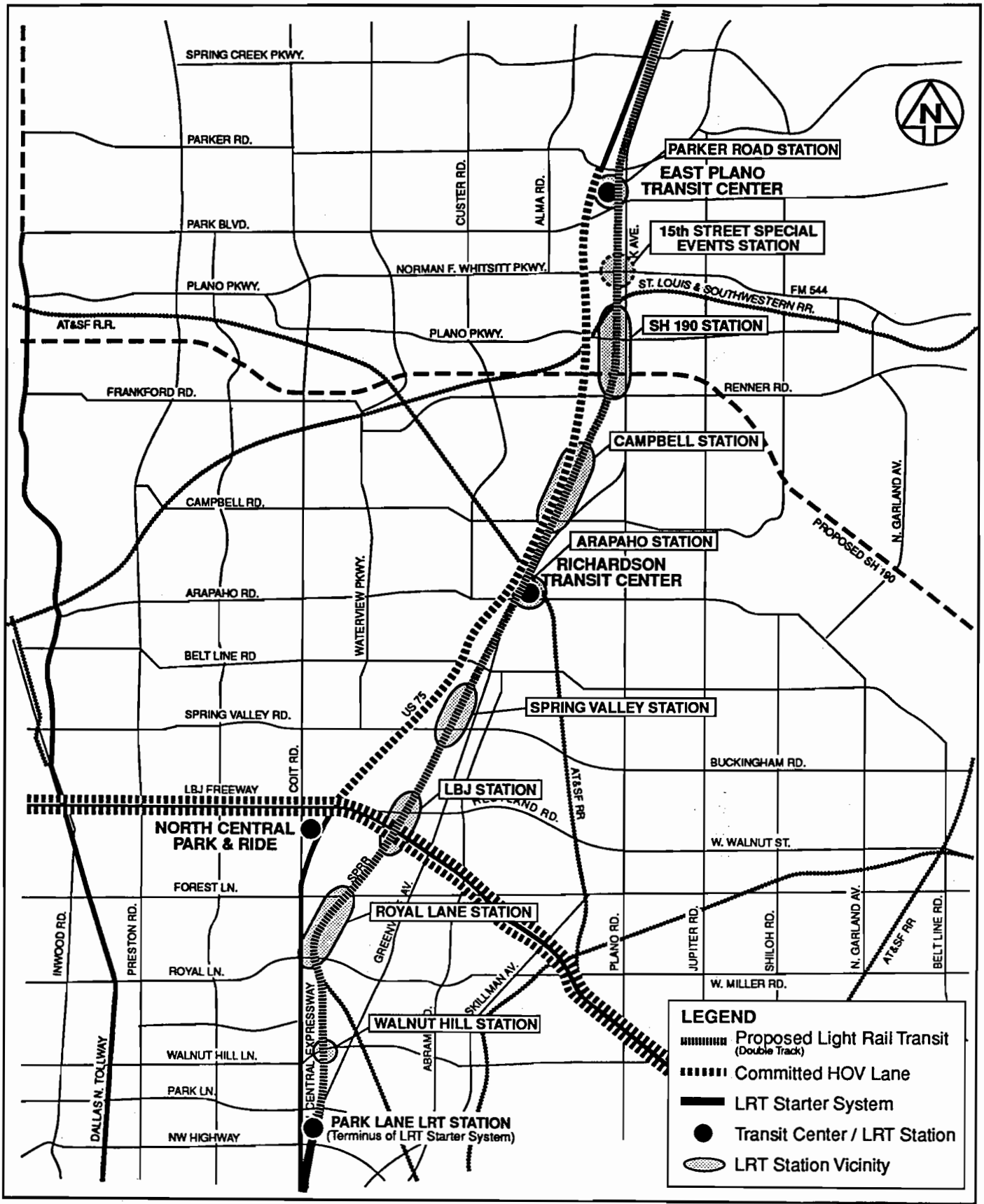
There are two options being considered for extending LRT service from Park Lane to Parker Road in Plano. The LRT/Parker Road Alternative is defined as full development (i.e., construction and operation) of double track LRT service to Plano in accordance with design and operating criteria of the LRT Starter System. The LRT/Parker Road Alternative, therefore, represents a completed system for the Study Corridor. The LRT/Parker Road Alternative would constitute a 12.3 mile extension of the LRT Starter System north of Park Lane Station in the Dallas (Figure S-4).

LRT service would operate within the former DART/SPRR ROW from Park Lane through Richardson to Parker Road in Plano. This alternative would include a total of eight (8) stations in addition to the Park Lane Station plus a "Special Events" platform at 15th Street in the City of Plano Downtown area. The operating plan for the LRT/Parker Road Alternative assumes an ultimate peak-hour headway of 10 minutes and an off-peak headway of 15 minutes. The LRT system would operate on a double track guideway at a maximum operating speed of 55 miles per hour and have an average low-level platform station dwell time of 30 seconds. Generally, two-car trains would operate most of the day, with some three-car trains in the peak periods and single-car trains in the evenings.

1.3.3.2 LRT/Parker Road Alternative - Intermediate Capacity

The second option for extending LRT service to Parker Road has been defined in terms of staging LRT system development beyond Arapaho Road. This alternative, referred to as LRT/Parker Road Alternative - Intermediate Capacity, would have no stations between Arapaho Road and Parker Road. Therefore, there would be only six stations beyond the Park Lane Station. North of Arapaho Road, LRT service would be developed to accommodate near-term demand (Figure S-5).

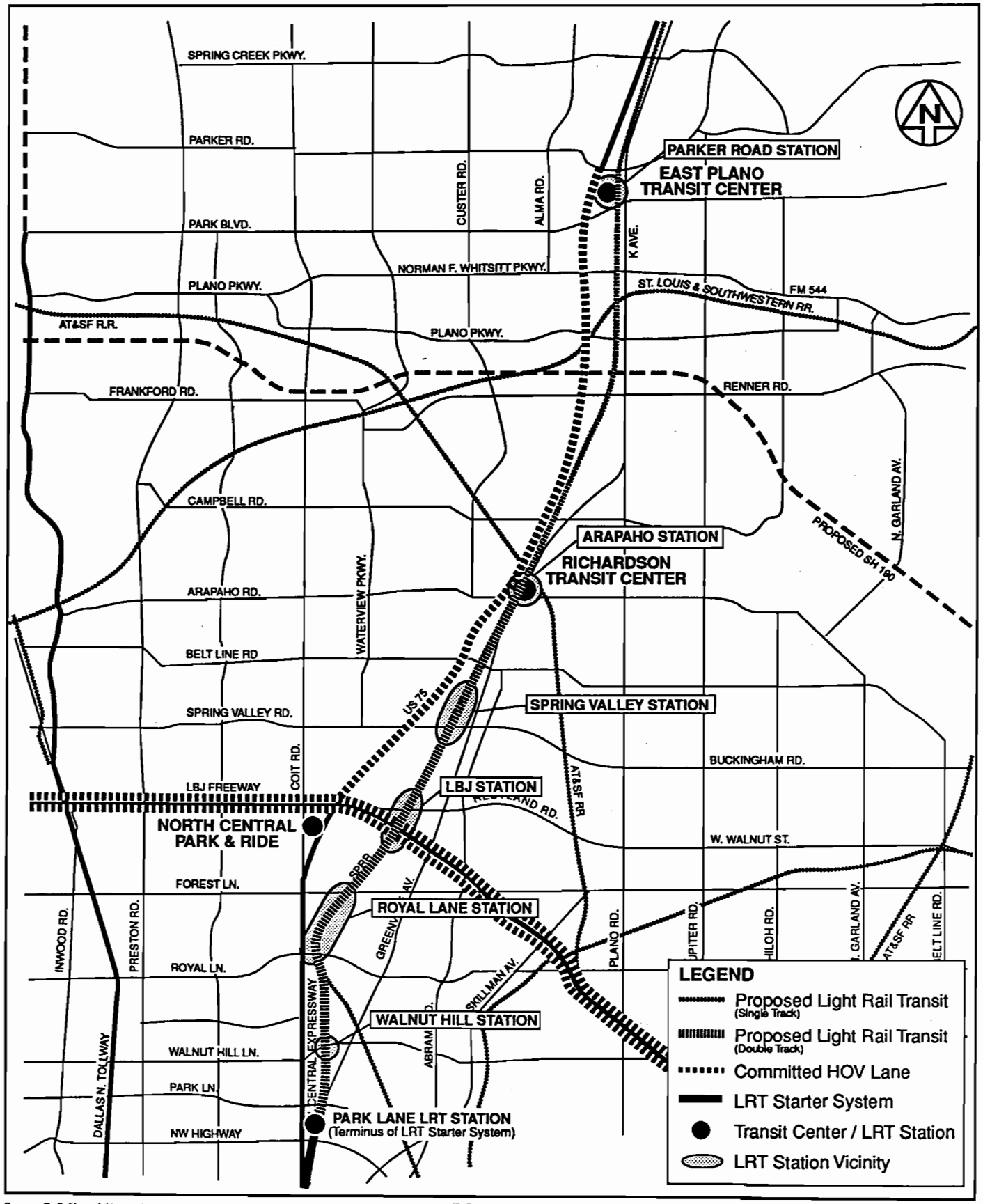
LRT/PARKER ROAD ALTERNATIVE



Source: Definition of Alternatives, March 1994.

Figure S-4

LRT/PARKER ROAD ALTERNATIVE - INTERMEDIATE CAPACITY



Source: Definition of Alternatives, March 1994.

Figure S-5

The operating plan between Park Lane and Arapaho Road would be similar to the LRT/Parker Road Alternative. Specific features defining this optional approach beyond Arapaho Road are:

- Use of existing tracks north of Arapaho Road, if possible, requiring single track operations through some segments;
- No intermediate stations between Arapaho Road and Parker Road;
- 20 minute peak headway/30 minute off-peak headway north of Arapaho Road;
- Single platform at the Parker Road Station; and
- Design and construction to accommodate the addition of a second track and intermediate stations in the future, i.e., full development.

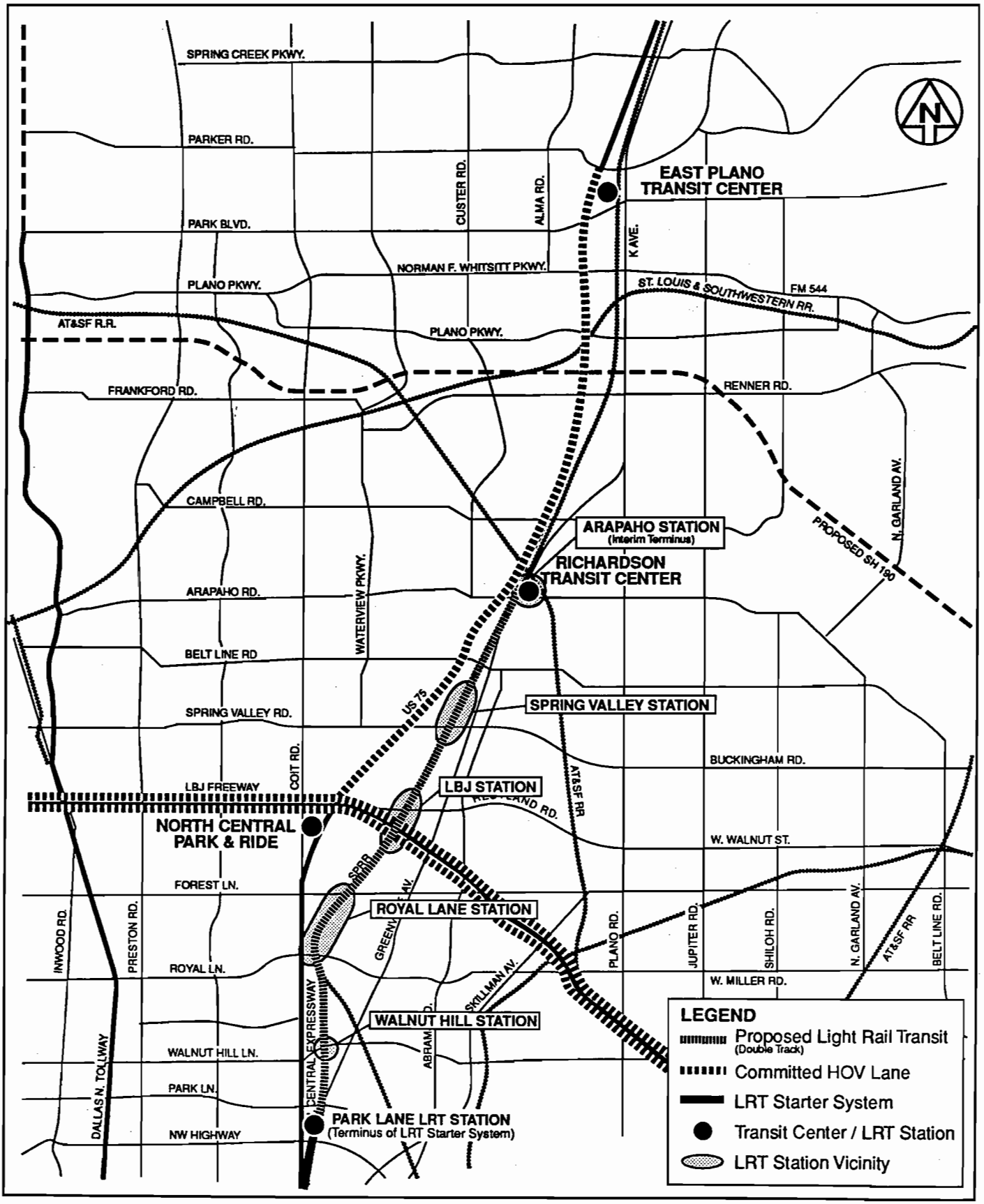
The single station site north of Richardson would be an at-grade platform located immediately adjacent the existing East Plano Transit Center bus loading/unloading facilities. The existing park-and-ride and kiss-and-ride facilities at this center would serve the function of the Parker Road Station contemplated under the LRT/Parker Road Alternative.

The LRT/Parker Road Alternative - Intermediate Capacity has been included to permit consideration and evaluation of the cost and ridership impacts associated with the decision initially to provide a minimal level of service beyond Richardson. It reflects the objective of DART to establish LRT service to Plano, while recognizing DART's responsibility for developing the full regional LRT network defined in the Transit System Plan. However, this alternative would not include intermediate stations at Campbell Road, SH 190, and 15th Street, because increased operating headways would lower expected boardings and alightings at these stations. Developing the LRT/Parker Road Alternative in stages would permit financial resources available to DART to be directed toward the development of other LRT segments, such as the Northeast Line.

1.3.3.3 LRT/Arapaho Road Alternative

The LRT/Arapaho Road Alternative would extend the LRT Starter System only 6.8 miles (Figure S-6). This LRT alternative would have an identical alignment and station configuration as the LRT/Parker Road Alternative up to Richardson. Service would terminate at Arapaho Road after crossing over Arapaho Road. The LRT/Arapaho Road Alternative is considered to be the "minimum operable segment" (MOS) for LRT service beyond Park Lane. The MOS is the shortest extension of the LRT Starter System that would preserve the greatest amount of ridership while reducing construction costs and (in some cases) environmental impacts. That is to say, it is the minimum operable "new" segment that can be constructed and operated in a cost-effective manner.

LRT/ARAPAHO ROAD ALTERNATIVE



Source: Definition of Alternatives, March 1994.

Figure S-6

This LRT alternative is shorter than the LRT/Parker Road Alternative; therefore, it would have only five additional stations beyond the Park Lane Station. Feeder bus service would operate to/from the East Plano Transit Center and other areas to the north. The LRT/Arapaho Road Alternative operating plan would be similar to the LRT/Parker Road Alternative, because the operating segment between Park Lane and Arapaho Road is common to both.

1.3.4 Station Vicinities

The possible vicinities for the location of LRT stations (as shown in previous figures) was developed by DART based on projected demand for fixed guideway transit service derived from patronage forecasts prepared by DART and NCTCOG. The Walnut Hill, LBJ Freeway, Arapaho Road, and Parker Road station vicinities are considered highest priority for service, based on ridership forecasts, cost, and joint development potential. The Royal Lane and Spring Valley station vicinities offer the next best potential for generating ridership. The Campbell Road, SH 190, and 15th Street station vicinities offer the lowest potential for ridership.

Optional LRT station sites have been established in each of the station vicinities identified for the LRT alternatives. Sites have been located within the limits of the recommended station vicinities through consideration of: available land, roadway access, proximity to existing development, space requirements, and environmental conditions. Station platforms would be either at-grade or elevated, depending on the vertical alignment of the LRT tracks within the station vicinities. In some cases, alternative vertical and horizontal alignments of the tracks have been considered. More detailed definition of the location and design of stations will be completed during Preliminary Engineering.

1.4 Evaluation Of Alternatives

ISTEA established a new policy for guiding consideration of proposed major transit investment projects, such as extension of the LRT Starter System, before advancing them through the FTA project development process. In the past, FTA rated major transit investment projects based on narrowly defined cost-effectiveness indices. ISTEA and new implementing regulations require FTA to consider a broad range of evaluation criteria during the conduct or "corridor" or "subarea" studies. The new Joint Planning Regulations published by FTA and the Federal Highway Administration (FHWA) indicate the sponsors of proposed major transportation investment projects now must consider, in addition to cost-effectiveness, the following factors:

- Mobility Improvements (specifically, travel time & travel opportunities, congestion relief, increased mobility for the transit dependent population);

- Social, Economic, and Environmental Effects (specifically, air pollution, noise pollution);
- Safety;
- Operating Efficiencies;
- Land Use and Economic Development (specifically, transit-supportive land use policies and patterns);
- Financing;
- Energy Consumption.[5]

The regulations also indicate that corridor or subarea studies should incorporate, as appropriate, analyses of demand reduction and operational management strategies (OMS).

Major investment (corridor or subarea) studies are undertaken to provide a basis for evaluating the effectiveness of alternative investments or strategies in attaining local, state, and national goals and objectives as well as cost-effectiveness Project goals providing the local framework for evaluating transportation improvement alternatives for the Study Corridor are stated below.

- **Travel and Mobility Goal** - Provide a transportation system within the Study Corridor that meets the Study Corridor's mobility needs and that is safe, efficient, and coordinated.

- **Environmental Goal** - Provide a transportation system that preserves and enhances the Study Corridor's social and physical environment and that minimizes potential impacts to sensitive resources.

- **Equity Goal** - Provide a transportation system that is consistent with the local community's goals and fairly distributes the system's costs, benefits, and impacts among various population subgroups.

In addition to considerations relating to the achievement of local and regional transportation, environmental, and equity goals, there remains the need to examine the cost-effectiveness of project alternatives. Cost-effectiveness, as applied to major transportation capital investment projects, is defined as the extent to which an alternative returns benefits in relation to its costs.

1.4 Evaluation Of Alternatives

Table S-1 summarizes the principal findings and conclusions with respect to potential impacts of alternatives evaluated during the Corridor Planning Study conducted for the North Central Corridor, north of Park Lane.

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5 "Statewide Planning; Metropolitan Planning," Final Rules.

Table S-1

Evaluation of Alternatives

North Central Corridor, North of Park Lane

Evaluation Criteria/Performance Measures

N/A = Not Applicable

	Alternative				
	No-Build	**TSM**	**LRT/Arapaho Road (MOS)**	**LRT/Parker Road Staged Implementation**	**LRT/Parker Road Full Development**
	• Expands current Bus Service • Includes Programmed HOV Lanes on US 75 & LBJ Freeway • Includes other Thoroughfare Improvements • LRT Terminus at Park Lane • Bus Access Ramp to US 75 HOV Lane at Richardson Transit Center	• Includes Projects of No-Build Alternatives • Additional Roadway Operational & Low-Cost Physical Improvements (LAP) • Expansion of Existing Park Lane LRT Station Parking Facility • Restructured Bus Rts. & 7 More Express Rts. • Bus Access Ramps to US 75 HOV Lanes at East Plano & SH 190 Transit Center • Circulator Service for Transit Centers • Improved Access for North Central P&R Fac.	• Includes Projects of No-Build Alternative • Extension of LRT Starter System to Arapaho Road in Richardson • Five New LRT Stations • 10 minute Headway in Peak Periods • 6.8 mile Double Track Guideway • Bus Feeder Service to Transit Stations	• Includes Projects of No-Build Alternative • Extension of LRT Starter System to Parker Road in Plano • Six New LRT Stations • 20 minute Headway in Peak Periods North of Arapaho Road LRT Station • 12.3 mile Double & Single Track Guideway with Sidings • Bus Feeder Service to Transit Stations	• Includes Projects of No-Build Alternative • Extension of LRT Starter System to Parker Road in Plano • Eight New LRT Stations plus Special Events Platform in Plano • 10 minute Headway in Peak Periods • 12.3 mile Double Track Guideway • Bus Feeder Service to Transit Stations
TRAVEL & MOBILITY					
• Population within 1 mile of Transit Stations/Centers	N/A	67,000	97,000	109,000	163,000
• Change in Daily Systemwide Transit Riders	N/A	Base	+3,500	+3,800	+5,400
• Average Transit Travel Time to CBD from:					
- LBJ Station/North Central Transit Center	26	26	21	21	21
- Arapaho Road Station	35	35	26	26	26
- Parker Road Station	40	40	40	32	34
• Travel Time Savings (Annual Hours)	N/A	Base	+948,800	+1,129,100	+1,536,900
Roadways					
• Reduction in Daily Roadway Vehicle Miles Traveled (VMT)	+18,460	Base	-62,480	-68,160	-96,560
EQUITY					
• Employment within 1 Mile of Transit Stations/Centers	N/A	117,780	164,000	172,000	238,000
ENVIRONMENTAL					
• Number of Noise Sensitive Sites Potentially Affected	N/A	N/A	20	34	34
• Number of Sensitive Visual/Aesthetic Resources Potentially Affected	N/A	N/A	11	15	15
• Number of Parklands Potentially Affected	N/A	1	4	5	5
• Number of Potential Displacements	None	None	2	2	2
• Change in Air Emissions	+0.2 Tons/Day	Base	-0.6 Tons/Day	-0.7 Tons/Day	-1.0 Tons/Day
COST/FINANCIAL FEASIBILITY					
• Added Capital Cost (Millions)	Base	+$44.9M	+$215.3M	+$267.6M	+$324.1M
• Available Capital Funding 1996-2001*	N/A	$240 - $250M	$240 - $250M	$240 - $250M	$240 - $250M
• Added Annual Operating & Maintenance Cost (Millions of 1993 Dollars)	Base	+$8.2M	+$7.6M	+$6.3M	+$9.8M
• Cost-Effectiveness Index (CEI)	N/A	Base	$9.83	$11.25	$12.24

* FY 1993-94 Financial Plan

1.4.1 Project Effectiveness - Travel and Mobility Goal

The evaluation associated with the Project Effectiveness - Travel and Mobility Goal seeks to determine how well each alternative improves travel times and accessibility within the Study Corridor and to/from points outside the Study Corridor. The LRT/Parker Road Alternative would serve the greatest population within one mile of transit stations. It would make efficient transit services available to about 100,000 more persons than the TSM Alternative. The result would be an additional 5,400 transit riders. The LRT/Parker Road - Intermediate Capacity option would add about 40,000 persons, while the LRT/Arapaho Road Alternative would add about 30,000. These two alternatives would add 3,800 and 3,500 transit riders daily to the transit system, respectively.

Transit time savings would be a principal benefit resulting from more efficient transportation systems. The average trip travel time from three representative station locations to the Dallas CBD is shown for all alternatives in Table S-1. The trip travel time forecasts indicate the LRT alternatives would reduce the trip travel time to the Dallas Central Business District (CBD) from locations in the Study Corridor. Average travel time saved in comparison to the No-Build and TSM Alternatives would range from 5 to 9 minutes. It is estimated that the LRT/Parker Road Alternative would generate annual travel time savings of 1,536,900 hours. Annual travel time savings would be slightly less than 1 million hours for the LRT/Arapaho Road Alternative and about 1.1 million hours for the LRT/Parker Road Alternative - Intermediate Capacity option.

The benefit of transit travel time savings would be the attraction of more transit riders to DART's system. The attraction of riders to the transit system serving the Study Corridor would reduce the daily non-transit vehicle miles of travel in the DART Service Area. The LRT/Parker Road Alternative, which would provide full development of LRT service to Plano, would generate a reduction in daily vehicle miles of almost 100,000 miles. The other two LRT alternatives would result in reducing daily vehicle miles by 60,000 to 70,000 miles.

1.4.2 Project Effectiveness - Environmental Goal

The evaluation associated with the Project Effectiveness - Environmental Goal focuses on the degree and character of impacts to the physical, social, and cultural resources of the Study Corridor. The potential for major environmental consequences from the implementation of each alternative was determined through review of available information and minimal field reconnaissance. The purpose of the review was two-fold: (1) determine the general differences in effects, consequences, or impacts between the alternatives being considered; and (2) differentiate between the significance of the different types of effects, consequences, or impacts anticipated.

Criteria for measuring the performance of an alternative relative to the environmental goal specifically address effects on the physical setting of the Study Corridor. Five criteria have been identified as "key" indicators of project effectiveness.

- Noise - The number of noise sensitive sites affected by proposed transportation improvements and the nature of the potential effects provides a measure to determine whether impacts have been minimized among alternatives. Little or no change in noise levels would be expected with implementation of the TSM Alternative. Park-and-ride facilities would be expected to generate additional traffic in the local area. Where traffic volumes would be less than double the existing activity, no significant impacts would occur. Facility design and orientation combined with landscaping and structural noise barriers may be used to mitigate possible noise impacts.

  The longer LRT alternatives extending to Plano would create more noise impacts, potentially affecting 34 sensitive sites compared to only 20 under the LRT/Arapaho Road Alternative. A number of mitigation measures would be available to minimize any adverse noise impacts identified. Available measures include: use of resilient wheels on the LRT vehicle; installation of continuously-welded steel rail; construction of sound barrier walls along the track in noise-sensitive areas; use of train operating speed limitations where needed; and procurement of quieter vehicles.

- Parklands - Alternative transportation improvements could adversely affect or impact parklands, recreation areas, historic or cultural sites, scenic areas, or other resources subject to Section 4(f) review. Each of the build alternatives would affect existing parklands. The TSM Alternative potentially would affect 1 park, the LRT/Arapaho Road Alternative potentially would affect 4 parks or open space areas, and the longer LRT alternatives extending service to Plano potentially would affect 5 parks or open space areas. Impact mitigation measures will need to be defined during Preliminary Engineering, respecting any construction activity and structural designs to be associated with crossing the creek.

- Visual/Aesthetic - The number of sensitive visual/aesthetic resources affected by proposed transportation improvements and the nature of the potential effects provides a measure to determine whether impacts have been minimized among alternatives. Few impacts would result from implementing the TSM Alternative. Mitigation measures (such as, landscaping and designing facilities to fit in with the surrounding community) may be employed to minimize potential visual/aesthetic impacts associated with this alternative.

The shorter LRT/Arapaho Road Alternative potentially would affect 11 sensitive sites, while the longer LRT alternatives extending service to Plano would potentially affect 15 sites. Incorporation of mitigation measures into the design of the LRT system would minimize adverse visual impacts. Stations and associated facilities can be designed to fit in with the character of the community or the surrounding neighborhood. Landscaping can be incorporated into station site design/layout to increase aesthetic appeal. The visual impacts of the aerial guideway can be reduced by minimizing the size of support columns, maximizing the span lengths between columns, and installing a guideway which is of uniform color and texture.

- Displacements - The number of displaced residents/homes and businesses provides a measure of the potential impacts on the fabric of the community. The TSM Alternative would not create any displacements. The LRT alternatives would require displacement of at least two businesses to make space for proposed station facilities. Federal law provides for the relocation and assistance of residents or businesses that may be displaced by Federally funded community infrastructure improvements. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) mandates uniform and equitable treatment of all displaced persons or businesses, including assistance with relocation services. DART would be required to comply with the Federal relocation assistance law in compensating any businesses or residents that may be displaced as a result of the required acquisitions.

- Air Quality - Reductions in automobile and bus emissions, as a function of annual vehicle miles traveled (VMT) indicates the relative improvement of air quality, which is a concern specifically identified in the framework of ISTEA. Any improvement in transportation efficiency will improve air quality. Thus, the TSM Alternative potentially could reduce vehicle emission by about 0.2 tons per day. The LRT alternatives potentially would reduce vehicle emissions by 0.6 to one ton per day over the TSM Alternative.

1.4.3 Project Effectiveness - Equity Goal

Equity criteria focus on the distribution of project effects or impacts across various segments of the population. The criteria are defined to determine whether any segment of the Study Corridor's population, when compared to the region's population as a whole, is (1) paying a disproportionate share of costs or other impacts or (2) receiving a disproportionate share of benefits. In the context of alternatives evaluation, the broadest consideration of equity means to weigh out the degree to which those in the local community bear the impacts of a proposed project (i.e., the costs

and environmental impacts) compared to those who benefit through the ability to use the services to be provided by the proposed project and, thereby, gain a benefit (i.e., increased mobility, access to jobs, etc.). In the absence of extensive and detailed demographic and economic investigations, this can be ascertained through an examination of changes in the social, economic, and land use patterns of the Study Corridor, which would bring about opportunities for greater interaction.

Table S-1 shows that the LRT/Parker Road Alternative would improve accessibility to the greatest number of employment opportunities in the Study Corridor. Employment within one mile of transit stations included under the LRT/Parker Road Alternative would be more than twice that served by the TSM Alternative. The LRT Arapaho Road Alternative would be less than a 50 percent improvement over the TSM Alternative. The improvement in accessibility to employment opportunities with implementation of the LRT/Parker Road Alternative - Intermediate Capacity would be almost 50 percent better than the TSM Alternative.

1.4.4 Cost Effectiveness/Financial Feasibility

The elements of cost are very important to any project. Therefore, it is important that the evaluation methodology include weighing the costs of proposed transit improvements in the Study Corridor against expected benefits and related impacts. Both short-term capital costs and long-term, continuing operating and maintenance (O&M) costs must be considered. Relating the costs with the benefits of the project, in terms of increased ridership, reveals the cost-effectiveness of proposed alternatives. Finally, the ability to fund both the short- and long-term costs must be evaluated to determine whether the proposed actions are financially feasible.

Capital Cost

The capital investment required to implement the alternatives, obviously, is a key cost-effectiveness criteria. There are numerous components to project cost for any particular alternative. Property acquisition usually is a major component; however, the LRT alternatives incorporate the previously acquired DART/SPRR ROW. Therefore, this cost would be a smaller than usual portion of total project cost for the LRT alternatives. Critical cost components include: civil/structural work associated with facilities (e.g., access ramps to HOV lane, stations, transit centers); vehicles (bus and LRT); signalization and service equipment; and trackwork (LRT only).

By definition, only planned and programmed costs would be incurred under the No-Build Alternative. The TSM Alternative would involve capital expenditures for the construction of HOV ramps, transit centers, transit center improvements, and vehicles. The capital

cost associated with the TSM Alternative would be approximately $44.9 million.

The capital cost associated with the LRT/Arapaho Road Alternative (MOS) would be approximately $215.3 million. The LRT/Parker Road Alternative - Intermediate Capacity would require about $50 million more, with an estimated total capital cost of $267.6 million. The LRT/Parker Road Alternative, which calls for "full development" of the complete LRT system to Plano, would be the most expensive, with a total estimated capital cost of $324.1 million. It should be noted that the ultimate cost of the LRT/Parker Road Alternative - Intermediate Capacity ($333.6 million), which calls for staged implementation of LRT service beyond Arapaho Road, would be slightly higher than the LRT/Parker Road Alternative. The greater capital cost of staged implementation would result from delaying construction of the full, double track LRT system and various other design and construction factors.

Available Capital Funding

The FY 1993-94 Financial Plan (currently being updated), provides for the funding of capital projects in the five-year period 1996-2001. Available funding for capital projects has been established at $240 to $250 million. Anticipated Federal grant funds account for 60 to 70 percent of the funds available for capital projects.

The No-Build Alternative would result in little additional direct financial burden for the community. Standard financing arrangements for replacing facilities and the vehicle fleet would be required. The TSM Alternative would require the purchase of approximately 130 new buses to support expanded express bus service and new construction, as indicated above. The HOV lane proposed for construction in US 75 north of LBJ Freeway has been programmed in the State's highway budget for several years. Available capital funding is more than sufficient to cover the cost of the TSM Alternative, which is estimated at $44.9 million.

Available capital funding also is sufficient to cover the cost of the LRT/Arapaho Road Alternative, estimated at $215.3 million. The LRT/Parker Road Alternative and the LRT/Parker Road Alternative - Intermediate Capacity would require new capital expenditures exceeding that which is established as available in the FY 1993-94 Financial Plan. The LRT/Parker Road Alternative, the most expensive alternative being considered, would exceed available capital funding by $74 to $84 million. The LRT/Parker Road Alternative - Intermediate Capacity, which offers capital savings in the near-term, would require $18 to $28 million more than is available. It should be noted that the ability of DART to implement any build alternative depends on the availability of Federal funds at the time of the grant application and DART's

ability to incur long-term debt. The updated Financial Plan will reflect the latest assumptions regarding this matter.

Annual Operating and Maintenance (O&M) Costs

The year 2010 O&M costs have been estimated in 1993 constant dollars for each of the alternatives. The total year 2010 O&M costs for the No-Build Alternative have been estimated at approximately $175.4 million. Implementation of the TSM Alternative would increase annual 2010 O&M costs by slightly less than 5% to about $183.6 million. O&M costs of the LRT/Parker Road Alternative ($185.2 million) would add $1.6 million to the TSM Alternative. Both the LRT/Parker Road Alternative - Intermediate Capacity and LRT/Arapaho Road Alternative would be less costly to operate than the TSM Alternative at $181.7 million and $183.0 million, respectively.

Cost-Effectiveness

Under current procedures, FTA uses the Cost Per New Rider Index to rate transit projects proposed for Federal funding assistance. The Cost Per New Rider Index is a ratio between (1) the incremental costs of building and operating an alternative and (2) the incremental transit riders attracted to that alternative. The incremental change compares the proposed system of services with that provided by the TSM Alternative. There are two versions of the New Transit Rider Index. The "Total" New Transit Rider Index includes the total annualized capital cost of the project, while the "Federal" New Transit Rider Index includes only the Federally-funded share of the project's annualized capital costs.

The "Federal" New Transit Rider Index was computed for the alternatives being considered for the Study Corridor. The "Federal" New Transit Rider Index for the LRT/Arapaho Road Alternative was computed at $9.83. The LRT/Parker Road Alternative - Intermediate Capacity option yields and index of $11.25. The LRT/Parker Road Alternative yields an index value of close to $12.24.

1.5 Comparison Of Alternatives

The comparison of alternatives involves an examination of the "trade-offs" related with the choices. In general, trade-offs are the identified relationships among impacts, affected interests, and alternatives. Trade-offs show the effect of making selected changes in alternatives by displaying how an action designed to achieve an effect in one impact area may have implications for other areas as well. For example, LRT alternatives are designed to provide fast travel times and attract new riders, but the facilities are expensive to construct and operate; this affects the financial feasibility of the project. The examination of trade-offs is particularly valuable when an alternative exhibits

strengths and weaknesses in different areas and in differing degrees than other alternatives. The trade-offs analysis provides a basis for decision-makers to weigh the pros and cons of each alternative and, ultimately, determine the desired future course of action.

Key Differences Among Alternatives

- The TSM Alternative would include four transit centers directly served by dedicated Express Bus Routes. The transit centers would have expanded park-and-ride and kiss-and-ride facilities. Direct access to US 75 would be available for each transit center. Expanded park-and-ride and kiss-and-ride would be developed at the LRT Park Lane Station.

- The LRT/Parker Road Alternative would include eight (8) stations plus a "Special Events" Station in the Plano Downtown area. These stations would be located near or at: Walnut Hill, Royal Lane, LBJ Freeway, Spring Valley, Arapaho Road, Campbell Road, SH 190, 15th Street (Special Events), and Parker Road. Dedicated "circulator" bus service would be established between stations, and "feeder" bus service would be oriented to the LRT stations.

- The LRT/Parker Road Alternative - Intermediate Capacity would not include the Campbell Road, SH 190, and 15th Street Special Events Stations. These three stations were identified as "low-activity" stations, because travel demand forecasts predicted total activity (i.e., boardings plus alightings) would be less than 2,000. During initial screening of potential ridership in the Study Corridor, an activity level of 2,000 was considered the minimum acceptable for including a station vicinity in the LRT system. The Parker Road Station significantly exceeded the threshold of 2,000 boardings and alightings in all scenarios tested. Therefore, it is considered reasonable to extend LRT service to Parker Road while bypassing the intermediate, poor-performing station vicinities. Dedicated "circulator" bus service would be established between stations, and "feeder" bus service would be oriented to the LRT stations.

- The LRT/Arapaho Road Alternative would add five (5) stations to the LRT Starter System: Walnut Hill, Royal Lane, LBJ Freeway, Spring Valley, Arapaho Road. Predicted activity at the Walnut Hill Station is just shy of the threshold of 2,000 boardings and alightings. Dedicated "circulator" bus service would be established between stations, and "feeder" bus service would be oriented to the LRT stations.

- The LRT alternatives potentially could require the removal of the T&NO RR bridge of White Rock Creek, depending on the alignment selected at Royal Lane.

- The LRT alternatives could result in construction activity in the White Rock Creek Greenbelt and floodplain, depending on the alignment selected at Royal Lane.

- The TSM Alternative would increase transit accessibility through the expansion of traditional express bus commuter services, while the LRT alternatives would increase transit accessibility through an intermodal approach, using a combination of modes (i.e., bus, express bus, circulator/feeder bus, and LRT).

- The base operating headways for all LRT alternatives would be 10 minutes in the Peak Period and 15 minutes in the Off-Peak Period. The LRT/Arapaho Road would not operate north of Arapaho Road in the City of Richardson. The LRT/Parker Road Alternative - Intermediate Capacity would operate at 20 minute Peak and 30 minute Off-Peak headways north of Arapaho Road.

- The LRT alternatives include the potential for future development of an HOV facility within the DART/SPRR ROW to the extent that the cost of LRT system development is not affected.

Affected Interests

- AM and PM commuters to the Dallas CBD would benefit mostly by the implementation of the network of express bus routes proposed under the TSM Alternative, because the need to transfer to LRT service would not exist.

- Drivers and service personnel of DART's bus system would benefit more with implementation of the TSM Alternative, because there would be more operating hours.

- The downtown areas of Richardson and Plano would benefit from the establishment of regular LRT service, connecting to the Dallas CBD and the regional LRT system.

- The real estate and development interests in the Corridor would be benefitted more by the establishment of permanent LRT service with fixed property investment. Land adjacent the station sites gain slightly in value with permanent transit facilities and services.

Assessment Of Choices

In general, the LRT/Parker Road Alternative would result in the greatest transportation benefits, considering accessibility, ridership, travel time, and emissions reduction. However, it would carry with it the greatest social and environmental impacts. This alternative would require the largest capital investment, exceeding available capital funds by approximately $74 to $84 million and

resulting in the highest annual O&M costs. The computed value of the "Federal" New Transit Rider Index is $12.24.

The TSM Alternative would require the least capital investment, but this alternative's annual O&M costs would be relatively high. No significant social or environmental impacts would be manifest with implementation of this alternative. Accessibility for work or commute trips would be significantly enhanced with implementation of the expanded Express Bus service through four transit centers. But, neither travel time nor accessibility would be improved to a significant degree.

The LRT/Arapaho Road Alternative and the LRT/Parker Road Alternative - Intermediate Capacity would be roughly comparable in terms of benefits and impacts. Because the latter alternative involves extending the LRT service to Parker Road, certain environmental effects (noise, visual/aesthetic, and parkland impacts) are associated with it that are not associated with the LRT/Arapaho Road Alternative. The LRT/Parker Road Alternative - Intermediate Capacity would require a larger capital investment, exceeding the expected availability of capital funds by $18 to $28 million. On the plus side, the annual O&M costs for this alternative ($6.3 million) would be less than for the LRT/Arapaho Road Alternative ($7.6 million). The computed Federal cost-effectiveness index for the LRT/Arapaho Road Alternative is $9.83; this is less than that computed for the LRT/Parker Road Alternative - Intermediate Capacity option ($11.25).

1.6 Next Steps

There are several steps to be completed from this point in order to advance the proposed extension of the LRT system for the North Central Corridor, north of Park Lane, into Preliminary Engineering and, ultimately, full implementation.

Public Review/Involvement

Several informational meetings will be conducted throughout the Study Corridor. These meetings will focus on apprising affected agencies and interested citizens of the contents of this Evaluation of Alternatives Report and results of the evaluation. The recommended LPA, as determined from the evaluation, will be identified at these meetings. Persons attending the meetings will have the opportunity to comment on or ask questions about the alternatives, the LPA, and/or assessments as to potential transportation effects or environmental impact.

Select LPA

After the public review/involvement activity is completed and comments are received, an LPA will be selected by the DART Board of Directors. Their decision will be based on the findings and

conclusions documented in this Evaluation of Alternatives Report and other pertinent information that may be deemed critical to selection of the LPA. The Board also will consider comments and concerns raised during public review of the Evaluation of Alternatives Report, including input from the public, interest groups, and government agencies. The DART Board will forward its decision to the North Central Texas Council of Governments (NCTCOG), the regional planning body, for action. The NCTCOG will consider the decision of the DART Board and define an appropriate line of action, given the regional transportation planning and development program and available funds.

Prepare LPA Report

A Locally Preferred Alternative Report will be prepared, following official action by NCTCOG adopting a specific action for transportation improvements in the North Central Corridor, north of Park Lane. The LPA Report will provide a description of the preferred technology of the LPA and its alignment, operating plan, estimated costs, and associated financing plan. The LPA Report will be submitted to FTA with a request to initiate Preliminary Engineering and prepare the Draft and Final Environmental Impact Statement (FEIS) on the project. This process is intended to provide DART and FTA with the information necessary to assure that any transportation improvement built in the Study Corridor represents a wise use of public funds, and that community and environmental impact issues related to its construction and operation are taken into account.

EIS/Engineering/Design

FTA approval of the grant application will permit DART to initiate the Preliminary Engineering phase of the project development process. Under the new planning regulations, it is during this phase that the Draft and Final EIS documents will be prepared. The EIS is assembled from information in all areas of technical analysis. The document will provide a detailed description of the LPA, affected environment, expected impacts, and mitigation measures. Implementation of the LPA will be evaluated against doing nothing (i.e., a No Build or "No Action" alternative).

The DEIS will be circulated for public examination, review, and comment. Specific coordination will be maintained with affected government agency during this review process. Review of the DEIS will be followed by revisions, as necessary to respond to comments received, and preparation of the FEIS. With publication of the FEIS and certain other administrative actions on the part of FTA, DART can proceed into Final Engineering/Final Design and then Construction/Implementation phases of project development.

Chapter One

INTRODUCTION

1.1 Project Background

Organized in 1983, Dallas Area Rapid Transit (DART) consists of 14 member cities in Dallas, Denton, and Collin Counties, forming a 700 square mile service area (Figure 1.1). In June 1989, the DART Board of Directors adopted a Transit System Plan with 66 miles of light rail transit (LRT), 37 miles of high-occupancy-vehicle (HOV) facilities and 18 miles of commuter rail (Figure 1.2). Twelve transportation corridors were identified during the development of the Transit System Plan.[1] Nine of the corridors are radial in nature and focus on the Dallas Central Business District (CBD). The other three corridors are circumferential and are associated with non-CBD travel patterns in the northern portion of DART's service area. One of the nine radial corridors is the North Central Corridor, which covers portions of the cities of Dallas, Richardson, and Plano.

The system planning effort was a comprehensive process that included the identification of logical travel corridors, development of alternatives designed to address the problems of each corridor, technical analysis of each set of alternatives, and intensive public involvement. Construction has begun on DART's first 20 miles of the LRT "Starter System." DART's LRT Starter System is divided into three "lines" plus a downtown transitway mall in the CBD (Figure 1.3).

- The **South Oak Cliff Line** will connect Ledbetter Road to the CBD.
- The **West Oak Cliff Line** will be constructed from Westmoreland Road to just south of the Trinity River bridge near Corinth Street where it joins the South Oak Cliff Line and enters downtown.
- The **North Central Line** will connect Park Lane in the northeast to the CBD.
- In the **Dallas CBD**, LRT service from/to these three lines will operate on a transitway mall to be constructed along Bryan Street and Pacific Avenue.

The Fixed Guideway Implementation Schedule, also adopted by the Board as part of the Transit System Plan, calls for DART's LRT Starter System to be completed in 1996. Alternative transportation

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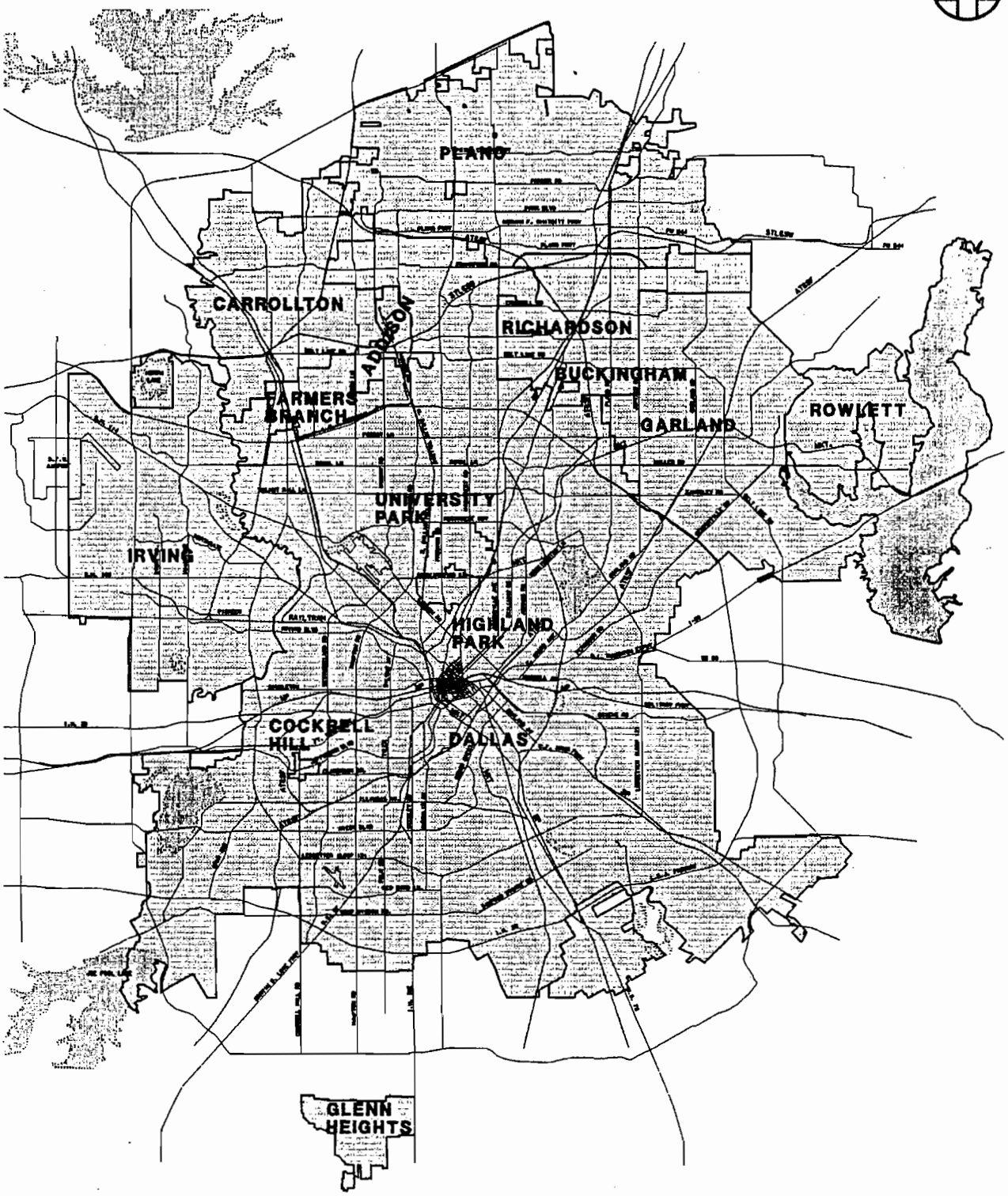
[1] System Plan Mobility Needs Assessment, October, 1988.

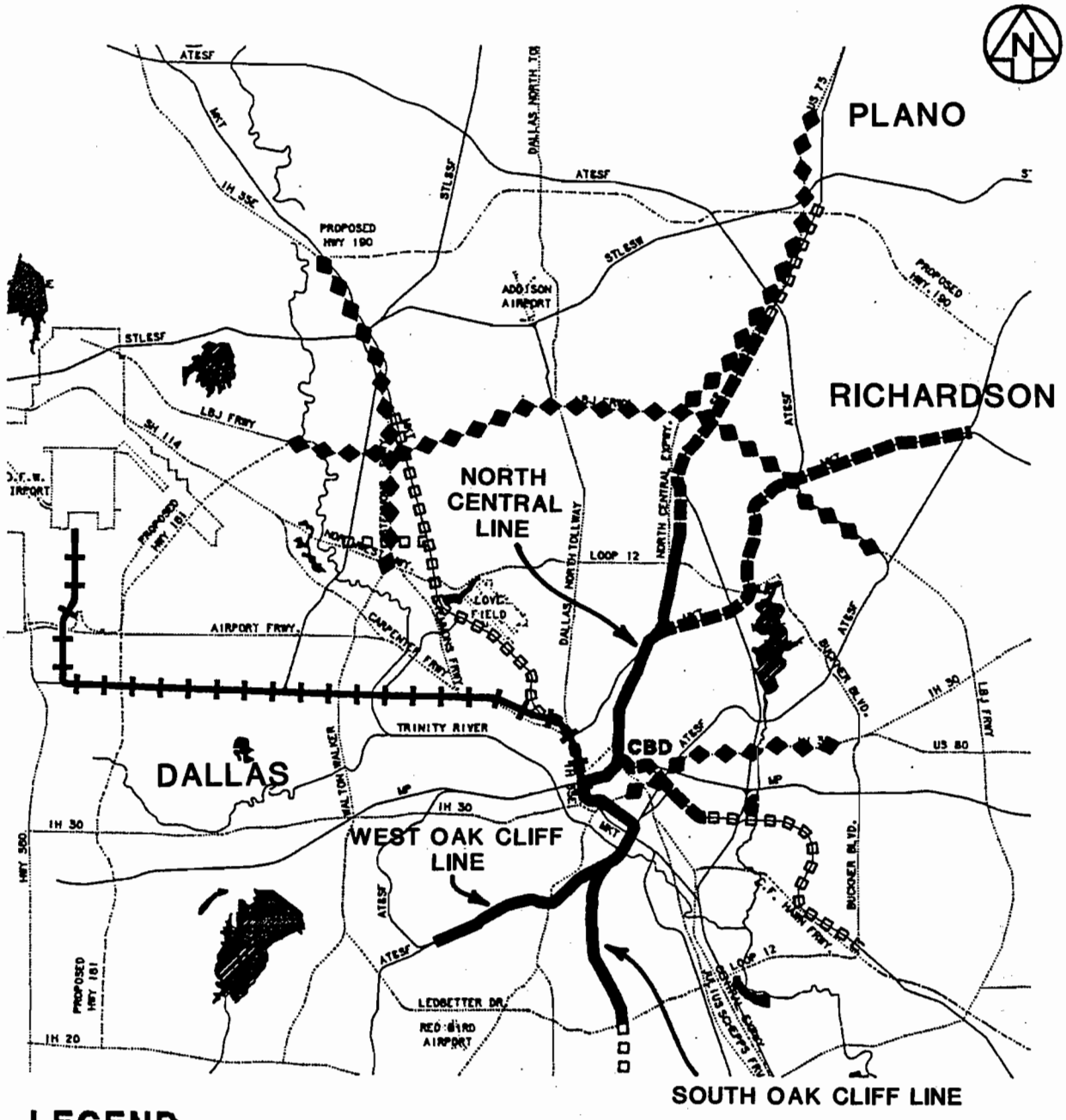
DART SERVICE AREA



SOURCE: Scoping Information, October, 1992.

Figure 1.1

TRANSIT SYSTEM PLAN



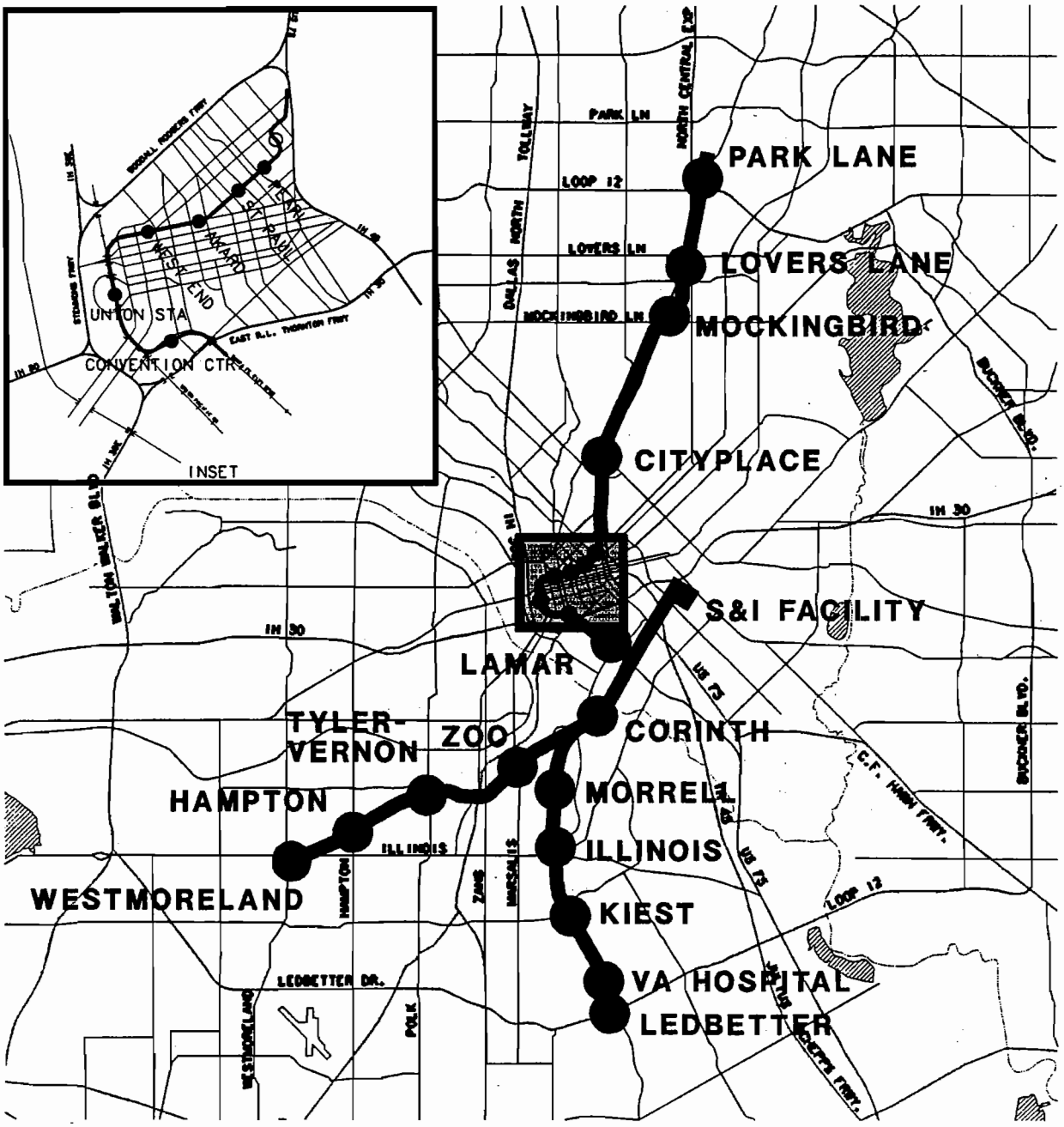
LEGEND

- COMMUTER RAIL LINE
- HOV TRANSITWAY
- LIGHT RAIL STARTER SYSTEM (1996)
- LIGHT RAIL TRANSIT SYSTEM (1997-2005)
- LIGHT RAIL TRANSIT SYSTEM (POST 2005)

SOURCE: Scoping Information, October, 1992.

Figure 1.2

LIGHT RAIL STARTER SYSTEM



SOURCE: Scoping Information, October, 1992.

Figure 1.3

improvements for the North Central Corridor, north of Park Lane (referred to hereinafter as the "Study Corridor"), are the subject of this report.

1.1.1 Scope Of Study

The Study Corridor is a loosely defined geographic area that represents the travelshed for most trips that would use the alternative transportation improvements being considered (Figure 1.4). The North Central Line of DART's LRT Starter System, when completed in 1996, will extend to an interim terminal station at Park Lane at the south end of the Study Corridor. Therefore, continuing planning and engineering studies are focused on that portion of the North Central Corridor that is north of Park Lane. The Study Corridor begins at the Park Lane Station and extends northward to Spring Creek Parkway in Plano, a distance of approximately 13 miles. The Study Corridor, includes portions of three cities: Dallas, Richardson, and Plano.

The study of alternative transportation improvements for the Study Corridor involves several steps in the project development process of the Federal Transit Administration (FTA). DART's Scoping Information document published October, 1992, provides a succinct summary of FTA's project development process.[2] The FTA project development process is designed to aid in the selection and implementation of the best transit solutions for transportation corridor mobility problems. This sequential process facilitates the selection of transit solutions that:

- Achieve mobility goals while minimizing social, economic, and environmental impacts;
- Increase transit use and reduce travel times at a reasonable cost;
- Have a fair distribution of costs and benefits; and
- Are publicly acceptable.

The process includes definition of an overall system of improvements for the DART Service Area. By following the process, local transit providers are guided in advancing alternatives from a low level of design to very specific designs and identification of environmental impacts.

The first phase of the process--system planning--was completed in June, 1989, when the Transit System Plan was adopted by the DART

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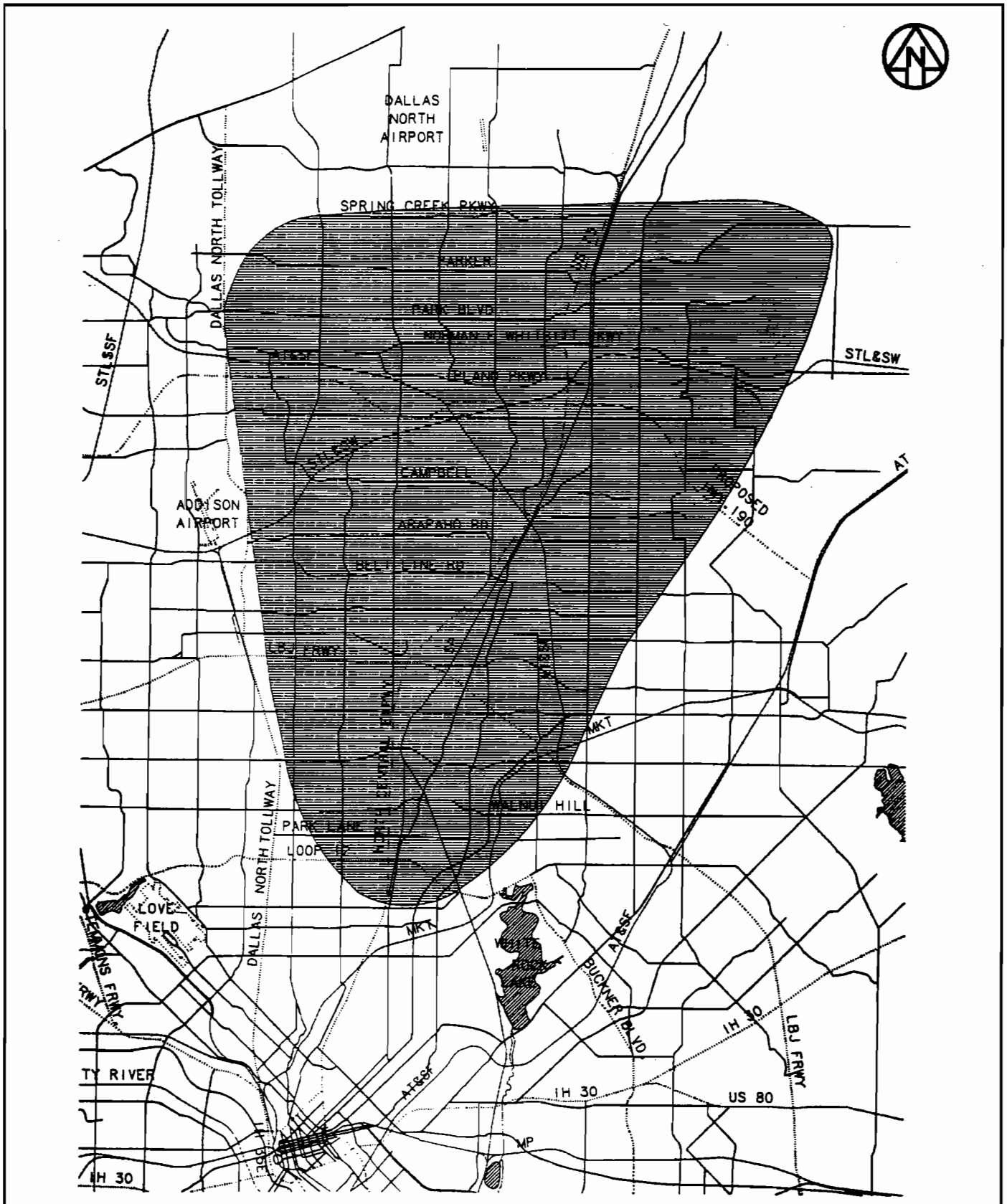
[2] Scoping Information, October, 1992, Alternatives Analysis/Draft Environmental Impact Statement, North Central Corridor, North Of Park Lane, U.S. Department of Transportation, Federal Transit Administration and Dallas Area Rapid Transit.

NORTH CENTRAL CORRIDOR - NORTH OF PARK LANE



SOURCE: Scoping Information, October, 1992.

Figure 1.4

Board of Directors. Since that time, a series of studies has been undertaken to establish the detailed planning and engineering knowledge necessary for implementation of projects identified therein. As noted above, construction of the LRT Starter System is underway, with operations to begin in late 1996. Improvements now are being addressed in the North Central Corridor, north of Park Lane, and the Northeast (Garland) Corridor.

1.1.2 North Central Corridor, north of Park Lane, AA/DEIS

Beyond development and adoption of the Transit System Plan and implementation of the LRT Starter System, DART has set additional priorities for development of the plan's elements. The resolution adopting the Transit System Plan calls for the concurrent implementation of LRT service in the North Central Corridor, north of Park Lane and the Northeast Corridor by the year 2001. The DART Board of Directors adopted a subsequent resolution March 24, 1992, selecting the North Central Corridor, north of Park Lane, as the priority corridor for extending the LRT Starter System.

DART intends to seek a capital grant from FTA to assist in funding an extension of the LRT system. To be eligible for a grant, DART must meet the requirements of the National Environmental Policy Act (NEPA) by satisfying regulations and guidelines established by the Council on Environmental Quality (CEQ) and FTA. These regulations and guidelines require that reasonable and feasible alternative solutions to transportation problems be evaluated and their associated environmental impacts be thoroughly assessed. In addition, FTA must determine that a locally preferred alternative (LPA) is cost-effective before it can be eligible for Federal funding.

Therefore, the DART Board, in cooperation with the Metropolitan Planning Organization (MPO) and FTA, initiated the second phase of the project development process--a study officially designated as the "North Central Corridor, north of Park Lane, Alternatives Analysis/Draft Environmental Impact Statement (AA/DEIS)." The purpose of DART's AA/DEIS study was to provide a basis for selecting the most appropriate transportation improvement for the Study Corridor. The AA/DEIS study was being conducted in accordance with CEQ "Regulations for Implementing the Procedural Requirements of the National Environmental Policy Act of 1969, as amended" (40 CFR Part 1500, and FTA "Environmental Impact and Related Procedures" (49 CFR Part 622). Six major steps had been defined to be performed in progression, leading from consideration of a wide range of possible alternatives (at the start of scoping) to the selection of an Locally Preferred Alternative (LPA).

1.1.3 Intermodal Surface Transportation Efficiency Act (ISTEA)

Subsequent to initiation of the AA/DEIS study, the U.S. Congress passed and the President signed into law the Intermodal Surface

Transportation Efficiency Act of 1991 (ISTEA).[3] This Federal legislation caused FTA, in cooperation with the Federal Highway Administration (FHWA), to change the manner in which the project development process unfolds. This section summarizes the ISTEA legislation and regulations promulgated to implement the Act's requirements. It also discusses the Act's effects on DART's AA/DEIS study efforts and the manner in which DART is adjusting those efforts to meet the new requirements.

ISTEA established new Federal policy regarding the development, evaluation, and implementation of solutions to transportation problems in the country's major metropolitan areas. In response to ISTEA, FTA and FHWA promulgated Joint Planning Regulations "governing the development of statewide plans and programs."[4] Implementation of these regulations is intended to "ensure the adequacy of statewide and metropolitan (*emphasis added*) transportation planning and programming and the eligibility of metropolitan areas and State for Federal highway and transit funds."[5] The new regulations change the project development process for major transportation investment projects, especially transit projects being developed under the sponsorship of FTA. The new regulations establish a framework for performing "major investment (corridor or subarea) studies, [which] shall be undertaken to develop or refine the [local transportation] plan and lead to decisions by the MPO, in cooperation with participating agencies, on the design concept and scope of the investment."[6]

FTA, by initiating this new planning approach, is now allowing potential grant recipients to define and identify an LPA without direct supervision. Potential projects coming out of the regional comprehensive planning process will be refined and evaluated at the local level. Nevertheless, guidelines will be promulgated to assist local agencies in managing this new study approach. Implementation of this new framework for planning requires extensive, coordinated agency action and seeks to guide communities in the development of "multimodal" solutions to regional mobility problems as contemplated under ISTEA. Integrated environmental analyses must be conducted as well as modal trade-off analyses. Effective cooperation and coordination with the many diverse interest groups becomes vitally important during the evaluation of

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3 Public Law 102-240, 105 Statute 1914.

4 "Statewide Planning; Metropolitan Planning," Final Rules, 23 CFR Part 450, Federal Highway Administration (FHWA) and 49 CFR Part 613, Federal Transit Administration (FTA), Federal Register, Vol. 58, No. 207, Thursday, October 28, 1993, p. 58040.

5 Ibid.

6 Ibid.

alternatives and development of a consensus plan, i.e., adoption of the LPA.

The AA/DEIS study undertaken for the Study Corridor was designed and organized to provide detailed examination, comparison, and evaluation of transportation alternatives in accordance with a comprehensive set of factors. These factors included environmental impacts, ridership forecasts, capital cost, operating and maintenance cost, economic and cost-effectiveness considerations. The factors were defined to determine how well each alternative achieved regional transportation goals and objectives. Performance with respect to the regional transportation goals and objectives was expected to play a major role in the selection of the LPA at the conclusion of the study.

Given changes in the Federal policy regarding the planning and programming of transportation improvement projects, FTA modified its project development process, eliminating the AA/DEIS phase. FTA has permitted local communities to adopt for on-going projects the new approach defined above as a "major investment (corridor or subarea) study." The work activities relating to the AA/DEIS study, which narrowly focused on transit solutions, have been revised in response to changes in Federal policy regarding the planning and programming of major transportation investment projects. The new "Corridor Planning Study" focuses on evaluating multimodal transportation solutions for the Study Corridor. The reorientation of the study focus means temporarily suspending preparation of the AA/DEIS document in favor of a more direct, but less detailed "Evaluation of Alternatives Report," which identifies key trade-offs among potential modal solutions. Draft and Final EIS documents will be prepared subsequent to this activity, during Preliminary Engineering (PE) of the LPA.

1.2 Purpose Of Evaluation Of Alternatives Report

This Evaluation of Alternatives Report is intended to assist community decision-makers in the selection of an LPA for the Study Corridor. The selection of the LPA will include definition of the design concept and scope of the proposed investment. The LPA will be carried into Preliminary Engineering for more detailed definition, examination, and analysis. Physical, operating, environmental, and cost aspects of the LPA will be examined in detail during the Preliminary Engineering phase. As noted above, detailed environmental studies, including the identification of mitigation measures, will be fully documented during Preliminary Engineering, and the DEIS and FEIS will be prepared. All aspects of the transportation infrastructure in the Study Corridor will be reviewed.

The five major components of the purpose and structure of this Evaluation of Alternatives Report are outlined below.

- **Establish Purpose and Need for Project**

  This Evaluation of Alternatives Report is intended to (1) provide adequate understanding of the purpose for a major investment in transportation improvements in the Study Corridor and (2) establish the need for proposed improvements. A summary of the project's purpose and need is provided in Chapter 2.

- **Description Of Alternatives**

  This Evaluation of Alternatives Report contains descriptions or definitions of the alternatives being considered. The definitions of alternatives are those formulated to date through previous efforts associated with the AA/DEIS study. Alternatives being considered within the framework of this Evaluation of Alternatives Report include: a No Build Alternative (i.e., no improvement action undertaken), a Transportation System Management (TSM) Alternative, and two Light Rail Transit (LRT) Alternatives. Chapter 3 presents descriptions of these alternatives.

- **Comparison Of Alternatives**

  This Evaluation of Alternatives Report provides a comparison of the transit improvement alternatives proposed for the Study Corridor. In Chapter 4, the evaluation process is outlined, existing conditions affected by the alternatives are summarized, potentially significant environmental impacts are noted, and other considerations weighing on the selection of an LPA are presented.

- **Decision Framework**

  Chapter 5 of this Evaluation Report presents a comparative analysis of the trade-offs among alternatives, focusing on similarities, differences, and affected interests. Community input and the evaluation of potential impacts is an important part of this project. Information for both of these sources will help ensure that significant social and environmental consequences are considered within an integrated decision-making process.

- **Action Document**

  After public review of this document, the DART Board of Directors will consider the proposed improvements for the Study Corridor. Their decision will be forwarded for action to the MPO, which is the regional transportation planning and policy body, for approval and adoption as part of the regional transportation improvement program (TIP). The process for effecting project implementation is outlined in Chapter 6.

Chapter Two

PURPOSE AND NEED

The Study Corridor currently is served by two major freeways, an extensive grid system of streets and arterials, and a bus system that operates daily in mixed traffic on city streets. Despite the existing transportation infrastructure and planned improvements, significant traffic congestion is anticipated to occur in the Study Corridor between now and the year 2010. Major increases in traffic are projected between now and 2010 along US 75, the major north-south freeway in this radial travel corridor. The expected traffic increase reflects projected growth in residential, commercial, and industrial development throughout the Study Corridor, especially in the cities of Richardson and Plano. In addition, congestion delays are anticipated on many of the arterials. Most arterials are expected to operate at traffic levels of service (LOS) E or F by the year 2010.

Consequently, a number of goals have been established by the DART Board of Directors for transportation improvements in the Study Corridor. These goals focus on the need to improve transit service throughout the Study Corridor, minimize the environmental impacts of these improvements, and promote an equitable use of resources. The purpose and goals of proposed transportation improvement alternatives, as outlined by the DART Board, are:

- Optimize public investment;
- Increase transit usage within the corridor;
- Integrate DART services to provide a high level of mobility to people throughout the DART Service Area in a manner that will offer convenience and safety;
- Reduce congestion on corridor freeways and arterials;
- Minimize adverse impacts to the natural, built, and social environments; and
- Reduce transportation-related energy consumption and resultant air pollution.

2.1 Specific Transportation Problems In The Study Corridor

The 1992 Transportation Improvement Program for the Dallas-Fort Worth Metropolitan Area (NCTCOG, 1992), also known as the TIP, identifies all of the State and local street improvements that are programmed for construction within the next five years, or proposed for the next 20 years. The roadway improvement plans for the Study Corridor in the TIP will provide some additional traffic-carrying capability to respond to the projected population and employment growth. For example, widening the North Central Expressway (US 75) will add capacity to carry an additional 120,000 vehicles per day.

Table 2.1 presents 1990 and 2010 traffic volumes and volume-to-capacity (V/C) ratios[7] for US 75 and the other freeways within the Study Corridor. The table indicates the heaviest average daily traffic (ADT) volumes along US 75 (240,000) will occur between IH-635 and Arapaho Road in Richardson. However, the most significant increase in ADT volumes along US 75 (91%) is expected to occur between Arapaho Road in Richardson and Parker Road in Plano. This increase in traffic reflects the anticipated growth in residential, commercial, and industrial development throughout the Study Corridor, especially in Richardson and Plano.

Table 2.1

FREEWAY TRAFFIC CONDITIONS IN NORTHERN CORRIDOR

Location	1990		2010		Increase	% Increase
	ADT[a]	V/C[b]	ADT[a]	V/C[b]		
North Central Expressway (US 75)						
Northwest Highway - IH 635	133.5	>.9	180	>.9	46.5	35%
IH 635 - Arapaho	135	>.9	240	>.9	105	78%
Arapaho - Parker	97	.8->.9	185	>.9	88	91%
LBJ Freeway (IH 635)						
Preston - US 75	197	>.9	261	<.8->.9	64	32%
US 75 - Abrams	182	.8->.9	244	.8->.9	62	34%
Abrams - Skillman	170	.8->.9	213	.8->.9	43	25%
SH 190 Freeway						
Preston - AT&SF Railroad	N/A	--	72	<.8->.9	--	--
AT&SF Railroad - US 75	N/A	--	83	>.9	--	--
US 75 - Shiloh	N/A	--	63	>.9	--	--

[a] ADT - Average Daily Traffic Volumes (in thousands)
[b] V/C - Volume-to-Capacity Ratio

Source: North Central Texas Council of Governments

A one-way, reversible HOV lane is programmed in the TIP for implementation on US 75; and two-way, concurrent flow HOV lanes are programmed for IH 635. No other transit-related improvements currently are committed for implementation in the Study Corridor. Table 2.1 indicates the freeway V/C ratios will be greater than 0.9 in some locations, reflecting an unacceptable Level of Service (LOS) "E." Thus, unacceptable V/C ratios are expected in spite of

7 Ratio of roadway volume to roadway capacity for a specific time period.

the fact that designs for the widening project on US 75 assumed extension of LRT Starter System to Plano. Should the LRT Starter System not be extended beyond Park Lane, the ability of the freeway to accommodate the anticipated demand would be reduced further.

Congestion delays can be expected on many of the arterials in the Study Corridor. As indicated in Table 2.2, NCTCOG has determined that most arterials in the Study Corridor are expected to operate at V/C ratios of greater than 0.9 by 2010. The projected V/C ratios reflect unacceptable traffic operating conditions by local and national standards.

Table 2.2

ARTERIAL TRAFFIC CONDITIONS IN NORTHERN CORRIDOR

Arterial	Location	1990		2010	
		ADT[a]	V/C[b]	ADT[a]	V/C[b]
Northwest Highway	Preston - Audelia	41-73	>.9	34-73	>.9
Skillman	Northwest Highway - Plano	28-75	>.9	29-85	>.9
Coit	LBJ Freeway - Plano Parkway	30-85	<.8->.9	23-84	>.9
Preston	Northwest Highway - Spring Creek Parkway	14-60	<.8->.9	6-78	<.8->.9
Belt Line	Jupiter - Preston	27-52	.8->.9	11-47	<.8->.9
Alexis	Preston - Belt Line	N/A	--	2	<.8
Polk	Central - Frances	N/A	--	4-9	<.8
Walnut Hill	Preston - Audelia	N/A	--	12-51	<.8->.9

[a] ADT - Average Daily Traffic Volumes (in thousands)
[b] V/C - Volume-to-Capacity Ratio

Source: North Central Texas Council of Governments

The above-described transportation system characteristics and improvement plans form the basis for examination of a number of problems that represent the underlying need for consideration of additional transportation improvements in the Study Corridor. These problems are highlighted below.

- **Peak Hour Congestion on Study Corridor Freeways and Arterial Roads Increases Travel Times and Delays**

  Tables 2.1 and 2.2 clearly indicate that, even with the improvements contained in the TIP, certain sections of freeways and arterials still will experience unacceptable levels of congestion (LOS E or worse). These congestion levels adversely affect mobility and the overall quality of life of area citizens.

- **Limitations of Existing DART Bus System Reduce Opportunities to Meet Travel Demands of Existing and Prospective Ridership, Especially Reverse-commute Trips to Employment Centers in Study Corridor**

  Limitations on the existing DART bus system creates an inequity in the distribution of service. Equity can be defined as the fairness of the distribution of transit costs, benefits, and impacts across various population subgroups. Fairness does not necessarily mean that all subgroups are equally affected. Rather, fairness is determined by the extent to which the costs and impacts of transit service are distributed in a way that is consistent with the community's goals.

  Data from NCTCOG indicate that the trend in the distribution of employment within the Dallas metropolitan area has been movement toward the north. Most of the metropolitan area's major employment centers are located either inside or north of the Dallas CBD. On the other hand, NCTCOG has determined that approximately 43 percent of the working residents in the highly transit dependent area of southern Dallas are working in or north of the CBD. Limited accessibility to employment centers in the Study Corridor reduces employment opportunities for workers living in the south portion of the larger North Central Corridor as well as other portions of the DART Service Area.

- **Existing Land Use Development Prevents Most Major Roadway Facilities in Study Corridor from being Widened**

  Limitations on existing roadway right-of-way (ROW), especially with respect to US 75--the North Central Expressway, prevent the addition of travel lanes that could increase capacity and reduce congestion. Existing and planned development in the Study Corridor utilizes all available property outside of the roadway ROW. Therefore, when the freeway and arterial widening projects identified in the TIP are completed, there will be almost no vacant ROW available for further roadway expansion.

- **Unacceptable Air Quality**

  The Dallas region is in a moderate non-attainment status for ozone (O_3). The level of O_3, carbon monoxide (CO), nitrous oxides (NO_x), and hydrocarbon (HC) pollutants is expected to be reduced in the Study Corridor through a combination of planned transportation improvements and technological advances in the reduction of vehicle emissions. Notwithstanding expectations of reduced pollutants levels, the moderate non-attainment status dictates that attention be given to

further transportation improvements capable of reducing ADT volumes and associated vehicle emissions.

2.2 The Need For Transportation Improvements

The specific transportation problems outlined above suggest the need to effect transportation improvements to (1) meet anticipated demand of the traveling public in the Study Corridor and (2) ameliorate other travel-related problems. Three primary needs for major transportation investments are summarized below.

- **Improve Mobility**

  One of the basic needs within a community is mobility for its citizens. Without mobility, workers are limited in job opportunities, and unproductive time is spent in traveling from one point to another. Significant shifts in the location of jobs within the Dallas metropolitan area have affected accessibility to employment opportunities for many workers. Changes and improvements to the transportation system are necessary to maintain vital, day-to-day social and economic interactions.

- **Reduce Traffic Congestion**

  Limitations on the capacity of existing streets and highways and the ROW available for increasing capacity has created and will magnify congestion delays. Even with the on-going widening of US 75 in the Study Corridor and other planned improvements identified in the TIP, additional capacity and/or service will be needed to achieve acceptable mobility conditions.

- **Increase People-Carrying Capacity**

  As noted above, most freeways and thoroughfares in the Study Corridor cannot be widened to provide more capacity, because existing ROW is severely limited. Therefore, DART needs to consider transit improvements that can provide increased "people-carrying" capacity within the current physical constraints posed by the existing and planned development pattern. Extension of the North Central Line of the LRT Starter System can provide this needed additional "people-carrying" capacity by utilizing surplus railroad ROW.

Chapter Three

DESCRIPTION OF ALTERNATIVES

Alternatives being considered for implementation in the Study Corridor include a No-Build Alternative, a Transportation Systems Management (TSM) Alternative, and two LRT alternatives. This chapter provides a description of each of the alternative transportation improvements being studied. The descriptions identify the physical qualities of the service proposed and a summary of the operating plan. Detailed definitions of each alternative may be found in the Definition of Alternatives Report.[8]

3.1 Range Of Alternatives Considered

Five conceptual alternatives were established to generate discussion and comments during Project Scoping conducted in the Spring of 1992. The alternatives ranged from doing nothing, referred to as the "No-Build" Alternative, to extension of the LRT Starter System as far as the City of Plano at Parker Road, referred to as the LRT/Parker Road Alternative. The No-Build Alternative was defined to include all projects already underway or programmed for implementation, i.e., HOV lanes on LBJ Freeway and US 75 north of LBJ Freeway, roadway improvements in the Study Corridor, and construction of the LRT Starter System to Park Lane. The LRT/Parker Road Alternative, as defined, included all the projects of the No-Build Alternative and added to this base the extension of the LRT Starter System to Plano. These two alternatives effectively bound the opportunities for providing advanced transit services in the North Central Corridor, north of Park Lane. Beyond doing nothing, but short of extending the LRT Starter System to Plano, opportunities were defined for providing a lower level of LRT service or a different type of transit service.

A second LRT alternative was defined to establish the minimum extent to which LRT service could be extended and still be operationally feasible. The Minimum Operable Segment (MOS) is the shortest extension of the LRT Starter System that would preserve the greatest amount of ridership while reducing construction costs and (in some cases) environmental impacts. That is to say, it is the minimum operable "new" segment that can be constructed and operated in a cost-effective manner. Definition of the MOS resulted in an alternative calling for extension of the LRT Starter System to the City of Richardson at Arapaho Road, referred to as the LRT/Arapaho Road Alternative.

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[8] Definition of Alternatives, Corridor Planning Study, North Central Corridor, North of Park Lane, March, 1994, U.S. Department of Transportation, Federal Transit Administration and Dallas Area Rapid Transit.

FTA requires consideration of at least one Transportation System Management (TSM) Alternative. Compared to some fixed guideway alternatives, TSM alternatives can be relatively low cost approaches to addressing transportation problems. They also provide a baseline against which the cost-effectiveness of other more capital intensive alternatives may be evaluated. Two TSM alternatives initially were defined. The TSM-NC HOV Alternative called for constructing two one-way concurrent flow HOV lanes in the median of the North Central Expressway (US 75) south of LBJ Freeway. The two HOV lanes would augment the HOV lanes programmed for construction on US 75 north of LBJ Freeway and on LBJ Freeway. The TSM-SP HOV Alternative, in contrast, called for construction of a two lane, two-way, concurrent flow HOV facility in the DART/SPRR ROW. This facility would originate at the LRT Park Lane Station and terminate at the East Plano Transit Center near Parker Road.

The initial screening of these alternatives led to the definition of less ambitious TSM objectives and a TSM Alternative without additional major HOV facilities south of LBJ Freeway. The screening of possibilities for LRT service led to the definition of an optional approach for development of LRT service. Under the LRT/Parker Road Alternative - Intermediate Capacity, the LRT Starter System would be extended to Plano; however, in the initial phase there would be no stations between Arapaho and Parker Roads and only single-track operations (where possible).

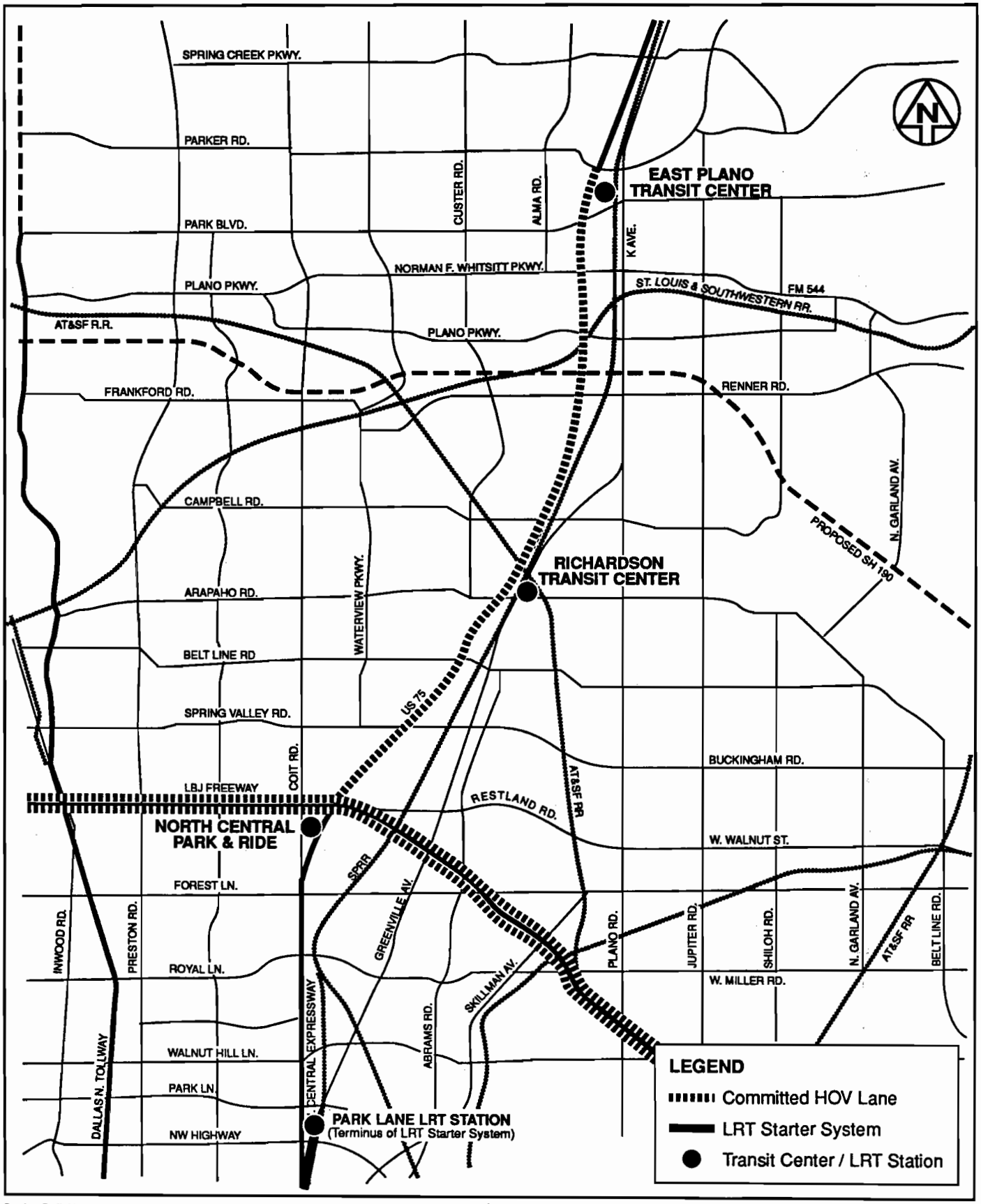
The No-Build, LRT/Parker Road, and LRT/Arapaho Road Alternatives remained essentially unchanged after the initial screening. It was decided to include in the definition of all LRT alternatives the option to reserve part of the DART/SPRR ROW for potential future construction of an HOV facility, provide the cost of developing the LRT system was not affected. This incorporated the key element of the TSM-SP Alternative, leaving a single TSM Alternative focused on the US 75. Descriptions of the final set of five alternatives proposed for evaluation and selection of an LPA are provided in the following sections.

3.2 No-Build Alternative

The No-Build Alternative is examined to determine the impact of not introducing transit improvements to the North Central Corridor, north of Park Lane. Evaluation of the No-Build Alternative also aids in the consideration of whether benefits to be derived from transit improvements are worth the social, economic, and environmental impacts and the associated mitigation costs. Evaluation of the No-Build Alternative is part of the environmental review process and must be given full consideration.

The No-Build Alternative includes only those facilities and services in the Study Corridor that either already exist or are included in the 1992 TIP and committed for construction. Major

NO-BUILD ALTERNATIVE



Source: Definition of Alternatives, March 1994.

Figure 3.1

transit capital improvements programmed for the Study Corridor under the No-Build Alternative are shown in Figure 3.1. Programmed improvements include:

- A one way, reversible HOV lane on the North Central Expressway (US 75) from Parker Road to the LBJ Freeway (IH 635);
- Two way, concurrent operation HOV lanes on the LBJ Freeway from Valley View Lane (proposed SH 161) to East R.L. Thornton Freeway (IH 30);
- The North Central Line of DART's 20-mile LRT Starter System to Park Lane.

The definition of the No-Build Alternative includes: express bus service; local, feeder, and crosstown bus service; and rail transit services (commuter and LRT) already committed to by the DART Board of Directors. Committed DART projects outside the Study Corridor include the other lines of the LRT Starter System and commuter rail from Union Station in Dallas to the transit centers at South Irving and Dallas/Fort Worth (D/FW) International Airport. This overall definition of transit services, as well as the committed highway network, are held constant among all the alternatives.

The bus operating plan for the No-Build Alternative in the Study Corridor represents the bus service expected to be provided in year 2010. No major changes from the FY 92 service levels have been made. It is expected that some small changes will involve the reassignment of vehicles between routes to balance service supplied with demand loads. These changes may include reassignment of buses to relieve routes that are currently experiencing heavy peak load conditions.

The bus operating plan for the No-Build Alternative in the Study Corridor assumes that the current level of bus transit service will increase as the population increases. Accordingly, an increase in vehicle miles of transit service is assumed. A result of this assumption is a decrease in transit schedule adherence, because lower operating speeds will be associated with increased traffic congestion in the future. The No-Build Alternative also assumes continuation of the CBD-oriented, radial bus transit service currently operated by DART. Guidelines derived from service standard policies adopted by the DART Board of Directors for establishing improved bus service are incorporated in the definition of the No-Build Alternative. These guidelines are as follows:

- Continue to provide service to all areas currently receiving bus transit service;
- Expand service consistent with DART's existing policy of servicing new demand;

- Maintain existing service standards and provide more frequent service to the extent warranted by increased ridership;
- Add direct bus service to Study Corridor and non-Corridor major employment areas, with service originating from the transit centers; and
- Provide connecting bus service to the North Central Line of the LRT Starter System.

Details regarding changes in bus routing and schedules may be found in Chapter Three, Definition of Alternatives Report.

3.3 TSM Alternative

The TSM Alternative represents an alternative that seeks to (1) enhance, to the greatest degree practicable, existing and available transit services in the Study Corridor and (2) augment programmed improvements to maximize the operational capabilities and efficiency of regular bus and express bus services now in place.

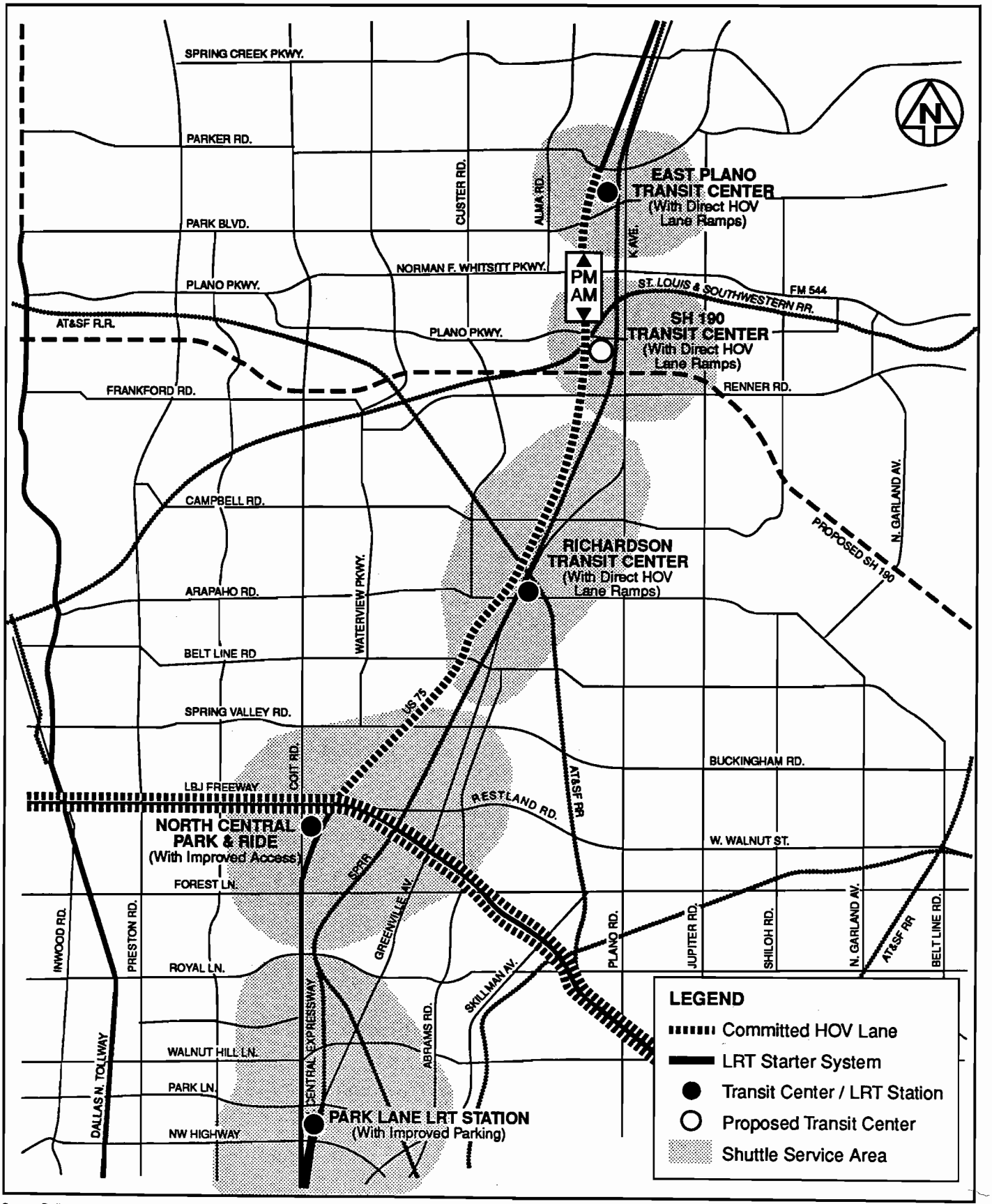
3.3.1 Bus Transit System

Generally, the TSM alternative emphasizes upgrading bus transit service in the Study Corridor through operational and minor physical improvements. Bus transit service improvements would be complimented by roadway improvements that enhance bus operations. These improvements would include: (1) operational and minor physical improvements, (2) selected intersection improvements, (3) limited street widenings, and (4) other focused traffic engineering actions. DART would continue to provide Local Assistance Program (LAP) funds on an annual basis to member cities in the Study Corridor for improvements that enhance bus operations. The bus service policies listed for the No-Build Alternatives are applicable to the TSM Alternative.

This alternative builds on the reversible HOV lane committed for construction on the North Central Expressway north of the LBJ Freeway (Figure 3.2). Bus access to the North Central Park-and-Ride (P&R) facility, south of LBJ Freeway, would be improved. Further, it is proposed that direct access ramps to the HOV lanes be constructed at three transit center locations:

- North of Arapaho Road near the Richardson Transit Center;
- South of SH 190 near the proposed SH 190 Transit Center; and
- North of Park Boulevard at the East Plano Transit Center.

TSM ALTERNATIVE



Source: Definition of Alternatives, March 1994.

Figure 3.2

These new ramps would permit express buses to enter and exit the HOV lane and support expansion of express bus service in the Study Corridor. The additional express bus service would provide direct access to/from downtown Dallas for patrons using the transit centers.

The TSM Alternative also calls for new or enhanced user facilities. These facilities would include: a new transit center to be located near the proposed SH 190 Freeway; improvement of the existing transit center at the North Central P&R facility; and expansion of the Park Lane Station P&R facility to permanently accommodate "end-of-the-line" parking. The Park Lane Station currently is designed only to serve interim demand, on the assumption that the LRT North Central Line will be extended north of Park Lane. The proposed new access ramps to the US 75 HOV lane would be constructed in lieu of extending the LRT North Central Line north of Park Lane.

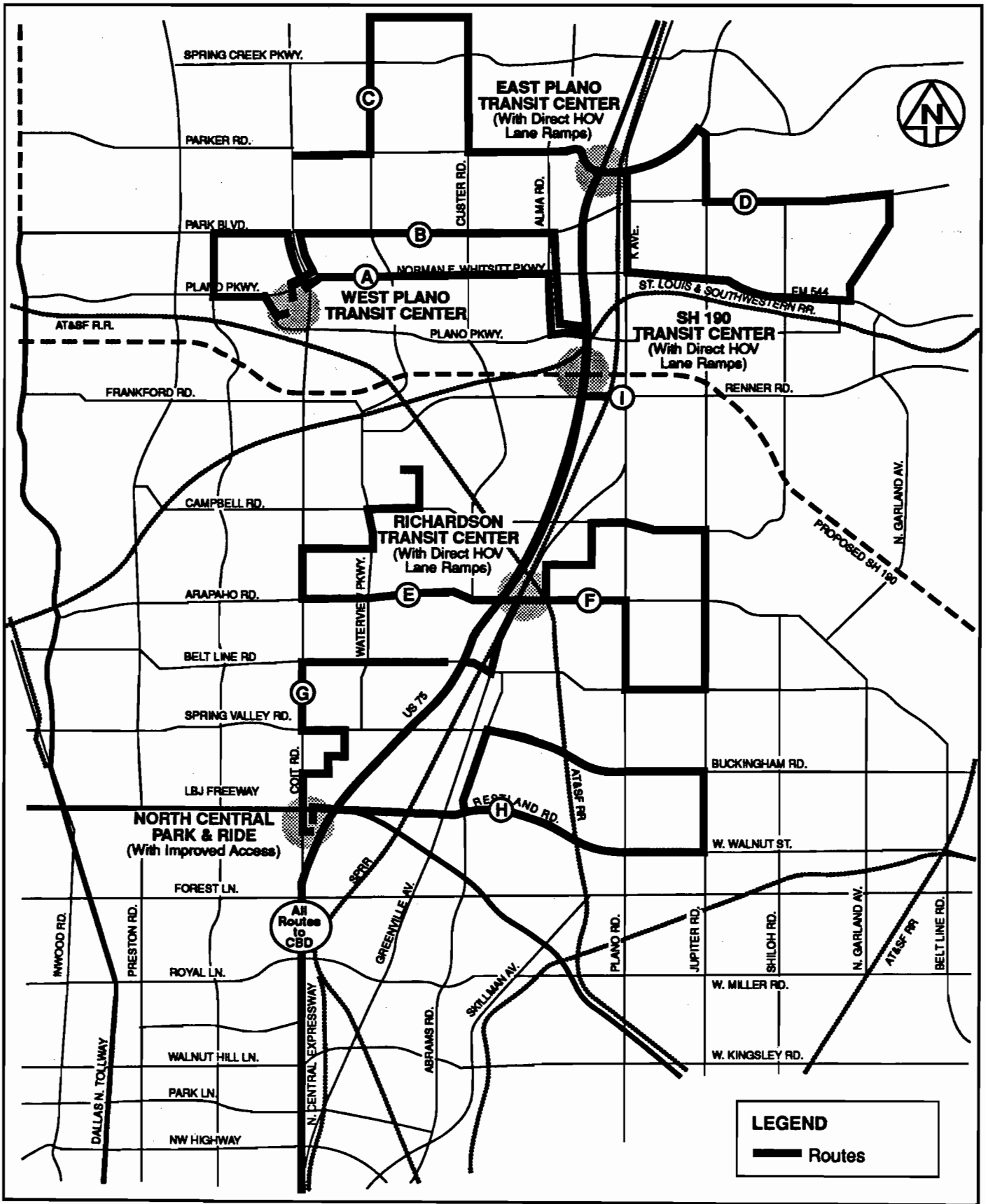
The 2010 bus operating plan assumed for the TSM Alternative includes all local, radial limited, crosstown, and circulator service included in and as defined for the No-Build Alternative. The TSM Alternative assumes, in addition, initiation of seven more express routes and bus circulator routes. Nine new express routes, operating via US 75, would be inaugurated to take advantage of the new direct access ramps to the HOV lane (Figure 3.3). Existing Express Routes 200 and 201 would be dropped, because they duplicate portions of the nine new express routes. The proposed new express routes, designated "A" through "I," would augment service provided by the LRT North Central Line that would terminate at the Park Lane Station.

Circulator route service would operate between the transit centers and major employment areas within the Study Corridor. The new circulator route service would improve the reverse-direction commute for employees working in the Study Corridor and residing in other parts of or outside the Study Corridor. This service generally would operate on short headways for distances of one to three miles around the three bus transit centers and the Park Lane LRT Station (refer to Figure 3.2). This would provide service to a majority of the employment opportunities beyond an acceptable walking distance of the bus transfer facilities.

No new bus maintenance facilities would be necessary as a result of the improved bus service. An allowance for maintenance activity related to adding buses at existing facilities is included as part of this alternative.

Service frequencies would be increased to provide a level of bus transit service considered necessary to satisfy changes in trip-making patterns (e.g., to locations where new jobs are located) and trip volumes between now and the year 2010. As with

TSM ALTERNATIVE - EXPRESS BUS ROUTES



Source: Definition of Alternatives, March 1994.

Figure 3.3

the No-Build Alternative, minor adjustments may be made to bus transit service levels on local, radial limited, crosstown, and circulator routes to optimally redistribute capacity to meet changes in demand. No major structural changes are anticipated in the basic DART bus transit network. Details regarding changes in bus routing and schedules may be found Chapter Three, Definition of Alternatives Report.

3.3.2 Fixed Guideway Transit Improvements

The committed fixed guideway transit improvements assumed for the No-Build Alternative are incorporated in the TSM Alternative. This includes DART's LRT Starter System, particularly the North Central Line to Park Lane, and the commuter rail service, as described for the No-Build Alternative.

3.4 Light Rail Transit Alternatives

Two LRT alternatives have been defined to satisfy travel needs in the Study Corridor. Each represents an extension of the North Central Line of the LRT Starter System within the DART/SPRR ROW, beginning at the Park Lane Station. Definition of the LRT alternatives also acknowledges the potential future development of an HOV facility within the DART/SPRR ROW in addition to LRT facilities. And, each includes the committed and programmed improvements to the existing bus transit and roadway system described for the No-Build Alternative. Some aspects of the bus transit system would vary between alternatives, reflecting the availability of rapid transit (i.e., LRT) services.

This section begins with a description of the key differences between the LRT alternatives being considered. The system and service descriptions are followed by descriptions of the common elements incorporated in the definition of the LRT alternatives, including:

- The vicinities selected for the location of stations (optional station sites have been identified for most station vicinities);
- The supporting bus transit system; and
- Technology, facilities, equipment, and operating policies.

3.4.1 Definition of LRT Alternatives

Definitions of the key physical and operational or service features and characteristics of the two LRT alternatives are provided in the following sections.

3.4.1.1 LRT/Parker Road Alternative

There are two options being considered for extending LRT service from Park Lane to Parker Road in Plano. The LRT/Parker Road Alternative is defined as full development (i.e., construction and operation) of double track LRT service to Plano in accordance with design and operating criteria of the LRT Starter System. The LRT/Parker Road Alternative, therefore, represents a completed system for the Study Corridor. "LRT/Parker Road Alternative" is used throughout this report to refer to this full development option.

The LRT/Parker Road Alternative would constitute a 12.3 mile extension of the LRT Starter System north of Park Lane Station in the Dallas (Figure 3.4). LRT service would operate along the former DART/SPRR ROW from Park Lane through the Richardson to Parker Road in the Plano. This alternative would include a total of eight (8) stations in addition to the Park Lane Station plus a "Special Events" platform at 15th Street in the City of Plano Downtown area.

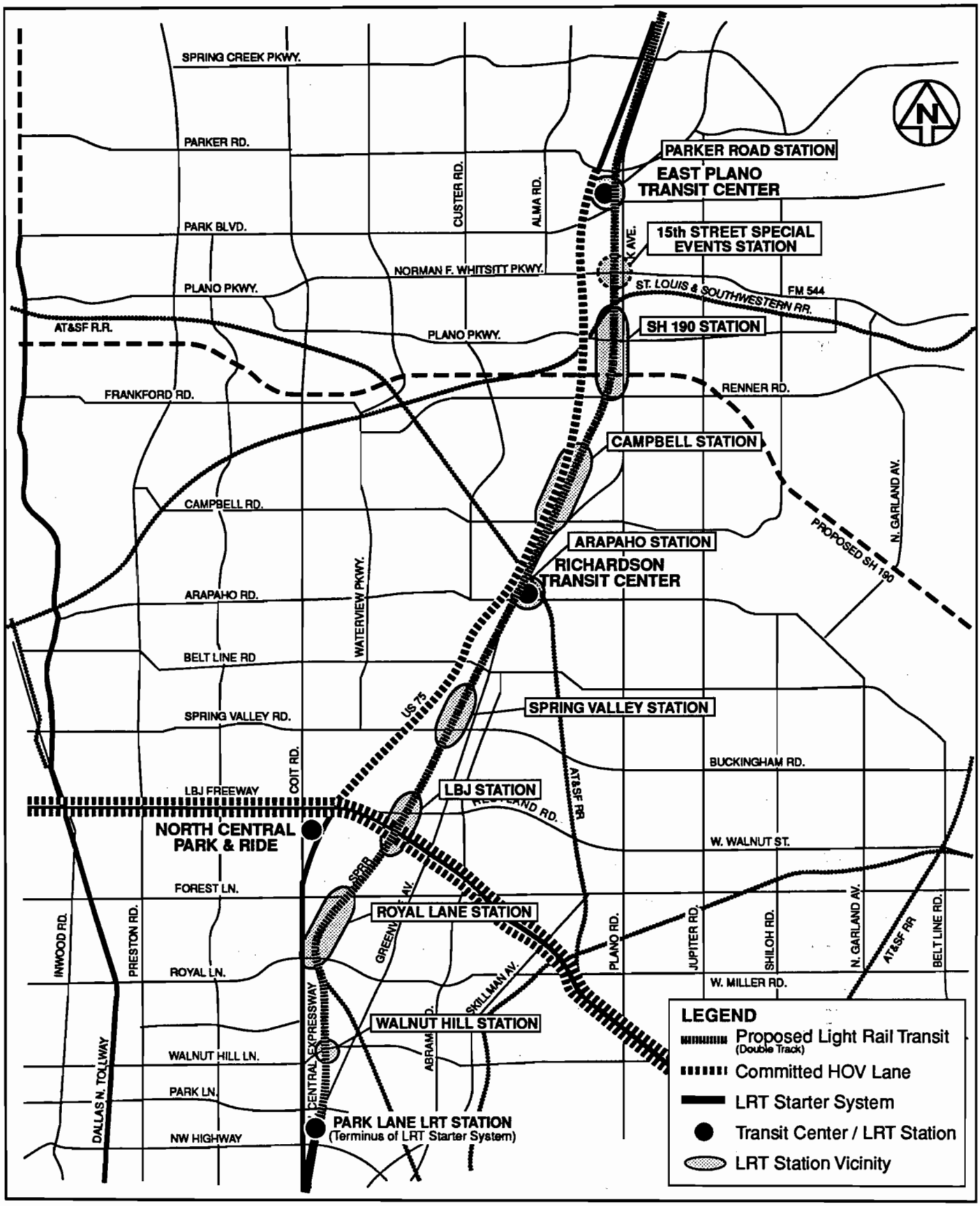
The operating plan for the LRT/Parker Road Alternative assumes an ultimate peak-hour headway of 10 minutes and an off-peak headway of 15 minutes. The LRT system would operate on a double track guideway at a maximum operating speed of 55 miles per hour and have an average low-level platform station dwell time of 30 seconds. The estimated average operating speed between stations is based on LRT acceleration and deceleration rates (3.0 mph/second and 3.5 mph/second, respectively), scheduled station dwell time, and the distance between stations. Table 3.1 displays the initial projected operating speeds between stations for the LRT/Parker Road Alternative. Generally, two-car trains would operate most of the day, with some three-car trains in the peak periods and single-car trains in the evenings.

3.4.1.2 LRT/Parker Road Alternative - Intermediate Capacity

The second option for extending LRT service to Parker Road has been defined in terms of staging LRT system development beyond Arapaho Road. This alternative, referred to as LRT/Parker Road Alternative - Intermediate Capacity, would have no stations between Arapaho Road and Parker Road. Therefore, there would be only six stations beyond the Park Lane Station. North of Arapaho Road, LRT service would be developed to accommodate near-term demand (Figure 3.5).

The operating plan between Park Lane and Arapaho Road would be similar to the LRT/Parker Road Alternative (refer to Table 3.1). Specific features defining this optional approach to providing service to Parker Road are:

LRT/PARKER ROAD ALTERNATIVE



Source: Definition of Alternatives, March 1994.

Figure 3.4

Table 3.1

PRELIMINARY OPERATING PLAN
LRT/PARKER ROAD ALTERNATIVE

Station	Distance (Miles)	Speed (MPH)	Time (Minutes)
Park Lane			0.43
to	0.80	23.56	1.61
Walnut Hill			0.43
to	1.15	31.10	1.79
Royal Lane			0.43
to	1.95	39.90	2.50
LBJ Freeway			0.43
to	1.65	37.38	2.22
Spring Valley			0.43
to	1.65	37.38	2.22
Arapaho Road			0.43
to	1.00	28.36	1.69
Campbell Road			0.43
to	2.40	42.71	2.94
SH 190			0.43
to	1.90	39.52	2.45
Parker Road			0.43

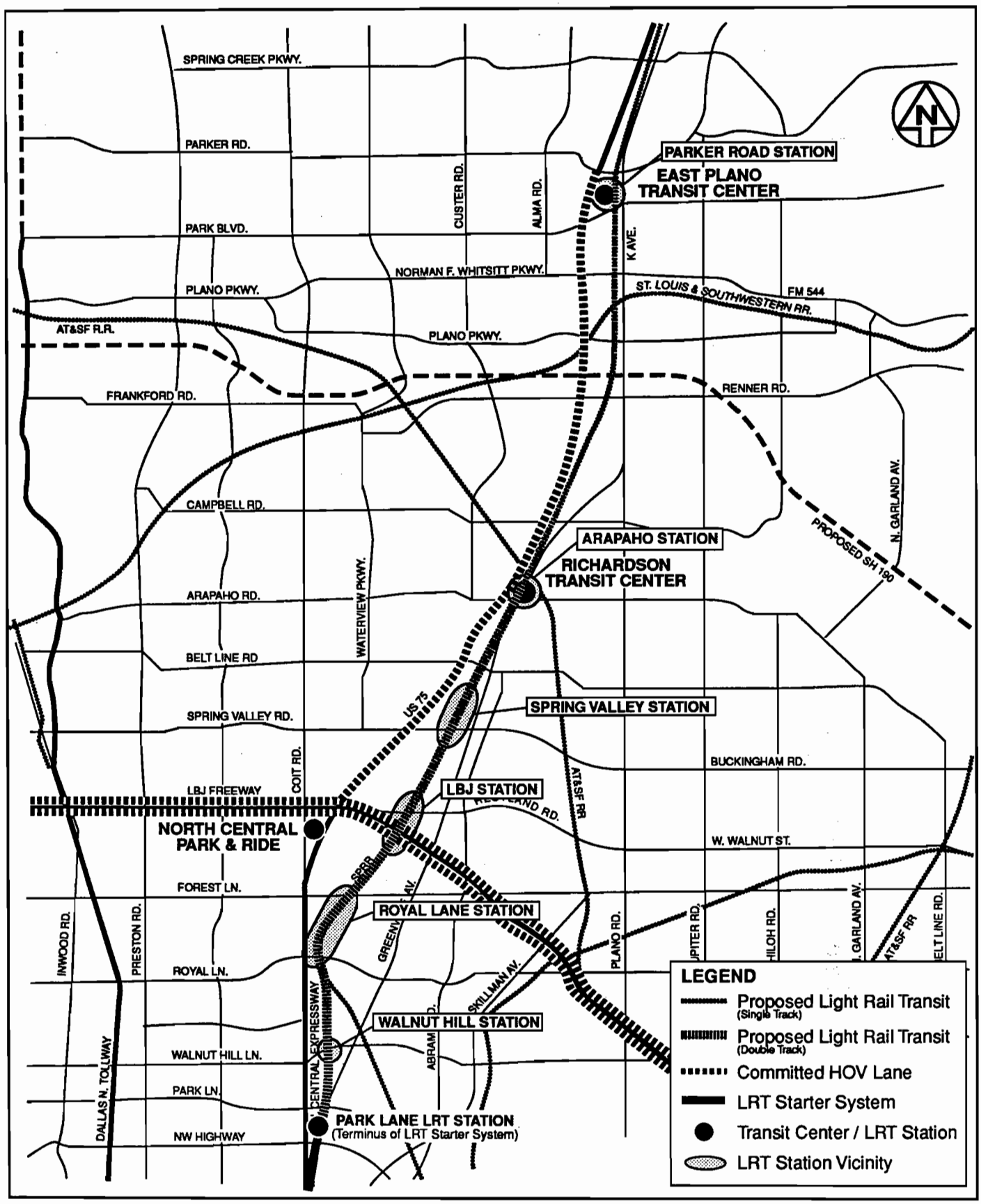
Note: 0.43 Minutes is the scheduled station dwell time.
Source: Table 3.3, "Station-To-Station Preliminary Network Coding Input, LRT Alternative - Parker Road," Definition Of Alternatives, Corridor Planning Study, North Central Corridor, North of Park Lane, March, 1994.

- Use of existing tracks north of Arapaho Road, if possible, requiring single track operations through some segments;
- No intermediate stations between Arapaho Road and Parker Road;
- 20 minute peak headway/30 minute off-peak headway north of Arapaho Road;
- Single platform at the Parker Road Station; and
- Design and construction to accommodate the addition of a second track and intermediate stations in the future, i.e., full development.

The single station site north of Richardson would be an at-grade platform located immediately adjacent the existing East Plano Transit Center bus loading/unloading facilities. The existing park-and-ride and kiss-and-ride facilities at this center would serve the function of the Parker Road Station contemplated under the LRT/Parker Road Alternative.

The LRT/Parker Road Alternative - Intermediate Capacity has been included to permit consideration and evaluation of the cost and

LRT/PARKER ROAD ALTERNATIVE - INTERMEDIATE CAPACITY



Source: Definition of Alternatives, March 1994.

Figure 3.5

ridership impacts associated with the decision initially to provide a minimal level of service beyond Richardson. It reflects the objective of DART to establish LRT service to Plano, while recognizing DART's responsibility for developing the full regional LRT network defined in the Transit System Plan. This option also recognizes that the forecast ridership at intermediate stations (Campbell Road, SH 190, and 15th Street) would be lower with increased LRT operating headways north of Arapaho Road. Developing the LRT/Parker Road Alternative in stages would permit financial resources available to DART to be directed toward the development of other LRT segments, such as the Garland Line.

3.4.1.3 LRT/Arapaho Road Alternative

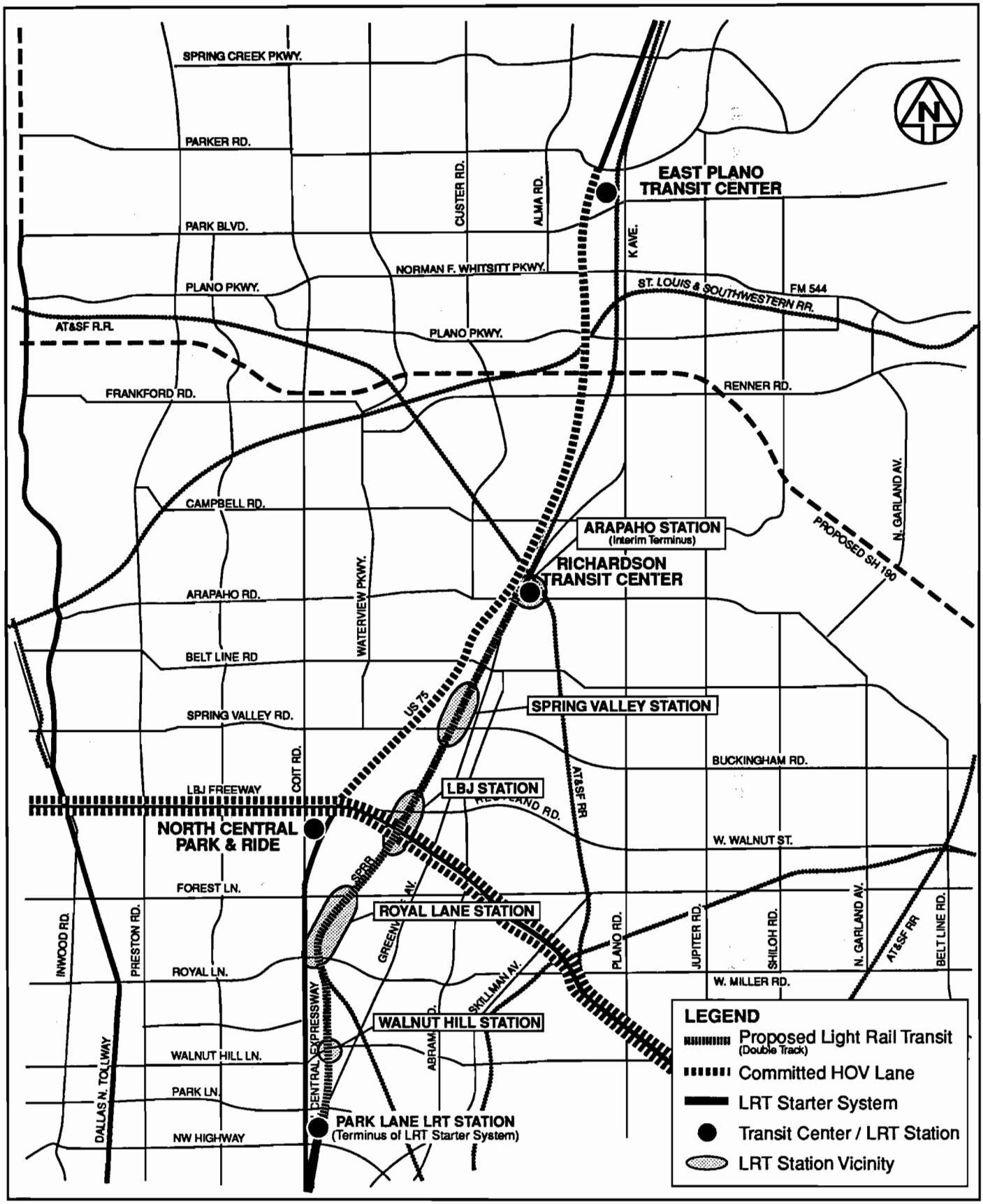
The LRT/Arapaho Road Alternative, also referred to as the MOS, would extend the LRT Starter System only 6.8 miles (Figure 3.6). This LRT alternative would have an identical alignment and station configuration as the LRT/Parker Road Alternative up to Richardson. Service would terminate at Arapaho Road after crossing over Arapaho Road. Because this alternative is shorter than the LRT/Parker Road Alternative, there would be only five additional stations beyond the Park Lane Station. Feeder bus service would operate to/from the East Plano Transit Center and other areas to the north.

The LRT/Arapaho Road Alternative operating plan would be similar to the LRT/Parker Road Alternative, because the operating segment between Park Lane and Arapaho Road is common to both (refer to Table 3.1). The plan assumes an ultimate peak-hour headway of 10 minutes and an off-peak headway of 15 minutes. The LRT system would operate on double track guideway at a maximum operating speed of 55 miles per hour and have an average low-level platform station dwell time of 30 seconds. The estimated average operating speed between stations is based on LRT acceleration and deceleration rates (3.0 mph/second and 3.5 mph/second, respectively), scheduled station dwell time, and the distance between stations. Generally, two-car trains would operate most of the day, with some three-car trains in the peak periods and single-car trains in the evenings.

3.4.2 Station Vicinities

The list of possible vicinities for the location of LRT stations was developed by DART based on projected demand for fixed guideway transit service derived from patronage forecasts prepared by DART and NCTCOG. Optional LRT station sites have been established in the station vicinities identified for the LRT alternatives. Sites have been located within the limits of the recommended station vicinities through application of a comprehensive analysis process. Station platforms would be either at-grade or elevated, depending on the vertical alignment of the LRT tracks within the station vicinities.

LRT/ARAPAHO ROAD ALTERNATIVE



Source: Definition of Alternatives, March 1994.

Figure 3.6

In some cases, alternative vertical and horizontal alignments of the tracks have been considered. Summary descriptions of the alternative station vicinities are provided below (see Figures 3.4, 3.5, & 3.6). Detailed descriptions of station vicinities are available in Definition of Alternatives Report.

- **Park Lane Station** - The Park Lane Station initially would be located directly south of Park Lane. This location would provide an at-grade, interim station for the LRT Starter System. When the LRT Starter System is extended north of Park Lane, the permanent station would be constructed as an aerial station above or directly north of Park Lane. Primarily a commuter station for residential areas east and west of North Central Expressway, the Park Lane Station also would serve nearby commercial areas and activity centers, notably: North Park Shopping Center, Caruth Plaza Shopping Center, and North Park East Office Complex.
  Alternatives: LRT/Parker Road, LRT/Arapaho Road, and LRT/Parker Road - Intermediate Capacity. No-Build and TSM Alternatives would require construction of a permanent Park Lane Station.

- **Walnut Hill Station** - There are three potential sites for the Walnut Hill Station. The Walnut Hill Station would be at-grade directly north or south of Walnut Hill Lane or above Walnut Hill Lane as part of the aerial guideway. Primarily a commuter station, the Walnut Hill Station also would serve nearby commercial areas and activity centers, notably: Walnut Glen Tower, Presbyterian Hospital, Walnut Place Nursing Home.
  Alternatives: LRT/Parker Road, LRT/Arapaho Road, and LRT/Parker Road - Intermediate Capacity.

- **Royal Lane Station** - This station would be located directly north or south of Royal Lane or immediately south of Forest Lane. The Royal Lane Station is a potential commuter station, which would serve residential areas east and west of North Central Expressway. The Royal Lane Station also would serve nearby activity centers, notably: The Forest Park Office Complex, Royal Oaks Country Club, and Medical City Hospital.
  Alternatives: LRT/Parker Road, LRT/Arapaho Road, and LRT/Parker Road - Intermediate Capacity.

- **LBJ Station** - The LBJ Station would be located directly north or south of LBJ Freeway. This station primarily would be a commuter station for originating trips, particularly from the Hamilton Park Community. The LBJ Station also would serve as a destination station serving area employment, including Texas Instruments (TI).
  Alternatives: LRT/Parker Road, LRT/Arapaho Road, and LRT/Parker Road - Intermediate Capacity.

- **Spring Valley Station** - The Spring Valley Station would a grade-separated station located over Spring Valley Road. The Spring Valley Station primarily would be a destination station serving nearby employment, commercial, and residential activity centers, notably: Blue Cross/Blue Shield, a Hotel, Office Complex, Commercial Centers, and a Water Treatment Plant.
  Alternatives: LRT/Parker Road, LRT/Arapaho Road, and LRT/Parker Road - Intermediate Capacity.

- **Arapaho Station** - The Arapaho Station would be located directly north of Arapaho Road or further to the north between Woodall and Monte Blaine. The Arapaho Station would serve primarily as a commuter station, utilizing significant park-and-ride facilities (1,100 parking spaces) available at the existing Richardson Transit Center. This station would provide access to the Richardson Municipal Center and other destinations in the Study Corridor through bus services at the Richardson Transit Center.
  Alternatives: LRT/Parker Road, LRT/Arapaho Road, and LRT/Parker Road - Intermediate Capacity.

- **Campbell Station** - Three potential sites for the Campbell Station have been identified. One is centered on the commercial development fronting on Lakeside, the other two are to the north of this development. This station primarily would be a destination station serving significant existing employment activity, notably: BNR/Northern Telecom, Aetna, The Travelers, Hewlett Packard, Richardson and Hilton Hotels, Texins Credit Union, and numerous other commercial and retail establishments. It also would serve potential future employment and activity centers.
  Alternatives: LRT/Parker Road.

- **SH 190 Station** - The SH 190 Station would be directly north or south of the SH 190 Freeway, west of Plano Road. This station has the potential to be both a destination station, serving future employment and commercial activity centers, and an originating station providing park-and-ride and feeder bus access for areas to the east and west via the SH 190 freeway.
  Alternatives: LRT/Parker Road.

- **15th Street Special Events Station** - This station would be located directly south of 15th Street or half way between 15th and 16th. Both locations offer the opportunity to provide off-peak service for special events, such as Dickens Downtown, the Municipal Band concert series, and productions by the Plano Arts Council. This station also would provide access to Haggard Park in Downtown Plano, the Douglas Community, Plano Municipal Center, and downtown commercial, retail, and service activities.
  Alternatives: LRT/Parker Road.

- **Parker Road Station -** The Parker Road Station would be located between Park Boulevard and Parker Road. This station would serve as the terminus for LRT service, utilizing significant park-and-ride facilities (1,400 parking spaces) at the existing East Plano Transit Center. The station also would serve a wide range of commercial and retail activities situated north and south of Parker Road.
  Alternatives: LRT/Parker Road and LRT/Parker Road - Intermediate Capacity.

3.4.3 Bus Transit System

Separate bus operating plans have been defined for the LRT alternatives. These plans are based on the TSM Alternative's operating plan. Some routes would act strictly as feeder bus service, while others would perform the dual role of feeder bus service plus limited corridor or CBD service. Express bus service paralleling the LRT service would be eliminated. However, other express bus routes, serving areas that cannot be served well by the LRT line or linked to it by new feeder bus service, would be retained. The general framework of the TSM bus service network would be modified for the LRT alternatives according to the guidelines identified above for the No-Build Alternative.

Most bus transit routes in the Study Corridor would be restructured or relocated to feed the LRT service. The feeder bus service proposed for the LRT alternatives would be comprised of a network of 31 circulator and crosstown bus routes providing direct service to LRT stations north of Park Lane. The feeder bus routes would be designed to meet several key objectives:

- Maximize connections with LRT stations in the Corridor;
- Facilitate continued and expanded local bus circulation of each service by linking together primary transit traffic generators (development patterns for the year 2010 were considered during route design) along each feeder bus route; and
- Maximize connections between bus routes in order to maintain regional connectivity.

Proposed service levels on each route have been set to (1) meet anticipated demand in the year 2010 and (2) provide for as many connections as possible between buses and the proposed LRT service. Details regarding changes in bus routing and schedules for each alternative may be found Chapter Three, Definition of Alternatives Report.

3.4.4 Common Elements of LRT Alternatives

As noted above, each alternative is based on extension of conventional the LRT technology of DART's LRT Starter System beginning at the Park Lane Station. There are several other common elements or features between the two alternatives. The common elements or features are the focus of the following paragraphs.

3.4.4.1 Technology

The LRT technology is a proven and mature technology, which consists of a driver-operated, articulated vehicle using an overhead catenary for traction power. For this study, conventional LRT technology is defined as having a capacity ranging from 5,000 to 20,000 passengers per hour in the peak direction. As presently conceived, DART's LRT technology would provide a capacity of approximately 10,000 passengers per hour in the peak direction. Extending the LRT technology would permit at-grade road crossings, be able to negotiate tight radius curves, and be compatible with the concept of a Transitway Mall in the Dallas Central Business District (CBD). The LRT technology would employ a mixture of cab signals, wayside signals, and modified traffic signals.

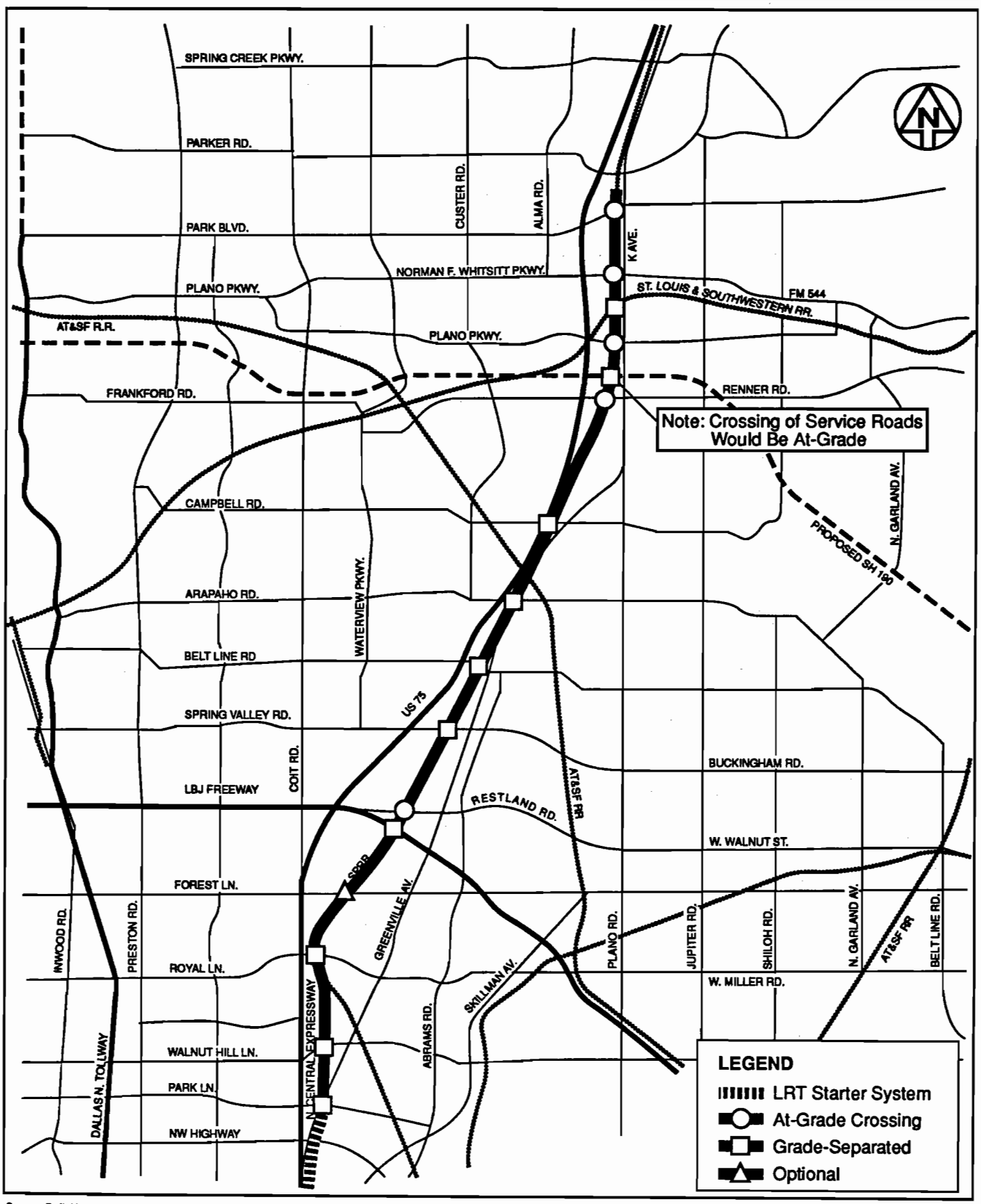
3.4.4.2 Reservation of Part of DART/SPRR ROW for Potential Future HOV Facility

As noted above, each LRT alternative includes consideration of reserving part of the DART/SPRR ROW for an HOV facility in the event it is warranted in the future. In accordance with direction from the DART Board of Directors, the reservation of ROW would be incorporated as an element of the project to the extent that it does not affect the cost of LRT system development. A preliminary evaluation was conducted to determine the cost impacts of shifting the LRT alignment to one side of the ROW to accommodate future construction of an HOV facility. The evaluation revealed an estimated cost impact to LRT system construction of between $2 million and $4 million per mile.

3.4.4.3 Roadway Grade Crossings

The northern terminus or northern-most station for LRT service in the Study Corridor would be the East Plano Transit Center between Park Boulevard and Parker Road. The LRT alignment generally would be located in the middle of the DART/SPRR ROW from Park Lane north to Plano. Street crossings would be at-grade or grade-separated (i.e., aerial or subsurface). Figure 3.7 shows the locations and configurations of grade crossings incorporated in the definition of the LRT alternatives. At-grade crossings would be protected with gates, lights, and warning bells.

LRT ROADWAY CROSSING CONFIGURATIONS



Source: Definition of Alternatives, March 1994.

Figure 3.7

3.4.4.4 Maintenance and Storage Facility Requirements

The maintenance and storage of additional bus and rail vehicles and equipment can be accommodated at existing and/or planned service facilities. The East Dallas Maintenance and Storage Facility would be able to accommodate additional buses. The Service and Inspection (S&I) Facility, now under construction south of the Dallas CBD, has sufficient design capacity to accommodate the additional LRT vehicles. Implementation of one of the LRT alternatives, however, would require construction of additional storage tracks.

3.4.4.5 Operating and Fare Policies

The fare structure assumed for all alternatives and all modes follow the current DART service/operating policies. Fares are calculated according to whether a route offers "local" or "premium" service. Local service is offered on Routes 1 - 77, 82 - 86, and 300 - 400. Premium service is provided on Routes 78, 80, 81 and 200 - 210. Transfers are always free between DART services with one exception. The cash fare difference must be paid when transferring between Hop-A-Bus and regular routes.

It is assumed that a self-service system of fare collection would be used for the LRT alternatives. A self-service fare collection system would require roving fare inspectors to check that passengers have paid the proper fare. Fare vending and validation machines would be available at all stations in sufficient numbers to service expect patronage demand. Standard, automated recording fare boxes would continue to be used on buses. DART policy for current and future park-and-ride lots is to provide free parking for all users of the DART transit system.

Chapter Four

EVALUATION OF ALTERNATIVES

This Evaluation of Alternatives Report is designed to provide community decision-makers with a knowledge and understanding of the primary advantages and disadvantages of each alternative. The principal purpose of this chapter is to provide a framework within which the Study Corridor transit improvement alternatives will be evaluated. The evaluation process focuses on the impacts of each alternative being considered. This permits comparison of the relative impacts among alternatives. This comparative process is based on goals and objectives relating to the planning and development of transportation improvement alternatives in the Dallas metropolitan area. Evaluation criteria defined within this methodology provide a means to weigh out whether the alternatives meet the region's transportation goals and objectives.

Having established the evaluation/decision framework, the bulk of this chapter focuses on relevant technical information bearing on the decision, including:

- Transportation Services and Mobility Impacts;
- Environmental Impacts;
- Equity Considerations; and
- Cost Effectiveness/Financial Feasibility.

Findings and conclusions derived from the technical information presented in this chapter are summarized in Chapter 5, Comparative Analysis of Alternatives. The key attributes of each alternative are compiled and organized in summary form in Chapter 5 to facilitate comparison and evaluation.

4.1 Evaluation Framework

A discussion of project goals and objectives and key evaluation criteria is presented at this point to provide the necessary context for assessing the proposed alternatives. A general, overall decision-making structure also is presented to guide in the evaluation of alternatives.

4.1.1 Study Goals And Objectives

ISTEA directs that changes be instituted in the Metropolitan Transportation Planning Process for major investments. ISTEA frames out a new policy for guiding consideration of proposed major transit investment projects (e.g., LRT) before advancing them through the FTA project development process. In the past, FTA rated major transit investment projects based on narrowly defined cost-effectiveness indices. ISTEA and new implementing regulations require FTA to consider a broad range of evaluation criteria during

the conduct of "corridor" or "subarea" studies. Major investment (corridor or subarea) studies are undertaken to provide a basis for evaluating the effectiveness and cost-effectiveness of alternative investments or strategies in attaining local, State, and national goals and objectives.

The new Joint Planning Regulations published by FTA and the Federal Highway Administration (FHWA) indicate the sponsors of proposed major transportation investment projects now must consider, in addition to cost-effectiveness, the following factors:

- Mobility Improvements (specifically, travel time & travel opportunities, congestion relief, increased mobility for the transit dependent population);
- Social, Economic, and Environmental Effects (specifically, air pollution, noise pollution);
- Safety;
- Operating Efficiencies;
- Land Use and Economic Development (specifically, transit-supportive land use policies and patterns);
- Financing;
- Energy Consumption.[9]

The regulations also indicate that corridor or subarea studies should incorporate, as appropriate, analyses of demand reduction and operational management strategies (OMS).

Chapter 2, Purpose and Need, defined the underlying transportation needs in the Study Corridor. The evaluation framework presented herein has been established to help decision-makers ferret out configurations or combinations of alternative transportation improvements that meet both the underlying needs and purposes of the project, while being cognizant of the objectives of ISTEA. Goals and objectives have been established for guiding the Corridor Planning Study. They are based on goals and objectives adopted as part of the DART Transit System Plan. It is important to note that, the project goals and objectives are derived from DART's mission statement, which reads:

> The mission of Dallas Area Rapid Transit is to build and operate an efficient and effective transportation system that, within the DART Service Area, provides mobility, improves the quality of life, and stimulates economic development through the implementation of the DART Service Plan as adopted by the voters on August 13, 1983, and as amended from time to time.

DART is a regional transit provider and its Service Area extends well beyond the city limits of Dallas. Therefore, the

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[9] "Statewide Planning; Metropolitan Planning," Final Rules.

transportation goals and objectives of NCTCOG and the Cities of Dallas, Richardson and Plano have influenced DART's goals.

The principal objective of the Corridor Planning Study is to identify the most feasible alternative for improving transportation in the Study Corridor. The selected alternative--the LPA--will be analyzed in greater detail during Preliminary Engineering. Project goals providing the framework for evaluating transportation improvement alternatives for the Study Corridor are stated below.

- **Travel and Mobility Goal** - Provide a transportation system within the Study Corridor that meets the Corridor's mobility needs and that is safe, efficient, and coordinated.

- **Environmental Goal** - Provide a transportation system that preserves and enhances the Study Corridor's social and physical environment and that minimizes potential impacts to sensitive resources.

- **Equity Goal** - Provide a transportation system that is consistent with the local community's goals and fairly distributes the system's costs, benefits, and impacts among various population subgroups.

In addition to considerations relating to the achievement of local and regional transportation, environmental, and equity goals, there remains the need to examine the cost-effectiveness of project alternatives. Cost-effectiveness, as applied to major transportation capital investment projects, is defined as the extent to which an alternative returns benefits in relation to its costs.

Generally, the analysis of cost-effectiveness focuses on comparing the "benefit-to-cost" relationship of the higher cost alternative to that of a lower cost alternative. The lower capital cost option of primary interest to FTA is the TSM Alternative. The TSM Alternative usually represents the most cost-effective solution to a given transportation problem, because significant transportation benefits can be achieved without large expenditures for the construction of major new facilities. The TSM Alternative, therefore, serves as a "baseline" against which the benefits and costs of proposed major transit investments are evaluated.

Specific decision-making criteria have been defined for each goal. These are presented in the Sections 4.2 - 4.4 below. Qualitative or quantitative information relating to each alternative has been developed with respect to these criteria to assist in determining differences between the alternatives. The information presented in Sections 4.2 - 4.4 indicates how an alternative performs relative to each goal. Section 4.5 presents capital and operating cost information for each alternative and an assessment of cost-effectiveness and financial feasibility.

4.1.2 Decision Framework

This project has been initiated and carried out to investigate and establish the optimal transportation solution for the Study Corridor. The Transit System Plan, adopted in 1989, recommends the North Central Corridor "have a light rail line on the DART-owned (former Southern Pacific Railroad) ROW between Arapaho Road and Mockingbird Lane."[10] To date, DART has made a commitment to construct and operate the LRT Starter System in three corridors and the CBD. The North Central Corridor is one of the corridors to be served by DART's LRT "Starter System."

This Corridor Planning Study continues DART's investigation of future transit improvements in the Study Corridor. Particular attention has been given to extending the LRT North Central Line north to Arapaho, which is in Richardson, and beyond to Parker Road in Plano. The alternatives defined earlier in this document represent the range of choices for future improvement. These choices must be considered within a logical framework that first addresses regional issues and concerns then directs attention to the specific potential solutions proposed within the Study Corridor. The decision tree presented below displays a series of choices to keep in mind while reviewing the information compiled in this document.

The first decision to be made is whether to move forward with an action to improve travel conditions in the Study Corridor, given the situation outlined in Chapter 2, Purpose and Need. Putting this in the form of a question: Is DART ready and willing to commit more resources toward detailed evaluation of potential transit improvements for implementation in the Study Corridor? If DART determines that no action is justified at this time, there is no further need for planning activity to continue and attention can be focused on other activities for improving transportation in the region. If DART chooses to pursue transit improvements in the Study Corridor, then the next choice is between the two "action" or build alternatives: a TSM Alternative defined as HOV treatments with enhanced express bus service and circulator service or an LRT alternative defined as extending the LRT Starter System north of Park Lane.

The choice to continue planning activities and decide between a low-cost TSM Alternative and a major transit investment (i.e., extension of the LRT North Central Line) is the real focus of this document. The Transit System Plan already specifies that LRT should serve the North Central Corridor at least to Arapaho in the City of Richardson in the near-term. It also notes that "an HOV lane is planned to link North Central Expressway with an HOV lane in LBJ Freeway. It would extend from Parker Road in Plano to LBJ

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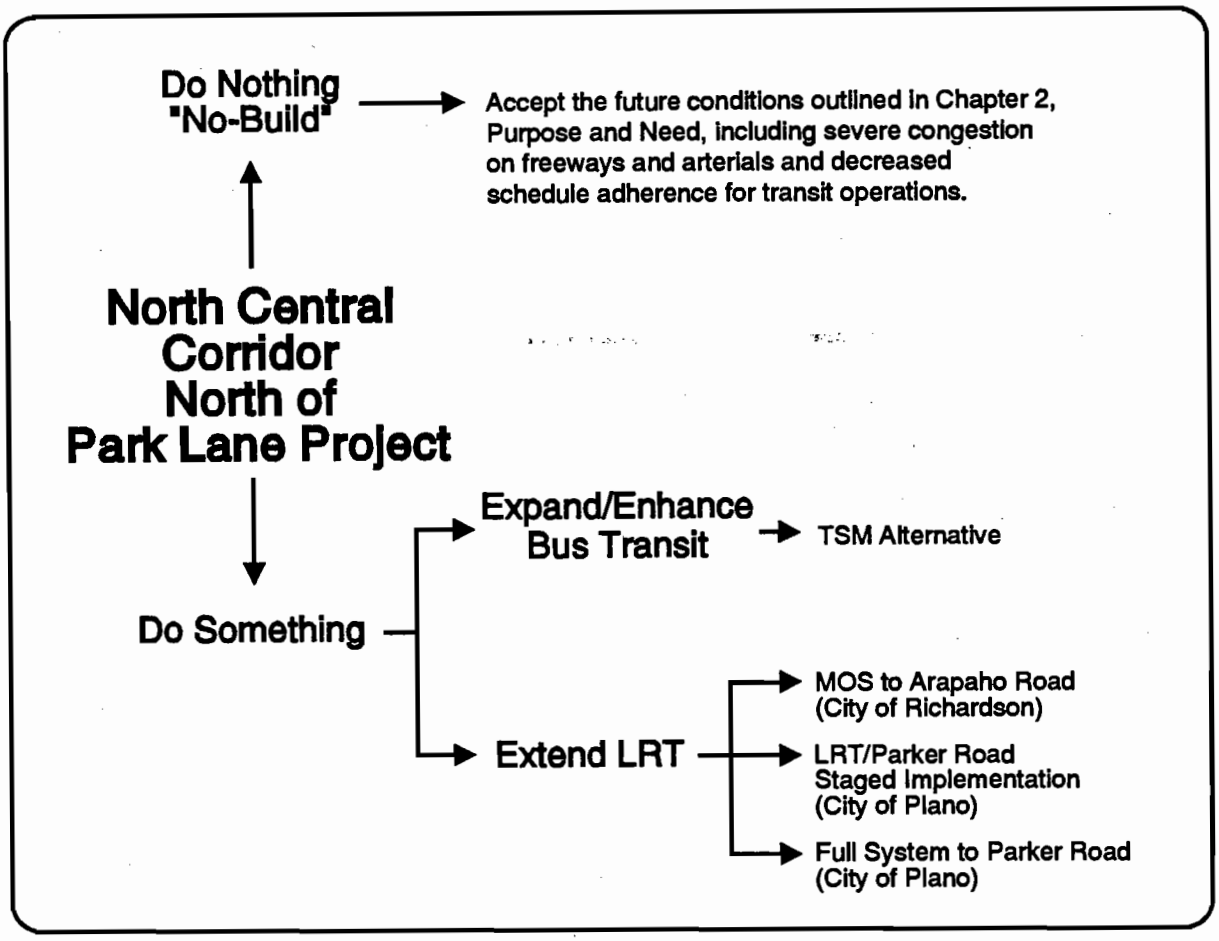
[10] Transit System Plan.



Freeway in North Dallas."[11] Thus, the choice is between:

(1) Holding to the recommendation of the Transit System Plan to extend the LRT Starter System beyond Park Lane as a compliment to the programmed HOV lane, or

(2) Incorporating the programmed HOV lane on the North Central Expressway as part of a TSM Alternative with expanded Express Bus service and developing the Park Lane Station as a major LRT terminus with significantly more accommodations for park-and-ride users.

A decision to move forward with the Transit System Plan recommendation to extend the LRT Starter System will bring up a

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[11] Ibid.

decision concerning the length of the LRT system and the level of service to be provided. Three opportunities for extending the LRT Starter System have been defined.

- As originally defined in the Transit System Plan, LRT service would have been completed to Arapaho Road in Richardson by the year 2005. LRT service would be extended to SH 190 in the post-2005 period. Therefore, the LRT/Arapaho Road Alternative is directly representative of the Transit System Plan. This alternative also represents the "minimum operable segment" for extending the LRT Starter System north of Park Lane. Thus, a decision to implement this alternative recognizes DART has no obligation to develop LRT service beyond Richardson in the near-term future (1997-2005). This alternative does not include a significant, captial intensive transit element to serve Plano; however, the potential for extending LRT service is not precluded by its selection.

- The LRT/Parker Road Alternative calls for extension of the LRT North Central Line from Park Lane to Parker Road in Plano. This goes beyond the recommendation of the Transit System Plan, but has been defined as the primary LRT alternative for the Study Corridor. That is to say, the thinking of DART has been adjusted to reflect the desire to take the LRT North Central Line all the way to the north end of the Study Corridor. This action would anticipate the ultimate LRT service concept embodied in the Transit System Plan and targeted for implementation after 2005. In point of fact, this alternative would extend it somewhat by establishing LRT service north of the propose SH 190 Freeway to North Plano.

- The LRT/Parker Road Alternative - Intermediate Capacity is defined in terms of the staging of LRT service development actions beyond Arapaho Road in the near-term. The staging of LRT service development beyond Arapaho Road would permit DART to advance the timing of LRT service to Plano, while permitting it to simultaneously develop other LRT elements identified in the Transit System Plan (particularly the Garland LRT Line). The LRT/Parker Road Alternative - Intermediate Capacity would result in cost savings for DART, because LRT service would operate on only a single track (where possible) and fewer stations would be constructed.

The LRT alternatives include consideration of reserving part of the DART/SPRR ROW for an HOV facility in the event it is warranted in the future. As noted in Chapter Three, the evaluation revealed an estimated cost impact to LRT System construction of between $2 million and $4 million per mile.

This sequence of decisions is the basic decision framework on which this Evaluation Of Alternatives Report is based. This chapter

presents the results of analyses and investigations regarding the potential impacts associated with implementing the alternatives identified for consideration.

Chapter 5 presents the principal findings and conclusions with respect to potential impacts and an examination of the "trade-offs" related with the choices just discussed. In general, trade-offs are the identified relationships among impacts, affected interests, and alternatives. Trade-offs show the effect of making selected changes in alternatives by displaying how an action designed to achieve an effect in one impact area may have implications for other areas as well. For example, LRT alternatives are designed to provide fast travel times and attract new riders, but the facilities are expensive to construct and operate; this affects the financial feasibility of the project. The examination of trade-offs is particularly valuable when an alternative exhibits strengths and weaknesses in different areas and in differing degrees than other alternatives. The trade-offs analysis provides a basis for decision-makers to weigh the pros and cons of each alternative and, ultimately, determine the desired future course of action.

4.2 Project Effectiveness - Travel and Mobility Goal

The evaluation associated with the Project Effectiveness - Travel and Mobility Goal seeks to determine how well each alternative improves travel times and accessability within the Study Corridor and to/from points outside the Study Corridor. This section presents first a discussion of the existing transportation services in the Study Corridor. This is followed by an evaluation of the effectiveness of each alternative in achieving the travel and mobility goal.

4.2.1 Existing Transportation Services

This section provides a discussion of existing transportation system characteristics in the Study Corridor, identifies current plans for improvements, and presents expected impacts relating to the implementation of the alternatives being considered.

4.2.1.1 Travel Patterns

Data used to determine travel patterns in the Study Corridor are based on information collected in the 1990 U.S. Census. NCTCOG staff expanded this sample "journey-to-work" data to represent the work trip travel patterns throughout the Dallas/Fort Worth urbanized area, including the Study Corridor. There were 567,468 home-based work (HBW) trips associated with weekday travel in the Study Corridor in 1990 (Table 4.1).

This total includes both productions within and attractions to the Study Corridor. Forty-seven (47) percent or 191,133 of the 403,397 trips originating in the Study Corridor were destined for locations within the Study Corridor. Although over one-half of the Study

Table 4.1

1990 DAILY HOME-BASED WORK (HBW) PERSON TRIPS

Trips from the Study Corridor	Total	Trips to the Study Corridor	Total
....to the Study Corridor	191,133		
....to the South	74,297	....from the South	62,506
....to the North	8,687	....from the North	26,296
....to the East	24,791	....from the East	28,939
....to the West	104,489	....from the West	46,330
TOTAL TRIPS	403,397	**TOTAL TRIPS**	164,071

Corridor's work force traveled outside the Study Corridor for employment, an additional 164,076 HBW trips were attracted to locations within the Study Corridor from outside the Study Corridor.

4.2.1.2 Transportation System Utilization

About one percent of the total HBW trips associated with weekday travel in the Study Corridor in 1990 used the public transit system. Thirty-five (35) percent of the transit ridership was going to the CBD, while sixty-five (65) percent was bound for other areas outside of the Study Corridor.

Transit System

The Study Corridor is served by a network of 32 DART bus routes. Bus transit service operates in mixed traffic on US 75 and other Study Corridor roadways. There are six local, eleven express, nine circulator, and six crosstown routes. The "circulator" routes operate between transit centers. There are other bus routes which pass through the southern edge of the Study Corridor on their way to the CBD. The Study Corridor bus network generally is oriented in a north-south direction, radiating from the CBD located to the south. Crosstown service to the suburbs and outlying areas is limited. Ridership on the bus routes operating in the Study Corridor is summarized in Table 4.2.

Highway/Roadway System

The existing highway system in the Study Corridor includes two freeways and a network of arterial roads and local streets. The

Table 4.2

CURRENT STUDY CORRIDOR TRANSIT RIDERSHIP

Average Weekday Ridership	20,662
Average Weekend Passengers	
• Saturday	3,660
• Sunday	504
Total	4,164
Average Monthly Passengers	474,872

Source: Dallas Area Rapid Transit: Service Planning, October 1992.

Study Corridor is bisected by two freeways. The principal freeway is the North Central Expressway or US 75. US 75 is part of a system of highways that radiates from the CBD freeway loop. US 75 runs in a north-south direction and carries an average of 100,000 to 135,000 vehicles per day. US 75 currently is being widened throughout the North Central Corridor. Construction will be completed on the section north of Park Lane sometime during 1995. The section south of Park Lane to the Dallas CBD will be completed by the year 2000.

The other freeway in the Study Corridor is LBJ Freeway (IH 635). LBJ Freeway is a "crosstown," outer loop around Dallas and carries an average of 170,000 to 200,000 vehicles per day. This volume of freeway traffic is the highest in the Dallas urbanized area. Plans are being prepared to widen LBJ Freeway, although the construction period is not set. SH 190 is a second circumferential freeway under construction in the Study Corridor between the cities of Richardson and Plano. The service roads for this freeway have been constructed east of US 75. Construction of the main lanes is not planned until after the year 2000.

A grid-like street pattern exists for most of the Study Corridor. Current weekday traffic volumes for principal roadways within the Study Corridor are shown in Figure 4.1. High traffic volumes contribute to congestion delays. Local and national standards suggest that, if the ratio of actual traffic volume to the theoretical traffic capacity of a roadway exceeds 0.9, traffic operating conditions are considered unacceptable. The volume-to-capacity (V/C) ratios on many arterials in the Study Corridor are at or exceed the 0.9 standard.

All major surface streets in the Study Corridor, except Royal Lane, cross the Southern Pacific Railroad (SPRR) tracks at-grade. This results in traffic delays and safety problems when trains are

EXISTING CORRIDOR TRAFFIC VOLUMES

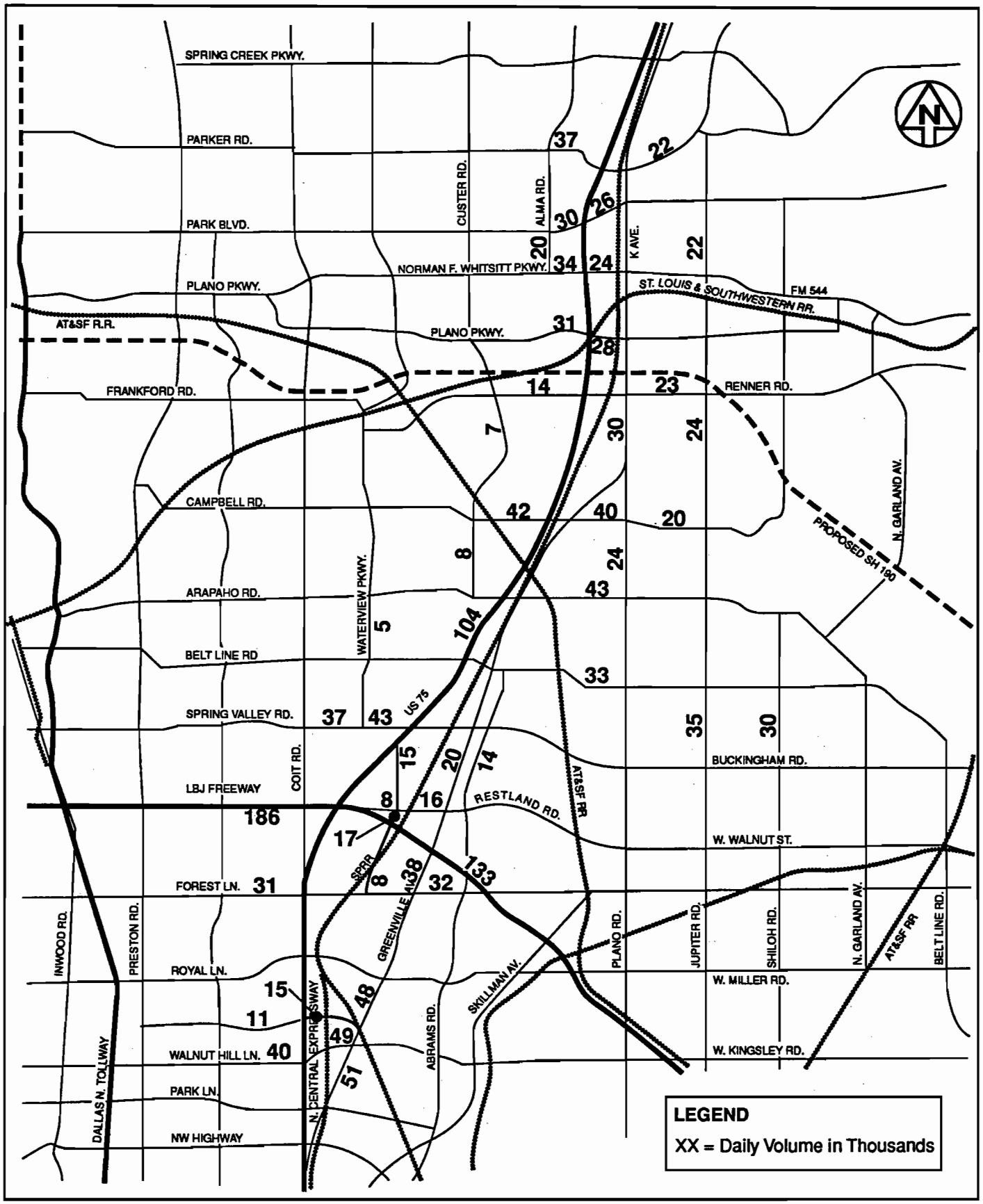


Figure 4.1

operated on the tracks. The SPRR tracks (now owned by DART) are grade-separated at LBJ Freeway. Current design plans for SH 190 indicate the DART/SPRR tracks will the cross frontage roads of this beltline facility (under construction) at-grade, but the tracks will be grade-separated at the main freeway lanes.

Parking

The supply of parking in the Study Corridor generally meets or exceeds current demands. Large activity centers have extensive off-street parking facilities. Parking also is allowed on most minor arterials, collectors, and local streets. Parking is not allowed on principal arterials.

Railroads

At present, there are four active freight rail lines operating through or traversing the Study Corridor (refer for Figure 4.1). All of the rail lines are single track, with no block signal systems. No passenger trains currently use any of these lines. The former Missouri, Kansas, & Topeka Railroad (MKT RR), now owned by DART, is located in the southeast portion of the Study Corridor. No freight trains operate on this line west of LBJ Freeway. Trains delivering construction materials and equipment for DART's LRT Starter System may use the portion of the line west of LBJ Freeway on an occasional basis. Local switching service is provided east of LBJ Freeway by the Dallas, Garland and Northeastern Railroad (DG&NO RR), a short line based in Garland.

The Atchison, Topeka and Santa Fe Railway Company (AT&SF RR) owns and operates a line that crosses the Study Corridor in Richardson. AT&SF RR has contracted to sell this line to the Kansas City Southern Railroad Company (KCS RR). KCS RR anticipates operating approximately six trains daily on this line. This number will be reduced to four trains daily after a connection (referred to as the "Renner V" connection) is completed with the former St. Louis & Southwestern Railroad (S&SW RR or Cotton Belt Railroad) near the campus of the University of Texas at Dallas northwest of the Study Corridor.

The DART-owned Cotton Belt Railroad line runs generally east-west through the Study Corridor in Plano. Except for the one train per day that operates between Addison and the Southern Pacific Transportation Company's Miller Yard on the south side of Dallas, only local switching service is provided on this line. After completion of the" Renner V" connection, at least two KCS RR trains will use the Cotton Belt Railroad line east of Renner.

The DART/SPRR line, parallelling US 75, soon will operate only local trains from Plano south to Richardson to serve customers on a track called the "Arapaho Lead." This area is located south of Arapaho Road and east of Greenville Avenue. By January of 1995, a

connection from the AT&SF RR track will be constructed, and service will be from that line instead of the DART/SPRR line. This action is the result of agreements DART has with AT&SF RR and SPRR. Under the agreements, DART will finance construction of the new connection to relieve the DART/SPRR line of commercial freight train traffic.

It has not yet been decided which railroad will provide service to Arapaho Lead customers or which entity will contract for the construction. Currently, the SP Transportation Company's train running between Addison and Miller Yard uses this line to Plano. This train will soon be temporarily rerouted via the former MKT line, which parallels Denton Drive. The permanent route will be via the AT&SF RR line south of Renner. A train to Dennison, north of Plano, also operates on this line six days per week. The SPRR is in the process of selling the line north of Spring Creek Parkway (the northerly limit of DART's ownership) to a private developer company--Chisolm-Haggard. The through route to Denison will be severed and only local switching service, and possibly a tourist train, will use the line north of Plano.

4.2.2 Travel and Mobility Impacts

The goals adopted by DART and the policy considerations established by ISTEA have served as the basis for defining travel and mobility "effectiveness" criteria. These criteria for measuring the performance of an alternative specifically address travel time and accessibility. Five criteria have been identified as "key" indicators of project effectiveness:

- DART's desire to maximize accessibility is reflected in the number of persons and jobs within a reasonable distance (1 mile) of its services;

- Maximizing ridership is a significant measure of the satisfaction of this goal, which can be measured by estimating the total annual ridership forecast to be served by each alternative and determining the difference among alternatives;

- Travel time changes provide a measure of achievement with regard to enhancing mobility and can be measured by evaluating typical trips to determine the change in time between alternatives to make the trip;

- Savings in travel time reveal a gain in operational efficiency; and

- Changes, specifically reductions, in actual annual vehicle miles travelled (VMT) or the expected rate of growth of VMT, indicate the relative effectivenss of an alternative in obtaining congetion relief.

These and other criteria or measures of effectiveness have been employed to evaluate the Study Corridor alternatives and to ascertain how well each alternative "performs" relative to the criteria identified for consideration.

The TSM Alternative and both the LRT alternatives would foster an increase in transit ridership. The LRT alternatives would reduce transfer requirements about 2 to 3 percent. This would make transit travel more efficient for Study Corridor residents. A discussion of travel/transportation impacts associated with each alternative is presented below.

4.2.2.1 Travel Demand Impacts

Travel demand generally is defined as the initiation of person trips in response to the availability of and mobility provided by various transportation modes. The measures used to evaluate travel demand impacts are based on the different transit networks and operating assumptions defined for each alternative. Thus, the measures provide information on user response to a given set of assumptions regarding characteristics of and service provided by the transit system. The measures of travel demand along with the system supply measures are used for determining system performance and level of service. Table 4.3 presents a summary of the travel demand impact measures, which include linked and unlinked transit trips and passenger miles and hours of travel.

Transit Trips

Transit trips expected to be associated with each alternative were forecast in terms of being "linked" or "unlinked." The forecast of linked transit trips counts all travel from the point of origin to the point of final destination as a single trip, whether or not there was a transfer en route. That is to say, the individual segments of a transit trip involving transfer are "linked" to reflect one complete trip. "Unlinked" trips refers to each individual transit vehicle boarding whether by payment of fare or by transfer. Thus, the various segments of a person's trip remain "unlinked." The number of unlinked trips will always be greater than the number of linked trips. Linked trips provides an estimate of how many people use the system, while unlinked trips provides a measure of the number of persons using each route or mode within the system.

The different measures of transit ridership provide information useful in sizing the required transportation system. Unlinked and linked transit trips have been forecast by mode for each alternative, including: local bus, express bus, and LRT (refer to Table 4.3). Total unlinked transit trips range from 290,600 under the No-Build Alternative to 296,600 under the LRT/Parker Road Alternative. The LRT/Parker Road Alternative - Intermediate Capacity would produce about 2,700 fewer unlinked trips. Rider

Table 4.3

SUMMARY OF TRAVEL DEMAND IMPACTS

Performance Measure	Alternative				
	No-Build	TSM	LRT/ Parker Road	LRT/ Arapaho Road	LRT/Parker Road - Intermediate Capacity
Daily Unlinked Transit Trips					
• Local Bus	197,000	192,600	187,300	187,800	188,100
• Express Bus	47,900	56,000	39,100	41,400	39,400
• Fixed Guideway	45,900	43,500	70,200	64,800	66,400
• Total	290,600	292,100	296,600	292,100	293,900
Daily Linked Transit Trips					
• Fixed Guideway	44,800	42,700	68,700	63,500	65,000
• Total	195,500	196,800	203,600	201,200	201,600
• Added Riders[1]	--	--	5,400	3,500	3,800
Daily Linked Transit Trips by Time of Day					
• Peak	--	135,900	141,100	139,300	139,800
• Off-Peak	--	60,900	62,500	61,900	61,800
Daily Linked Transit Trips by Mode of Access					
• Walk	--	160,200	161,400	160,300	160,100
• Automobile	--	36,600	42,200	40,900	41,500
Daily Passenger Miles					
• Local Bus	641,000	630,800	610,400	614,900	613,900
• Express Bus	601,100	641,900	467,200	509,700	473,800
• LRT	255,700	250,400	509,100	418,000	469,400
• Total	1,497,800	1,523,100	1,586,700	1,542,600	1,557,100
• % Chg Fm TSM	--	--	4.2%	1.3%	2.2%
Annual Net Travel Time Benefit Over TSM					
• Total Hours	--	--	1,536,900	948,800	1,129,100
• Dollars Saved	--	--	$6,082,200	$3,065,600	$4,613,100

[1] Estimate of "Added Riders" assumes the provision of LRT service in the Northeast Corridor.

activity on the LRT/Arapaho Road Alternative and TSM Alternative are forecast to produce the same level of activity (292,100 unlinked trips).

It should be noted that the total number of unlinked trips does not differ significantly among alternatives. The maximum number of trips expected to occur under the LRT/Parker Road Alternative is only two percent greater than the minimum number of trips expected to be produced under the No-Build Alternative. The key aspect of the values shown for unlinked trips is the change in distribution between available modes of travel. Fixed guideway (i.e., LRT) trips under the No-Build and TSM Alternatives would account for about 15 percent of all unlinked trips. Under the LRT alternatives, the share of trips using fixed guideway would rise to between 22 and 24 percent of all trips.

The forecast of trips for the LRT alternatives includes passengers, who access LRT service at stations via automobile, walking, or other manner of travel, and passengers, who transfer from bus transit. Linked transit trips (i.e., bus to rail) are used to determine the number of added riders. By eliminating the effect of transfers on the total number of system users (i.e., counting only "linked" trips), the "net" increase in system ridership can be determined. A comparison of linked trips by alternative shows the expected increase in system ridership would be highest for the LRT/Parker Road alternative. Ridership would increase by 5,400 trips daily, which would be about 54% higher than the shorter LRT/Arapaho Road Alternative (3,500). The LRT/Parker Road Alternative - Intermediate Capacity with 3,800 added riders would be only slightly better than the LRT/Arapaho Road Alternative. Table 4.3 also shows that the increase in transit ridership would be manifested mostly in the Peak period, when congestion problems are greatest.

There would be no significant change in the number of persons accessing transit services by walking. However, the number of persons accessing transit services by automobile (i.e., park-and-ride or kiss-and-ride) would differ noticeably. Automobile access principally represents work or commute trips. Therefore, an increase in automobile access trips would be reflected in reduced vehicle miles of travel on the Study Corridor roadway system and freeways. The travel forecast predicts 36,600 trips would access by automobile transit services provided under the TSM Alternative. Automobile access would increase to 42,200 trips under the LRT/Parker Road Alternative, representing a 15 percent increase. The increase in automobile access trips under the other two LRT alternatives would exceed 10 percent.

Passenger Miles

Passenger miles of travel summarize the total amount of travel by transit riders. Passenger miles are forecast to total 1,497,800 under the No-Build Alternative; the TSM Alternative would increase passenger miles of travel by transit to 1,523,100. The LRT/Parker Road Alternative would bring about a 4.2 percent increase in transit ridership as measured by passenger miles of travel. The

LRT/Arapaho Road Alternative would bring about only a 1.3 percent increase in passenger miles. The LRT/Parker Road Alternative - Intermediate Capacity would be only slightly better, increasing passenger miles of travel by transit 2.2 percent. The longer LRT/Parker Road Alternative would have the least number of local and express bus passenger miles and highest number of rail passenger miles of all the alternatives.

Travel Time

Table 4.3 shows that the LRT/Parker Road Alternative would save existing riders slightly more than 1.5 million hours annually in travel time over the TSM Alternative. This represents a financial benefit exceeding $6.1 million per year (current dollars). The amount of savings gained with implementation of the LRT/Parker Road Alternative is significantly more than either the LRT/Arapaho Road Alternative (948,800 hours and $3.1 million) or LRT/Parker Road Alternative - Intermediate Capacity (1,129,100 hours and $4.6 million).

4.2.2.2 Transportation System Supply Impacts

Transportation system supply measures provide an indication of the amount of service provided by each alternative. Four measures were used to evaluate the differences among the alternatives according to system supply: vehicle miles of travel (VMT), vehicle hours of travel (VHT), vehicle trips, and peak vehicle requirements (Table 4.4).

Vehicle Miles and Hours of Travel

Total vehicle miles and hours provide a measure of the amount of transit service forecast to be supplied on an average day by the different alternatives. A comparison of vehicle miles by alternative shows that VMT associated with the TSM Alternative (122,100 miles) would be greater than that of the LRT alternatives (114,000-116,000 miles). The reason for this is that the TSM Alternative includes a major expansion of express bus service over the No-Build Alternative. Regular, "local" bus VMT would be approximately the same across all alternatives. As expected, rail vehicle miles would be significantly higher for the LRT alternatives.

Similar differences are noted in the comparison of total vehicle hours by alternative. The measure of vehicle hours refers to hours in revenue service. The TSM Alternative would have the highest amount of total vehicle hours (7,960). Again, this would be due to operation of an extensive express bus route system. Express bus hours under the TSM Alternative would be almost 50 percent higher than under the LRT alternatives. In contrast, rail hours would be almost 40 percent higher under the LRT alternatives.

Table 4.4

SUMMARY OF DAILY SYSTEM SUPPLY IMPACTS

Performance Measure	Alternative				
	No-Build	TSM	LRT/ Parker Road	LRT/ Arapaho Road	LRT/Parker Road - Intermediate Capacity
Vehicle Miles					
• Local Bus	72,600	72,600	73,000	73,000	73,100
• Express Bus	32,000	41,800	29,700	30,500	29,700
• Rail	7,700	7,700	13,000	11,400	11,200
• Total	112,300	122,100	115,700	114,900	114,000
Vehicle Hours					
• Local Bus	5,400	5,400	5,500	5,500	5,500
• Express Bus	1,600	2,200	1,400	1,500	1,400
• Rail	400	360	500	500	400
• Total	7,400	7,960	7,400	7,500	7,300
Vehicle Trips					
• Local Bus	7,700	7,700	7,400	7,400	7,400
• Express Bus	1,600	2,100	1,600	1,600	1,600
• Rail	680	700	680	680	600
• Total	9,980	10,500	9,680	9,680	9,600
Peak Vehicles					
• Local Bus	670	670	670	670	670
• Express Bus	300	430	270	280	270
• Rail	40	40	58	52	55
• Total	1,010	1,140	990	1,000	990

Vehicle Trips

The comparison of vehicle trips by transit reveals that the total number of trips under the LRT alternatives would be about eight percent less than under the TSM Alternative. A reduction of local bus trips would result from reconfiguration to provide "feeder" bus service to the LRT service, replacing the extensive express bus route system proposed under the TSM Alternative. Total vehicle trips would be greatest under the TSM Alternative, as there would a more extensive express bus network in the Study Corridor, and this network would feed the LRT service at Park Lane.

Peak Vehicle Requirements

The peak vehicle requirements measure refers to the number of vehicles needed to serve the Study Corridor in the peak period. The peak vehicle requirement excludes extra vehicles on hand as spares or backup vehicles to those actually in operation or revenue

service. Table 4.4 shows that under the TSM Alternative a total of 1,140 bus and rail vehicles would be required during the peak period of travel. The TSM Alternative would have a large number of express buses; 430 express buses would be required to serve the expanded express bus network in the peak period. The number of express bus vehicles would be reduced by 37 percent under the LRT/Parker Road Alternative, while the number of Peak rail vehicles would be increased by about 45 percent. The LRT/Parker Road Alternative would require the least number of vehicles (990). The number of local bus vehicles would remain the same for all alternatives. Overall, the LRT alternatives would reduce peak vehicle requirements by 12-13 percent.

4.2.2.3 Transportation System Performance Impacts

Transportation performance measures represent relationships between travel demand and supply. They reflect the appropriateness of investment in the transportation system by revealing the attractiveness of the proposed system to the user. Thus, the measures show the response of users to the service supplied or the advantage gained by users with system improvements in place. Performance measures for each alternative are shown in Table 4.5.

Table 4.5

SUMMARY OF TRANSPORTATION PERFORMANCE IMPACTS

Performance Measure	Alternative				
	No-Build	TSM	LRT/ Parker Road	LRT/ Arapaho Road	LRT/Parker Road - Intermediate Capacity
Passengers/Vehicle Mile					
• Local Bus	2.71	2.65	2.57	2.57	2.57
• Express Bus	1.50	1.34	1.32	1.36	1.33
• Rail	5.94	5.65	5.40	5.68	5.93
• Total	2.59	2.39	2.56	2.54	2.58
Passenger Trip Length (Linked Trips Only)	7.66	7.75	7.79	7.67	7.72

Passengers Per Vehicle Mile

The passengers per vehicle mile measure reveals the loading of the system of transit services provided for travel by DART. The TSM Alternative would be the least productive service scheme, carrying less thatn 2.5 passengers per vehicle mile. Expansion of the

express bus network would increase vehicle miles almost nine percent over the No-Build, but total transit trips would only increase by less that one percent. The concentration of service that occurs with the LRT/Parker Road Alternative would minimize the overall downward effect associated with expanding transit service in the Study Corridor. This would lead to a more productive system of transit services, carrying 2.56 (plus 7 percent) passengers per vehicle mile. The passengers per vehicle mile ratio of the LRT/Parker Road Alternative - Intermediate Capacity would be the highest (2.58), due to minimizing the miles of vehicle operations beyond Richardson while gaining a significant number of new riders in Plano.

Passenger Trip Length

Although loading of the Study Corridor's transit system would not be dramatic with implementation of the build alternatives, each would provide an additional benefit by increasing the opportunity for travel in the region. This is reflected by the increase in trip length. The LRT alternatives would produce a shift of shorter local and express bus transit trips to the LRT system, resulting in slightly fewer system-wide transfers and longer trips. A slightly greater average trip length would be achieved with implementation of the LRT/Parker Road Alternative, which would extend the LRT Starter System to Plano. Expanding the express bus network, as defined under the TSM Alternative, would result in a slight travel advantage over the other two LRT alternatives.

4.2.2.4 Localized Traffic Effects

The number of areas with localized traffic increases would be fewest under the TSM Alternative compared to the LRT alternatives. The TSM Alternative would not include as many park-and-ride facilities. There would be a new transit center located near the proposed SH 190 freeway and an improved transit center at the existing North Central park-and-ride facility. Both of these locations would experience localized traffic increases associated with additional park-and-ride demand for expanded express bus services. The SH 190 freeway transit center location is the same as the Parker Road Station under the LRT/Parker Road Alternative. However, the increase in traffic would be less under the TSM Alternative, because there would be a lower park-and-ride demand. The Park Lane Station under the TSM Alternative would become a permanent terminus. This would require expanded bus transit (express and local) and park-and-ride facilities to accommodate "end-of-the-line" transfers and parking.

The LRT alternatives would reduce overall travel by automobile. However, localized traffic increases would occur near stations that have park-and-ride facilities. The greatest potential for impact due to park-and-ride activity would occur at stations with the largest parking facilities or the greatest demand for parking.

Increases in traffic volumes associated with park-and-ride activity could have an effect on critical intersections in these station vicinities. Critical intersections are those which have significant influence on traffic flow. Intersections may be deemed critical because of high traffic volumes, inadequate physical design, congestion, or a combination of these deficiencies.

Park-and-ride facilities would be located at the following LRT/Parker Road Alternative stations: Royal Lane, LBJ Freeway, Arapaho Road, SH 190, and Parker Road. A high potential for localized traffic impacts under the LRT/Parker Road Alternative would be associated with the LBJ Freeway, Arapaho, and Parker Road stations. Critical intersections near the Walnut Hill, Spring Valley Road, and Campbell Road Stations would not be significantly affected, because no park-and-ride facilities are proposed for these locations.

Under the LRT/Arapaho Road Alternative, the number of areas with localized traffic increases would be fewer, because there would be fewer stations--five as compared to eight under the LRT/Parker Road Alternative. Only three of the five stations (Royal Lane, LBJ Freeway, and Arapaho Road) would include park-and-ride facilities. These station vicinities would experience greater localized traffic increases, because a greater amount of park-and-ride activity. Nevertheless, the total number of critical intersections affected would be fewer under the shorter LRT/Arapaho Road Alternative. This also would be true for the LRT/Parker Road Alternative - Intermediate Capacity, which would have only the Parker Road Station park-and-ride facilities beyond Arapaho Road.

Implementation of the LRT alternatives also would result in traffic impacts at surface streets, where the proposed LRT alignment (the DART/SPRR ROW) crosses at-grade. An analysis of fifteen at-grade crossings of surface streets between Park Lane and Parker Road was conducted to determine potential operational impacts on traffic and the need for mitigation. The results of the analysis revealed that grade separation could be justified at six at-grade crossings to avoid excessive queue lengths and traffic delay.

4.3 Project Effectiveness - Environmental Goal

The evaluation associated with the Project Effectiveness - Environmental Goal focuses on the degree and character of impacts to the physical, social, and cultural resources of the Study Corridor. The potential for major environmental consequences from the implementation of each alternative was determined through review of available information and minimal field reconnaissance. The purpose of the review was two-fold: (1) determine the general differences in effects, consequences, or impacts between the alternatives being considered; and (2) differentiate between the significance of the different types of effects, consequences, or

impacts anticipated. The following categories of potential impacts were examined:

- Noise and Vibration
- Parklands
- Visual and Aesthetics
- Acquisitions and Displacements
- Air Quality
- Cultural Resources
- Hazardous/Regulated Materials
- Wetlands
- Ecosystems, Hydrology/Water Quality, and Energy.

The review was not conducted at the same level of detail as would be expected in an EIS. The information provided herein will be used as input to further, more detail environmental studies. An EIS will be prepared pursuant to NEPA, during the PE phase of the project.

Impacts should be minimized, if achievement of environmental goals is desired. The goals adopted by DART and the policy considerations established by ISTEA, as cited above, have served as the basis for defining "effectiveness" criteria. Criteria for measuring the performance of an alternative relative to the environmental goal specifically address effects on the physical setting of the Study Corridor. Five criteria have been identified as "key" indicators of project effectiveness:

- The number of noise sensitive sites affected by proposed transportation improvements and the nature of the potential effects provides a measure to determine whether impacts have been minimized among alternatives;

- Alternative transportation improvements could adversely affect or impact parklands, recreation areas, historic or cultural sites, scenic areas, or other resources subject to Section 4(f) review;

- The number of sensitive visual/aesthetic resources affected by proposed transportation improvements and the nature of the potential effects provides a measure to determine whether impacts have been minimized among alternatives;

- The number of displaced residents/homes and businesses provides a measure of the potential impacts on the fabric of the community; and

- Reductions in automobile and bus emissions, as a function of annual VMT indicates the relative improvement of air quality, which is a concern specifically identified in the framework of ISTEA.

These and other criteria or measures of effectiveness have been reviewed to evaluate the Study Corridor alternatives and to ascertain how well each alternative "performs" relative to environmental concerns.

This section addresses these "key" impact concerns and the other major impact categories by presenting (1) a brief description of the existing environmental conditions of the Study Corridor and (2) a summary of potential consequences or impacts associated with the alternatives being considered. The brief picture of the "environmental setting"--the setting within which the proposed action will take place--is provided to give context and perspective to potential consequences which must be recognized in the decision process. More detail regarding the conditions of the affected environment may be found in the "Existing Conditions" Reports prepared for each of the major areas of environmental consideration studied. These reports are available for review at the DART offices.

Information regarding physical environmental conditions and potential environmental consequences is focused within a general Environmental Study Area shown in Figure 4.2. Immediate consequences associated with the alternatives being considered would be most readily apparent and measurable in the Environmental Study Area. The results of the analysis and investigation of potential consequences are presented below in accordance with the categories identified above.

4.3.1 Noise and Vibration

4.3.1.1 Affected Environment

Twenty-one locations within 200 feet of the proposed LRT alignments were selected for obtaining a sample of existing noise levels. Sample monitoring was conducted June 22 through June 24, 1993. The locations chosen included noise-sensitive receivers, such as apartments, houses, a hotel, a hospital, a park, and a day care center. Seven sites were continuously monitored and 14 sites were monitored at 15-minute intervals.

The "typical" magnitude of the day-night average sound level (DNL) value for an urban setting generally is about 65 decibels (dB) on the A-Scale (dBA). DNL represents a measure to estimate the average noise level affecting a receiver. It is computed by averaging the hourly equivalent noise level (L_{eq}) measurements over a 24-hour period. A 10 dB penalty is added to L_{eq} values for the nighttime hours (10:00 pm - 7:00 am) to account for the greater relative impact of sound producing activities when the prevailing ambient noise level is very low.

The DNL noise metric ranged from 59 to 68 dBA at the seven continuously monitored sites. L_{eq} levels at these locations ranged

GENERAL ENVIRONMENTAL STUDY AREA

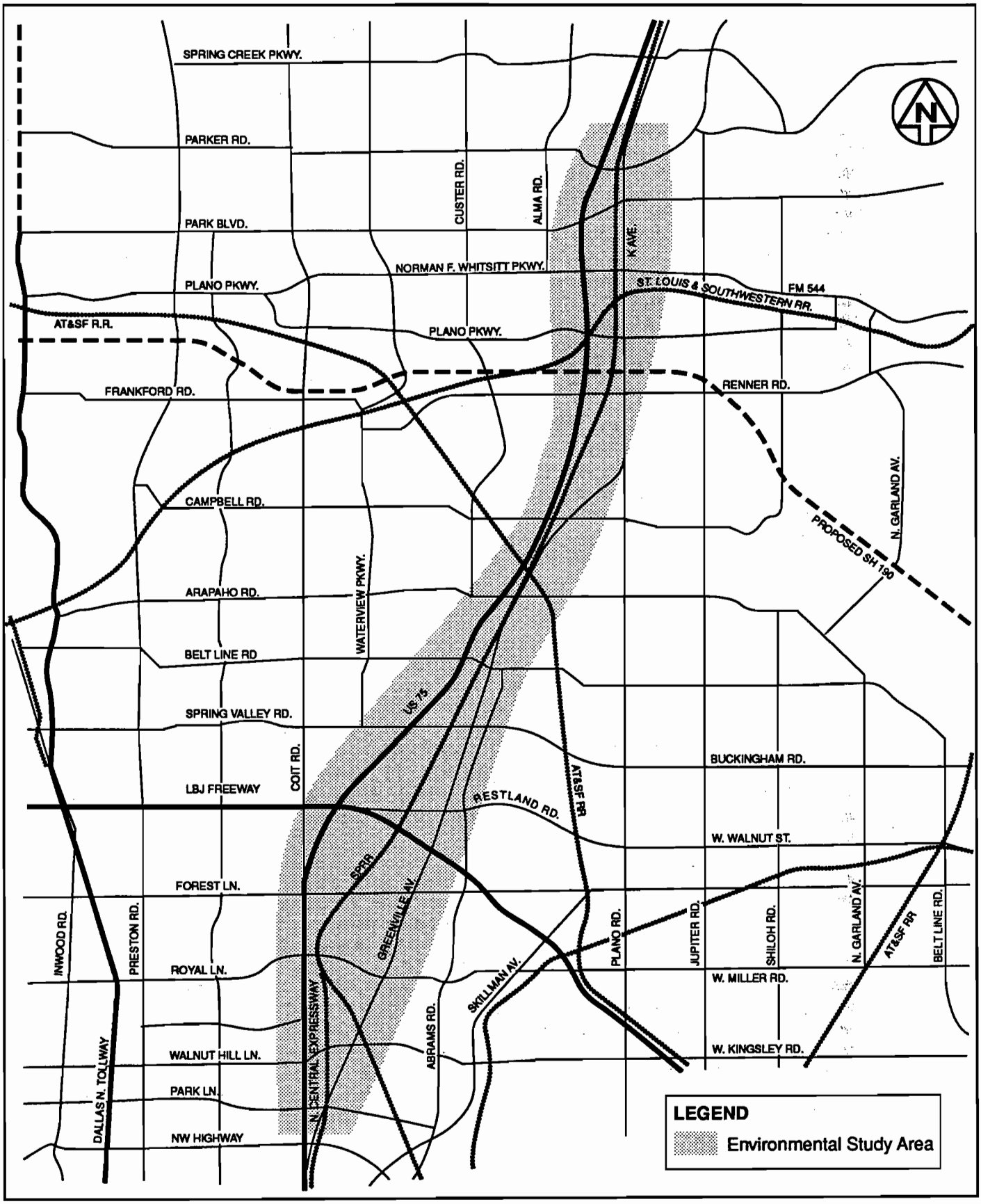


Figure 4.2

from 59 to 71 dBA between 10:00 am and 2:00 pm; 55 to 62 dBA between 4:00 pm and 7:00 pm; and 53 to 65 dBA between 10:00 pm and 1:00 am. L_{eq} levels at the 14 sites monitored at 15-minute intervals ranged between 50 and 71 dBA between 10:00 am and 2:00 pm; 53 and 64 dBA between 4:00 pm and 7:00 pm; and 53 and 65 dBA between 10:00 pm and 1:00 am.

Proposed FTA guidelines do not recommend documenting existing levels of vibration for alternatives analysis purposes, because ground vibration generally is very low unless train activity is present along potential alignments. No recent train activity close to vibration-sensitive receivers has occurred along the portions of the DART/SPRR tracks, which are proposed for use within the definition of the two LRT alternatives. Therefore, no measurements of existing vibration levels were conducted.

4.3.1.2 Potential Noise Impacts

The South Oak Cliff AA/DEIS indicated that train operations had no adverse noise impacts at a distance farther than 200 feet from the track centerline. This spacing was used as a screening distance for review of potential LRT vehicle operation impacts. The noise screening procedure was designed to identify the point at which LRT operations would have little possibility of noise impact. This procedure allows the focusing of further noise analysis on locations where impacts are likely.

No-Build Alternative

Noise impacts associated with the No-Build Alternative would be dependent on the overall noise levels produced by traffic flow on streets and highways, which is highly dependent on the number of vehicles and the speed of the traffic. The type of vehicle has only a small effect unless heavy vehicles or the bus-type vehicle becomes a major percentage of the total traffic mix. Bus traffic would not become a major percentage of the total traffic mix along any of the routes or major traveled ways in the Study Corridor. Thus, little or no change in the noise level would be expected.

TSM Alternative

Noise impacts associated with the TSM Alternative also would be dependent on the overall noise levels produced by traffic flow on streets and highways, which is highly dependent on the number of vehicles and the speed of the traffic. The type of vehicle has only a small effect unless heavy vehicles or the bus-type vehicle becomes a major percentage of the total traffic mix. Bus traffic would not become a major percentage of the total traffic mix along any of the routes or major traveled ways in the Study Corridor. Thus, little or no change in the noise level would be expected. Localized impacts possibly could be associated with ramps constructed for travel to/from the HOV lane on US 75.

The TSM Alternative would include park-and-ride facilities at the proposed new SH 190 Freeway transit center and expanded facilities would be built at the existing North Central park-and-ride facility and Park Lane station. These facilities would be expected to generate additional traffic in the local area. Although the actual extent of new traffic activity is not known at this time, it should be noted that a 100% increase in traffic volume would be expected to increase the noise level by only 3 dBA. This is the level at which an average listener begins to detect changes in noise. Where traffic volumes would be less than double the existing activity, no significant impacts would occur.

There also is the potential for adverse noise impacts from idling buses. This potential exists wherever noise-sensitive land uses are close to the area where the buses load and unload passengers. The number and character of potentially impacted land uses will be analyzed in detail during preparation of the DEIS.

LRT Alternatives

There would be 20 sensitive sites located within 200 feet of the proposed alignment for the LRT/Arapaho Road Alternative (Figure 4.3). A total of 34 sites would be within this distance with implementation of the LRT/Parker Road Alternative and LRT/Parker Road Alternative - Intermediate Capacity. Further noise analysis will be done during preparation of the DEIS and PE to determine which of these noise-sensitive land uses may actually be adversely affected by operation of LRT service in the DART/SPRR ROW. A number of mitigation measures would be available to minimize any adverse impacts identified. Available measures include: use of resilient wheels on the LRT vehicle; installation of continuously-welded steel rail; construction of sound barrier walls along the track in noise-sensitive areas; use of train operating speed limitations where needed; and procurement of quieter vehicles.

Further noise impact analyses would be required to determine the potential impacts associated with HOV lanes within the DART/SPRR ROW. However, it can be concluded that the addition of HOV lanes in the ROW would result in a significant noise level increase. Barrier walls, landscaping, and other noise mitigation treatments would reduce the significance of impact.

All three LRT alternatives include construction or improvement of park-and-ride facilities. The LRT/Arapaho Road Alternative would have park-and-ride facilities at three stations, and the LRT/Parker Road Alternative would have such facilities at five stations. The LRT/Parker Road Alternative - Intermediate Capacity would have four stations with park-and-ride facilities. These facilities would be expected to generate additional traffic in the local area. Although the actual extent of new traffic activity is not known at this time, it should be noted that a 100% increase in traffic

NOISE SENSITIVE LOCATIONS ALONG LRT ALIGNMENT

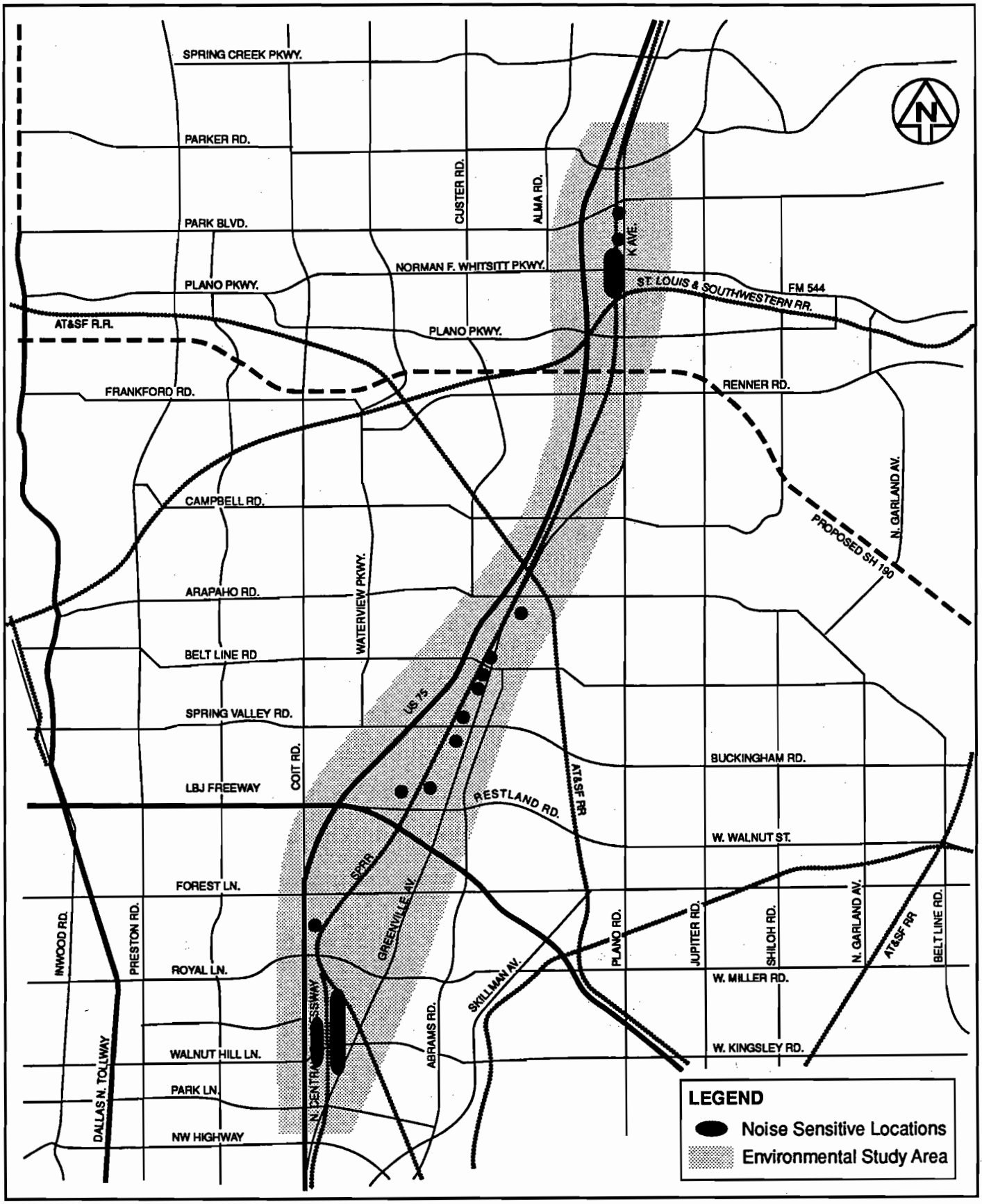


Figure 4.3

volume would be expected to increase the noise level by only 3 dBA. This is the level at which an average listener begins to detect changes in noise. Where traffic volumes would be less than double the existing activity, no significant impacts would occur.

There also is the potential for adverse noise impacts from idling buses. This potential exists wherever noise-sensitive land uses are close to the area where the buses load and unload passengers. The number and character of potentially impacted land uses will be analyzed during preparation of the DEIS.

4.3.1.3 Potential Vibration Impacts

There are a large number of factors that can influence the levels of vibration at the receiver location. The major factors are identified below.

- **Operational factors** - Factors such as high speed, stiff primary vehicle suspensions, stiff track support systems, jointed rail, flat or worn wheels, or worn rail will increase the possibility of problems.

- **Guideway** - The type of guideway, rail support system, and the mass and stiffness of the guideway structure will have an influence on the level of ground-borne vibration. Directly radiated noise usually is the dominant problem from an at-grade guideway although vibration can be a problem.

- **Geology** - Soil conditions have a strong influence on the levels of ground-borne vibration. Vibration propagation is more efficient in stiff clay soils. Shallow rock seems to concentrate the vibration energy close to the surface, resulting in ground-borne vibration problems at significant distances from the track. Factors, such as layering of the soil and depth to water table, generally are considered to have significant effects on the propagation of ground-borne vibration.

- **Receiving building** - Vibration levels inside a building are dependent on the vibration energy that reaches the building foundation, the coupling of the building foundation to the soil, and the propagation of the vibration through the building. The general guideline is that the heavier mass of construction materials used in a building, the lower the response will be to the incident vibration energy.

Detailed analysis, involving evaluation of all these factors influencing vibration impacts, will be conducted during preparation of the DEIS.

No-Build Alternative

Improvements associated with the No-Build Alternative principally would be within the confines of existing transportation facilities. Vehicle operations as a result of these improvements would not be a significant portion of current total vehicle operations. Therefore, no added exposure to vibrations would be expected.

TSM Alternative

Improvements included with the TSM Alternative definition are not well defined, but it is unlikely this alternative would produce significant levels of increased ground vibration. The South Oak Cliff Corridor EIS concluded that the increased volume of traffic associated with TSM elements was insignificant as a percentage of the daily volume. As a result, no significant change in vibration was expected. The same conclusion is expected to be valid for the TSM Alternative for the Study Corridor.

LRT Alternatives

FTA guidelines provide a basis for performing a cursory vibration impact assessment by using screening distances associated with assumed normal vibration propagation. The screening distances for LRT projects are: 450 feet for Category 1 land uses; 150 feet for Category 2 land uses; and 100 feet for Category 3 land uses. Category 1 land uses include vibration-sensitive research and manufacturing buildings, hospitals with vibration-sensitive equipment, and university research operations. All residential land uses and any buildings where people sleep, such as hotels and hospitals, are included in Category 2. Institutional uses, such as schools, hospitals, libraries, and other institutions that do not have vibration sensitive equipment, but still have the potential for activity interference, would be included in Category 3. Each of the noise-sensitive locations shown on Figure 4.4 also may be vibration-sensitive. More detailed analysis will need to be pursued during preparation of the DEIS.

4.3.2 Parklands

4.3.2.1 Affected Environment

There are 16 existing public parklands within the Environmental Study Area (Figure 4.4). They include municipally-owned, public parklands (owned by the Cities of Dallas, Richardson, and Plano) and privately-owned recreational areas. There are four region-serving parks or open space/greenbelts. Three of the parklands are considered to be "community" parks, having significant group-oriented facilities and large natural areas. The remaining nine parklands are considered to be "neighborhood" parks generally 10 acres or less in size.

PARKLANDS

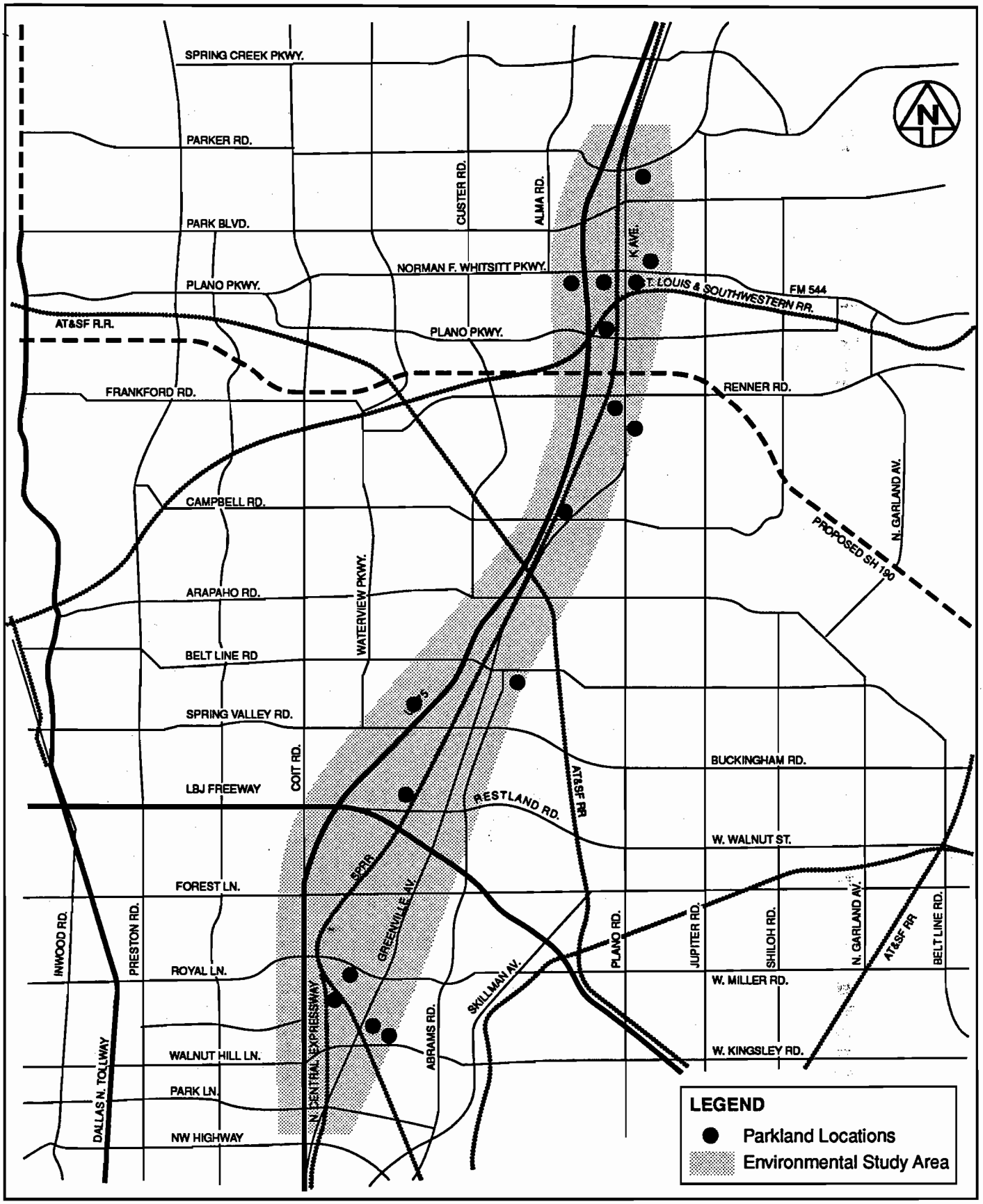


Figure 4.4

4.3.2.2 Potential Impacts

Potential impacts to parklands and open space must be carefully screened to determine whether the impact constitutes a "taking" within the framework of Section 4(f) of the U.S. Department of Transportation Act. If there is a potential "taking," then the significance of the parkland or open space to the community must be determined. A "taking," may be direct or indirect, as discussed above for cultural resources. A determination must be made that there is no other reasonable or practical alternative to the taking, before parkland can be used for a public transportation project.

No-Build Alternative

No impacts would be expected under the No-Build Alternative.

TSM Alternative

The review of potential parkland impacts conducted for purposes of this Evaluation Report, indicated the TSM Alternative potentially could directly or indirectly affect the Spring Creek Nature Area. The extent and character of impacts would depend on final plans for this new transit center to be built near the proposed SH 190 Freeway. Potential impacts to this resource would need to be determined once plans for the TSM Alternative are better defined.

LRT Alternatives

Most of the parklands in the Study Corridor are of sufficient distance from the proposed LRT alignment that no adverse direct or indirect impacts would be anticipated. The LRT alternatives would affect a greenbelt area located adjacent to the alignment in the area north of Royal Lane, where the track crosses White Rock Creek. White Rock Creek and associated right-of-way are under the jurisdiction of the City of Dallas Public Works Stormwater Management Department. The "Leisure Trail," maintained by Dallas Parks and Recreation Department, traverses the eastern side of the creek in this area. The greenbelt, due to its open space qualities and park-like qualities would be a resource subject to review under Section 4(f). Such a review would be carried out during preparation of the DEIS. Impact mitigation measures will need to be defined during PE, respecting any construction activity and structural designs to be associated with crossing the creek.

The Royal Lakes Country Club also is located adjacent to the alignment and this greenbelt area. Royal Lakes Country Club is a privately-owned, members-only golf course. The boundaries of the club property are: Royal Lane and Northwood Park on the north; Greenville Avenue on the east; and the DART/SPRR ROW on the west and south. However, the Country Club, because it is a

privately-owned, members-only organization, is not subject to examination under the requirements of Section 4(f).

Two alignment options for the LRT alternatives are being considered in the area of Royal Lane. The proposed alignment to the east of the existing DART/SPRR ROW likely would require acquisition of a strip of land from the Country Club and necessitate the establishment of new ROW through the greenbelt. Also, some land in the White Rock Greenbelt would be required for station development along with a portion of the Country Club property. The west alignment option would use the existing DART/SPRR ROW, which could involve demolition of an historic bridge (see Section 4.3.6.2). Use of the existing DART/SPRR ROW would preclude the need for Country Club property, but land from the White Rock Creek greenbelt would be required for station development.

Both the Country Club and greenbelt would be considered noise-sensitive receivers. They are located within the 200-foot screening distance of both alignment options. Therefore, noise impacts are possible. Significant, adverse noise impacts on the greenbelt could be considered a "taking" under the guidelines of Section 4(f). Further noise analysis would be conducted during preparation of the DEIS to determine if these resources would be adversely affected by noise levels produced from LRT operations. Mitigation measures would be identified to minimize adverse impacts.

Negative visual impacts to these recreational/open space areas also would result from installation of the LRT catenary and stations. Incorporation of mitigation measures into the design of the LRT system elements would minimize adverse impacts. For example, a low-profile catenary can be installed to help minimize the visual impact of the LRT electrification system. The station and associated facilities also can be designed to fit in with the area, and landscaping can be used in the station area to increase its aesthetic appeal.

The Spring Creek Nature Area in the City of Richardson would be adjacent the alignment for the LRT alternatives. This is a City of Richardson dedicated park, containing 51 acres of woods and 1.25 miles of trail. The Spring Creek Nature Area extends along Spring Creek between North Plano Road and the DART/SPRR ROW. It would be subject to the provisions of Section 4(f). The area also is within the 200-foot noise impact screening distance, and visual impacts also are a matter for concern. Impact mitigation measures for this open space resource would need to be considered during PE.

Alignment of the LRT/Parker Road Alternative and LRT/Parker Road Alternative - Intermediate Capacity would be just east of Haggard Park in downtown Plano. Haggard Park is a 4.9 acre site, owned by the City of Plano. The park contains a children's playground, a pond, the Interurban Building with Museum and train car, and picnic

areas. The review of impacts to this park would be subject to the provisions of Section 4(f). Like the greenbelt and country club near Royal Lane, Haggard Park is located within the 200-foot screening distance for determining whether noise impacts would occur. If it is determined during the EIS process that adverse noise impacts would occur, mitigation measures could be defined to minimize impacts. In addition, potential visual/aesthetic impacts from the LRT system elements must be considered. Mitigation measures, such as those discussed previously, may need to be recommended.

4.3.3 Visual and Aesthetics

4.3.3.1 Affected Environment

Significant visual/aesthetic resources along alternative LRT alignments have been identified through a review of planning reports and a "windshield" survey of the Environmental Study Area. Generally, significant visual/aesthetic resources include historic structures, parklands, and undeveloped open space. In addition, sensitive receptors, i.e., areas or users affected by changes in the visual/aesthetic quality of the adjacent area, have been identified. The primary sensitive receptors of concern are residential areas adjacent to the alignments. The localities of sensitive visual/aesthetic resources and receptors in the project area are shown in Figure 4.5.

4.3.3.2 Potential Impacts

No-Build Alternative

There would be no significant visual/aesthetic impacts associated with the No-Build Alternative.

TSM Alternative

The TSM Alternative could impact the visual/aesthetic setting anywhere direct access ramps to the HOV lane would be located. Impacts would be more significant near sensitive visual resources or receptors. In addition, negative visual/aesthetic impacts could be associated with development of the new transit center near the proposed SH 190 Freeway, improvement of the existing North Central park-and-ride facility, or expansion of the Park Lane Station park-and-ride facility. However, mitigation measures (such as landscaping and designing facilities to fit in with the surrounding community) may be employed to minimize potential visual/aesthetic impacts under the TSM Alternative.

LRT Alternatives

Although the LRT alternatives incorporate the existing DART/SPRR ROW, there are several physical features unique to the

VISUAL / AESTHETIC RESOURCES

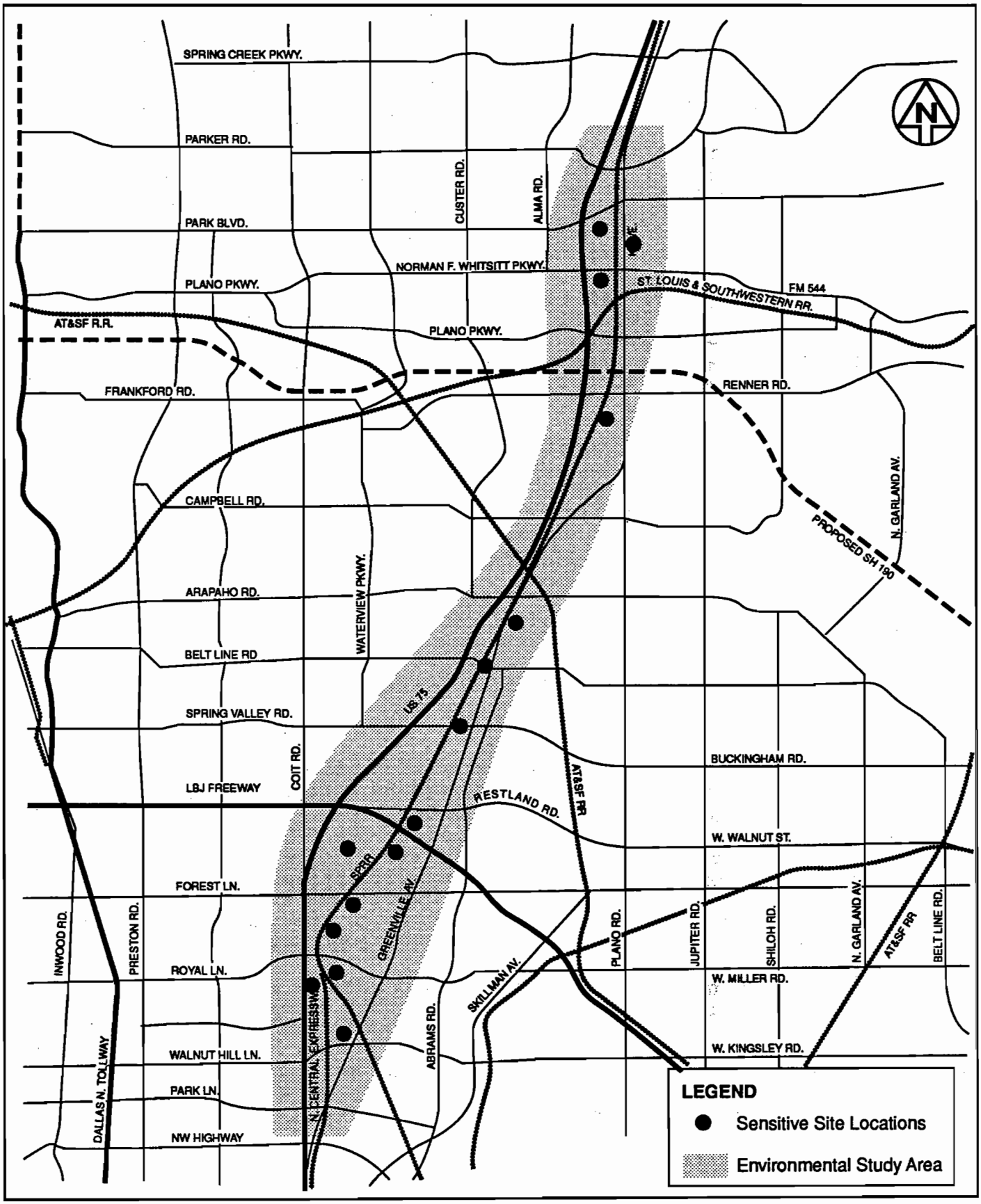


Figure 4.5

LRT technology that potentially could be significant with respect to the visual/aesthetic setting of the Environmental Study Area. Physical features that could cause negative visual/aesthetic impacts include: catenary, poles supporting the catenary, and other wires and supports associated with LRT power requirements. Station platforms and other features associated with the stations and transit centers (e.g., canopies, electrical transformers, parking areas, etc.) also can negatively affect the visual/aesthetic environment. In certain locations, aerial guideways may be constructed to facilitate the crossing of major roadways. Aerial guideways would have a significant effect on the visual/aesthetic environment.

The LRT vehicles/trains themselves would project a different look than the SPRR locomotives and trains that operate along the proposed LRT alignments. However, because they generally would be perceived as more modern, cleaner, and quieter than the existing trains, LRT vehicles/trains probably would not be viewed as negatively.

Incorporation of mitigation measures into the design of the LRT system would minimize adverse visual impacts. Several of these measures were noted above in the discussion of cultural resources. Stations and associated facilities can be designed to fit in with the character of the community or the surrounding neighborhood. Landscaping can be incorporated into station site design/layout to increase aesthetic appeal. The visual impacts of the aerial guideway can be reduced by minimizing the size of support columns, maximizing the span lengths between columns, and installing a guideway which is of uniform color and texture.

4.3.4 Acquisitions and Displacements

4.3.4.1 Affected Environment

Federal law provides for the relocation and assistance of residents or businesses that may be displaced by Federally funded community infrastructure improvements. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) mandates uniform and equitable treatment of all displaced persons or businesses, including assistance with relocation services. DART would be required to comply with the Federal relocation assistance law in compensating any businesses or residents that may be displaced as a result of the required acquisitions.

In addition, USDOT Regulation 49 CFR Part 24 addresses relocation planning for displaced businesses. This Regulation requires that a detailed analysis of commercial displacements be performed after the LPA is selected. Estimated relocation costs are based on Federal guidelines and include: costs for moving expenses; direct loss of tangible personal property not to exceed an amount equal to the reasonable expenses that would have been required to relocate

such property; reasonable expenses in searching for a replacement business; displacement payments equal to the average annual net earnings but no less than $2,500 and no more than $10,000; and cost of land/building as determined by an appraiser. DART would be required to comply with this Regulation assisting displaced businesses or residents.

4.3.4.2 Potential Impacts

No-Build Alternative

There would be no acquisition/displacement impacts associated with the No-Build Alternative.

TSM Alternative

Some land acquisition would be required to increase the size of park-and-ride facilities under the TSM Alternative. An estimate of property acquisition requirements has not been prepared, but the requirement would be roughly comparable to those shown below for the Arapaho and SH 190 Stations. In addition, land would be required at Park Lane, which would be the LRT Terminus, under the TSM Alternative.

LRT Alternatives

Although the principal alignment for LRT service alternatives would be within the DART/SPRR ROW, some linear ROW requirements would exist where the existing ROW is of insufficient width. These requirements have not been determined and must await greater design detail to be developed during Preliminary Engineering. Alignment ROW requirements are not considered to be significant. The acquisition of additional ROW would be required to develop LRT stations. A preliminary estimate of station ROW requirements has been prepared and is shown below:

Station	Right-of-Way Requirements
Arapaho	62,800 sq. ft.
Royal Lane	366,000 sq. ft.
LBJ Freeway	471,200 sq. ft.
SH 190 (LRT/Parker Road only)	284,800 sq. ft.

4.3.5 Air Quality

4.3.5.1 Affected Environment

The Dallas/Fort Worth (D/FW) urbanized area currently is in attainment status for all criteria pollutants except ozone. The region is classified as a "moderate" nonattainment area for ozone.

It is important to note that during the past decade the number of times the ozone level exceeded Federal standards has decreased significantly from a high of 21 exceedance days in 1983 to four exceedance days in 1992 and 1993. Most of the exceedances have occurred in areas south and west of the Study Corridor. Records available from the two air monitoring stations closest to the Study Corridor indicate there were no exceedances of the ozone standards during 1992 (the most recent data available).

4.3.5.2 Potential Impacts

Air quality impacts of the alternative transit improvements proposed for the Study Corridor were determined not to be significant, when viewed independently from regional air quality concerns. However, the contribution to regional air quality, whether by way of improvement or degradation, is considered important. Each of the alternatives would contribute to reduced pollution, because some person trips by automobile will be attracted to new public transit services encourage travelers to leave their automobiles and ride transit. All proposed alternatives would be a positive effort to reduce the total amount of vehicle miles traveled in the Study Corridor and, therefore, the amount of pollutants.

No-Build Alternative

Some improvements in mobility would come with the projects outlined under the No-Build Alternative. Mobility improvements would be translated into transportation efficiencies and aid slightly efforts to maintain regional air quality. However, increasing congestion in the Study Corridor, resulting from increasing travel, ultimately would impede traffic flow and bring about further deterioration of air quality.

TSM Alternative

The TSM Alternative would bring about a reduction in automobile vehicle miles of travel through expanded express bus transit service. This would be beneficial to regional air quality. However, several hundred more buses would be operating in the Study Corridor, and the problems associated with diesel fuel emission would need to be addressed.

LRT Alternatives

The LRT/Parker Road Alternative would have the highest transit ridership when compared to the other alternatives; therefore, it would be expected to have the greatest positive benefit to regional air quality. Also, as noted above in the discussion of mode share, this alternative would attract a slightly greater commuter travel (i.e., home-based-work trips). It is possible that localized carbon monoxide (CO) "hot spots" could occur, due to localized

increases in traffic in the vicinity of LRT stations with expanded park-and-ride lots. At intersections where hot spots are anticipated, mitigation measures (e.g., widening of intersections or installation of left-turn signals) could be employed to minimize adverse impacts.

Air quality impacts likely would occur in the short-term, during construction activities. Air quality impacts from construction would come from two sources: fugitive dust and emissions from equipment operation. Fugitive dust can be controlled with regular watering or other control measures. Ground cover also can be re-established as quickly as practicable in areas left bare after construction. Adequate Federal and State regulations and controls are in place regarding the operation of construction equipment.

4.3.6 Cultural Resources

4.3.6.1 Affected Environment

An inventory of cultural resources (i.e., historic and archaeological sites) in the Environmental Study Area was prepared (Figure 4.6). The inventory of cultural resources was based on available information provided by the Texas Historical Commission, and the cities of Dallas, Plano, and Richardson, as well as from two studies prepared by the Texas Department of Transportation (TxDOT): Final Environmental Assessment US 75/IH 635 Interchange, February, 1993, and Final Environmental Impact Statement, US 75 from Spur 366 (Woodall Rodgers) to IH 635, July, 1986. The results of this inventory indicate that no sites listed on the National Register of Historic Places (NRHP) are located within the Environmental Study Area.

The Texas Historical Commission's records reveal one possible archaeological site, but that site likely has been destroyed. There are 11 archaeological sites in the City of Dallas designated for further research to determine their historical significance. There is a cemetery in the City of Richardson that has potential historic significance. The City of Plano has 13 structures designated as "Plano Historic Landmarks" and two sites bear Texas Historical Commission Subject Markers. In addition, a portion of downtown Plano has been recommended for local designation as an historic district.

A more detailed survey of cultural resources will be conducted during the Preliminary Engineering phase of this project in support of EIS preparation activities. The Area of Potential Effect (APE) for the LPA will be defined in consultation with the State Historic Preservation Officer (SHPO). Properties with potential historic significance located within the APE will be evaluated to determine eligibility for listing on the NRHP in accordance with Section 106 of the National Historic Preservation Act (NHPA). An assessment of the potential impacts of the LPA on these properties will be

CULTURAL RESOURCES

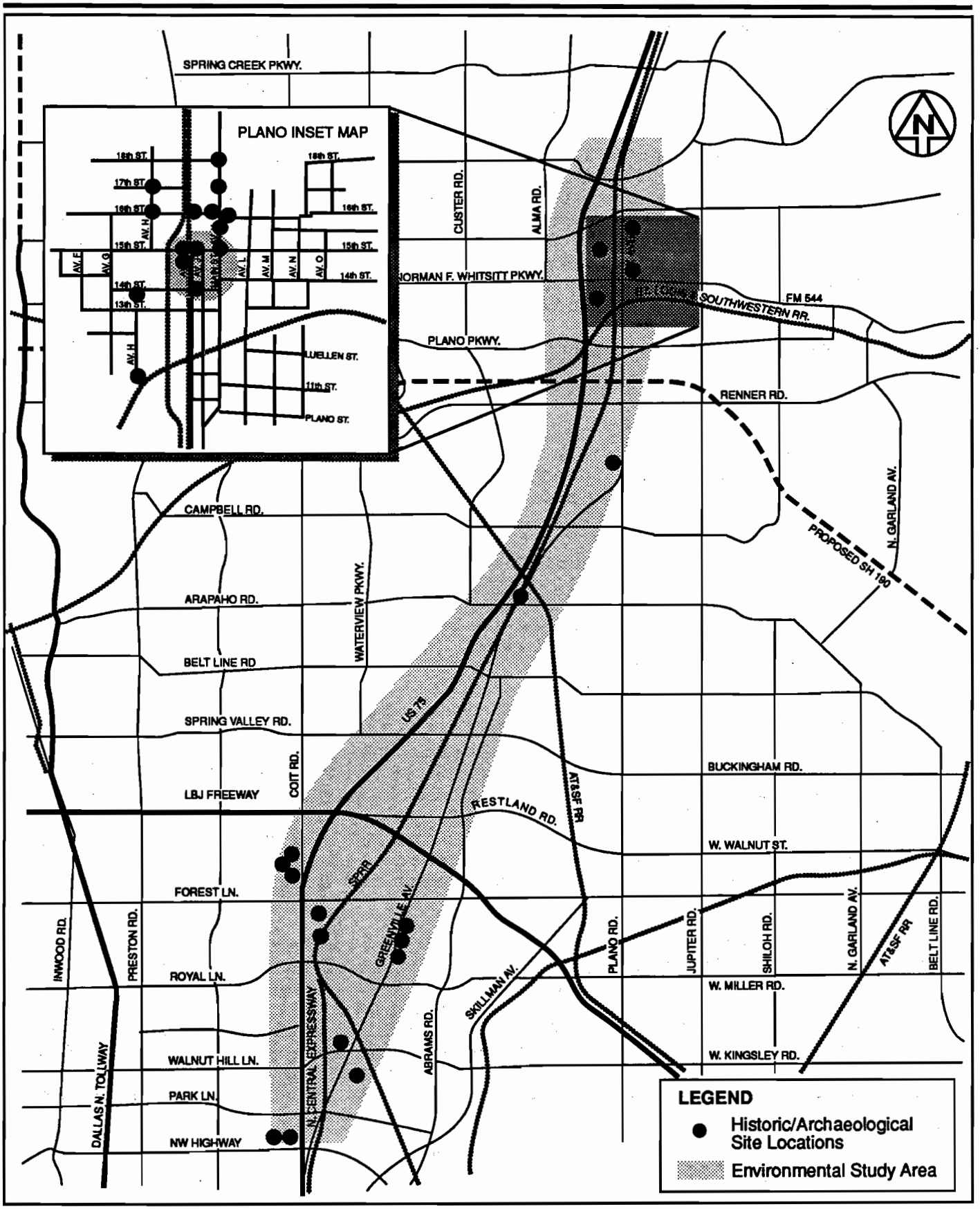


Figure 4.6

prepared. Appropriate mitigation actions will be identified and integrated into the design/development of the LPA.

4.3.6.2 Potential Impacts

No-Build Alternative

No impacts to cultural resources would be expected. Continued limitations on accessibility to these important resources means that the community would not realize the fullest benefit from their existence and presence. For example, the events in Plano would not be as accessible to the region as they would be should the LRT Starter System be extended north of Park Lane under the LRT/Parker Road Alternative and LRT/Parker Road Alternative - Intermediate Capacity.

TSM Alternative

The North Central park-and-ride facility, proposed for expansion under the TSM Alternative, is located close to the St. Paul AME Church, institutional structure, and house at 12230 Coit Road. Expansion plans for this facility would need to consider the location and setting of these structures.

LRT Alternatives

All of the sites identified in Figure 4.6 potentially could be impacted by the LRT/Parker Road Alternative and LRT/Parker Road Alternative - Intermediate Capacity. All sites south of Arapaho Road potentially would be impacted by the LRT/Arapaho Road Alternative. Only three sites could be impacted by the new and expanded transit facilities proposed under the TSM Alternative.

Both direct and indirect impacts of project alternatives need to be considered in the analysis of cultural impacts. Direct effects could occur as a result of the need to demolish/destroy or otherwise physically modify an historic structure or an archaeological resource. Indirect effects commonly are associated with visual or noise impacts of the project, during either the construction period or subsequent operations. Indirect effects also include modification of the "setting" or historic context of the resource in such a way as to affect its value to the community. There are only two locations where the LRT alternatives potentially would impact cultural resources: one is at Royal Lane and the other is in Plano.

Implementation of the Royal Lane west alignment option (i.e., the DART/SPRR ROW), which is identified for all LRT alternatives, would require demolition of the old Texas & New Orleans Railroad (T&NO RR) Bridge over White Rock Creek. According to the *Historic Resources Survey of Dallas - Phase Two*, the T&NO RR bridge has been assigned a high priority for further research regarding its

historic significance. The Royal Lane east alignment option, also identified for all LRT alternatives, is preferred and would avoid demolition of this bridge.

The LRT/Parker Road Alternative and LRT/Parker Road Alternative - Intermediate Capacity potentially could cause indirect impacts to two Plano Historic Landmarks: the Moore House/Plano Masonic Lodge and the Plano National Bank/IOOF Lodge. It also could affect portions of Old Town Plano, which has been recommended for local designation as an historic district. Although no survey has been undertaken to determine eligibility for listing on the NRHP, the City of Plano has indicated that Old Town Plano is potentially eligible for listing. These two cultural resources and portions of Old Town Plano are located within the 200-foot noise impact screening distance (refer to Section 4.3.1.2). More detailed noise analyses conducted during preparation of the DEIS will determine whether adverse noise impacts actually would occur. Impact mitigation measures would be defined, if necessary.

Visual impacts to these cultural resources also are possible, due to installation of the LRT catenary and other physical elements of the LRT system. The possible construction of a Special Events Platform, to be accomplished by the City of Plano in conjunction with LRT service development, also would have a visual impact. Incorporation of mitigation measures into the design of both of these elements of the project would minimize adverse impacts. For example, a low-profile catenary would help minimize the visual impact of the LRT electrification system. The City of Plano could design the platform and associated facilities to be compatible with the historic character of Old Town Plano. Landscaping can be used to increase the aesthetic appeal and soften visual impacts.

The Interurban Building also is located in Old Town Plano adjacent to the DART/SPRR ROW, which would be the alignment for the LRT/Parker Road Alternative and LRT/Parker Road Alternative - Intermediate Capacity. From 1908 to 1948 this building served as a station on the Texas Electric Railway that linked Denison and Dallas. A museum exhibit inside the building presents a history of this Interurban Line and Plano. The Interurban Building has been designated a Plano Historic Landmark, and the City of Plano also has indicated that this structure is potentially eligible for listing on the NRHP. Because of its original use as a station on the Interurban Line, the reintroduction of an electrically-powered LRT system should be compatible with and may even enhance the historic significance and character of this structure.

4.3.7 Hazardous/Regulated Materials

4.3.7.1 Affected Environment

To determine the potential for encountering hazardous or toxic materials during construction, a search of Federal and State

regulatory agency data bases was performed by Environmental Support Services, Inc. The search covered an area within one-eighth mile to either side of the proposed LRT alignment. The search identified one CERCLA (Comprehensive Environmental Response, Compensation and Liability Act) site, 52 RCRA (Resource Conservation and Recovery Act) sites, 54 PST (Petroleum Storage Tank) facilities, 19 LPST (Leaking Petroleum Storage Tank) sites, and 4 spill responses. The locations of sites listed in the regulatory agency data bases is shown in Figure 4.7. The RCRA (with the exception of one site with a violation record) and PST sites are not shown, because these facilities do not necessarily pose any hazard or threat. Also, during a biological field survey for this project, a biologist noted some 55-gallon drums in the Floyd Branch of Cottonwood Creek and an area of stressed vegetation in the immediate vicinity of Liquid Air Corporation (Site 3).

4.3.7.2 Potential Impacts

A field survey of the RCRA site with a violation record, as well as the CERCLA and LPST sites was conducted on January 11, 1994. The survey was limited to an outside general inspection of facilities; the inside of the buildings were not inspected. For some facilities, brief discussions with on-site personnel occurred to aid in gathering pertinent information. The two suspect areas identified during the biological field survey for this project also were surveyed. Reasonable care was used during this survey to avoid reliance upon data or information that is inaccurate. However, the accuracy or completeness of all available data and information was not able to be verified.

Conclusions, relating to the potential consequences of hazardous/regulated materials, are based on the information reasonably available at the time of the survey which was obtained within the context of the authorized Scope of Work. Some conclusions could be different, if the information upon which they are based is determined to be false, inaccurate, or incomplete. Conclusions drawn from the survey represent an assessment of the "potential" for encountering contaminated soils or hazardous materials during construction activities associated with project alternatives. The survey was conducted and findings and conclusion prepared in accordance with a good faith effort and generally accepted industry standards regarding such assessments. No other representations whatsoever should be implied or assumed concerning this information, including but not limited to ownership of any property or the interpretation of any law.

No-Build Alternative

Excavation and construction associated with transit system improvements would occur principally on existing sites owned and operated by DART. However, the potential to uncover or disturb hazardous materials would be present during construction activity.

SITES APPEARING ON REGULATORY AGENCY DATA BASES

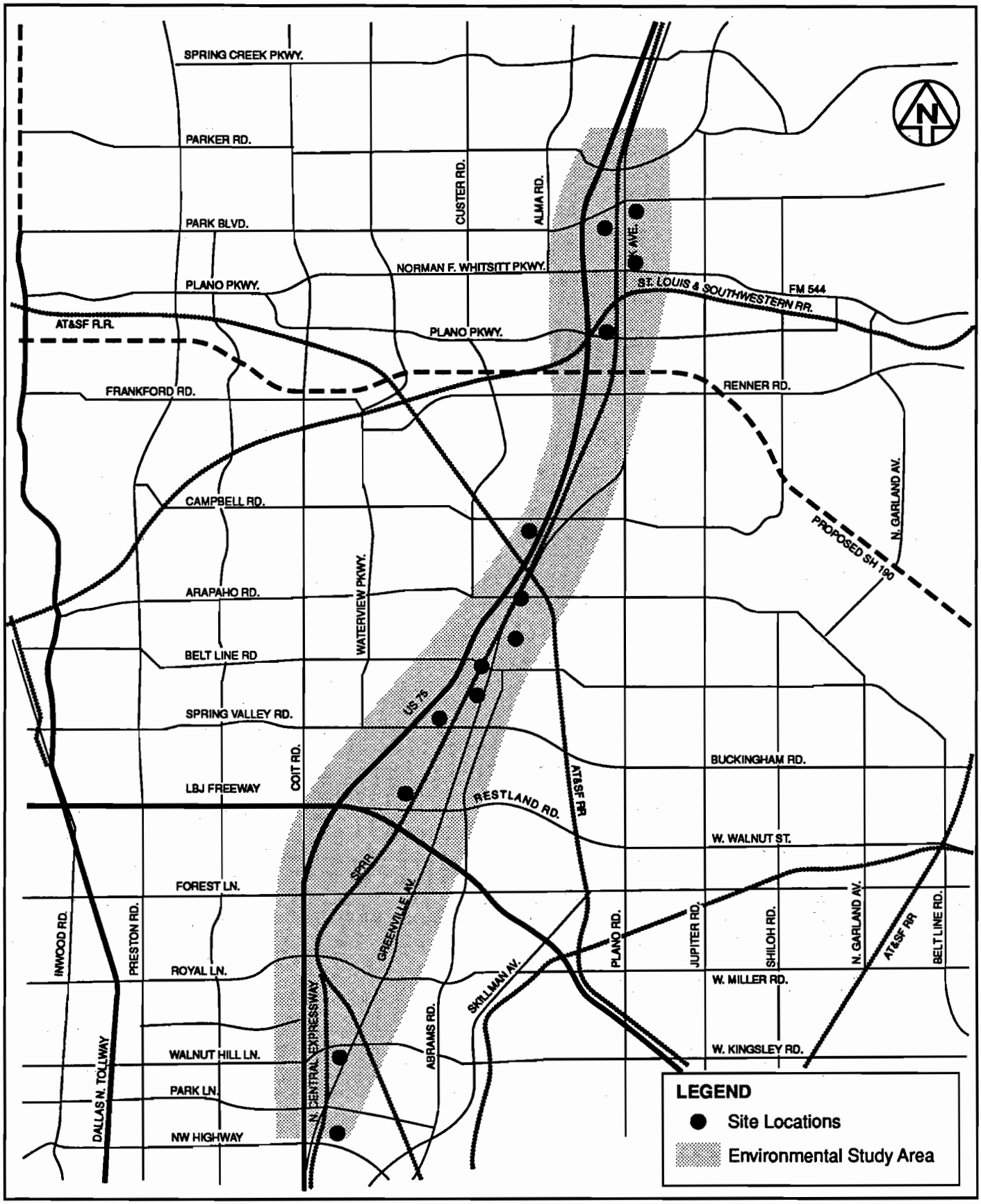


Figure 4.7

TSM Alternative

Excavation and construction for transit system elements of the TSM Alternative would occur principally on existing sites currently owned and operated by DART. However, the potential to uncover or disturb hazardous materials would be present during any construction activity, particularly construction of the on/off ramps connecting transit centers with the HOV lane on US 75.

LRT Alternatives

The potential to uncover or disturb hazardous materials would be present during construction activity. Excavation for the LRT alternatives would be limited to placement of columns and clearing/grubbing in preparation for station construction and creation of parking and other traffic areas. Much of this activity would occur within or immediately adjacent to the existing DART/SPRR ROW.

Given that there are a number of contaminated sites located close to the proposed LRT alignments, there would be a potential to encounter hazardous materials during construction or excavation. Soil or groundwater contamination could present a significant impact on the construction of proposed transit improvements. In-depth field studies would be undertaken during PE to determine the extent of contamination present in the area of construction activity. If contamination is encountered during construction, appropriate disposal methods would be implemented in accordance with Federal, State, and local regulations. The discharge of wastewater suspected of containing hazardous material into storm drains is forbidden without a National Pollutant Discharge Elimination System (NPDES) discharge permit. The NPDES discharge permit may be obtained if the discharge is well-characterized, meets discharge standards, and does not pose a threat to the surface water receiving the discharge. DART would be required to obtain this permit, if necessary.

4.3.8 Wetlands

4.3.8.1 Affected Environment

Wetlands are land areas subject to regular, periodic inundation of water. Wetlands exhibit hydric soils and support the growth of certain hydrophytic (water plant) vegetation. Six "suspect" wetland areas have been identified within the Study Corridor (Figure 4.8). The locations of these areas are:

- Floyd Branch of Cottonwood Creek northeast of the Forest Lane crossing;

"SUSPECT" WETLANDS

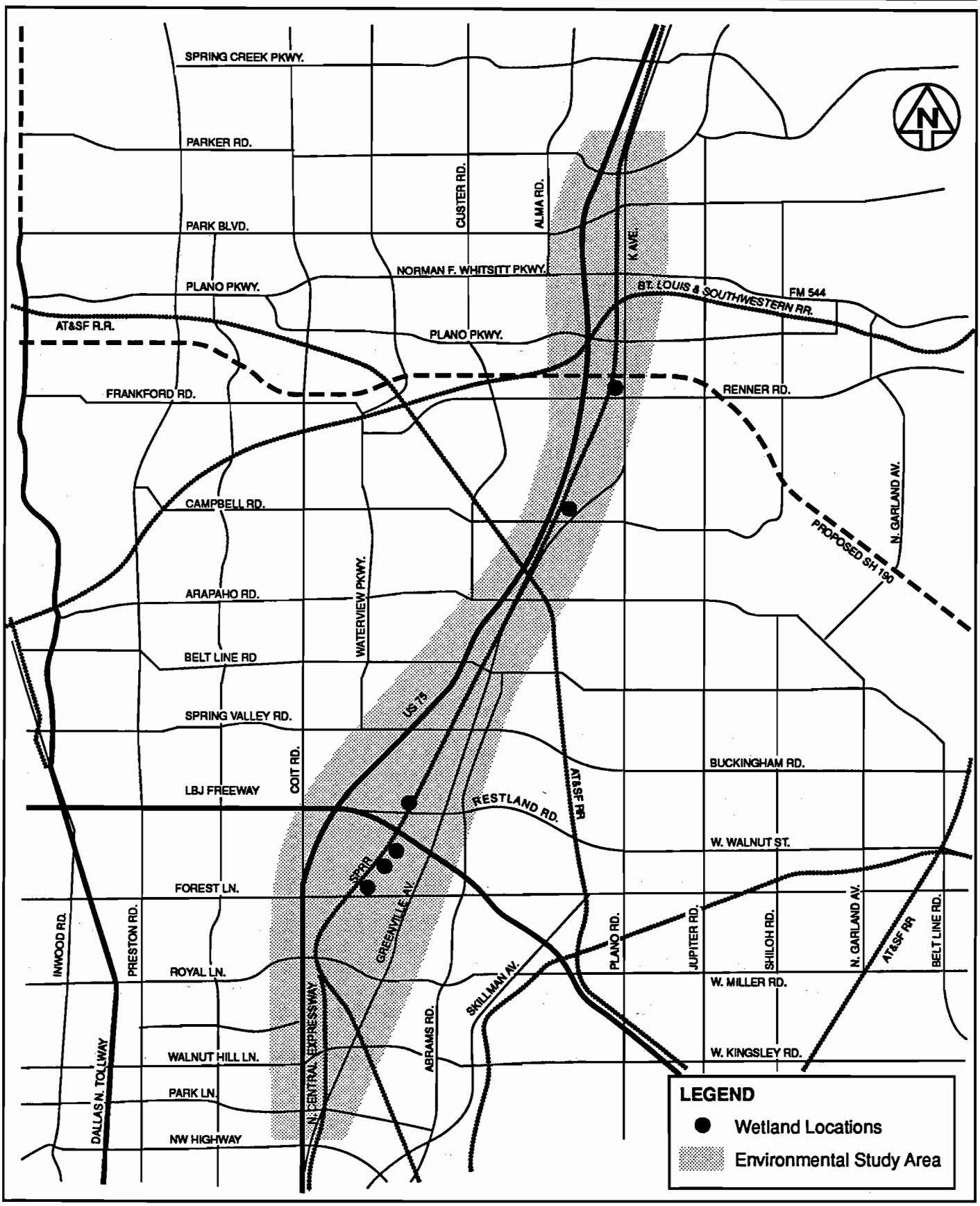


Figure 4.8

- Floyd Branch of Cottonwood Creek south-southwest of the Floyd Road crossing;
- Floyd Branch of Cottonwood Creek north-northeast of the Floyd Road crossing;
- Floyd Branch of Cottonwood Creek north of the Restland Road crossing;
- Stream 218 (a tributary of Spring Creek) north of the Lakeside Boulevard crossing; and
- Intermittent tributary of Spring Creek northeast of the Renner Road crossing.

4.3.8.2 Potential Impacts

Avoidance of wetlands is best course of action. DART would be required to obtain a Section 404 Permit under the Federal Water Pollution Control Act Amendments of 1972 before locating any structure, excavating, or discharging dredged or fill materials into areas determined to be wetlands. It is important to note that a Federal policy of "no net loss" of wetlands is in place. If adequate mitigation measures are undertaken to avoid--to the fullest extent possible--draining, filling, or otherwise disturbing the "suspect" wetland areas and the water resources supplying them, then significant adverse effects can be minimized. A wetlands determination would need to be carried out in cooperation with the U.S. Army Corps of Engineers, before formulating final conclusions regarding potential impacts to "suspect" wetlands.

No-Build Alternative

There would be no wetland impacts associated with the No-Build Alternative.

TSM Alternative

It is not likely that the TSM Alternative would affect any of the "suspect" wetlands, because the principal project elements of this alternative would be developed in existing ROW or on existing sites. However, at this time, it is not known for certain whether the transit centers to be expanded and developed under the TSM Alternative would effect any of the "suspect" wetlands.

LRT Alternatives

All of the "suspect" wetlands potentially could be affected with implementation of LRT/Parker Road Alternative and the LRT/Parker Road Alternative - Intermediate Capacity. Two stations to be constructed as part of the LRT/Parker Road alternative are located near the "suspect" wetlands sites: the Forest Lane at-grade option

and Campbell Road #2. The siting of the Forest Lane at-grade station option is close to Floyd Branch of Cottonwood Creek. If the station remains to the south of Forest Lane, no encroachment into these "suspect" wetlands would occur. The Campbell Road #2 station option is close to Stream 218. No encroachment into these "suspect" wetlands would be expected, if the facilities are built on the west side of the proposed LRT alignment. The LRT/Parker Road Alternative - Intermediate Capacity would not include the Campbell Road Station.

The shorter LRT/Arapaho Road Alternative also would not include the Campbell Road Station. And, this alternative would not have any effects on Stream 218 and the intermittent tributary of Spring Creek, which are north of Arapaho Road.

4.3.9 Other Environmental Considerations

4.3.9.1 Ecosystems

A field reconnaissance was conducted to identify and characterize the natural plant communities present in the Environmental Study Area. This activity also involved determining whether any rare or endangered plant species were present. No rare or endangered plant species were observed. According to information obtained from the Texas Parks and Wildlife Department, there are no known occurrences of rare or endangered plant species within the general vicinity of the project.

A review of conditions in the Environmental Study Area revealed a number of creeks, streams, and other surface water resources. These empty into Lake Ray Hubbard, White Rock Lake, or directly into the Trinity River. Among the more common aquatic species associated with these water resources are: bull frogs, cricket frogs, black bass, gizzard shad, black crappie, golden shiner, green sunfish, red horse shiner, red ear sunfish, shiners, small sunfish, spotted sunfish, stoneroller, and yellow catfish. There are no known occurrences of rare or endangered animal species within the general vicinity of the project.

The potential exists to significantly affect aquatic habitats, if the project results in any long-term contamination of surface water bodies or a reduction in local water quality. However, satisfactory mitigation measures could be implemented to minimize adverse impacts. Excess surface runoff and potential pollutants from project sites can be retained during construction and subsequent transit operations. Existing vegetation would be removed near some of the station sites to accommodate transit facilities; however, no existing habitats in the station vicinities are considered unique. Areas left bare after construction would be revegetated as quickly as possible to minimize adverse impacts.

4.3.9.2 Hydrology/Water Quality

Several streams and creeks cross or are located within the Environmental Study Area (Figure 4.9). Any action directly affecting water resources determined to be "wetlands" would require a Section 404 Permit. More detail is provide on this subject in the discussion above concerning wetlands. A U.S. Coast Guard Section 9 Permit would not be required, because the identified surface water resources are not navigable waterways.

Surface Water Quality

Hydrology and water quality impacts could occur during construction as sediment and other materials are carried off-site by storm water runoff. Impacts associated with the operation of transit services under all alternatives would result primarily from the addition of impervious surface for parking lots, HOV lane access ramps, etc. Added impervious surfaces would increase the amount of runoff and associated surface contaminants discharged to area storm water systems and surface waters.

The LRT alternatives potentially would have direct impacts on a number of the Study Corridor's surface water resources and, therefore, surface water quality. The alignments of the LRT/Parker Road Alternative and the LRT/Parker Road Alternative - Intermediate Capacity would cross or would be located near nine of the surface water resources in the Environmental Study Area. The shorter LRT/Arapaho Road Alternative would cross or be located near only six. Therefore, project development actions would have the potential to affect surface water quality. The LRT/Parker Road Alternative would result in the greatest additional impervious surface, because it is a larger project with more stations and parking. Also, because it would involve more stations, the potential surface water quality impacts during construction would be greater. The other build alternatives would involve less construction activity and, ultimately, a smaller amount of impervious surfaces.

Mitigation measures that retain excess surface runoff and potential pollutants would minimize surface water quality impacts during both construction and operation of the project. The potential for runoff pollutants from large paved areas can be minimized through the installation of oil/water separators installed in parking lot drains, sediment traps, and interception or diversion ditches around paved surfaces. Specific water quality impact mitigation measures will be examined during preparation of the DEIS and PE. No long-term effect on surface water quality would be expected with implementation of any of the alternatives, assuming the adoption of appropriate mitigation measures.

SURFACE WATER RESOURCES

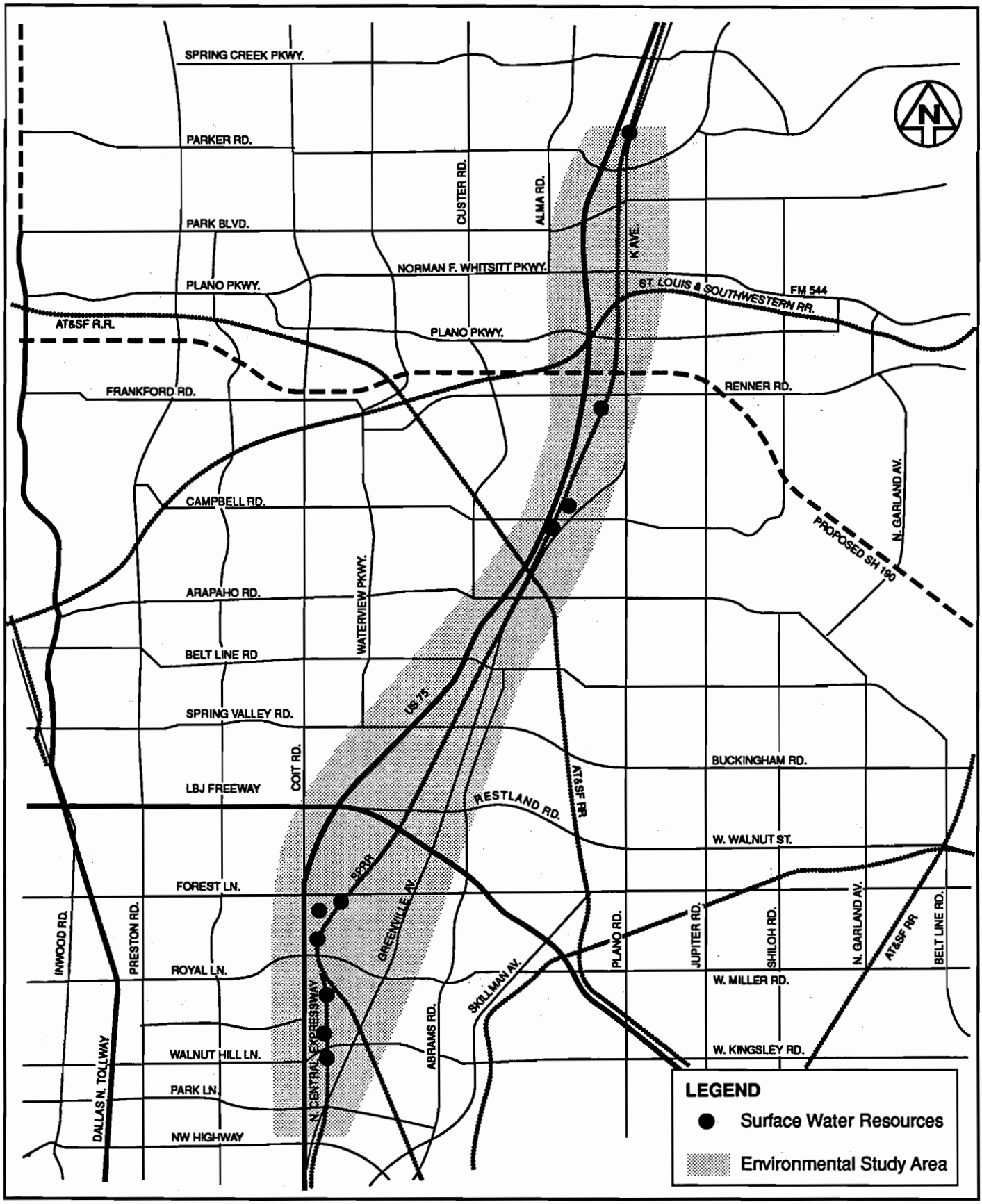


Figure 4.9

Floodplains

Facilities defined for the LRT alternatives would either span or border several floodplains associated with streams and creeks in the Environmental Study Area. Crossing of the floodplains, in most cases, would be via the existing DART/SPRR ROW, and no adverse impacts would be anticipated. However, some station options now being studied and the alternative LRT alignment at Royal Lane would either be in or potentially could impact floodplains. All potential floodplain impact sites, with one exception, would be located in the City of Dallas. Potential floodplain impacts associated with the Campbell Road Station options would be within the City of Richardson. DART would be required to comply with all applicable Federal, State, and local floodplain regulations and would obtain any necessary permits prior to construction. The terms of the permits would assure that no adverse impacts to the floodplain would occur.

4.3.9.3 Energy Consumption

Without a detailed assessment of the mix of travel modes in the Study Corridor, the level of modal activity, and the type of fuel consumed, it is not possible to make a definitive conclusion regarding energy consumption. Nevertheless, based on transit ridership alone as a measure of energy consumption, more transit riders would result in less fuel consumed. This assumption flows on the simple observation that transit vehicles carry a larger number of passengers per vehicle hour and the average amount of fuel consumed per passenger hour would be less than for automobiles. Also, the LRT technology uses electricity for power, and electricity as direct "fuel" is more efficiently converted to power than gasoline or diesel fuel. While, the overall energy requirements of LRT technology must consider the original source of the electricity, i.e., the electric power generating station, and the fuel used to generate the electricity (nuclear, coal, natural gas, hydroelectric), it must be noted that electricity generation is not dependent on nor stimulated by the presence and operation of LRT service.

4.4 Project Effectiveness - Equity Goal

Equity criteria focus on the distribution of project effects or impacts across various segments of the population. The criteria are defined to determine whether any segment of the Study Corridor's population, when compared to the region's population as a whole, is (1) paying a disproportionate share of costs or other impacts or (2) receiving a disproportionate share of benefits. Effects or impacts borne by the local population include: improved mobility, reduced travel times for transit users, reduced levels of congestion for auto users, and improved environmental quality in the region. These aspects of the transportation improvements

proposed for the Study Corridor have been addressed in previous sections.

In the context of alternatives evaluation, the broadest consideration of equity means to weigh out the degree to which those in the local community bear the impacts of a proposed project (i.e., the costs and environmental impacts) compared to those who benefit through the ability to use the services to be provided by the proposed project and, thereby, gain a benefit (i.e., increased mobility, access to jobs, etc.). In the absence of extensive and detailed demographic and economic investigations, this can be ascertained through an examination of changes in the social, economic, and land use patterns of the Study Corrridor, which would bring about opportunities for greater interaction. The areas of examination selected for this purpose are:

- Population and Employment
- Land Use and Economic Development
- Neighborhoods and Community Cohesion.

4.4.1 Population and Employment

4.4.1.1 Transportation-Disadvantaged Population

Providing essential services for transportation disadvantaged citizens has always been a primary national and local concern. Effects or impacts on the transportation disadvantaged population also are of particular interest. This group includes low-income households, persons/households without automobiles, minorities, the elderly, and environmentally challenged individuals.

While not a specific measure of equity, the number of new transit trips produced by an alternative (i.e., "added riders") is a surrogate measure for determining benefits to the transit-dependent population of the Study Corrdior. A certain percentage of new transit trips will be taken by transportation disadvantaged persons. Therefore, the more equitable alternative will be the one that produces the most new transit trips. This alternative is the LRT/Parker Road Alternative.

4.4.1.2 Regional Accessibility

The accessibility of the Study Corridor's population to transit services is a key factor in their use. Because the utilization of transit services in widely scattered, modern automobile-oriented urban areas is very low, a greater population with direct accessibility to the services will bring about greater utilization. It follows that a greater number of jobs accessible by transit services would promote use of transit for work-related trips. In addition to long-term job accessibility, short-term economic and employment effects from the construction and operation phases would be experienced throughout the Study Corridor and the Dallas

urbanized area. The economy of the Study Corridor and the Dallas urbanized area also would experience increased stimulus as a result of additional expenditures for routine O&M required for any of the alternatives considered.

No-Build Alternative

No significant economic benefit would be realized under the No Build Alternative. In fact, an economic disbenefit could be predicted, given increasing congestion and reduced quality of life from inefficient, overcrowded transportation facilities.

TSM Alternative

The TSM Alternative would have the least positive impact among the build alternatives with respect to long-term job accessibility, short-term economic and employment effects from the construction, because it would involve the least construction activity. The TSM Alternatives would be expected to generate the greatest direct economic effect once operations are initiated, because it would involve the largest number of operating hours and miles. Expenditures for labor, fuel, maintenance, and administration would be greatest for this alternative, which would translate into direct economic benefits.

Direct investments in stations, except for the two transit centers at Arapaho and Parker Roads, is not included in the TSM Alternative. This minimizes the impact of the alternative on direct investment in the Study Corridor and precludes using the expenditure of public funds to support, enhance, or revitalize community or neighborhood areas. The end result of the TSM Alternative, in terms of equity, is direct benefit to suburban carpoolers inbound to the center city through the implementation of AM and PM express bus service. Outbound travel from the center city to the northern part of the Study Corridor would not be improved with implementation of the TSM Alternative.

LRT Alternatives

Table 4.6 shows projected population and employment for an area within one mile of the potential LRT station vicinities identified in the Study Corridor. The total population served by the longer LRT/Parker Road Alternative is projected to be 132,970 in the year 2010. Extending the LRT Starter System beyond the City of Richardson (Arapaho Road) would make the regional LRT system accessible to 35,600 more persons in the Study Corridor. This represents a 37 percent increase over the shorter LRT/Arapaho Road Alternative. The LRT/Parker Road Alternative - Intermediate Capacity would add only the population shown for the Parker Road vicinity (12,000).

Table 4.6

PROJECTED STATION VICINITY POPULATION AND EMPLOYMENT (2010)

Station Vicinity	Population	Employment
Park Lane	28,370	35,480
Walnut Hill	21,200	35,100
Royal Lane	15,600	23,000
LBJ Freeway	11,700	33,200
Spring Valley	12,300	13,700
Arapaho Road	8,200	23,700
LRT/Arapaho Road Alternative	**97,370**	**164,180**
Campbell Road	4,600	39,600
SH 190	7,000	17,100
15th Street Special Events Platform*	12,000	8,400
Parker Road	12,000	8,300
LRT/Parker Road Alternative - Intermediate Capacity	**109,370**	**172,480**
LRT/Parker Road Alternative (Study Corridor Total)	**132,970**	**237,580**
Study Corridor, Excluding 15TH Street*	120,970	229,180

* Not used for Regular Daily Service.

The total 2010 employment within one mile of all the station vicinities listed in Table 4.7 (excluding 15th Street) is projected to be 237,580. Projected employment opportunities would be accessible to all persons in the region with access to the LRT system. About 45 percent more employmnt would be associated with the longer LRT/Parker Road Alternative when compared to the LRT/Arapaho Road Alternative. Extending the LRT system to Parker Raod would bring an additional 73,400 jobs within one mile of LRT service. The LRT/Parker Road Alternative - Intermediate Capacity would add only the employment shown for Parker Road (8,300).

The LRT/Parker Road Alternative would have the greatest positive impact on employment during construction, because it would constitute a larger project with greater capital investment. The Intermediate Capacity LRT/Parker Road and LRT/Arapaho Road Alternatives would be roughly comparable to each other. The considerable amount of funding for construction of the build

alternatives, which is expected to come from the Federal government, represents significant new money coming into the local economy. This promotes increases in business activity, jobs, and household income.

The LRT/Parker Road Alternative would be expected to generate the greatest direct, long-term economic effect once operations are initiated, because it would involve the largest number of operating hours and miles. Expenditures for labor, fuel, maintenance, and administration would be greatest for this alternative, which would translate into direct economic benefits. The two other LRT alternatives would not significantly change operating costs in the Study Corridor; therefore, the expected additional long-term, direct economic effect would be negligible.

The extent of service provided by the LRT/Parker Road Alternative also will open up new employment opportunities for persons living in the area south of Park Lane, particularly south Dallas. Access to points at the south and north end of the Study Corridor would be improved substantially with implementation of the LRT/Parker Road Alternative. Reduced mobility benefits would come with implementation of the LRT/Arapaho Road Alternative, because LRT service would stop at Richardson.

4.4.2 Land Use and Economic Development

4.4.2.1 Regional Land Use and Development Impacts

No-Build Alternative

The No-Build Alternative would have no notable effect on regional land use and development.

TSM Alternative

The TSM Alternative focuses on enhancing movements through the Study Corridor, especially along US 75--the North Central Expressway, during peak periods. The lack of actual investment or service extending beyond the Study Corridor precludes a major influence on land use and economic development.

LRT Alternatives

Case studies in other urban areas have found that LRT facilities and services produce no net change in growth and development at the regional level. This is expected to be the case for improvements proposed for the Study Corridor.

4.4.2.2 Corridor-Level Land Use and Development Impacts

There are 11 major employers in the Study Corridor, and they tend to be concentrated along US 75. The major centers include: Blue

Cross/Blue Shield, Rockwell International, Texas Instruments, Travelers Insurance Company, Northern Telecom, Humana Hospital, Presbyterian Hospital, Richardson Medical Center, Collin Creek Mall, North Park Center, and Richland Community College. Six of the 11 major employers are located within one-half mile or about a ten minute walk of the proposed LRT alignment on the DART/SPRR tracks.

Expected growth in population and employment within the DART service area, the Cities of Dallas, Richardson, and Plano, and the Study Corridor is presented in Table 4.7. As can be seen, significant growth is anticipated to occur within nearly all of the areas between 1990 and 2010.

Table 4.7

1990-2010 POPULATION AND EMPLOYMENT PROJECTIONS
(Percent Increase)

	Population	Employment
DART Service Area	18%	34%
Dallas	6%	24%
Richardson	10%	72%
Plano	44%	63%
Study Corridor	8%	16%
Dallas	5%	17%
Richardson	17%	63%
Plano	7%	8%

Source: NCTCOG/Sasaki Associates, Inc.

No-Build Alternative

The No-Build Alternative will suffice to support the current land use trends in the Study Corridor. However, it would not support the changes necessary to focus development actions in the Study Corridor into more transportation-efficient patterns (e.g., clusters, high density, etc.)

TSM Alternative

The TSM Alternative offers the opportunity to improve the flow of travel through the Study Corridor. A large number of travel movements taking advantage of the TSM Alternative's transportation

elements (principally the HOV lane) would be oriented to destinations beyond the Study Corridor. The efficiency of travel gained through the use of the HOV lane and improved traffic flow would permit greater economic interaction, based on the assumption that time saved is money earned. The impact of proposed transit centers on adjacent, existing land use characteristics (e.g., employment) would be dependent on market forces operating in the immediate surrounding area and land use controls in place to guide development and redevelopment. Therefore, the land use and area development benefits associated with the TSM Alternative generally would be indirect and diffuse.

LRT Alternatives

The land use effects of the build alternatives at the corridor-level principally would be manifested as a redistribution of development not "new" or "additional" development. The LRT alternatives would have permanent, fixed station facilities and services. These facilities and services would stimulate and attract development that depends on long-term, stable conditions. The impact that stations have on adjacent, existing land use characteristics (e.g., employment) would be dependent on market forces currently operating within the vicinity and the land use controls in place to guide development and redevelopment. Thus, transit stations or centers are not expected to foster new markets, but they would serve as catalysts and focal points for development.

Development would be reoriented to the station vicinities, where accessibility is permanently enhanced. Land use controls, land use trends, and patterns of land ownership in the station vicinities would be conducive to development or redevelopment. The constant flow of transit users in station vicinities would present a ready market for various commercial interests. Over the long-term, economic interaction between station vicinities would establish stronger nodal development opportunities and strengthen the economic base of the Study Corridor.

Land use and area development decisions would be influenced along the full line. The most influential land use component of the LRT alternatives is the number of stations, because stations become the focus of transit user activity. Therefore, the degree of influence would be greatest for the longer the LRT/Parker Road Alternative. The LRT/Parker Road Alternative potentially would provide the best opportunity for influencing land use patterns and economic development. This alternative would enhance accessibility more than the other alternatives and have the most stations. The LRT/Parker Road Alternative - Intermediate Capacity would have the second greatest potential followed by the LRT/Arapaho Road Alternative--the MOS. The TSM Alternative would have the least potential of the build alternatives, because new or expanded development of transit centers would be limited to two locations.

4.4.2.3 Consistency With Land Use Plans

An evaluation of equity of land use and economic development effects also needs to consider a project's consistency with local land use plans. The Study Corridor includes portions of three cities with land use planning authority: Dallas, Richardson, and Plano.

City of Dallas

The City of Dallas prepared a *Growth Policy Plan* in 1987, which was revised in 1990 and 1993. The *Growth Policy Plan* is a long-range planning tool, providing a framework for the future development of Dallas, as well as a context for the preparation of more detailed level plans, among these being station vicinity plans. The *Growth Policy Plan* calls for preparation of station vicinity plans to address: the linkage of DART stations to employment centers and residential areas, site layout and design (including access improvements, urban design features, and impact mitigation measures), and, where appropriate, development policies (i.e., density bonuses necessary to support higher levels of development).

No-Build Alternatives

The No-Build Alternative would not be consistent with the City of Dallas' *Growth Policy Plan*

TSM Alternative

The development of transit centers to support express bus operations under the TSM Alternative would adhere to the basic principals established for station planning and transit improvments. The design and operations of enhanced or expanded transit centers (including additional park-and-ride capacity) would need to be more sensitive to the negative effects of traffic and the potential for incompatible commercial development.

LRT Alternatives

The LRT alternatives would be the most consistent with the City of Dallas' *Growth Policy Plan*, because they support "...the desirability of capitalizing on the development potential stimulated by LRT stations." The *Growth Policy Plan* acknowledges that increased density and height is appropriate near many stations, but may be inappropriate for others, such as those in residential areas. Areas of higher development intensity, or "growth nodes" would include mid- and high-density residential and/or commercial and industrial development. Furthermore, development around LRT stations in low-density residential areas should not encourage incompatible commercial development. Any commercial development that is allowed adjacent to these stations should be of a neighborhood scale, providing for the buffering of

station noise, light, and other obtrusive features. DART will continue to work with the City of Dallas on these issues as the plans for station design develop.

The *Dallas Bike Plan* was adopted by the City of Dallas in 1985 and identifies bike routes and trails throughout the City. An important component of this plan is development of connections with LRT stations, increasing accessibility to transit, and contributing to DART ridership. The *Dallas Bike Plan* calls for the extension of the Davenport/Melrose bike route into Richardson, connecting with the Richardson Transit Center. The *1992 Trail Plan of the Dallas County Park and Open Space System* identifies an eleven mile trail along the DART/SPRR ROW. The trail would branch off from the DART/SPRR ROW to the southeast just south of Royal Lane. DART would coordinate transit improvements/designs in the Study Corridor with both of these plans to ensure compatibility and to enhance opportunities for transit ridership.

City of Richardson

The City of Richardson currently is in the process of finalizing a *Comprehensive Planning Guide*. Richardson's *Comprehensive Planning Guide* is based on the assumption that DART will: (1) establish and adopt a *Service Plan* for Richardson, (2) implement transportation improvements according to the adopted *Service Plan*, and (3) include in the *Service Plan* policies relative to the development of various physical elements in the communities such as transportation, housing, and public facilities.

No-Build Alternative

The No-Build Alternative incorporates certain improvements to the existing bus transit network, which will provide direct connections to the LRT Arapaho Road Station. These new connections and enhanced Express Bus service, which would be have access to the new US 75 HOV lane, would improve overall transit services for Richardson.

TSM Alternative

Added Express Bus routes combined with direct access to the US 75 HOV lane and enhancement of the Richardson Transit Center, would improve overall transit services for Richardson.

LRT Alternatives

All of the build alternatives are consistent with the expressed desires of the City of Richardson. The LRT alternatives would result in the LRT Starter System being expanded to serve Richardson along with the HOV lane improvements on US 75. The TSM Alternative would expand express bus service only, improving access to the DART bus system through enhancements at transit centers. DART would

consider the guidance found in the Richardson *Comprehensive Planning Guide* during preparation of the DEIS and PE.

City of Plano

The City of Plano adopted a *Comprehensive Plan* in 1987. The *Plano Comprehensive Plan* "...encourages DART to develop and expand express bus service as well as light rail transit from Plano to major employment centers outside the City." The City of Plano also also has prepared the *Douglas Area Study* (1990) and *Downtown Development Plan* (1992). While the *Douglas Area Study* identifies potential DART transit improvements for the Douglas community, it does not make specific recommendations regarding which improvements are most desirable for implementation. The result of the study, however, was the establishment, as one of the city's goals, the preservation of the Douglas area as a residential neighborhood with "alternative land uses along the perimeter." The *Downtown Development Plan* encourages the development of an LRT station in downtown Plano, located either between 15th Place and 16th Street or adjacent to Haggard Park.

No-Build Alternative

The No Build Alternative would not address the transit objectives of the *Comprehensive Plan* and would not be consistent with the *Downtown Development Plan*, because the LRT Starter System would not be extended to Plano.

TSM Alternative

The TSM Alternative would bring about significant expansion of express bus service for the community; however, the LRT Starter System would not be extended beyond Park Lane. Therefore, this alternative is not consistent with with the *Comprehensive Plan* or *Downtown Development Plan*.

LRT Alternatives

The LRT/Parker Road Alternative and LRT/Parker Road Alternative - Intermediate Capacity would result in connecting the City of Plano to the regional LRT system and major employment centers. However, these two LRT alternatives would not include expansion of express bus service. In this respect they would be inconsistent with the transit objectives of the City of Plano. Both the LRT/Parker Road Alternative and LRT/Parker Road Alternative - Intermediate Capacity would provide the opportunity for the City of Plano to develop a special events platform in the general vicinity of the downtown. The LRT/Arapaho Road Alternative would not be consistent with the *Comprehensive Plan* or *Downtown Development Plan*, because the LRT Starter System would not be extended to Plano.

4.4.2.4 Joint Development Issues

No committed joint development opportunities exist within the Study Corridor. However, future opportunities (at the Campbell and SH 190 station vicinities) may emerge in response to market demand. Joint development opportunities represent a potential for private sector contributions to the funding of proposed transit improvements. Only the LRT/Parker Road Alternative would provide LRT service to these two station vicinities.

4.4.3 Neighborhoods and Community Cohesion

The Study Corridor generally is comprised of loosely defined residential areas lacking distinct boundaries or identities. However, several distinct neighborhoods do exist, including:

- Hamilton Park - City of Dallas
- Richardson Old Town
- Old Town Plano
- Douglas Neighborhood - City of Plano
- Haggard Neighborhood - City of Plano.

Transportation improvments issues associated with neighborhoods focus on neighborhood integrity and community cohesion.

4.4.3.1 Neighborhood Integrity

Neighborhood integrity generally refers to sustaining the actual physical boundaries of a area defined by an identifiable set of common values, features, patterns, or characteristics.

No-Build Alternative

The No-Build Alternative, in itself, would not impose additional barriers to social interaction or community functions. However, the No-Build Alternative would result in increased traffic congestion. Resultant access and mobility restrictions associated with congestion under the No-Build Alternative would reduce the quality of life in the Study Corridor's neighborhoods. It must be noted that the expected increase in traffic congestion, resultant limitations on travel and mobility, and potential deterioration of quality of life fostered the undertaking of this study. Thus, the No-Build Alternative would not be consistent with the established purpose and need for the project, as set forth in Chapter Two of this report.

TSM Alternative

The TSM Alternative would not significantly enhance travel within the Study Corridor, but it would provide direct express service to many neighborhoods and enhance transportation for work trips, i.e., commuter travel. Increased bus volumes associated with the TSM

Alternative are not likely to impose any new barriers to social interaction in the Study Corridor.

LRT Alternatives

The LRT/Parker Road Alternative would best serve all of the identified neighborhoods. Only Hamilton Park and Richardson Old Town would be served directly with implementation of LRT/Arapaho Road Alternative. The LRT/Arapaho Road Alternative would incorporate feeder bus service, connecting LRT service with the Plano neighborhoods, but overall accessibility and mobility by transit would be of lesser quality than with the LRT/Parker Road Alternative. The LRT/Parker Road Alternative - Intermediate Capacity would provide direct access to the regional LRT system for residents of the Plano neighborhoods, but the level of service would be less than with the LRT/Parker Road Alternative. Thus, accessibility would be enhanced, but convenience and directness of service would be inferior.

None of the LRT alternatives would present barriers to social interaction, because the guideway mainly would follow the existing DART/SPRR ROW. This existing rail facility already established boundaries between neighborhoods. Likewise, the TSM Alternative has no element that would create a barrier to social interaction within or between neighborhoods. Therefore, none of the alternatives would have an adverse impact on neighborhoods or community cohesion.

4.4.3.2 Community Cohesion

Community cohesion generally refers to sustaining the perceived unity of an area, which often is based on the day-to-day interaction of the area's residents.

No-Build Alternative

The No-Build Alternative represents a "status quo" position with respect to the overall social, economic, and environmental setting of the Study Corridor. There would be no direct effects from no action, but there are indirect effects that would result over time as the transportation situation in the Study Corridor deteriorates. Congestion and other transportation inefficiencies would penalize the level and quality of social interaction and economic activity.

TSM Alternative

The TSM Alternative would improve the throughput of vehicles and, therefore, people in the Study Corridor. Improved traffic flow would aid in sustaining the current levels of social interaction and economic activity and support continued development. The TSM Alternative does not offer a true alternative to the current pattern of socioeconomic interaction that has produced inefficient

land use patterns and widespread impacts on the natural environment.

LRT Alternatives

The LRT alternatives would concentrate travel around the thinly defined corridor of the DART/SPRR ROW. This would create limitations with respect to diffuse travel throughout the Study Corridor. Focusing travel on the travel spine created by the LRT alternatives would alter the pattern of social and economic interaction within the Study Corridor. The permanent stations would become the focus of transit travel in the Study Corridor and to/from points outside the Study Corridor. The efficiency of connections with this spine would determine the manner in which land use and socioeconomic patterns would change over time. Focused and efficient transportation activity would reduce the degree to which environmental impacts associated with transportation requirements (particularly air quality and noise) are manifest in the Study Corridor.

4.5 Cost-Effectiveness/Financial Feasibility

The elements of cost are very important to any project. Therefore, it is important that the evaluation methodology include weighing the costs of proposed transit improvements in the Study Corridor against expected benefits and related impacts. Both short-term capital costs and long-term, continuing operating and maintenance (O&M) costs must be considered. Relating the costs with the benefits of the project, in terms of increased ridership, reveals the cost-effectiveness of proposed alternatives. Finally, the ability to fund both the short- and long-term costs must be evaluated to determine whether the proposed actions are financially feasible.

4.5.1 Capital Costs

The capital investment required to implement the alternatives, obviously, is a key effectiveness criteria. There are numerous components to project cost for any particular alternative. Properaty acquisition usually is a major component; however, the LRT alternatives incorporate the DART/SPRR ROW. Therefore, this cost would be a smaller than usual portion of total project cost for the LRT alternatives. Critical cost components include: civil/structural work associated with facilities (e.g., HOV lanes, stations, transit centers); vehicles (bus and LRT); signalization and service equipment; and trackwork (LRT only).

No-Build Alternative

By definition, only planned and programmed costs would be incurred under the No-Build Alternative.

TSM Alternative

The TSM Alternative would involve capital expenditures for the construction of HOV ramps, transit centers, transit center improvments, and vehicles. The capital cost associated with the TSM Alternative would be approximately $44.9 million.

LRT Alternatives

Capital expenditures for the LRT Alternatives would go toward the construction of required trackwork, stations, signalization, right-of-way/property acquisition, communications, traction power, vehicles, and fare vending and other service equipment. Extension of the LRT Starter System also would require some modifications to the elements of the LRT Starter System. The Service and Inspection Facility would need to be expanded (storage tracks added), and the signal and communications equipment would need to be modified.

The capital cost associated with the LRT/Arapaho Road Alternative (MOS) would be approximately $215.3 million. The LRT/Parker Road Alternative - Intermediate Capacity would require about $50 million more, with an estimated total capital cost of $267.6 million. The LRT/Parker Road Alternative, which calls for "full development" of the complete LRT system to Plano, would be the most expensive. It has associated with it a total estimated capital cost of $324.1 million. It should be noted that the ultimate cost of the LRT/Parker Road Alternative - Intermediate Capacity, which calls for staged implementation of LRT service beyond Arapaho Road, would be slighly higher ($333.6 million). The greater capital cost of staged implementation would result from delaying construction of the full, double track LRT system and various other design and construction factors.

4.5.2 Annual Operating and Maintenance Costs

Continuing cost/financial feasibility issues are associated with vehicle O&M costs. The O&M costs of Local Bus service vary significantly from those associated with Express Bus service. And, LRT O&M costs differ widely from service using buses. Therefore, each alternative offers different combinations of costs, which results in variation in annual O&M costs. The year 2010 O&M costs have been estimated in 1993 constant dollars for each of the alternatives.

The total year 2010 O&M costs for the No-Build Alternative have been estimated at approximately $175.4 million. Implementation of the TSM Alternative would increase annual 2010 O&M costs by slightly less than 5% to about $183.6 million. O&M costs of the LRT/Parker Road Alternative ($185.2 million) would add $1.6 million to the TSM Alternative. Both the LRT/Parker Road Alternative - Intermediate Capacity and LRT/Arapaho Road Alternative would be less costly to operate than the TSM Alternative at $181.7 million and $183.0 million, respectively.

4.5.3 Cost-Effectiveness

Rather than attempt to measure all benefits of a major transit investment, FTA recommends using a few measures to assess a wide range of transportation and other benefits associated with a project. The direct benefits of a major transit investment are improvements in travel time and increases in transit ridership over that provided by the TSM Alternative. Other indirect benefits, such as improved mobility, reduced congestion, and less air pollution, are consequences of the travel time and ridership changes. Accordingly, FTA has defined two cost-effectiveness indices. FTA's first index uses travel time savings as the measure of a project's benefits, and the second index uses new additional transit riders.

Under current procedures, FTA uses the Cost Per New Rider Index (which is easier to compute) to rate transit projects proposed for Federal funding assistance. The Cost Per New Rider Index is a ratio between (1) the incremental costs of building and operating an alternative and (2) the incremental transit riders attracted to that alternative. The incremental change compares the proposed system of services with that provided by the TSM Alternative. There are two versions of the New Transit Rider Index. The "Total" New Transit Rider Index includes the total annualized capital cost of the project, while the "Federal" New Transit Rider Index includes only the Federally-funded share of the project's annualized capital costs.

The "Federal" New Transit Rider Index was computed for the alternatives being considered for the Study Corridor. The LRT/Arapaho Road Alternative's "Federal" New Transit Rider Index was computed at $9.83--the lowest of the three LRT alternatives being considered. The LRT/Parker Road Alternative - Intermediate Capacity option yields and index of $11.25. The LRT/Parker Road Alternative yields an index value of close to $12.24.

4.5.4 Financial Feasibility

The criteria of financial feasibility is used to assess the impact of projected transit funding needs on existing and potential sources of funds. In a detailed assessment of financial feasibility, funding requirements for both the capital and O&M costs of each alternative are compared to projected revenue from existing sources of funds and potential revenue from new funding sources. The indicator of financial feasibility for any given alternative, then, is the funding surplus or deficit that would result from construction and long-term operation. If a deficit is projected, additional revenue requirements and sources must be identified. The likelihood of success in securing additional, new revenue sources (e.g., referenda, local legislation, state legislation, etc.) must be identified to assess financial

feasibility. Where existing and potential new sources of funds are not sufficient, the project is deemed to be financially infeasible.

The FY 1993-94 Financial Plan (currently being updated) provides for the funding of capital projects in the five-year period 1996-2001. Available funding for capital projects has been established at $240 to $250 million. Anticipated Federal grant funds account for 60 to 70 percent of the funds available for capital projects.

The No-Build Alternative would result in little additional direct financial burden for the community. Standard financing arrangements for replacing facilities and the vehicle fleet would be required. The TSM Alternative would require the purchase of approximately 130 new buses to support expanded express bus service and new construction, as indicated above. The HOV lane proposed for the US 75 has been programmed in the State's highway budget for several years. Available capital funding is more than sufficient to cover the cost of the TSM Alternative, which is estimated at $44.9 million. It also is sufficient to cover the cost of the LRT/Arapaho Road Alternative, estimated at $215.3 million.

The LRT/Parker Road Alternative and the LRT/Parker Road Alternative - Intermediate Capacity option would require new capital expenditures exceeding the capital funding availability identified in the FY 1993-94 Financial Plan. The LRT/Parker Road Alternative, the most expensive alternative being considered, would exceed available capital funding by $74 to $84 million. The LRT/Parker Road Alternative - Intermediate Capacity, which offers capital savings in the near-term, would require about $18 to $28 million more than is available.

4.6 Other Considerations And Evaluation Factors

Safety

Safety with respect to transportation principally is a matter of minimizing conflicting travel patterns--the more focused and controlled the travel pattern, the fewer the accidents. And, more obviously, the fewer the number of movements the lower the likelihood of conflicts occurring. Therefore, the LRT alternatives offer the highest potential for increasing the safety of the traveling population in the Study Corridor. However, the potential of train/automobile conflicts would be created at all at-grade crossings of roadways by LRT vehicles.

Operating Efficiencies

The LRT/Parker Road Alternative would have "in-service vehicle hours" equal to the No-Build Alternative and have fewer operating vehicles in the peak period. At the same time, the number of transit trips in the Study Corridor would be increased by about

2 percent accompanied by an increase in transit miles of about 3 percent. Thus, this alternative offers the ability to offer more miles of service to more people, while keeping high-cost "in-service vehicle hours" constant. In contrast, the TSM Alternative would increase "in-service vehicle hours" 7.6 percent and vehicle miles almost 9 percent, while producing a gain of less than one percent in transit trips. The LRT/Arapaho Road Alternative would produce a ridership increase equal to the TSM Alternative but have associated with it about 6 percent fewer vehicle miles and 6 percent fewer "in-service vehicle hours."

Thus, the operating efficiency of transit services would be improved with implementation of the LRT/Parker Road Alternative, which would require the same amount of "in-service vehicle hours," produce more vehicle miles, require fewer vehicles, and generate increased ridership. The LRT/Arapaho Road Alternative would generate more vehicle miles and require fewer vehicles, but there would be an increase in "in-service vehicle hours" and the gain in ridership would be almost insignificant. The number of vehicles trips required for the LRT alternatives would be almost 4 percent less than required for the No-Build Alternative. This would be reflect in maintenance savings. The gain in ridership associated with the TSM Alternative would be almost insignificant despite significant increases in "in-service vehicle hours" and the requirement for more vehicles. Vehicle trips would be 4 percent greater than for the No-Build Alternative. Increased vehicle trips, miles, and hours will be reflected in increased maintenance costs.

Public Acceptance

DART's Transit System Plan was adopted after extensive community review and discussion. LRT service in the Study Corridor is included in this plan. Delays in the implementation of elements of the Transit System Plan (i.e., extension of the LRT Starter System) in the Study Corridor resulted in the formulation of a plan to construct the HOV lane in the center of US 75. With the passage of ISTEA, there now is a format for evaluating the two separate solutions to transportation problems in the Study Corridor. Public acceptance varies with the alternatives, according to the degree to which an area is benefited through support for the current lifestyle and community/neighborhood aspirations.

The TSM Alternative and the LRT alternatives would serve to focus travel patterns/activity and require a change in commuting practices. The TSM Alternative, which would offer significantly expanded express bus service, would provide somewhat exclusive, personalized service from various communities/neighborhoods in the Study Corridor to the center city via the LRT station at Park Lane. The express bus routes may even take on an identity with respect to the areas served. In contrast, the LRT alternatives would orient a larger portion of the Study Corridor's regionally-oriented

transit travel to a single "spine." Most north-south commuters opting to use transit would move through the Study Corridor by way of the LRT service, operating on the former SPRR tracks. Local, feeder bus service would provide access to the LRT service. There also would be park-and-ride options at some stations. Both proposals call for a transfer to the LRT system; public acceptance would be a matter of when and under what conditions this transfer would take place.

Chapter Five

COMPARATIVE ANALYSIS OF ALTERNATIVES

The analysis presented in this chapter identifies trade-offs among the No-Build, TSM, and LRT Alternatives. Specific measures (absolute or relative) of the impacts of each alternative are related to specific measures (absolute or relative) of the impacts of every other alternative. A summary of findings is presented in matrix form to aid in decision-making.

5.1 Trade-Offs Among Alternatives

The trade-offs analysis is undertaken to gain an understanding of the major differences among the alternatives being considered. It also is intended to reveal the degree to which each of the alternatives achieves the stated goals of this project.

The first consideration focuses on measures of specific impacts that are similar among alternatives. The second consideration focuses on the differences between alternatives. Measures of impacts are expressed quantitatively whenever possible and compared on the basis of the incremental differences between them. For those impacts which are qualitative in nature, the differences between alternatives are described in narrative form and the significance of the differences are assessed. Where the differences of impact between alternatives are significant, the size and nature of that difference will be presented. Lastly, there is a discussion of the various interests that would be affected with implementation of the different alternatives.

5.1.1 Similarities Among Alternatives

The similarities among alternatives are highlighted below. Predicted or anticipated impacts are divided into three categories:

- Those with similar but negligible values for all alternatives considered;
- Those with similar but significant values; and
- Those with diverse values.

5.1.1.1 Similarities Of Minor Consequence

- None of the alternatives should have any significant impacts on vegetation, wildlife, or aquatic habitats.

- None of the alternatives would create barriers to social interaction or community cohesion. The guideway associated with the LRT alternatives would be wholly contained within the DART/SPRR ROW (except possibly at Royal Lane), following the

existing railroad tracks which already creates a corridor within, or boundary between, some neighborhoods.

- None of the alternatives are expected to produce any net change in growth or development at the regional level.

- All alternatives potentially could have adverse noise impacts, but adequate means are available for mitigation.

5.1.1.2 Similarities Of Major Consequence

- The LRT alternatives potentially would aid in achieving air quality objectives, because travelers (particularly commuters) would be encouraged to leave their automobiles and ride transit. The LRT/Parker Road Alternative is expected to divert the highest number of auto trips to transit; therefore, the potential contribution of this alternative to regional air quality also would be the highest. The TSM Alternative potentially would result in a slight improvement in air quality, because the provision of expanded express bus service and circulator routes is expected to attract commuter trips.

- The LRT alternatives potentially would impact wetlands which exist along the DART/SPRR ROW.

- New transit center and station facilities would focus transit services for the rider. Any major investment in enhanced transit services and facilities would publicize a commitment to current riders and potential riders.

- The estimated annual O&M costs associated with the alternatives would not vary significantly, ranging form $175.4 million under the No-Build Alternative to $185.2 million under the LRT/Parker Road Alternative. There would be no significant difference between the build alternatives.

- Annual travel time saved for existing and new riders with implementation of the LRT/Parker Road Alternative is forecast to be 1.5 million hours compared to the TSM Alternative. Annual travel time savings accruing to the other two LRT alternatives has been estimated at 950,000 and 1.13 million hours for the LRT/Arapaho Road Alternative and LRT/Parker Road Alternative - Intermediate Capacity, respectively.

- The LRT/Parker Road Alternative potentially would result in estimated travel time savings of $6.08 million annually for existing and new riders, when compared to the TSM Alternative. The value of annual travel time savings, relative to the TSM Alternative, would be $3.07 million for the LRT/Arapaho Road Alternative and $4.61 million for the LRT/Parker Road Alternative - Intermediate Capacity option.

- The LRT alternatives include the potential for future development of an HOV facility within the DART/SPRR ROW to the extent that the cost of LRT system development is not affected.

5.1.1.3 Diverse Levels Of Impact

- The LRT alternatives potentially would require acquisition of strips of property from the Royal Oaks Country Club and golf course and White Rock Creek Greenbelt.

- The LRT/Parker Road Alternative would add 5,400 new transit riders daily to DART's LRT system. The other two LRT alternatives would be produce significantly less new riders: 3,400 for the LRT/Arapaho Road Alternative and 3,800 for the LRT/Parker Road Alternative - Intermediate Capacity option.

- The LRT alternatives potentially would impact a different number of parklands, because the length of the project and the number of stations varies.

- The LRT/Parker Road Alternative would serve a projected resident population of about 163,000 persons and employment of about 238,000 within 1 mile of stations. This is significantly higher than the other two LRT alternatives and more than double that of the TSM Alternative.

- The LRT alternatives potentially would require significant acquisition of property and ROW for the development of stations and park-and-ride facilities.

- The estimated capital cost for major investment in transit services and facilities varies from about $44.9 million for the TSM Alternative to $324.1 million for the LRT/Parker Road Alternative. The LRT/Arapaho Road Alternative would be the least cost LRT alternative with an estimated capital cost of $215.3 million. Initial, near-term (1996-2001) LRT development costs associated with the LRT/Parker Road Alternative - Intermediate Capacity option would be $267.6 million. It should be noted that the ultimate cost of $333.6 million for the LRT/Parker Road Alternative - Intermediate Capacity option, which calls for staged development of LRT service beyond Arapaho Road, would be slightly higher that the LRT/Parker Road Alternative. The greater capital cost of staged implementation would result from delaying construction of the full, double track LRT system and various other design and construction factors.

- The extent of visual/aesthetic impacts likely would be greater for the LRT/Parker Road Alternative, because a greater number of sensitive resources and receptors potentially would be affected. The TSM Alternative would be expected to have fewer

visual impacts, because this alternative does not require installation of an overhead catenary system and its principal elements would be developed within the existing transportation environment of US 75. However, proposed improvements to existing transit centers and construction of new facilities could result in some localized impacts.

5.1.2 Difference Between Alternatives

- The TSM Alternative would include four transit centers directly served by dedicated Express Bus Routes. The transit centers would have expanded park-and-ride and kiss-and-ride facilities. Direct access to US 75 would be available for each transit center. Expanded park-and-ride and kiss-and-ride would be developed at the LRT Park Lane Station.

- The LRT/Parker Road Alternative would include eight (8) stations plus a "Special Events" Station in the Plano Downtown area. These stations would be located near or at: Walnut Hill, Royal Lane, LBJ Freeway, Spring Valley, Arapaho Road, Campbell Road, SH 190, 15th Street (Special Events), and Parker Road. Dedicated "circulator" bus service would be established between stations, and "feeder" bus service would be oriented to the LRT stations.

- The LRT/Parker Road Alternative - Intermediate Capacity would not include the Campbell Road, SH 190, and 15th Street Special Events Stations. These three stations were identified as "low-activity" stations, because travel demand forecasts predicted total activity (i.e., boardings plus alightings) would be less than 2,000 per day. During initial screening of potential ridership in the Study Corridor, an activity level of 2,000 was considered the minimum acceptable for including a station vicinity in the LRT system. The Parker Road Station significantly exceeded the threshold of 2,000 boardings and alightings in all scenarios tested. Therefore, it is considered reasonable to extend LRT service to Parker Road while bypassing the intermediate, poor-performing station vicinities. Dedicated "circulator" bus service would be established between stations, and "feeder" bus service would be oriented to the LRT stations.

- The LRT/Arapaho Road Alternative would add five (5) stations to the LRT Starter System: Walnut Hill, Royal Lane, LBJ Freeway, Spring Valley, Arapaho Road. Dedicated "circulator" bus service would be established between stations, and "feeder" bus service would be oriented to the LRT stations.

- The LRT alternatives potentially could require the removal of the T&NO RR bridge of White Rock Creek, depending on the alignment selected at Royal Lane.

- The LRT alternatives likely would result in construction activity in the White Rock Creek Greenbelt and floodplain. The significance of potential impacts would depend on the alignment selected at Royal Lane.

- The TSM Alternative would increase transit accessibility through the expansion of traditional express bus commuter services, while the LRT alternatives would increase transit accessibility through an intermodal approach, using a combination of modes (i.e., bus, express bus, circulator/feeder bus, and LRT).

- The base operating headways for all LRT alternatives has been established at 10 minutes for the Peak Period and 15 minutes for the Off-Peak Period. These operating headways would be maintained on the segment between Park Lane and Arapaho Road, which is common to all alternatives. The LRT/Arapaho Road would not operate north of Arapaho Road in the City of Richardson. The LRT/Parker Road Alternative - Intermediate Capacity would operate at 20 minute Peak and 30 minute Off-Peak headways north of Arapaho Road because of the single track operation.

5.1.3 Affected Interests

- AM and PM commuters to the Dallas CBD would benefit mostly by the implementation of the network of express bus routes proposed under the TSM Alternative, because the need to transfer to LRT service would not exist.

- Drivers and service personnel of DART's bus system would benefit more with implementation of the TSM Alternative, because there would be more operating hours.

- The downtown areas of Richardson and Plano would benefit from the establishment of regular LRT service, connecting to the Dallas CBD and the regional LRT system.

- The real estate and development interests in the Corridor would be benefitted more by the establishment of permanent LRT service with fixed property investment. Land adjacent the station sites gain slightly in value with permanent transit facilities and services.

5.2 Evaluation Summary

Figure 5.1 presents a summary of the principal evaluation criteria defined for this Corridor Planning Study of the North Central Corridor, north of Park Lane. Performance measures for each of the evaluation criteria employed in the matrix have been extracted from the information presented in Chapter Four. In general, the LRT/Parker Road Alternative would result in the greatest

Table 5-1

Evaluation of Alternatives

North Central Corridor, North of Park Lane

Evaluation Criteria/Performance Measures

N/A = Not Applicable

	Alternative				
	No-Build	**TSM**	**LRT/Arapaho Road (MOS)**	**LRT/Parker Road Staged Implementation**	**LRT/Parker Road Full Development**
	• Expands current Bus Service • Includes Programmed HOV Lanes on US 75 & LBJ Freeway • Includes other Thoroughfare Improvements • LRT Terminus at Park Lane • Bus Access Ramp to US 75 HOV Lane at Richardson Transit Center	• Includes Projects of No-Build Alternatives • Additional Roadway Operational & Low-Cost Physical Improvements (LAP) • Expansion of Existing Park Lane LRT Station Parking Facility • Restructured Bus Rts. & 7 More Express Rts. • Bus Access Ramps to US 75 HOV Lanes at East Plano & SH 190 Transit Center • Circulator Service for Transit Centers • Improved Access for North Central P&R Fac.	• Includes Projects of No-Build Alternative • Extension of LRT Starter System to Arapaho Road in Richardson • Five New LRT Stations • 10 minute Headway in Peak Periods • 6.8 mile Double Track Guideway • Bus Feeder Service to Transit Stations	• Includes Projects of No-Build Alternative • Extension of LRT Starter System to Parker Road in Plano • Six New LRT Stations • 20 minute Headway in Peak Periods North of Arapaho Road LRT Station • 12.3 mile Double & Single Track Guideway with Sidings • Bus Feeder Service to Transit Stations	• Includes Projects of No-Build Alternative • Extension of LRT Starter System to Parker Road in Plano • Eight New LRT Stations plus Special Events Platform in Plano • 10 minute Headway in Peak Periods • 12.3 mile Double Track Guideway • Bus Feeder Service to Transit Stations
TRAVEL & MOBILITY					
• Population within 1 mile of Transit Stations/Centers	N/A	67,000	97,000	109,000	163,000
• Change in Daily Systemwide Transit Riders	N/A	Base	+3,500	+3,800	+5,400
• Average Transit Travel Time to CBD from:					
- LBJ Station/North Central Transit Center	26	26	21	21	21
- Arapaho Road Station	35	35	26	26	26
- Parker Road Station	40	40	40	32	34
• Travel Time Savings (Annual Hours)	N/A	Base	+948,800	+1,129,100	+1,536,900
Roadways					
• Reduction in Daily Roadway Vehicle Miles Traveled (VMT)	+18,460	Base	-62,480	-68,160	-96,560
EQUITY					
• Employment within 1 Mile of Transit Stations/Centers	N/A	117,780	164,000	172,000	238,000
ENVIRONMENTAL					
• Number of Noise Sensitive Sites Potentially Affected	N/A	N/A	20	34	34
• Number of Sensitive Visual/Aesthetic Resources Potentially Affected	N/A	N/A	11	15	15
• Number of Parklands Potentially Affected	N/A	1	4	5	5
• Number of Potential Displacements	None	None	2	2	2
• Change in Air Emissions	+0.2 Tons/Day	Base	-0.6 Tons/Day	-0.7 Tons/Day	-1.0 Tons/Day
COST/FINANCIAL FEASIBILITY					
• Added Capital Cost (Millions)	Base	+$44.9M	+$215.3M	+$267.6M	+$324.1M
• Available Capital Funding 1996-2001*	N/A	$240 - $250M	$240 - $250M	$240 - $250M	$240 - $250M
• Added Annual Operating & Maintenance Cost (Millions of 1993 Dollars)	Base	+$8.2M	+$7.6M	+$6.3M	+$9.8M
• Cost-Effectiveness Index (CEI)	N/A	Base	$9.83	$11.25	$12.24

* FY 1993-94 Financial Plan

transportation benefits, considering accessibility, ridership, travel time, and emissions reduction. However, it would carry with it the greatest social and environmental impacts. This alternative also would require the largest capital investment, exceeding available capital funds by $74 to $84 million and resulting in the highest annual O&M costs ($9.8 million). The computed value of the Federal cost-effectiveness index for the LRT/Parker Road Alternative is $12.24.

The TSM Alternative would require the least capital investment, but this alternative's annual O&M costs would be relatively high. No significant social or environmental impacts would be manifest with implementation of this alternative. Accessibility for work or commute trips would be significantly enhanced with implementation of the expanded Express Bus service through four transit centers. But, neither travel time nor accessibility would be improved to a significant degree.

The LRT/Arapaho Road Alternative and the LRT/Parker Road Alternative - Intermediate Capacity would be roughly comparable in terms of benefits and impacts. Because the latter alternative involves extending LRT service to Parker Road, certain environmental effects (noise, visual/aesthetic, and parkland impacts) are associated with it that are not associated with the LRT/Arapaho Road Alternative. The LRT/Parker Road Alternative - Intermediate Capacity would require a larger capital investment, exceeding the expected availability of capital funds by $18 to $28 million. On the plus side, the annual O&M costs for this alternative ($6.3 million) would be less than for the LRT/Arapaho Road Alternative ($7.6 million). The computed Federal cost-effectiveness index for the LRT/Arapaho Road Alternative is $9.83; this is less than that computed for the LRT/Parker Road Alternative - Intermediate Capacity option ($11.25).

Chapter Six

NEXT STEPS

There are several steps to be completed from this point in order to advance the proposed extension of the LRT system for the North Central Corridor, north of Park Lane, into Preliminary Engineering and, ultimately, full implementation.

6.1 Public Review/Involvement

Public involvement remains a critical component of project development process, which involves narrowing and refining a list of reasonable alternatives to an LPA. Therefore, community meetings and other public involvement opportunities will be instituted. This Evaluation of Alternatives Report will be subjected to public review in the same manner as the AA/DEIS.

Several informational meetings will be conducted throughout the Study Corridor. These meetings will focus on apprising affected agencies and interested citizens of the contents of this Evaluation of Alternatives Report and findings and conclusion contained herein. The recommended LPA, as determined from the evaluation, will be identified at these meetings. Persons attending the meetings will have the opportunity to comment on or ask questions about the alternatives, the LPA, and/or assessments as to potential transportation effects or environmental impact.

The informational meetings will be held during a formal public review period of 30 days. A formal public hearing(s) will be conducted at the end of this review period. At the public hearing(s), DART staff will summarize the key aspects of the proposed project and highlight critical findings and conclusions. Public comments then will be received.

6.2 Select LPA

After the public review/involvement activity is completed and comments are received, an LPA will be selected by the DART Board of Directors. Their decision will be based on the findings and conclusions documented in this Evaluation of Alternatives Report and other pertinent information that may be deemed critical to selection of the LPA. The Board also will consider comments and concerns raised during public review of the Evaluation of Alternatives Report, including input from the public, interest groups, and government agencies. The DART Board will forward its decision to the North Central Texas Council of Governments (NCTCOG), the regional planning body, for action. The NCTCOG will consider the decision of the DART Board and define an appropriate line of action, given the regional transportation planning and development program and available funds.

6.3 Prepare LPA Report

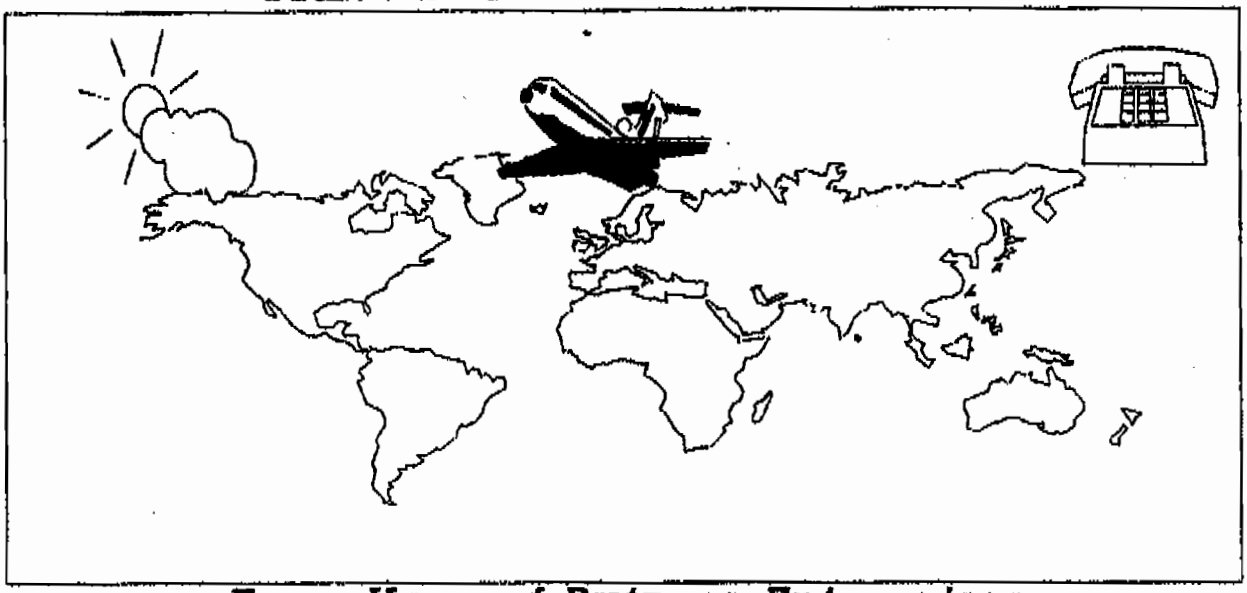
A Locally Preferred Alternative Report will be prepared, following official action by NCTCOG adopting a specific action for transportation improvements in the North Central Corridor, north of Park Lane. The LPA Report will provide a description of the preferred technology of the LPA and its alignment, operating plan, estimated costs, and associated financing plan. The LPA Report will be submitted to FTA with a request to initiate Preliminary Engineering and prepare the Draft and Final Environmental Impact Statement (FEIS) on the project. This process is intended to provide DART and FTA with the information necessary to assure that any transportation improvement built in the Study Corridor represents a wise use of public funds, and that community and environmental impact issues related to its construction and operation are taken into account.

6.4 EIS/Engineering/Design

FTA approval of the grant application will permit DART to initiate the Preliminary Engineering phase of the project development process. Under the new planning regulations, it is during this phase that the Draft and Final EIS documents will be prepared. The EIS is assembled from information in all areas of technical analysis. The document will provide a detailed description of the LPA, affected environment, expected impacts, and mitigation measures. Implementation of the LPA will be evaluated against doing nothing (i.e., a No Build or "No Action" alternative).

The DEIS will be circulated for public examination, review, and comment. Specific coordination will be maintained with affected government agency during this review process. Review of the DEIS will be followed by revisions, as necessary to respond to comments received, and preparation of the FEIS. With publication of the FEIS and certain other administrative actions on the part of FTA, DART can proceed into Final Engineering/Final Design and then Construction/Implementation phases of project development.

HERE COMES A FAX!



From Howard Putnam Enterprises

Sending 7 Pages Including This Page

DATE: 4-30-92

TO: LYNN SPRUILL

COMMENTS

Regards,

Howard

OUR PHONE & FAX IS: 214-985-9827

Howard D. Putnam

April 30, 1992

F A X

TO: Lynn Spruill
Mayor-City of Addison

Good Morning Lynn.....

This is for your information in anticipation of your Mayors meeting tomorrow. Please do not make copies for distribution before it appears.

I gave a copy to Florence this morning. She agrees.

The Morning News plans to run this in about a week, according to Carolyn Barta, Editor of the Viewpoints page.

Best of regards,

Howard

Howard Putnam

Howard D. Putnam Enterprises
P.O. Box 796336 Dallas, Texas 75379-6336 (214) 985-9827

D R A F T

FOR: DALLAS MORNING NEWS

CAROLYN BARTA/VIEWPOINTS

TO BE SUBMITTED ON

MONDAY, MAY 4, 1992

NOT FOR DISTRIBUTION

HOWARD D. PUTNAM
4/29/92
214-985-9827

coming to the end of an era. Many of the active civic servants were ending careers in public service and/or retiring from business. Then the Texas downfall of oil, real estate, and banking took many participants active in community projects, like DART, out of circulation. People had other priorities and concerns. As banks and companies disappeared that we had known, others appeared with new names, new approaches and out of state ownership. Financial interests and survival outweighed efforts for strong leadership in a united effort. Whenever that occurs, and a vacuum is created, then the door is open for special interest groups to publicize and politicize their agendas. For the last several years Dallas has been in political and racial gridlock, and I see no signs of a short term solution. DART has become the whipping post for these attacks and agendas. Its organization makes it vulnerable and an easy target.

DART as structured was probably doomed from day one, we just wouldn't admit it. As a board member in year one, we saw that a twenty-five person board was not workable. We saw that with Dallas having control of the voting that the suburbs were always going to be scratching for their share of service and attention. Even without the bickering within Dallas, the process would be a difficult one. Recent discussions to change to a smaller and elected board would do little in my opinion to improve the process.

DART Rail Program Should be Terminated & Future Implications

Some will say we don't need another article on DART. Others will say, leave Jack Evans, the new Executive Director of DART, alone as he needs time to begin anew. I have known Jack Evans for years and have great respect for his business acumen and civic leadership abilities. This viewpoint has nothing to do with any one individual. These thoughts are not an attempt to place blame. That is of no value to the process.

These comments are offered from the perspective of one who served on the original DART board in 1983, as the representative for Plano. From day one I supported the DART concept based on the need for a regional ground transportation network. Even when many were getting off the bandwagon, or train, I hung on. Three years ago I co-chaired the effort in Plano to approve the referendum to stay in DART. For all of its mistakes, faults and bureaucracy, I supported the concept in the interest of a regional network.

But in the past year, I have changed my mind and have concluded it is time to terminate or derail the rail part of DART. Why after nine years and hundreds of millions of sales tax dollars invested and some wasted, would I now want to burst the bubble? Here is why.

DART was conceived over a decade ago under another name and different leadership. We were still in an economic boom era. However the leadership, especially in Dallas, was

Maybe some good has come out of this nine year excursion of wandering through the wilderness looking for a place to lay our tracks. The metroplex has changed dramatically in growth patterns and demographics. Dallas is no longer the hub and everyone else the spokes. The term metroplex is probably outdated, for it is truly a "region" and rapidly expanding northward toward the Red River, across the "Trinity Commons."

In Plano we are just completing phase one of our "Vision 2015" project. A year long process with leaders from across the community to anticipate and aim Plano in a positive direction looking out twenty five years. Dr. Don Beck of the National Values Center in Denton, has facilitated the process. At this point it is only a framework and a scaffolding. As soon as the Plano city council sees it for the first time and has their input, then it will be taken to the people for their input and opportunity to put meat on the carcus. It is their city.

What the first phase clearly shows is that the region is becoming a grid, a spider web with several key destinations. Irving, Los Colinas, Arlington, Garland, Addison, and Plano to name a few, have emerged in these years as the homes of Fortune 500 companies and have become economic entities in and of themselves. Travel patterns have changed. In Plano for example as many people come to Plano to work each day as go somewhere else. 50-50, and ten years ago it was 80% leaving for work. The rail plan as designed years ago does

not meet the needs for the year 2000 and beyond. It will be outdated before it is ever built. The growth is across and between suburban destinations, not into and out of Dallas.

Rail is intrusive into neighborhoods. It is expensive and inflexible. Once there, it is permanent. And certainly at grade or street level, it isn't very rapid. What has worked has been the ability to adapt the bus and van system quickly to the needs of the customer. HOV lanes, high occupancy vehicle lanes, for buses again follow the flow and the expense is minimal compared to rail. Under that approach DART beomes a much simpler, lower cost bureaucracy and earier to run. It can then truly become a network for the region. Does it need to be taxpayer owned? What about examining privatization? The old argument about rail saving energy and being more efficient is a weak one. Alternative sources of fuel will be here in one form or another for buses, vans and autos. Our society demands flexibility and independence. Rail no longer fulfills that request.

For years we have been taught how to reduce stress. You can't medicate a problem forever. The real solution is to remove the cause of the problem. In the case of the quest for regional transportation.....put rail to bed....take DART out of the political stress.....and put our dollars to work in a productive manner.

72

FAX

To:Beckert, Mayor, Rich

From: Gary A. Slagel, Mayor

Date:6/24/93

Pages : 7

Fax Number : 9960-7684

Comments:

Please call Eileen Hanson at 214-238-4249 if any pages of this fax are not received.

TO: DART Suburban Member City Mayors

FROM: Gary A. Slagel, Mayor

DATE: June 24, 1993

SUBJECT: New 15-Member DART Board Appointments

The following cities have agreed to aggregate their populations for the purpose of appointing DART Board representatives:

1. Dallas
   Plano
   Glenn Heights
   Cockrell Hill

2. Richardson
   Highland Park
   University Park
   Addison
   Buckingham

3. Carrollton
   Irving

4. Farmers Branch
   Garland
   Rowlett

Most of these cities are now in the process of making their appointments as well as finalizing their draft agreements with the cities in their group.

In making your appointments, be sure to make them effective July 2, 1993, to avoid any legal technicality related to the legislation not officially taking effect until July 1. Attached is another copy of the draft agreement prepared by the City of Plano which several of the cities have already agreed to utilize.

The majority of the appointments are expected to be made by July 5. The first currently scheduled meeting of the new Board is July 27.

P.O. Box 860358
Plano, Texas 75086-0358
214 434 8531
Fax. No. 214-424-0099

MEMORANDUM

DATE: June 16, 1993

TO: Suburban DART Mayors

FROM: James N. Muns
Mayor, City of Plano

SUBJECT: Draft Aggregation Appointment Agreement

Attached is a preliminary draft of the agreement we discussed with the City of Dallas at our meeting on Monday, June 14, 1993. Mayor Bartlett has received a copy for consideration regarding participation with the cities aggregating their population for the ninth board member for Dallas and other cities.

Based on discussion with some of the members, this draft is provided should your city desire a similar agreement. In essence, this agreement provides veto power of ANY member city allowing the use of their population for additional board appointments.

Please advise if you have any suggestions or comments. I can be reached at 867-3997 or you may forward comments to Assistant City Manager James McCarley at 578-7122 or via fax 424-0099.

JNM/wkt

Attachment

DRAFT

RESOLUTION NO. _____

A RESOLUTION OF THE _____ CITY COUNCIL AFFIRMING AN AGREEMENT WITH THE CITY OF _____, REGARDING THE SELECTION PROCESS FOR A SHARED MEMBER TO THE DALLAS AREA RAPID TRANSIT (DART) BOARD.

WHEREAS, Article 1118y, Vernons Texas Civil Statute, as amended, provides cities having a fractional allocation for board membership to aggregate its population with another city to appoint a member; and

WHEREAS, cities aggregating their population to make an appointment shall agree on a method of making this appointment; and

WHEREAS, it is the desire of the City of _____ in conjunction with the City(s) of _____ to aggregate population for the selection of a DART Boardmember; and

WHEREAS, it has been determined by the City Council the most effective method to promote an area-wide approach to regional mobility and transportation is achievement of this appointment through consensus of participating cities;

NOW, THEREFORE, BE IT RESOLVED BY THE _____ **CITY COUNCIL THAT:**

SECTION 1. The City of _____, _____, and _____, will mutually agree upon a candidate to serve as a DART Boardmember making use of fractional population aggregation for a full Boardmember. It will be preferred that this candidate who will serve more than one City shall have regional qualifications of interest background and experience.

SECTION 2. The City having the highest percentage of the fractional allocation shall submit a candidate for

DRAFT

Resolution No. _____

approval by the other cities through the Mayor of each city. If all cities concur with the nomination, the individual will be the DART Board appointment.

SECTION 3. If concurrence with all cities is not reached on the individual nominated, another candidate must be proposed for consideration. This candidate, and any subsequent nominations, may be proposed by any of the member cities participating in aggregation of population. All municipalities participating in the aggregation for a specific Board seat must agree on the selection of an individual candidate.

DULY PASSED AND APPROVED this the _____ day of _____, 1993.

_____
James N. Muns, MAYOR

ATTEST:

_____
Jackie Blakely, CITY SECRETARY

APPROVED AS TO FORM:

_____
Gary F. Chatham, CITY ATTORNEY

CITY OF RICHARDSON **NEWS RELEASE**

DART MEMBER CITIES COMPLETE AGREEMENTS TO AGGREGATE AND APPOINT DART BOARD MEMBERS

The following cities have agreed to aggregate their populations for the purpose of appointing DART Board representatives:

1. Dallas
   Plano
   Glenn Heights
   Cockrell Hill

2. Richardson
   Highland Park
   University Park
   Addison
   Buckingham

   SEE ATTACHMENT FOR REPRESENTATIVE ALLOCATION

3. Carrollton
   Irving

4. Farmers Branch
   Garland
   Rowlett

Most cities are in the process of passing resolutions adopting the agreements on the aggregation and on the method of agreeing on shared Board appointments. Most of the cities are expected to have their Board members agreed-upon and appointed by July 5. The new legislation becomes effective July 1, 1993, and the first currently scheduled meeting of the new Board is Tuesday, July 27.

For information on individual cities' appointments, please contact either the individual city's mayor or city manager.

GH93132

Street Address:
411 W. Arapaho Rd.
Richardson, TX
75080-4542

Mailing Address:
P.O. Box 830309
Richardson, TX
75083-0309

BOARD ALLOCATION*

Dallas	8.76	
Plano	1.11	
Cockrell Hill	0.03	
Glenn Heights	0.04	
		9.94
Richardson	0.65	
Highland Park	0.08	
University Park	0.19	
Addison	0.08	
Buckingham	0.00	
		1.00
Carrollton	0.71	
Irving	1.35	
		2.06
Farmers Branch	0.22	
Garland	1.57	
Rowlett	0.20	
		1.99
		14.99

*Based on 1990 census.
Dallas allocated 8 members + Plano, Cockrell Hill, Glenn Heights, and Dallas agree on one member.

6/24/93
gb

Regional Transportation Council
P.O. Box 5888 • Arlington, Texas 76005-5888 • (817) 640-3300

MAY 28 93

May 25, 1993

The Honorable Gary Slagel
Mayor
City of Richardson
P.O. Box 830309
Richardson, TX 75083

The Honorable Rich Beckert
Mayor
Town of Addison
P.O. Box 144
Addison, TX 75001

Dear Mayor Slagel and Mayor Beckert:

In April, the Regional Transportation Council (RTC) approved revisions to its Bylaws. The revisions include development of RTC Subcommittees for programming purposes, integration of the Technical Committees, representation formulas for RTC, and mechanisms to combine smaller political jurisdictions.

Membership on the Council is either by direct membership or by indirect representation. In the previous RTC structure, Richardson was directly represented by Gary Slagel. Addison had indirect representation through Dallas County. As a result of the Bylaws revisions, Richardson and Addison have been combined into one group and are entitled to one seat on the Council. A copy of the RTC Bylaws is enclosed for your reference. Sections 3.A and 3.B pertain to membership on the Council and appointment of representatives. These sections have been highlighted for your convenience.

As noted in Section 3.B of the Bylaws, a group representative shall be selected by a weighted vote of the affected Mayors/County Judges using the maximum of the daytime or nighttime population. Please select an appointment to the Council in accordance with these procedures. The designated representative must be an elected official. You may reappoint Gary Slagel or select a new representative. Please contact LaDonna Smith of my staff at 817/640-3300, ext. 231, or by fax at 817/640-7806, with your designation. This designation should be confirmed in writing by both entities included in this group.

The next meeting of the RTC is scheduled for Friday, May 28, 1993, at which time the draft 1994 Transportation Improvement Program will be presented. Action on the TIP will be requested on June 17. An agenda for the May 28 meeting is enclosed. Please pass this information on to your designated representative if appointed by this date. A new member orientation will be scheduled in June once new appointments have been designated.

We look forward to hearing from you soon. If you have any questions, please feel free to call me.

Sincerely,

Michael Morris
Director of Transportation

lms
Enclosures

c: Bob Hughey, City Manager, City of Richardson
Ron Whitehead, City Manager, Town of Addison

REGIONAL TRANSPORTATION COUNCIL MEMBERSHIP

CITY	NIGHTTIME POP	DAYTIME POP *	MAXIMUM DAYTIME & NIGHTTIME
Collin County			
Plano	128,700	58,000	128,700
McKinney	21,300	15,000	21,300
Allen	19,100	4,000	19,100
Dallas County			
Dallas	1,007,000	948,000	1,007,000
Garland	181,000	68,000	181,000
Irving	155,000	110,000	155,000
Mesquite	101,000	33,000	101,000
Grand Prairie	100,000	62,000	100,000
Richardson	75,000	68,000	75,000
Duncanville	36,000	11,000	36,000
DeSoto	31,000	10,000	31,000
Farmers Branch	24,000	66,000	66,000
Rowlett	23,000	5,000	23,000
Lancaster	22,000	8,000	22,000
University Park	22,000	10,000	22,000
Cedar Hill	20,000	3,000	20,000
Balch Springs	17,400	4,000	17,400
Coppell	17,000	3,000	17,000
Addison	8,800	45,000	45,000
Denton County			
Carrollton	82,000	63,000	82,000
Denton	66,000	34,000	66,000
Lewisville	47,000	18,000	47,000
The Colony	22,000	2,000	22,000
Flower Mound	16,000	3,000	16,000
Ellis County	76,000	32,000	76,000
Waxahachie	18,000	5,000	18,000
Ennis	14,000	3,500	14,000
Johnson County	95,000	36,000	95,000
Cleburne	16,000	8000	16,000
Burleson	16,000	5,000	16,000
Rockwall County	24,000	11,000	24,000
Rockwall	11,000	6,000	11,000
Tarrant County			
Fort Worth	448,000	333,000	448,000
Arlington	262,000	97,000	262,000
North Richland Hill	46,000	12,000	46,000
Bedford	44,000	15,000	44,000
Euless	38,000	9,000	38,000
Hurst	34,000	19,000	34,000
Haltom City	33,000	12,000	33,000
Grapevine	29,000	25,000	29,000
Watauga	20,000	2,000	20,000
Benbrook	20,000	3,000	20,000
Mansfield	16,000	4,000	16,000
White Settlement	15,000	4,000	15,000
Keller	14,000	1,000	14,000
Colleyville	13,000	2,000	13,000
Forest Hill	11,000	2,000	11,000

* Assumed equal to employment.

Source: North Central Texas Council of Governments

BYLAWS AND OPERATING PROCEDURES
REGIONAL TRANSPORTATION COUNCIL

April 1993

STATEMENT OF PRINCIPLES

1. The physical, economic, and social well-being of the region, its citizens, and business enterprises, now and in the future, is determined to a great extent by its transportation system. Therefore, decisions involving transportation systems and subsystems must consider the environmental, economic, and social impacts of the alternatives in the future development of the transportation system and must attain the principal objective of having an efficient, safe, and practical system for moving people, goods, and services in the region according to their needs.

2. A transportation system can best be planned on a large-area basis involving city, county, regional, and state jurisdictional responsibilities and a proper mix of various modes of travel.

3. Counties and cities have the local responsibility for anticipating and meeting the transportation needs for adequately moving people and goods within their jurisdictions. However, the Texas Department of Transportation is charged, by law, with the responsibility for planning, designing, constructing, and maintaining the State Highway System. In addition, duly authorized transportation authorities are responsible for planning, developing, and operating public transportation services in their respective service areas. With new federal legislation, the Metropolitan Planning Organization (MPO), through the NCTCOG Regional Transportation Council, has an expanded role in project selection and transportation project programming.

4. Evaluation of transportation alternatives and the determination of the most desirable transportation system can best be accomplished through a Regional Transportation Council (RTC) of primarily elected officials as spokesmen for the counties and cities in the North Central Texas Region. The Regional Transportation Council will be the forum for cooperative decision making by primarily elected officials of general purpose local governments and including representatives of entities responsible for highway and mass transit improvements.

5. The Regional Transportation Council will make recommendations involving the regional transportation system to the counties and cities, the State, and the authorities for all modes of transportation. Final decisions for implementing the regional transportation plan rest with the governing bodies of the counties and cities, the Transportation Commission, the Regional Transportation Council, and the authorities.

6. The Regional Transportation Council will monitor the transportation planning process to assure that it is conducted in a manner consistent with requirements of federal law and regulations.

7. In an attempt to fulfill the above concepts and to meet the requirements of the Federal Aid Highway Act of 1973, the Governor, on April 18, 1974, designated the North Central Texas Council of Governments as the Metropolitan Planning Organization for transportation planning with the proviso that the Regional Transportation Council be the decision-making group for regional transportation policy for the Dallas-Fort Worth urbanized area. More recently, the Governor has designated the Regional Transportation Council as the MPO for the Lewisville and Denton urbanized areas. As the designated Metropolitan Planning Organization, the North Central Texas Council of Governments must assure that transportation planning in the urbanized area is satisfactorily coordinated and integrated with other comprehensive planning

in the State Planning Region. These Bylaws and Operating Procedures spell out the manner in which the Regional Transportation Council shall fulfill its responsibilities as the cooperative transportation decision-making group of the Metropolitan Planning Organization for the Dallas-Fort Worth metropolitan area.

DEFINITIONS

Section 1. The following definitions shall apply to terms used in these Bylaws and Operating Procedures:

A. Transportation Planning Process. The transportation planning process is the process of estimating future travel demand, identifying transportation improvement alternatives, and evaluating those alternatives and financial resources to determine the best combination of facilities and services for all modes of travel.

B. Regional Transportation Plan. The Regional Transportation Plan is the delineation of the highway, transit, and airport facilities which would serve the projected travel demand for a forecast year. Included in this intermodal transportation plan is a listing of projects for development of the proposed plan. In addition, as a second inventory, the Regional Transportation Plan will include a subset of projects anticipated to be funded over the next 20 years and be developed consistent with federal guidelines.

C. Regional Transportation System. The Regional Transportation System is the continuous network of roadways and transit services that provides for movement and interchange of people and goods, primarily between local jurisdictions within the region. Included in the Regional Transportation System are highways and streets, parking and intermodal terminals, tollways, fixed-guideway transit lines, bus routes, taxi services, paratransit and ridesharing services, railroad facilities, and general aviation and air carrier airports.

D. Regional Highway System. The regional highway system is those freeways, principal and minor arterials, tollways, truck terminals, parking facilities, and ridesharing services which make up the system for travel by automobile or truck.

E. Regional Public Transportation System. The regional public transportation system includes all fixed-guideway facilities, bus routes, personal rapid transit, paratransit, and taxi services operated by public or private entities.

F. Regional Airport System. The regional airport system is the collective airports and heliports in the urbanized area which provide terminals for commercial air travel, general aviation, and air cargo.

G. Metropolitan Area. The Metropolitan Area is that portion of Dallas, Tarrant, Denton, Collin, Rockwall, and surrounding counties expected to be principally urbanized by 2010.

ORGANIZATION

Section 2. The organization for regional transportation planning shall consist of the Regional Transportation Council, Regional Transportation Council Program Subcommittees, and Technical Committees, as described in subsequent paragraphs and sections of these Bylaws and Operating Procedures.

A. Regional Transportation Council. The Regional Transportation Council shall be the forum for cooperative decision making by primarily elected officials of general purpose local governments in the Metropolitan Area.

B. Regional Transportation Council Program Subcommittees. The Regional Transportation Council will have two Program Subcommittees defined along Texas Department of Transportation District boundaries and will be composed of all members of the full Regional Transportation Council plus cities with a daytime or nighttime population of 10,000 persons or greater. Their primary purpose is to discuss specific transportation projects within their subregion and recommend projects to the Regional Transportation Council for possible funding. All impacted entities listed under Section 3.A will reside on the Subcommittees, and cities/counties with multiple seats will be represented by the number of seats on the RTC.

C. Technical Committees. These committees shall provide technical review and advice for the regional transportation planning process to the Regional Transportation Council.

REGIONAL TRANSPORTATION COUNCIL

Section 3. The following rules shall govern the procedure, membership, and records of the Regional Transportation Council and its Subcommittees.

A. Membership. Membership on the Regional Transportation Council shall be provided for local governments in the Metropolitan Area, either by direct membership or by representation. Federally designated urbanized areas of 50,000 or greater, in which the Regional Transportation Council is serving as the Metropolitan Planning Organization, shall be provided direct membership. The following local governments and public agencies shall be represented as indicated:

Dallas County	2
Tarrant County	2
Collin County	1
Denton County	1
Ellis County, Ennis, and Waxahachie	1
Johnson County, Burleson, and Cleburne	1
City of Dallas and University Park	6

City of Fort Worth, Benbrook Forest Hill, and White Settlement	3	
City of Arlington	1	
City of Carrollton and Farmers Branch	1	
City of Denton	1	(urbanized area)
City of Garland, Rowlett, and Rockwall County	1	
City of Grand Prairie and Mansfield	1	
City of Irving and Coppell	1	
City of Mesquite and Balch Springs	1	
City of Plano, Allen, and McKinney	1	
City of Richardson and Addison	1	
Cities of Haltom City, Keller, Watauga, and North Richland Hills	1	
Cities of Bedford, Euless, Hurst, Colleyville, and Grapevine	1	
Cities of Lewisville, The Colony, and Flower Mound	1	(urbanized area)
Cities of Duncanville, DeSoto, Lancaster, and Cedar Hill	1	
District Engineer, Dallas District, TxDOT	1	
District Engineer, Fort Worth District, TxDOT	1	
Representative, Eastern Subregion Transportation Authority	1	
Representative, Western Subregion Transportation Authority	1	
TOTAL	34	

The representatives of the transportation authorities shall be approved by all authorities in the respective subregions; the subregions are described in State law (VATS 1118y). The transportation authority representatives shall be board members of an authority.

B. Appointees. All members of the RTC shall be elected officials except the two transportation authority representatives and the two TxDOT District Engineers. Representatives of individual cities and counties shall be appointed by and serve at the pleasure of the city councils and commissioners courts respectively. The appointing bodies are encouraged to select members in common for the RTC and the NCTCOG Executive Board. The person representing a group of several cities shall be selected by a weighted vote using the maximum of the daytime or nighttime population of the mayors/County Judges of the

cities/counties represented, and the person selected shall serve a two-year term beginning in January of even-numbered years.

C. Ballots. A ballot shall be sent to each RTC member as part of the meeting preparation package. Ballots should be used by absent members to indicate their position on any matters to be acted on by the RTC. Completed ballots received before or at the RTC meeting shall be counted with votes of members attending the meeting, provided that a quorum of members is present at the meeting. Ballots shall not be counted if the proposal submitted in the meeting preparation package mailed to members is changed in substance at the meeting. The Chairman shall decide whether the change is sufficient to discard ballots.

D. Attendance. Records of attendance of RTC meetings shall be kept and presented monthly as part of the minutes. These records shall be sent to the represented local governments quarterly. RTC members that have missed at least three consecutive meetings or at least four meetings in the preceding 12 months shall be dropped from the RTC roster, and the appointing bodies shall be asked to name a new representative. The quarterly attendance notice shall indicate that such notice is standard practice and not indicative of any particular problem.

E. Quorum. At least 50 percent of the appointed members identified in Section 3.A above must be present at meetings for the RTC to take action.

F. Officers. The Regional Transportation Council shall elect a Chairman, Vice Chairman, and Secretary for a term of two calendar years. Elections shall be held in the last meeting of each odd-numbered year. The Chairman shall appoint a nominating committee prior to the

last meeting of each odd-numbered year for the purpose of bringing before the Council a slate of officers for consideration. Officers shall be elected public officials appointed by and from the governing body of the member government. In the event that the Chairman of the Regional Transportation Council cannot continue to serve at any time during his term of election, the Vice Chairman shall automatically become Chairman. A vacancy in either the office of the Vice Chairman or Secretary shall be filled by the Regional Transportation Council in the first meeting of the Council after the vacancy becomes known. In the event that the offices of Chairman, Vice Chairman, and Secretary all become vacant, new officers shall be elected at the next regularly scheduled meeting of the Regional Transportation Council, with nominations from the floor.

G. Meetings. At least one meeting shall be held annually by the Regional Transportation Council, but the Council shall meet as often as necessary for the purpose of transacting the business at hand. The Chairman shall call the meeting and shall designate in the written notice of the meeting the business to be transacted or considered.

Written notice of the meeting, accompanied by an Agenda, shall be mailed to the members and major news media at least 72 hours prior to the meeting and confirmed by telephone. The place of meetings shall be designated by the Chairman. All meetings shall be held as open meetings as defined in Article 6252-17, Vernon's Annotated Civil Statutes.

H. Minutes. Minutes of the meetings shall be kept and shall be submitted to the members of the Council for approval. Minutes from the Surface Transportation Technical Committee will also be transmitted to the RTC.

I. Staff Support. Staff support for the Regional Transportation Council shall be furnished by the staff of the North Central Texas Council of Governments and the Regional Planning Office of the Texas Department of Transportation.

J. Council Functions. Functions of the Regional Transportation Council shall be as follows:

1. Provide direction to the regional transportation planning process.

2. Certify the coordination, comprehensiveness, and continuity of the regional transportation planning process.

3. Develop the Unified Planning Work Program, Regional Transportation Plan, and Transportation Improvement Program in accordance with requirements of federal statutes and regulations.

4. Review the Transportation Improvement Program to assure that transportation projects do not reasonably exceed what funding currently seems likely to be available for each metropolitan subarea, to the degree that is reasonable.

5. Review the limits of the Metropolitan Area and make revisions considered appropriate.

6. Authorize transit planning technical assistance to transit operating agencies at their request.

7. Encourage the Federal Aviation Administration to follow the General Aviation System Plan 2010.

8. Identify the kinds of consultant projects eligible for federal transportation funding.

9. County representatives are appointed to represent the transportation needs of the entire county, especially those areas of the county within unincorporated areas, and local governments within each county which are not directly represented on the RTC. It is the responsibility of the county representative to inform and discuss policies and actions of the RTC with those impacted areas they represent and to communicate the transportation needs of these areas to the RTC.

10. RTC members representing groups of entities are appointed to represent the transportation needs of all entities within the group. It is the responsibility of the RTC members representing groups to inform and discuss policies and actions of the RTC with elected officials in their impacted areas and to communicate the transportation needs of these areas to the RTC.

TECHNICAL COMMITTEES

Section 4. The following rules shall govern the procedures, membership, and records of the Technical Committees.

A. Technical Committees. The following Technical Committees shall be the minimum number of committees formed to provide technical advice and review for the transportation planning process.

1. Surface Transportation Technical Committee
2. Air Transportation Technical Advisory Committee
3. Travel Demand Management Committee

B. Membership. Members of the Surface Transportation Technical Committee shall be staff personnel nominated by their respective governments or agencies and shall include at least one member from each jurisdiction and agency represented on the Regional Transportation Council. Membership and voting on the Surface Transportation Technical Committee shall be provided to the following local governments and public agencies and shall be represented as indicated:

- Each central urban county within the Metropolitan Area shall have two representatives including:

Dallas County	2
Tarrant County	2

- Each perimeter county in the Metropolitan Area shall have one representative including:

Collin County	1
Denton County	1
Ellis County	1
Johnson County	1

Rockwall County	1

- Each central urban city within the Metropolitan Area shall have three representatives including:

City of Dallas	3
City of Fort Worth	3

- Each suburban city within the Metropolitan Area with a combined population and employment greater than 200,000 shall each have two representatives including:

City of Arlington	2
City of Garland	2
City of Irving	2

- Each suburban city within the Metropolitan Area with a combined population and employment greater than 40,000 shall each have one representative including:

City of Addison	1
City of Bedford	1
City of Carrollton	1
City of Denton	1
City of DeSoto	1
City of Duncanville	1
City of Euless	1
City of Farmers Branch	1
City of Grand Prairie	1
City of Grapevine	1
City of Haltom City	1
City of Hurst	1
City of Lewisville	1
City of Mesquite	1

City of North Richland Hills	1
City of Plano	1
City of Richardson	1

- The following planning agencies will be represented as listed:

TxDOT District 2	2
TxDOT District 18	2
TxDOT Regional Planning Office	1
TxDOT Division 10 (Austin)	2
Dallas Area Rapid Transit	2
Fort Worth Transportation Authority	2
RAILTRAN	1
Texas Turnpike Authority	1
TOTAL	51

Each city with an RTC member representing multiple local governments and not having a Surface Transportation Technical Committee member by the above representation will also be provided one member. (RTC membership on January 1, 1993, would result in one additional Technical Committee member.)

Representatives from other local governments are welcome to attend the meetings.

Members of the Travel Demand Management Committee and the Air Transportation Technical Advisory Committee are selected on an as-needed basis and, as with the Surface Transportation Technical Committee, shall be appointed by the Executive Board of the North Central Texas Council of Governments.

C. Officers. A Chairman, Vice Chairman, and a Secretary for the Surface Transportation Technical Committee, Travel Demand Management Committee, and the Air Transportation Technical Advisory Committee shall be designated by the Executive Board of the North Central Texas Council of Governments for a term of two calendar years, beginning on January 1 of even-numbered years.

D. Meetings. Meetings of the Technical Committees shall be held as necessary to review and advise on matters referred to them. The Chairrnan shall call such meetings as necessary and shall notify all Committee members.

E. Minutes. Minutes of all meetings shall be kept and submitted to the membership of the Committee for approval and also provided to the RTC. The Regional Transportation Council will be kept apprised of Surface Transportation Technical Committee membership by public agency.

F. Staff Support. Staff support for the Surface Transportation Technical Committee shall be furnished by the Regional Planning Office of the Texas Department of Transportation and by the North Central Texas Council of Governments. Staff support for the Travel Demand Management Committee and the Air Transportation Technical Advisory Committee shall be furnished by the North Central Texas Council of Governments.

G. Committee Functions. The functions of the Technical Committees shall be to review and comment on all matters referred to them by either the Regional Transportation Council or their respective Technical Committee Chairmen. The Surface Transportation Technical Committee, Travel Demand Management Committee, and the Air Transportation Technical Advisory Committee shall advise the North Central Texas Council of Governments on projects submitted for review as part of the Texas Review and Comment System.

INTENT

Section 5. These Bylaws and Operating Procedures are intended to provide rules and procedures to assure the orderly function of the regional transportation planning process in North Central Texas.

ADOPTION

Section 6. These Bylaws and Operating Procedures shall be in full force and effect at such time as they have been approved by two-thirds vote of the Regional Transportation Council at a meeting at which a quorum, as defined herein, is present.

REVISION

Section 7. These Bylaws and Operating Procedures may be revised by approval of two-thirds of the members of the Regional Transportation Council at a meeting at which a quorum, as defined herein, is present. Changes in the Bylaws must be presented at one regularly scheduled meeting and voted at a following regularly scheduled meeting. No Bylaw change shall be made that has not been presented at a previous meeting. The Chairman shall vote on Bylaw changes.

JOHN A. MURPHY
120 WEST SHORE DRIVE
RICHARDSON, TEXAS 75080
(H) 214-690-3370 (W) 214-508-5158

EDUCATION:

MBA, Ohio University, Athens, Ohio; 1975
BA, Ohio University, Athens, Ohio; 1973

EXPERIENCE:

1989 - Present

NationsBank, P.O.Box 831000, Dallas, Texas, 75283-1000 (formerly NCNB)

Vice President, Manager - Treasury Services Customer Support; Manage and coordinate support staff providing consulting services to corporate customers using Treasury Management Products. Consulting provided covers topics such as: Bank Operations, Check Processing, Wire Transfer, ACH, Lockbox, Controlled Disbursement, Vault and ARP.

1984 - 1989

NCNB, P.O. Box 831000, Dallas Texas, 75283-1000 (formerly First Republic Bank and Republic Bank)

Assistant Vice President, Manager - Check Processing Support; Managed half of Check Processing Operations including Return Items, Research and Adjustments, and Customer Service Units. Directed staff of 120. Planned and administered annual budget of $10mm. Coordinated facility consolidation between Republic and Interfirst Bank operations units.

1981 - 1984

Republic Bank, P.O. Box 655961 Dallas, Texas 75265-5961

Senior Operations Analyst - Consulting Services/Check Processing Division; Coordinated facilities redesign for $5mm renovation. Staff administrator and office manager. Customer Service and New Corporate Customer Representative.

1977 - 1981

Southern Union Company, 1st International Bldg., Dallas, Texas, 75270

Rate Manager; Directed staff in preparation and presentation of rate applications to municipal and state regulatory agencies. Organized and coordinated activities of department involved in regulatory actions including legal, accounting and engineering. Advised and assisted senior management in planning regulatory strategy. Testified on accounting policy and procedures before various regulatory commissions. Negotiated rate settlements.

1975 - 1977

Rate Accountant; Supervised support groups charged with data collection, financial and statistical analysis, and document preparation. Analyzed and evaluated operating performance, working capital and rate of return requirements. Prepared written testimony and testified before state and municipal regulatory agencies on various accounting subjects including expense levels, inflation accounting, attrition and rate design.

1975	**Ronald E. Stemmler and Associates (RESA)**, Athens, Ohio Consultant; Developed contract negotiation strategies and policies for the State of Ohio and Ohio Department of Transportation. Analyzed and presented financial research findings on the State's energy requirements to management seminars. Supervised research personnel.
PROFESSIONAL AND CIVIC:	-Councilman, Richardson City Council, Richardson Texas 1991-93, reelected 1993 -Phi Gamma Delta Graduate Association -Chairperson, Caring for Children Program 1991-1993 -Member, Treasury Management Association
MILITARY:	United States Air Force 1968-1972; Honorable Discharge
REFERENCES:	Available on request

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REFERENCES:	Available on request

Survey of Community Attitudes about DART

Preliminary Findings

April 8, 1993

Conducted by:
Dr. Edward T. Rincon
Survey Method Research Class
University of Texas at Dallas

Introduction

In March 1993, a study was initiated to examine community attitudes regarding Dallas Area Rapid Transit.

To assure objectivity, interviews were conducted from March 12 - 18 at the central telephone interviewing center of Rincon & Associates in Dallas, Tx. Eight graduate students from the Survey Research Methods course at The Unversity of Texas at Dallas conducted all interviewing under the supervision and training of Dr. Edward T. Rincon.

One professional bilingual interviewer from Rincon & Associates also assisted with Spanish-speaking respondents.

Study Objectives

There were four stated objectives for the survey project:

1. Determine public awareness about DART Light Rail Construction now underway, and the future willingness of area residents to use the system, especially in terms of downtown Dallas travel.

2. Determine the public approval rating of DART since the new Transit System Plan was established in 1989.

3. Determine rider perceptions of current DART service.

4. Provide the DART Public Affairs Department direction in communicating to taxpayers in the 14 city service area.

The following sections present a synopsis of the survey project.

Methodology

Sampling Design

A random digit sample (RDD) was acquired from Survey Sampling Inc., a professional sampling organization, for telephone exchanges within Dallas and Collin counties. A total of 400 interviews were completed from this sample, which is a probability sample of all telephone households within these two counties.

By stratifying by all telephone exchanges in the sampling area, a proportionate-to-size sample is drawn. A sample of 400 respondents permits inferences to be made at a 95 percent confidence interval with a margin of error of plus or minus 5 percent.

The following table presents the actual number of completed interviews by race and sex, the unweighted percentage distribution and the weighted percentage distribution. The weighted percents were derived by mathematically weighting the sample percentages by the 1990 Census information on race and sex distributions in Dallas and Collin counties.

			Weighted
Race	Number	Percent	Percent
White	290	72.5	63.4
Black	57	14.2	17.6
Hispanic	39	9.8	15.8
Other	14	3.5	3.2
Sex			
Male	166	41.5	49.4
Female	234	58.5	50.6
Total	400	100.0	100.0

Questionaire Design

Working in conjunction with Media Relations Manager Ron Whittington of DART, Dr. Rincon and the UTD graduate students designed a short, five-minute questionaire that addressed general transportation issues. A Spanish-language version of the questionaire was also available.

Executive Summary

April 8, 1993

Summary of Key Findings

Listed below are a few facts that should be kept in mind as issues are addressed.

Awareness of DART and Related Projects

1. Awareness of DART is high (94%) among Dallas and Collin County residents.

2. A majority (79%) of respondents are aware that DART is building a light rail system today.

Awareness and Expected Usage of the Light Rail System

3. Respondents who are aware of the light rail system, however, appear confused about its completion date. Only 9 percent correctly indicated DART's 1996 completion date, 42 percent were unable to provide a date, and 49 percent provided a different date.

4. Respondents are optimistic about the potential success of the light rail system. About one third (32%) believe that it will be very successful, while nearly half (45%) believe it will be somewhat successful.

5. Downtown workers appear enthusiastic about utilizing the light rail system upon completion. One third (33%) of the downtown workers say they are very likely to use it upon completion, while another 29 percent are somewhat likely to use the llight rail system.

6. Nearly six out of ten (58%) respondents would use a light rail system to go downtown on weekends.

Evaluation of DART and DART Services

7. DART's current bus service is evaluated very positively, with 13 percent of all respondents saying it is excellent and 39 percent indicating it is good.

8. Given Dallas' political environment, nearly half (49%) of respondents nevertheless believe that DART has excellently or well since its adoption of the new transit plan in 1989.

9. Safety of waiting areas is cited as very important by DART non-riders (58%) in their decision not to ride the bus more often, followed by routing (52%), needing a car for work (48%), frequency of service (41%), and travel time of buses (36%).

Current and Expected Visits to Downtown Dallas

10. Almost seven in ten (68%) respondents would consider visiting downtown Dallas more often for shopping and entertainment if DART were to make downtown Dallas more accessible to them.

11. About 21 percent of respondents visit downtown Dallas for weekend recreation on a regular basis (3-4 times a month or more).

12. While awareness of DART's HandiRides service is high (82%), only a small proportion (8%) of respondents have used the service.

Respondent Characteristics

— About 12 percent of respondents work downtown.

— Three fourths of downtown workers (73%) currently use a car or truck as their mode of transportation.

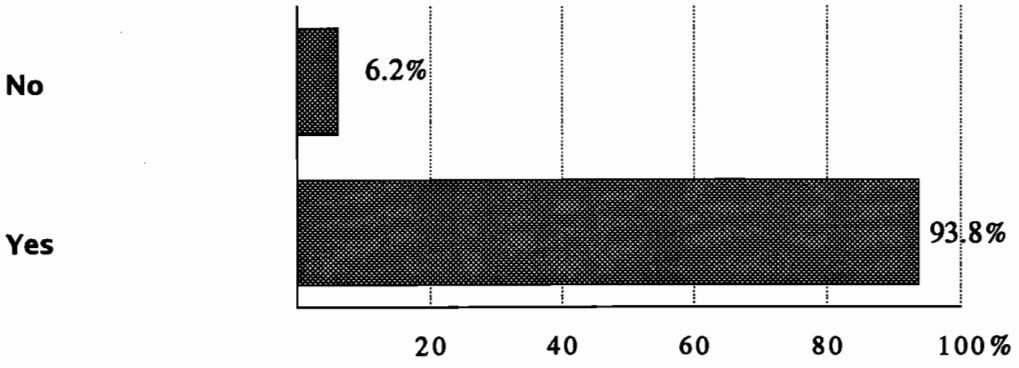
— About 22 percent of respondents are DART riders while 78 percent are non-riders.

-- Respondents reflect the racial and gender characteristics of Dallas and Collin county residents: White (63%), Black (18%), Hispanic (16%), and others (3%); males (49%), females (51%).

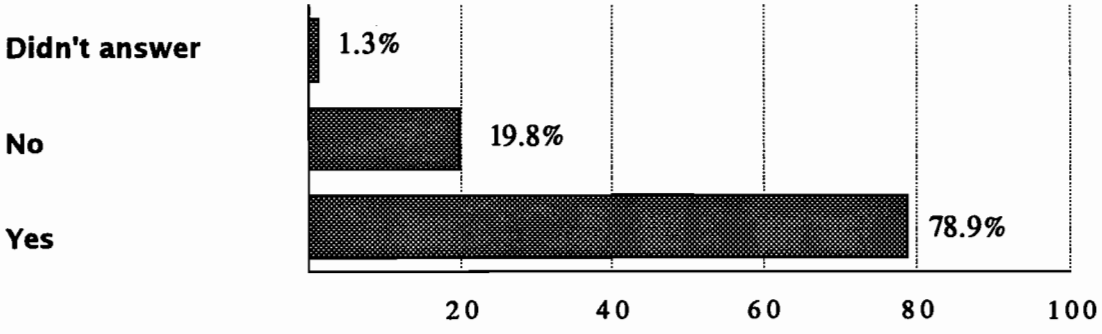
University of Texas at Dallas
Graduate Students Participating in the DART Survey

Chris Boyd, MPA major -- Public Affairs
Jeff Carbiener, Ph. D. candidate -- Political Economy
Jackie Chandler, MPA major -- Public Affairs
Carol Mendez, MPA major -- Public Affairs
Daniel Oney, Ph. D. candidate -- Political Economy
Anna Sicher, MPA major -- Public Affairs
Paula Tibandebage, Ph. D. candidate -- Political Economy
Scott Walker, Ph. D. candidate -- Political Economy

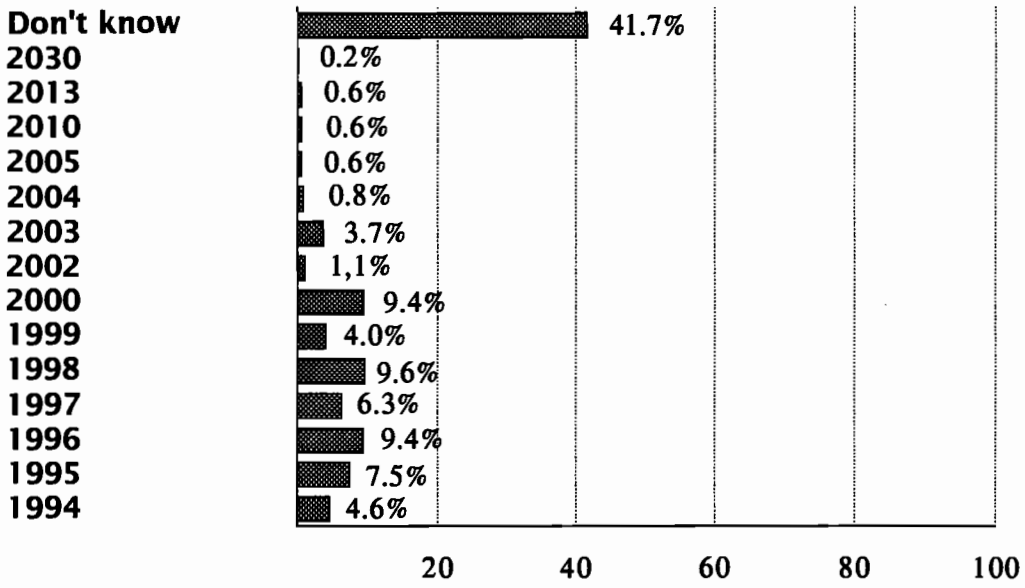
Question 1: First, have you ever heard of Dallas Area Rapid Transit, or DART?



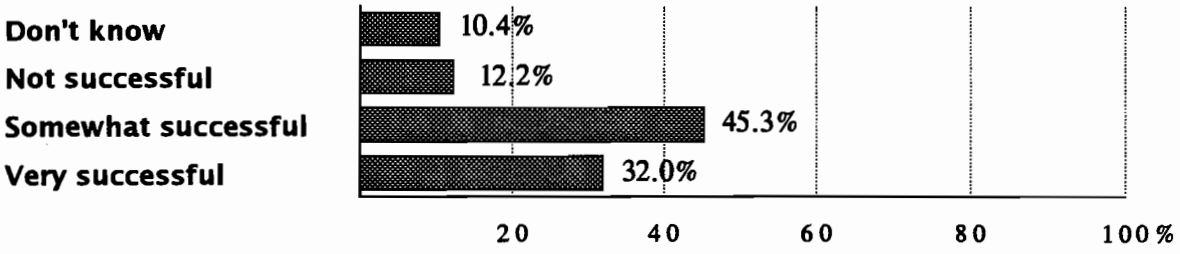
Question 2: As you may or may not know, a light rail system is a train that holds about 150 people per car and runs on rail tracks at speeds up to 60 mph. Are you aware DART is building a light rail system today?



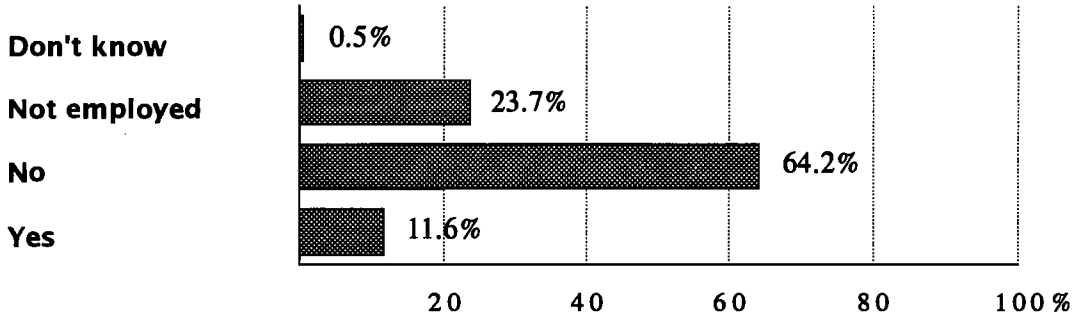
Question 3: In terms of what you have heard or read, what year do you think that the light rail system is projected to open?



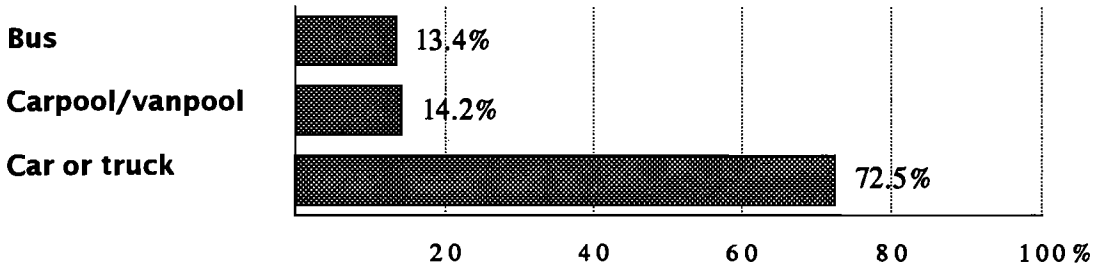
Question 4: Light rail systems are operating today in Portland, San Diego and other large cities. How successful do you think a system like this will be in Dallas? Do you think it will be very successful, somewhat successful, or not at all successful?



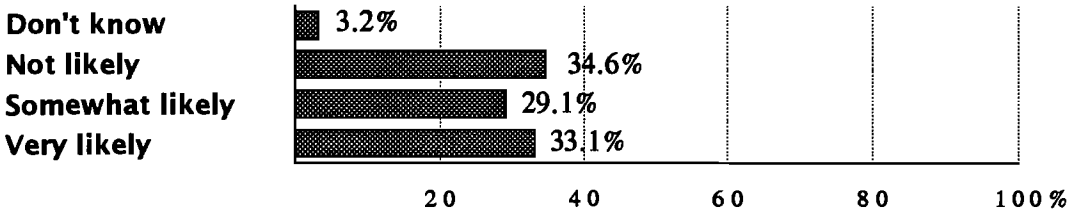
Question 5: Do you currently work in downtown Dallas?



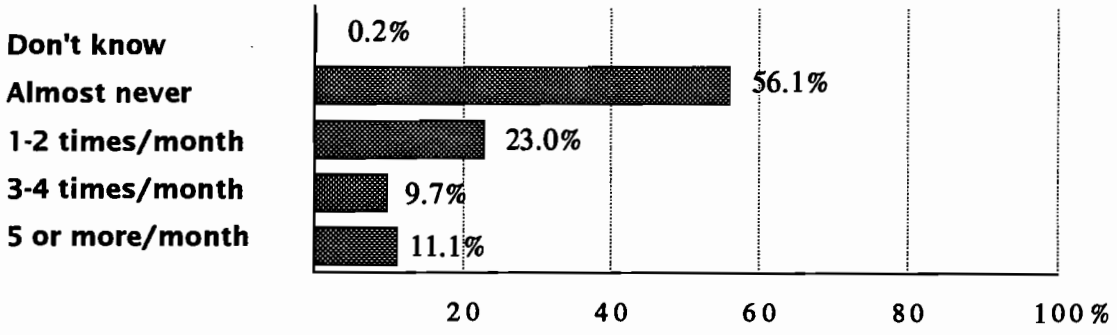
Question 5A: What form of transportation do you usually use to travel to and from work?



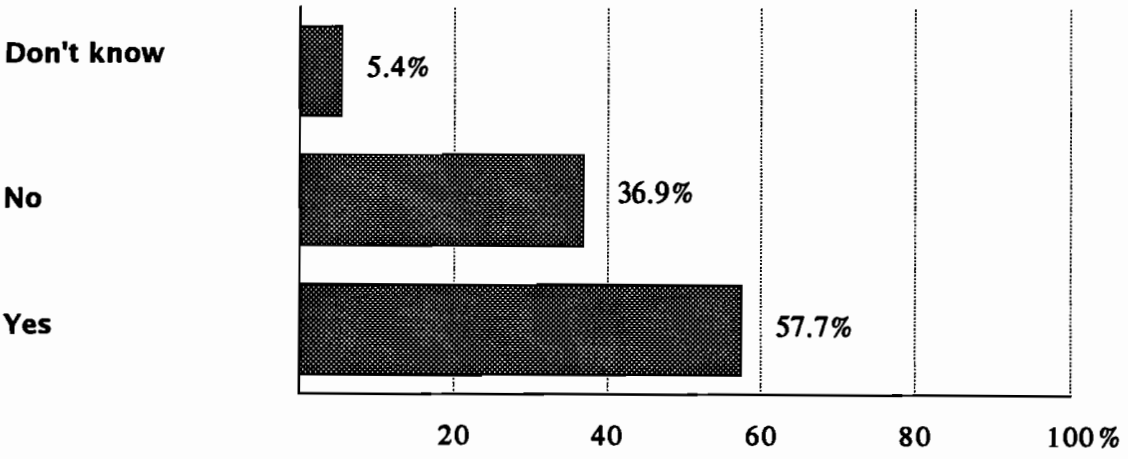
Question 5B: And what is the likelihood that you will ride the light rail system to work when it is completed? Would you say it is very likely, somewhat likely or not at all likely?



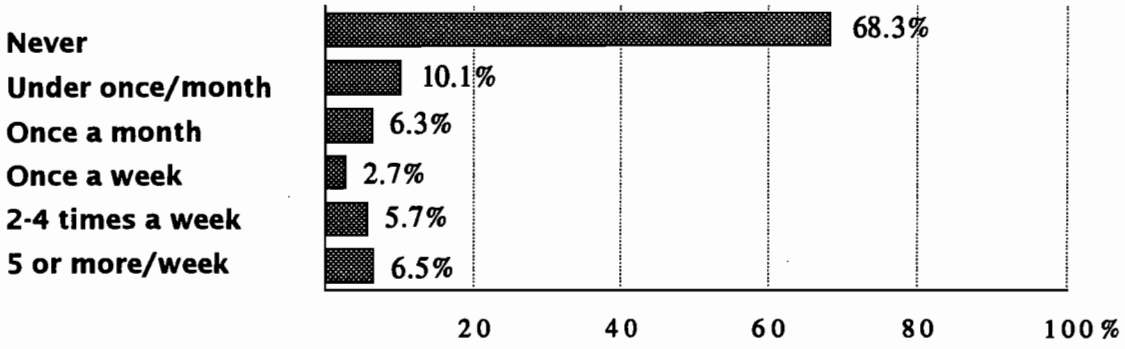
Question 6: For weekend recreation, about how often do you come downtown to visit Reunion Arena, city hall, the West End or other places in downtown Dallas? Would you say . . .



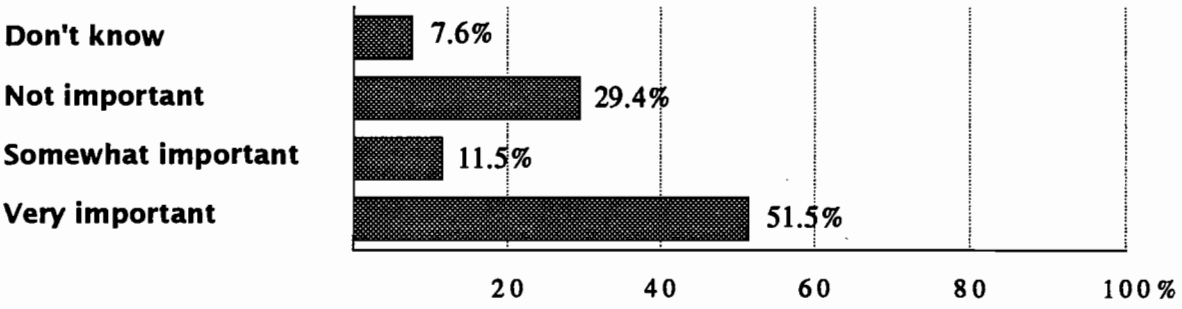
Question 7: Would you use a light rail system to go downtown on weekends?



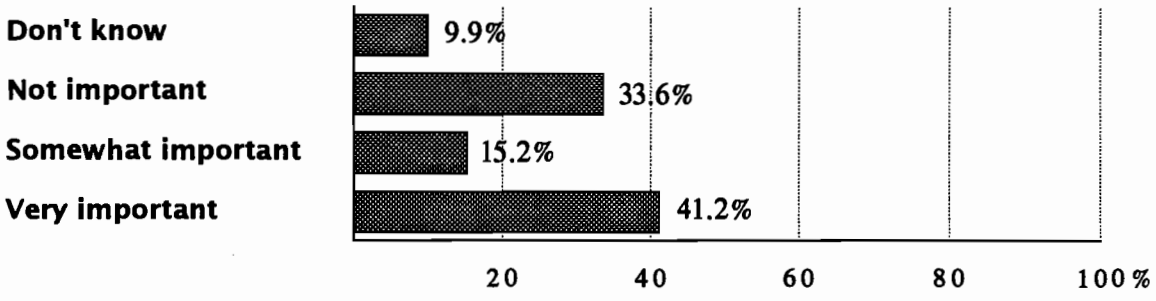
Question 8: About how often do you ride the DART bus in the Dallas area? Would you say . . .



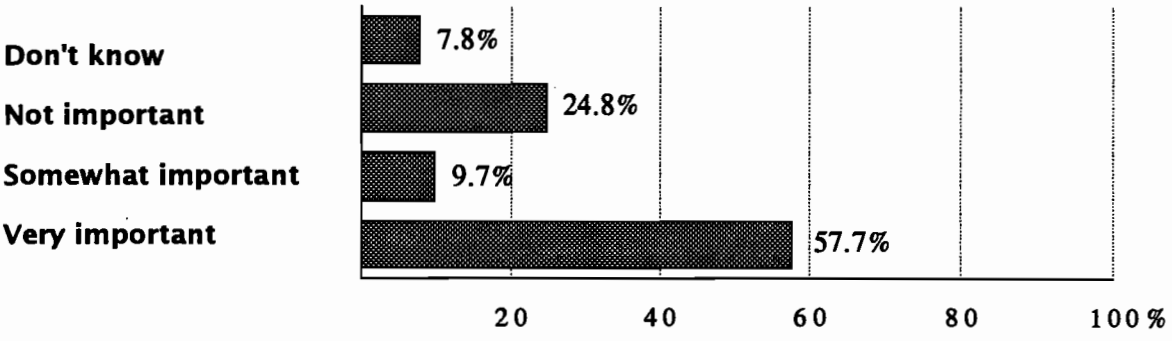
Question 9A: Would you say that routing, or where the buses go, is very important, somewhat important, or not at all important in your decision not to ride the DART bus more often?



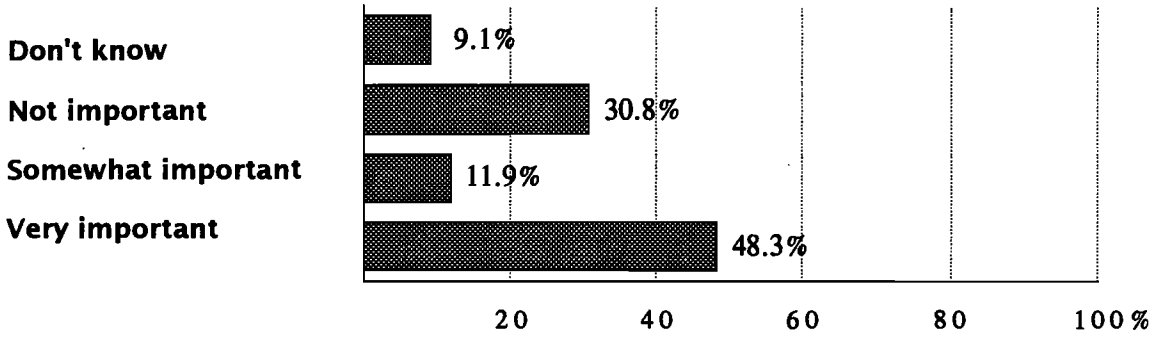
Question 9B: Would you say that frequency of service is very important, somewhat important, or not at all important in your decision not to ride the DART bus more often?



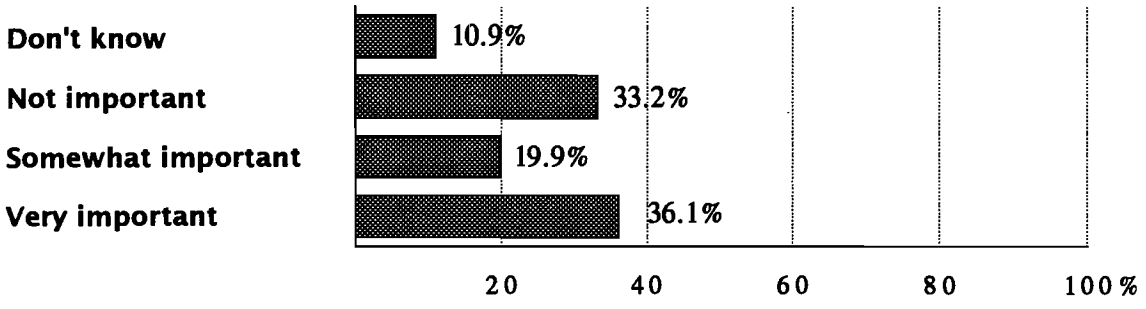
Question 9C: Would you say that safety of waiting areas or while waiting is very important, somewhat important or not important at all in your decision not to ride the DART bus more often?



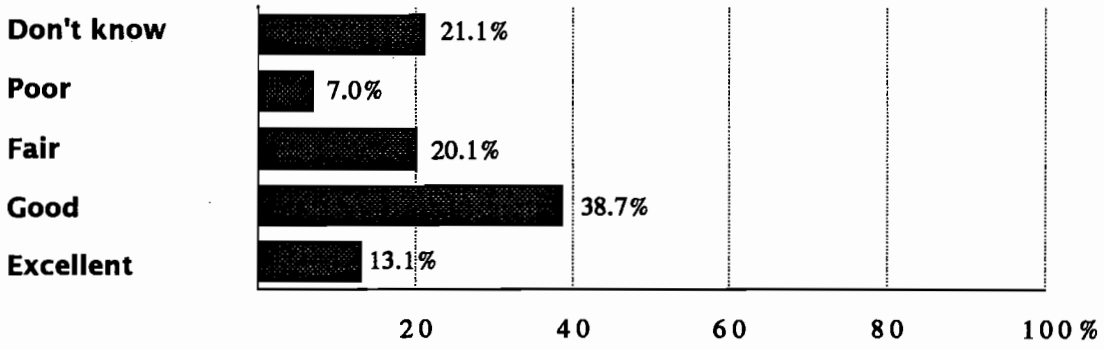
Question 9D: Would you say that needing a car for work is very important, somewhat important or not at all important in your decision not to ride the DART bus more often?



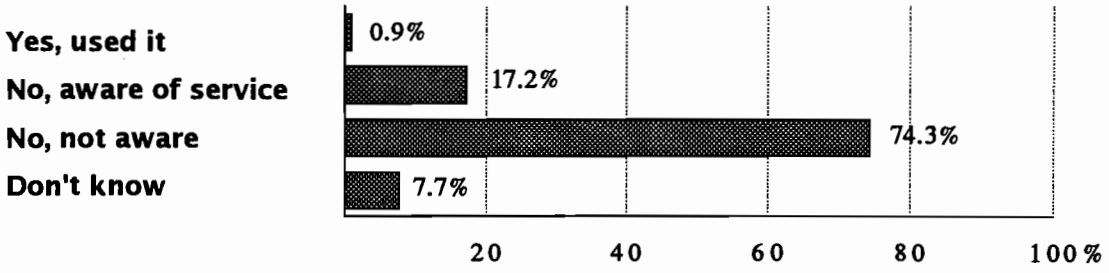
Question 9E: Would you say that the travel time of buses is very important, somewhat important or not at all important in your decision not to ride the DART bus more often?



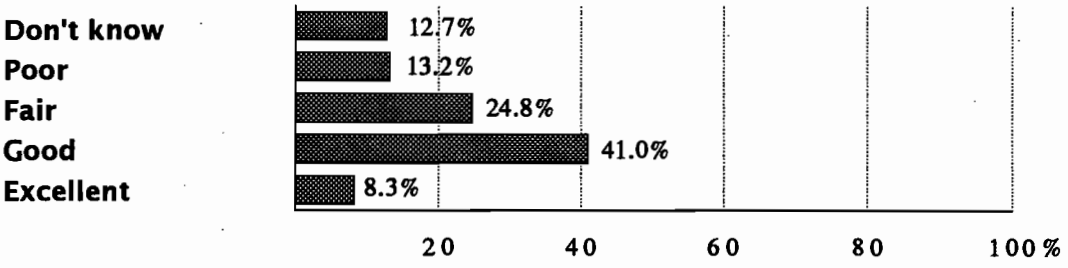
Question 10: Overall, how do you rate DART's current bus service? Would you say it is excellent, good, fair or poor?



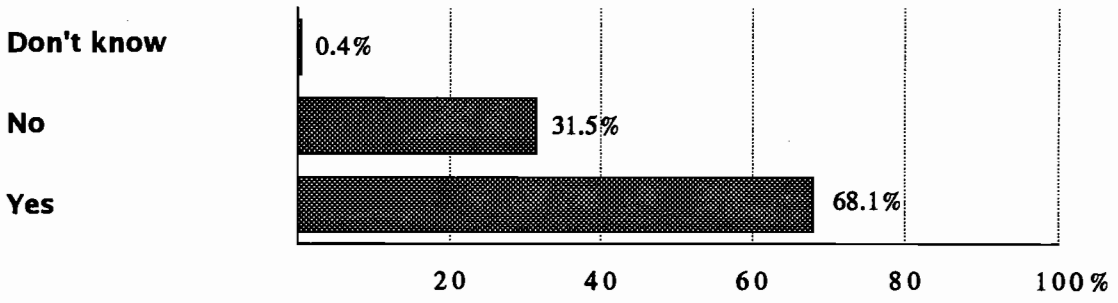
Question 11: Has anyone in your household ever used DART's HandiRides service?



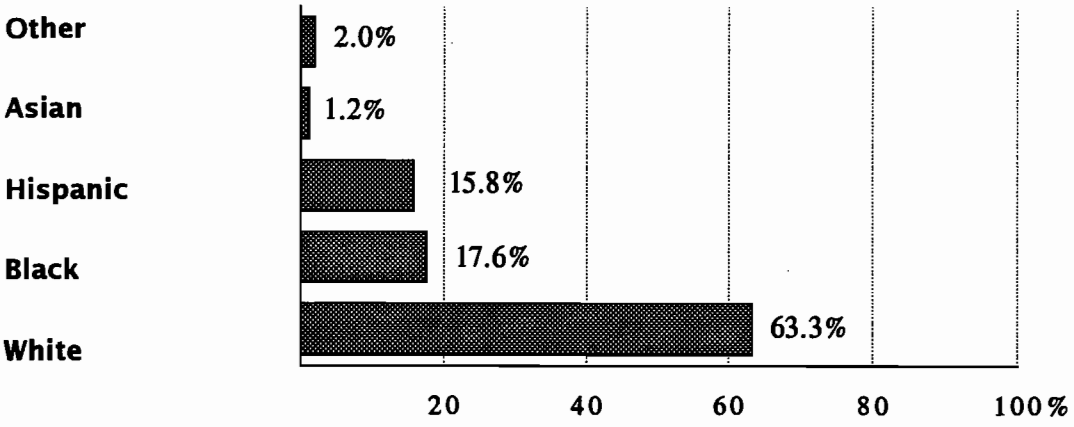
Question 12: Given the political environment in the Dallas area, how well do you think DART has performed since it adopted its new transit plan in 1989? Would you say DART's performance has been excellent, good, fair or poor?



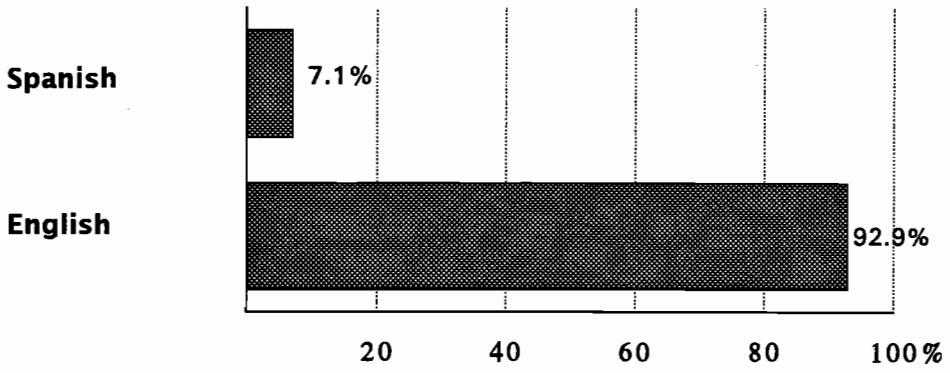
Question 13: If DART were to make downtown Dallas more accessible, would you consider visiting Dallas more often for shopping and entertainment?



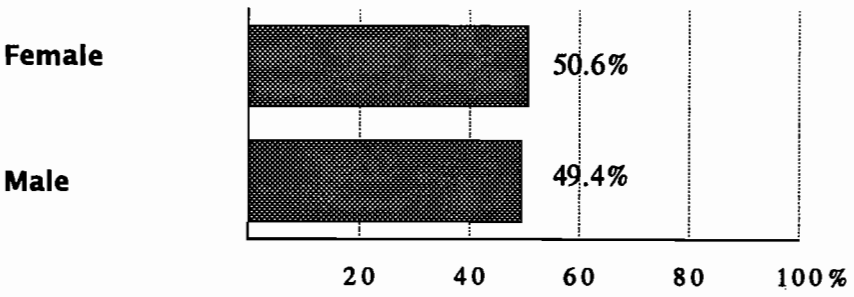
Question 14: What is your racial, ethnic origin? Are you white, black, Hispanic, Asian or some other origin?



Language used during the interview:



Gender of those interviewed:



April 8, 1993

Contact: Ron Whittington
214/749-2675
Tony Salters
214/749-2662

INDEPENDENT SURVEY SHOWS MAJORITY SUPPORT RAIL CONSTRUCTION, DART'S PROGRESS SINCE 1989

More than 75 percent of citizens in Dallas and Collin counties expect Dallas Area Rapid Transit's light rail system will be successful -- and 62 percent of residents surveyed said they would ride the light rail system when it is opened for service in 1996.

The independent survey was conducted by graduate students in a Survey Research Methods Class at the University of Texas at Dallas. Questions were developed by the students and course instructor, Dr. Edward T. Rincon (a survey and research professional and UTD adjunct lecturer) in conjunction with DART's Media Relations Section. The survey results have an error rate of plus or minus five percent.

"Many agencies use polls to guage taxpayer support and overall perceptions," said Rincon. "As a student project, the survey was conducted at a minimal cost, but it rivals surveys that cost big dollars for veteran pollsters to conduct, and it gave students an opportunity to focus on important urban issues."

Given the political environment, nearly half (48.3%) believe DART has done a good to excellent job since DART adopted its new transit plan in 1989, while 24 percent say DART has done a fair job.

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There was a high level of awareness of DART (94%), and nearly 80 percent of those surveyed are aware that DART is under construction on the light rail system.

Other highlights of the survey include:

* While most people (79 percent) are aware DART is building the light rail system, only nine percent correctly identified 1996 as the completion year for the first 20 miles of the system;

* About 77 percent of those surveyed believe the light rail system will be somewhat successful (45.3%) or very successful (32%) in Dallas;

* About 62 percent of the respondents said they will ride the light rail system when it is opened;

* While 56 percent said they "almost never" go to downtown Dallas for weekend activities, six out of 10 respondents said they would use the light rail system to go downtown, and 68.1 percent would consider visiting downtown more often if DART made downtown Dallas more accessible;

* More than half (52 percent) ranked DART's current bus service positively. People that do not ride DART buses said safety in waiting areas was a major concern in their decisions not to ride (58 percent), and

* The majority of citizens (72.5%) drive alone to work, and carpools and vanpools (14.2%) rank slightly higher than bus service (13.4) as a daily means of transportation to work.

The survey was conducted in March 1993, with results compiled from 400 telephone interviews with adults in Dallas and Collin counties. Using a five-minute bilingual questionnaire, students addressed general transportation issues with adult respondents. The survey's results are based on the ethnic/gender percentages from the 1990 Census.

The survey was developed to guage public awareness of light rail construction underway, determine DART's public approval rating and get input from riders about current bus service.

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