ARAPAHO PHASE II/III PRELIM ENGR
to Jan '99

GBW Engineers, Inc.

Grantham, Burge & Waldbauer

John -
Is this OK?
Jim
- Yes

January 13, 1999

John Baumgartner, P.E.
City Engineer
Town of Addison
16801 Westgrove Drive
Addison, Texas 75001

Ref: Agreement for Update of Study for
Two Proposed Union Pacific Railroad Crossings

Dear Mr. Baumgartner:

GBW Engineers, Inc. (GBW) is pleased to provide this agreement to update a study for two proposed Union Pacific railroad crossings in the Town of Addison.

GBW has prepared the following Scope of Services for this project:

- Edit the existing report to incorporate comments from the Town of Addison including more recent traffic numbers.
- Review the report and make any other appropriate revisions.
- Incorporate color graphics in the report exhibits.
- Prepare ten final copies of the final report including any City comments on a draft submittal.

GBW proposes to complete the aforementioned Scope of Services for a fixed fee of $900.

If you have any questions or would like to discuss this proposal further, please do not hesitate to call.

Very truly yours,

Bruce Grantham, P.E.
President

APPROVED BY:

Town of Addison Date

BG/gg
C:\WPDOCS\PROPOSAL\ADDISON\RR-RPT.LTR

1919 S. Shiloh Road, Suite 530, L.B. 27, Garland, Texas 75042 Tel (972) 840-1916 Fax (972) 840-2156

Arapaho Phase II/III Meeting 12-28-98

Goals today
Make a recommendation to Council { Alignment / Midway
Understanding the costs

Leave road "alone" from Surveyor west
add improvements to intersect @ Midway
Redo costs including (RR) & Land

Extend the Bridge to allow more parking

Any outside sources of funds?
Fed & State Money bring up safety issues

Do an overpass w Sidewalk

Look @ 18' Clear opening under the bridge

Give Council an update on Arapaho Phase I

Make Presentation Jan 26th Need info on Jan 19th

Need Section @ Charter & MBNA
inc Wall Thickness

Pat Haggerty 972-248-8888

ROW Map

ALIGNMENT STUDY CONCLUSIONS AND RECOMENDATIONS ARAPAHO ROAD EXTENSION

Town of Addison, Texas

PROJECT DESCRIPTION

The project consists of alignment studies, determination of right-of-way needs, meetings with property owners, and the preparation of right of way documents for Arapaho Road, from Addison Road to Marsh Lane.

HISTORY OF STUDIED ALIGNMENTS

The Town of Addison and our project team defined a design corridor earlier this year for the Arapaho Road extension. This corridor generally runs near or adjacent to the railroad track from Addison Road, to just east of Surveyor Boulevard. The corridor angles toward the southwest, as it crosses Surveyor Boulevard, then turns back to the west to follow the existing Realty Road to the Marsh Lane intersection.

Within the design corridor, a preferred horizontal alignment has been established, with the exception of sections of roadway approximately 2,500 feet long bisected by the Midway Road intersection.

Alternatives Considered for the Midway Road Section

In recent months, the following alternatives have been evaluated for the Midway Road section:

1. Overpass with ramps on the north side, requiring building acquisition(s) in this section.
2. Underpass with ramps on the north side (same horizontal alignment as Alternative 1).
3. Overpass without ramps (same horizontal alignment as Alternative 1).
4. Underpass without ramps (same horizontal alignment as Alternative 1).
5. Overpass without ramps, requiring no building acquisition in this section.
6. Underpass without ramps (same horizontal alignment as Alternative 5).
7. Overpass with ramps on the south side (same horizontal alignment as Alternative 1).
8. Underpass with ramps on the south side (same horizontal alignment as Alternative 1).
9. Intersection at-grade.

CORRIDOR DESCRIPTIONS

There are six alternates being pursued at the present. From these six alternates, one will be chosen to implement for the project. The alternates are described in detail below, with a brief list of major issues associated with each alternate.

Alternate names in the following section correspond to the roll plot drawings that were submitted to the Town of Addison, Texas.

1. ALTERNATE 1 - OVERPASS AT MIDWAY ROAD WITH RAMPS ON THE NORTH SIDE OF PROPOSED ARAPAHO ROAD

Alternate 1 has the same beginning and ending points as all of the alternates. The corridor begins at the Marsh Lane and the Realty Lane intersection on the west end. From this point, the corridor remains on the existing alignment of Realty Road, to a point of curve south of the existing substation, west of Surveyor Boulevard. From there, the alignment follows on an angle south of the existing pump station and elevated storage tank, to a point of curve on the south and west side of the ground storage tank. The alignment then parallels the railroad right-of-way to a point in front of the MBNA Building fronting on Centurion Way. The corridor then curves to the right and proceeds east, perpendicular with Midway Road, approximately 200 feet south of the existing at-grade crossing with the railroad. Once through Midway Road, the corridor curves to the left and follows parallel to the railroad right-of-way. The corridor then makes two at-grade crossings with wye tracks south of the east-west rail corridor, just west of Addison Road. Once on the east side of the tracks, the corridor ties into the future intersection of Arapaho Road and Addison Road on the east end.

The proposed roadway would essentially be placed at existing grade for most of its entire length, except for the potential condition at Midway Road. The overpass at Midway Road would be a three-span precast prestressed I-beam bridge. The ramps associated with this alternate would be on the north side of this alternate between the proposed roadway and the railroad right-of-way. The ramps would be at-grade and would tie into the proposed roadway at a point where the project grade line returns to the existing grade.

This alternate has several major issues of importance.

- **GEOMETRY** - Geometrically the only issue is the ramp geometry. In order to tie-in with the proposed roadway, the ramp speed is controlled by the vertical alignment to a design speed of 25mph, resulting in a differential of more than 10mph between the ramp and the mainline.

- **SAFETY** - A major safety issue is associated with the merge area for the westbound on ramp from Midway Road. The conditions may not allow for desired design speed, due to AASHTO guidelines for stopping sight distance and intersection sight distance. The taper rates from the Manual on Uniform Traffic Control Devices are also possible areas where deficiencies may occur with this corridor. The issues can be improved by lowering design speeds on the ramp or by creating a stop or signaled condition at the on ramp terminal.

- **RIGHT-OF-WAY** - Impacts include the purchase of one or probably two buildings at Midway Road. The corridor also requires that a building at Addison Road be purchased as well as some of the mini storage facility at Surveyor Boulevard.

- **CONSTRUCTIBILITY** - The issues include construction sequencing for the overpass erection and relocation of the concrete surface ditch. This alternate does not affect the 60-inch Dallas Water Utilities transmission main. There are no foreseen impacts to the underground franchise utilities at Midway Road.

- **COST** - This corridor is predicted to be the most costly alternate excluding the cost of right-of-way acquisition.

2. ALTERNATE 2 - UNDERPASS AT MIDWAY ROAD WITH RAMPS ON THE NORTH SIDE OF PROPOSED ARAPAHO ROAD

The underpass horizontal alignment is the same as its overpass counterpart. Vertically, the corridor will underpass existing Midway Road. The corridor will require that Midway Road traffic be placed on a precast prestressed concrete structure.

This alternate has several major issues of importance.

- **GEOMETRY** - The issues are the same as the previous alternate.

- **SAFETY** - The issues are the same as the previous alternate. The provision of adequate underpass lighting and provision of adequate drainage to prevent flooding during heavy rainfall.

- **RIGHT-OF-WAY** - The issues are the same as the previous alternate.

- **CONSTRUCTIBILITY** - The issues include construction sequencing for the underpass construction and relocation of the concrete surface ditch. This alternate does not affect the 60-inch Dallas Water Utilities transmission main, but its location is quite close and behind the retaining walls along the depressed section of roadway. The underground franchise utilities at Midway Road will require relocation with service maintained with temporary bypass facilities.

- **COST** - This corridor is predicted to be one the most economic alternates, excluding the cost of right-of-way acquisition and any lane-hour charges for reducing the number of lanes on Midway Road while the bridge is being constructed.

3. ALTERNATE 3 - OVERPASS AT MIDWAY ROAD WITHOUT RAMPS ON THE NORTH SIDE OF PROPOSED ARAPAHO ROAD

The overpass corridor follows the same horizontal and vertical alignment alternates with ramps.

This alternate has several major issues of importance.

- **GEOMETRY** - There are no negative geometric issues with this corridor.
- **SAFETY** - There are no negative safety issues with this corridor.
- **RIGHT-OF-WAY** - The issues are the same as the alternate with ramps.
- **CONSTRUCTIBILITY** - The issues are the same as the alternate with ramps.
- **COST** - This corridor is predicted to be one the most economical alternatives, excluding the cost of right-of-way acquisition and any traffic congestion for reducing the number of lanes on Midway Road while the bridge is being constructed.

4. ALTERNATE 4 - UNDERPASS AT MIDWAY ROAD WITHOUT RAMPS

The underpass corridor follows the same horizontal and vertical path as its counterpart with ramps.

This alternate has several major issues of importance.

- **GEOMETRY** - The only negative geometric issue is the sag condition under Midway Road, which will most likely require the structure to be lighted.
- **SAFETY** - The only safety issue is the provision of adequate underpass lighting and provision of adequate drainage to prevent flooding during heavy rainfall.
- **RIGHT-OF-WAY** - The issues are the same as the alternate with ramps.
- **CONSTRUCTIBILITY** - The issues are the same as the alternate with ramps.

- **COST** - This corridor is predicted to be the most economical alternate excluding the cost of right-of-way acquisition and any costs related to the reduction of traffic for reducing the number of lanes on Midway Road while the bridge is being constructed.

5. ALTERNATE 5 - OVERPASS WITHOUT RAMPS - NO TAKING OF CHARTER FURNITURE WAREHOUSE

The alignment of Arapaho Road for this alternative would parallel the railroad tracks at project crossing of Midway Road.

The issues related to this alternate are:

- **GEOMETRY** - The alignment would be on straight tangent, parallel to tracks.
- **SAFETY** – No significant safety issues foreseen.
- **RIGHT-OF-WAY** – The alternative would not require the acquisition of the Charter Furniture building if roadway clearance of only 9 feet would be acceptable to the Town of Addison and Property Owner.
- **CONSTRUCTIBILITY** - Same as Alternate 1, except retaining walls would require relocation of Dallas Water Utilities (DWU) 60-inch water line.
- **COST** - The cost of this alternative is essentially the same as underpass alternative, Alternate 1.

6. ALTERNATE 6 - UNDERPASS WITHOUT RAMPS - NO TAKING OF CHARTER WAREHOUSE

The alignment for Alternate 6 is the same as Alternate 5.

The issues related to this alternate are:

- **GEOMETRY** - Same as Alternate 5.
- **SAFETY** - Sight distance in sag vertical curve-Flooding in Heavy Rainfall.
- **RIGHT-OF-WAY** - Same as Alternate 5.
- **CONSTRUCTIBILITY** - Requires construction and placement of retaining wall very close to and below the elevation of DWU 60-inch water line. Relocation of the water line is recommended.

- **COST** - The cost of this alternate is approximately 5-percent greater than Alternate 5.

Traffic Analysis

The North Central Texas Council of Governments (NTCOG) prepared traffic assignments for the year 2020 for five alternatives for the Arapaho Road Extension. These alternatives are described below.

- "No Build" Alternative - What is the impact on adjacent streets if Arapaho Road is not extended?
- "At-Grade" Alternative - Arapaho Road extended with its intersection with Midway Road at-grade.
- "Grade-Separated" Alternative - Arapaho Road Extended with a grade separation at Midway Road without ramps.
- "Ramps on the North Side" Alternative - Arapaho Road extended with a grade separation at Midway Road and ramps on the north side of Arapaho Road.
- "Ramps on the South Side" Alternative - Arapaho Road extended with a grade separation at Midway Road and ramps on the south side of Arapaho Road.

Projected Traffic Volumes

The table below presents a summary of projected traffic impacts for the extension of Arapaho Road with its intersection at Midway Road grade separated without ramps.

Roadway Section	**Projected Daily Traffic Volumes by Year 2020**	
	"No Build"	**"Grade Separated"**
Arapaho Road		
Addison Road to Midway Road	-	17,000
Midway Road to Marsh Lane	-	13,000
Belt Line Road		
Addison Road to Midway Road	58,000	54,000
Midway Road to Surveyor	47,000	42,000
Midway Road		
North of Arapaho Road	52,000	44,000
South of Arapaho Road	58,000	46,000

As shown in the above table, the extension of Arapaho Road from its current terminus to Marsh Lane reduces projected traffic on Belt Line and Midway Roads. Year 2020 volumes on Belt Line Road are projected to be approximately 5,000 vehicles per day (vpd) less with Arapaho Road

extended. Volumes on Midway Road are projected to be reduced 8,000 to 12,000 vpd. Arapaho road is projected to carry 17,000 vpd east of Midway Road and 13,000 vpd west of Midway Road.

The section of Arapaho Road, east of Midway Road, should be constructed as a four-lane divided facility, based on projected traffic volumes. West of Midway Road, Arapaho Road can be constructed as a four-lane undivided roadway.

In summary, traffic projections prepared by NTCOG indicate that the extension of Arapaho Road to Marsh Lane will aid in reducing the projected future traffic on Belt Line and Midway Roads.

Evaluation of Final Alternatives for Midway Road Section

The alignment alternative numbers used in this section are the same as those listed on Page 1 of this report.

Horizontal and vertical alignments, along with Opinions of Probable Cost, were prepared for Alternatives 1 through 5. These costs are included in a matrix of issues related to these alternatives, in addition to Alternative 6.

Due to extensive utility relocations in a tight construction corridor, the viability of Alternative 6 is questionable at this point. If the Town of Addison wishes to pursue this alternative, further coordination would be necessary with Dallas Area Rapid Transit (DART) and DWU prior to developing an Opinion of Probable Cost.

A discussion of the issues described in the attached matrix are provided below:

- Charter Furniture Building Take - Moving the alignment south of the railroad provides space between Arapaho Road and the railroad right-of-way (ROW) for the existing 60-inch DWU water line and the proposed double 9-foot x 5-foot box culverts.

- MNBA Building Take - Without taking the MNBA building, there is insufficient room to create a safe merge condition for the westbound entry ramp onto Arapaho Road. The lack of sight distance at the merge is more severe with the overpass than the underpass, due to the additional distance for merging the vertical alignment. The underpass alternative is not recommended without a stop condition on the ramp traffic.

- Relocate DWU Water Line - There is 81 feet from the railroad ROW to the face of the Charter Furniture building. Consequently, the DWU water line, which is located approximately 7 feet off the railroad ROW, would need to be relocated with Alternative 6 (underpass). Using a four-lane undivided roadway with 11-foot lanes for Alternative 5 (overpass), and providing a 15-foot easement for DWU, the south overpass wall would be located approximately 9 feet from the Charter Furniture building. If a sidewalk were provided across the ramp for emergency access, the separation from the wall to the furniture building would be reduced to 4 feet.

- Noise - Although truck traffic is likely to be low on the Arapaho Road extensions, noise may still be a source of complaint from affected business owners if an overpass is constructed. If automobile traffic is the predominate source of noise, such noise is primarily due to tire noise at pavement level. Asphalt surfacing has been known to reduce tire noise and might be considered if automobile noise is an issue. Additionally the normal height traffic barrier could be increased to provide some insertion loss or a full height noise barrier may be in order.

- Realign Midway for Construction Sequence - If the underpass were selected, a probable construction sequence would require the removal of one half of Midway Road at a time. In conjunction, Midway Road would have to be realigned and narrowed to four lanes through the construction zone on two occasions. The underpass construction could affect Midway Road in this manner for up to a year.

- Sump Storm Sewer - All the underpass options would require the draining of the roadway under Midway Road. There appears to be sufficient grade to install a storm sewer from inlets in the depressed roadway to the concrete channel west of Surveyor.

- Move Box Culvert to North Side of Railroad Right-of-Way - Alternative 6 (underpass) would require the installation of double 9-foot x 5-foot box culverts on the north side of the railroad. If a minimal separation were to be provided from the box culverts to an existing 12-inch sanitary sewer line, the edge of the boxes would be approximately five feet from several existing buildings. In addition, multiple drainage utility relocations would be required under the railroad tracks at Midway Road, and the box culverts would need to cross back under the railroad further to the west.

Other Project Issues

Two other issues of note have been discussed, outside the limits of the Midway Road section.

1. Railroad Spur Crossings

   The two railroad spur crossings just west of Addison Road could prove difficult and time-consuming to obtain. We recommend that coordination begin with DART as soon as a final alignment has been selected.

2. Realty Road Section

   The traffic volumes indicate that a four-lane undivided roadway would be adequate along the existing Realty Road alignment. Omitting a median from most of this section of the project would minimize the impact on adjacent parking lots and driveways. The roadway could still be widened for turn lanes at Midway Road and Surveyor Boulevard.

Conclusions and Recommendations

The primary goal, which has been expressed by Town of Addison staff for this project, is to relieve congestion on Belt Line Road. All the alternatives will provide some relief to Belt Line Road, however, no one alternative clearly stands out as preferred. The attached matrix presents a comparison associated with each alternative.

Three overpass and three underpass alternatives were evaluated, and in each case, the corresponding underpass alternative was more expensive, given that the extensive utility relocations required for Alternative 6 would result in its cost exceeding that of Alternative 5. An underpass would be more visually appealing than an overpass, however, the narrowing of Midway Road would increase traffic delays during the estimated 12 months of construction. Although a tunnel would create less noise impact, only five commercial buildings are located within the overpass limits on both sides of the railroad, including the Charter Furniture building.

If Town of Addison staff are comfortable with an overpass at this location, we would recommend that one of the overpass alternatives be selected.

Of the three overpass alternatives analyzed, Alternative 5 pushes the south overpass wall within 9 feet of the Charter Furniture building without a sidewalk for emergency access on the overpass. In addition, it would require DWU to accept 15 feet for maintenance of their 60-inch water line. This is their normal easement width for a much smaller service line.

Alternative 3, like Alternative 5, has no ramps. Although it would require the purchase of the Charter Furniture building, this extra cost would be largely offset by construction cost savings. In addition, the purchase of this property would make for less constricted construction in this area.

Alternative 1 requires the purchase of the Charter Furniture and MNBA buildings in order to make the entry ramp onto Arapaho Road safe at the merge point. Alternative 3 could be constructed with an exit ramp only, and no entry ramp. Therefore, the benefit of the entry ramp may be compared with the cost of the MNBA building to determine its justification.

ADDISON ALIGNMENT ALTERNATIVES
Midway Road Section — Matrix of Issues

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5	ALTERNATIVE 6
DESCRIPTION OF ISSUE	Overpass with ramps on north side	Underpass with ramps on north side	Overpass without ramps	Underpass without ramps	Overpass without ramps; without building take	Underpass without ramps; without building take
Alignment Description	Separated from railroad right-of-way	Same as 1	Same as 1	Same as 1	Adjacent to railroad right-of-way	Same as 5
Charter furniture building take	Yes	Yes	Yes	Yes	No	No
MBNA building take (for ramp safety)	Yes	Probably	No	No	No	No
Relocate DWU water line	No	No	No	No	Possibly	Yes
Noise	Yes	No	Yes	No	Yes	No
Realign Midway for construction sequence (4 lanes)	No	Yes	No	Yes	No	Yes
Sump storm sewer	No	Yes	No	Yes	No	Yes
Move box culvert to north side of R/R; other utility relocations	No	No	No	No	No	Yes
Opinion of Probable Cost (with 20% contingency)	$19,708,065 (+buildings)	$21,920,110 (+buildings)	$19,669,785 (+building)	$21,881,830 (+building)	$21,809,772	N/A

ADR Realty Partners

Gary B. Crouch, CCIM, CPM

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13455 Noel Road
Dallas, Texas 75240
972-778-8128 Fax 972-778-8187
www.iptrack@gte.net

1-12-99

I met with Mr. Crouch (MBNA) & showed him our preferred alternate - overpass with no ramps.

Mr Crouch is concerned with the loss of parking and asked if the road could be kept on piers past his bldg so he could park underneath. He will probably write you a letter to that effect. I told him about the project being on the 1/26/99 Council agenda. I gave him copies of the plans we have.

Also, yesterday, I talked at some length to the owner of the building on the west side of Sunveyor (the one that will be taken). She wanted to know the schedule, and how the property acquisition would work. I also told her about the Council meeting.

Jim

Dan- Some comments- Jim 12-21-98 cc John

ALIGNMENT STUDY CONCLUSIONS AND RECCOMENDATIONS ARAPAHO ROAD EXTENSION

DRAFT

Town of Addison, Texas

PROJECT DESCRIPTION

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HISTORY OF STUDIED ALIGNMENTS

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Within the design corridor, a preferred horizontal alignment has been established, with the exception of a 2,500 ± foot section of roadway centered around the Midway Road intersection.

Alternatives Considered for the Midway Road Section

In recent months, the following alternatives have been evaluated for the Midway Road section:

1. Overpass with ramps on the north side requiring building acquisition(s) in this section.
2. Underpass with ramps on the north side (same horizontal alignment as Alternative 1).
3. Overpass without ramps (same horizontal alignment as Alternative 1).
4. Underpass without ramps (same horizontal alignment as Alternative 1).
5. Overpass without ramps requiring no building acquisition in this section.
6. Underpass without ramps (same horizontal alignment as Alternative 5).
7. Overpass with ramps on the south side (same horizontal alignment as Alternative 1).
8. Underpass with ramps on the south side (same horizontal alignment as Alternative 1).
9. Intersection at-grade.

CORRIDOR DESCRIPTIONS

There are six alternates being pursued at the present. From these six alternates, one will be chosen to implement for the project. The alternates are described in detail below, with a brief list of major issues associated with each alternate.

Alternate names in the following section only correspond to the roll plot drawings that were submitted to the Town of Addison, Texas.

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Alternate 1 has the same beginning and ending points as all of the alternates. The corridor begins at the Marsh Lane and Realty Lane intersection on the west end. From this point, the corridor remains on the existing alignment of Realty Road, to a point of curve south of the existing substation west of Surveyor Boulevard. From there, the alignment follows on an angle south of the existing pump station and elevated storage tank, to a point of curve on the south and west side of the ~~elevated~~ ground storage tank. The alignment then parallels the railroad right-of-way to a point in front of the MBNA Building fronting on Centurion Way. The corridor then curves to the right and proceeds east, perpendicular with Midway Road, approximately 200' south of the existing at-grade crossing with the railroad. Once through Midway Road, the corridor curves to the left and follows parallel to the railroad right-of-way. The corridor then makes two at-grade crossings with wye tracks south of the east-west rail corridor, just west of Addison Road. Once on the east side of the tracks, the corridor ties into the future intersection of Arapaho Road and Addison Road on the east end.

The proposed roadway would essentially be placed at existing grade for most of its entire length, except for the potential condition at Midway Road. The overpass at Midway Road would be a three-span precast prestressed I-beam bridge. The ramps associated with this alternate would be on the north side of this alternate between the proposed roadway and the railroad right-of-way. The ramps would be at-grade and would tie into the proposed roadway at a point where the project grade line returns to the existing grade.

This alternate has several major issues of importance.

- **GEOMETRY** - Geometrically the only issue is the ramp geometry. In order to tie-in with the proposed roadway, the ramp speed is controlled by the vertical alignment to a design speed of 25mph, resulting in a differential of more than 10mph between the ramp and the mainline.

- **SAFETY** - A major safety issue is associated with the merge area for the westbound on ramp from Midway Road. The conditions may not allow for desired design speed, due to AASHTO guidelines for stopping sight distance and intersection sight distance. The taper rates from the Manual on Uniform Traffic Control Devices are also possible areas where

deficiencies may occur with this corridor. But, the issues can be improved by lowering design speeds on the ramp or by creating a stop or signaled condition at the on ramp terminal.

- **RIGHT-OF-WAY** - Impacts include the purchase of one and probably two buildings at Midway Road. The corridor also requires that a building at Addison Road be purchased as well as some of the mini storage facility at Surveyor Boulevard.

- **CONSTRUCTIBILITY** - The issues include construction sequencing for the overpass erection and relocation of the concrete surface ditch. This alternate does not affect the 60" Dallas Water Utilities transmission main. There are no foreseen impacts to the underground franchise utilities at Midway Road.

- **COST** - This corridor is predicted to be the most costly alternate excluding the cost of right-of-way acquisition.

2. ALTERNATE 2 - UNDERPASS AT MIDWAY ROAD WITH RAMPS ON THE NORTH SIDE OF PROPOSED ARAPAHO ROAD

The underpass horizontal alignment is the same as its overpass counterpart. Vertically, the corridor will underpass existing Midway Road. The corridor will require that Midway Road traffic be placed on a precast prestressed concrete structure.

This alternate has several major issues of importance.

- **GEOMETRY** - The issues are the same as the previous alternate.

- **SAFETY** - The issues are the same as the previous alternate.

- **RIGHT-OF-WAY** - The issues are the same as the previous alternate.

- **CONSTRUCTIBILITY** - The issues include construction sequencing for the underpass construction and relocation of the concrete surface ditch. This alternate does not affect the 60" Dallas Water Utilities transmission main, but would require ~~that it be placed~~ its location behind the retaining walls along the depressed section of roadway. The underground franchise utilities at Midway Road will require relocation and have to be maintained with temporary.

- **COST** - This corridor is predicted to be one the most economic alternates excluding the cost of right-of-way acquisition and any lane-hour charges for reducing the number of lanes on Midway Road while the bridge is being constructed.

flooding? need a stronger discussion should first appear here

3. ALTERNATE 3 - OVERPASS AT MIDWAY ROAD WITHOUT RAMPS ON THE NORTH SIDE OF PROPOSED ARAPAHO ROAD

The overpass corridor follows the same horizontal and vertical alignment alternates with ramps.

This alternate has several major issues of importance.

- **GEOMETRY** - There are no negative geometric issues with this corridor.
- **SAFETY** - There are no negative safety issues with this corridor.
- **RIGHT-OF-WAY** - The issues are the same as the alternate with ramps.
- **CONSTRUCTIBILITY** - The issues are the same as the alternate with ramps.
- **COST** - This corridor is predicted to be one the most economical alternatives, excluding the cost of right-of-way acquisition costs and any traffic congestion cost for reducing the number of lanes on Midway Road while the bridge is being constructed.

4. ALTERNATE 4 - UNDERPASS AT MIDWAY ROAD WITHOUT RAMPS

The underpass corridor follows the same horizontal and vertical path as its counterpart with ramps.

This alternate has several major issues of importance.

- **GEOMETRY** - The only negative geometric issue is the sag condition under Midway Road will most likely require the structure to be lighted.
- **SAFETY** - The only safety issue is the underpass lighting.
- **RIGHT-OF-WAY** - The issues are the same as the alternate with ramps.
- **CONSTRUCTIBILITY** - The issues are the same as the alternate with ramps.
- **COST** - This corridor is predicted to be the most economical alternate excluding the cost of right-of-way acquisition and any costs related to the reduction of traffic for reducing the number of lanes on Midway Road while the bridge is being constructed.

flooding? ditto

5. ALTERNATE 5 - OVERPASS WITHOUT RAMPS - NO TAKING OF CHARTER FURNITURE WAREHOUSE

The alignment of Arapaho Road for this alternative would parallel the railroad tracks at project crossing of Midway Road.

The issues related to this alternate are:

- **GEOMETRY** - The alignment would be on straight tangent, parallel to tracks.
- **SAFETY** - No safety issues except sight distance of vertical geometry.
- **RIGHT-OF-WAY** - The issues are the same as the alternate with ramps.
- **CONSTRUCTIBILITY** - Same as Alternate 1, except retaining walls would require relocation of Dallas Water Utilities (DWU) 60" water line.
- **COST** - The cost of this alternative is essentially the same as underpass alternative, Alternate 1.

6. ALTERNATE 6 - UNDERPASS WITHOUT RAMPS - NO TAKING OF CHARTER WAREHOUSE

The alignment for Alternate 6 is the same as Alternate 5.

The issues related to this alternate are:

- **GEOMETRY** - Same as Alternate 5.
- **SAFETY** - Sight distance in sag vertical curve-Flooding in Heavy Rainfall.
- **RIGHT-OF-WAY** - Same as Alternate 5.
- **CONSTRUCTIBILITY** - Requires construction and placement of retaining wall very close to and below the elevation of DWU 60" water line. Relocation of the water line is recommended.
- **COST** - The cost of this alternate is approximately 5-percent greater than Alternate 5.

7. ALTERNATE 7 - UNDERPASS WITHOUT RAMPS - NO TAKING OF CHARTER WAREHOUSE

The other alternatives considered in preliminary designs have been dropped from further consideration due to drainage and utility conflicts.

Traffic Analysis

The North Central Texas Council of Governments (NTCOG) prepared traffic assignments for the year 2020 for the five alternatives for the Arapaho Road Extension. These alternatives are described below.

- "No Build" Alternative - What is the impact on adjacent streets if Arapaho Road is not extended?
- "At-Grade" Alternative - Arapaho Road extended with its intersection with Midway Road at-grade.
- "Grade-Separated" Alternative - Arapaho Road Extended with a grade separation at Midway Road without ramps.
- "Ramps on the North Side" Alternative - Arapaho Road extended with a grade separation at Midway Road and ramps on the north side of Arapaho Road.
- "Ramps on the South Side" Alternative - Arapaho Road extended with a grade separation at Midway Road and ramps on the south side of Arapaho Road.

Projected Traffic Volumes

The table below presents a summary of projected traffic impacts for the extension of Arapaho Road with its intersection at Midway Road grade separated without ramps.

Roadway Section	**Projected Daily Traffic Volumes by Year 2020**	
	"No Build"	**"Grade Separated"**
Arapaho Road		
Addison Road to Midway Road	-	17,000
Midway Road to Marsh Lane	-	13,000
Belt Line Road		
Addison Road to Midway Road	58,000	54,000
Midway Road to Surveyor	47,000	42,000
Midway Road		
North of Arapaho Road	52,000	44,000
South of Arapaho Road	58,000	46,000

As shown in the above table, the extension of Arapaho Road from its current terminus to Marsh Lane reduces projected traffic on Belt Line and Midway Roads. Year 2020 volumes on Belt Line Road are projected to be approximately 5,000 vehicles per day (vpd) less with Arapaho Road extended. Volumes on Midway Road are projected to be reduced 8,000 to 12,000 vpd. Arapaho road is projected to carry 17,000 vpd east of Midway Road and 13,000 vpd west of Midway Road.

The section of Arapaho Road, east of Midway road, should be constructed as a four-lane divided facility based on projected traffic volumes. West of Midway Road, Arapaho Road can be constructed as a four-lane undivided roadway.

In summary, traffic projections prepared by NTCOG indicate that the extension of Arapaho Road to Marsh Lane will aid in reducing the projected future traffic on Belt Line and Midway Roads.

Evaluation of Final Alternatives for Midway Road Section

The alignment names in the following sections are as follows:

1. Overpass with ramps on the north side requiring building acquisition(s) in this section.
2. Tunnel with ramps on the north side (same horizontal alignment as Alternative 1).
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4. Tunnel without ramps (same horizontal alignment as Alternative 1).
5. Overpass without ramps requiring no building acquisition in this section.
6. Tunnel without ramps (same horizontal alignment as Alternative 5).
7. Overpass with ramps on the south side (same horizontal alignment as Alternative 1).
8. Tunnel with ramps on the south side (same horizontal alignment as Alternative 1).
9. At-grade.

Horizontal and vertical alignments, along with Opinions of Probable Cost, were prepared for Alternatives 1 through 5. These costs are included in a matrix of issues related to these alternatives, in addition to Alternative 6.

Due to extensive utility relocations in a tight construction corridor, the viability of Alternative 6 is questionable at this point. If the Town of Addison wishes to pursue this alternative, further coordination would be necessary with Dallas Area Rapid Transit (DART) and DWU prior to developing an Opinion of Probable Cost.

A discussion of the issues described in the attached matrix are provided below:

- Charter Furniture Building Take - Moving the alignment south of the railroad provides space between Arapaho Road and the railroad right-of-way (ROW) for the existing 60-inch DWU water line and the proposed double 9'x5' box culverts.

- MNBA Building Take - Without taking the MNBA building, there is insufficient room to create a safe merge condition for the westbound entry ramp onto Arapaho Road. The lack of sight distance at the merge is more severe with the overpass than the underpass, due to the additional distance for merging the vertical alignment. The underpass alternative is not recommended without a stop condition on the ramp traffic.

- Relocate DWU Water Line - There is 81 feet from the railroad ROW to the face of the Charter Furniture building. Consequently, the DWU water line, which is located approximately seven feet off the railroad ROW, would need to be relocated with Alternative 6 (underpass). Using a four-lane undivided roadway with 11-foot lanes for Alternative 5 (overpass), and providing a 15-foot easement for DWU. The south overpass wall would be located approximately nine feet from the Charter Furniture building. If a sidewalk were provided across the ramp for emergency access, the separation from the curb to the furniture building would be reduced to four feet.

Mitigation? Discussion

- Noise - Although truck traffic is likely to be low on the Arapaho Road extensions, noise may still be a source of complaint from affected business owners if an overpass is constructed.

- Realign Midway for Construction Sequence - If the underpass were selected, a probable construction sequence would require the removal of one half of Midway Road at a time. In conjunction, Midway Road would have to be realigned and narrowed to four lanes through the construction zone on two occasions. The underpass construction could affect Midway Road in this manner for up to a year.

- Sump Storm Sewer - All the underpass options would require the draining of the roadway under Midway Road. There appears to be sufficient grade to install a storm sewer from inlets in the depressed roadway to the concrete channel west of Surveyor.

- Move Box Culvert to North Side of Railroad Right-of-Way - Alternative 6 (underpass) would require the installation of double 9'x5' box culverts on the north side of the railroad. If a minimal separation were to be provided from the box culverts to an existing 12-inch sanitary sewer line, the edge of the boxes would be approximately five feet from several existing buildings. In addition, multiple drainage utility relocations would be required under the railroad tracks at Midway Road, and the box culverts would need to cross back under the railroad further to the west.

Other Project Issues

Two other issues of note have been discussed, outside the limits of the Midway Road section.

1. Railroad Spur Crossings

   The two railroad spur crossings just west of Addison Road could prove difficult and time-consuming to obtain. We recommend that coordination begin with DART as soon as a final alignment has been selected.

2. Realty Road Section

   The traffic volumes indicate that a four-lane undivided roadway would be adequate along the existing Realty Road alignment. Omitting a median from most of this section of the project would minimize the impact on adjacent parking lots and driveways. The roadway could still be widened for turn lanes at Midway Road and Surveyor Boulevard.

Conclusions and Recommendations

The primary goal, which has been expressed by Town of Addison staff for this project, is to relieve congestion on Belt Line Road. All the alternatives will provide some relief to Belt Line Road, however, no one alternative clearly stands out as preferred. The attached matrix presents a comparison associated with each alternative.

Three overpass and three underpass alternatives were evaluated, and in each case, the corresponding underpass alternative was more expensive given that the extensive utility relocations required for Alternative 6 would result in its cost exceeding that of Alternative 5. An underpass would be more visually appealing than an overpass, however, the narrowing of Midway Road would increase traffic delays during the estimated 12 months of construction. Although a tunnel would create less noise impact, only five commercial buildings are located within the overpass limits on both sides of the railroad, including Charter Furniture.

If Town of Addison staff are comfortable with an overpass at this location, we would recommend that one of the overpass alternatives be selected.

Of the three overpass alternatives analyzed, Alternative 5 pushes the south overpass wall within nine feet of the Charter Furniture building without a sidewalk for emergency access on the overpass. In addition, it would require DWU to accept 15 feet for maintenance of their 60" water line. This is their normal easement width for a much smaller service line.

Alternative 3, like Alternative 5, has no ramps. Although it would require the purchase of the Charter Furniture building, this extra cost would be largely offset by construction cost savings. In addition, the purchase of this property would make for less constricted construction in this area.

Alternative 1 requires the purchase of the Charter Furniture and MNBA buildings in order to make the entry ramp onto Arapaho Road safe at the merge point. Alternative 3 could be constructed with an exit ramp only, and no entry ramp. Therefore, the benefit of the entry ramp may be compared with the cost of the MNBA building to determine its justification.

ADDISON ALIGNMENT ALTERNATIVES
Midway Road Section — Matrix of Issues

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5	ALTERNATIVE 6
DESCRIPTION OF ISSUE	Overpass with ramps on north side	Underpass with ramps on north side	Overpass without ramps	Underpass without ramps	Overpass without ramps; without building take	Underpass without ramps; without building take
Alignment Description	Separated from railroad right-of-way	Same as 1	Same as 1	Same as 1	Adjacent to railroad right-of-way	Same as 5
Charter furniture building take	Yes	Yes	Yes	Yes	No	No
MBNA building take (for ramp safety)	Yes	Probably	No	No	No	No
Relocate DWU water line	No	No	No	No	Possibly	Yes
Noise	Yes	No	Yes	No	Yes	No
Realign Midway for construction sequence (4 lanes)	No	Yes	No	Yes	No	Yes
Sump storm sewer	No	Yes	No	Yes	No	Yes
Move box culvert to north side of R/R; other utility relocations	No	No	No	No	No	Yes
Opinion of Probable Cost (with 20% contingency)	$19,708,065 (+buildings)	$21,920,110 (+buildings)	$19,669,785 (+building)	$21,881,830 (+building)	$21,809,772	N/A

HNTB
The HNTB Companies
Suite 630, 14114 Dallas Parkway, Dallas Texas 75240 (972) 661-5626

LETTER OF TRANSMITTAL

Job No. 25768

Date December 17, 1998

To: Mr. James C. Pierce Jr., P.E.
Asst. City Engineer
Town of Addison
16801 Westgrove Dr.
Addison Texas 75001 0144

Re: Arapaho Road Ext.

WE ARE FORWARDING TO YOU:

NO. OF COPIES	SHEET NO.	LAST DATED	DESCRIPTION
1		Dec. 15,1998	1" =50' Scale drawing of the Arapaho Ext. at Midway Rd.

THESE ARE TRANSMITTED:

☐ For approval ☒ For your use ☐ As requested ☒ For review & comment

PLEASE NOTE:

Centerline 0f 60" DWU water line shown in relationship to a Tangent alignment of Arapaho. We are having ARS field check the distance between the RR R/W and the Charter furniture warehouse. We should have this by 12/22/98

COPY TO:

By: Daniel F Becker

Dan Becker P.E.

HNTB
The HNTB Companies
Suite 630, 14114 Dallas Parkway, Dallas Texas 75240 (972) 661-5626

LETTER OF TRANSMITTAL

Job No. 25768

Date December 15, 1998

To: James C. Pierce, Jr., P.E.
Asst. City Engineer
Town of Addison
P.O. Box 144
Addison, Texas 75001-0144

Re: Arapaho Road Extension
Phase II & III

WE ARE FORWARDING TO YOU:

NO. OF COPIES	SHEET NO.	LAST DATED	DESCRIPTION
2	Summary	12/14/98	Summary Report of Alternative Alignment Studies

THESE ARE TRANSMITTED:

☐ For approval ☐ For your use ☐ As requested ☒ For review & comment

PLEASE NOTE:

If you need additional copies, please let me know.

COPY TO:
GBW Engineers Inc. Bruce Grantham P.E.
Jack Hatchell P.E.

By: Daniel F. Becker

Daniel F. Becker P.E.

ALIGNMENT STUDY CONCLUSIONS AND RECCOMENDATIONS
ARAPAHO ROAD EXTENSION

DRAFT

Town of Addison, Texas

PROJECT DESCRIPTION

The project consists of alignment studies, determination of right-of-way needs, meetings with property owners, and the preparation of right of way documents for Arapaho Road, from Addison Road to Marsh Lane.

HISTORY OF STUDIED ALIGNMENTS

The Town of Addison and our project team defined a design corridor earlier this year for the Arapaho Road extension. This corridor generally runs near or adjacent to the railroad track from Addison Road to just east of Surveyor Boulevard. The corridor angles toward the southwest as it crosses Surveyor Boulevard, then turns back to the west to follow the existing Realty Road to the Marsh Lane intersection.

Within the design corridor, a preferred horizontal alignment has been established, with the exception of a 2,500 ± foot section of roadway centered around the Midway Road intersection.

Alternatives Considered for the Midway Road Section

In recent months, the following alternatives have been evaluated for the Midway Road section:

1. Overpass with ramps on the north side requiring building acquisition(s) in this section.
2. Underpass with ramps on the north side (same horizontal alignment as Alternative 1).
3. Overpass without ramps (same horizontal alignment as Alternative 1).
4. Underpass without ramps (same horizontal alignment as Alternative 1).
5. Overpass without ramps requiring no building acquisition in this section.
6. Underpass without ramps (same horizontal alignment as Alternative 5).
7. Overpass with ramps on the south side (same horizontal alignment as Alternative 1).
8. Underpass with ramps on the south side (same horizontal alignment as Alternative 1).
9. Intersection at-grade.

CORRIDOR DESCRIPTIONS

There are six alternates being pursued at the present. From these six alternates, one will be chosen to implement for the project. The alternates are described in detail below, with a brief list of major issues associated with each alternate.

Alternate names in the following section only correspond to the roll plot drawings that were submitted to the Town of Addison, Texas.

1. ALTERNATE 1 - OVERPASS AT MIDWAY ROAD WITH RAMPS ON THE NORTH SIDE OF PROPOSED ARAPAHO ROAD

Alternate 1 has the same beginning and ending points as all of the alternates. The corridor begins at the Marsh Lane and Realty Lane intersection on the west end. From this point, the corridor remains on the existing alignment of Realty Road, to a point of curve south of the existing substation west of Surveyor Boulevard. From there, the alignment follows on an angle south of the existing pump station and elevated storage tank, to a point of curve on the south and west side of the elevated storage tank. The alignment then parallels the railroad right-of-way to a point in front of the MBNA Building fronting on Centurion Way. The corridor then curves to the right and proceeds east, perpendicular with Midway Road, approximately 200' south of the existing at-grade crossing with the railroad. Once through Midway Road, the corridor curves to the left and follows parallel to the railroad right-of-way. The corridor then makes two at-grade crossings with wye tracks south of the east-west rail corridor, just west of Addison Road. Once on the east side of the tracks, the corridor ties into the future intersection of Arapaho Road and Addison Road on the east end.

The proposed roadway would essentially be placed at existing grade for most of its entire length, except for the potential condition at Midway Road. The overpass at Midway Road would be a three-span precast prestressed I-beam bridge. The ramps associated with this alternate would be on the north side of this alternate between the proposed roadway and the railroad right-of-way. The ramps would be at-grade and would tie into the proposed roadway at a point where the project grade line returns to the existing grade.

This alternate has several major issues of importance.

- **GEOMETRY** - Geometrically the only issue is the ramp geometry. In order to tie-in with the proposed roadway, the ramp speed is controlled by the vertical alignment to a design speed of 25mph, resulting in a differential of more than 10mph between the ramp and the mainline.

- **SAFETY** - A major safety issue is associated with the merge area for the westbound on ramp from Midway Road. The conditions may not allow for desired design speed, due to AASHTO guidelines for stopping sight distance and intersection sight distance. The taper rates from the Manual on Uniform Traffic Control Devices are also possible areas where

deficiencies may occur with this corridor. But, the issues can be improved by lowering design speeds on the ramp or by creating a stop or signaled condition at the on ramp terminal.

- **RIGHT-OF-WAY** - Impacts include the purchase of one and probably two buildings at Midway Road. The corridor also requires that a building at Addison Road be purchased as well as some of the mini storage facility at Surveyor Boulevard.

- **CONSTRUCTIBILITY** - The issues include construction sequencing for the overpass erection and relocation of the concrete surface ditch. This alternate does not affect the 60" Dallas Water Utilities transmission main. There are no foreseen impacts to the underground franchise utilities at Midway Road.

- **COST** - This corridor is predicted to be the most costly alternate excluding the cost of right-of-way acquisition.

2. ALTERNATE 2 - UNDERPASS AT MIDWAY ROAD WITH RAMPS ON THE NORTH SIDE OF PROPOSED ARAPAHO ROAD

The underpass horizontal alignment is the same as its overpass counterpart. Vertically, the corridor will underpass existing Midway Road. The corridor will require that Midway Road traffic be placed on a precast prestressed concrete structure.

This alternate has several major issues of importance.

- **GEOMETRY** - The issues are the same as the previous alternate.

- **SAFETY** - The issues are the same as the previous alternate.

- **RIGHT-OF-WAY** - The issues are the same as the previous alternate.

- **CONSTRUCTIBILITY** - The issues include construction sequencing for the underpass construction and relocation of the concrete surface ditch. This alternate does not affect the 60" Dallas Water Utilities transmission main, but would require that it be placed behind the retaining walls along the depressed section of roadway. The underground franchise utilities at Midway Road will require relocation and have to be maintained with temporary.

- **COST** - This corridor is predicted to be one the most economic alternates excluding the cost of right-of-way acquisition and any lane-hour charges for reducing the number of lanes on Midway Road while the bridge is being constructed.

3. ALTERNATE 3 - OVERPASS AT MIDWAY ROAD WITHOUT RAMPS ON THE NORTH SIDE OF PROPOSED ARAPAHO ROAD

The overpass corridor follows the same horizontal and vertical alignment alternates with ramps.

This alternate has several major issues of importance.

- **GEOMETRY** - There are no negative geometric issues with this corridor.
- **SAFETY** - There are no negative safety issues with this corridor.
- **RIGHT-OF-WAY** - The issues are the same as the alternate with ramps.
- **CONSTRUCTIBILITY** - The issues are the same as the alternate with ramps.
- **COST** - This corridor is predicted to be one the most economical alternatives, excluding the cost of right-of-way acquisition costs and any traffic congestion cost for reducing the number of lanes on Midway Road while the bridge is being constructed.

4. ALTERNATE 4 - UNDERPASS AT MIDWAY ROAD WITHOUT RAMPS

The underpass corridor follows the same horizontal and vertical path as its counterpart with ramps.

This alternate has several major issues of importance.

- **GEOMETRY** - The only negative geometric issue is the sag condition under Midway Road will most likely require the structure to be lighted.
- **SAFETY** - The only safety issue is the underpass lighting.
- **RIGHT-OF-WAY** - The issues are the same as the alternate with ramps.
- **CONSTRUCTIBILITY** - The issues are the same as the alternate with ramps.
- **COST** - This corridor is predicted to be the most economical alternate excluding the cost of right-of-way acquisition and any costs related to the reduction of traffic for reducing the number of lanes on Midway Road while the bridge is being constructed.

5. ALTERNATE 5 - OVERPASS WITHOUT RAMPS - NO TAKING OF CHARTER FURNITURE WAREHOUSE

The alignment of Arapaho Road for this alternative would parallel the railroad tracks at project crossing of Midway Road.

The issues related to this alternate are:

- **GEOMETRY** - The alignment would be on straight tangent, parallel to tracks.
- **SAFETY** - No safety issues except sight distance of vertical geometry.
- **RIGHT-OF-WAY** - The issues are the same as the alternate with ramps.
- **CONSTRUCTIBILITY** - Same as Alternate 1, except retaining walls would require relocation of Dallas Water Utilities (DWU) 60" water line.
- **COST** - The cost of this alternative is essentially the same as underpass alternative, Alternate 1.

6. ALTERNATE 6 - UNDERPASS WITHOUT RAMPS - NO TAKING OF CHARTER WAREHOUSE

The alignment for Alternate 6 is the same as Alternate 5.

The issues related to this alternate are:

- **GEOMETRY** - Same as Alternate 5.
- **SAFETY** - Sight distance in sag vertical curve-Flooding in Heavy Rainfall.
- **RIGHT-OF-WAY** - Same as Alternate 5.
- **CONSTRUCTIBILITY** - Requires construction and placement of retaining wall very close to and below the elevation of DWU 60" water line. Relocation of the water line is recommended.
- **COST** - The cost of this alternate is approximately 5-percent greater than Alternate 5.

7. ALTERNATE 7 - UNDERPASS WITHOUT RAMPS - NO TAKING OF CHARTER WAREHOUSE

The other alternatives considered in preliminary designs have been dropped from further consideration due to drainage and utility conflicts.

Traffic Analysis

The North Central Texas Council of Governments (NTCOG) prepared traffic assignments for the year 2020 for the five alternatives for the Arapaho Road Extension. These alternatives are described below.

- "No Build" Alternative - What is the impact on adjacent streets if Arapaho Road is not extended?
- "At-Grade" Alternative - Arapaho Road extended with its intersection with Midway Road at--grade.
- "Grade-Separated" Alternative - Arapaho Road Extended with a grade separation at Midway Road without ramps.
- "Ramps on the North Side" Alternative - Arapaho Road extended with a grade separation at Midway Road and ramps on the north side of Arapaho Road.
- "Ramps on the South Side" Alternative - Arapaho Road extended with a grade separation at Midway Road and ramps on the south side of Arapaho Road.

Projected Traffic Volumes

The table below presents a summary of projected traffic impacts for the extension of Arapaho Road with its intersection at Midway Road grade separated without ramps.

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ADDISON ALIGNMENT ALTERNATIVES
Midway Road Section — Matrix of Issues

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5	ALTERNATIVE 6
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Realign Midway for construction sequence (4 lanes)	No	Yes	No	Yes	No	Yes
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Opinion of Probable Cost (with 20% contingency)	$19,708,065 (+ buildings)	$21,920,110 (+ buildings)	$19,669,785 (+ building)	$21,881,830 (+ building)	$21,809,772	N/A

HNTB Corporation

December 14, 1998

Arapahoe II/III

12-3-98

Craig, Jack, Bruce, Dan, John, Jo?

~~Meet w Ron A~~

Will produce a summary — work from Monday
give pro/cons of ea alt.

~~Alt Eval Matrix~~

Meet w Ron Between
Xmas & New Years

North Central Texas Council Of Governments

November 24, 1998

Mr. Jack Hatchell
Jack Hatchell & Associates
P.O. Box 2660119
Plano, Texas 75026-0119

Dear Mr. Hatchell:

Per your request of October 22, 1998, enclosed are the projected 2020 volumes for Arapaho Road, provided with six volume maps for various scenarios. Each map presents the volumes on the Addison Airport Tunnel. Listed below are the scenarios that have been modeled:

- No-Build – Arapaho Road terminates at Addison Road (Airport Tunnel)
- At Grade – Arapaho Road extends to Marsh Lane (Airport Tunnel)
- Grade Separated – Arapaho Road extends to Marsh Lane (no interchange with Midway Road) (Airport Tunnel)
- Grade Separated with Full Ramps at Midway Road – Arapaho Road extends to Marsh Lane (full interchange at Midway Road) (Airport Tunnel)
- Grade Separated with Ramps at Midway Road – Arapaho Road extends to Marsh Lane (ramps exiting westbound Arapaho Road to northbound Midway Road and ramps exiting southbound Midway Road to westbound Arapaho Road (Airport Tunnel)
- Grade Separated with Ramps at Midway Road – Arapaho Road extends to Marsh Lane (ramps exiting westbound Arapaho Road to northbound Midway Road and ramps exiting southbound Midway Road to westbound Arapaho Road (No Airport Tunnel)

If you have any questions regarding the traffic forecasts for Arapaho Road, please contact Mitzi Ward or me at (817) 695-9240.

Sincerely,

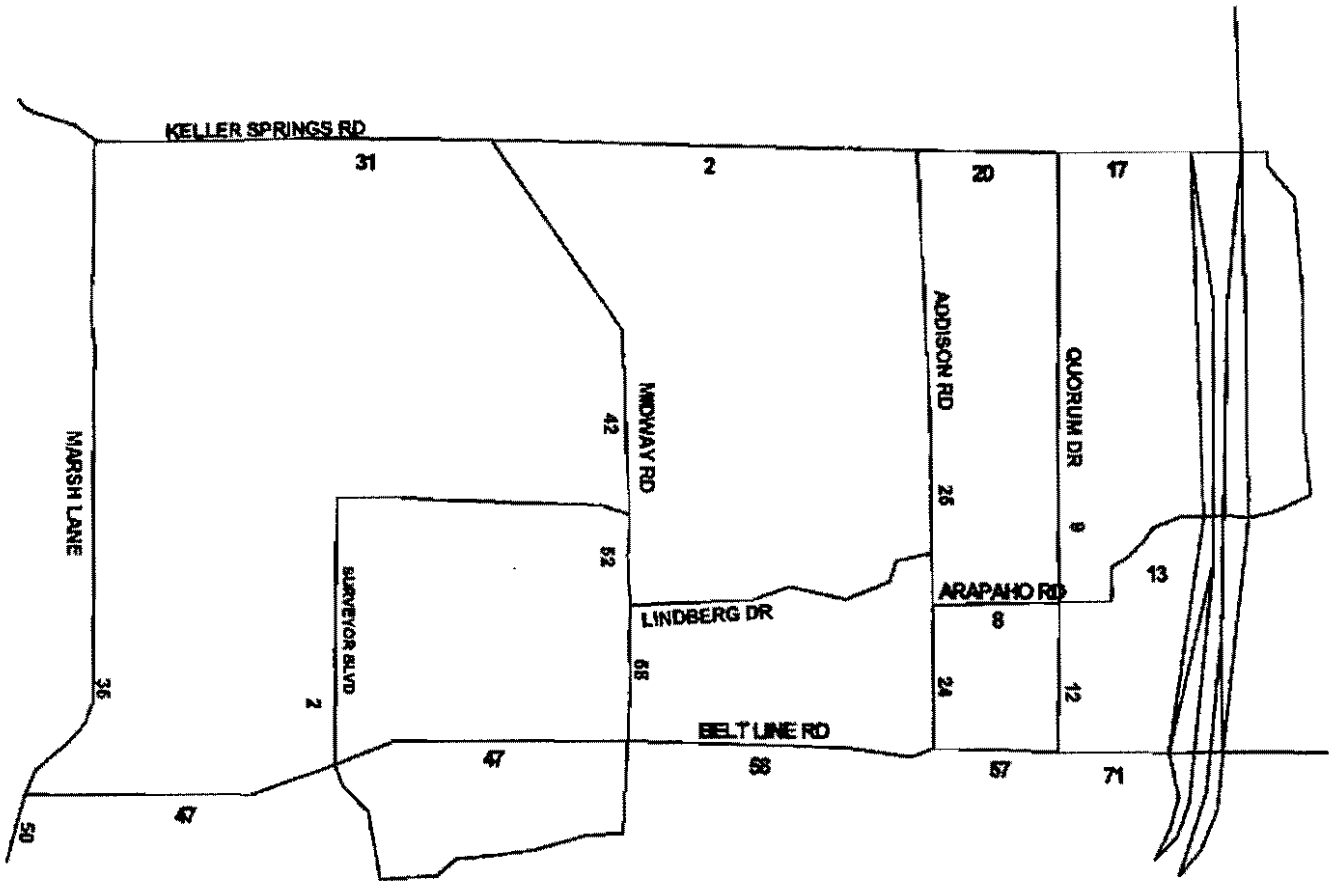
Michael Morris, P.E.
Director of Transportation

MW:ez
Enclosures

cc: 1998-99 UPWP Element 5.03 Project File

616 Six Flags Drive, Centerpoint Two
P. O. Box 5888, Arlington, Texas 76005-5888
(817) 640-3300 FAX: 817-640-7806 recycled paper

ARAPAHO ROAD
NO BUILD ALTERNATIVE
2020 VOLUMES / 1000

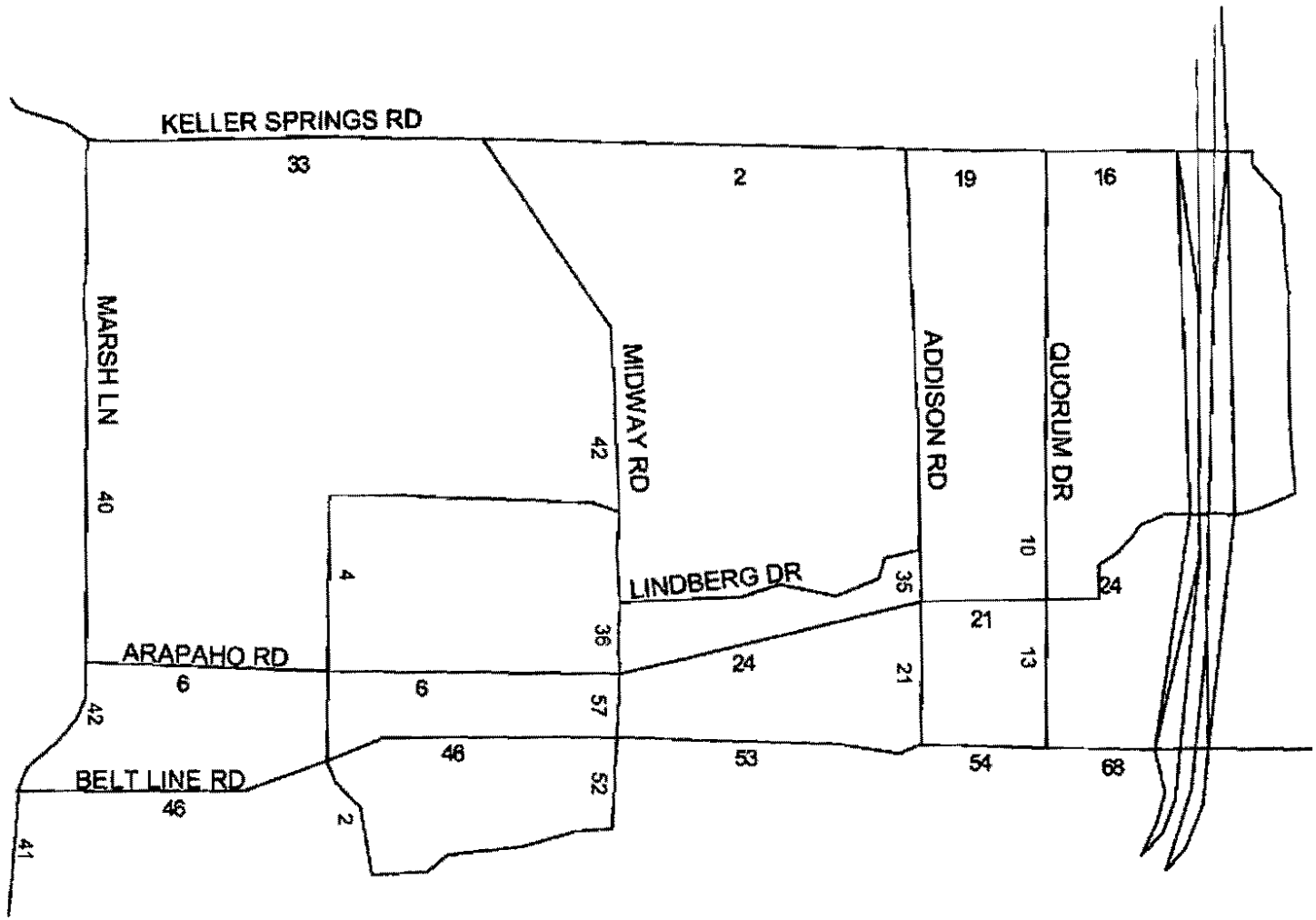


Arap_Nobuild
- Freeway
- Principal, HOV
- Minor
- Collector, Frontage
- Ramps

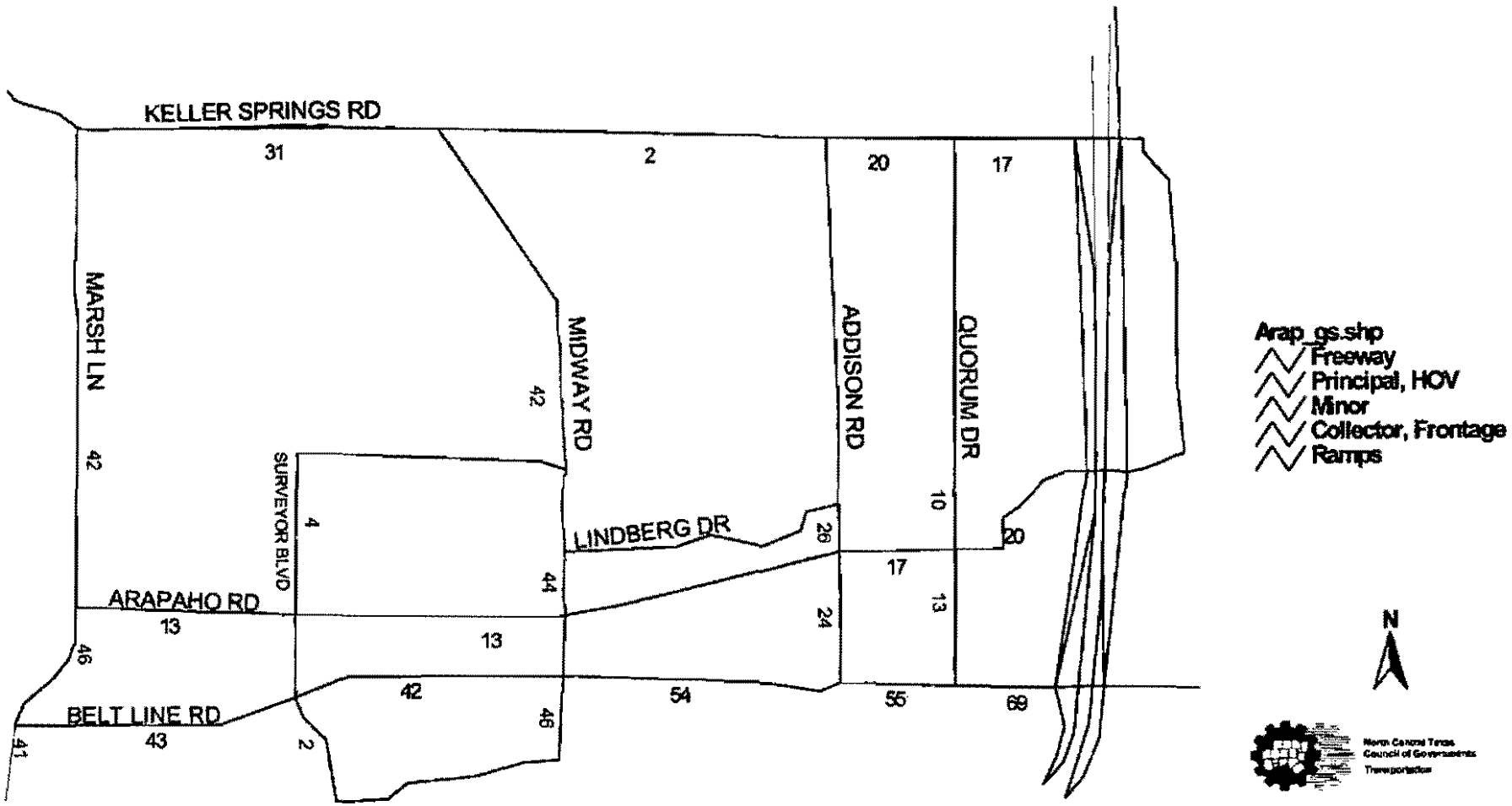
N

North Central Texas Council of Governments Transportation

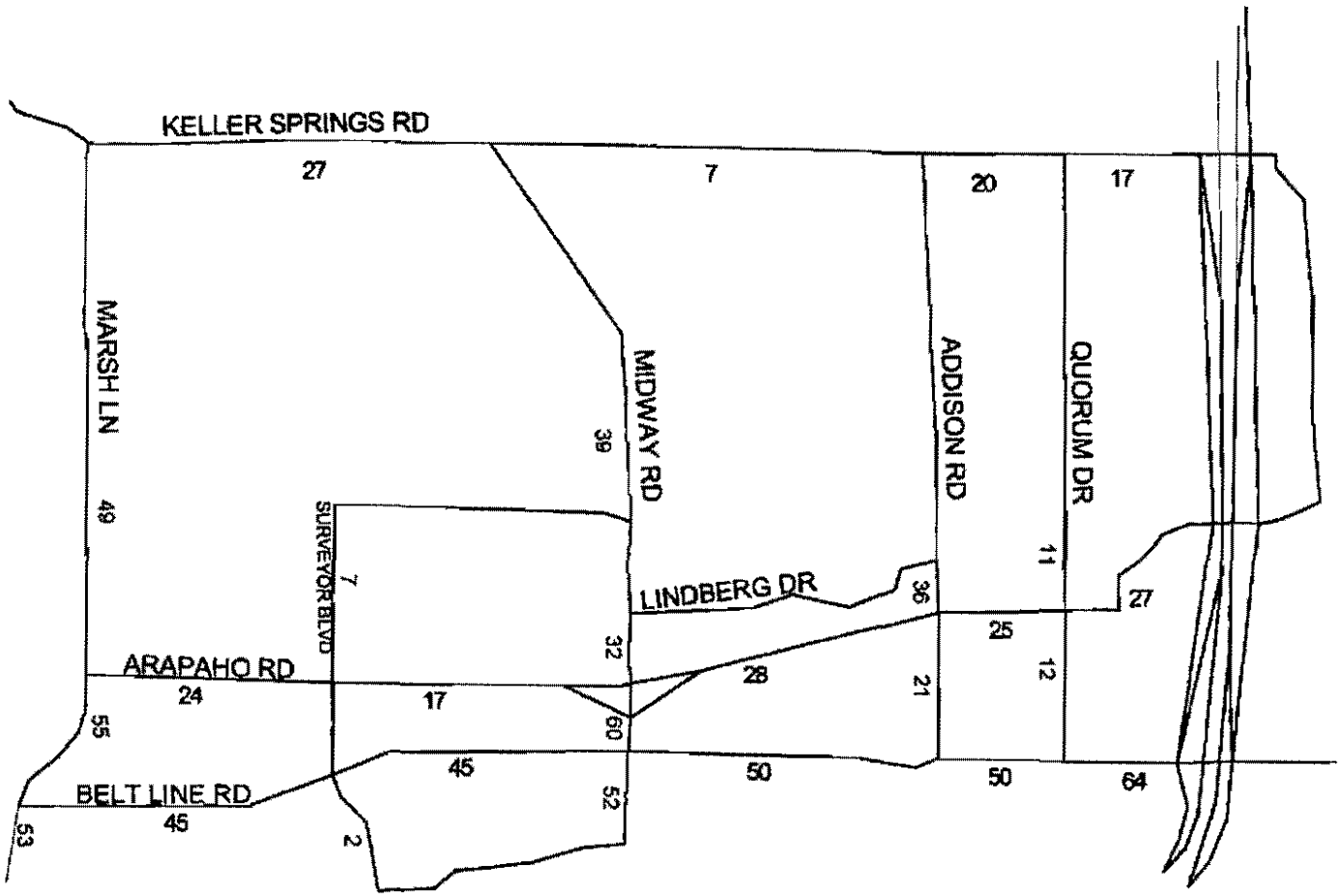
ARAPAHO ROAD EXTENSION
AT GRADE
2020 VOLUMES / 1000



ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY RD
2020 VOLUMES / 1000



ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY W/ FULL RAMPS
2020 VOLUMES / 1000

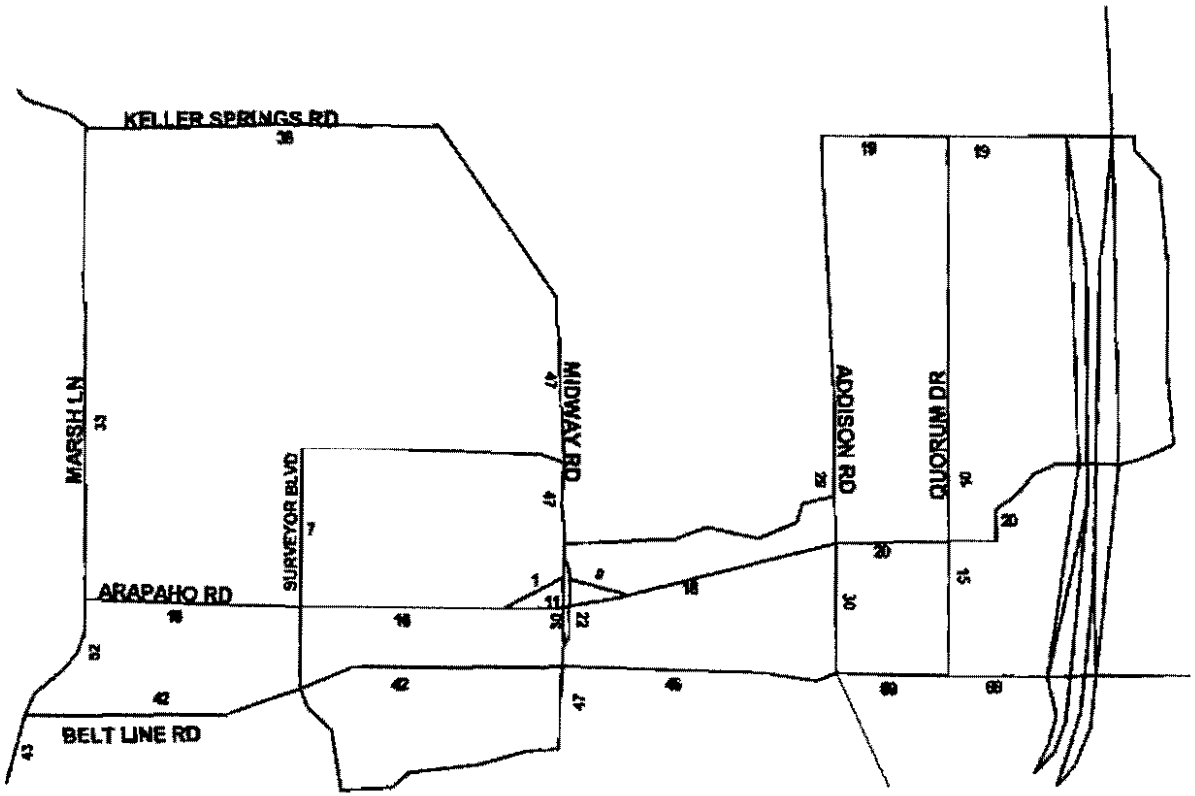


Arap_gsrmp.shp
- Freeway
- Principal
- Minor
- Collectors, Frtg
- Ramps

N

North Central Texas Council of Governments Transportation

ARAPAHO ROAD
GRADE SEPARATED @ MIDWAY W/RAMPS
(NO AIRPORT TUNNEL)
2020 VOLUMES / 1000

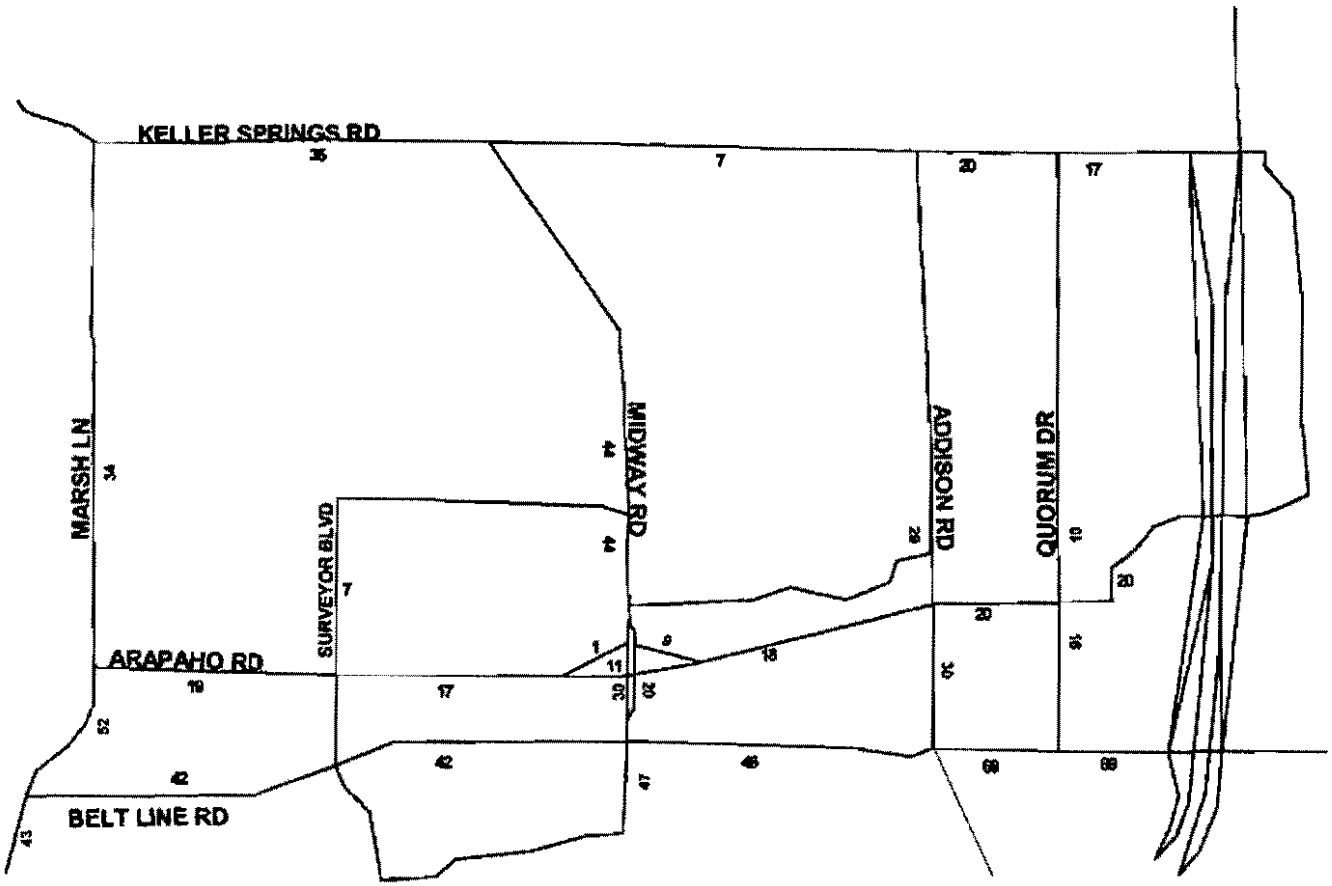


Arap no tunnel
- Freeway
- Principal, HOV
- Minor
- Collector, Frontage
- Ramps

N

North Central Texas Council of Governments
Transportation

ARAPAHO ROAD
GRADE SEPARATED @ MIDWAY W/RAMPS
(AIRPORT TUNNEL)
2020 VOLUMES / 1000



arap & tunnel
- Freeway
- Principal, HOV
- Minor
- Collector, Frontage
- Ramps

N

North Central Texas Council of Governments
Transportation

North Central Texas Council Of Governments

November 24, 1998

Mr. Jack Hatchell
Jack Hatchell & Associates
P.O. Box 2660119
Plano, Texas 75026-0119

Dear Mr. Hatchell:

Per your request of October 22, 1998, enclosed are the projected 2020 volumes for Arapaho Road, provided with six volume maps for various scenarios. Each map presents the volumes on the Addison Airport Tunnel. Listed below are the scenarios that have been modeled:

- No-Build – Arapaho Road terminates at Addison Road (Airport Tunnel)
- At Grade – Arapaho Road extends to Marsh Lane (Airport Tunnel)
- Grade Separated – Arapaho Road extends to Marsh Lane (no interchange with Midway Road) (Airport Tunnel)
- Grade Separated with Full Ramps at Midway Road – Arapaho Road extends to Marsh Lane (full interchange at Midway Road) (Airport Tunnel)
- Grade Separated with Ramps at Midway Road – Arapaho Road extends to Marsh Lane (ramps exiting westbound Arapaho Road to northbound Midway Road and ramps exiting southbound Midway Road to westbound Arapaho Road (Airport Tunnel)
- Grade Separated with Ramps at Midway Road – Arapaho Road extends to Marsh Lane (ramps exiting westbound Arapaho Road to northbound Midway Road and ramps exiting southbound Midway Road to westbound Arapaho Road (No Airport Tunnel)

If you have any questions regarding the traffic forecasts for Arapaho Road, please contact Mitzi Ward or me at (817) 695-9240.

Sincerely,

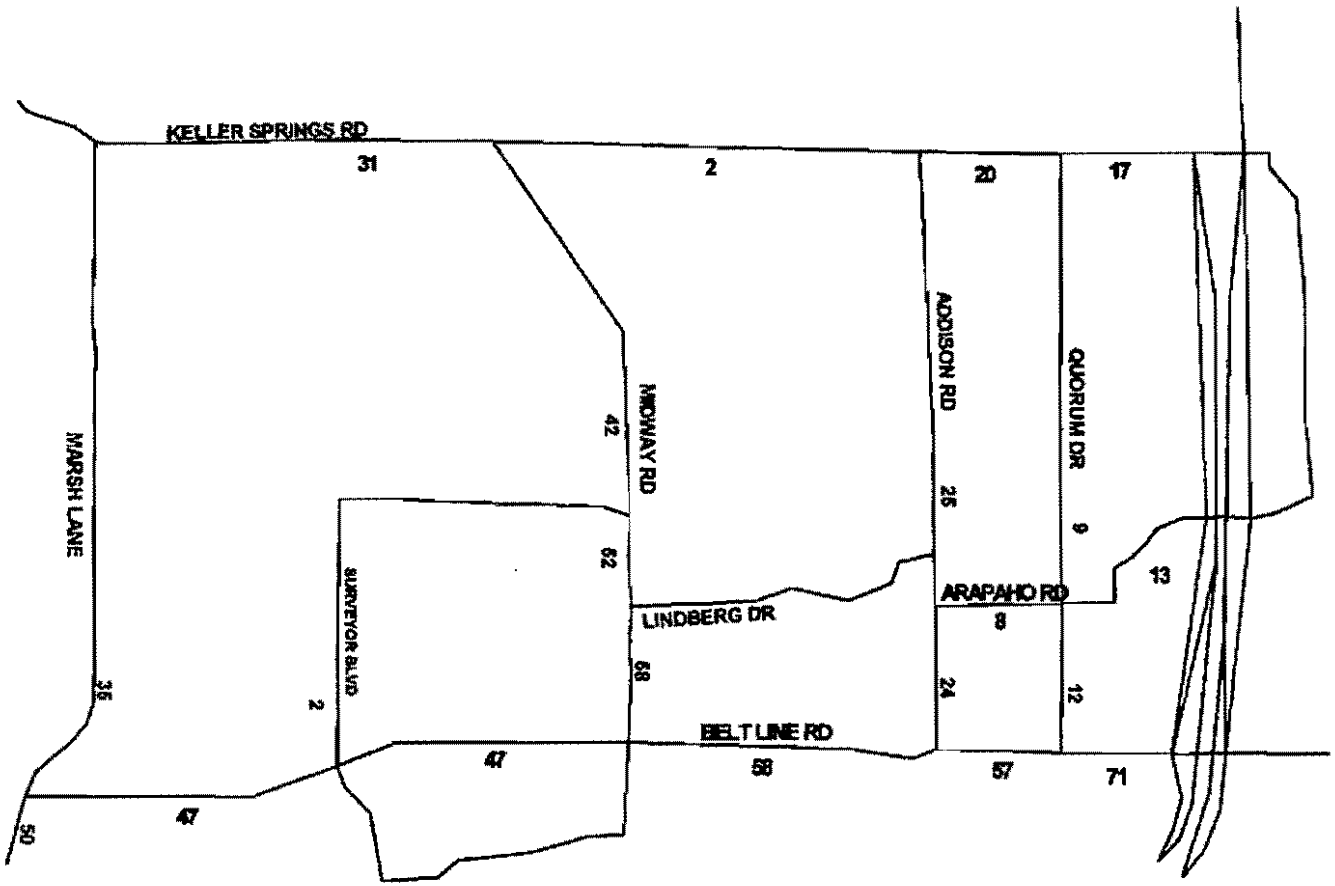
Michael Morris, P.E.
Director of Transportation

MW:ez
Enclosures

cc: 1998-99 UPWP Element 5.03 Project File

616 Six Flags Drive, Centerpoint Two
P. O. Box 5888, Arlington, Texas 76005-5888
(817) 640-3300 FAX: 817-640-7806 recycled paper

ARAPAHO ROAD
NO BUILD ALTERNATIVE
2020 VOLUMES / 1000

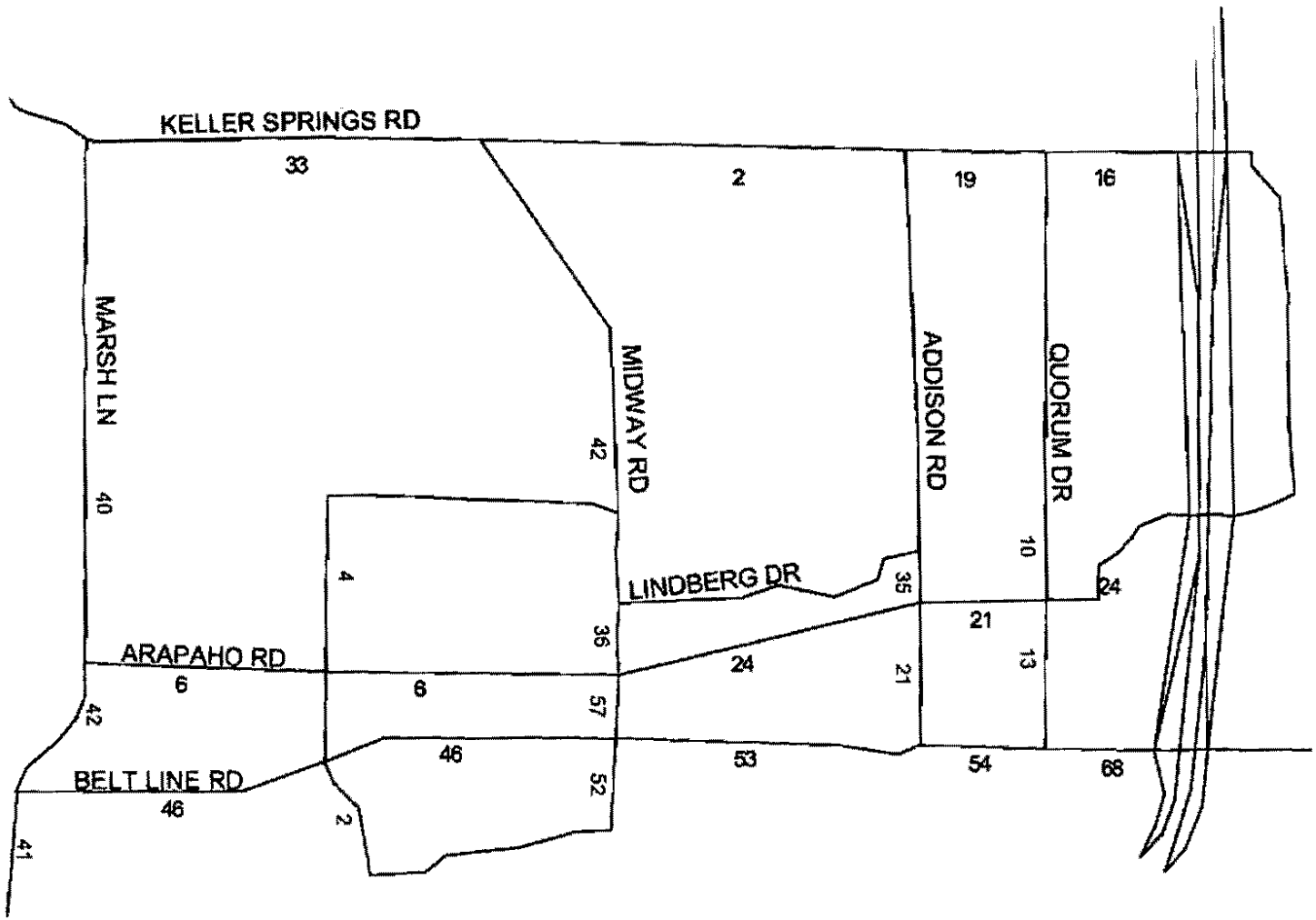


Arap_Nobuild
- Freeway
- Principal, HOV
- Minor
- Collector, Frontage
- Ramps

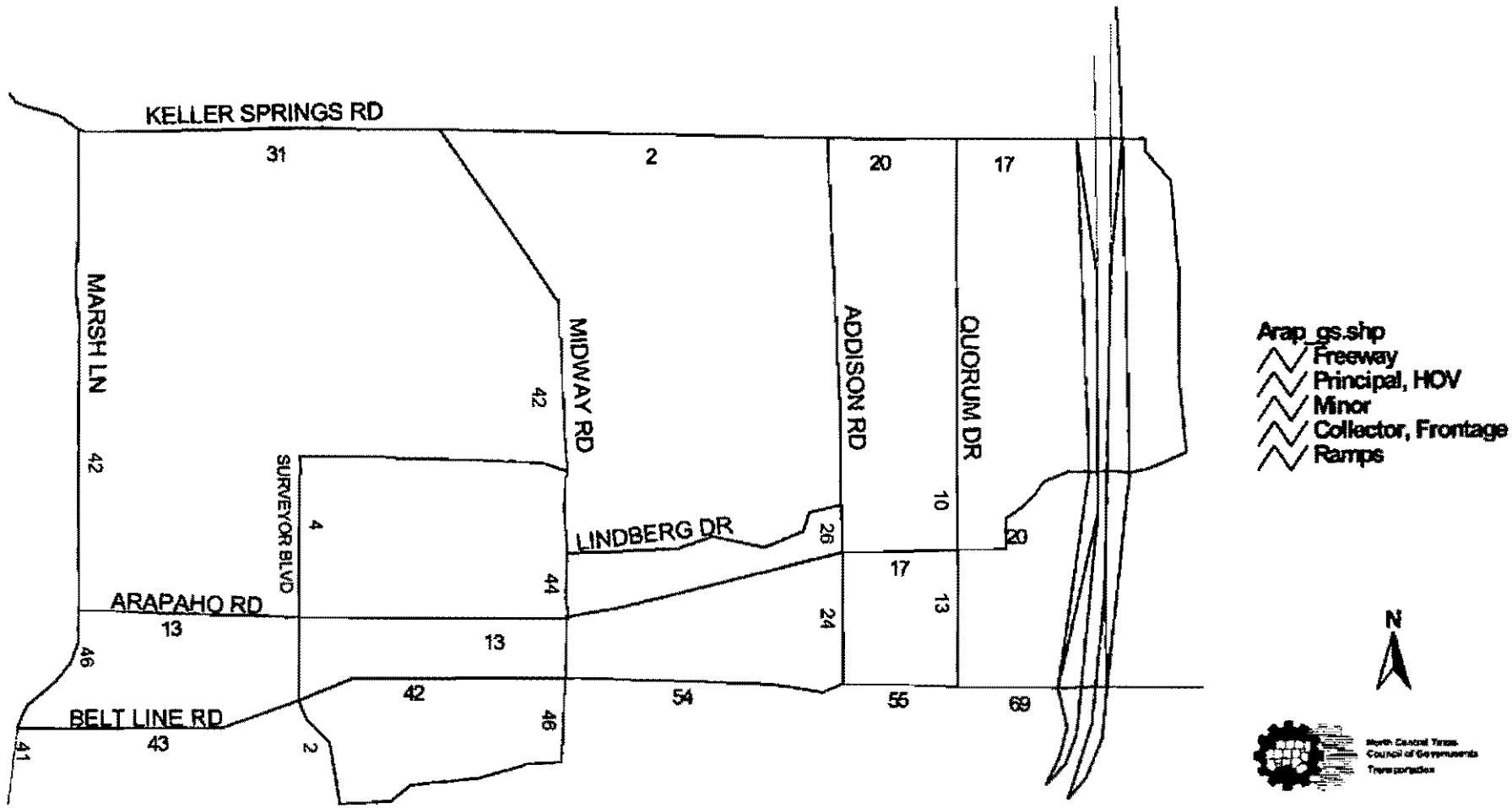
N

North Central Texas Council of Governments Transportation

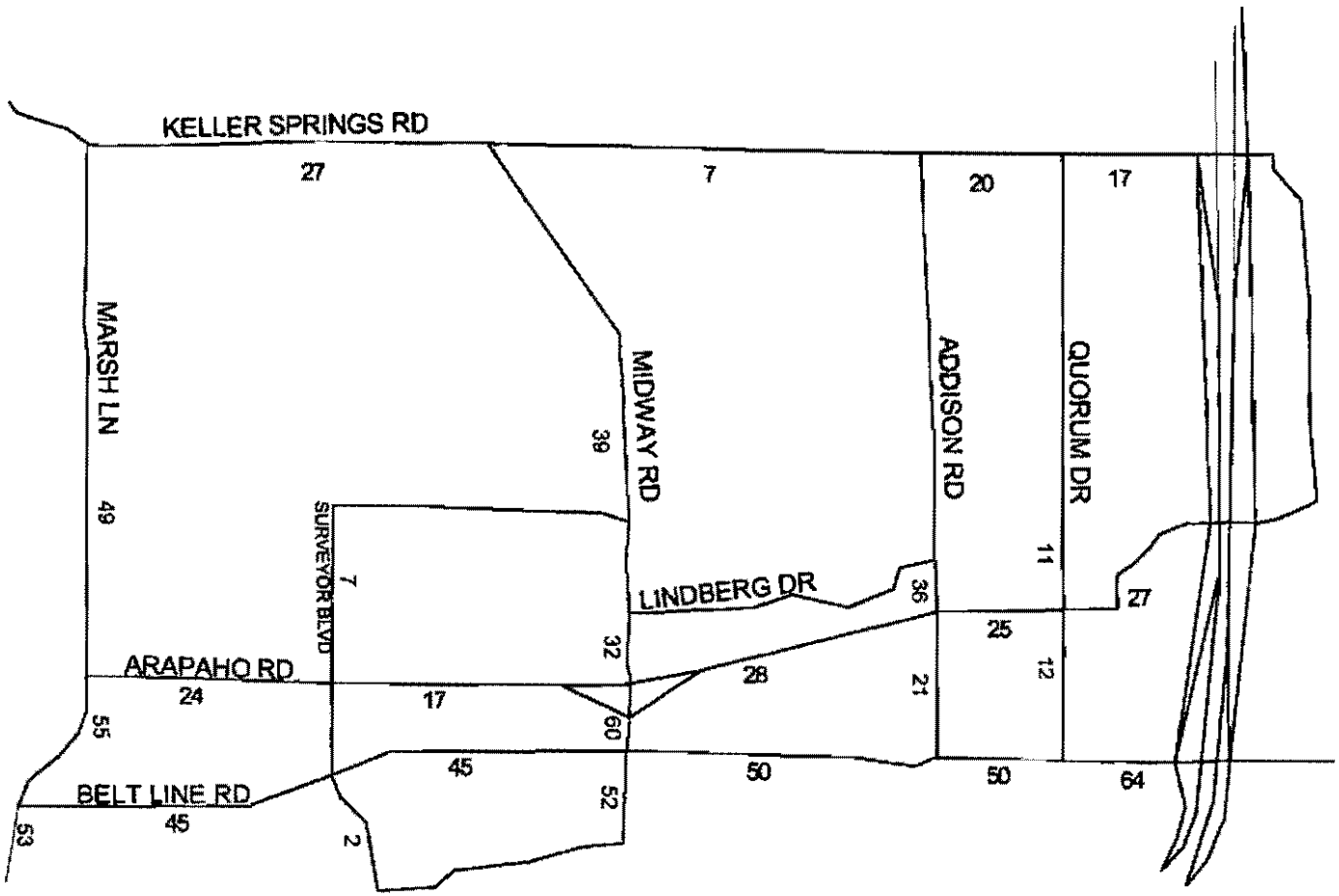
ARAPAHO ROAD EXTENSION
AT GRADE
2020 VOLUMES / 1000



ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY RD
2020 VOLUMES / 1000



ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY W/ FULL RAMPS
2020 VOLUMES / 1000

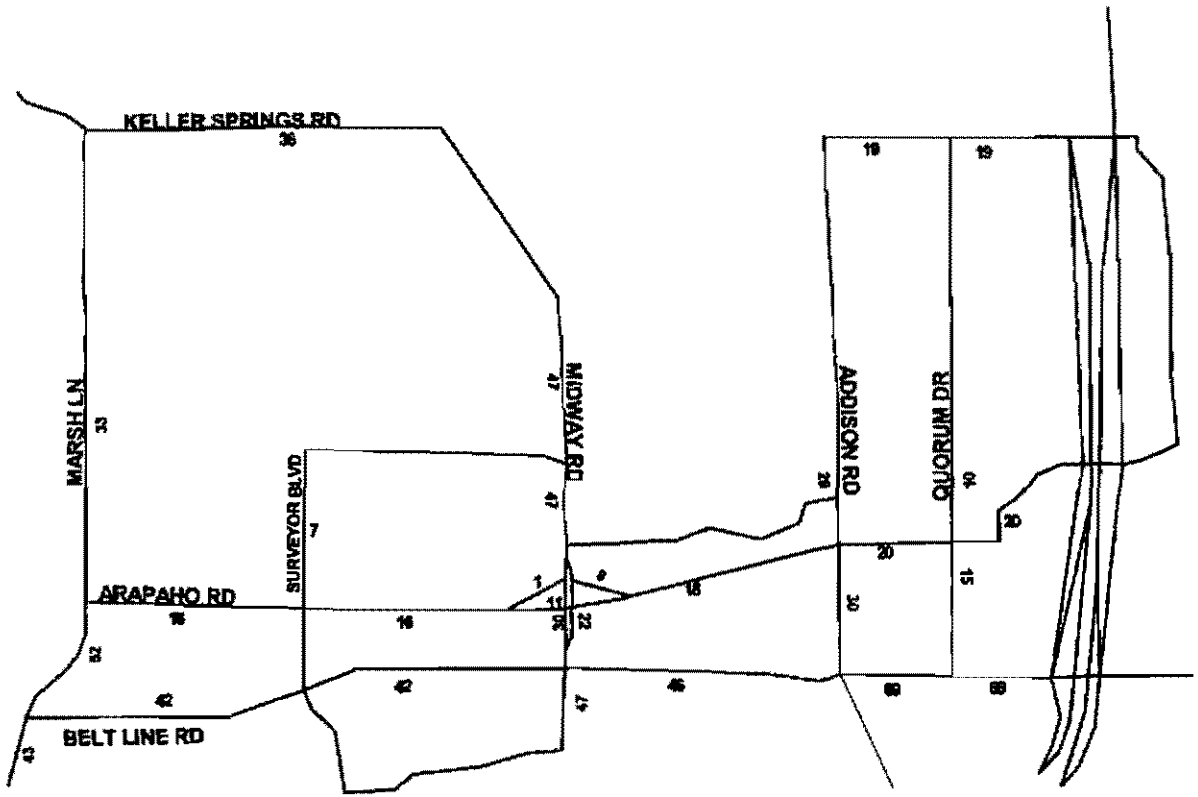


Arap_gsmp.shp
- Freeway
- Principal
- Minor
- Collectors, Frtg
- Ramps

N

North Central Texas Council of Governments
Transportation

ARAPAHO ROAD
GRADE SEPARATED @ MIDWAY W/RAMPS
(NO AIRPORT TUNNEL)
2020 VOLUMES / 1000

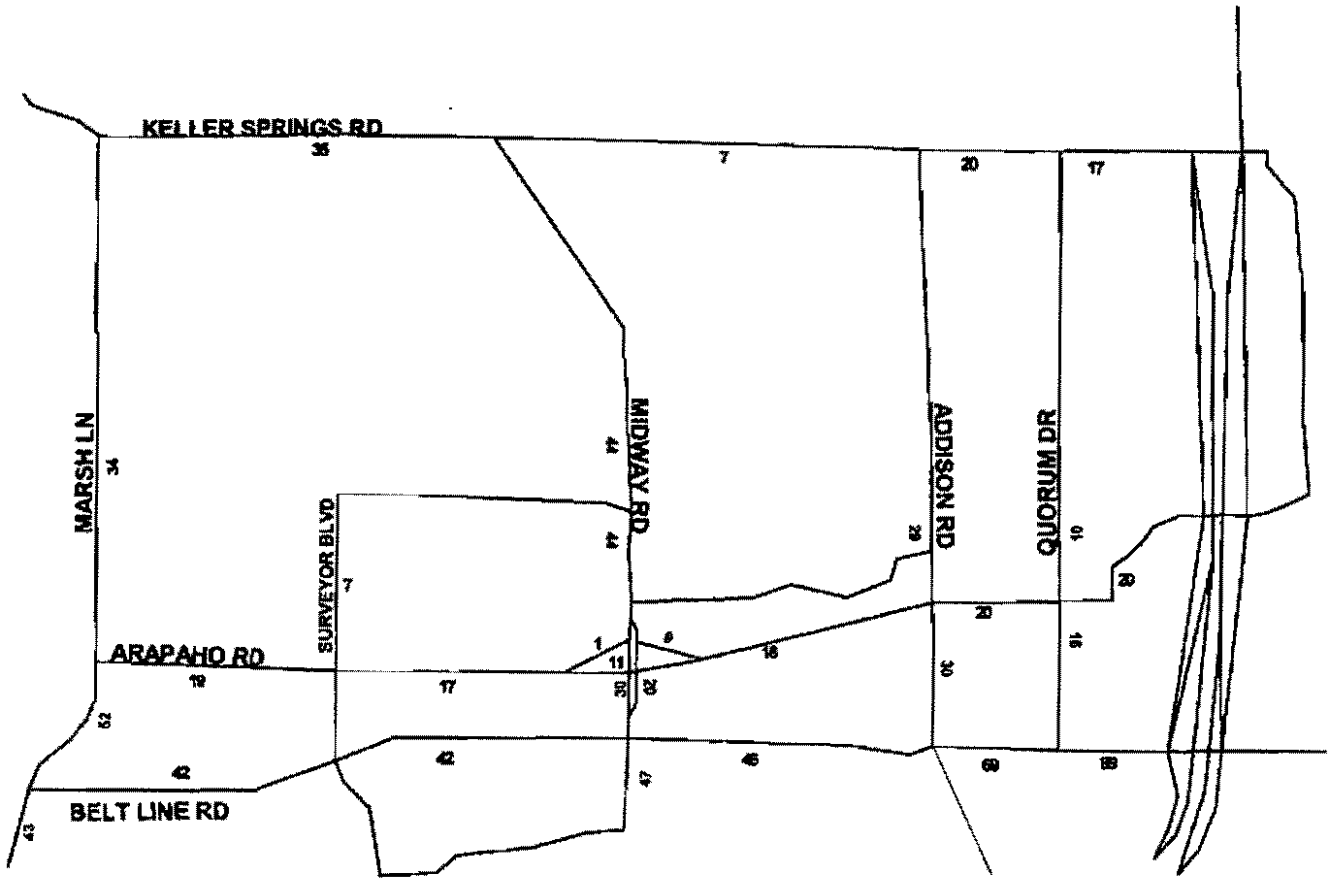


Arap no tunnel
- Freeway
- Principal, HOV
- Minor
- Collector, Frontage
- Ramps

N

North Central Texas Council of Governments
Transportation

ARAPAHO ROAD
GRADE SEPARATED @ MIDWAY W/RAMPS
(AIRPORT TUNNEL)
2020 VOLUMES / 1000



arap & tunnel
- Freeway
- Principal, HOV
- Minor
- Collector, Frontage
- Ramps

N

North Central Texas Council of Governments
Transportation

TRAFFIC VOLUME COMPARISON

	No Build	At Grade	Grade Separated	Grade Separated With Ramps South Side	Grade Separated With Ramps North Side	Grade Separated With Ramps No Tun
ARAPAHO						
Addison to Midway	-	24,000	17,000	28,000	18,000	18,000
Midway to Surveyor	-	6,000	13,000	17,000	17,000	17,000
BELT LINE						
Addison to Midway	58,000	53,000	54,000	50,000	46,000	46,000
Midway to Surveyor	47,000	46,000	42,000	45,000	42,000	42,000
MIDWAY						
North of Arapaho	52,000	36,000	44,000	32,000	44,000	47,000
South of Arapaho	58,000	57,000	-	60,000	50,000	52,000
South of Belt Line	-	52,000	46,000	52,000	47,000	47,000
KELLER SPRINGS						
East of Addison	20,000	19,000	20,000	20,000	20,000	19,000
Tunnel	2,000	2,000	2,000	7,000	7,000	-
West of Midway	31,000	33,000	31,000	27,000	36,000	36,000

TOWN OF ADDISON, TEXAS

ARAPAHO ROAD EXTENSION FROM ADDISON ROAD TO MARSH LANE

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

SUMMARY OF COSTS FOR EACH ALTERNATE

HNTB / GBW Engineers 12/03/98

ALTERNATE	DESCRIPTION	ENGINEER'S ESTIMATED COST
ALTERNATE 4AU	ALTERNATE 4 - UNDERPASS CONDITION AT MIDWAY ROAD WITH RAMPS	$ 19,708,065.60
ALTERANTE 4AO	ALTERNATE 4 - OVERPASS CONDITION AT MIDWAY ROAD WITH RAMPS	$ 21,920,109.60
ALTERANTE 4BU	ALTERNATE 4 - UNDERPASS CONDITION AT MIDWAY ROAD WITHOUT RAMPS	$ 19,669,785.60
ALTERANTE 4BO	ALTERNATE 4 -OVERPASS CONDITION AT MIDWAY ROAD WITHOUT RAMPS	$ 21,881,829.60
ALTERANTE 5	ALTERNATE 5 - OVERPASS CONDITION AT MIDWAY ROAD WITHOUT RAMPS	$ 21,809,772.00

PRELIMINARY ONLY

12/3/98

TOWN OF ADDISON, TEXAS

HNTB / GBW Engineers 12/03/98

ARAPAHO ROAD EXTENSION FROM ADDISON ROAD TO MARSH LANE

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

ALTERNATE 4 - UNDERPASS CONDITION AT MIDWAY ROAD WITH RAMPS

ITEM NO	ITEM DESCRIPTION ROADWAY	UNIT	QUANTITY	ENGINEERS ESTIMATE UNIT PRICE	 AMOUNT
100	PREP. & MAINT. OF RIGHT-OF-WAY	STA	78.0	$ 2,500.00	$ 195,000.00
104	REMOVE OLD CONCRETE (PVMT.)	SY	7,200	$ 2.00	$ 14,400.00
110	EXCAVATION (ROADWAY)	CY	35,500	$ 3.20	$ 113,600.00
132	EMBANKMENT (ORDINARY COMPACTION)	CY	21,000	$ 8.50	$ 178,500.00
260	LIME TREATED SUBGRADE (6 in) (Ramps)	SY	19,430	$ 1.60	$ 31,088.00
260	LIME TREATED SUBGRADE (6 in) (Mainline)	SY	380,300	$ 1.60	$ 608,480.00
360	CONCRETE PAVEMENT (10 in) (Mainline)	SY	380,300	$ 24.00	$ 9,127,200.00
360	CONCRETE PAVEMENT (10 in) (Ramps)	SY	19,430	$ 24.00	$ 466,320.00
360	MONOLITHIC CURB (TYPE A) (6 in)	LF	28,450	$ 2.00	$ 56,900.00
423	RETAINING WALL (CAST IN PLACE)	SF	30,000	$ 40.00	$ 1,200,000.00
500	MOBILIZATION	LS	1	$ 20,000.00	$ 20,000.00
502	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1	$ 20,000.00	$ 20,000.00
666	REFLECT PAVE MARKINGS	LF	80,000	$ 1.50	$ 120,000.00
*	LIGHTING	LF	12,000	$ 35.00	$ 420,000.00
*	TRAFFIC SIGNALS (PER INTERSECTION)	EA	3	$ 80,000.00	$ 240,000.00
681	TEMPORARY TRAFFIC SIGNAL	EA	2	$ 10,000.00	$ 20,000.00
*	ROADWAY STRUCTURE	SF	6,150	$ 45.00	$ 276,750.00
	INLETS	EA	30	$ 2,500.00	$ 75,000.00
	MANHOLES	EA	5	$ 5,000.00	$ 25,000.00
	LATERALS	LF	1,230	$ 50.00	$ 61,500.00
	24" RCP	LF	3,000	$ 50.00	$ 150,000.00
	30" RCP	LF	1,530	$ 65.00	$ 99,450.00
	36" RCP	LF	500	$ 80.00	$ 40,000.00
	6' X 5' RCBC	LF	260	$ 220.00	$ 57,200.00
	7' X 5' RCBC	LF	400	$ 250.00	$ 100,000.00
	9' X 5' RCBC	LF	500	$ 300.00	$ 150,000.00
	2 - 7' X 5' RCBC	LF	800	$ 500.00	$ 400,000.00
	2 - 9' X 5' RCBC	LF	1,460	$ 630.00	$ 919,800.00
	10' X 6' RCBC	LF	920	$ 720.00	$ 662,400.00
	10' X 7' RCBC	LF	130	$ 760.00	$ 98,800.00
	HEADWALL CONCRETE	CY	60	$ 600.00	$ 36,000.00
	REMOVE CONCRETE CHANNEL LINING	SY	11,200	$ 10.00	$ 112,000.00
	REMOVE/REPLACE CONCRETE CHANNEL LINING	SY	1,300	$ 60.00	$ 78,000.00
	OTHER UTILITY RELOCATIONS	LS	1	$250,000.00	$ 250,000.00
	SUBTOTAL				$ 16,423,388.00
	20% CONTINGENCY				$ 3,284,677.60
	TOTAL CONSTRUCTION COST				$ 19,708,065.60

TOWN OF ADDISON, TEXAS

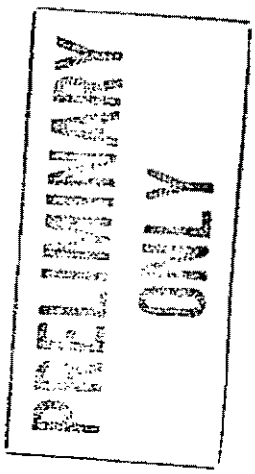
HNTB / GBW Engineers 12/03/98

ARAPAHO ROAD EXTENSION FROM ADDISON ROAD TO MARSH LANE

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

ALTERNATE 4 - OVERPASS CONDITION AT MIDWAY ROAD WITH RAMPS

ITEM NO	ITEM DESCRIPTION ROADWAY	UNIT	QUANTITY	ENGINEERS ESTIMATE UNIT PRICE	 AMOUNT
100	PREP. & MAINT. OF RIGHT-OF-WAY	STA	78.0	$ 2,500.00	$ 195,000.00
104	REMOVE OLD CONCRETE (PVMT.)	SY	7,200	$ 2.00	$ 14,400.00
110	EXCAVATION (ROADWAY)	CY	9,650	$ 3.20	$ 30,880.00
132	EMBANKMENT (ORDINARY COMPACTION)	CY	202,540	$ 8.50	$ 1,721,590.00
260	LIME TREATED SUBGRADE (6 in) (Ramps)	SY	19,430	$ 1.60	$ 31,088.00
260	LIME TREATED SUBGRADE (6 in) (Mainline)	SY	380,300	$ 1.60	$ 608,480.00
360	CONCRETE PAVEMENT (10 in) (Mainline)	SY	380,300	$ 24.00	$ 9,127,200.00
360	CONCRETE PAVEMENT (10 in) (Ramps)	SY	19,430	$ 24.00	$ 466,320.00
360	MONOLITHIC CURB (TYPE A) (6 in)	LF	28,450	$ 2.00	$ 56,900.00
423	RETAINING WALL (CAST IN PLACE)	SF	45,000	$ 40.00	$ 1,800,000.00
500	MOBILIZATION	LS	1	$ 20,000.00	$ 20,000.00
502	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1	$ 20,000.00	$ 20,000.00
666	REFLECT PAVE MARKINGS	LF	80,000	$ 1.50	$ 120,000.00
*	LIGHTING	LF	12,000	$ 35.00	$ 420,000.00
*	TRAFFIC SIGNALS (PER INTERSECTION)	EA	3	$ 80,000.00	$ 240,000.00
681	TEMPORARY TRAFFIC SIGNAL	EA	4	$ 10,000.00	$ 40,000.00
*	ROADWAY STRUCTURE	SF	9,550	$ 45.00	$ 429,750.00
	INLETS	EA	30	$ 2,500.00	$ 75,000.00
	LATERALS	LF	1,230	$ 50.00	$ 61,500.00
	30" RCP	LF	530	$ 65.00	$ 34,450.00
	36" RCP	LF	500	$ 80.00	$ 40,000.00
	6' X 5' RCBC	LF	260	$ 220.00	$ 57,200.00
	7' X 5' RCBC	LF	400	$ 250.00	$ 100,000.00
	9' X 5' RCBC	LF	500	$ 300.00	$ 150,000.00
	2 - 7' X 5' RCBC	LF	800	$ 500.00	$ 400,000.00
	2 - 9' X 5' RCBC	LF	1,460	$ 630.00	$ 919,800.00
	10' X 6' RCBC	LF	920	$ 720.00	$ 662,400.00
	10' X 7' RCBC	LF	130	$ 760.00	$ 98,800.00
	HEADWALL CONCRETE	CY	60	$ 600.00	$ 36,000.00
	REMOVE CONCRETE CHANNEL LINING	SY	11,200	$ 10.00	$ 112,000.00
	REMOVE/REPLACE CONCRETE CHANNEL LINING	SY	1,300	$ 60.00	$ 78,000.00
	OTHER UTILITY RELOCATIONS	LS	1	$ 100,000.00	$ 100,000.00
	SUBTOTAL				$ 18,266,758.00
	20% CONTINGENCY				$ 3,653,351.60
TOTAL CONSTRUCTION COST					$ 21,920,109.60



TOWN OF ADDISON, TEXAS

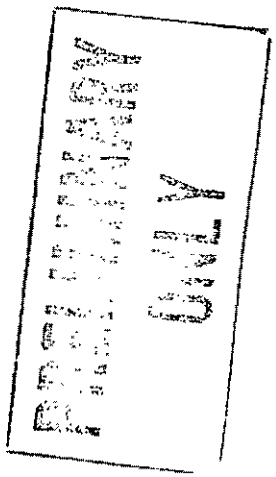
HNTB / GBW Engineers 12/03/98

ARAPAHO ROAD EXTENSION FROM ADDISON ROAD TO MARSH LANE

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

ALTERNATE 4 - UNDERPASS CONDITION AT MIDWAY ROAD WITHOUT RAMPS

ITEM NO	ITEM DESCRIPTION ROADWAY	UNIT	QUANTITY	ENGINEERS ESTIMATE UNIT PRICE	 AMOUNT
100	PREP. & MAINT. OF RIGHT-OF-WAY	STA	78.0	$ 2,500.00	$ 195,000.00
104	REMOVE OLD CONCRETE (PVMT.)	SY	7,200	$ 2.00	$ 14,400.00
110	EXCAVATION (ROADWAY)	CY	35,500	$ 3.20	$ 113,600.00
132	EMBANKMENT (ORDINARY COMPACTION)	CY	21,000	$ 8.50	$ 178,500.00
260	LIME TREATED SUBGRADE (6 in) (Ramps)	SY	19,430	$ 1.60	$ 31,088.00
260	LIME TREATED SUBGRADE (6 in) (Mainline)	SY	380,300	$ 1.60	$ 608,480.00
360	CONCRETE PAVEMENT (10 in) (Mainline)	SY	380,300	$ 24.00	$ 9,127,200.00
360	CONCRETE PAVEMENT (10 in) (Ramps)	SY	19,430	$ 24.00	$ 466,320.00
360	MONOLITHIC CURB (TYPE A) (6 in)	LF	25,000	$ 2.00	$ 50,000.00
423	RETAINING WALL (CAST IN PLACE)	SF	30,000	$ 40.00	$ 1,200,000.00
500	MOBILIZATION	LS	1	$ 20,000.00	$ 20,000.00
502	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1	$ 20,000.00	$ 20,000.00
666	REFLECT PAVE MARKINGS	LF	75,000	$ 1.50	$ 112,500.00
*	LIGHTING	LF	11,500	$ 35.00	$ 402,500.00
*	TRAFFIC SIGNALS (PER INTERSECTION)	EA	3	$ 80,000.00	$ 240,000.00
681	TEMPORARY TRAFFIC SIGNAL	EA	2	$ 10,000.00	$ 20,000.00
*	ROADWAY STRUCTURE	SF	6,150	$ 45.00	$ 276,750.00
	INLETS	EA	30	$ 2,500.00	$ 75,000.00
	MANHOLES	EA	5	$ 5,000.00	$ 25,000.00
	LATERALS	LF	1,230	$ 50.00	$ 61,500.00
	24" RCP	LF	3,000	$ 50.00	$ 150,000.00
	30" RCP	LF	1,530	$ 65.00	$ 99,450.00
	36" RCP	LF	500	$ 80.00	$ 40,000.00
	6' X 5' RCBC	LF	260	$ 220.00	$ 57,200.00
	7' X 5' RCBC	LF	400	$ 250.00	$ 100,000.00
	9' X 5' RCBC	LF	500	$ 300.00	$ 150,000.00
	2 - 7' X 5' RCBC	LF	800	$ 500.00	$ 400,000.00
	2 - 9' X 5' RCBC	LF	1,460	$ 630.00	$ 919,800.00
	10' X 6' RCBC	LF	920	$ 720.00	$ 662,400.00
	10' X 7' RCBC	LF	130	$ 760.00	$ 98,800.00
	HEADWALL CONCRETE	CY	60	$ 600.00	$ 36,000.00
	REMOVE CONCRETE CHANNEL LINING	SY	11,200	$ 10.00	$ 112,000.00
	REMOVE/REPLACE CONCRETE CHANNEL LINING	SY	1,300	$ 60.00	$ 78,000.00
	OTHER UTILITY RELOCATIONS	LS	1	$ 250,000.00	$ 250,000.00
	SUBTOTAL				$ 16,391,488.00
	20% CONTINGENCY				$ 3,278,297.60
TOTAL CONSTRUCTION COST					$ 19,669,785.60



TOWN OF ADDISON, TEXAS

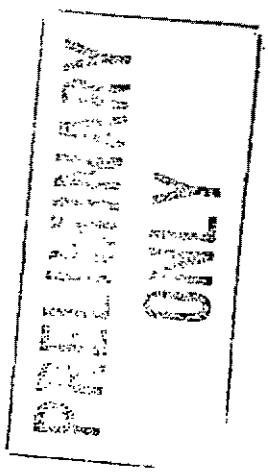
HNTB / GBW Engineers 12/03/98

ARAPAHO ROAD EXTENSION FROM ADDISON ROAD TO MARSH LANE

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

ALTERNATE 4 - OVERPASS CONDITION AT MIDWAY ROAD WITHOUT RAMPS

ITEM NO	ITEM DESCRIPTION ROADWAY	UNIT	QUANTITY	ENGINEERS ESTIMATE UNIT PRICE	 AMOUNT
100	PREP. & MAINT. OF RIGHT-OF-WAY	STA	78.0	$ 2,500.00	$ 195,000.00
104	REMOVE OLD CONCRETE (PVMT.)	SY	7,200	$ 2.00	$ 14,400.00
110	EXCAVATION (ROADWAY)	CY	9,650	$ 3.20	$ 30,880.00
132	EMBANKMENT (ORDINARY COMPACTION)	CY	202,540	$ 8.50	$ 1,721,590.00
260	LIME TREATED SUBGRADE (6 in) (Ramps)	SY	19,430	$ 1.60	$ 31,088.00
260	LIME TREATED SUBGRADE (6 in) (Mainline)	SY	380,300	$ 1.60	$ 608,480.00
360	CONCRETE PAVEMENT (10 in) (Mainline)	SY	380,300	$ 24.00	$ 9,127,200.00
360	CONCRETE PAVEMENT (10 in) (Ramps)	SY	19,430	$ 24.00	$ 466,320.00
360	MONOLITHIC CURB (TYPE A) (6 in)	LF	25,000	$ 2.00	$ 50,000.00
423	RETAINING WALL (CAST IN PLACE)	SF	45,000	$ 40.00	$ 1,800,000.00
500	MOBILIZATION	LS	1	$ 20,000.00	$ 20,000.00
502	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1	$ 20,000.00	$ 20,000.00
666	REFLECT PAVE MARKINGS	LF	75,000	$ 1.50	$ 112,500.00
*	LIGHTING	LF	11,500	$ 35.00	$ 402,500.00
*	TRAFFIC SIGNALS (PER INTERSECTION)	EA	3	$ 80,000.00	$ 240,000.00
681	TEMPORARY TRAFFIC SIGNAL	EA	4	$ 10,000.00	$ 40,000.00
*	ROADWAY STRUCTURE	SF	9,550	$ 45.00	$ 429,750.00
	INLETS	EA	30	$ 2,500.00	$ 75,000.00
	LATERALS	LF	1,230	$ 50.00	$ 61,500.00
	30" RCP	LF	530	$ 65.00	$ 34,450.00
	36" RCP	LF	500	$ 80.00	$ 40,000.00
	6' X 5' RCBC	LF	260	$ 220.00	$ 57,200.00
	7' X 5' RCBC	LF	400	$ 250.00	$ 100,000.00
	9' X 5' RCBC	LF	500	$ 300.00	$ 150,000.00
	2 - 7' X 5' RCBC	LF	800	$ 500.00	$ 400,000.00
	2 - 9' X 5' RCBC	LF	1,460	$ 630.00	$ 919,800.00
	10' X 6' RCBC	LF	920	$ 720.00	$ 662,400.00
	10' X 7' RCBC	LF	130	$ 760.00	$ 98,800.00
	HEADWALL CONCRETE	CY	60	$ 600.00	$ 36,000.00
	REMOVE CONCRETE CHANNEL LINING	SY	11,200	$ 10.00	$ 112,000.00
	REMOVE/REPLACE CONCRETE CHANNEL LINING	SY	1,300	$ 60.00	$ 78,000.00
	OTHER UTILITY RELOCATIONS	LS	1	$ 100,000.00	$ 100,000.00
	SUBTOTAL				$ 18,234,858.00
	20% CONTINGENCY				$ 3,646,971.60
TOTAL CONSTRUCTION COST					$ 21,881,829.60



TOWN OF ADDISON, TEXAS

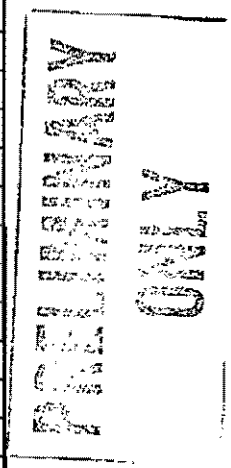
HNTB / GBW Engineers 12/03/98

ARAPAHO ROAD EXTENSION FROM ADDISON ROAD TO MARSH LANE

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

ALTERNATE 5 - OVERPASS CONDITION AT MIDWAY ROAD WITHOUT RAMPS

ITEM NO	ITEM DESCRIPTION	UNIT	QUANTITY	ENGINEERS ESTIMATE	
	ROADWAY			UNIT PRICE	AMOUNT
100	PREP. & MAINT. OF RIGHT-OF-WAY	STA	78.0	$ 2,500.00	$ 195,000.00
104	REMOVE OLD CONCRETE (PVMT.)	SY	7,200	$ 2.00	$ 14,400.00
110	EXCAVATION (ROADWAY)	CY	6,035	$ 3.20	$ 19,312.00
132	EMBANKMENT (ORDINARY COMPACTION)	CY	86,360	$ 8.50	$ 734,060.00
260	LIME TREATED SUBGRADE (6 in) (Ramps)	SY	19,430	$ 1.60	$ 31,088.00
260	LIME TREATED SUBGRADE (6 in) (Mainline)	SY	380,300	$ 1.60	$ 608,480.00
360	CONCRETE PAVEMENT (10 in) (Mainline)	SY	380,300	$ 24.00	$ 9,127,200.00
360	CONCRETE PAVEMENT (10 in) (Ramps)	SY	19,430	$ 24.00	$ 466,320.00
360	MONOLITHIC CURB (TYPE A) (6 in)	LF	24,750	$ 2.00	$ 49,500.00
423	RETAINING WALL (CAST IN PLACE)	SF	45,000	$ 40.00	$ 1,800,000.00
500	MOBILIZATION	LS	1	$ 20,000.00	$ 20,000.00
502	BARRICADES, SIGNS AND TRAFFIC HANDLING	LS	1	$ 20,000.00	$ 20,000.00
666	REFLECT PAVE MARKINGS	LF	75,000	$ 1.50	$ 112,500.00
*	LIGHTING	LF	11,500	$ 35.00	$ 402,500.00
*	TRAFFIC SIGNALS (PER INTERSECTION)	EA	3	$ 80,000.00	$ 240,000.00
681	TEMPORARY TRAFFIC SIGNAL	EA	4	$ 10,000.00	$ 40,000.00
*	ROADWAY STRUCTURE	SF	9,540	$ 45.00	$ 429,300.00
	INLETS	EA	30	$ 2,500.00	$ 75,000.00
	MANHOLES	EA	5	$ 5,000.00	$ 25,000.00
	LATERALS	LF	1,230	$ 50.00	$ 61,500.00
	24" RCP	LF	3,000	$ 50.00	$ 150,000.00
	30" RCP	LF	1,530	$ 65.00	$ 99,450.00
	36" RCP	LF	500	$ 80.00	$ 40,000.00
	6' X 5' RCBC	LF	260	$ 220.00	$ 57,200.00
	7' X 5' RCBC	LF	400	$ 250.00	$ 100,000.00
	9' X 5' RCBC	LF	500	$ 300.00	$ 150,000.00
	2 - 7' X 5' RCBC	LF	800	$ 500.00	$ 400,000.00
	2 - 9' X 5' RCBC	LF	1,460	$ 630.00	$ 919,800.00
	10' X 6' RCBC	LF	920	$ 720.00	$ 662,400.00
	10' X 7' RCBC	LF	130	$ 760.00	$ 98,800.00
	HEADWALL CONCRETE	CY	60	$ 600.00	$ 36,000.00
	REMOVE CONCRETE CHANNEL LINING	SY	11,200	$ 10.00	$ 112,000.00
	REMOVE/REPLACE CONCRETE CHANNEL LINING	SY	1,300	$ 60.00	$ 78,000.00
	RELOCATE 60" WATER MAIN	LF	2,000	$ 350.00	$ 700,000.00
	OTHER UTILITY RELOCATIONS	LS	1	$100,000.00	$ 100,000.00
	SUBTOTAL				$ 18,174,810.00
	20% CONTINGENCY				$ 3,634,962.00
	TOTAL CONSTRUCTION COST				$ 21,809,772.00



10-22-98

TRAFFIC VOLUME COMPARISON

	No Build	At Grade	Grade Separated	Grade Separated With Ramps South Side
ARAPAHO				
Addison to Midway	-	24,000	17,000	28,000
Midway to Surveyor	-	6,000	13,000	17,000
BELT LINE				
Addison to Midway	58,000	53,000	54,000	50,000
Midway to Surveyor	47,000	46,000	42,000	45,000
MIDWAY				
North of Arapaho	52,000	36,000	44,000	32,000
South of Arapaho	58,000	57,000	-	60,000
South of Belt Line	-	52,000	46,000	52,000

No Build alternate added -

Other #'s have not changed.

Jack will ask for counts for 4 turn lanes on the north side. will get tunnel #s too.

Underpass/Overpass options

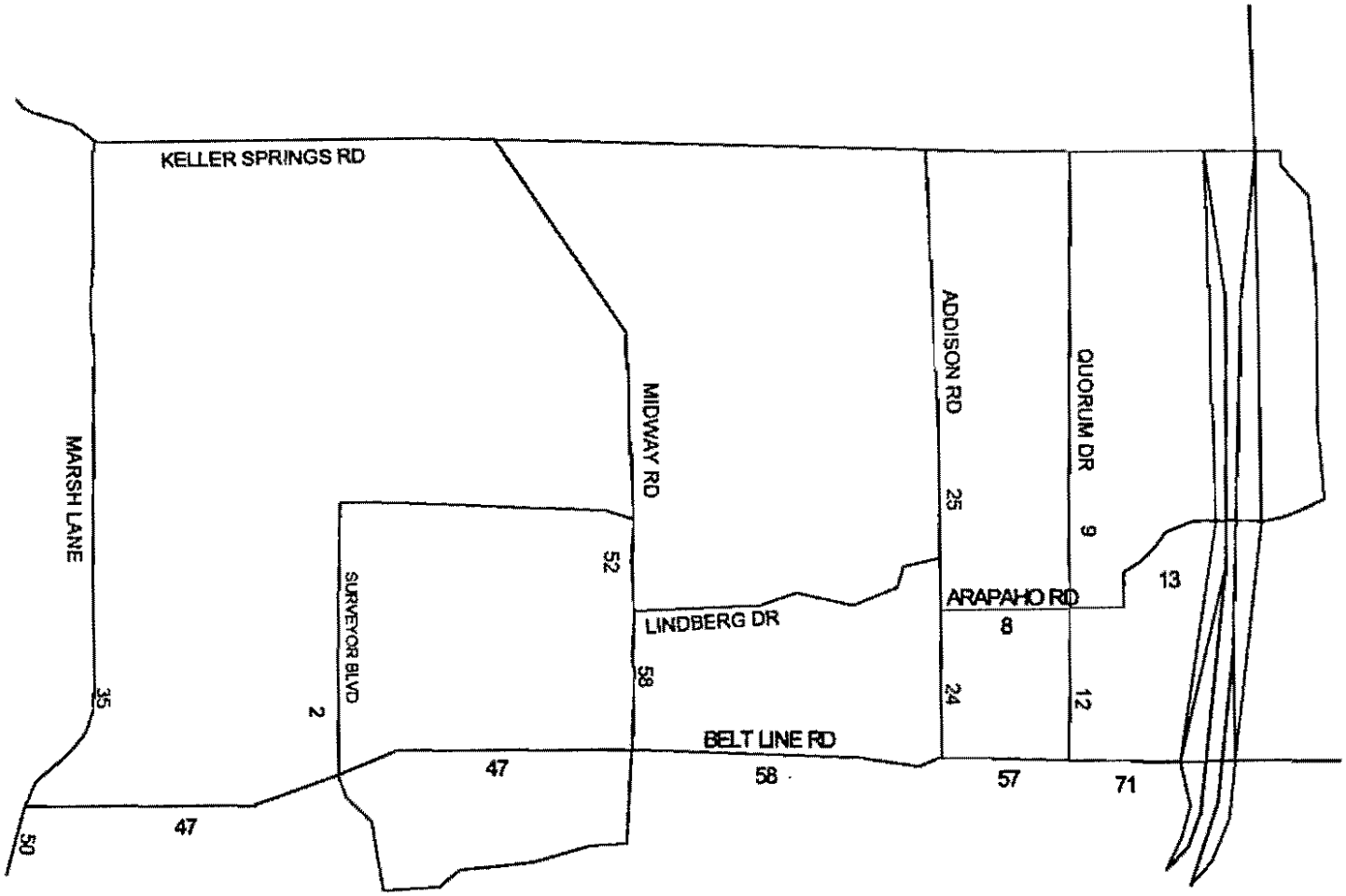
Next meeting Nov 19th Thurs 1:30 PM

~~Nov 30th~~

Dec meet with Ron ——

Jan 12th Present to Council

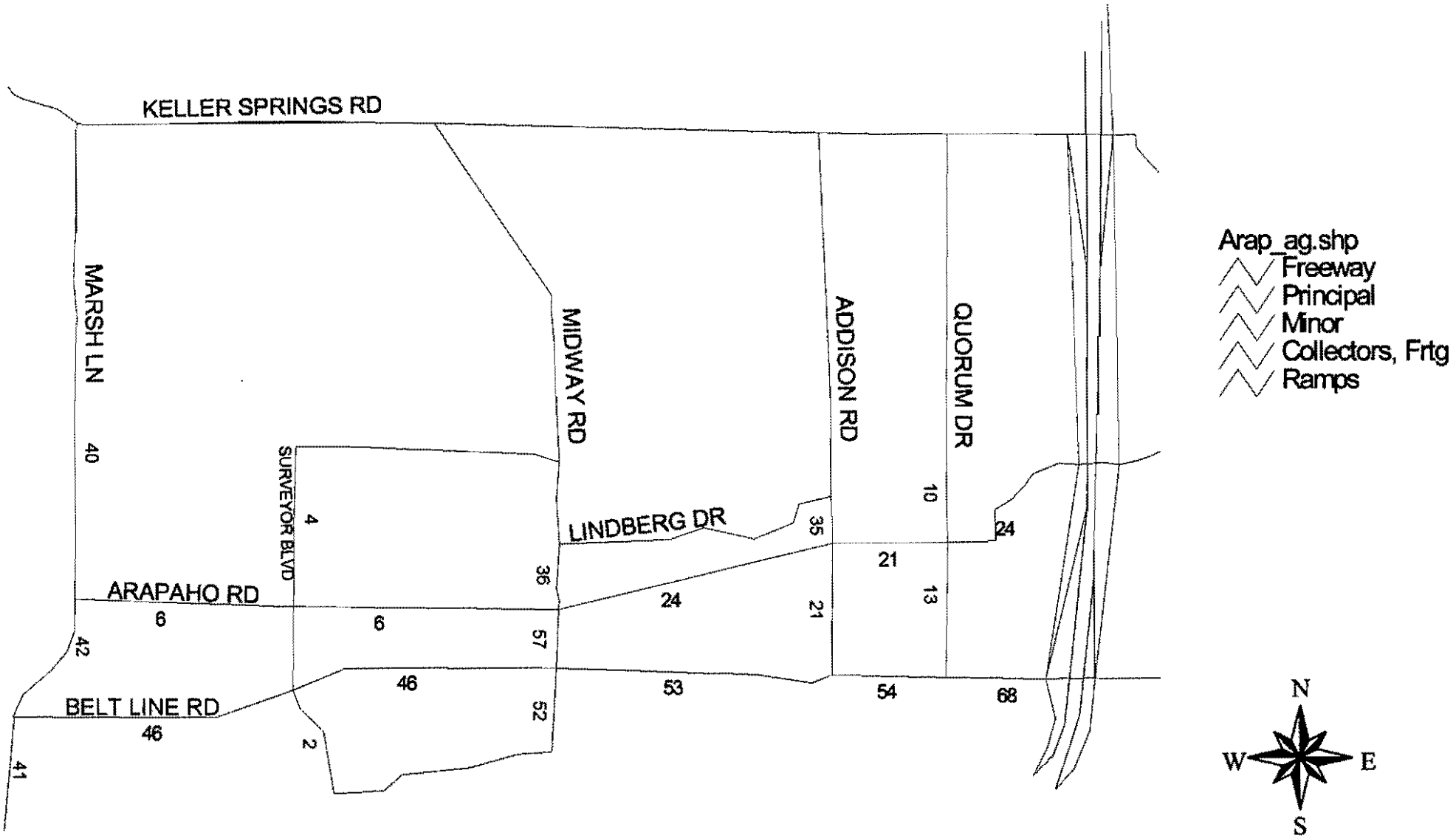
ARAPAHO ROAD
NO BUILD ALTERNATIVE
2020 VOLUMES / 1000



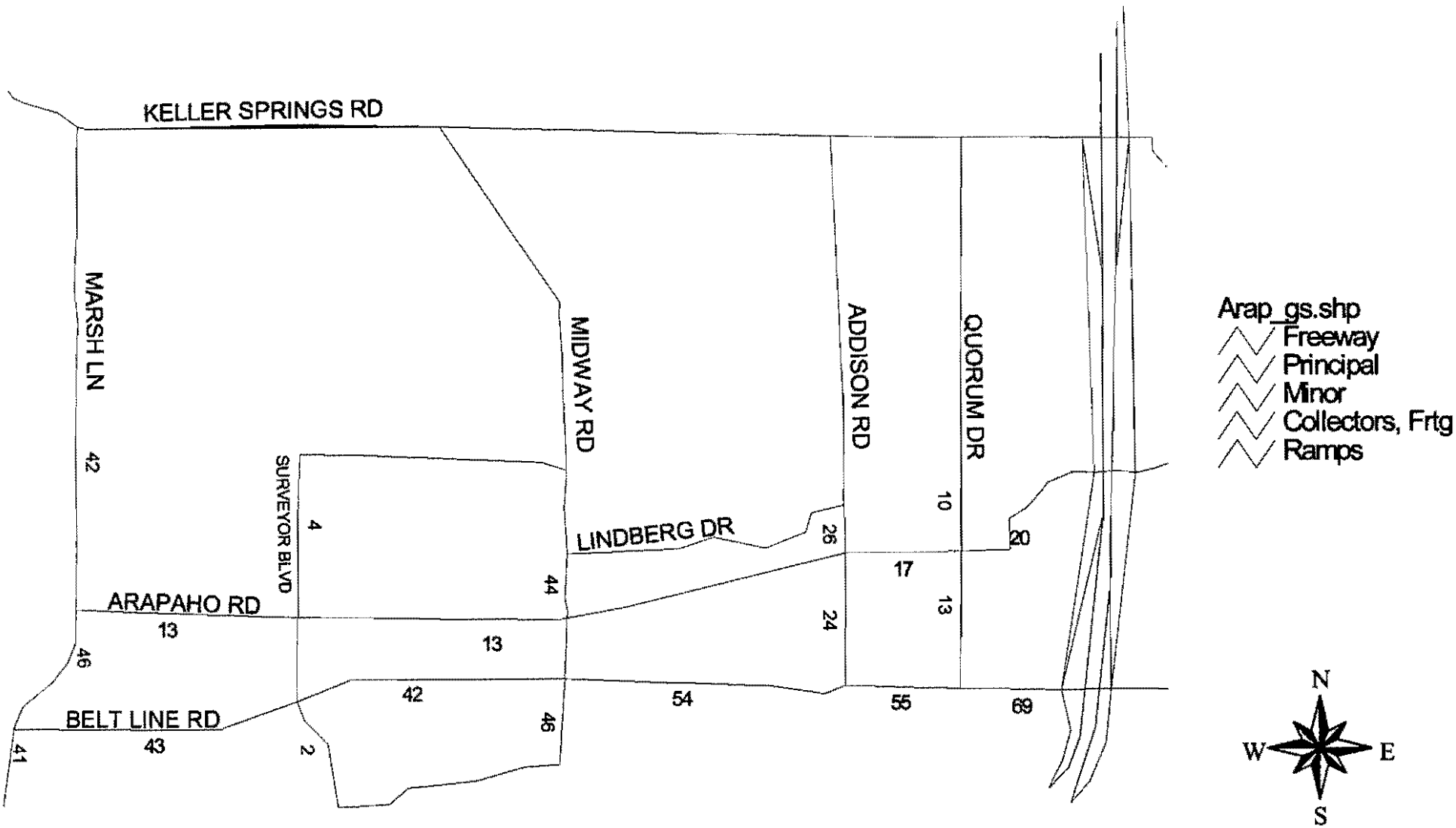
Arap_Nobuild
- Freeway
- Principal, HOV
- Minor
- Collector, Frontage
- Ramps

North Central Texas Council of Governments
Transportation

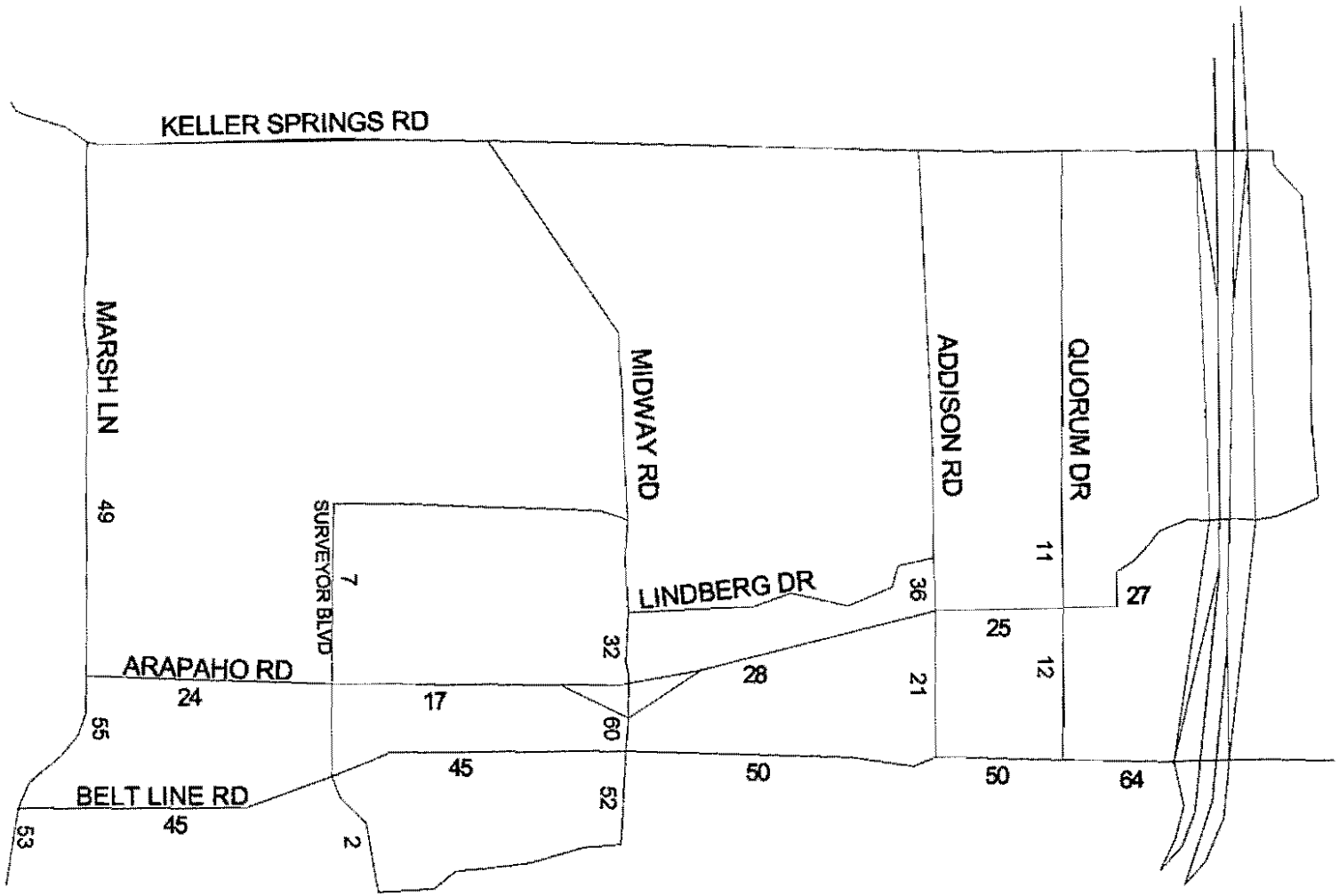
ARAPAHO ROAD EXTENSION
AT GRADE
2020 VOLUMES / 1000



ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY RD
2020 VOLUMES / 1000



ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY W/RAMPS
2020 VOLUMES / 1000



Arap_gsrmp.shp
- Freeway
- Principal
- Minor
- Collectors, Frtg
- Ramps

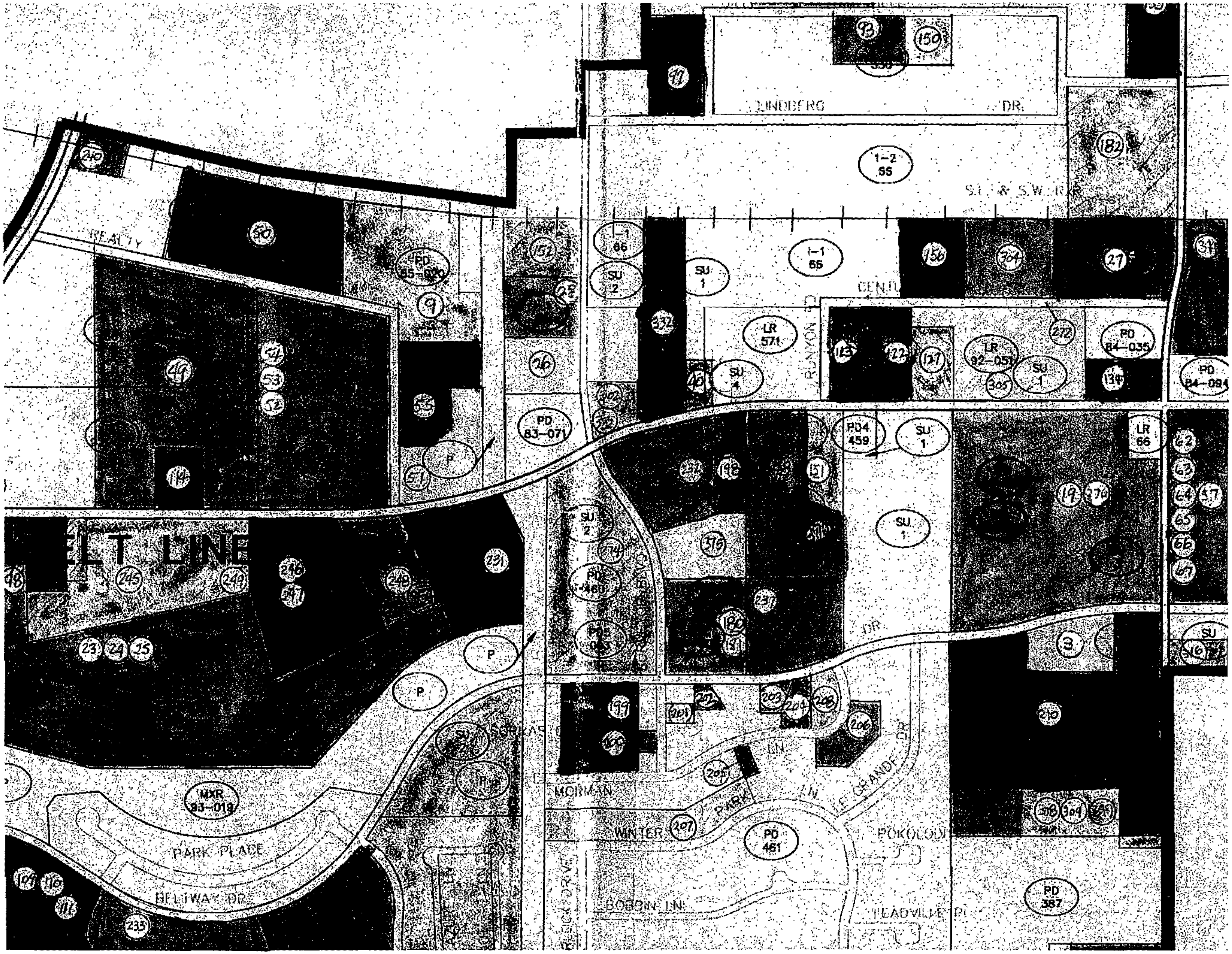
N
W E
S

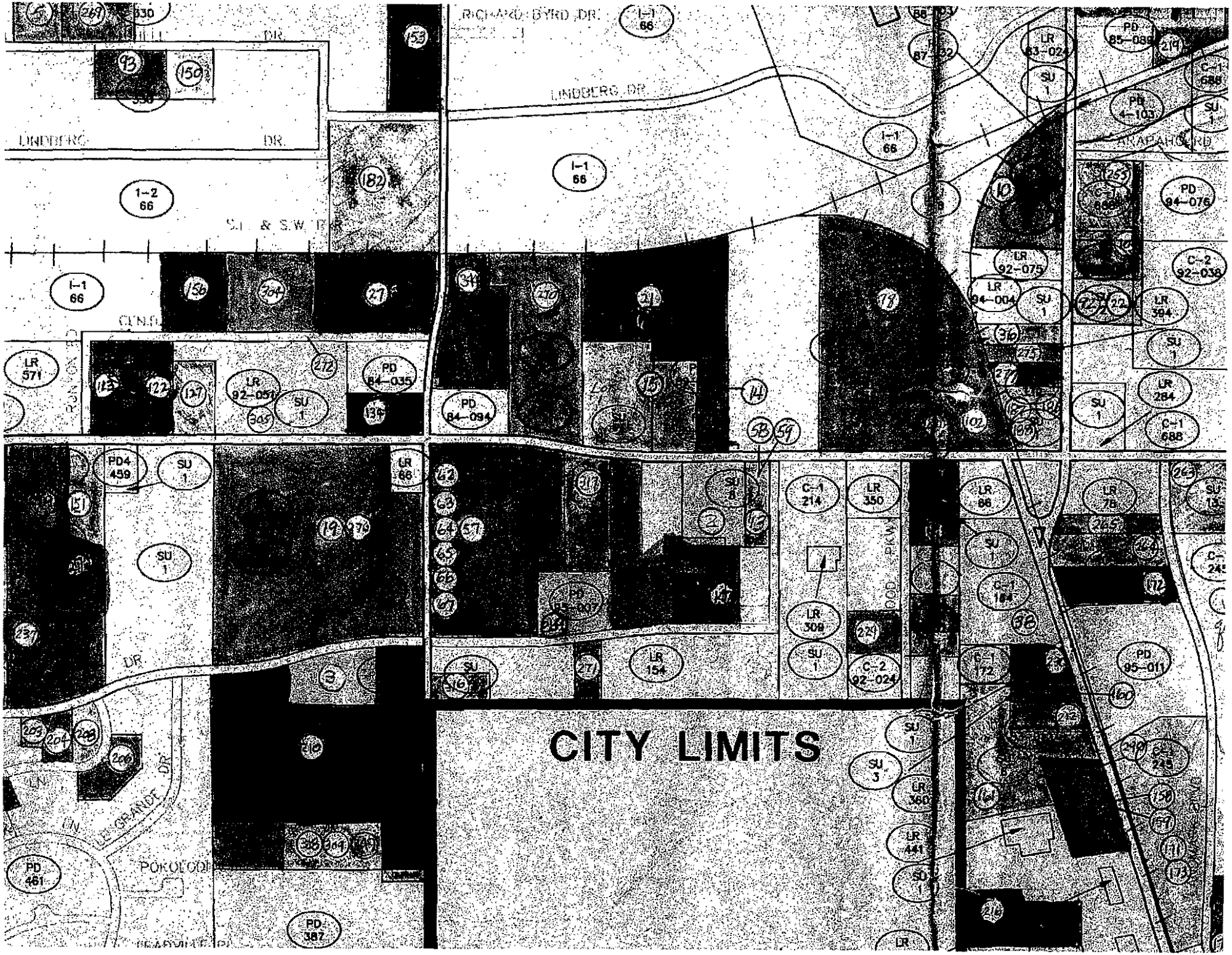
PROJECT #98-094 Arapaho Road Extension
UTILITIES COORDINATION

MANAGER: Bruce Grantham

Print Date: **October ~~14~~ 15, 1998 (4:29pm)**

UTILITY COMPANY	CONTACT	PHONE & FAX	DATE	ACTIVITY / RESPONSE	FOLLOW UP	NOTES
Lone Star Gas Co. 1015 Hutton St. Carrollton, TX 75006	Howard Lewis	Ph: 972-323-8936 Fx:	10/15/98	Sent letter and map to Howard Lewis.		
TU Electric 1015 Hutton St. Carrollton, TX 75006	Todd Guinn	Ph: 972-323-8928 Fx: 972-323-8925	10/15/98	Sent letter and map to Todd Guinn.		
Southwestern Bell 275 N. Greenville, 2nd Floor Richardson, TX 75081	Tim Beidelman	Ph: 214-464-4095 Fx:	10/15/98	Sent letter and map to Tim Beidelman.		
TCI 327 Gross Road Mesquite, TX 75149	Don Burkhart	Ph: Fx:	10/15/98	Sent letter and map to Don Burkhart.		
MCI Tech Support Dept. 2855/642 2250 Lakeside Drive Richardson, TX 75082	Michael White	Ph: 972-498-6041 Fx:	10/15/98	Sent letter and map to Michael White.		
WorldCom 2477 Gateway Drive Irving, TX 75063	Theresa Hardin or Jim Dunn	Ph: 972-753-1900 Fx:	10/15/98	Sent letter and map to Jim Dunn.		
Harron Cable TV P. O. Box 2628 Waxahachie, TX 75165	Dennis Anderson	Ph: Fx:	10/15/98	Sent letter and map to Dennis Anderson.		


LINDBERG DR.
1-2 66
S.T. & S.W. R.R.
REALTY
I-1 66
SU 2
SU 1
LR 571
RUNYON RD
LR 92-051
PD 84-035
PD 84-084
PD 83-071
PD4 459
LR 66
ELT LINE
MXR 83-019
PARK PLACE
BELTWAY DR.
MORMAN
WINTER
PARK
LN
LE GRANDE DR
POKOLODI
PD 461
BOBBIN LN
LEADVILLE PL
PD 387


CITY LIMITS

Jack Hatchell & Associates
P.O. Box 260119
Plano, Texas 75026-0119
(972-424-1368) Telephone & FAX

FAX

To: James C. Pierce, Jr., P.E., DEE
Assistant City Engineer
Town of Addison
(972)450-2837

From: Jack Hatchell, P.E.

Date: October 15, 1998

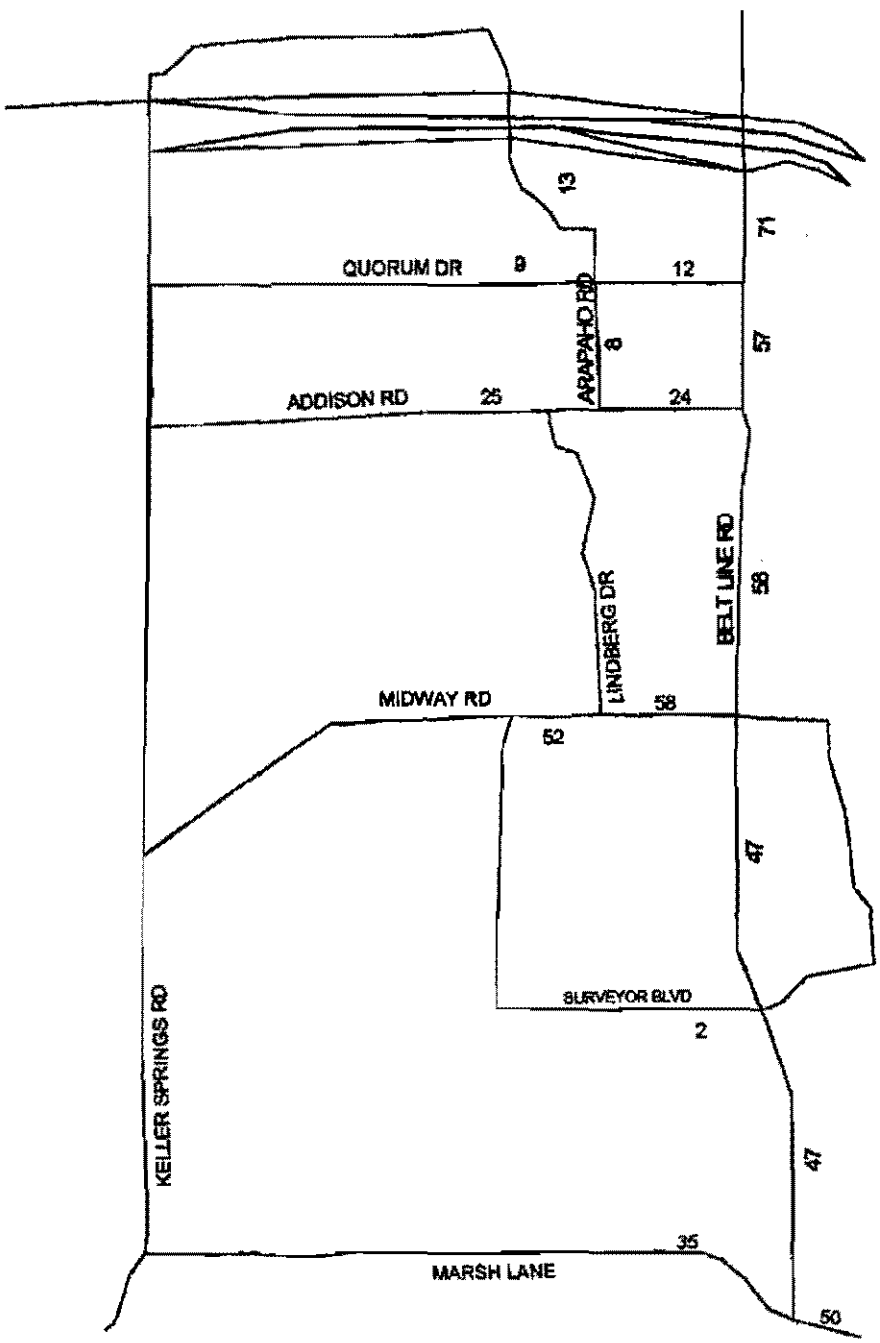
James -

Please find attached the traffic assignments for the "No Build" alternative for Arapaho Road. As you can see, the extension of Arapaho Road does provide relief to Belt Line and Midway Roads. I will have a comparison of the alternatives to include "No Build" for our meeting next week.

Please do not hesitate to call me if you have any questions or need additional information.

Number of pages including this sheet 2

ARAPAHO ROAD
NO BUILD ALTERNATIVE
2020 VOLUMES / 1000



Arapaho Rd Meeting 9-18-98
John, JoP, Jack Hatchell, Bruce, Dan

Alternate #4 Preferred -
Take a little of mini storage
Miss TV Tower

Grade separated with right turn lanes (only) @ Midway

R. Whitehead will not like the fly over

Next meeting Tentative
Oct 23rd

✓* Midway B Sewer Interceptor in corridor

✓* Ditch by Espey Huston
Addison Bank / Surveyor Drainage

* Water & Sewer maps in corridor

✓* Full size drainage plan

✓* Overall city contour maps

for Bruce Grantham

✓TU Drainage Project
(David N. here)

✓Bank Plans AGF Addison Nat Bk.
3939 Belt Line
75001

✓Les Lacs Development
3700 Block Belt Line

✓Lindberg / Billy Mitchel Plans

✓Runyon / centurian

✓Watson & Taylor mini Warehouse
(4015 Belt Line Rd.)

North Central Texas Council Of Governments

July 14, 1998

Mr. Jack Hatchell
Jack Hatchell & Associates
P.O. Box 2660119
Plano, TX 75026-0119

Dear Mr. Hatchell:

Enclosed are maps of the projected 2020 volumes for Arapaho Road per your May 29, 1998, request. Twenty-four hour volumes were developed for Arapaho Road using the Dallas-Fort Worth Regional Travel Model. Three scenarios were modeled for the facility with each alternative extending Arapaho from its current terminus at Addison Road to Marsh Lane as a four-lane facility. Arapaho was modeled at grade in the first alternative. The second alternative modeled Arapaho grade separated at Midway Road with no connections at Midway. The last alternative also modeled a grade separation at Midway Road, but ramps with connecting the two roads.

If you have any questions regarding the Arapaho Road assignments, please contact me or Mitzi Ward of my staff at (817) 695-9240.

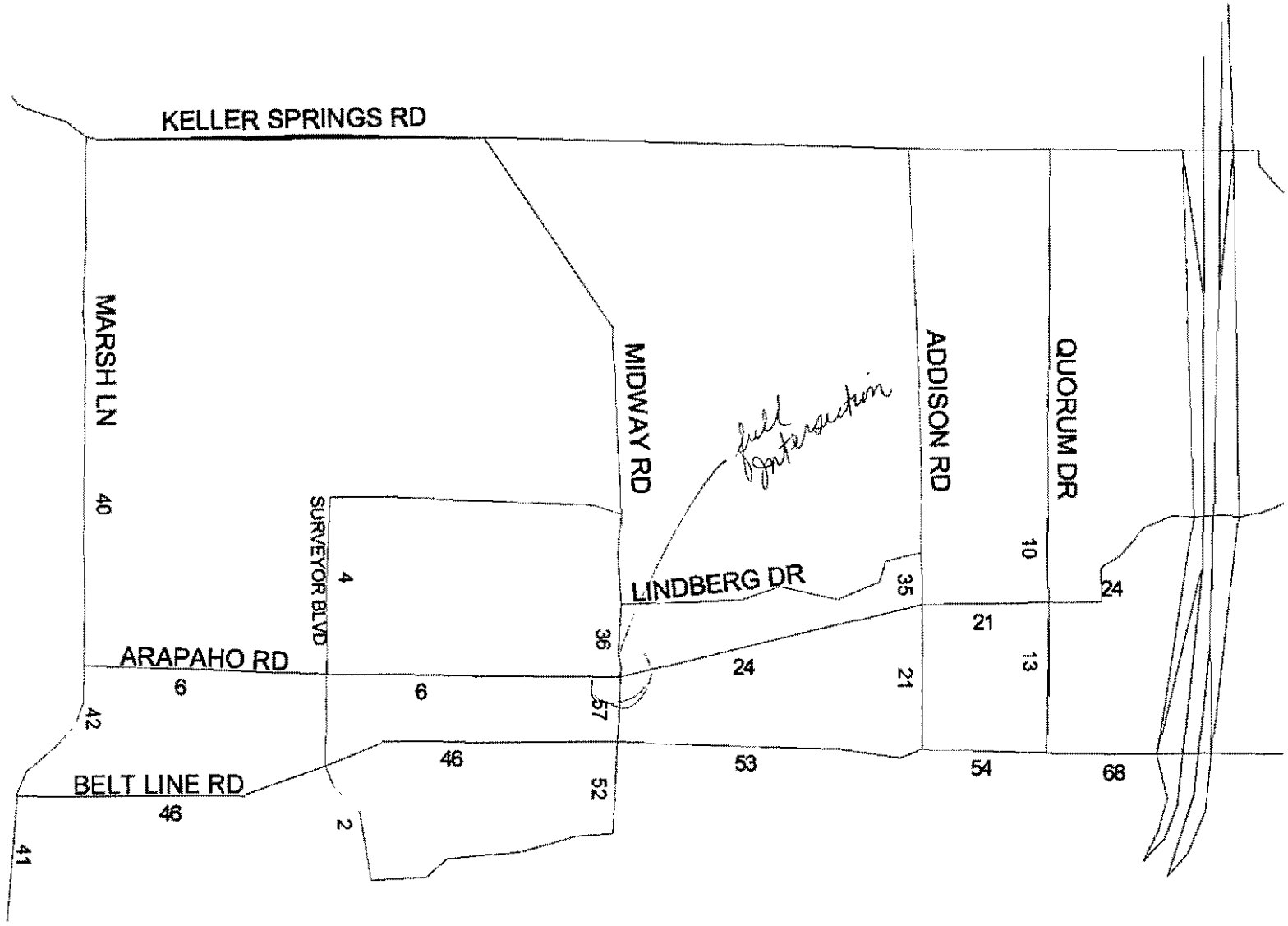
Sincerely,

Michael Morris, P.E.
Director of Transportation

MM:db
Enclosure

616 Six Flags Drive, Centerpoint Two
P. O. Box 5888, Arlington, Texas 76005-5888
(817) 640-3300 FAX: 817-640-7806 ♻ recycled paper

ARAPAHO ROAD EXTENSION
AT GRADE
2020 VOLUMES / 1000



Arap_ag.shp
- Freeway
- Principal
- Minor
- Collectors, Frtg
- Ramps

N
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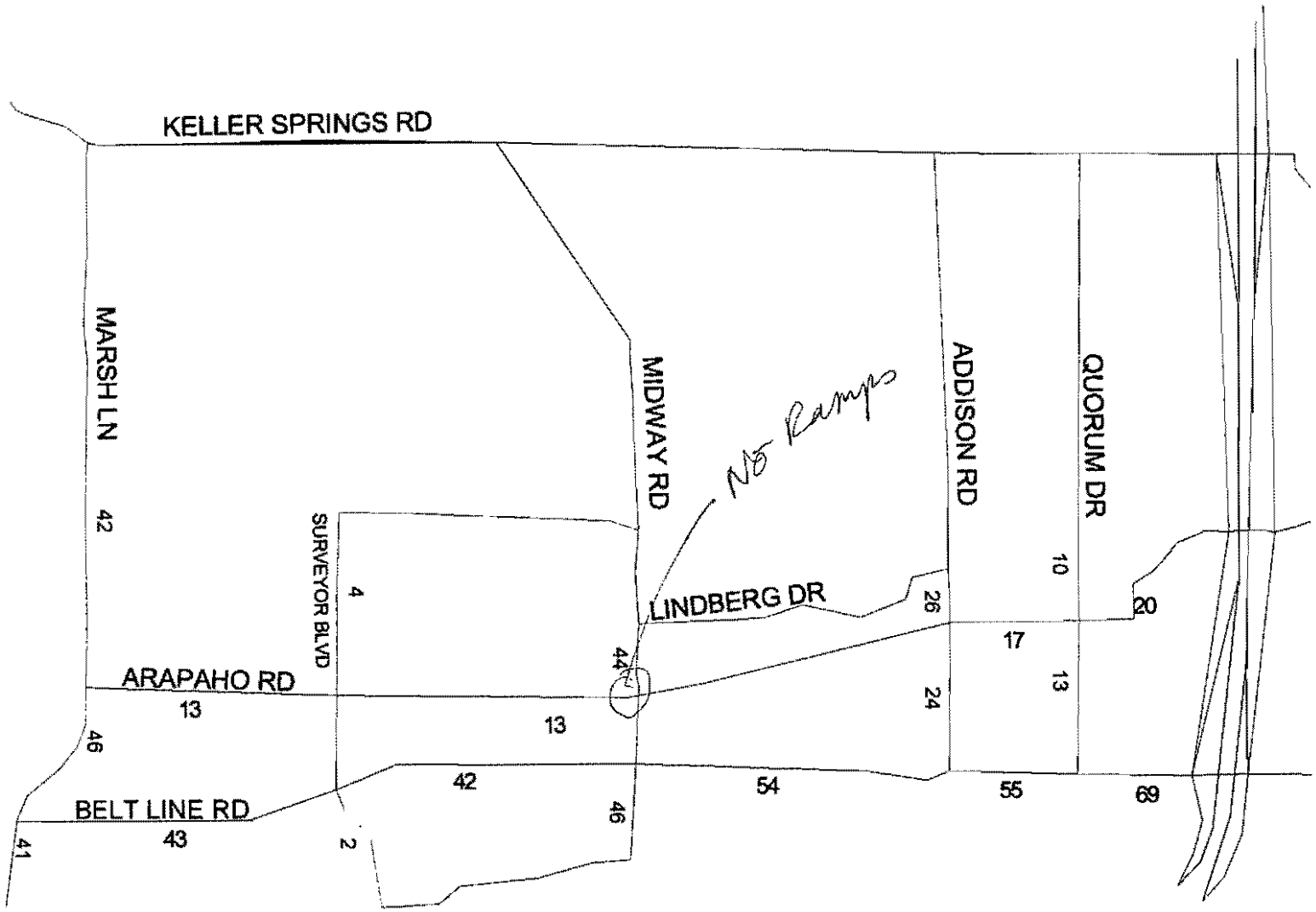
ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY RD
2020 VOLUMES / 1000



Arap_gs.shp
- Freeway
- Principal
- Minor
- Collectors, Frtg
- Ramps

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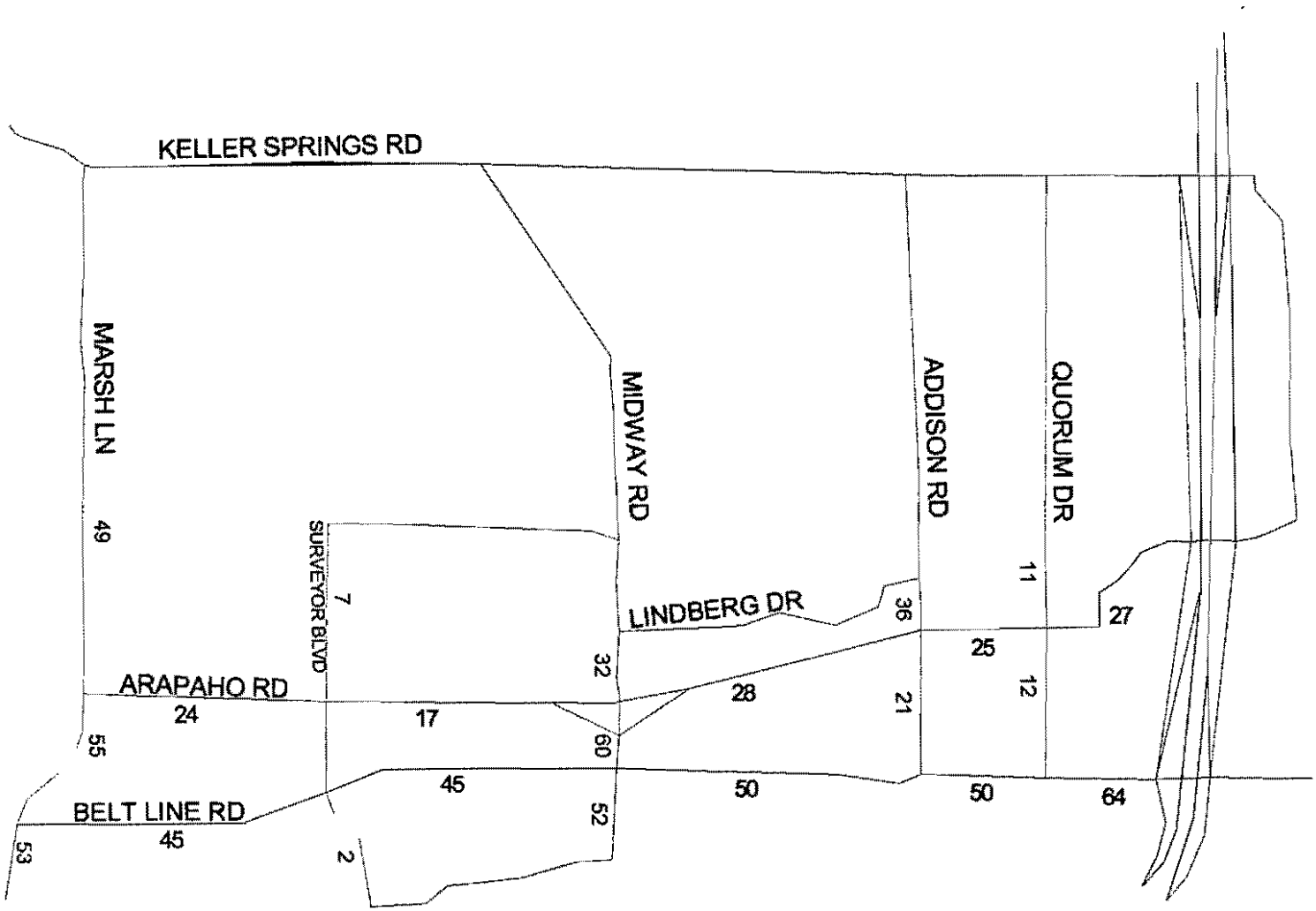
ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY W/RAMPS
2020 VOLUMES / 1000



Arap_gsrmp.shp
- Freeway
- Principal
- Minor
- Collectors, Frtg
- Ramps

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TRAFFIC VOLUME COMPARISON

	At Grade	Grade Separated No Ramps	Grade Separated With Ramps South	
ARAPAHO				
Addison to Midway	24,000	17,000	28,000	East
Midway to Surveyor	6,000	13,000	17,000	West
BELT LINE				
Addison to Midway	53,000	54,000	50,000	
Midway to Surveyor	46,000	42,000	45,000	
MIDWAY				
North of Arapaho	36,000	44,000	32,000	
South of Arapaho	57,000	-	60,000	
South of Belt Line	52,000	46,000	52,000	

± 30 percent accuracy

North Central Texas Council Of Governments

July 14, 1998

Mr. Jack Hatchell
Jack Hatchell & Associates
P.O. Box 2660119
Plano, TX 75026-0119

Dear Mr. Hatchell:

Enclosed are maps of the projected 2020 volumes for Arapaho Road per your May 29, 1998, request. Twenty-four hour volumes were developed for Arapaho Road using the Dallas-Fort Worth Regional Travel Model. Three scenarios were modeled for the facility with each alternative extending Arapaho from its current terminus at Addison Road to Marsh Lane as a four-lane facility. Arapaho was modeled at grade in the first alternative. The second alternative modeled Arapaho grade separated at Midway Road with no connections at Midway. The last alternative also modeled a grade separation at Midway Road, but ramps with connecting the two roads.

If you have any questions regarding the Arapaho Road assignments, please contact me or Mitzi Ward of my staff at (817) 695-9240.

Sincerely,

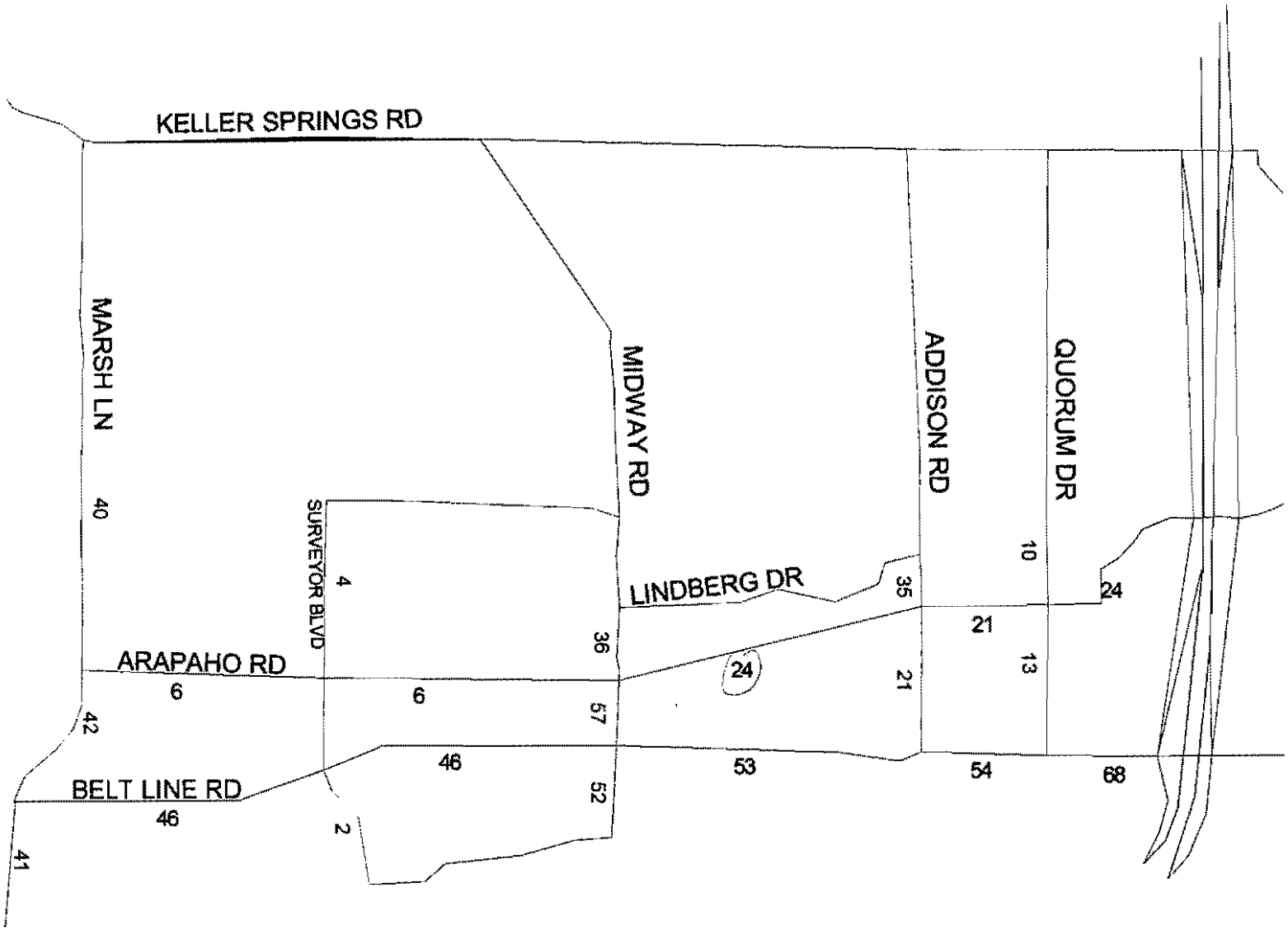
Michael R. Morris

Michael Morris, P.E.
Director of Transportation

MM:db
Enclosure

616 Six Flags Drive, Centerpoint Two
P. O. Box 5888, Arlington, Texas 76005-5888
(817) 640-3300 FAX: 817-640-7806 ♻ recycled paper

ARAPAHO ROAD EXTENSION
AT GRADE
2020 VOLUMES / 1000



Arap_ag.shp
- Freeway
- Principal
- Minor
- Collectors, Frtg
- Ramps

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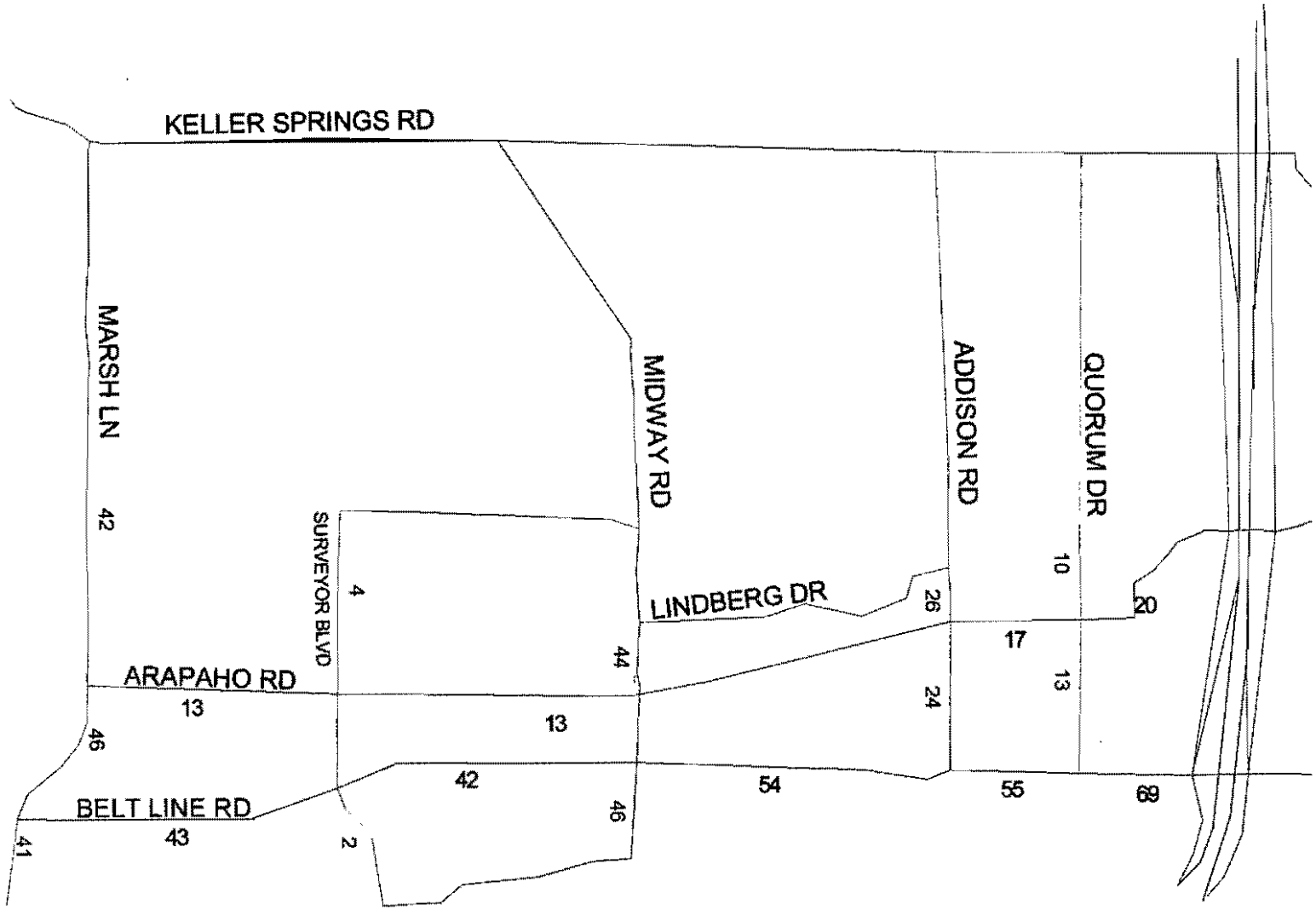
ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY RD
2020 VOLUMES / 1000



Arap_gs.shp
- Freeway
- Principal
- Minor
- Collectors, Frtg
- Ramps

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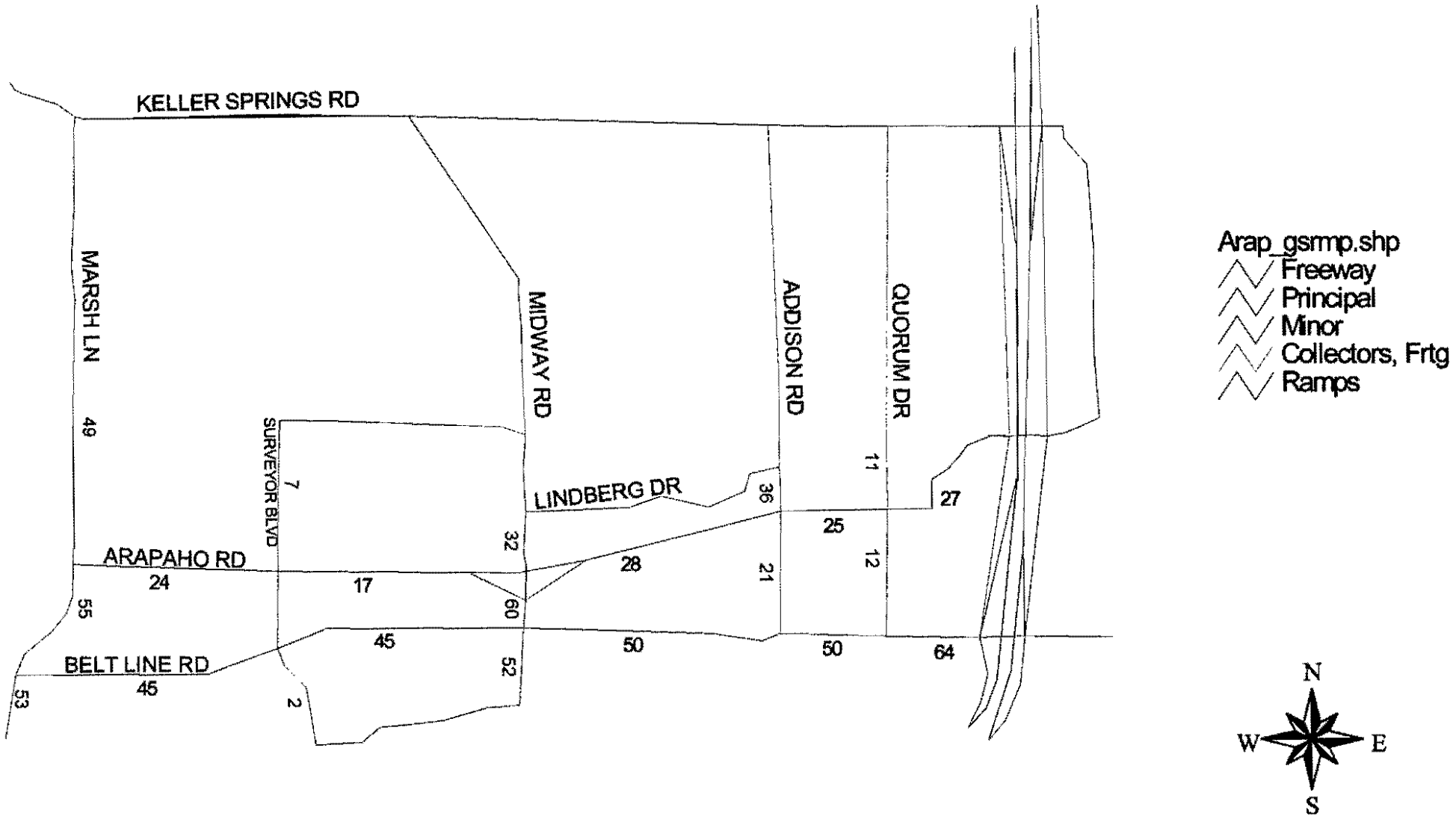
ARAPAHO ROAD EXTENSION
GRADE SEPARATED @ MIDWAY W/RAMPS
2020 VOLUMES / 1000



TRAFFIC VOLUME COMPARISON

	At Grade	Grade Separated	Grade Separated With Ramps South
ARAPAHO			
Addison to Midway	24,000	17,000	28,000
Midway to Surveyor	6,000	13,000	17,000
BELT LINE			
Addison to Midway	53,000	54,000	50,000
Midway to Surveyor	46,000	42,000	45,000
MIDWAY			
North of Arapaho	36,000	44,000	32,000
South of Arapaho	57,000	-	60,000
South of Belt Line	52,000	46,000	52,000

10-5-98

Call Jack for Model

Beltline

Midway

With Arapaho

GBW Engineers, Inc.

MEMO

1919 S. Shiloh Rd., Suite 530, LB 27, Garland, TX 75042

Date: **September 23, 1998**

To: **Mr. Jim Pierce, Town of Addison**

From: **Bruce Grantham**

Re: **Arapaho Road Extension**

Please find enclosed an updated schedule for the Arapaho Road project. If you have any questions, please give me a call.

Bruce

Tel.: (972) 840-1916 / *FAX:* (972) 840-2156 / *E-mail:* Info@gbwengineers.com

HNTB ARCHITECTS ENGINEERS PLANNERS

14114 Dallas
Parkway, Suite 630
Dallas, Texas
75240-4381
(972) 661-5626
FAX (972) 661-5614

August 25, 1998

Town of Addison
5300 Beltline Road
P.O. Box 144
Addison, Texas 75001

Attn: James E. Pierce, Jr., P.E.
Assistant City Engineer

ARAPAHO ROAD EXTENSION

Dear Mr. Pierce:

During the month of July, Dallas Aerial Surveys continued the development of mapping for the Arapaho Road extension project and digital files for the mapping were delivered on August 13, 1998. We are beginning the study of alignments just south of the railroad and along Centurion and Realty. Electronic files will be furnished to GBW Engineers, Inc. to begin plotting of utilities.

Jack Hatchell has collected available traffic data and has received traffic counts at Midway Road with and without connections to the extension from the North Central Texas Council of Governments.

ARS Engineers, Inc. has completed their control traverse and established panel points for use by Dallas Aerial Surveys for aerial photography control. They have also assembled deed sketches for approximately 90% of the property primarily between Addison Road and Surveyor.

Very truly yours,

HNTB CORPORATION

Daniel F. Becker, P.E.
Vice President, Central Division

DFB/lnb

25768

Arapaho II/III

6-18-98

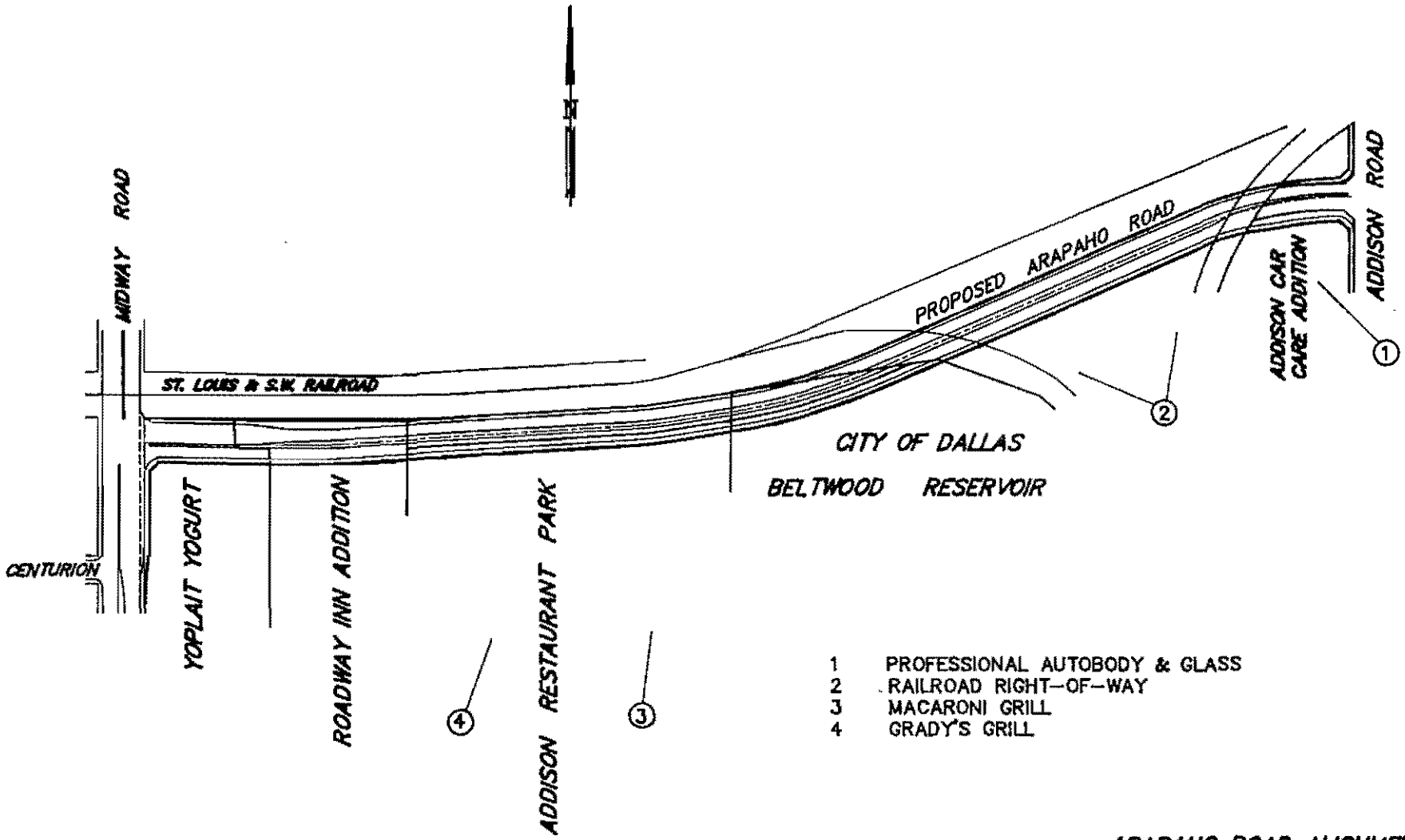
Jeff -

Please mark up & show any utility projects you know of that are not on our overall maps.

Thanks,

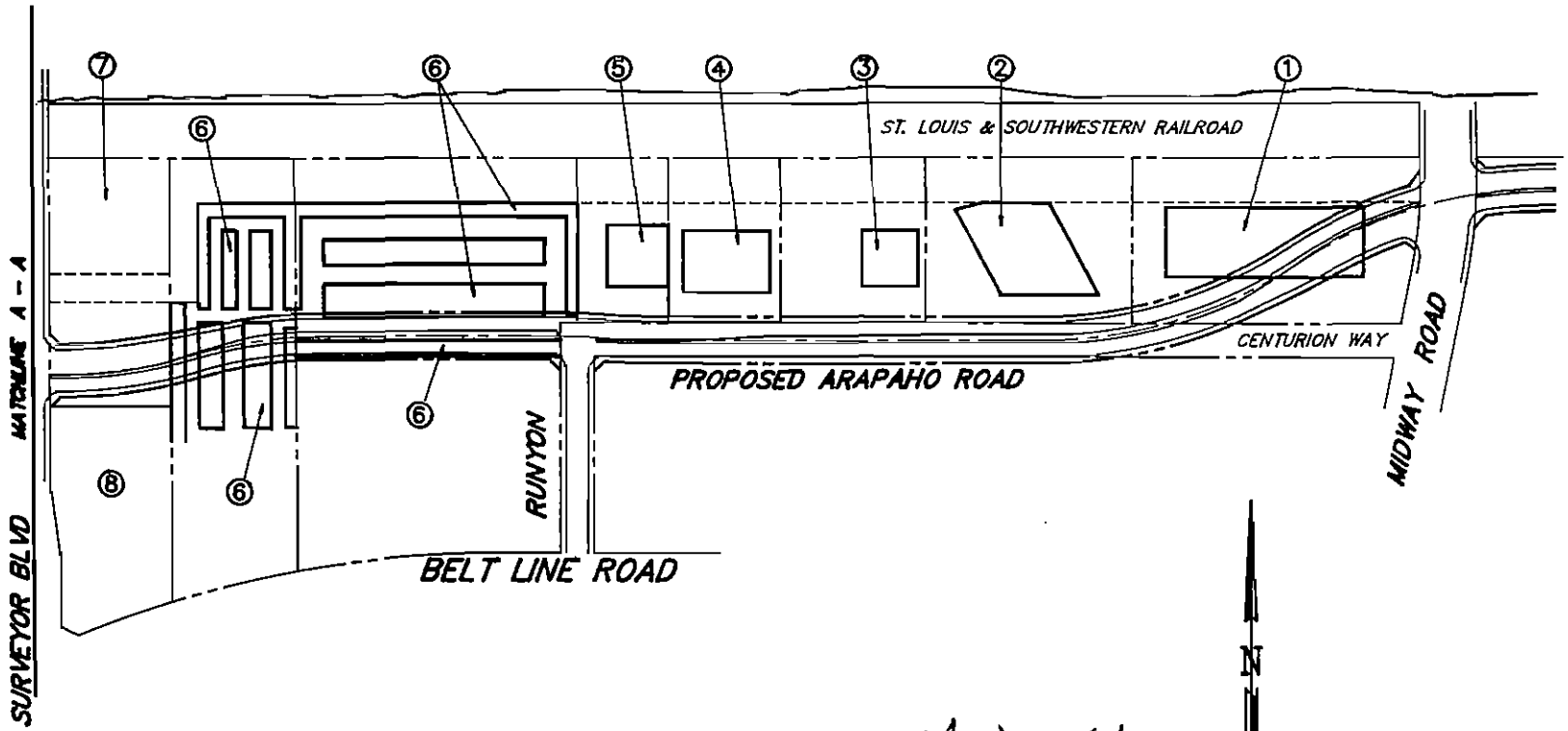
Jim

I am only aware of 1 project.



ARAPAHO ROAD ALIGNMENT

BARTON-ASCHMAN ASSOCIATES, INC.
5440 BELT LINE RD. #199 • DALLAS, TEXAS 75240 • (214) 991-1900
PARSONS TRANSPORTATION GROUP



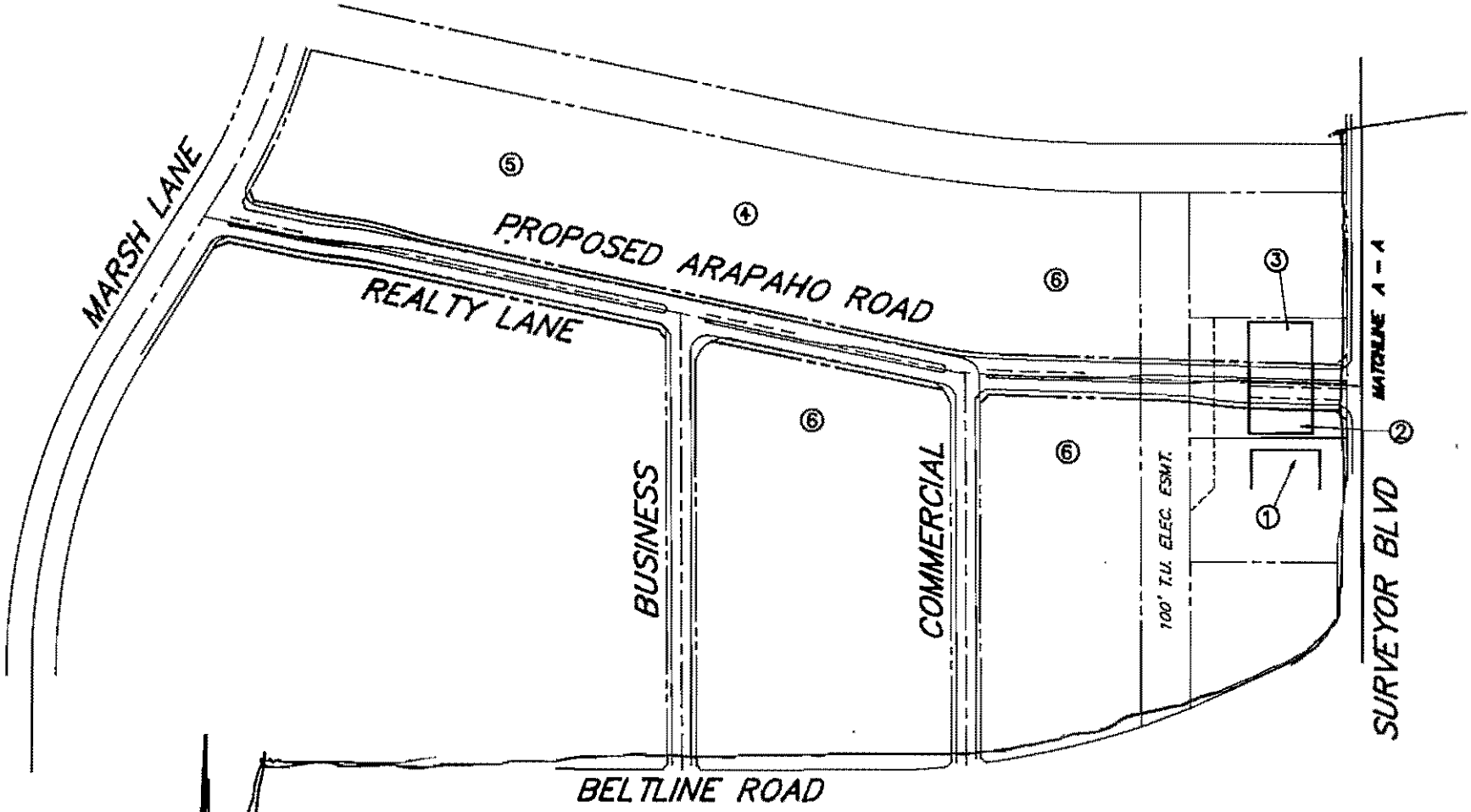
= Midway / BL Sewer Interceptor.

1	15101 MIDWAY ROAD
2	4139 CENTURION WAY
3	4131 CENTURION WAY
4	4125 CENTURION WAY
5	4101 CENTURION WAY
6	TILT SLAB MINI-WAREHOUSES
7	GROUND MOUNT WATER TANK
8	VACANT PROPERTY

ARAPAHO ROAD ALIGNMENT

BARTON-ASCHMAN ASSOCIATES, INC.
6400 BELT LINE RD. #199 • DALLAS, TEXAS 75240 • (214) 991-1900

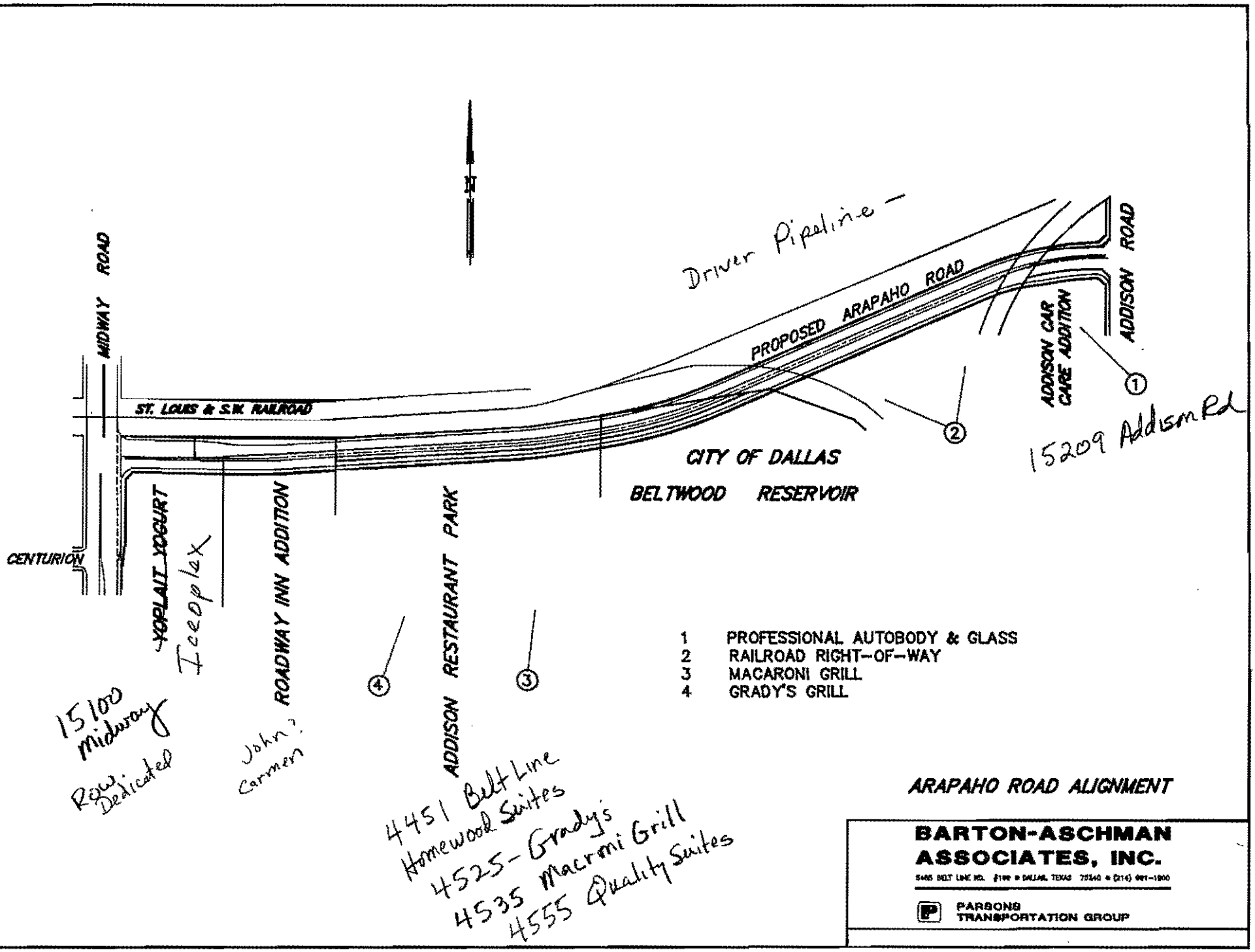
PARSONS TRANSPORTATION GROUP



1	15107 SURVEYOR BLVD.
2	15109 SURVEYOR BLVD.
3	15115 SURVEYOR BLVD.
4	3801 REALTY LANE
5	3799 REALTY LANE
6	VACANT

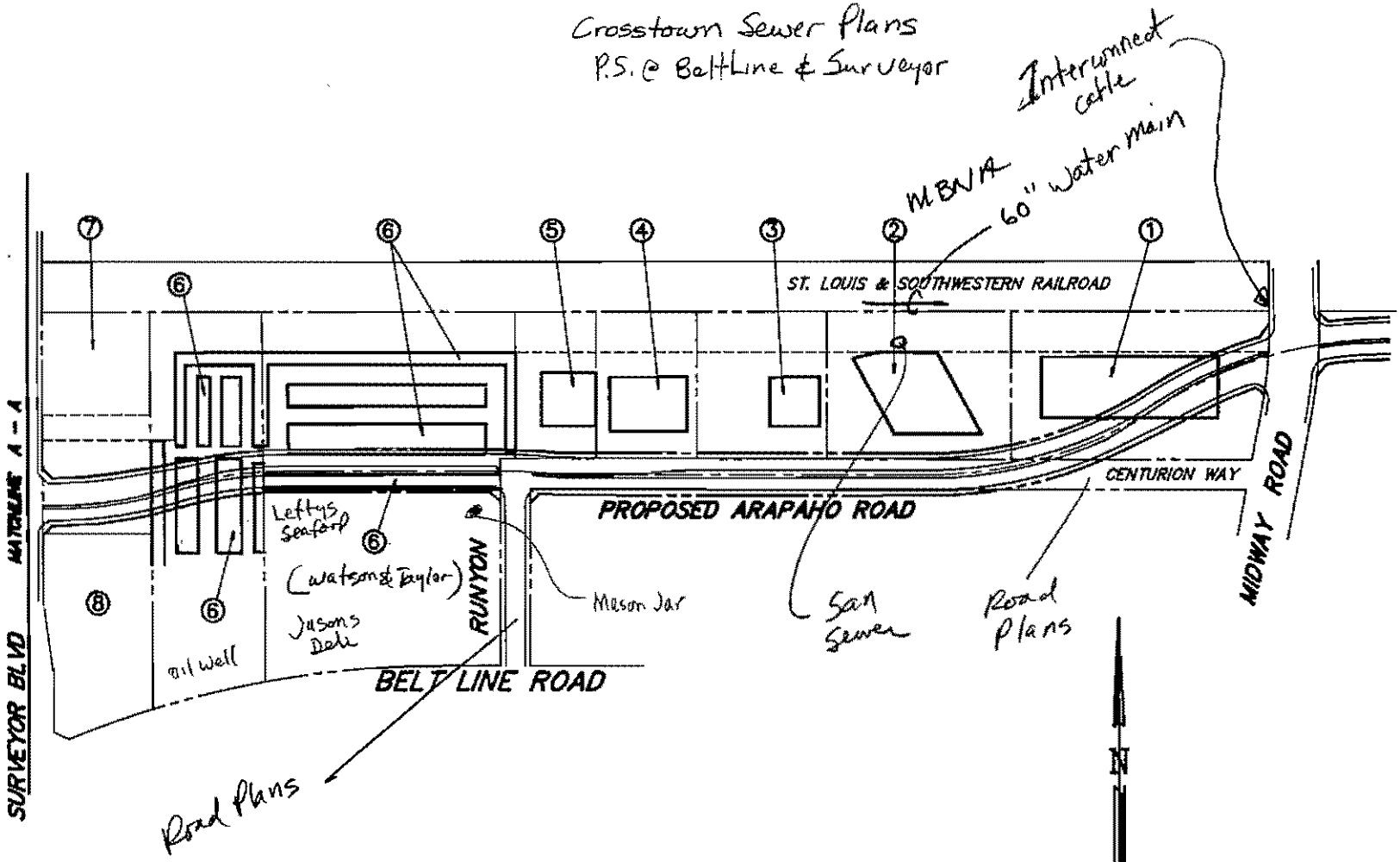
ARAPAHO ROAD ALIGNMENT

BARTON-ASCHMAN ASSOCIATES, INC.
8400 BELT LINE RD. #100 • DALLAS, TEXAS 75240 • (214) 991-1800
PARSONS TRANSPORTATION GROUP


MIDWAY ROAD
ST. LOUIS & S.W. RAILROAD
PROPOSED ARAPAHO ROAD
Driver Pipeline
ADDISON ROAD
ADDISON CAR CARE ADDITION
CITY OF DALLAS
BELTWOOD RESERVOIR
15209 Addison Rd
CENTURION
YOPLAIT YOGURT
Iceoplex
ROADWAY INN ADDITION
ADDISON RESTAURANT PARK
15100 Midway
Row Dedicated
John's Carmen
4451 Belt Line
Homewood Suites
4525 - Grady's
4535 Macrmi Grill
4555 Quality Suites
1 PROFESSIONAL AUTOBODY & GLASS
2 RAILROAD RIGHT-OF-WAY
3 MACARONI GRILL
4 GRADY'S GRILL
ARAPAHO ROAD ALIGNMENT
BARTON-ASCHMAN ASSOCIATES, INC.
PARSONS TRANSPORTATION GROUP

(2)

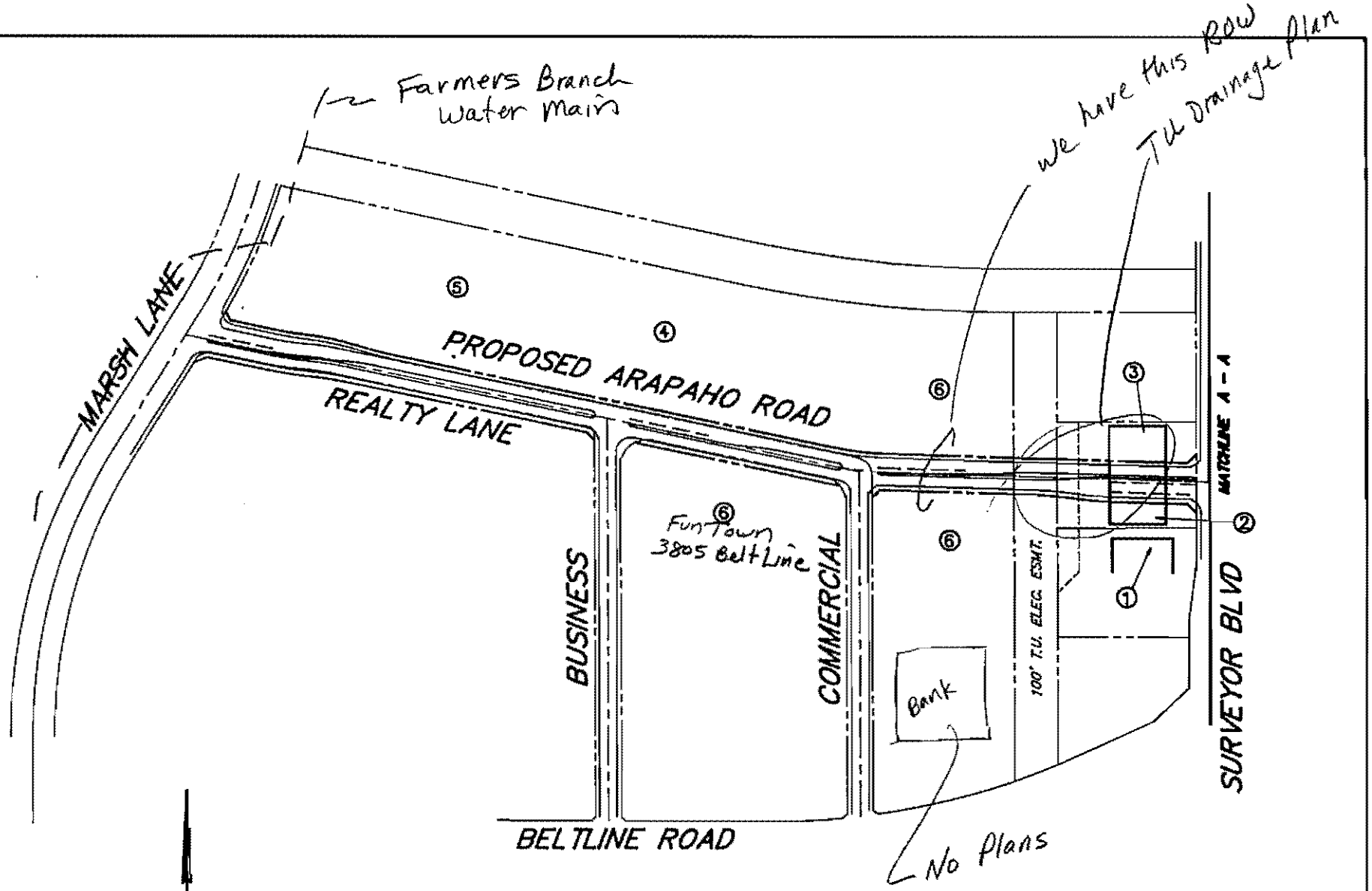
Crosstown Sewer Plans
P.S. @ BeltLine & Surveyor



1	15101 MIDWAY ROAD
2	4139 CENTURION WAY MBNA (Vacant)
3	4131 CENTURION WAY
4	4125 CENTURION WAY
5	4101 CENTURION WAY Athletic club 4015 Belt Line Rd
6	TILT SLAB MINI-WAREHOUSES —
7	GROUND MOUNT WATER TANK — Surveyor P.S.
8	VACANT PROPERTY — 4005 Belt Line Sleep-In

ARAPAHO ROAD ALIGNMENT

BARTON-ASCHMAN ASSOCIATES, INC.
8405 BELT LINE RD. #144 • DALLAS, TEXAS 75240 • (214) 691-1900
PARSONS TRANSPORTATION GROUP



ARAPAHO ROAD ALIGNMENT

BARTON-ASCHMAN ASSOCIATES, INC.
PARSONS TRANSPORTATION GROUP

TOWN OF
ADDISON

Faxed

PUBLIC WORKS

To: Bruce Grantham

Company: GBW

FAX #: 972-840-~~7976~~ 2156

Date: 8-14-98

# of pages (including cover):

Re: Utility Contacts

From: James C. Pierce,Jr.,P.E.,DEE
Assistant City Engineer
Phone: 972/450-2879
FAX: 972/450-2837

16801 Westgrove
P.O. Box 9010
Addison, TX 75001-9010

☐ Original in mail ☐ Per your request ☒ FYI ☐ Call me

Comments: Utility contacts that I have. Some changes have been made @ TU so I'm not sure who the contact is now

Jim

Utility Contacts

SW Bell — Tim Beidelman
972-234-7085

TU Electric — Todd Guinn 972-383-7856
Joe Perez 214-812-7812

MCI - Adrian Thebeau
972-554-4127 or
Mike White

Brooks Cable — Theresa Harden
972-753-1900 -or-
Jim Dunn 972-753-1900

Lone Star Gas - Howard Lewis
972-323-8936

TCI Cable Vision - Don Burkhart
327 Cross Rd
Mesquite TX 75149

Harron Cable TV - Dennis Anderson
PO Box 2628
Waxahatchie Tx 75165

TOWN OF ADDISON

For Pick-up

LETTER OF TRANSMITTAL

Public Works / Engineering
16801 Westgrove • P.O. Box 144
Addison, Texas 75001
Telephone: (214) 450-2871 • Fax: (214) 931-6643

DATE 7-8-98	JOB NO.
ATTENTION	
RE: Arapaho Rd. Extension Phase II/III	

TO Liz Metting
HNTB

GENTLEMAN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Chapter 3, Design Standards from Addison Transportation Plan
1			Bid Set – Construction Plans for Arapaho Rd, Phase I

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please return the Construction Plans

COPY TO _____

SIGNED: Jim Pierce

If enclosures are not as noted, please notify us at once.

Recd 6-15-98

HNTB ARCHITECTS ENGINEERS PLANNERS

14114 Dallas
Parkway, Suite 630
Dallas, Texas
75240-4381
(972) 661-5626
FAX (972) 661-5614

June 2, 1998

Town of Addison
P.O. Box 144
Addison, Texas 75001-0144

Attn: Mr. James C. Pierce, Jr., P.E., DEE
Assistant City Engineer

ARAPAHO ROAD EXTENSION

Dear Mr. Pierce:

We are proceeding with the Phase 1 services for the extension of Arapaho Road, and this is to provide you with the status of activities in progress.

Our surveyor, ARS Engineers, Inc. (ARS), began work setting panel points for Dallas Aerial Surveys (DAS) and is continuing their design survey activities. Benchmark data and horizontal controls have been furnished to ARS for their use in setting controls for DAS. Written agreements with subcontractors have been executed and insurance certificates issued. Jack Hatchell & Associates has compiled the available traffic data and has requested traffic projections from the North Central Texas Council of Governments for streets in the vicinity of the project.

In cooperation with GBW, we have updated the schedule to reflect the delay in starting work with no change in the completion dates and a copy has been furnished to the Town of Addison.

During June, we expect to continue the traffic studies, design surveys, aerial mapping, and collection of utility information.

We will submit brief status reports to you monthly to keep you abreast of project development activities. If you have any questions, please call.

Very truly yours,

HNTB CORPORATION

Daniel F. Becker, P.E.
Vice President, Central Division

DFB/lnb

25768

GBW Engineers, Inc.

MEMO

1919 S. Shiloh Rd., Suite 530, LB 27, Garland, TX 75042

Date: 6/4/98

To: Jim Pierce

From: Bruce Grantham

Re: Arapaho Road Extension

I have enclosed the revised Arapaho Road Extension Project Schedule per our discussion. Please call if you have any questions.

Tel.: (972) 840-1916 / *FAX:* (972) 840-2156 / *E-mail:* Info@gbwengineers.com

TOWN OF
ADDISON

LETTER OF TRANSMITTAL

Public Works / Engineering
16801 Westgrove • P.O. Box 144
Addison, Texas 75001
Telephone: (214) 450-2871 • Fax: (214) 931-6643

DATE	6-3-98	JOB NO.
ATTENTION		
RE:	Arapaho Rd Phase II/III	

TO Dan Becker
HNTB

GENTLEMAN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Town Benchmark Map
1			Chapter 3, Design Standards from Addison Transportation Plan, 12/92

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☒ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19_____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO _____

SIGNED: Jim Lewis

If enclosures are not as noted, please notify us at once.

Arapahoe Rd Phase II/III 6-1-98
Telecon with Bruce Grantham

Updating Schedule

End point the same

Dan will put together a Status report

Review City Plans — Bruce ??

a. Borrow 1 or 2 sets @ a time
transfer plan info from
development projects
City ROW

b. Copy the Sheets

Start an Inventory of Plans available
Use Route Layout
Private Plans
ROW Plans

Arapaho II/III

5-20-98

Received a call from Bruce Grantham -
Dan Out
Jack Hatchell — left voice mail

Bruce will update schedule after contacting Dan and Jack.

They all made a commitment to the schedule. Some schedule items may be re-arranged — such as utility coordination.

I stated I wanted a good schedule that produced a good job even if it had to be extended.

JP

May 20, 1998

Not Sent

Mr. Daniel F. Becker, P.E., Vice President
HNTB Engineers
14114 Dallas Parkway, Suite 630
Dallas, TX 75240-4381

Re: Arapaho Road Extension - PhaseII/III

Dear Mr. Becker:

I am somewhat concerned about the apparent limited progress being made on the preliminary design of the above referenced project. We discussed this briefly on the telephone about two weeks ago and you acknowledged the limited progress, and stated that a new schedule would be forthcoming, and that the completion date would remain the same.

I look forward to receiving the new schedule and discussing how we can get the project moving at a good pace.

Please call and schedule a meeting date.

Very truly yours,

Town of Addison

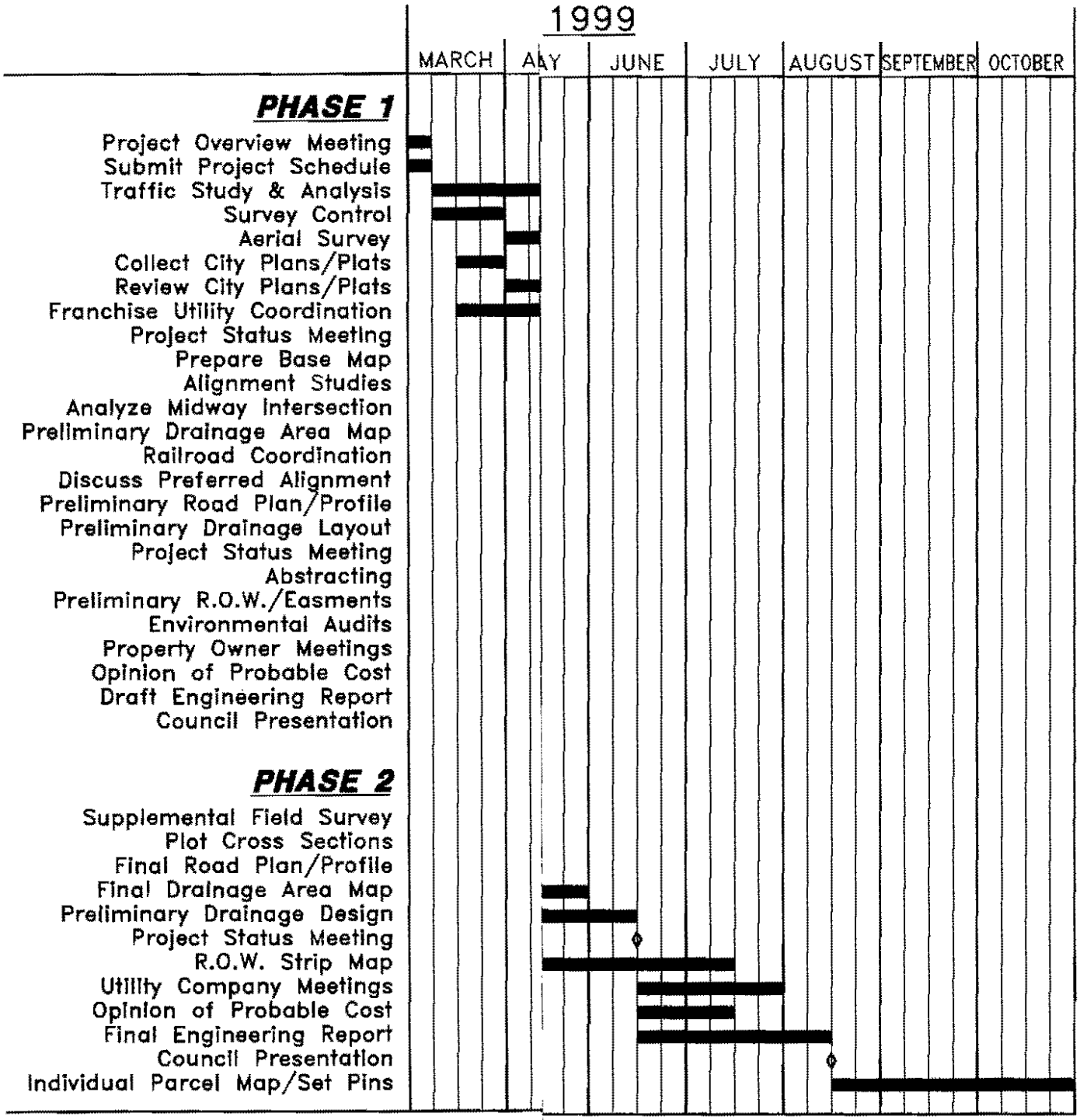
James C. Pierce, Jr., P.E., DEE
Assistant City Engineer

cc: John Baumgartner, Director of Public Works

TOWN OF ADDISON

HNTB/GBW/ARS/JH&A

TOWN OF
ADDISON



ARAPAHO ROAD EXTENSION PROJECT SCHEDULE

TOWN OF ADDISON

PUBLIC WORKS DEPARTMENT (972) 450-2871

Post Office Box 144 Addison, Texas 75001 16801 Westgrove

April 6, 1998

Post-it® Fax Note 7671	Date 4/6/98	# of pages ▶ 1
To Jack Hatchell	From Jim Pierce	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # 972-424-1368	Fax #	

Mr. Michael Morris
Director of Transportation
NCTCOG
P.O. Box 5888
Arlington, TX 76005-5888

Re: Preliminary Design, Arapaho Road Phase II/III

Dear Mr. Morris:

The Town of Addison has retained HNTB to evaluate the potential for extending Arapaho Road from Addison Road to Marsh Lane. Jack Hatchell & Associates is a subconsultant to HNTB for the transportation engineering elements of the study.

Please accept this letter as authorization for Mr. Jack Hatchell, P.E. to obtain traffic assignments for the Town of Addison from NCTCOG, and to work with your office on traffic assignments for alternative alignments and intersection configurations.

Please do not hesitate to call me at 972-450-2879 if you have any questions or need additional information.

Very truly yours,

Town of Addison

Post-it® Fax Note 7671	Date 4/6/98	# of pages ▶ 1
To Dan Becker	From Jim Pierce	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # 972-661-5614	Fax #	

James C. Pierce, Jr., P.E., DEE
Assistant City Engineer

cc: Dan Becker, P.E., HNTB
Jack Hatchell, P.E.

Jack Hatchell & Associates
P.O. Box 260119
Plano, Texas 75026-0119
(972-424-1368) Telephone & FAX

FAX

To: James C. Pierce, Jr., P.E., DEE
Town of Addison
(972)450-2837

From: Jack Hatchell, P.E.

Date: April 6, 1998

James -

It was nice to see you Thursday. I look forward to working with you on the Arapaho Road extension project. Please find attached a draft of a letter to Michael Morris, Director of Transportation, with NCTCOG requesting authorization for me to obtain traffic assignments.

Please do not hesitate to call me if you have any questions or need additional information.

Number of pages including this sheet 2

Mr. Michael Morris
Director of Transportation
NCTCOG
P.O. Box 5888
Arlington, Texas 76005-5888

Dear Mr. Morris:

The Town of Addison has retained HNTB to evaluate the potential for extending Arapaho Road from Quorum Drive to Marsh Lane. Jack Hatchell & Associates is a subconsultant to HNTB for the transportation engineering elements of the study.

Please accept this letter as authorization for Mr. Jack Hatchell to obtain traffic assignments for the Town of Addison from NCTCOG and to work with your office on traffic assignments for alternative alignments and intersection configurations.

Please do not hesitate to call me if you have any questions or need additional information.

Sincerely,

James O. Pierce, Jr., P.E., DEE
Assistant City Engineer
Town of Addison.

LETTER OF TRANSMITTAL

TOWN OF ADDISON
Public Works / Engineering
16801 Westgrove • P.O. Box 144
Addison, Texas 75001
Telephone: (214) 450-2871 • Fax: (214) 931-6643

DATE 4-7-98	JOB NO.
ATTENTION	
RE: Arapaho Rd II/III Preliminary Engr	

TO Jack Hatchell PE, Jack Hatchell & Assoc Plano

Post-it® Fax Note 7671

To Dan Becker	Date 4-7-98 # of pages ▶ 1
Co./Dept. HNTB	From Jim Pierce
Phone #	Co.
Fax # 972-661-5614	Phone #
	Fax #

GENTLEMAN:

WE ARE SENDING YOU
- [X] Attached
- [ ] Shop Drawings
- [ ] Prints
- [ ] Copy of letter
- [ ] Change order
- [ ] _____

COPIES	DATE	NO.	DESCRIPTION
1	12/18/92		Barton-Aschman Memo to Ron Whitehead re East/West Roadway Capacity
1	5/13/93		Letter to Barton-Aschman from Wilbur Smith re Arapaho affects on Toll Tunnel

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- [ ] For approval
- [X] For your use
- [ ] As requested
- [ ] For review and comment
- [ ] FOR BIDS DUE _____ 19____
- [ ] Approved as submitted
- [ ] Approved as noted
- [ ] Returned for corrections
- [ ] _____
- [ ] Resubmit _____ copies for approval
- [ ] Submit _____ copies for distribution
- [ ] Return _____ corrected prints
- [ ] PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO Dan Becker ←

SIGNED: Jim Pierce

If enclosures are not as noted, please notify us at once.

FILE
KELLERSPRINGS
TUNNEL

WILBUR
SMITH
ASSOCIATES
ENGINEERS • ECONOMISTS • PLANNERS
135 COLLEGE STREET • P.O. BOX 9412 • NEW HAVEN, CT 06534 • (203) 865-2191 • FAX (203) 624-0484

May 13, 1993

Post-It™ brand fax transmittal memo 7671	# of pages ▸ 5
To John Baumgartner	From Gary Jost
Co. Town of Addison	Co. B-A-A
Dept.	Phone #
Fax # 931-6643	Fax # 490-9261

Mr. Robert Wunderlich
Barton-Aschman Associates, Inc.
5485 Belt Line Road, Suite 199
Dallas, TX 75240

Dear Mr. Wunderlich:

Pursuant to your Authorization to proceed of March 2, 1993, Wilbur Smith Associates (WSA) has completed a review of the impacts which the Extension of Arapaho Road west of the Dallas-North Tollway would have on the proposed Addison Airport Toll Tunnel assessment project. The study findings presented build upon the initial feasibility assessment study of the Addison Airport Toll Tunnel completed by WSA in June of 1991 and the Final Feasibility Report completed in February of 1992 for the Texas Turnpike Authority (TTA).

As agreed, WSA has updated the traffic models used in the earlier study to accommodate certain assumptions made in the proposal. This included modifying some roadway capacities in the travel corridor, and developing several different traffic networks which would accurately portray the three different implementation phases of the Arapaho Extension, as described by Barton-Aschman. All other assumptions from the Final Feasibility Report of February 1992 remain unchanged.

A series of capacity- constrained toll diversion traffic assignments were run, including assignments at both 1995 and 2010 traffic levels, as well as $0.50 and $0.75 toll rates at the Addison Tunnel. The results of the new traffic assignments which incorporated the extended Arapaho Road were then compared to the traffic assignments originally run in the previous Addison Toll Tunnel study to evaluate the impact that this would have on the forecasted toll revenue.

Traffic Modeling Procedure

The first step involved retrieval of the traffic modeling network used by WSA in

the previous Addison study. This windowed network was originally developed for the northern Dallas region from a comprehensive traffic network supplied to WSA by the North Central Texas Council of Governments (NCTCOG). Modifications were made to the links in both the 1995 opening year network as well as the 2010 design year network, to ensure consistency between the network assumptions and the data supplied by Barton-Aschman. A total of 15 different traffic assignments scenarios were then completed, which included alternate tunnel toll rates, alternate assignment years, and the various phases of the Arapaho Road Extension. For each of the scenarios, traffic assignments were made for the A.M. peak hour, P.M. peak hour, and the off-peak average hour, which were then combined into an average total daily traffic figure.

The impacts that the extended Arapaho Road would have on the forecasted traffic and revenue of the Addison Tunnel were determined for each planned phase of the Extension. The phasing information was supplied by Barton-Aschman, and assumes the following:

- Phase I consists of upgrading Arapaho Road for the entire length of its existing alignment, ending at Addison Road, and open to traffic on January 1, 1996;

- Phase 2 would extend Arapaho on new alignment from its present junction at Addison Road to Midway Road, and would be completed five to ten years after Phase I;

- Phase 3 would extend Arapaho on new alignment from its junction with Midway Road to Marsh Lane, and would be completed 10+ years after Phase I.

For the traffic modeling analysis, WSA used a completion or opening year of January 1, 2000 for Phase II and January 1, 2010 for Phase III.

Estimated Annual Revenue Impacts

After completing the traffic assignments, plotting and summarizing the results,

the new traffic forecasts for the Addison Airport Toll Tunnel were compared to the traffic forecasts developed without the Arapaho Road Extension included in the network. As summarized in Table A, the Extension of Arapaho Road has a moderate impact on the forecasted tunnel traffic figures. If the Addison Tunnel toll rate is set at $0.50 for all traffic, the completion of Phase I of the Extension will have little measurable impact on tunnel traffic and revenue forecasts. Approximately a 10 percent decrease in traffic is forecast upon completion of Phase II, with an annual toll revenue impact of $347,000. Assuming the entire Arapaho Extension is in place, tunnel traffic in the year 2010 is expected to be slightly over 15 percent less than originally forecast, with $712,000 less annual toll revenue realized as a result.

Under the $0.75 toll forecasts, the completion of Phase I will also have a negligible impact on tunnel traffic and revenue. When Phase II of the Arapaho Road Extension is completed in 2000, it would result in an estimated 15 percent drop in the average daily traffic using the Addison Airport Toll Tunnel, with a corresponding decrease in annual revenue of slightly over $600,000. When the full construction of the Arapaho Road Extension is completed to Marsh Lane and evaluated in terms of its impact on the design year traffic, approximately 18 percent less traffic can be expected on the Tunnel, with a corresponding drop of $985,000 in annual revenue.

The extension of Arapaho Road will have the greatest impact on the future traffic levels of the Beltline Road. Although some traffic diversion is expected on the other major east-west arterials in the study corridor, most of the impacts will occur between Arapaho Road and Belt Line Road in the area studied. Rather than directly competing with the Addison Toll Tunnel, the Arapaho Road Extension's primary impact will be to improve conditions on the Belt Line Road, thus making Belt Line Road more competitive with the proposed Tunnel.

During the course of quantifying the impacts which Arapaho Road would have on the Addison Toll Tunnel, the most current, accepted professional practices and

Table A

ESTIMATED TRAFFIC AND REVENUE IMPACTS ON ADDISON TUNNEL

From Extension of Arapaho Road

PHASE OF ARAPAHO ROAD EXTENSION	EXPECTED COMPLETION DATE	ADDISON TUNNEL TOLL OF $0.50					
		Original Forecasts		Modified Forecasts		Total Impacts	
		Average Daily Traffic	Annual Toll Revenue	Average Daily Traffic	Annual Toll Revenue	Average Daily Traffic	Annual Toll Revenue
Phase I	1996	14,200	$ 2,592,000	14,200	$ 2,592,000	--	--
Phase II	2000	18,600	3,395,000	16,700	3,048,000	(1,900)	$ (347,000)
Phase III	2010	25,500	4,654,000	21,600	3,942,000	(3,900)	(712,000)
		ADDISON TUNNEL TOLL OF $0.75					
Phase I	1996	11,600	$ 3,176,000	11,600	$ 3,176,000	--	--
Phase II	2000	14,400	3,942,000	12,200	3,340,000	(2,200)	$ (602,000)
Phase III	2010	19,800	5,420,000	16,200	4,435,000	(3,600)	(985,000)

procedures were used. However, there are sometimes differences between forecasted and actual results caused by events and circumstances beyond the control of the forecasters and these differences could be material.

* * *

WSA has sincerely appreciated the opportunity to continue working on such an important project concerning the future of the Town of Addison. Please do not hesitate to contact us if there are questions or if we can continue to be of service.

Thanks and best regards.

Very truly yours,

WILBUR SMITH ASSOCIATES

John Smolley, Jr. /pk

John Smolley, Jr.
Associate

JS/lao

cc: Mr. James W. Griffin - TTA

#2-7

Barton-Aschman Associates, Inc.

5485 Belt Line Road, Suite 199
Dallas, Texas 75240
USA

Phone: (214) 991-1900
Fax: (214) 490-9261
Metro: 263-9138

MEMORANDUM

To: Ron Whitehead
Town Manager

From: Robert Wunderlich
Gary Jost

Date: December 18, 1992

Subject: Analysis of East/West Roadway Capacity in Addison

Belt Line Road serves as the primary conduit of east/west traffic flow north of the LBJ freeway (Figure 1). The combination of continuity from I-35E on the west to US 75 on the east and the concentration of employment and residential centers along its route and an interchange with the Dallas North Tollway (DNT), have resulted in a heavily travelled corridor with significant congestion during the peak hour. Currently, Belt Line Road carries approximately 37,783 vehicles per day just west of the DNT.

Travel demand estimates project that congestion is to continue and worsen. Very little opportunity exists to expand Belt Line Road due to adjacent property impacts and aesthetic considerations. Therefore, it is essential that alternate routes be developed to relieve Belt Line Road.

POSSIBLE RELIEVER ROUTES

Between Belt Line and Spring Valley, opportunities to provide relief are limited due to the presence of residential neighborhoods. Therefore, attention has focused on the corridor north of Belt Line Road where a connection of Keller Springs and an extension of Arapaho Road are the most likely candidates for relieving Belt Line Road (see figure 2).

KELLER SPRINGS

Keller Springs Road currently extends to the east and west from Addison Airport. Keller Springs extends from the Airport past Preston Road to Campbell Road on the east side of the Airport. On the west, the road continues through Carrollton to I-35E. Tunnelling under the Airport has been identified as the only feasible way to connect the eastern and western sections of Keller Springs while maintaining Airport operations. Because of the substantial cost of such a project, funding is proposed through tolls. A two-lane (one lane in each direction) tunnel with a $.75 toll is under consideration at this time.

ARAPAHO ROAD

Arapaho Road is continuous from the Dallas North Tollway to US 75 west of the tollway, Arapaho intersects with Spectrum, at an all-way stop right angle intersection. Arapaho then continues west to Addison Road. An alignment has been proposed which would extend Arapaho west from the DNT to Marsh Lane.

PROJECT TRAFFIC ANALYSIS

As part of the Addison Transportation Plan project, the NCTCOG modeled several alternative roadway networks. One of the purposes of this effort was to explore the interaction between the two alternative roadways and their ability to relieve Belt Line Road. Representative volumes are shown for this alternative model in Table 1.

Table 1
COMPARISON OF VOLUMES JUST WEST OF ADDISON ROAD
YEAR 2010

	No Keller Springs or Arapaho	Keller Springs Free 4-Lane Facility; No Arapaho	2 -Lane Keller Springs Tollroad; No Arapaho	2 Lane Keller Springs Tollroad; Arapaho Extended to Marsh
SH 190	113,000	113,000	114,000	112,000
Trinity Mills	17,000	19,000	20,000	18,000
Keller Springs	--	30,000	16,000	16,000
Lindburg	15,000	10,000	13,000	1,000
Arapaho	--	--	--	40,000
Belt Line	61,000	56,000	58,000	49,000
TOTAL	254,000	273,000	267,000	267,000

Without either of the alternative routes, Belt Line Road is projected to have a demand of 61,000 vehicles per day. When the Keller Springs tunnel connection is modeled as a four-lane, free-access roadway, the volume of Belt Line Road is reduced by about 5,000 vehicles, and the resulting volume on Keller Springs is 30,000 vehicles per day.

When access to Keller Springs is restricted by charging a toll and reducing the width to two lanes, the volumes on Keller Springs drops to 16,000 and the volume on Belt Line Road is reduced by only 3,000 vehicles.

When Arapaho is added between the North Tollway and Marsh, the volumes on Keller Springs toll tunnel are not affected, but volumes on Belt Line Road are reduced by 12,000 vehicles per day to 49,000 vehicles per day. The daily traffic volume on Arapaho is projected to be 40,000 under these conditions.

SUMMARY

It is apparent from the projected volumes that the Keller Springs toll tunnel and the Arapaho Road extension generally serve different travel needs and projected volumes on Keller Springs are not diminished when Arapaho is extended. The projected traffic volumes also support the need for all three facilities (Arapaho Road, Keller Springs Toll Tunnel, and SH 190) to meet future east-west travel demand. Each facility meets a specific need for travel in the area.

Arapaho serves as a relief facility for Belt Line Road and provides a continuous circulation route for adjacent land uses. The proposed Keller Springs Toll Tunnel chiefly links areas west of the Airport to the Dallas North Tollway. Land uses within Addison are generally not served directly although the toll tunnel could be used to access areas within Addison.

It does not appear that even a four-lane, free Keller Springs connection would relieve Belt Line Road. On the other hand, the Arapaho extension does carry traffic that could otherwise travel on Belt Line, but does not attract trips that would use Keller Springs.

An analysis of the intersections of Midway Road at Keller Springs and Addison Road at Keller Springs will be sent under separate cover. These intersections support the toll tunnel and will be important to the success of the toll tunnel.

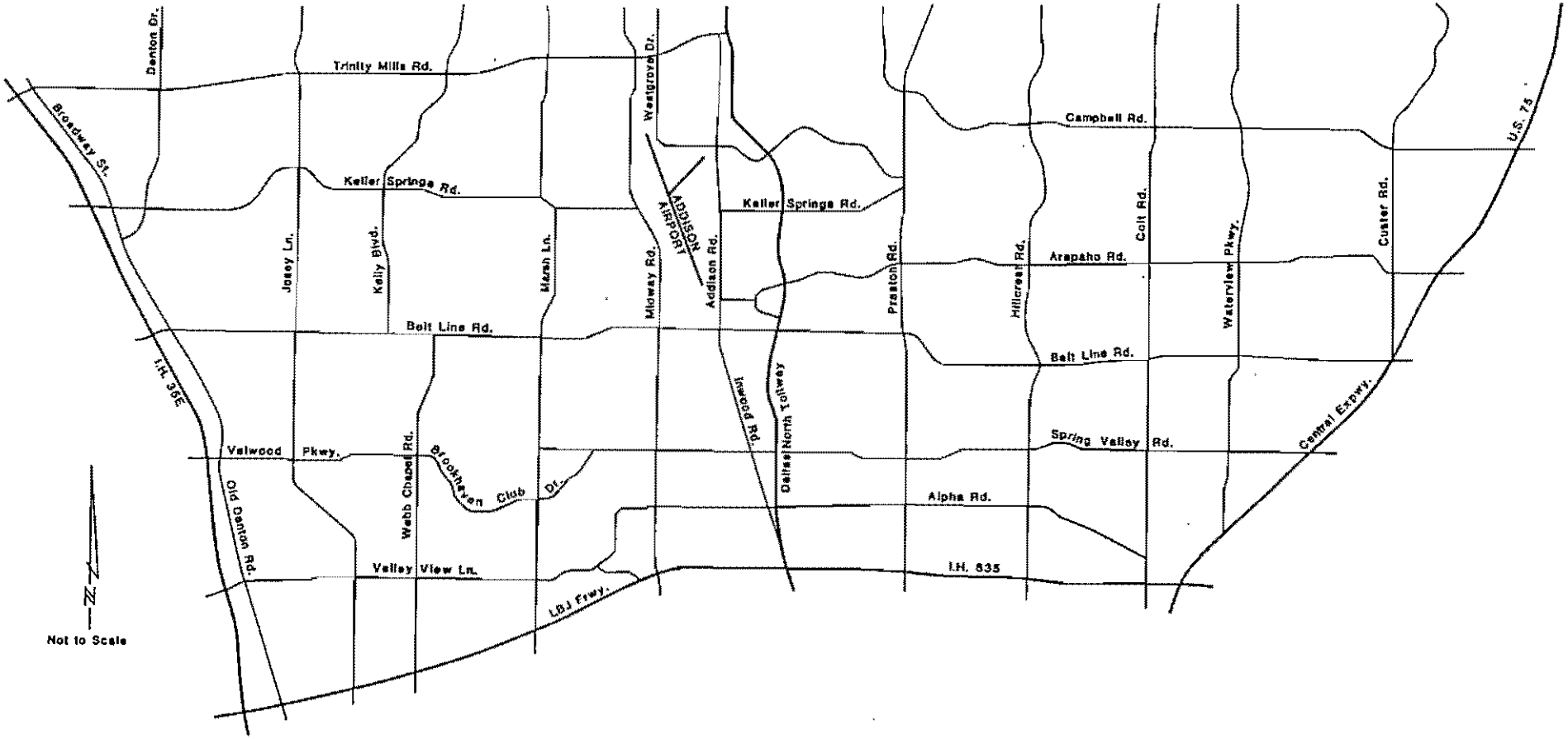

FIGURE 1

EXISTING ROADWAY CONFIGURATION

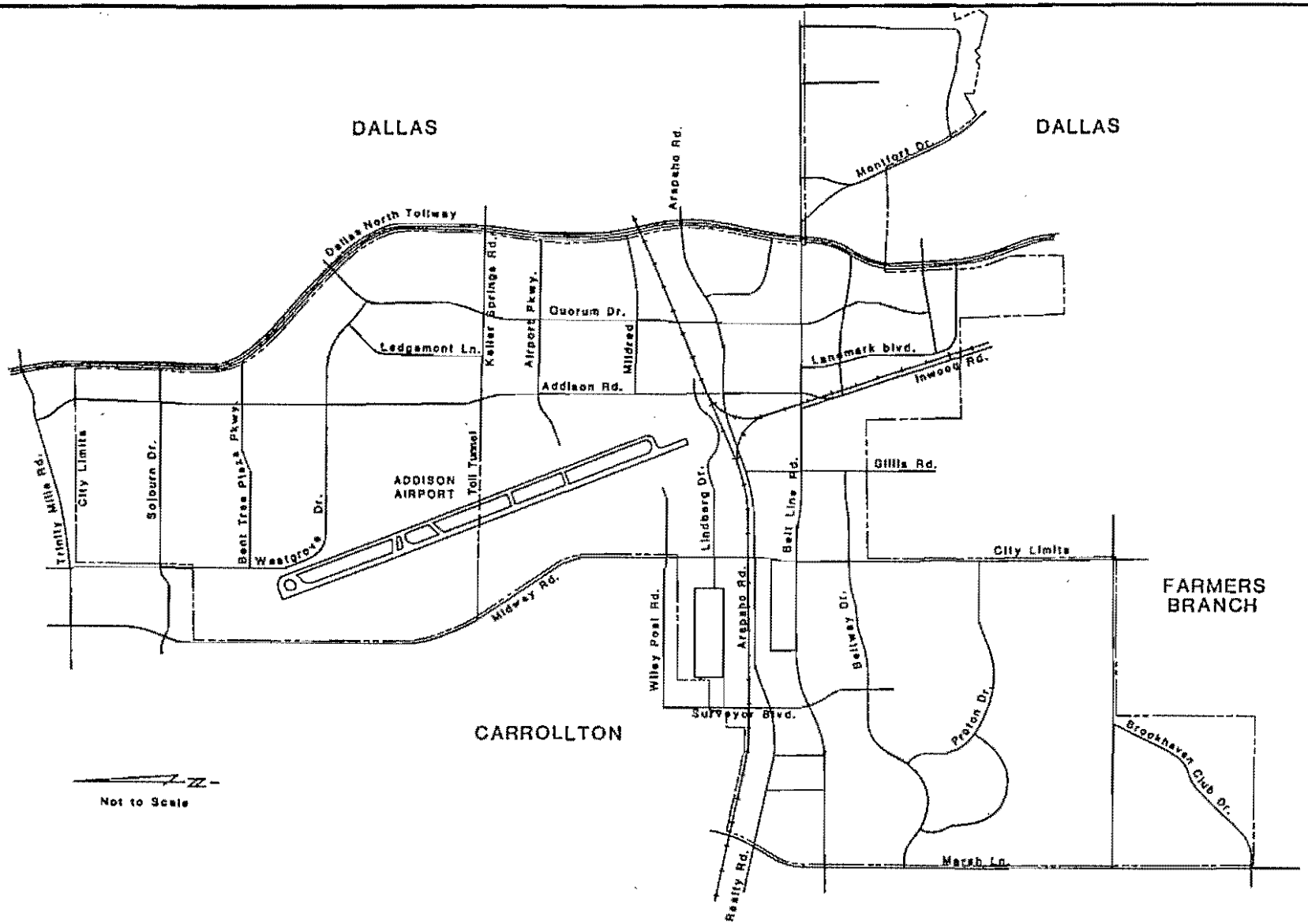

FIGURE 2

CONCEPTUAL ROADWAY CONFIGURATION

TOWN OF ADDISON

LETTER OF TRANSMITTAL

Public Works / Engineering
16801 Westgrove • P.O. Box 144
Addison, Texas 75001
Telephone: (214) 450-2871 • Fax: (214) 931-6643

DATE 4-3-98	JOB NO.
ATTENTION	
RE: Arapaho Rd Phase II / III	

TO Jack Hatchell, P.E.
Jack Hatchell & Assoc
Plano

GENTLEMAN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Draft Transportation Plan - Parsons Transportation Group - page 40 thru appendix

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

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☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Traffic on Midway - Counted about 1 week ago -
South of Beltline - 46,397 - 24 hour 2 way
North of Beltline - 45,464 - " "

Jack - with this infor, do you need any more - like counts on Belt Line ?

COPY TO Dan Becker

SIGNED: Jim Pierce

If enclosures are not as noted, please notify us at once.

Arapaho Phase II/III - John, Jeff

Dan Becker, Kelsey Johnston, Jack Hatchell, Bruce Grantham — 4-2-98

counts: Just counted Midway, N & S of Beltline

Jack — Would like a count on beltline

Barton Aschman — counts on Arapaho Rd
Wilbur Smith — wrt Tunnel
John will make study available

COG has year 2020 numbers now — traffic predictions.

Can rerun cog's model with increased development. We don't know how COG's model works —
Jack will fax me a suggested letter to COG to release data.

Jeff Scherbarth 991-1900

Fly over Midway — no ramps?
~~Do "Compact"~~ or entire rd elevated bet. Midway and Surveyor??

Get → Latest counts from Robin — Midway
45K is traffic capacity we consider —

Prep a Zoning map with projected development
Robin Has a vacant parcel map

John: we have an — RFQ out, that will map our utilities & ROW's

TOWN OF
ADDISON

Public Works / Engineering
16801 Westgrove • P.O. Box 144
Addison, Texas 75001
Telephone: [214] 450-2871 • Fax: [214] 931-6643

LETTER OF TRANSMITTAL

DATE 3-26-98	JOB NO.
ATTENTION	
RE: Arapaho Rd II-/III	

TO Dan Becker
HNTB

GENTLEMAN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
3			Latest Traffic Counts

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS FYI and distribution

COPY TO _____

SIGNED: Jim

If enclosures are not as noted, please notify us at once.

NOV

Town of Addison
1996 Daily Traffic Volume Summary

Street	Location	1996 Daily Traffic Volumes					1986	1989	1993	1996	Difference 1996-1993	% Change From 1993
		NB	SB	EB	WB	Total VPD						
Midway Road	Trinity Mills to Sojourn	18011	20771			38782	NR	NR	34108	38782	4674	14%
	Sojourn to Keller Springs	18298	16754			35052	25655	27277	34203	35052	849	2%
	Keller Springs to Lindbergh	19946	20707			40653	32137	30562	44065	40653	-3412	-8%
	Lindbergh to Belt Line	20474	20816			41290	36166	29138	40179	41290	1111	3%
	Belt Line to Beltway	23413	21584			44997	31975	35831	43665	44997	1332	3%
	Beltway to Proton	29051	23163			52214	36915	37383	47484	52214	4730	10%
	Proton to Spring Valley	30024	23755			53779	40689	39699	46836	53779	6943	15%
	South of Spring Valley	31969	26836			58805	48051	44042	54508	58805	4297	8%
Montfort Drive	Verde Valley to Sakowitz	NR	NR			NR	16477	15945	NR	NR	NA	NA
	Sakowitz to Belt Line	10151	7372			17523	16332	12225	15500	17523	2023	13%
Paladium Road	East of Montfort			518	497	1015	NR	NR	1358	1015	-343	-25%
Pebble Beach	West of Marsh			1350	1662	3012	NR	NR	NR	3012	NA	NA
Proton Road	Midway to Belt Line			2147	1998	4145	NR	NR	2651	4145	1494	56%
	Beltway to Les Lacs	1312	1639			2951	NR	NR	NR	2951	NA	NA
	Les Lacs to Azure			1583	1450	3033	NR	NR	NR	3033	NA	NA
Quorum Drive	Dallas Parkway to Landmark			5398	5669	11067	11198	10510	9987	11067	1080	11%
	Landmark to Belt Line	5879	5511			11390	8120	9271	8739	11390	2651	30%
	Belt Line to Arapaho	5339	4804			10143	10107	8182	10261	10143	-118	-1%
	Arapaho to Airport Parkway	2381	1893			4274	5247	4769	6262	4274	-1988	-32%
	Airport Pkwy. to Keller Springs	2533	1977			4510	4925	4625	5946	4510	-1436	-24%
	Keller Springs to Westgrove	1525	1531			3056	2907	2708	3518	3056	-462	-13%
Realty	Marsh to Business			1289	1519	2808	NR	NR	NR	2808	NA	NA
Runyon Road	North of Belt Line	1014	1431			2445	NR	NR	2446	2445	-1	-0%
Sakowitz Parkway	Belt Line to Montfort	700	2977			3677	4642	2482	2258	3677	1419	63%
Sojourn	Midway Road to Voss Road			5887	5602	11489	4165	7088	10047	11489	1442	14%
	Voss Road to Addison Road			2380	2985	5365	5091	4001	6079	5365	-714	-12%
	Addison Road to Dallas Pkwy.			2380	2985	5365	3847	1073	NR	5365	NA	NA
Spectrum	Dallas Pkwy. to Arapaho Road	1761	1968			3729	2628	2382	3107	3729	622	20%
Spring Valley Rd.	Marsh Lane to Brookhaven			15444	15750	31194	10171	16254	12349	31194	18845	153%
	Brookhaven to Midway			11234	12264	23498	16187	12017	21927	23498	1571	7%
	East of Midway			6922	7149	14071	26892	26536	27902	14071	-13831	-50%
Surveyor Blvd.	North of Belt Line Road	3022	3436			6458	7310	4961	NR	6458	NA	NA
	Belt Line to Beltway	1453	2037			3490	2191	2222	NR	3490	NA	NA
Westgrove	Dallas Pkwy. to Addison Road	4080	4448			8528	9264	6291	8055	8528	473	6%
	Addison Road to Sunbelt	5779	5245			11024	12578	7924	9366	11024	1658	18%
	Bent Tree Plaza to Sojourn	6070	6530			12600	11151	8491	10287	12600	2313	22%
	Trinity Mills to Sojourn	4280	4105			8385	9030	5407	6520	8385	1865	29%
Winwood Drive	South of Belt Line	310	354			664	NR	NR	609	664	55	9%

Town of Addison
1996 Daily Traffic Volume Summary

Street	Location	1996 Daily Traffic Volumes NB	SB	EB	WB	Total VPD	1986	1989	1993	1996	Difference 1996-1993	% Change From 1993
Addison Road	Trinity Mills to Sojourn	5372	3759			9131	5195	5293	6832	9131	2299	34%
	Sojourn to Westgrove	5620	4815			10435	8751	7546	9359	10435	1076	11%
	Westgrove to Keller Springs	10391	9706			20097	N/A	13491	18076	20097	2021	11%
	Keller Springs to Airport Pkwy	10867	11167			22034	N/A	14884	17130	22034	4904	29%
	Airport Pkwy. to Mildred	11356	11904			23260	19693	15826	17505	23260	5755	33%
	Mildred to Arapaho	11529	11902			23431	NR	NR	18526	23431	4905	26%
	Arapaho to Belt Line	11352	12018			23370	20468	17490	20949	23370	2421	12%
	South of Arapaho	8985	10088			19073	NR	NR	NR	19073	NA	NA
Airport Parkway	West of Addison			765	700	1465	1120	1079	1152	1465	313	27%
	Addison Road to Dallas Parkway			1447	1554	3001	3648	1054	1597	3001	1404	88%
Arapaho Road	Addison Road to Spectrum			6690	6576	13266	10115	6205	16097	13266	-2831	-18%
	Spectrum to Dallas Parkway			5462	5719	11181	11640	10379	11731	11181	-550	-5%
Belt Line Road	West of Marsh Lane			25579	28633	54212	41115	39539	42847	54212	11365	27%
	Marsh Lane to Surveyor			25951	28895	54846	41411	36171	41054	54846	13792	34%
	Surveyor to Midway Road			28092	24617	52709	38435	36396	40010	52709	12699	32%
	Midway Road to Beltway			30825	28323	59148	46249	41928	54199	59148	4949	9%
	Beltway to Addison Road			34316	35275	69591	54442	44772	52243	69591	17348	33%
	Addison Road to Quorum			32401	36356	68757	42387	42340	49026	68757	19731	40%
	Quorum Road to Dallas Pkwy.			31486	35291	66777	38084	40788	44949	66777	21828	49%
	Dallas Pkwy. to Montfort			25069	24836	49905	34862	37332	42046	49905	7859	19%
	Montford to White Rock Creek			24740	26305	51045	32612	43037	42192	51045	8853	21%
Beltway Drive	West of Marsh Lane			3847	3991	7838	6315	5987	6927	7838	911	13%
	Marsh Lane to Surveyor			4076	4833	8909	5607	4500	4346	8909	4563	105%
	Surveyor to Midway Road			3185	2740	5925	4985	3463	4822	5925	1103	23%
	East of Midway Road			3302	2606	5908	4946	3415	4965	5908	943	19%
	South of Belt Line	3008	2217			5225	3980	4919	4603	5225	622	14%
Beltwood Parkway	South of Belt Line Road	1520	1643			3163	3533	2936	2879	3163	284	10%
Brookhaven Club	West of Marsh Lane			5518	6976	12494	9932	7912	9360	12494	3134	33%
	Marsh Lane to Spring Valley			5537	7410	5537	9591	8591	1170	5537	4367	373%
Celestial Road	East of Montfort			466	400	866	NR	NR	642	866	224	35%
Dallas Parkway	Quorum Drive to Belt Line	13984	15684			29668	39137	25026	23754	29668	5914	25%
	Belt Line to Arapaho	18645	18626			37271	39476	36251	30745	37271	6526	21%
	Arapaho to Airport	14344	14334			28678	24848	24114	20837	28678	7841	38%
	Westgrove to Bent Trails	12693	14795			27488	18154	25002	20108	27488	7380	37%
	Sojourn to Trinity Mills	13390	13715			27105	17462	23770	21004	27105	6101	29%
Excel	Addison to Westgrove			630	849	1479	NR	NR	NR	1479	NA	NA
Inwood Road	South of Belt Line			NR	NR		9229	16440	17958	NR	NA	NA
Keller Springs	West of Addison Road			192	191	383	1123	1024	1106	383	-723	-65%
	Addison Road to Dallas Pkwy			6803	6489	13292	8359	7942	8916	13292	4376	49%
Landmark Blvd.	Belt Line to Quorum	1518	2493			4011	2422	2466	2962	4011	1049	35%
Les Lacs	Beltway to Proton	968	1093			2061				2061	NA	NA
Lindberg	Midway Road to Addison			6596	8039	14635	9790	6595	10373	14635	4262	41%
	Midway Road to Billy Mitchell			2422	2583	5005	NR	NR	NR	5005	NA	NA
Marsh Lane	North of Belt Line Road	22066	24255			46321	30835	31503	34325	46321	11996	35%
	Belt Line to Beltway	25716	27751			53467	33931	32980	33987	53467	19480	57%
	Beltway to Spring Valley	20821	18705			39526	32787	37942	37196	39526	2330	6%
	Spring Valley to Brookhaven	17806	17712			35518	37531	35382	32621	35518	2897	9%
	South of Brookhaven	19762	21755			41517	53648	33421	36878	41517	4639	13%

MINUTES OF MEETING

Project:	Arapaho Road Extension HNTB	**Meeting Date:**	March 10, 1998
GBW No.:	98-094	**Attendees:**	Ron Whitehead, Town of Addison John Baumgartner, Town of Addison Jim Pierce, Town of Addison Dan Becker, HNTB Bruce Grantham, GBW Engineers, Inc.

- The Town has 60 feet of right-of-way (ROW) dedicated on the City of Dallas Reservoir and Addison Restaurant Park properties, adjacent to the railroad.
- The Roadway Inn Addition property has a tennis court in the rear which should not significantly impact the property's functionality if it is acquired as ROW.
- The Yoplait Yogurt property is already pressed for parking space. If a portion of the rear of this property is acquired for ROW, replacement parking space will need to be acquired nearby.
- The racquet club facility on Centurion Way is vacant at the present time.
- The City-owned pump station can be relocated, if necessary, according to a previous study performed for the Town.
- If a portion of the mini-warehouse tract is taken, the remainder of the tract will need to be evaluated for its functionality.
- The Midway Road intersection is a key element of the project design. The following issues were discussed regarding this intersection:
  - Jack Hatchell will study the traffic implications of an at-grade crossing on other intersections in the neighborhood, particularly the one at Belt Line Road.
  - Mr. Hatchell's study should help determine the viability of an at-grade crossing.
  - If an elevated crossing is selected, no access at Midway should be considered as an alternative, along with access only on ramps.
- A two-way couplet will be evaluated between Midway Road and Surveyor Boulevard as widening the existing Centurion Way may have a significant impact on parking and access to the adjoined tracts, particularly on the north side.
- Property acquisition costs for an at-grade alignment should be compared with a more extensive elevated roadway alignment.

GBW Engineers, Inc.

1919 S. Shiloh Road, Suite 530, LB 27
Garland, Texas 75042
Phone: 972-840-1916
Fax: 972-840-2156

Project: Arapaho Road Extension
HNTB

Meeting Date: March 10, 1998

- It is not possible to elevate the roadway over the railroad crossings near Addison Road due to clearance requirements at Addison Airport.
- Dan Becker will check on the property acquisition cost for a commercial tract recently acquired for the Keller Springs project.
- The Town will consider bond financing to build a section of the roadway if it is feasible to obtain the necessary ROW while other issues are resolved on the balance of the project.
- The section from Marsh Lane to Surveyor Boulevard may be the most straightforward to fast track.
- The HNTB team should investigate all the construction and design alternatives for this corridor in order to select the most cost effective alignment which is feasible.

HNTB ARCHITECTS ENGINEERS PLANNERS

14114 Dallas
Parkway, Suite 630
Dallas, Texas
75240-4381
(972) 661-5626
FAX (972) 661-5614

April 2, 1998

Mr. James C. Pierce, Jr., P.E., DEE
Assistant City Engineer
Town of Addison
P.O. Box 144
Addison, Texas 75001

TOWN OF ADDISON
Arapaho Road Extension - Phase II/III

Dear Mr. Pierce:

As requested in your letter dated March 9, 1998 authorizing us to proceed with the referenced project, we are enclosing Certificates of Insurance as required.

Should you have any questions following review of these certificates, please let us know.

Very truly yours,

HNTB CORPORATION

Daniel F. Becker, P.E.
Vice President, Central Division

DFB/cec

Enclosures

25768

ACORD CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YY): 3/30/98

PRODUCER

Lockton Companies/Kansas City
P.O. Box 419351
Kansas City, MO 64141-6351

Phone No. 913-676-9000

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

HNTB Corporation
14114 Dallas Parkway, Suite 630
Dallas, TX 75240-4381

COMPANIES AFFORDING COVERAGE

COMPANY A	Continental Casualty Co.
COMPANY B	Victor O. Schinnerer
COMPANY C	
COMPANY D	

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
	GENERAL LIABILITY COMMERCIAL GENERAL LIABILITY CLAIMS MADE / OCCUR OWNER'S & CONTRACTOR'S PROT	NOT APPLICABLE			GENERAL AGGREGATE	$ XXXXXXXXXX
					PRODUCTS - COMP/OP AGG	$ XXXXXXXXXX
					PERSONAL & ADV INJURY	$ XXXXXXXXXX
					EACH OCCURRENCE	$ XXXXXXXXXX
					FIRE DAMAGE (Any one fire)	$ XXXXXXXXXX
					MED EXP (Any one person)	$ XXXXXXXXXX
	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS	NOT APPLICABLE			COMBINED SINGLE LIMIT	$ XXXXXXXXXX
					BODILY INJURY (Per person)	$ XXXXXXXXXX
					BODILY INJURY (Per accident)	$ XXXXXXXXXX
					PROPERTY DAMAGE	$ XXXXXXXXXX
	GARAGE LIABILITY ANY AUTO	NOT APPLICABLE			AUTO ONLY - EA ACCIDENT	$ XXXXXXXXX
					OTHER THAN AUTO ONLY: EACH ACCIDENT	$ XXXXXXXXX
					AGGREGATE	$ XXXXXXXXX
	EXCESS LIABILITY UMBRELLA FORM OTHER THAN UMBRELLA FORM	NOT APPLICABLE			EACH OCCURRENCE	$ XXXXXXXXX
					AGGREGATE	$ XXXXXXXXX
						$ XXXXXXXXX
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY THE PROPRIETOR/ PARTNERS/EXECUTIVE OFFICERS ARE: INCL / EXCL	NOT APPLICABLE			WC STATU-TORY LIMITS / OTH-ER	
					EL EACH ACCIDENT	$ XXXXXXXXX
					EL DISEASE - POLICY LIMIT	$ XXXXXXXXX
					EL DISEASE - EA EMPLOYEE	$ XXXXXXXXX
A	OTHER PROFESSIONAL LIABILITY	PLN 008213985	1/1/98	1/1/99	$1,000,000 per claim & the annual aggregate for all projects	

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

HNTB Job 25768; Arapaho Road Extension - Phase II/III

CERTIFICATE HOLDER

Town of Addison
Public Works Department
P.O. Box 144
Addison, TX 75001

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ~~ENDEAVOR TO~~ MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, ~~BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.~~

AUTHORIZED REPRESENTATIVE: J. T. Lockton III

ACORD CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YY): 3/30/98

PRODUCER

Liberty Mutual Insurance Group
10561 Barkley, Suite 400
Overland Park, KS 66212

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

HNTB Corporation
14114 Dallas Parkway, Suite 630
Dallas, TX 75240-4381

COMPANIES AFFORDING COVERAGE

COMPANY A: Liberty Mutual Insurance Group
COMPANY B:
COMPANY C:
COMPANY D:

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	GENERAL LIABILITY [X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS MADE [X] OCCUR [ ] OWNER'S & CONTRACTOR'S PROT	TBl-141-037577-138	1/1/98	1/1/99	GENERAL AGGREGATE	$ 2,000,000
					PRODUCTS - COMP/OP AGG	$ 1,000,000
					PERSONAL & ADV INJURY	$ 1,000,000
					EACH OCCURRENCE	$ 1,000,000
					FIRE DAMAGE (Any one fire)	$ 1,000,000
					MED EXP (Any one person)	$ 5,000
A	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] ALL OWNED AUTOS [ ] SCHEDULED AUTOS [X] HIRED AUTOS [X] NON-OWNED AUTOS	AS2-141-037577-058	1/1/98	1/1/99	COMBINED SINGLE LIMIT	$ 1,000,000
					BODILY INJURY (Per person)	$
					BODILY INJURY (Per accident)	$
					PROPERTY DAMAGE	$
	GARAGE LIABILITY [ ] ANY AUTO				AUTO ONLY - EA ACCIDENT	$
					OTHER THAN AUTO ONLY:	
					EACH ACCIDENT	$
					AGGREGATE	$
	EXCESS LIABILITY [ ] UMBRELLA FORM [ ] OTHER THAN UMBRELLA FORM				EACH OCCURRENCE	$
					AGGREGATE	$
						$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY THE PROPRIETOR/ PARTNERS/EXECUTIVE OFFICERS ARE: [X] INCL [ ] EXCL	WC7-141-037577-018	1/1/98	1/1/99	[X] WC STATUTORY LIMITS [ ] OTHER	
					EL EACH ACCIDENT	$ 500,000
					EL DISEASE - POLICY LIMIT	$ 500,000
					EL DISEASE - EA EMPLOYEE	$ 500,000
	OTHER					

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

HNTB Job 25768; Arapaho Road Extension - Phase II/III

Additional Insured: Town of Addison as respects general liability and automobile liability.

CERTIFICATE HOLDER

Town of Addison
Public Works Department
P.O. Box 144
Addison, TX 75001

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

Arapaho Rd Phase II/III 3-9-98

Kick-off Meeting:

Dan Becker, Orville Grantham, Ron Whitehead, John, Jeff

Items Discussed:

1. Investigate feasible alternatives
   Grade Separation
   Split roadway – one piece along drainage ditch – elevated ??
   Right turns only @ Midway

2. Lindberg serves as an "alternate" cross town path

3. Buy a piece of the tennis court and old racket ball facility as parking alignment ??
   MBNA is short on parking

4. Ron is concerned with property impacts

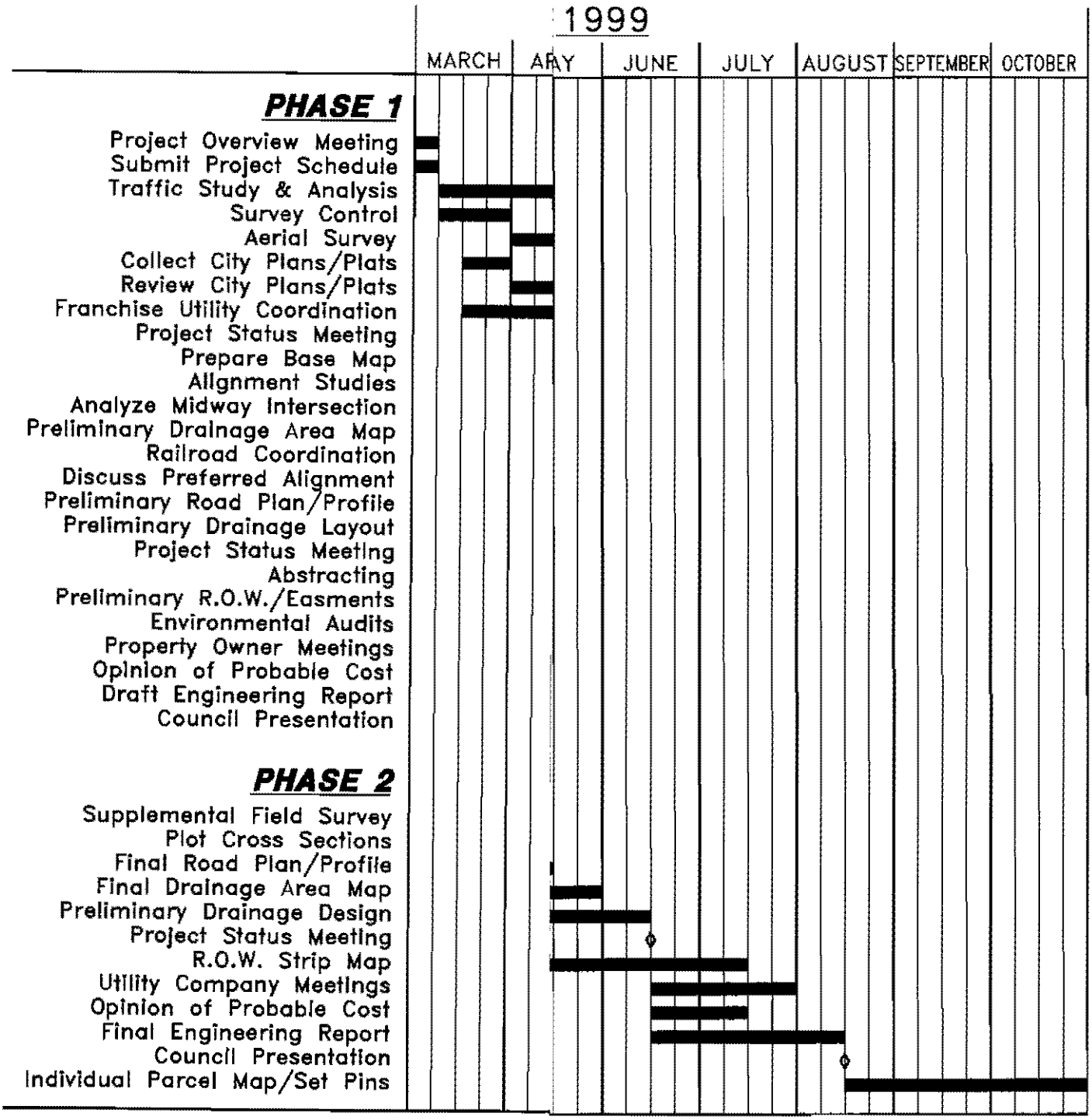
5. Build certain pieces now, where easiest?

3-19-98 – Telecon to Bruce Grantham: Bruce suggests a meeting with John, Jeff Dan & Jack Hatchel to collect traffic info available and outline additional traffic studies needed. I suggested April 3 @ 10 AM

TOWN OF ADDISON

HNTB/GBW/ARS/JH&A

TOWN OF
ADDISON



ARAPAHO ROAD EXTENSION PROJECT SCHEDULE