The Condition of County Roads and City Streets

Developed in Response to
House Bill Number 89
Sixty-Eighth Special Session
of the Texas Legislature

and

Submitted to
The Sixty-Ninth, Regular Session
of the Texas Legislature

Prepared by
The State Department of Highways
on Public Transportation
1984

ADDENDUM

Subsequent to completion of this report, an addendum note has been added to page i, for clarity.

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AUSTIN, TEXAS 78701

ENGINEER-DIRECTOR
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January 30, 1985

IN REPLY REFER TO
FILE NO.

Lieutenant Governor William P. Hobby

Speaker of the House Gibson D. Lewis

As a portion of House Bill 89, Special Session of the Sixty- Eighth Texas Legislature, the State Department of Highways and Public Transportation was requested to assess the condition of city and county roads that feed state highways and to recommend improvements in these roads. A study has been conducted and a report prepared. The report represents information based on available data and reflects the current need for reconstruction and capacity improvements for these facilities.

This report is hereby submitted in accordance with the request in House Bill 89.

Sincerely yours,

Mark Goode

M. G. Goode
Engineer-Director

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EXECUTIVE SUMMARY

The condition of county roads and city streets was assessed using two methods-(1) by questionnaire to the cities and counties and (2) by using Department of Highways and Public Transportation records. There was some discrepancy between the two methods in actual mileage and bridge needs; however, the results were within reason. Therefore, it is suggested that the results of the questionnaire be used to form the basis for needs. The study found the following needs for roads and streets feeding the state highways:

Agency	Mileage in Need of Reconstruction	Bridges in Need of Reconstruction	Funds Needed
City	1346 Miles	82	$153 Million
County	1543 Miles	513	$128 Million
TOTAL	2889 Miles	595	$281 Million

Also, an additional $321 Million should be included for capacity improvement needs in the urban areas for a total funding need of $602 Million.

If the local needs are funded by the legislature, a system should be established to determine if the funds are being used as directed and to report the improvements in road condition. This monitoring system should result in a certifiable, auditable report which would be forwarded annually to the Comptroller of Public Accounts or appropriate state agency.

NOTE
The estimate for road and bridge reconstruction represents a one time cost. Subsequent costs would depend upon future facility deterioration. The funds estimated for capacity improvement in urban areas represent a 1984 cost that could vary each subsequent year.

List of Tables

I. Background

As a result of House Bill 89, Special Session of the 68th Texas Legislature, the Department of Highways and Public Transportation was requested to perform several studies.

One of these studies was to:

> "(2) assess the condition of city and county roads that feed state highways and recommend improvements in these roads."

This report is in response to this request and considers the following items:

- To what degree are additional monies needed by counties and cities and for what specific purpose (that is: rehabilitation or capacity needs).
- An identification of how the city or county would expect to spend the money and an establishment of processes to monitor the expenditure of funds that might be appropriated for this purpose.

It should be noted that the Department of Highways and Public Transportation maintains little information in matters concerned with county or city jurisdiction. Therefore, much of the information contained in this report is based on a statistical interpolation or extrapolation of a small amount of available data.

II. Defining Feeder Systems

Prior to 1917 a system of local roads and streets existed which served specific local areas. When the legislature established the State Highway Department in 1917, the State Highway Engineer was authorized to prepare a comprehensive plan for state highways. Counties and cities still were to maintain road and street systems at a local level. Since that time a system of roads, streets, and highways has been developed to serve the public, not only in local areas but from area to area, with federal interstate connections, etc.

Not all local roads and streets feed into the highway system. Some roads or streets intersect with other roads or streets which do feed into the highway system. In the Federal-aid Highway Act of 1973, Section 148, Congress specified that the classification of all streets and highways be based on functional usage. There are three basic highway functional classifications as follows: (1)

- Arterial - Provides the highest level of service at the greatest speed for the longest uninterrupted distance.

Note: Numbers in parenthesis refer to reference numbers.

° Collector - Provides a less highly developed service at a lessor speed for shorter distances by collecting traffic from local roads and connecting them with arterials.

° Local - Consists of all roads not defined as arterials or collectors. Primarily provides access to abutting land with little or no through movement.

This classification system was used to categorize streets, roads, and highways. The categories overlap into city, county, and state roads and streets. Therefore, the "city and county roads that feed state highways" are defined as the Arterials and Collectors which are explained above. Local roads or streets are not considered as feeding into the state highway system. However, as a matter of information, all (Arterial, Collector, and Local) paved roads and streets are reported separately. Non-paved roads or streets are not considered.

III. Analysis

The analysis is separated into studies of the needs of cities and counties. At the time of the conception of this report, the "Texas Municipal League" had sent a questionnaire concerning reconstruction needs to each incorporated city in the state. The results of that questionnaire were made available to the Department.

After discussions with "Texas Association of Counties" personnel a similar questionnaire was developed and forwarded to each county in the state. The responses of both questionnaires forms the basis of the city and county needs. As a check, Departmental information was used to develop a second needs estimate for both counties and cities. Where possible, roads (or streets) and bridges are considered separately as well as the needs for reconstruction or capacity improvements.

City Needs

Departmental records indicate there are approximately 1110 incorporated cities in the state. There are about 52,200 miles of city maintained streets that are paved. Of this mileage about 5300 miles or 10.2 percent is functionally classified as either arterials or collectors and is considered to be feeding into the state highways.

Questionnaire: Not all of the cities responded to the "Texas Municipal League" questionnaire. However, most of the larger cities did respond and the cities responding constitute the majority of mileage, bridge, and cost needs. The questionnaire results reveal the following:

(1)	a.	Number of miles of paved city maintained streets.	- 49,421 miles
	b.	Number of miles of city streets in need of major repair.	- 13,199 miles
(2)	a.	Number of city maintained bridges.	- 4,715
	b.	Number of city bridges in need of major repair.	- 807
(3)		Amount budgeted for street and bridge repair or maintenance in 1983-84 fiscal year.	- $194 Million
(4)		Amount budgeted for street and bridge repair or maintenance in 1981-82.	- $191 Million
(5)		If funding were available what is the total amount cities would need to bring all deteriorated streets and bridges up to standard?	- $1.5 Billion

When considering the above, it should be noted that all (arterial, collector and local) paved streets were considered. Also, only deteriorated streets and bridges were considered (for reconstruction). Capacity improvements will also be needed in many of the cities.

Departmental Estimates: The Department is a member of the Metropolitan Planning Organizations in the state which consist of city, county, state and federal personnel oriented toward transportation. Each city or community of cities with a population greater than 50,000 has developed a Metropolitan Planning Organization. These organizations developed detailed "Transportation Improvement Projects" which are updated annually or biannually with an "Annual Element." This Annual Element for each planning organization was used to estimate the reconstruction and capacity needs for the state. An example of an Annual Element for Victoria, Texas, is shown in Appendix B. Additionally, the cities were catagorized into groups by population brackets. The catagories used by the Departments Finance Division were adopted for use in this report. The publication "Texas Local Road Finance Report" contains this information as well as receipt and disbursement information for cities and counties.(2) Examples of this information are shown in Appendices C and E.

The reconstruction and capacity needs for each of the cities involved in the Metropolitan Planning Organizations were summed by catagory and expanded or extrapolated to form an estimate of the city needs for all cities in that group (see Appendix D). Since all cities are not represented by the Metropolitan Planning Organizations, a second procedure was used to extrapolate the needs from the larger cities (involved in Metropolitan Planning) to develop the needs of all cities. This extrapolation is based on the percent of disbursements used in the cities for right of way, engineering, and street construction (see Appendix E). The results of this extrapolation represent an estimate of city needs for street improvements and may be found in Appendix F. Note the capacity improvement needs for cities which were calculated in Appendix F. Some $321 million is needed for capacity improvements.

Using the 10.2 percent value of paved feeder to all paved streets, estimates were made of the needs of all paved streets. A summary of the information developed for cities is in Table I.

Table I

Summary of City Needs

Questionnaire Results				Departmental Estimates			
Feeder Streets		All Paved Streets		Feeder Streets		All Paved Streets	
Mileage	Funds Needed (Millions)	Mileage	Funds Needed (Millions)	Mileage	Funds Needed (Millions)	Mileage	Funds Needed (Millions)
1346	$148	13199	$1455	385	$141	3775	$1382

Note: (1) The mileage in the above table is the paved mileage estimated to be in need of repair.

(2) The funds needed as reported in the "Questionnaire Results" are for streets only and have been reduced from the original questionnaire quantities by an amount estimated to be the bridge portion of the needs. This reduction was accomplished so that Questionnaire and Departmental Estimates can be compared. Bridge need estimates follow.

County Needs

Departmental records show there are 137,000 miles of rural roads in the state but only 25,000 miles are paved. There are several counties which do not have any paved county roads. Some 1,878 miles of the paved roads or 7.6 percent is functionally classified as either arterial or collectors. Actually, no county roads were noted which were classified as arterials.

Questionnaire: At the time this report was written about 55 percent of the counties had responded to the questionnaire which was sent to each county. The response was reasonably representative of the state, therefore, the information recieved was extrapolated to represent all (100%) counties in the state.

A listing of the responses may be found in Appendix G and a summary of this information follows:

° Amount of county maintained paved roads	-	43,398	Miles.
° Amount of paved miles needing major repair	-	20,302	Miles.
° Number of county maintained bridges	-	15,655	
° Number of bridges needing repair	-	6,751	
° Amount needed to bring roads to standard	-	$1,235	Million.
° Amount needed to bring the bridges to standard	-	$ 443	Million.

Some counties apparently misunderstood question number 3 of the questionnaire which asked for funding information on all roads. The intent was to recieve information on all paved roads. Most counties did respond with information on paved roads and no corrections were attempted.

The 7.6 percent factor of paved feeder roads to all paved roads was used to develop information for county roads functionally classified as arterial or collector. The results of this work are shown in Table II.

Departmental Estimates: The Department in conjunction with the Federal Highway Administration is involved in sampling and maintaining a "Highway Performance Monitoring System." This is an automated system which contains a variety of information but is primarily directed toward monitoring the performance of highways. A sample of county roads is also included in the data collection and this sample was used to estimate the reconstruction needs for the counties in the state. A computer program was used to access, process, and summarize the "Highway Performance Monitoring" data. A summary and an example of the printed output may be found in Appendix H. The results indicate the following:

15% of the roads are in deteriorated condition.
66% of the roads are in fair condition.
19% of the roads are in good condition.

Using these percentages and the length of paved arterials and collectors (1878 Miles), mileage needs were determined. By estimating the amount of restoration work needed and the costs associated with this work, state wide information for feeder roads was developed. Then the 7.6 percent value was again used to develop needs estimates for all roads.

Note the capacity needs of county roads have not been included. Historically, major capacity improvement needs have resulted in the roadway being placed on the state system (Farm to Market) and the work funded by the state. For this reason capacity improvements were not listed with the county needs.

The values developed for county roads are revealed in Table II.

Table II

Summary of County Needs

Questionnaire Results				Deparmental Estimates			
Feeder Roads		All Paved Roads		Feeder Roads		All Paved Roads	
Mileage	Funds Needed (Millions)	Mileage	Funds Needed (Millions)	Mileage	Funds Needed (Millions)	Mileage	Funds Needed (Millions)
1543	$94	20302	$1235	1878	$51	24710	$671

Note: (1) The mileage in the above table is the paved mileage estimated to be in need of repair.

(2) Bridges are not considered in the "Funds Needed." Bridge need estimates follow.

Bridges

The questionnaire which was sent to the cities did not distinguish between bridges and roads when the funding questions were considered. However, the questionnaire which was forwarded to the counties was modified slightly to obtain individual estimates of the funding needs of roads and bridges. Departmental records indicate the following approximate numbers:

3,500	bridges in the cities.
13,500	bridges in the counties
16,000	bridges not on the state system.

Questionnaire: The bridge information from the questionnaires has been included in previous information, but a summary for bridges is shown in Table III.

Deparmental Estimates: The Department maintains an automated file of "Bridge Inspection Data." This file contains inventory, condition, and appraisal data on all bridges, over passes and underpasses. The appraisal data has cost information on reconstruction and repair needs of each bridge. This information was used to estimate the reconstruction needs for bridges in cities and counties. A listing of the needs by county was placed in Appendix I and a summary is revealed in Table III.

Table III

Summary of Bridge Needs

for Cities and Counties

Local Government	Questionnaire Results				Departmental Estimates			
	Feeder Roads & Streets		All Paved Roads & Streets		Feeder Roads & Streets		All Paved Roads & Streets	
	Number	Funds Needed (Millions)	Number	Funds Needed (Millions)	Number	Funds Needed (Millions)	Number	Funds Needed (Millions)
City	82	$ 5 *	807	$ 45 *	201	$11	1,970	$111
County	513	$34	6,751	$443 *	866	$46	11,390	$609
TOTAL	595	$39	7,558	$488	1,067	$57	13,360	$720

Note: The cost information shown for city questionnaire results (asterisks) was developed using the number of bridges needing reconstruction as indicated in the questionnaire and a cost of $56,000 needed per bridge for reconstruction. The $56,000 per bridge is the average reconstruction cost needed as found for all city bridges on paved feeders when using departmental bridge files.

IV Results

A summary or comparison of the data developed for this report is shown in Table IV, where cities and counties have been considered along with two estimates of needs. There is some difference between Departmental estimates and the questionnaires in amount of mileage and number of bridges, however, the comparison is within reason. It is recommended that the returns from the questionnaires be used as an assessment of the condition of the county roads and city streets. However, the studies of the cities indicates additional funds are needed for capacity improvements. Therefore, it is further recommended that an additional $321 Million be considered for capacity improvements in urban areas. The funds needed for reconstruction and capacity needs for roads and streets feeding state highways would be $281 Million plus $321 Million or $602 Million.

Some 3.2 billion dollars would be needed to improve all paved road and street systems. As stated previously, there are some 112,000 miles of unpaved county roads in the state. It is estimated that approximately $4.2 billion would be needed to provide a base structure, where needed, and paving on all unpaved county roads.

Table IV

Summary of Data Developed

on Road and Street Systems

for Cities and Counties

Local Government	Questionnaire Results						Departmental Estimates					
	Feeder Roads & Streets			All Paved Roads & Streets			Feeder Roads & Streets			All Paved Roads & Streets		
	Mileage	No. Bridges	Funds (Mil)	Mileage	No. Bridges	Funds (Mil)	Mileage	No. Bridges	Funds (Mil)	Mileage	No. Bridges	Funds (Mil)
City	1,346	82	$153	13,199	807	$1,500	385	201	$152	3,775	1,970	$1,493
County	1,543	513	$128	20,302	6,751	$1,678	1,878	866	$ 97	24,710	11,390	$1,280
TOTAL	2,889	595	$281	33,501	7,558	$3,178	2,263	1,067	$249	28,485	13,360	$2,773

V. Monitoring

Should the legislature fund the local needs, a system for monitoring should be established. Monitoring should determine if the money is being spent as directed by the Legislature and if the desired improvement in road condition is being achieved. The monitoring should be in the form of a certifiable, auditable report from both cities and counties indicating the amount spent and the purpose of the expenditure. The monitoring should be reported to the Comptroller of Public Accounts or an appropriate state agency. The report should contain the program and source of funds as from city or county, state or federal. The following format would be beneficial:

City or County Name

Program	Source		
	City (or County)	State	Federal
Lateral Road Fund	Funds	Funds	Funds
Federal Aid Urban	"	"	"
Monies Made Available by Legislature	"	"	"
Other Readily Identifiable Source (off System Safety Fund)	"	"	"

In addition, the number of miles of roads or streets reconstructed or rehabilitated should be reported along with the cost. Mileage constructed for capacity improvements and bridge improvements should be reported with the associated costs. The following format would be beneficial:

City or County Name

Limits From - To	Number of Bridges	Mileage	Type of Improvement	Costs
Point to Point	___	___	Reconstruct	___
o	o	o	o	o
o	o	o	o	o
o	o	o	o	o
Point to Point	___	___	Capacity	___
o	o	o	o	o
o	o	o	o	o
o	o	o	o	o

References

1. "Highway Functional Classification, A Management Tool," Department of Transportation, Federal Highway Administration, Program Management Division, HHP-15, November 1, 1982.

2. "Texas Local Road Finance Report," State Department of Highways and Public Transportation, Finance Division, 1982.

Appendix A

Examples of Questionnaires

City of _____

Your Name & Title _____

(1) (a) Number of miles of paved (concrete or asphalt) city streets maintained by the city: _____ miles

(b) Number of miles of city streets in need of major repair: _____ miles. NOTE: Please enter the number of miles of deteriorated streets as determined by verifiable engineering studies. Please do not use guesswork, as this will detract from the credibility of our statistics.

(2) (a) Total number of city-maintained bridges in your city: _____

(b) Number of city bridges in need of major repair: _____. NOTE: Please base your response on verifiable engineering studies.

(3) Total amount budgeted by the city for street and bridge repair and maintenance in the current (1983-84) fiscal year: $_____

(4) Total amount budgeted by the city for street and bridge repair and maintenance in fiscal 1981-82: $_____

(5) If the funding were available, what is the total number of dollars your city would have to spend today to bring all of its deteriorated streets and bridges up to standard: $_____. NOTE: Please base your response on verifiable engineering studies.

Please send completed questionnaire to: Texas Municipal League
1020 Southwest Tower
Austin, Texas 78701

County of _____

Your Name & Title_____

(1) (a) Number of miles of paved (concrete or asphalt) county roads maintained by the County: _____miles.

(b) Number of miles of paved county roads in need of major repair:_____ miles.

(2) (a) Total number of county-maintained bridges in your county: _____.

(b) Number of county bridges in need of major repair: _____.

(3) If the funding were available, what is the total number of dollars your county would have to spend today to bring all of its deteriorated roads up to standard: $_____.

(4) If the funding were available, what is the total number of dollars your county would have to spend today to bring all of its deteriorated bridges up to standard: $_____.

Note: In formulating the above information, please use verifiable studies. Engineering estimates would be appropriate.

Please send completed questionnaire to: Mr. Phil Wilson
State Department of Highways
and Public Transportation
P. O. Box 5051
Austin, Texas 78763
512-465-7682
Attention: Ken Hankins

Appendix B

Annual Element for Victoria, Texas

Note: Only the projects with the asterisk are totally city financed and are functionally classified. By observing the work to be done, it is possible to determine if the work is to be reconstruction or capacity (lane widening or addition) improvements. In Victoria it was found that:

- Three reconstruction projects were needed totaling $1.897 Million.
- Two capacity improvement projects were needed totaling $1.000 Million.

These values can be observed in Appendix D in relation to the city of Victoria.

PROJECT	DESCRIPTION	LENGTH	FEDERAL AID SYSTEM	FUNCTIONAL CLASSIFICATION	TYPE OF WORK AND PROGRAM STAGE	SPONSOR	FUNDING SOURCE FEDERAL	STATE	LOCAL	TOTAL COST	CONSTRUCTION
Airport-Runway Renovation	H.M.A.C. overlay and porous course Runway 12L-30R	NA	NA	NA	Rehabilitation/Construction	AIRPORT	$2,196,900 FAA		AIRPORT $244,100	$2,441,000	1984
Airport-Apron/Taxi Renovation	H.M.A.C. overlay and porous course Aircraft parking apron and taxiway	NA	NA	NA	Rehabilitation/Construction	AIRPORT	$1,587,600 FAA		AIRPORT $176,400	$1,764,000	1984
Airport-Approach Marker Renovation	Relocate I.L.S. glide slope antenna and approach light system	NA	NA	NA	Reconstruction	AIRPORT	$ 225,000 FAA		AIRPORT $ 25,000	$ 250,000	1984
Airport-Relocate Runway lighting and marking	Relocate runway edge lighting runway striping and marking	NA	NA	NA	Reconstruction	AIRPORT	$ 171,000 FAA		AIRPORT $ 19,000	$ 190,000	1984
Red River Reconattuction Vine to Memorial	Rehab & Reconstruction of existing pavement section	4,150 Mi 0.8	URBAN	ARTERIAL	Reconstruction	CITY — Use			city $50,000	$50,000	1984-85
Ben Wilson Reconstruction U.S. 87 to Airline	Point repair and rebuild and overlay	13,250 2.5	URBAN	ARTERIAL	Reconstruction	CITY — Use			CITY $1,800,000	$1,800,000	1984-85
Airline Reconstruction Ben Wilson to Ben Jordan	Completely rebuild	2,700 0.5	URBAN	ARTERIAL	~~Reconstruction~~ Capacity	CITY — Use			CITY $500,000	$ 500,000	1984-85
Ben Jordan Construction Airline to Crestwood	Completely rebuild	2,800 0.5	URBAN	ARTERIAL	~~Reconstruction~~ Capacity	CITY — Use			CITY $500,000	$ 500,000	1984-85
Rio Grande Reconstruction Ben Wilson to Delmar	Point repair and overlay	2,700 0.5	URBAN	ARTERIAL	Reconstruction	CITY — Use			CITY $ 47,138	$ 47,138	1984-85
Stayton Street Bridge	Bridge replacement	NA	URBAN	ARTERIAL	Replacement	CITY			CITY $ 91,000	$ 91,000	1984-85
Dairy Road Bridge	Bridge replacement	NA	NO	ARTERIAL	Replacement	CITY			CITY $ 65,000	$ 65,000	1984-85
Signalization	New signalization placement	NA	URBAN	ARTERIAL	Construction	CITY			CITY $100,000	$ 100,000	1984-85
Misc. Street Reconstruction	Street, curb and gutter, reconstruction of local network		NO	LOCAL	Rehabilitation/Reconstruction	CITY			CITY $480,956	$ 480,956	1984-85
Misc. Road Reconstruction	Resurface and rebuilding	NA	NO	ARTERIAL	Reconstruction	COUNTY			COUNTY $863,714	$ 863,744	1984-85
Fordtran Road Bridge	Bridge Replacement	NA	NO	ARTERIAL	Replacement	COUNTY			COUNTY $ 30,000	$ 30,000	1984-85
Raab Rd./Spring Cr. Bridge	Bridge Replacement	NA	NO	ARTERIAL	Replacement	COUNTY			COUNTY $ 30,000	$ 30,000	1984-85
Aloe Road Bridge	Bridge Replacement	NA	NO	ARTERIAL	Replacement	COUNTY			COUNTY $ 30,000	$ 30,000	1984-85
U.S. 87 (Goodwin Street) from Navarro to Laurent	Purchase ROW & construct curb and gutter section	0.536	PRIMARY	ARTERIAL	Purchase ROW & Construction	STATE	$ 720,000 FHWA	$ 406,000	CITY $ 81,500	$1,207,500	1985
U.S. 77 from Coleto Creek to 3.4 mi. N. of Refugio	Purchase ROW, Construction, Widen to 4 lane divided	8.400	PRIMARY	ARTERIAL	Purchase ROW/ Construction	STATE	$8,258,000 FHWA	$2,711,000	COUNTY $ 41,000	$11,010,000	1984-85
FM 444 from FM 444 to U.S. 77 near Fordtran	Construct 2 lane FM Highway	4.000	SECONDARY	COLLECTOR	Construction	STATE		$ 834,000		$ 834,000	1985
U.S. 87 at Placedo	Purchase ROW & construct 4 lane divided RR, grade separation	1.900	PRIMARY	ARTERIAL	Purchase ROW / construction	STATE	$5,175,000 FHWA	$ 675,000	COUNTY $150,000	$6,000,000	1985
Ben Jordan Street S.P.T.C. Crossing	Warning Devices	NA	URBAN	ARTERIAL	Construction	STATE	$ 81,000 FHWA	$ 4,500	CITY $ 4,500	$ 90,000	1985
Laurent (FM 404) S.P.T.C. Crossing	Warning Devices	NA	URBAN	ARTERIAL	Construction	STATE	$ 79,200 FHWA	$ 4,400	CITY $ 4,400	$ 88,000	1984
Red River S.P.T.C. Crossing	Warning Devices	NA	URBAN	ARTERIAL	Construction	STATE	$ 77,400 FHWA	$ 4,300	CITY $ 4,300	$ 86,000	1984
Navarro S.P.T.C. Crossing	Warning Devices	NA	PRIMARY	ARTERIAL	Construction	STATE	$ 72,000 FHWA	$ 4,000	CITY $ 4,000	$ 80,000	1984
							$18,643,100	$4,643,200	$5,342,008	$28,628,308	

ANNUAL ELEMENT
TRANSPORTATION IMPROVEMENT PROGRAM

Appendix C

Examples of City and County Grouping

Note: Cities have been grouped by population and counties by County Assessed Valuation. A partial list of cities and counties are included as an example.

Examples of County Grouping

Counties (Enumerated in alphabetical order within the various 1980 assessed valuation groups.)

Group #11 (Over $5,000,000,000)

1. Bexar
2. Brazoria
3. Dallas
4. El Paso
5. Galveston
6. Harris
7. Jefferson
8. Pecos
9. Tarrant
10. Travis

Group #12 ($4,999,999,999 to $1,000,000,000)

1. Andrews
2. Bell
3. Calhoun
4. Cameron
5. Chambers
6. Collin
7. Crane
8. Denton
9. Ector
10. Fort Bend
11. Gaines
12. Grayson
13. Gregg
14. Hale
15. Hidalgo
16. Hockley
17. Howard
18. Kleberg
19. Lubbock
20. Matagorda
21. McLennan
22. Midland
23. Montgomery
24. Nueces
25. Orange
26. Potter
27. Randall
28. Refugio
29. Rusk
30. San Patricio
31. Scurry
32. Smith
33. Taylor
34. Victoria
35. Waller
36. Ward
37. Webb
38. Wharton
39. Wichita
40. Winkler
41. Wood
42. Yoakum

Group #13 ($999,999,999 to $500,000,000)

1. Anderson
2. Angelina
3. Bowie
4. Brazos
5. Cherokee
6. Cochran
7. Comal
8. Cooke
9. Crockett
10. Ellis
11. Freestone
12. Gray
13. Guadalupe
14. Harrison
15. Hemphill
16. Henderson
17. Hutchinson
18. Jackson
19. Jim Wells
20. Johnson
21. Kent
22. Liberty
23. Milam
24. Moore
25. Nacogdoches
26. Panola
27. Parker
28. Polk
29. Terry
30. Titus
31. Tom Green
32. Upton
33. Van Zandt
34. Wheeler
35. Williamson
36. Wise

Group #14 ($499,999,999 to $250,000,000)

1. Aransas
2. Archer
3. Atascosa
4. Bastrop
5. Bee
6. Borden
7. Brooks
8. Brown
9. Burleson
10. Caldwell
11. Carson
12. Cass
13. Castro
14. Coke
15. Colorado
16. Coryell
17. Dawson

Note: Group numbers signify categories established by the Federal Highway Administration reporting procedures.

Example of City Grouping

Cities (Listed in alphabetical order within the various population groups, based on 1980 census release PHC80-V-45 dated April, 1980. 14,299,191 Texas Total-Revised)

Group #21
100,000 and Over

City	Population
Amarillo	149,230
Arlington	160,113
Austin	345,496
Beaumont	118,102
Corpus Christi	231,999
Dallas	904,078
El Paso	425,259
Fort Worth	385,164
Garland	138,857
Houston	1,595,138
Irving	109,943
Lubbock	173,979
Pasadena	112,560
San Antonio	785,880
Waco	101,261

Group #22
50,000 to 99,999

Abilene	98,315
Baytown	56,923
Brownsville	84,997
Galveston	61,902
Grand Prairie	71,462
Laredo	91,449
Longview	62,762
McAllen	66,281
Mesquite	67,053
Midland	70,525
Odessa	90,027
Plano	72,331
Port Arthur	61,251
Richardson	72,496
San Angelo	73,240
Tyler	70,508
Victoria	50,695
Wichita Falls	94,201

Group #23
25,000 to 49,999

Bryan	44,337
Carrolton	40,595
College Station	37,272

Group #23 (Cont.)
25,000 to 49,999

City	Population
Del Rio	30,034
Denton	48,063
Duncanville	27,781
Haltom City	29,014
Harlingen	43,543
Hurst	31,420
Killeen	46,296
Kingsville	28,808
Lufkin	28,562
Nacogdoches	27,149
N. Richland Hills	30,592
Paris	25,498
Sherman	30,413
Temple	42,483
Texarkana	31,271
Texas City	41,403

Group #24
10,000 to 24,999

Alice	20,961
Alvin	16,515
Andrews	11,061
Angleton	13,929
Athens	10,197
Balch Springs	13,746
Bay City	17,837
Bedford	20,821
Beeville	14,574
Bellaire	14,950
Belton	10,660
Benbrook	13,579
Big Spring	24,804
Borger	15,837
Brenham	10,966
Brownfield	10,387
Burkburnett	10,668
Brownwood	19,396
Burleson	11,734
Canyon	10,724
Cleburne	19,218
Conroe	18,034
Copperas Cove	19,469

Appendix D

Extrapolations of Reconstruction and Capacity Needs by City Grouping

Note: This expansion was performed to develop needs for all cities in a group based on data from a portion of the cities in that group. For example in Group 21 Cities, information on only 12 of 15 cities was available. So the totals for the 12 cities was multiplied by the ratio of 15/12 or 1.25 to estimate a total for all 15 cities.

Group 21 Cities

Population 100,000 and Over

(Extrapolation Factor $^{15}/_{12}$=1.25)

(Funds in 1000's)

City	Reconstruction Miles	Reconstruction Funds	Capacity Miles	Capacity Funds
Houston	0.50	$ 700	47.76	$102,876
San Antonio	0	0	0	0
El Paso	0	0	0	0
Austin	0	0	0	0
Corpus Christi	4.90	3,141	0.50	350
Dallas/ Ft. Worth	57.70	69,383	44.60	67,668
Amarillo	0	0	5.50	1,235
Lubbock	0	0	3.66	3,465
Beaumont	1.00	1,605	6.83	7,582
Waco	0	0	0	0
Pasadena	3.20	2,674	2.90	3,330
TOTAL	67.30	$77,503	111.75	$186,506
EXPANDED TOTAL	84.13	$96,879	139.69	$233,133

Example: $77,503 X 1.25 = $96,879 which is an estimate of the amount needed for Reconstruction of the 15 Group 21 Cities in $1000's.

Group 22 Cities

Population 50,000 to 99,999

(Extrapolation Factor $^{18}/_{13}$=1.38)

(Funds in 1000's)

City	Reconstruction Miles	Reconstruction Funds	Capacity Miles	Capacity Funds
San Angelo	5.00	$ 1,850	4.20	$ 1,800
Tyler	0	0	7.98	8,447
McAllen, Pharr, and Edinburg	15.40	4,210	7.20	4,332
Brownsville	0	0	1.10	812
Wichita Falls	0	0	1.50	760
Abilene	0	0	0.50	232
Odessa	0	0	0	0
Midland	0	0	0	0
Laredo	2.70	860	1.10	630
Longview	0	0	1.94	2,164
Victoria	3.80	1,897	1.00	1,000
TOTAL	26.90	$ 8,817	26.52	$20,177
EXPANDED TOTAL	37.12	$12,167	36.60	$27,844

Group 23 Cities

Population 25,000 to 49,999

(Funds in $1000's)

(Extrapolation Factor=19/9=2.11)

City	Reconstruction Miles	Reconstruction Funds	Capacity Miles	Capacity Funds
Texarkana	0	$ 0	0.27	$ 354
Sherman/ Denison	0.50	600	0.50	680
Harlingen	0	0	0	0
Bryan/ College Station	1.30	2,515	1.00	2,600
Killeen	0	0	0	0
Temple	0	0	0	0
Texas City	1.20	300	2.40	825
TOTAL	3.00	$3,415	4.17	$4,459
EXPANDED TOTAL	6.33	$7,206	8.80	$9,408

Group 24 Cities

Population 10,000 to 24,999

(Funds in $1000's)

(Extrapolation Factor=99/4=24.75)

City	Reconstruction Miles	Reconstruction Funds	Capacity Miles	Capacity Funds
Nederland	0.25	$ 400	0	$ 0
Orange	0	0	0.25	100
San Benito	0	0	0	0
Belton	0	0	0.80	600
TOTAL	0.25	$ 400	1.05	$ 700
EXPANDED TOTAL	6.19	$9,900	25.99	$17,325

Appendix E

Examples of City and County

Disbursements by Group

Note: Observe the Group 21 information under Purpose of Disbursements, City Streets, Regular Street or Road Funds.

Then Find: Right of Way - 2,522,169
Engineering - 25,003,180
Construction - 101,629,475

These values were summed (129,154,824) to form a factor representing Group 21 cities. A similar calculation was performed for other groups with the following results:

Group 21	$129,154,824	- 57.0%
Group 22	30,303,468	- 13.4%
Group 23	15,858,521	- 7.0%
Group 24	27,788,172	- 12.2%
Group 25	14,503,591	- 6.4%
Group 26	4,139,976	- 1.8%
Group 27	4,945,376	- 2.2%
TOTAL	$226,693,928	- 100.0%

The percentages shown above were used as extrapotation factors in Appendix F.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
TRANSPORTATION PLANNING DIVISION

UNIT TOTAL GROUP #21 CITIES FISCAL YEAR 1982 NO. 15 CITIES

PURPOSE OF DISBURSEMENTS			LINE	1. REGULAR STREET OR ROAD FUNDS	2. PARKING FACILITIES	3. ALLIED STREET FUNCTIONS A. SIDEWALKS	B. STREET CLEANING	C. STREET LIGHTS	D. STORM SEWERS	TOTAL	LINE
CAPITAL OUTLAY	STATE HIGHWAYS	RIGHT-OF-WAY	31	2796,169							31
		ENGINEERING	32								32
		CONSTRUCTION	33	94580							33
	COUNTY ROADS	RIGHT-OF-WAY	34								34
		ENGINEERING	35								35
		CONSTRUCTION	36								36
	CITY STREETS	RIGHT-OF-WAY	37	2522,169	664,785						37
		ENGINEERING	38	25,003,180	110,933						38
		CONSTRUCTION	39	101,629,475	1564,211	7053,271	874 319	1532, 671	33789,789	43250,050	39
MAINTENANCE	STATE HIGHWAYS	REGULAR MAINTENANCE	40		36,650						40
		TRAFFIC SERVICES	41	8635,303							41
	COUNTY ROADS	REGULAR MAINTENANCE	42								42
		TRAFFIC SERVICES	43								43
	CITY STREETS	REGULAR MAINTENANCE	44	57401,301	1,475.826	179	9354,505	25,610,233	5587,537	40552,454	44
		TRAFFIC SERVICES	45	15,973,591							45
GENERAL ADMINISTRATIVE EXPENSES		OPERATING FUNDS	46	15827,916	226,684		750,594	45528	1089,138	1885,260	46
TRAFFIC POLICE		COST OF REGULATING TRAFFIC	47	124,610,771	2793,359						47
DEBT SERVICE	BONDS	PRINCIPAL PAID	48	38,331,692	275,000	3750		30,974	9698,203	9,732,927	48
		INTEREST & ADMIN.	49	46,268,283	924,063	239		7860	8910,154	8918,253	49
	NOTES	PRINCIPAL PAID	50								50
		INTEREST & ADMIN.	51								51
REIMBURSEMENTS TO STATE		TRUST FUND # 927	52	8118,910							52
		OTHER	53								53
REIMBURSEMENTS TO COUNTIES			54	78061							54
REIMBURSEMENTS TO CITIES			55								55
DISBURSEMENTS & TRANSFERS FOR NON-ROAD PURPOSES			56		26,049,027						56
TOTAL DISBURSEMENTS			57	447,291,401	34,120,538	7,057,439	10,979,418	27,227,266	59,074,821	104,338,944	57
ENDING CASH BALANCES		OPERATING AND CONSTRUCTION FUNDS	58	228,903,484	21,106,145				41,591,374	41,591,374	58
		INTEREST AND SINKING FUNDS	59	53,207	2522,211				763,065	763,065	59
TOTAL FUNDS ACCOUNTED FOR			60	676,248,092	57,748,894	7057,439	10979,418	27227,266	101,429,260	146,693,383	60
DEBT OUTSTANDING	BONDS	BEGINNING BALANCE	61	828,671,737	23,123,899					204,042,082	61
		ENDING BALANCE	62	864,760,045	22,848,899					196,059,155	62
	NOTES	BEGINNING BALANCE	63								63
		ENDING BALANCE	64								64
MEMO		REFUNDING BONDS ISSUED AND RETIRED	65								65
		REFUNDING NOTES ISSUED AND RETIRED	66								66

FORM 535B. FINANCIAL SECTION 1983 REV. FILE 10.444

State Department of Highways and Public Transportation
Transportation Planning Division

TOTAL 254 COUNTIES ROAD FUNDS 1982

File 10.424

Purpose of Disbursements			Line	No. of Counties / County Assessed Valuations Group: 10 over 5000 #11	42 5,999-1,000 #12	36 999-500 #13	79 499-250 #14	37 249-150 #15	25 149-100 #16	25 less than 100 #17	Total 254 Counties	Line
Capital Outlay:	State Highways:	Right-of-Way	31	30175,244	4728,758	3067,343	3794,385	618,118	374,250	145,021	42903,119	31
		Engineering	32									32
		Construction	33									33
	County Roads:	Right-of-Way	34	9905,758	101969	40073	53848	3700	67949	2534	10175,831	34
		Engineering	35	10954,145	1082,637	82,431	53,286	7226	31309	15,238	12,226,272	35
		Construction	36	73,744911	19793,809	10159,916	11039,790	3,617,388	1062,637	378,481	119496,932	36
	City Streets:	Right-of-Way	37									37
		Engineering	38	107,587			4451				112,038	38
		Construction	39	930,711		213,248		2258			1146,217	39
Maintenance	State Highways:	Regular Maintenance	40									40
		Traffic Services	41									41
	County Roads:	Regular Maintenance	42	50290,651	54875,262	30570,207	38,981,445	13797,641	5780,790	3539,728	197,835,674	42
		Traffic Services	43	132,725	110,808	13,832	13,807	540	415		272,127	43
	City Streets:	Regular Maintenance	44	149,805	27,990	5467					183,262	44
		Traffic Services	45		101,964						101,964	45
General Administrative Expenses:		Operating Funds	46	8,587,810	12,036,791	6118,412	9862,615	3517,777	1670,268	1357,804	43,146,477	46
Traffic Police:		Cost of Regulating Traffic	47	6908,084	147,915	222,132	109,662	85,547	13,282	18,116	7504,738	47
Debt Service:	Bonds:	Principal Paid	48	28,063,000	3,237,688	1126,990	2905,283	528,803	206,861	103,343	36,166,968	48
		Interest & Admin.	49	24,762,534	1243,062	379,943	976,168	66,810	81,815	57,811	27,568,143	49
	Notes:	Principal Paid	50		613,312	250,865	355,969	171,161	203,591	35,000	1629,898	50
		Interest & Admin.	51		64,331	36,145	57,085	9331	7842	2265	178,999	51
Reimbursements to State:		Trust Fund # 927	52	12041,029	466,074	702,241	276,353	14,118	32,050	52,225	13,584,090	52
		Other:	53									53
Reimbursements to Counties			54		28261						28,261	54
Reimbursements to Cities			55									55
Disbursements & Transfers for Non-Road Purposes			56	2006,809	2,774,349	911,702	2284,581	325,724	369,532	186,895	8,859,592	56
TOTAL DISBURSEMENTS			57	258,460,803	101,431,980	53,895,947	70,768,728	22,766,142	9902,541	5,894,461	523,120,602	57
Ending Cash Balances:	Operating and Construction Funds		58	253,554,795	45,530,185	21,735,608	32,180,556	10,215,010	4218,122	2,788,116	370,222,392	58
	Interest and Sinking Funds		59	48,095,784	8,975,571	2,628,678	2,790,310	192,713	471,892	139,038	63,293,986	59
TOTAL FUNDS ACCOUNTED FOR			60	560,111,382	155,937,736	78,260,233	105,739,594	33,173,865	14,592,555	8,821,615	956,636,780	60
Debt Outstanding:	Bonds:	Beginning Balance	61	384,173,000	25,752,027	8361,205	15,450,470	1109,198	1385,392	551,921	436,783,213	61
		Ending Balance	62	462,210,000	22,730,835	8028,188	14,181,239	4,117,707	1237,708	549,288	513,054,965	62
	Notes:	Beginning Balance	63		613,312	231,124	350,643	241,942	256,041	35,000	1728,062	63
		Ending Balance	64		326,812	151,926	130,712	172,798	52,450	71,850	906,548	64
MEMO: Refunding Bonds Issued and Retired			65									65
Refunding Notes Issued and Retired			66									66

Appendix F

Group Extrapolation for Cities to Estimate City Street Needs

Group Extrapolation

Based on Annual Element

	Reconstruction Miles	Reconstruction Funds (Millions)	Capacity Miles	Capacity Funds (Millions)	% Spent on City Streets (Finance Report)	No. Cities
Group 21	84.13	$ 96.879	139.69	$233.133	57.0	15
Group 22	37.12	12.167	36.60	27.844	13.4	18
Group 23	6.33	7.206	8.80	9.408	7.0	19
Group 24	6.19	9.900	25.99	17.325	12.2	99
Group 25	(9.56)	(9.012)	(15.08)	(20.551)	6.4	103
Group 26	(2.69)	(2.534)	(4.24)	(5.780)	1.8	159
Group 27	(3.28)	(3.097)	(5.18)	(7.064)	2.2	697
PARTIAL TOTAL	133.77	$126.152	211.08	$287.710	89.6%	
TOTAL	149.30	$140.795	235.58	$321.105	100 %	1110

Note: The numbers in parenthesis were calculated using the percentages given in the finance report. Example - $321.105 X 0.064=$20.551.

Funds Needed - Total Urban $140.795 For Reconstruction
321.105 For Capacity Improvements
$461.900 TOTAL

Appendix G

Questionnaire Returns of Texas Counties

	No. Paved Miles	Miles Need Repair	No. Bridges	No. Bridge Need Repair	Fund Needs For Roads	Fund Needs For Bridges	Possible Misinterpr. of Questionnaire
ANDERSON	600.00	300.00	110	86	11,208,000	1,082,000	X
ANDREWS	220.00	47.00	0	0	1,000,000	0	
ANGELINA							
ARANSAS							
ARCHER							
ARMSTRONG							
ATASCOSA							
AUSTIN	203.60	67.00	175	104	3,750,000	748,000	
BAILEY	35.75	35.75	2	2	2,323,750	200,000	
BANDERA	72.05	60.00	4	4	475,200	16,000	
BASTROP	209.60	102.00	122	61	400,000	4,200,000	
BAYLOR							
BEE							
BELL	525.00	262.00	150	80	1,310,000	8,418,000	
BEXAR							
BLANCO	37.60	26.00	1	1	600,000	UNKNOWN	
BORDEN	87.00	12.00	3	3	75,000	20,000	
BOSQUE							
BOWIE							
BRAZORIA	635.00	356.00	89	47	17,800,000	4,700,000	
BRAZOS	110.00	75.00	75	40	8,250,000	4,000,000	
BREWSTER							
BRISCOE	2.00	2.00	5	3	5,000	1,000	
BROOKS							
BROWN							
BURLESON	54.00	2.00	51	25	10,850,000	3,950,000	X
BURNET	317.20	118.50	9	9	1,881,400	789,600	
CALDWELL							
CALHOUN	202.90	70.40	28	7	729,000	105,000	X
CALLAHAN							
CAMERON	165.00	53.00	43	19	2,650,000	1,425,000	
CAMP	0	0	0	0	0	0	
CARSON	15.00	10.50	18	10	247,500	54,000	
CASS	34.00	28.00	21	16	300,000	4,000,000	
CASTRO							
CHAMBERS							
CHEROKEE							

HBO (ss)

	No. Paved Miles	Miles Need Repair	No. Bridges	No. Bridges Need Repair	Fund Needs For Roads	Fund Needs for Bridges	Possible Misinterpr. of Questionnaire
CHILDRESS	0	0	64	17	900,000	795,000	0
CLAY							
COCHRAN	48.00	10.00	0	0	100,000	0	
COKE	76.20	24.50	15	10	455,000	224,000	
COLEMAN	1.00	.25	12	4	5,000	50,000	
COLLIN	150.00	20.00	140	50	792,000	6,500,000	
COLLINGSWORTH	0	0	36	16		37,209	
COLORADO	472.00	253.00	283	48	2,530,000	2,400,000	X
COMAL							
COMANCHE	12.00	12.00	110	107	800,000	5,350,000	
CONCHO	0	0	6	0	0	0	
COOKE	16.00	2.00	155	82	8,000,000	4,000,000	
CORYELL	100.00	25.00	10	10	25,000	4,000,000	
COTTLE							
CRANE	69.70	30.00	0	0	75,000	0	
CROCKETT	217.00	0	2	0	0	0	
CROSBY	42.20	42.20	4	0	379,800	0	
CULBERSON							
DALLAM							
DALLAS	193.92	39.90	73	53	2,845,000	9,890,000	
DAWSON							
DEAF SMITH	55.70	35.70	13	6	1,650,000	780,000	
DELTA							
DENTON							
DEWITT	331.10	115.00	122	19	1,332,000	2,022,000	X
DICKENS							
DIMMIT							
DONLEY	0	0	13	10	2,000,000	400,000	0
KENEDY							
DUVAL							
EASTLAND	21.80	21.00	69	37	3,880,000	2,880,000	
ECTOR	282.90	22.80	1	0	5,933,579	0	X
EDWARDS	0	0	0	0	0	0	
ELLIS	760.00	465.00	160	76	15,200,000	2,120,000	
EL PASO	380.00	80.00	35	4	1,440,000	250,000	
ERATH							
FALLS	697.00	19.20	273	136	115,000	2,000,000	
FANNIN							
FAYETTE							
FISHER	2.00	2.00	31	22			
FLOYD	17.50	17.50	3	3	1,500,000	80,000	
FOARD	0	0	60	20	0	350,000	

	No. Paved Miles	Miles Need Repair	No. Bridges	No. Bridges Need Repair	Fund Needs For Roads	Fund Needs for Bridges	Possible Misinterpr. of Questionnaire
FORT BEND	347.21	128.80	157	145	7,084,000	7,723,876	X
FRANKLIN							
FREESTONE							
FRIO							
GAINES							
GALVESTON							
GARZA							
GILLESPIE	485.90	96.00	35	10	650,000	850,000	
GLASSCOCK							
GOLIAD							
GONZALES	18.00	18.00	94	94			
GRAY	8.00	5.00	17	10	250,000	1,250,000	
GRAYSON							
GREGG							
GRIMES							
GUADALUPE	362.00	150.00	50	20	1,000,000	500,000	
HALE	25.00	22.00	6	3	250,000	40,000	
HALL	0	0	32	6	70,000	175,000	0
HAMILTON	10.00	10.00	55	16	100,000	34,500	
HANSFORD	78.00	38.00	31	3	300,000	100,000	
HARDEMAN	0	0	40	22	0	300,000	
HARDIN							
HARRIS							
HARRISON	609	345	87	52	27,400,000	3,285,000	
HARTLEY	0	0	1	1		15,000	
HASKELL							
HAYS							
HEMPHILL	1.5	0.5	15	13	33,900	1,500,000	
HENDERSON	263.0	263.0	34	34	5,500,000	202,000	
HIDALGO							
HILL							
HOCKLEY	158.00	31.00	0	0	100,000	0	
HOOD							
HOPKINS	0	454.00	296	140	4,092,636	506,000	0
HOUSTON							
HOWARD	252.00	5.00	5	1	50,000	100,000	
HUDSPETH	0	0	0	0	200,000	0	0
HUNT							
HUTCHINSON							

	No. Paved Miles	Miles Need Repair	No. Bridges	No. Bridges Need Repair	Fund Needs For Roads	Fund Needs for Bridges	Possible Misinterpr. of Questionnaire
IRION	4.50	3.00	6	6	100,000	180,000	
JACK							
JACKSON							
JASPER	168.00	85.00	26	18	1,100,000	360,000	
JEFF DAVIS	6.00	6.00	0	0	0	0	
JEFFERSON	282.40	71.00	96	22	4,260,000	4,000,000	
JIM HOGG							
JIM WELLS	450.00	150.00	30	10	4,000,000	2,000,000	X
JOHNSON							
JONES	0	0	44	25		4,000,000	
KARNES							
KAUFMAN							
KENDALL							
KENEDY	7.00	7.00	0	0	280,000	0	
KENT	15.00		13	0			
KERR	305.40	75.9	28	18	10,846.000	7,858.000	
KIMBLE	1.00	0	20	10	350,000	150,000	
KING							
KINNEY	0	0	8	6	48,500	65,000	
KLEBERG	105.70	2.20	3	0	109,390	0	
KNOX	14.40	14.40	20	13	160,000	20,000	
LAMAR							
LAMB	49.10	49.10	2	2	46,645	5,000	
LAMPASAS	121.20	47.00	12	8	303,250	1,450,000	
LA SALLE							
LAVACA	112.50	80.80	126	53	1,330,000	3,200,000	
LEE							
LEON							
LIBERTY	347.00	263.00	116	78	9,205,000	868,000	
LIMESTONE	10.00	8.00	163	13	2,000,000	800,000	
LIPSCOMB							
LIVE OAK							
LLANO							
LOVING	0	0	0	0	0	0	
LUBBOCK	235.00	35.00	0	0	954,500	0	
LYNN	12.00	12.00	0	0	1,200,000	0	
MADISON	20.00	17.00	51	15	4,800,000	150,000	

	No. Paved Miles	Miles Need Repair	No. Bridges	No. Bridges Need Repair	Fund Needs For Roads	Fund Needs for Bridges	Possible Misinterpr. of Questionnaire
MARTIN							
MASON	5.00	3.00	13	8	3,750,000	1,400,000	
MATAGORDA							
MAVERICK	138.00	65.10	11	3	12,718,000	1,200,000	X
MC CULLOUGH	11.00	8.00	14	4	750,000	185,000	
MC LENNAN	293.00	146.00	290	81	1,460,000	4,050,000	X
MC MULLEN							
MEDINA							
MENARD							
MILAND	350.00	175.00	0	0	5,250,000	0	X
MILAM							
MILLS	0	0	16	16	1,200,000	630,000	0
MITCHELL							
MONTAGUE							
MONTGOMERY	848.00	721.00	128	53	57,680,000	7,400,000	
MOORE	130.00	90.00	5	0	123,819	0	
MORRIS							
MOTLEY							
NACOGDOCHES	152.00	140.00	77	61	33,000,000	770,000	X
NAVARRO	58.00	29.00	324	160	6,800,000	1,900,000	
NEWTON	54.40	28.00	80	25	15,000,000	125,000	
NOLAN							
NUECES	440.00	40.00	68	30	2,815,000	1,000,000	
OCHILTREE							
OLDHAM							
ORANGE							
PALO PINTO							
PANOLA							
PARKER	682.99	272.08	184	19	3,813,000	1,435,000	
PARMER							
PECOS							
POLK							
POTTER	400.00	200.00	1	1	1,400,000	25,000	X
PRESIDIO	0	0	1	1	1,000,000	100,000	0
RAINS							
RANDALL	136.00	82.40	10	10	4,556,720	830,000	
REAGAN	15.90	15.30	0	0	369,163	0	
REAL							

	No. Paved Miles	Miles Need Repair	No. Bridges	Bridges Need Repair	Fund Needs For Roads	Fund Needs for Bridges	Possible Misinterpr. of Questionnaire
RED RIVER	0	0	297	70	4,650,000	390,000	0
REEVES							
REFUGIO							
ROBERTS	-	-	1	-	-	-	
ROBERTSON							
ROCKWALL	72.40	36.20	9	9	470,000	216,000	
RUNNELS	32.50	18.00	35	19	1,750,000	2,100,000	
RUSK	571.00	43.00	184	69	5,917,416	1,175,000	X
SABINE	39.80	35.00	47	20	1,636,500	152,000	
SAN AUGUSTINE	20.00	20.00	27	20	500,000	80,000	
SAN JACINTO							
SAN PATRICIO							
SAN SABA	23.00	23.00	20	20	1,150,000	2,000,000	
SCHLEICHER	28.00	6.00	0	0	385,000		
SCURRY	268.00	49.00	27	10	1,320,000	1,200,000	
SHACKELFORD	2.00	2.00	?	11	15,840	1,444,000	
SHELBY							
SHERMAN	60.00	47.00	5	4	329,000	96,000	
SMITH	210.00	160.00	180	30	12,800,000	1,800,000	
SOMERVELL							
STARR							
STEPHENS							
STERLING	0	0	1	1	0		
STONEWALL	1.75	1.75	58	10	1,080,000	100,000	
SUTTON							
SWISHER	7.50	5.00	7	5	100,000	125,000	
TARRANT	523.00	110.00	49	4	1,000,000	1,500,000	
TAYLOR	175.00	40.00	41	17	500,000	2,400,000	
TERRELL							
TERRY	86.00	60.00	0	0	600,000	600,000	
THROCKMORTON	1.20	1.20	2	0	25,365	0	
TITUS	456.00	298.00	53	35	7,450,000	3,500,000	X
TOM GREEN	301.90	282.00	40	22	4,722,000	1,302,492	
TRAVIS	1103.00	345.00	159	93	186,571,123	32,384,616	
TRINITY							
TYLER	60.00	40.00	93	60	6,000,000	8,000,000	
UPSHUR	37.00	37.00	40	25	10,500,000	5,000,000	

	No. Paved Miles	Miles Need Repair	No. Bridges	No. Bridges Need Repair	Fund Needs For Roads	Fund Needs for Bridges	Possible Misinterpr. of Questionnaire
UPTON	65.20	24.10	0	0	335,000	0	
UVALDE	68.00	68.00	4	2	832,000	100,000	
VAL VERDE	50.00	41.00	20	20	492,000	500,000	
VAN ZANDT	1445.00	1000.00	500	100	4,000,000	1,000,000	
VICTORIA	436.30	213.30	94	24	9,065,000	1,200,000	
WALKER	70.00	32.00	54	16	7,000,000	632,000	
WALLER							
WARD							
WASHINGTON							
WEBB	52.00	30.00	100	80	1,200,000	1,000,000	
WHARTON	267.00	84.80	465	144	40,140,323	12,538,480	
WHEELER	0	0	56	7	0	69,000	
WICHITA							
WILBARGER	88.50	70.00	132	62	614,000	365,000	
WILLACY							
WILLIAMSON	1,101.00	535.00	316	220	13,500,000	21,000,000	
WILSON							
WINKLER	112.50	52.00	0	0	184,500	0	
WISE							
WOOD							
YOAKUM							
YOUNG							
ZAPATA	8.00	5.00	1	1	150,000	20,000	
ZAVALA							
TOTAL FOR 55.1%	23,912.37	11,186.13	8626	3720	680,657,707	244,230,773	
EXPANDED TO 100%	43,398.13	20,301.51	15655	6751	1,235,314,000	433,250,000	

HB5 (ss)

Appendix H

Summary and Example of the Output

From the HPMS Study of County Roads

Highway Performance

Monitoring System

Sample of

Rural Roads

HPMS Sample of Paved Feeder Roads (Arterial & Collector)

Classification	Miles Considered in HPMS Sample		Mileage in Deteriorated Cond.		Mileage in Fair Cond.		Mileage in Good Cond.	
	Miles	%	Miles	%	Miles	%	Miles	%
Rural Major Collector	119	20	0	0	119	100	0	0
Rural Minor Collector	474	80	90	19	271	57	113	24
TOTAL	593	100	90	15	390	66	113	19

All Paved Feeder Roads (Arterials & Collectors)
(Using the percentages in the above table and the amount of paved feeder roads in the counties - 1878 Miles - the following table was formed.)

Classification	Miles Considered		Mileage in Deteriorated Cond.		Mileage in Fair Cond.		Mileage in Good Cond.	
	Miles	%	Miles	%	Miles	%	Miles	%
Rural Major Collector	376	20	0	0	376	100	0	0
Rural Minor Collector	1,502	80	285	19	856	57	361	24
TOTAL	1,878	100	285	15	1,232	66	361	19

The following reconstruction costs were assumed and assigned to the road needs based on Classification and condition. The costs were developed using current construction costs for specific reconstruction techniques and verified by calls and discussions with county personnel:

Rural Major Collector-Deteriorated=$100,000/Mi-Fair $30,000/Mi
Rural Minor Collector-Deteriorated= 50,000/Mi-Fair 30,000/Mi

Using these cost and mileages the following funding needs were developed:

Rural Major Collectors-Deteriorated	$ 0
Rural Major Collectors-Fair	11,280,000
Rural Minor Collectors-Deteriorated	14,250,000
Rural Minor Collectors-Fair	25,680,000
TOTAL	$51,210,000

1983 RURAL MILEAGE AND TRAVEL (IN THOUSANDS)
BY PAVEMENT CONDITION AND PAVEMENT TYPE

TEXAS

RURAL

MINOR COLLECTOR

	HIGH MILES	%	INTERMEDIATE MILES	%	LOW MILES	%	TOTAL MILES	%		
PAVED¤										
UNDER 1.0	0	0.0	0	0.0	0	0.0	0	0.0	*	
1.0 - 1.4	0	0.0	0	0.0	56	13.3	56	11.8	*DETERIORATED	19.0%
1.5 - 1.9	0	0.0	0	0.0	34	8.2	34	7.2	*	
2.0 - 2.4	0	0.0	0	0.0	172	40.9	172	36.3	*	
2.5 - 2.9	0	0.0	0	0.0	45	10.7	45	9.5	*FAIR	57.1%
3.0 - 3.4	54	100.0	0	0.0	0	0.0	54	11.4	*	
3.5 - 3.9	0	0.0	0	0.0	24	5.6	24	5.0	*	
4.0 - 4.5	0	0.0	0	0.0	89	21.2	89	18.8	*GOOD	23.8%
OVER 4.5	0	0.0	0	0.0	0	0.0	0	0.0	*	
TOTAL PAVED	54	100.0	0	0.0	420	100.0	474	100.0		
UNPAVED¤										
GRAVEL	*******	***.*	*******	***.*	*******	***.*	55	100.0		
GRADED & DRAINED	*******	***.*	*******	***.*	*******	***.*	0	0.0		
UNIMPROVED	*******	***.*	*******	***.*	*******	***.*	0	0.0		
TOTAL UNPAVED	*******	***.*	*******	***.*	*******	***.*	55	100.0		
T O T A L	*******	***.*	*******	***.*	*******	***.*	529	***.*		

	DVMT	%	DVMT	%	DVMT	%	DVMT	%		
PAVED¤										
UNDER 1.0	0	0.0	0	0.0	0	0.0	0	0.0	*	
1.0 - 1.4	0	0.0	0	0.0	3	1.8	3	1.6	*DETERIORATED	20.9%
1.5 - 1.9	0	0.0	0	0.0	31	21.5	31	19.3	*	
2.0 - 2.4	0	0.0	0	0.0	35	24.4	35	21.8	*	
2.5 - 2.9	0	0.0	0	0.0	46	32.6	46	29.2	*FAIR	61.6%
3.0 - 3.4	17	100.0	0	0.0	0	0.0	17	10.6	*	
3.5 - 3.9	0	0.0	0	0.0	13	8.9	13	7.9	*	
4.0 - 4.5	0	0.0	0	0.0	15	10.8	15	9.6	*GOOD	17.6%
OVER 4.5	0	0.0	0	0.0	0	0.0	0	0.0	*	
TOTAL PAVED	17	100.0	0	0.0	142	100.0	158	100.0		
UNPAVED¤										
GRAVEL	*******	***.*	*******	***.*	*******	***.*	15	100.0		
GRADED & DRAINED	*******	***.*	*******	***.*	*******	***.*	0	0.0		
UNIMPROVED	*******	***.*	*******	***.*	*******	***.*	0	0.0		
TOTAL UNPAVED	*******	***.*	*******	***.*	*******	***.*	15	100.0		
T O T A L	*******	***.*	*******	***.*	*******	***.*	173	***.*		

Appendix I

Bridge Information from Departmental Bridge Files

BRIDGE INFORMATION FROM DEPARTMENTAL FILES

COUNTY NAME	Urban Bridges Brinsap <50		Rural Bridges Brinsap <50		Urban Bridges Brinsap 50-80		Rural Bridges Brinsap 50-80	
	No	Cost	No	Cost	No	Cost	No	Cost
ANDERSON	5	214	86	1,924			2	0
ANDREWS								
ANGELINA	6	304	112	2,257	3	38	8	21
ARANSAS								
ARCHER			21	696			8	180
ARMSTRONG							1	16
ATASCOSA			17	440			5	36
AUSTIN	1	250	156	43,327			10	2,331
BAILEY								
BANDERA	1	31	3	70			1	30
BASTROP	4	800	78	6,415	3	127	18	1,293
BAYLOR			5	265	2	171	2	21
BEE	1	37	12	815	3	52	8	143
BELL	4	1,329	77	11,234	13	2,103	30	1,782
BEXAR	30	2,137	9	511	105	5,478	21	1,163
BLANCO			2	514	1	48	2	94
BORDEN							3	439
BOSQUE	2	160	23	4,645			10	578
BOWIE	5	350	146	3,916	2	0	5	336
BRAZORIA	18	1,574	70	3,008	30	706	95	1,862
BRAZOS			79	1,970	2	95	6	58
BREWSTER			1	34			1	26
BRISCOE			4	149				
BROOKS			1	81	2	43	3	76
BROWN	1	200	37	2,599	4	123	12	471
BURLESON	1	91	42	973			13	240
BURNET	1	631	8	785	1	169	5	1,244
CALDWELL			42	6,317	2	99	17	1,703
CALHOUN	3	215	10	328	2	21	10	123
CALLAHAN	11	776			1	61	1	42
CAMERON	10	459	12	368	8	68	25	362
CAMP			6	345				
CARSON			7	122			7	90
CASS			10	643			1	7
CASTRO			2	151			1	10
CHAMBERS	1	87	16	1,357			5	472
CHEROKEE	6	71	89	1,989	3	39	7	104
CHILDRESS			20	872			17	239
CLAY			9	373	1	10	2	20
COCHRAN								
COKE			11	331	1	0	7	34
COLEMAN	3	248	24	2,966	4	88	17	486

NOTE:
No=Number of bridges
Cost=Reconstruction cost in thousands of dollars
The numbers <50 and 50-80 are sufficiency ratings with <50 being poor condition, 50-80 fair condition and >80 being good condition.

BRIDGE INFORMATION FROM DEPARTMENTAL FILES

COUNTY NAME	Urban Bridges Brinsap <50		Rural Bridges Brinsap <50		Urban Bridges Brinsap 50-80		Rural Bridges Brinsap 50-80	
	No	Cost	No	Cost	No	Cost	No	Cost
COLLIN	13	454	135	3,665	8	82	13	187
COLLINGSWORTH			32	1,244			3	36
COLORADO			75	2,024	1	14	25	311
COMAL	4	2,219	6	867	1	22	13	1,197
COMANCHE	2	148	100	6,784	1	10	1	43
CONCHO			2	120			3	88
COOKE	1	39	121	3,843	1	0	29	190
CORYELL	1	563	26	5,778			3	165
COTTLE			6	298			22	271
CRANE								
CROCKETT								
CROSBY			3	345			1	0
CULBERSON								
DALLAM	2	0	1	50				
DALLAS	88	3,321	20	943	148	6,485	3	55
DAWSON								
DEAF SMITH			1	32			6	72
DELTA			64	1,544			1	10
DENTON	18	506	58	2,086	25	134	27	193
DEWITT	4	171	50	2,943	2	47	66	955
DICKENS			10	309			5	41
DIMMIT			1	45				
DONLEY	2	47	14	1,398	2	43	1	8
DUVAL			1	49				
EASTLAND			32	2,554			4	96
ECTOR					1	31		
EDWARDS								
ELLIS	11	344			2	85		
EL PASO	11	479	9	264	17	97	5	444
ERATH	2	73	73	2,159	1	27	21	69
FALLS			154	21,891			25	4,142
FANNIN	1	38	192	3,934				
FAYETTE	3	77	169	3,857			9	122
FISHER			42	3,316			30	1,571
FLOYD							1	0
FOARD			14	314	2	12	8	89
FORT BEND	13	1,660	125	16,034	9	230	22	2,581
FRANKLIN			49	957			1	6
FREESTONE			61	1,576			2	22

BRIDGE INFORMATION FROM DEPARTMENTAL FILES

COUNTY NAME	Urban Bridges Brinsap <50		Rural Bridges Brinsap <50		Urban Bridges Brinsap 50-80		Rural Bridges Brinsap 50-80	
	No	Cost	No	Cost	No	Cost	No	Cost
FRIO			10	408			2	20
GAINES								
GALVESTON	36	1,684	3	420	15	223	2	41
GARZA			5	115				
GILLESPIE	1	237	3	552	2	257	12	2,908
GLASSCOCK							2	8
GOLIAD	1	15	23	2,397	2	56	5	21
GONZALES			90	3,112	2	20	2	0
GRAY			15	551	3	66	13	279
GRAYSON	10	147	244	6,023	5	145	11	135
GREGG	13	1,105	19	673	8	282	8	64
GRIMES	3	169	64	1,491	2	69	3	21
GUADALUPE			15	497			3	32
HALE			2	153	1	0	1	24
HALL	1	153	30	1,022			8	78
HAMILTON	2	438	35	8,472	2	502	4	848
HANSFORD							4	0
HARDEMAN			24	1,477			10	43
HARDIN	3	205	51	3,895			13	1,607
HARRIS	150	7,599	212	10,250	340	19,229	200	463
HARRISON	2	0	66	1,426			2	26
HARTLEY			1	98				
HASKELL			6	417			3	188
HAYS			5	727			8	2,235
HEMPHILL			15	792	1	0	2	6
HENDERSON	4	156	67	1,188				
HIDALGO	1	46	44	5,643	4	704	50	3,197
HILL	5	693	189	28,040	5	381	19	1,559
HOCKLEY								
HOOD	1	140	9	460			6	31
HOPKINS	1	16	144	2,444			2	7
HOUSTON			112	3,218			9	65
HOWARD			5	339	1	12	2	91
HUDSPETH			3	45				
HUNT	2	65	140	3,020	5	163	10	117
HUTCHINSON			4	97			7	776
IRION								
JACK			25	551			38	401
JACKSON	2	86	30	1,272	2	15	16	344
JASPER			54	4,046			5	370

BRIDGE INFORMATION FROM DEPARTMENTAL FILES

COUNTY NAME	Urban Bridges Brinsap <50		Rural Bridges Brinsap <50		Urban Bridges Brinsap 50-80		Rural Bridges Brinsap 50-80	
	No	Cost	No	Cost	No	Cost	No	Cost
JEFFERSON	19	1,843	27	3,203	12	635	23	1,765
JIM WELLS			19	921	2	86	8	165
JOHNSON	2	400	63	2,219	6	39	36	66
JONES	1	130	43	3,818	1	42	7	361
KARNES			31	1,468			10	425
KAUFMAN	1	17	71	1,524	1	25	8	125
KENDALL	1	236	10	322	1	209	7	110
KENT			7	631			4	199
KERR	2	1,238	10	613	2	126	9	244
KIMBLE			1	36			2	149
KING			5	214				
KNOX			4	249			7	49
LAMAR	6	181	133	3,084	1	0	5	63
LAMB			1	50				
LAMPASAS			12	906			2	40
LA SALLE			25	708			2	34
LAVACA	2	92	119	5,680			19	327
LEE	1	0	36	5,464			24	2,151
LEON	1	15	68	1,705			4	32
LIBERTY	8	602	84	5,719			8	597
LIMESTONE	1	54	99	13,663	1	63	63	5,948
LIPSCOMB			3	146			4	31
LIVE OAK			13	962			3	65
LLANO	1	166	3	1,094			3	464
LOVING								
LUBBOCK	3	0	2	83	3	27		
LYNN								
MADISON	3	152	34	591				
MARTIN								
MARION			11	789				
MASON	1	169	7	731	4	373	2	578
MATAGORDA	3	142	56	2,865	2	58	31	756
MAVERICK	1	85	6	593	1	72	4	29
MC CULLOUGH			14	1,225			10	363
MC LENNAH	19	2,074	193	31,649	24	3,590	51	3,680
MC MULLEN			15	271				
MEDINA			33	1,445			12	162
MENARD			2	70	1	115		

BRIDGE INFORMATION FROM DEPARTMENTAL FILES

COUNTY NAME	Urban Bridges Brinsap <50		Rural Bridges Brinsap <50		Urban Bridges Brinsap 50-80		Rural Bridges Brinsap 50-80	
	No	Cost	No	Cost	No	Cost	No	Cost
MIDLAND					2	31		
MILAM			122	3,640			3	33
MILLS			13	1,303			2	168
MITCHELL	1	73	18	1,809			3	144
MONTAGUE	2	64	124	3,846			14	51
MONTGOMERY	7	1,162	84	12,210	2	372	14	1,260
MOORE							3	14
MORRIS			12	615			2	0
MOTLEY			12	607			3	33
NACOGDOCHES	4	371	74	2,010	2	21	7	118
NAVARRO	10	423	232	4,868	8	210	5	87
NEWTON	1	282	53	3,676			11	499
NOLAN			18	1,044	5	75	6	156
NUECES	12	940	36	1,058	8	52	30	729
OCHILTREE			2	98			1	0
OLDHAM								
ORANGE	12	693	16	1,281	13	656	10	1,522
PALO PINTO	2	50	19	688	2	0	17	92
PANOLA			82	1,535				
PARKER	3	54	80	2,681	4	71	49	316
PARMER			2	197			2	27
PECOS							1	41
POLK	1	18	84	1,947			2	101
POTTER	5	45	4	162	3	49	1	17
PRESIDIO			2	40				
RAINS			20	328	1	0	1	20
RANDALL			3	150			2	0
REAGAN								
REAL								
RED RIVER	6	172	87	2,482	4	56		
REEVES			4	100			1	17
REFUGIO			11	462			13	307
ROBERTS			2	67	1	20		
ROBERTSON	3	240	43	1,952	1	20	7	75
ROCKWALL			6	181			1	10
RUNNELS			17	1,121	2	10	30	370
RUSK	1	25	99	2,450			23	194
SABINE			39	804			6	108
SABINE			39	804			6	108
SAN AUGUSTINE			26	654			3	30
SAN JACINTO			38	1,122			1	8
SAN PATRICIO			22	790			24	401
SAN SABA	1	0	24	2,943			1	28
SCHLEICHER							1	0
SCURRY	1	45	7	483	4	56	11	440
SHACKELFORD	1	41	10	1,403				

BRIDGE INFORMATION FROM DEPARTMENTAL FILES

COUNTY NAME	Urban Bridges Brinsap <50		Rural Bridges Brinsap <50		Urban Bridges Brinsap 50-80		Rural Bridges Brinsap 50-80	
	No	Cost	No	Cost	No	Cost	No	Cost
SHELBY			105	1,975			6	35
SHERMAN			1	120			2	0
SMITH	5	100	182	3,536	6	33	22	177
SOMERVELL							2	0
STARR			3	37			4	11
STEPHENS	9	753	20	1,924	3	375	1	135
STERLING	1	24	2	237			1	13
STONEWALL			11	1,511			5	73
SUTTON					1	0		
SWISHER			6	366			1	0
TARRANT	60	3,906	1	26	143	2,044	28	109
TAYLOR	9	419	33	2,119	9	419	3	197
TERRELL								
TERRY								
THROCKMORTON			5	227				
TITUS			39	2,730			2	38
TOM GREEN	4	679			6	517	10	228
TRAVIS	6	510	28	5233	39	5,948	66	10,124
TRINITY			43	1,024			4	42
TYLER			63	3474			4	234
UPSHUR			26	543				
UPTON								
UVALDE			1	86			3	0
VAL VERDE			1	0	3	110	2	0
VAN ZANDT	3	88	149	2,917			34	322
VICTORIA	3	25	22	862	1	67	29	462
WALKER			37	868			4	89
WALLER	4	426	33	3,363	4	309	34	3,783
WARD			1	288				
WASHINGTON	1	19	106	2,239			20	326
WEBB	4	58	31	434	6	129	23	50
WHARTON	2	40	192	6,206	1	14	12	226
WHEELER			24	649			4	53
WICHITA	5	356	20	982	6	58	3	40
WILBARGER			48	1,528			10	102
WILLACY			15	464			1	20
WILLIAMSON	5	802	62	10,637	3	729	91	8,827
WILSON			38	2,194			4	210
WINKLER								
WISE	3	194	127	3,498			39	273
WOOD			44	882			8	83
YOAKUM								
YOUNG			20	581				
ZAPATA			3	115			4	29
ZAVALA			1	20				
TOTALS	801	53,750	9,007	510,757	1,169	56,893	2,383	97,806

Urban - 1,970 @ $110,643
Rural - 11,390 @ $608,563