ASSESSMENT PROCESS

Planning for Mississippi's highway system requires an understanding of and appreciation for its financial requirements. These financial requirements, called needs, cover the essential activities of system construction and maintenance. The process whereby these financial requirements are determined is commonly called a "Needs Analysis."

In determining highway needs for the Mississippi Long Range Transportation Plan, special care was taken to ensure that detailed and statistically valid data were compiled so that a credible analysis was performed. Additionally, every effort was taken to ensure a rigorous analytical approach so that sound results were produced. To meet these objectives, the Highway Needs Analysis utilized two FHWA computer models:

- HERS-ST – Highway Economics Requirements System; and
- BNIP – Bridge Needs and Investment Process.

The HERS-ST model [(1) (2)] developed by FHWA is designed to analyze the effects of alternative funding levels on highway performance. The model simulates highway conditions and performance levels and identifies deficiencies through the use of engineering principles. In selecting improvements for implementation, the model is designed to select only those projects whose benefits exceed initial costs.

A separate software package and model was used to analyze bridge conditions, namely the Bridge Needs and Investment Process (BNIP) [(3)]

METHODOLOGY

The needs analysis process includes several procedural steps:

- **Highway System Data Base** - The purpose of the data base is to define the existing characteristics of roadway sections and bridges that comprise the highway system. These data include information about the geometric, structural and operational features of the existing infrastructure. The data base was used to define the major existing characteristics of the road system. Additionally, projections are made of future conditions. These projections take into account the changes anticipated in traffic volumes and in the structural conditions of pavements and bridges.

- **Determine Deficiencies** - Inventory data were compared to minimum tolerable conditions considered acceptable by MDOT. Acceptability reflects judgment about the level of congestion and safety and the minimum structural conditions for pavements and bridges that the public should have to tolerate. Minimum tolerable conditions also reflect

(1)HERS-ST, Version 2 0, Highway Economic Requirements System State Version, Users Guide, U.S. Department of Transportation, FHWA. 2002..

(2)HERS-ST, Version 2.0, Overview, U.S. Department of Transportation, FHWA. 2002.

(3)Bridge Needs and Investment Process (BNIP), Version 1.2, U.S. Department of Transportation, FHWA, August 1989.

cost effectiveness principles. Criteria were defined for different types of facilities reflecting their functional classification, traffic volume, and location (as defined by terrain and rural/urban characteristics). Any condition below the minimum tolerable criteria was classified as a deficiency. This was done for existing conditions (as of 2002) and for future conditions forecasted through the year 2030.

- **Determine Needed Improvements** - Based on the types of deficiencies and the years in which the deficiencies occur, improvements which would correct the problem(s) were selected where appropriate. Improvements to overcome existing deficiencies constitute "backlog" needs, while those which address future deficiencies are considered as "future" needs. Improvements were based on design standards identified by MDOT for each functional classification of facility, the traffic volume it will serve in the future design year, and its location characteristics.

- **Estimate Costs** - The cost of each selected improvement was estimated using unit costs that reflect composite practices and cost experience in the state of Mississippi for each functional class of highways. Costs are expressed in constant 2002 dollars. The effects of inflation on construction costs are taken into account in Chapter 5 by reducing the value (purchasing power) of revenue dollars in future years.

Apart from the compilation of the highway system data base, all steps within the analysis process utilized the computer models referenced previously.

Needs Assessment Criteria

Highway system needs are largely a reflection of the deficiency criteria and unit cost values employed in the needs assessment. The study's deficiency criteria, standards and unit cost values varied by roadway functional classification. The values used in the study were provided by MDOT staff.

For this study, a conservative approach was taken because it is well known that most states have insufficient resources to eliminate all system deficiencies. Thus, this study's tolerable conditions are much lower than existing officially adopted design standards. As a result, many roadways, especially on the lower functional classifications, are not improved to full standards during the 28-year time period. For example, many unpaved rural roads with the functional class of “local” remain unpaved.

The minimum tolerable conditions, design standards and construction unit costs employed in this study are presented in **Appendix A**.

In addition, needs results are affected by a number of other features including:

- **Time period** - The analysis covered backlog needs existing in 2002, as well as future needs through 2030. For analysis purposes, the 28 years to 2030 were divided into four seven-year periods.

- **Full Needs** - The needs reported herein may be characterized as "full needs" as defined by the study's tolerable condition criteria. That is, no constraints were imposed in the analysis regarding the level of funding that will be available over the period to 2030.

- **No Inflation** - The unit costs employed in this needs analysis chapter reflect actual costs experienced in 2002 ("Base Year" dollars) and no allowance is included for inflation to 2030. The impact of forecasted inflation rates is presented in Chapter 5, Financial Plan.

- **"Jurisdiction Blind" Analysis** - The needs assessment was performed to be "jurisdiction blind." This approach was taken so that needs for all jurisdictional levels were based upon a strictly comparable basis, thereby avoiding preferential treatment of a facility based upon which jurisdiction holds administrative responsibility. Therefore, the study's criteria, standards and unit cost values do not necessarily reflect the actual experiences of a specific jurisdiction or jurisdictional level, but reflect the experience of all jurisdictions.

- **Traffic Growth** - Traffic growth rates were developed by analyzing historical traffic growth and projections for Mississippi population and employment.

- **Pavement Deterioration Rate** - Future pavement needs depend on the rate of deterioration of the pavement and other factors.

- **Needs Models** - In total, the needs analysis involved a data base that included more than 18,256 records for individual roadway sections and 16,315 records for bridges. Analyses of these large data bases were conducted using the computer models described earlier.

- **The *Vision 21* Program** - The needs models can reliably estimate the vast majority of needs for existing facilities. However, they do not address unique circumstances such as new or modified facilities already planned. Accordingly, needs for completion of the *Vision 21* program were estimated by the State and incorporated in the needs results. In addition, an estimate of resurfacing needs and maintenance needs for roadways in these programs was developed using the same principles as other roadway segments.

Inventory Data

A sound needs analysis must be based on good data that describe important features of the highway system. Therefore, substantial efforts were expended to achieve the quality and quantity of data needed to provide a rigorous assessment of highway needs.

The Mississippi Department of Transportation maintains, on a continuous basis, inventory data for all highways under its jurisdiction. Two data bases were used for the study of state roadways. The first, the Roadway Characteristics File, contains physical and traffic characteristics, as well as identification data. The second, the Pavement Management File, contains information about the pavement type, history and present condition of all roads under the state jurisdiction. It was determined during the course of this study that in order to join the information contained in these databases, the information would have to be processed using the linear analysis functions with a geographic information system. The Department had already

initiated the development of a statewide linear referencing system (LRS) which would link numerous databases, including the ones needed for the highway needs analysis. WSA worked directly with the Department to complete the LRS for use in the highway needs assessment. Upon completion, GIS was used to spatially merge the information into a single database containing the information required by the needs estimation model.

Available records for local jurisdiction roadways were neither sufficiently detailed nor current to provide a reliable data base for these needs assessments. Likewise, it was deemed to be prohibitively expensive to develop a 100 percent inventory of all local jurisdiction roadways. Therefore, six representative counties were selected and a complete inventory of all local roads in these counties was conducted. The sample counties of Forrest, Lafayette, Lincoln, Noxubee, Quitman and Warren were selected because they are expected to be representative of local highway types and conditions statewide. The resulting sample was then expanded to represent local jurisdiction roadways for the entire state.

The roadway inventory recorded information regarding highway geometric characteristics, structural conditions and other features. These data were digitized and extensive validity and logic checks were made. In some cases, some samples had to be revisited to verify the appropriate data. The field inventory process resulted in the collection of data for 9,333 roadway segments covering over 5,000 centerline miles of roadways. These records were checked for consistency with state and national highway statistics, and valid records for municipal and county controlled roadways were then processed to be consistent with the 2000 Highway Performance Monitoring System (HPMS) format, as required by HERS-ST.

As mandated by the Federal government, MDOT maintains, and regularly updates, an extensive data file concerning all bridges regardless of jurisdiction. All bridges under state or local jurisdiction carrying a public roadway were analyzed to estimate bridge needs for this study.

HIGHWAY AND BRIDGE NEEDS

MISSISSIPPI HIGHWAY NEEDS

Needs Categories

For the purpose of this report, the roadway portion of highway needs have been grouped into a number of categories:

- State controlled
  - Preservation
  - Modernization
  - Expansion
- Local controlled
  - Preservation
  - Modernization
  - Expansion

Locally controlled roads include those under the jurisdiction of County and City agencies. Federally controlled roads were not considered in the analysis.

HERS-ST defines various types of roadway improvements. For summary purposes, these improvements have been grouped into the three construction categories of Preservation, Modernization and Expansion, as shown in **Table 2-1**.

Table 2-1: Roadway Improvement Types

HERS-ST Improvement Type	Category
Reconstruction with more lanes	Expansion
Reconstruction with wider lanes	Modernization
Reconstruction	Modernization
Major widening	Expansion
Minor Widening	Modernization
Resurfacing + shoulder improvements	Modernization
Resurfacing	Preservation

For construction needs, the analyses involved determining existing deficiencies in the study's base year (2002), called backlog needs. Then the analysis developed forecasts of future needs to 2030, by considering traffic growth, deterioration rates and other factors. The results of these analyses are discussed in the following sections. Detailed results are contained in **Appendix B**.

Roadway Maintenance Needs – Roadway maintenance needs are not considered as capital construction needs and are not included in the Highway Needs described in this chapter.

Roadway maintenance needs include two categories of maintenance: general roadway maintenance such as drainage, traffic control and roadside; and routine pavement maintenance such as patching. For unpaved roads, maintenance costs represent the annualized rehabilitation and reconstruction costs (re-gravelling for example), as well as routine maintenance.

Resurfacing is considered a construction need, not a maintenance need.

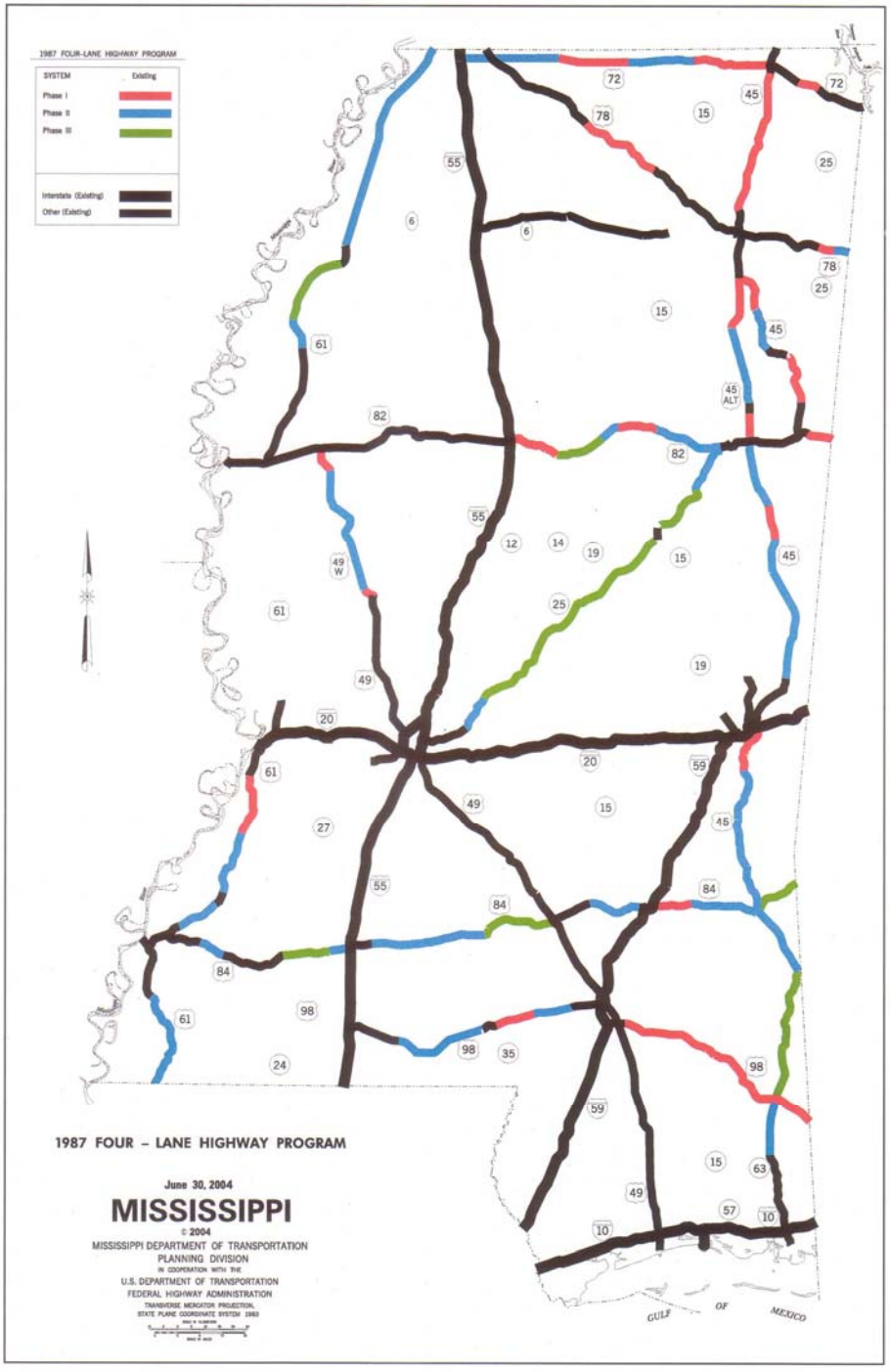
Vision 21

Vision 21[4] is a needs-based highway program initiated in 2002 to continue the work of the 1987 Four-Lane Highway Program (or A.H.E.A.D. Program – Advocating Highways for Economic Advancement and Development). The original 1987 program was expected to build 1,077 miles of four-lane highways over 14 years. The highways were to be built in phases, based primarily on vehicle count and road capacity. Three phases were established with each having a mileage goal and estimated cost.

[4] Mississippi Looking A.H.E.A.D., 1987 Four-Lane Highway Program including Vision 21, Annual Report, June 2005.

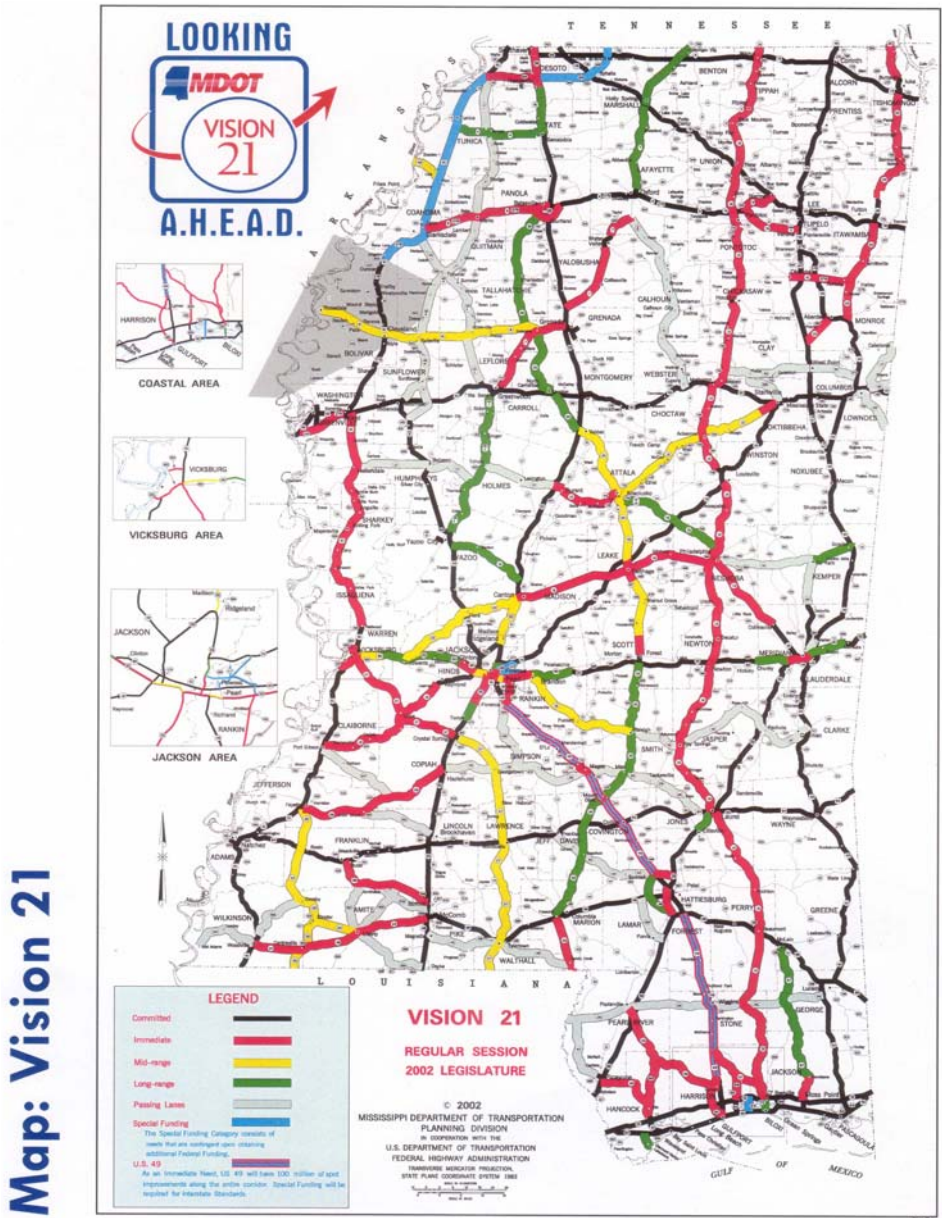
Highway user revenues were dedicated to build the system, including a portion of the state motor fuel tax, a $5 car tag fee, a highway contractors tax, federal aid and proceeds from revenue bonds. In 1998 MDOT was given authority to borrow $200 million in revenue bonds, if funding sources dictated. In 2002, a Phase IV of the Four-Lane Highway Program was incorporated into *Vision 21*. The status of the Four-Lane Highway Program, as of June 30, 2004, is illustrated in **Figure 2-1**.

Figure 2-1: 1987 Four-Lane Highway Program



Relationship to Highway Needs – The highway needs identified in this chapter are broken down by type of improvement and by functional classification of the roadway. The HERS-ST improvement type "major widening" when applied to MDOT "Principal Arterial" roadways closely matches the type of improvement projects funded by *Vision 21*. Proposed *Vision 21* projects are illustrated in **Figure 2-2**. Total costs through the study period for *Vision 21* projects and the completion of the Four-Lane Highway Programs are estimated at $6,505 million[5], which includes $505 million already incurred since 2003. Including the *Vision 21* estimate of $6,505 million results in total state roadway needs of $20,585.9 million. When bridge needs are included, the total state highway needs amount to $22,006.5 million.

Figure 2-2: Vision 21



[5] Mississippi DOT, Programming Division.

Roadway Construction Needs by Jurisdiction

As summarized in **Table 2-2** and **Figure 2-3**, total construction needs for roadways under state and local jurisdiction amount to $45.8 billion for the study's 28-year time frame. Of these, $13.5 billion, or 29 percent, are backlog needs.

Table 2-2: Total Mississippi Roadway Construction Needs

Jurisdiction and Type of Roadway Need	Roadway Construction Needs by Functional Class [1] ($ millions)						
	Interstate and Other Freeways	Other Principal Arterials	Minor Arterials	Collectors	Local	Total	% of Total
	2003 to 2030 (including Backlog Needs)						
State Jurisdiction							
Preservation	$1,863.0	$619.5	$455.2	$874.4	$22.6	$3,834.7	18.6%
Modernization	$151.5	$1,624.7	$3,244.2	$1,726.4	$4.9	$6,751.8	32.8%
Expansion	$2,112.9	$6,770.7	$548.9	$567.0	$0.0	$5,866.0	48.6%
Total State Needs	**$4,127.4**	**$9,014.9**	**$4,248.4**	**$3,167.8**	**$27.5**	**$20,585.9**	**100.0%**
Local Jurisdiction							
Preservation	$0.0	$163.0	$438.6	$11,286.0	$7,323.6	$19,211.3	76.3%
Modernization	$0.0	$198.3	$377.3	$3,199.7	$1,810.1	$5,585.5	22.2%
Expansion	$0.0	$56.8	$133.7	$186.6	$3.0	$380.1	1.5%
Total Local Needs	**$0.0**	**$418.1**	**$949.6**	**$14,672.4**	**$9,136.7**	**$25,176.9**	**100.0%**
All Jurisdictions							
Preservation	$1,863.0	$782.5	$893.8	$12,160.4	$7,346.1	$23,045.9	50.4%
Modernization	$151.5	$1,823.0	$3,621.6	$4,926.2	$1,815.0	$12,337.3	27.0%
Expansion	$2,112.9	$6,827.5	$682.6	$753.6	$3.0	$10,379.6	22.6%
Total Needs	**$4,127.4**	**$9,433.0**	**$5,198.0**	**$17,840.2**	**$9,164.2**	**$45,762.6**	**100.0%**
	Backlog Needs Only						
State Jurisdiction							
Preservation	$38.6	$19.1	$16.0	$54.0	$1.8	$129.6	2.4%
Modernization	$117.6	$721.6	$2,150.8	$722.5	$0.0	$3,712.5	69.7%
Expansion	$544.8	$859.3	$61.6	$22.2	$0.0	$1,487.9	27.9%
Total State Needs	**$701.0**	**$1,600.0**	**$2,228.4**	**$798.7**	**$1.8**	**$5,329.9**	**100.0%**
Local Jurisdiction							
Preservation	$0.0	$0.0	$3.4	$265.6	$955.6	$1,224.5	15.0%
Modernization	$0.0	$140.0	$588.5	$5,471.8	$537.3	$6,737.6	82.8%
Expansion	$0.0	$0.0	$47.6	$126.4	$3.0	$177.0	2.2%
Total Local Needs	**$0.0**	**$140.0**	**$639.5**	**$5,863.7**	**$1,495.9**	**$8,139.1**	**100.0%**
All Jurisdictions							
Preservation	$38.6	$19.1	$19.3	$319.6	$957.4	$1,354.1	10.1%
Modernization	$117.6	$861.6	$2,739.3	$6,194.2	$537.3	$10,450.1	77.5%
Expansion	$544.8	$859.3	$109.2	$148.5	$3.0	$1,664.9	12.4%
Total Needs	**$701.0**	**$1,740.0**	**$2,867.9**	**$6,662.4**	**$1,497.7**	**$13,469.1**	**100.0%**

(1) Expressed in base year 2002 dollars.

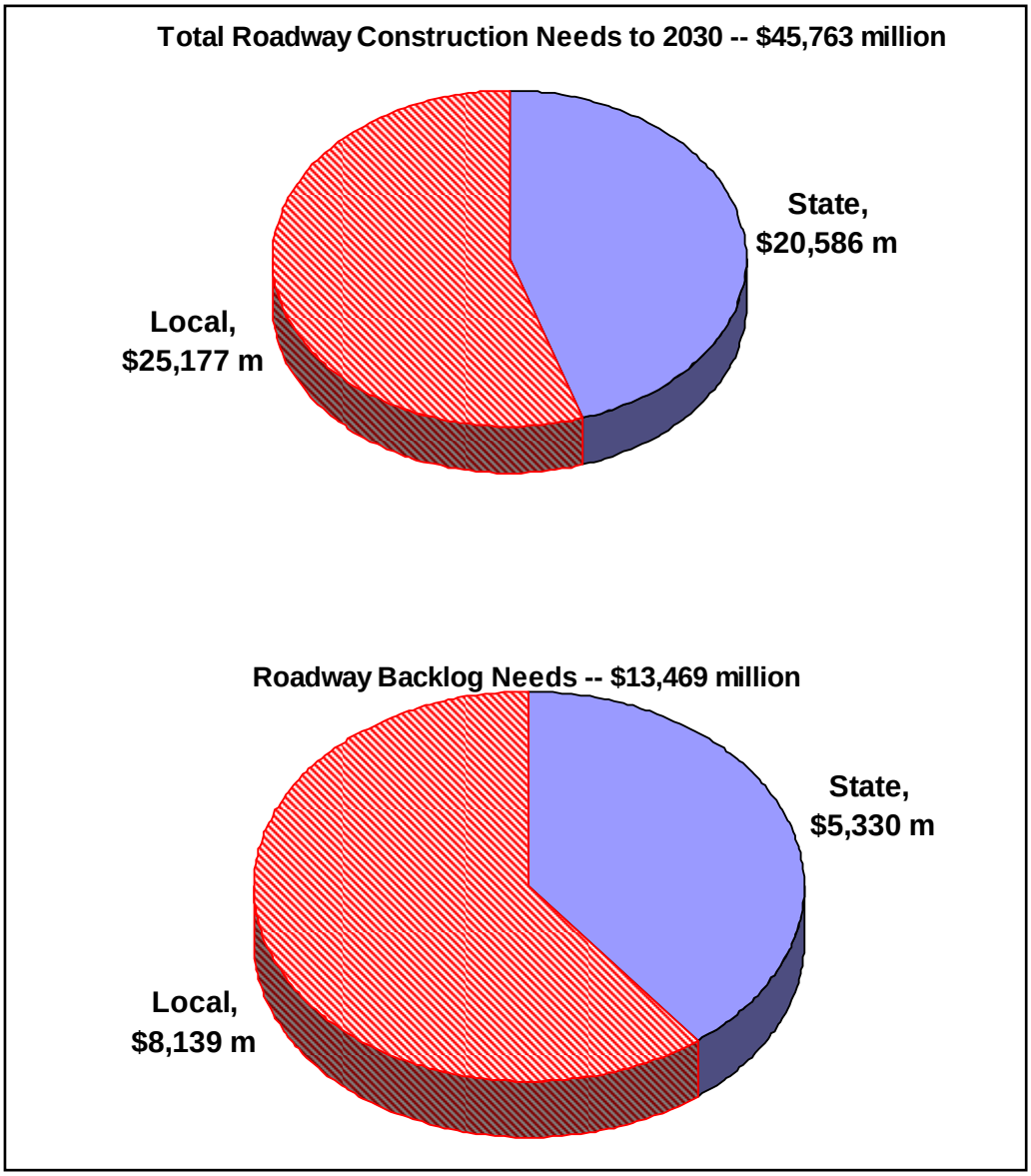
- Roadway construction needs for the state system amount to approximately $20.6 billion. Of these, approximately $5.3 billion (or 39 %) are backlog needs.

- Roadway construction needs for local jurisdiction roads total approximately $25.2 billion, including $8.1 billion (or 32 %) in backlog needs.

Travel on state roadways constitutes just over 61 percent of total travel, while the 28-year needs for these facilities comprise 45 percent of total roadway construction needs. Travel on county/city roads is about 39 percent of total highway travel in the State, accounting for 55 percent of the total roadway construction needs.

In terms of backlog roadway construction needs, the state roadway backlog needs comprise 40 percent of backlog needs, while local/county roads comprise 60 percent of total backlog needs.

Figure 2-3: Roadway Construction Needs ($ millions)



Roadway Construction Needs by Functional Class

Figure 2-4 presents these roadway construction needs by functional classification.

Figure 2-4: Roadway Construction Needs by Functional Class ($ millions)

The largest roadway construction needs are for Collectors with more than $17.8 billion in needs. Interstates (and Other Freeways), Other Principal Arterials and Minor Arterials have roadway construction needs ranging from $4.1 billion to $9.4 billion. Construction needs on roads with a local functional classification amount to $9.2 billion.

The largest backlog roadway construction needs by functional classification are for Collectors, at $6.7 billion, followed by Minor Arterials at $2.9 billion. Backlog needs are least for Interstates and Other Freeways, with $0.7 billion.

BRIDGE CONSTRUCTION NEEDS

Bridge Needs by Jurisdiction

As summarized in **Table 2-3** and **Figure 2-5**, total construction needs for the 16,315 bridges carrying a highway under state, county or city jurisdiction amount to $2.4 billion for the period to 2030. The majority (74 %) of these construction needs are backlog needs, as they correct existing deficiencies.

- Bridge construction needs for the state system amount to $1.4 billion. Of these, $954 million (or 67 %) are backlog needs.

- Construction needs for bridges under local jurisdiction total $1.0 billion, including $844 million (or 84 %) backlog needs.

Whereas backlog highway construction needs comprise 27 percent of the total, backlog bridge construction needs comprise a much higher percentage of the total for this category of needs (74 %). This suggests that future bridge construction needs are mainly for rehabilitation due to deterioration of the structures, whereas backlog needs are largely a reflection of widening and replacement needs that already exist.

The share of total bridge construction needs by jurisdiction is closely related to its share of bridges in terms of deck area, not in terms of number of bridges. State bridges represent 33 percent of all bridges, but 66 percent of all deck area and 59 percent of bridge total construction needs. County and City bridges represent 67 percent of all bridges but only 34 percent of deck area and 41 percent of construction needs.

Unlike highway construction needs, there is no large difference between the share of total bridge construction needs and the share of backlog bridge construction needs by jurisdiction. At 53 percent, the share of backlog construction needs for state bridges is slightly lower than its 59 percent share of total needs, while the 47 percent backlog needs for county and city bridges is only a little higher than its 41 percent share of total needs.

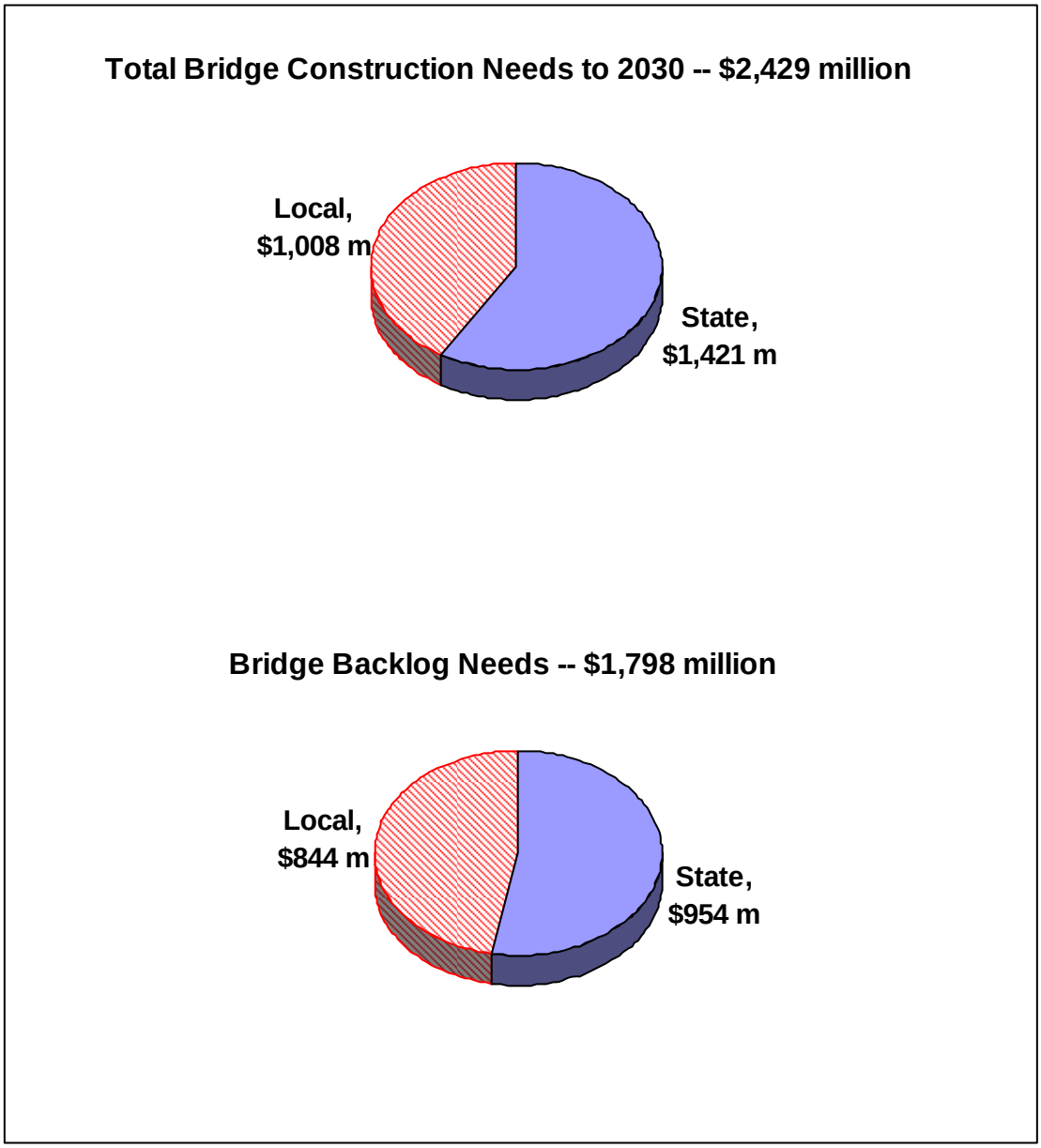
A detailed breakdown of bridge construction needs by functional classification of road and time period is provided in **Appendix C**.

Table 2-3: Total Mississippi Bridge Construction Needs

Jurisdiction and Type of Roadway Need	Bridge Construction Needs by Functional Class [1] ($ millions)						
	Interstate and Other Freeways	Other Principal Arterials	Minor Arterials	Collectors	Local	Total	% of Total
	2003 to 2030 (including Backlog Needs)						
State Jurisdiction							
Rehabilitation	$284.0	$112.3	$21.2	$16.2	$10.2	$443.9	31.3%
Widening	$161.6	$75.6	$162.1	$87.4	$45.6	$532.2	37.4%
Replacement	$31.6	$250.9	$119.5	$41.5	$1.0	$444.5	31.3%
Total State Needs	**$477.3**	**$438.8**	**$302.8**	**$145.1**	**$56.7**	**$1,420.6**	**100.0%**
Local Jurisdiction							
Rehabilitation	$0.0	$7.5	$0.1	$7.5	$44.1	**$59.2**	5.9%
Widening	$0.0	$0.9	$2.1	$30.8	$32.2	**$66.0**	6.5%
Replacement	$0.0	$16.7	$26.6	$374.9	$464.7	**$882.8**	87.6%
Total Local Needs	**$0.0**	**$25.2**	**$28.7**	**$413.1**	**$541.0**	**$1,008.0**	**100.0%**
All Jurisdictions							
Rehabilitation	$284.0	$119.9	$21.3	$23.7	$54.3	**$503.1**	20.7%
Widening	$161.6	$76.5	$164.2	$118.2	$77.8	**$598.2**	24.6%
Replacement	$31.6	$267.6	$146.1	$416.3	$465.7	**$1,327.3**	54.7%
Total Needs	**$477.3**	**$463.9**	**$331.5**	**$558.2**	**$597.7**	**$2,428.6**	**100.0%**
	Backlog Needs Only						
State Jurisdiction							
Rehabilitation	$26.5	$25.3	$0.0	$0.3	$0.0	**$52.1**	5.5%
Widening	$161.6	$75.6	$160.7	$81.9	$44.8	**$524.4**	55.0%
Replacement	$30.5	$192.7	$114.5	$38.6	$0.8	**$377.1**	39.5%
Total State Needs	**$218.6**	**$293.5**	**$275.1**	**$120.8**	**$45.6**	**$953.7**	**100.0%**
Local Jurisdiction							
Rehabilitation	$0.0	$7.5	$0.1	$1.6	$6.4	**$15.7**	1.9%
Widening	$0.0	$0.9	$2.1	$27.1	$31.7	**$61.8**	7.3%
Replacement	$0.0	$16.7	$26.4	$369.0	$354.4	**$766.6**	90.8%
Total Local Needs	**$0.0**	**$25.2**	**$28.6**	**$397.8**	**$392.5**	**$844.1**	**100.0%**
All Jurisdictions							
Rehabilitation	$26.5	$32.8	$0.1	$2.0	$6.4	**$67.8**	3.8%
Widening	$161.6	$76.5	$162.7	$109.0	$76.5	**$586.3**	32.6%
Replacement	$30.5	$209.4	$140.9	$407.7	$355.2	**$1,143.7**	63.6%
Total Needs	**$218.6**	**$318.7**	**$303.7**	**$518.6**	**$438.1**	**$1,797.7**	**100.0%**

(1) Expressed in base year 2002 dollars.

Figure 2-5: Bridge Construction Needs ($ millions)

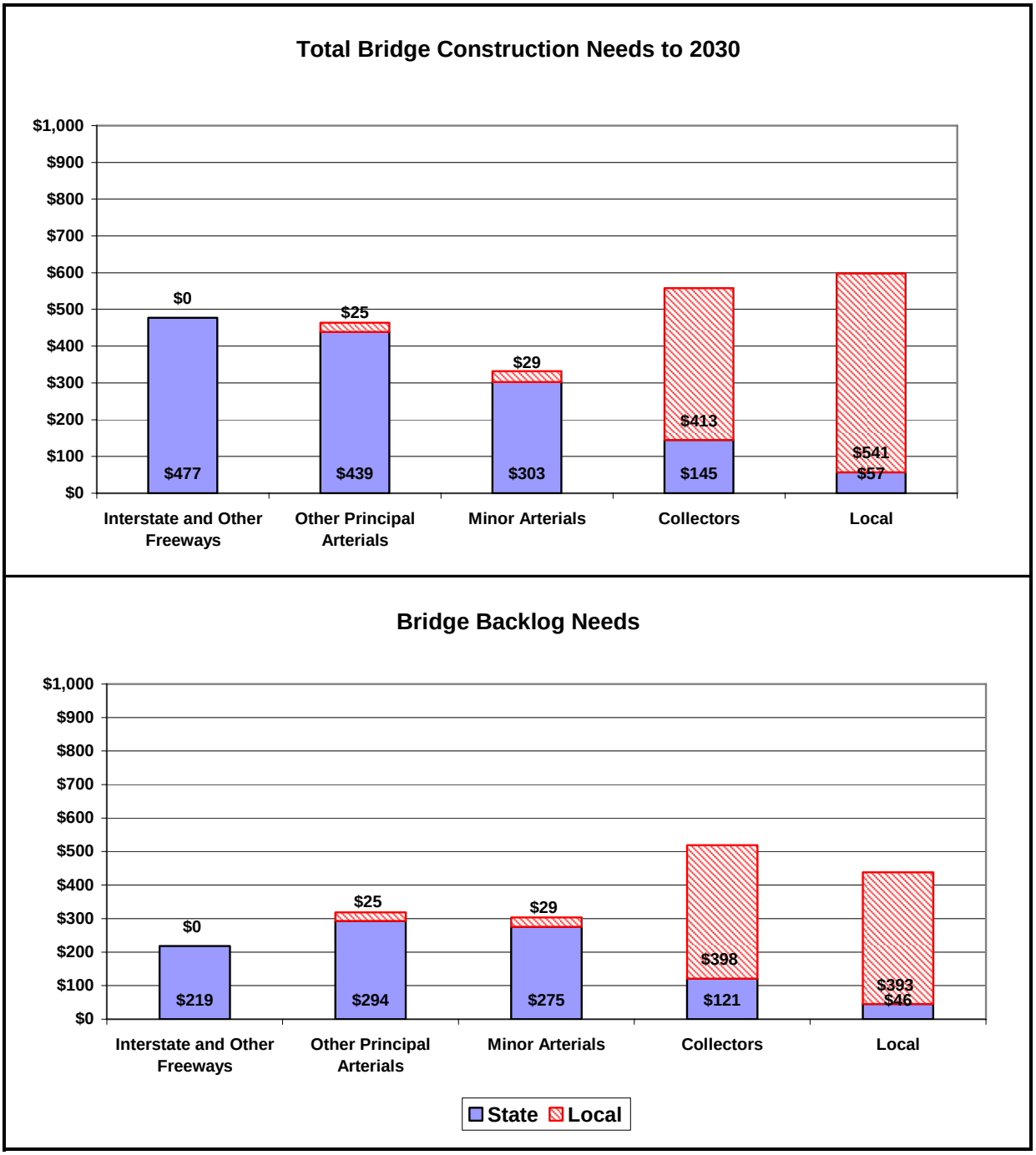


Bridge Needs by Functional Class

Figure 2-6 presents these bridge construction needs by functional classification of the highway carried by the structure. Bridge construction needs by functional classification are correlated to the total amount of deck area. Construction needs shares for bridges in the Interstate, Collectors, or Local functional classes are higher than their share of total deck area (67 % versus 62 %), while construction needs share for bridges in the Other Principal Arterials and Minor Arterials functional classes have a share of construction needs slightly lower than their share of deck area (33 % versus 38 %).

Except for bridges carrying an interstate or other freeway, backlog construction needs represent 81 percent or more of total construction needs. The proportion of backlog needs to total needs for bridges carrying an interstate or other freeway is less than 46 percent. This may be due to the fact that bridges carrying interstate routes are not as old and were built with much stricter standards than other bridges.

Figure 2-6: Bridge Construction Needs by Functional Class ($ millions)



TOTAL HIGHWAY NEEDS

Presented in **Table 2-4** and **Figure 2-7** are the total estimated Highway needs (Roadway needs plus Bridge needs) for the period 2003 to 2030, inclusive of backlog needs. Total needs amount to $48.2 billion for the 28-year period, which may be broken down, as follows:

By work category:

- Roadway construction needs account for 95 percent of the total ($45.7 billion). Capacity needs (Expansion) account for 22 percent of all roadway construction needs, with the balance in Preservation and Modernization improvements. Capacity needs are more significant on state roads, amounting to 45 percent of state roadway needs, than on local roads, where they comprise only 2 percent of local roadway needs.
- Bridge construction amounts to 5 percent of total needs.

By type of need:

- Backlog construction needs for roadways and bridges account for 32 percent of total needs ($15.3 billion).
- Needs for future construction during the period 2003 to 2030 represent 68 percent of all needs (approximately $32.9 billion).

By jurisdiction:

- Needs for facilities under state jurisdiction amount to nearly 46 percent of all needs ($22 billion).
- Needs for facilities under local jurisdiction account for 54 percent of all needs (approximately $26.2 billion).

Figure 2-8 and **Figure 2-9** present total highway needs by work category and type of need for facilities under state and local jurisdiction respectively.

State Highway Needs by Period

Total Highway needs for roads and bridges under state jurisdiction by time period are shown in **Table 2-5** and **Figure 2-10**. The first period from 2003 to 2009 includes backlog needs.

Highway needs are not distributed evenly over time periods. Short-term needs, those occurring in the period to 2009, account for 42 percent of total needs, due in large part to the $6.3 billion of backlog needs, which themselves amount to 28 percent of the $22 billion total.

Table 2-4: Total Mississippi Roadway and Bridge Construction Needs

Jurisdiction and Type of Highway Need	Highway Construction Needs by Functional Class (1) ($ millions)						
	Interstate and Other Freeways	Other Principal Arterials	Minor Arterials	Collectors	Local	Total	% of Total
	2003 to 2030 (including Backlog Needs)						
State Jurisdiction							
Road Preservation	$1,863.0	$619.5	$455.2	$874.4	$22.6	$3,834.7	17.4%
Road Modernization	$151.5	$1,624.7	$3,244.2	$1,726.4	$4.9	$6,751.8	30.7%
Road Expansion	$2,112.9	$6,770.7	$548.9	$567.0	$0.0	$9,999.5	45.4%
Bridge Needs	$477.3	$438.8	$302.8	$145.1	$56.7	$1,420.6	6.5%
Total State Needs	**$4,604.6**	**$9,453.7**	**$4,551.1**	**$3,312.9**	**$84.1**	**$22,006.6**	**100.0%**
Local Jurisdiction							
Road Preservation	$0.0	$163.0	$438.6	$11,286.0	$7,323.6	$19,211.3	73.4%
Road Modernization	$0.0	$198.3	$377.3	$3,199.7	$1,810.1	$5,585.5	21.3%
Road Expansion	$0.0	$56.8	$133.7	$186.6	$3.0	$380.1	1.5%
Bridge Needs	$0.0	$25.2	$28.7	$413.1	$541.0	$1,008.0	3.8%
Total Local Needs	**$0.0**	**$443.3**	**$978.3**	**$15,085.6**	**$9,677.7**	**$26,184.9**	**100.0%**
All Jurisdictions							
Road Preservation	$1,863.0	$782.5	$893.8	$12,160.4	$7,346.1	$23,045.9	47.8%
Road Modernization	$151.5	$1,823.0	$3,621.6	$4,926.2	$1,815.0	$12,337.3	25.6%
Road Expansion	$2,112.9	$6,827.5	$682.6	$753.6	$3.0	$10,379.6	21.5%
Bridge Needs	$477.3	$464.0	$331.5	$558.2	$597.7	$2,428.6	5.0%
Total Needs	**$4,604.6**	**$9,897.0**	**$5,529.5**	**$18,398.4**	**$9,761.9**	**$48,191.3**	**100.0%**
	Backlog Needs Only						
State Jurisdiction							
Road Preservation	$38.6	$19.1	$16.0	$54.0	$1.8	$129.6	2.1%
Road Modernization	$117.6	$721.6	$2,150.8	$722.5	$0.0	$3,712.5	59.1%
Road Expansion	$544.8	$859.3	$61.6	$22.2	$0.0	$1,487.9	23.7%
Bridge Needs	$218.6	$293.5	$275.1	$120.8	$45.6	$953.7	15.2%
Total State Needs	**$919.6**	**$1,596.8**	**$2,503.6**	**$919.5**	**$47.4**	**$6,283.5**	**100.0%**
Local Jurisdiction							
Road Preservation	$0.0	$0.0	$3.4	$265.6	$955.6	$1,224.5	13.6%
Road Modernization	$0.0	$140.0	$588.5	$5,471.8	$537.3	$6,737.6	75.0%
Road Expansion	$0.0	$0.0	$47.6	$126.4	$3.0	$177.0	2.0%
Bridge Needs	$0.0	$25.2	$28.6	$397.8	$392.5	$844.1	9.4%
Total Local Needs	**$0.0**	**$165.1**	**$668.1**	**$6,261.5**	**$1,888.4**	**$8,983.2**	**100.0%**
All Jurisdictions							
Road Preservation	$38.6	$19.1	$19.3	$319.6	$957.4	$1,354.1	8.9%
Road Modernization	$117.6	$861.6	$2,739.3	$6,194.2	$537.3	$10,450.1	68.4%
Road Expansion	$544.8	$859.3	$109.2	$148.5	$3.0	$1,664.9	10.9%
Bridge Needs	$218.6	$318.7	$303.7	$518.6	$438.1	$1,797.7	11.8%
Total Needs	**$919.6**	**$2,058.7**	**$3,171.6**	**$7,181.0**	**$1,935.8**	**$15,266.8**	**100.0%**

(1) Expressed in base year 2002 dollars.

Figure 2-7: Total Highway Needs, All Jurisdictions ($ millions)

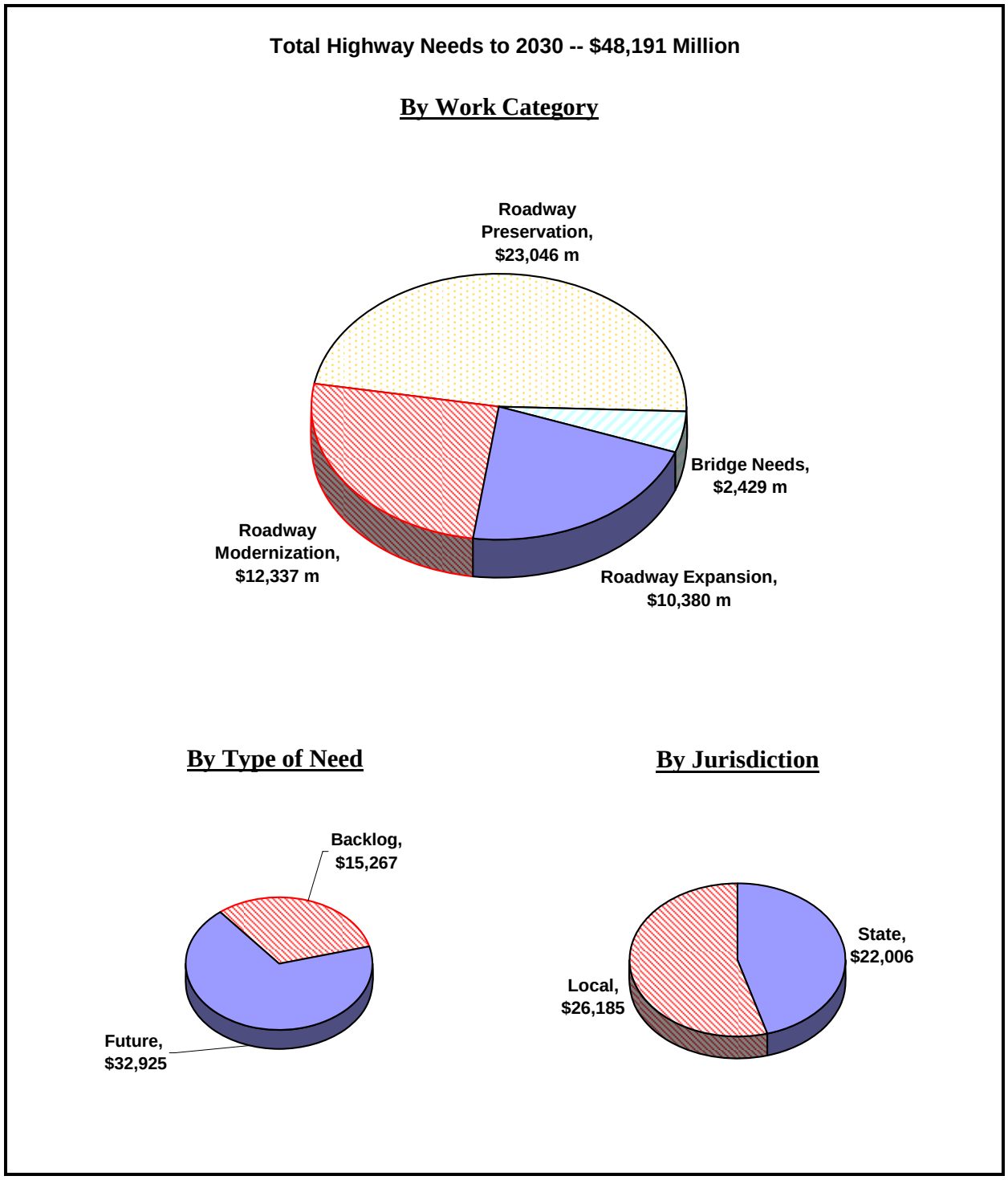


Figure 2-8: Total State Highway Needs ($ millions)

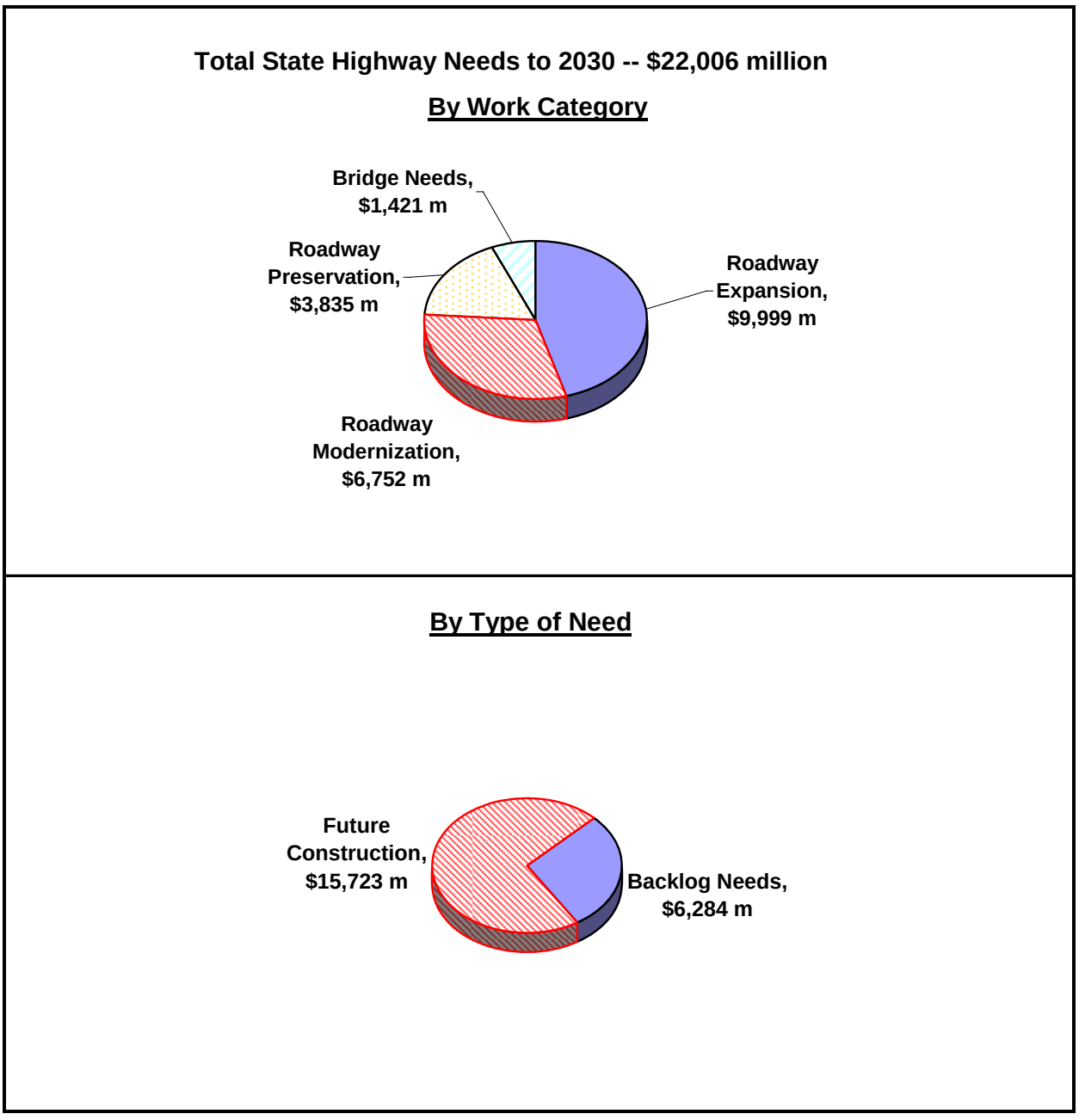


Figure 2-9: Total Local Jurisdiction Highway Needs ($ millions)

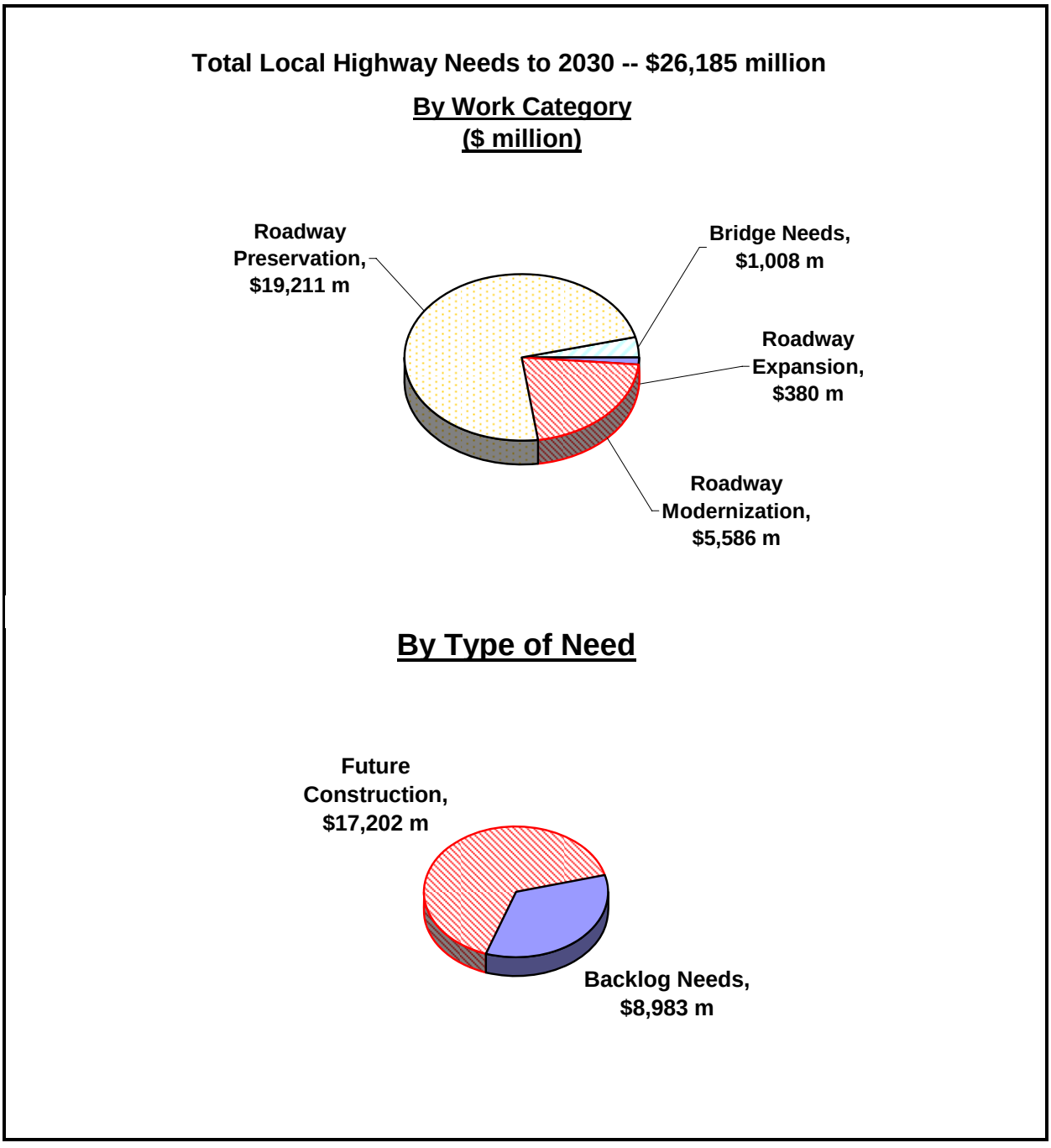


Table 2-5: State Highway Needs by Type of Need and Time Period

Type of Highway Need	2003 - 2009	2010 - 2016	2017 - 2023	2024 - 2030	Total (1)
Road Preservation	$329.9	$843.2	$1,177.3	$1,484.3	$3,834.7
Road Modernization	$4,510.5	$480.9	$554.7	$1,205.7	$6,751.8
Road Expansion	$3,381.5	$1,843.1	$2,839.8	$1,935.0	$9,999.5
Bridge Needs	$1,046.4	$106.5	$104.2	$163.5	$1,420.6
Total State Needs	**$9,268.3**	**$3,273.8**	**$4,676.0**	**$4,788.5**	**$22,006.5**
Percent by Period	**42.1%**	**14.9%**	**21.2%**	**21.8%**	

Note: (1) Needs in Millions of base year 2002 Dollars.

Figure 2-10: State Highway Needs by Type of Need and Time Period