

**State of Virginia**  
**Virginia Department of Transportation**  
**Report of**  
**Roadway Values**

**October 2000**

## **ROADWAY VALUES**

### **(JUNE 1999 – JUNE 2000)**

Within Virginia there are four roadway surface genre: aggregate surface (dirt roads), surface treated (tar & chip), asphalt concrete (black top), and concrete. These roadways also have three different categories: secondary, primary, and interstate. Lastly, these highways lie in two different domain classifications: rural and urban. To determine their values, the roads were ordered into a total of twelve roadway types, considering the above criteria. A baseline value (cost) was then calculated for each category. The “base asset” was established for the district of Suffolk, for reasons shown in the “*About*” document that follows. In determining the “lane mile” value of the roadways, the current costs of all construction phases were examined, encompassing drainage structures up to and including box culverts, but *not including bridges*. The “real property” (right-of-way) value was *not included*. As in real property values, roadway values vary district to district. The district deviations are shown below to allow for a more accurate appraisal within each inventoried roadway district. The values were established using *low bid histories* for construction projects awarded during the year beginning June 1999 and ending June 2000. The processes are more fully described elsewhere in the “About” document.

The categories and costs are:

#### **SECONDARIES**

Secondary, Rural – Aggre. Surface	\$228,155.92	per lane mile.
Secondary, Rural – Surface Treated	\$256,956.46	per lane mile.
Secondary, Rural – Asphalt Paved	\$281,671.23	per lane mile.
Secondary, Urban – Asphalt Paved	\$539,358.31	per lane mile.

#### **PRIMARY**

Primary, Rural – Asphalt Paved	\$904,043.40	per lane mile.
Primary, Rural – Concrete Paved	\$1,080,037.91	per lane mile.
Primary, Urban – Asphalt	\$914,025.41	per lane mile.
Primary, Urban – Concrete	\$1,064,610.57	per lane mile.

#### **INTERSTATE**

Interstate, Rural – Asphalt	\$1,936,147.66	per lane mile.
Interstate, Rural – Concrete	\$2,140,712.12	per lane mile.
Interstate, Urban – Asphalt	\$2,515,695.17	per lane mile.
Interstate, Urban – Concrete	\$2,687,097.95	per lane mile.

#### **District Deviations by Percentiles**

District 1	Bristol	-24.9 %.
District 2	Salem	-18.5 %.
District 3	Lynchburg	-21.4 %.
District 4	Richmond	+1.6 %.
District 5	Suffolk	0 %. This is the baseline district.
District 6	Fredricksburg	-22.2 %.
District 7	Culpeper	-32.6 %.
District 8	Staunton	-10.7 %.
District 9	Northern Va.	-11.4 %.

The above is the baseline; the district by district values are in the following pages.

## District by District Road Values.

### BRISTOL

#### SECONDARIES

Secondary, Rural – Aggre. Surface	\$171,345.09	per lane mile.
Secondary, Rural – Surface Treated	\$192,974.30	per lane mile.
Secondary, Rural – Asphalt Paved	\$211,535.09	per lane mile.
Secondary, Urban – Asphalt Paved	\$405,058.09	per lane mile.

#### PRIMARY

Primary, Rural – Asphalt Paved	\$678,936.59	per lane mile.
Primary, Rural – Concrete Paved	\$811,108.46	per lane mile.
Primary, Urban – Asphalt	\$686,433.08	per lane mile.
Primary, Urban – Concrete	\$799,522.54	per lane mile.

#### INTERSTATE

Interstate, Rural – Asphalt	\$1,454,046.89	per lane mile.
Interstate, Rural – Concrete	\$1,607,674.80	per lane mile.
Interstate, Urban – Asphalt	\$1,889,287.07	per lane mile.
Interstate, Urban – Concrete	\$2,018,010.56	per lane mile.

### SALEM

#### SECONDARIES

Secondary, Rural – Aggre. Surface	\$185,947.08	per lane mile.
Secondary, Rural – Surface Treated	\$209,419.51	per lane mile.
Secondary, Rural – Asphalt Paved	\$229,562.05	per lane mile.
Secondary, Urban – Asphalt Paved	\$439,577.02	per lane mile.

#### PRIMARY

Primary, Rural – Asphalt Paved	\$736,795.37	per lane mile.
Primary, Rural – Concrete Paved	\$880,230.90	per lane mile.
Primary, Urban – Asphalt	\$744,930.71	per lane mile.
Primary, Urban – Concrete	\$867,657.61	per lane mile.

#### INTERSTATE

Interstate, Rural – Asphalt	\$1,577,960.34	per lane mile.
Interstate, Rural – Concrete	\$1,744,680.38	per lane mile.
Interstate, Urban – Asphalt	\$2,050,291.56	per lane mile.
Interstate, Urban – Concrete	\$2,189,984.83	per lane mile.

## LYNCHBURG

### SECONDARIES

Secondary, Rural – Aggre. Surface	\$179,330.55	per lane mile.
Secondary, Rural – Surface Treated	\$201,967.78	per lane mile.
Secondary, Rural – Asphalt Paved	\$221,393.59	per lane mile.
Secondary, Urban – Asphalt Paved	\$423,935.63	per lane mile.

### PRIMARY

Primary, Rural – Asphalt Paved	\$710,578.11	per lane mile.
Primary, Rural – Concrete Paved	\$848,909.80	per lane mile.
Primary, Urban – Asphalt	\$718,423.97	per lane mile.
Primary, Urban – Concrete	\$836,784.05	per lane mile.

### INTERSTATE

Interstate, Rural – Asphalt	\$1,521,812.06	per lane mile.
Interstate, Rural – Concrete	\$1,682,599.73	per lane mile.
Interstate, Urban – Asphalt	\$1,977,336.40	per lane mile.
Interstate, Urban – Concrete	\$2,112,058.99	per lane mile.

## RICHMOND

### SECONDARIES

Secondary, Rural – Aggre. Surface	\$231,806.42	per lane mile.
Secondary, Rural – Surface Treated	\$261,067.76	per lane mile.
Secondary, Rural – Asphalt Paved	\$286,177.97	per lane mile.
Secondary, Urban – Asphalt Paved	\$547,988.04	per lane mile.

### PRIMARY

Primary, Rural – Asphalt Paved	\$918,508.09	per lane mile.
Primary, Rural – Concrete Paved	\$1,097,318.52	per lane mile.
Primary, Urban – Asphalt	\$928,649.82	per lane mile.
Primary, Urban – Concrete	\$1,081,644.34	per lane mile.

### INTERSTATE

Interstate, Rural – Asphalt	\$1,967,126.02	per lane mile.
Interstate, Rural – Concrete	\$2,174,963.51	per lane mile.
Interstate, Urban – Asphalt	\$2,555,946.29	per lane mile.
Interstate, Urban – Concrete	\$2,730,091.52	per lane mile.

## SUFFOLK

### SECONDARIES

Secondary, Rural – Aggre. Surface	\$228,155.92	per lane mile.
Secondary, Rural – Surface Treated	\$256,956.46	per lane mile.
Secondary, Rural – Asphalt Paved	\$281,671.23	per lane mile.
Secondary, Urban – Asphalt Paved	\$539,358.31	per lane mile.

### PRIMARY

Primary, Rural – Asphalt Paved	\$904,043.40	per lane mile.
Primary, Rural – Concrete Paved	\$1,080,037.91	per lane mile.
Primary, Urban – Asphalt	\$914,025.41	per lane mile.
Primary, Urban – Concrete	\$1,064,610.57	per lane mile.

### INTERSTATE

Interstate, Rural – Asphalt	\$1,936,147.66	per lane mile.
Interstate, Rural – Concrete	\$2,140,712.12	per lane mile.
Interstate, Urban – Asphalt	\$2,515,695.17	per lane mile.
Interstate, Urban – Concrete	\$2,687,097.95	per lane mile.

## FREDRICKSBURG

### SECONDARIES

Secondary, Rural – Aggre. Surface	\$177,505.31	per lane mile.
Secondary, Rural – Surface Treated	\$199,912.13	per lane mile.
Secondary, Rural – Asphalt Paved	\$219,140.22	per lane mile.
Secondary, Urban – Asphalt Paved	\$419,620.77	per lane mile.

### PRIMARY

Primary, Rural – Asphalt Paved	\$703,345.77	per lane mile.
Primary, Rural – Concrete Paved	\$840,269.49	per lane mile.
Primary, Urban – Asphalt	\$711,111.77	per lane mile.
Primary, Urban – Concrete	\$828,267.02	per lane mile.

### INTERSTATE

Interstate, Rural – Asphalt	\$1,506,322.88	per lane mile.
Interstate, Rural – Concrete	\$1,665,474.03	per lane mile.
Interstate, Urban – Asphalt	\$1,957,210.84	per lane mile.
Interstate, Urban – Concrete	\$2,090,562.21	per lane mile.

## CULPEPER

### SECONDARIES

Secondary, Rural – Aggre. Surface	\$153,777.09	per lane mile.
Secondary, Rural – Surface Treated	\$173,188.65	per lane mile.
Secondary, Rural – Asphalt Paved	\$189,846.40	per lane mile.
Secondary, Urban – Asphalt Paved	\$363,527.50	per lane mile.

### PRIMARY

Primary, Rural – Asphalt Paved	\$609,325.25	per lane mile.
Primary, Rural – Concrete Paved	\$727,945.55	per lane mile.
Primary, Urban – Asphalt	\$616,053.13	per lane mile.
Primary, Urban – Concrete	\$717,547.52	per lane mile.

### INTERSTATE

Interstate, Rural – Asphalt	\$1,304,963.52	per lane mile.
Interstate, Rural – Concrete	\$1,442,839.97	per lane mile.
Interstate, Urban – Asphalt	\$1,695,578.55	per lane mile.
Interstate, Urban – Concrete	\$1,811,104.02	per lane mile.

## STAUNTON

### SECONDARIES

Secondary, Rural – Aggre. Surface	\$203,743.24	per lane mile.
Secondary, Rural – Surface Treated	\$229,462.12	per lane mile.
Secondary, Rural – Asphalt Paved	\$251,532.41	per lane mile.
Secondary, Urban – Asphalt Paved	\$481,646.97	per lane mile.

### PRIMARY

Primary, Rural – Asphalt Paved	\$807,310.76	per lane mile.
Primary, Rural – Concrete Paved	\$964,473.85	per lane mile.
Primary, Urban – Asphalt	\$816,224.69	per lane mile.
Primary, Urban – Concrete	\$950,697.24	per lane mile.

### INTERSTATE

Interstate, Rural – Asphalt	\$1,728,979.86	per lane mile.
Interstate, Rural – Concrete	\$1,911,655.92	per lane mile.
Interstate, Urban – Asphalt	\$2,246,515.79	per lane mile.
Interstate, Urban – Concrete	\$2,399,578.47	per lane mile.

## NORTHERN VIRGINIA

### SECONDARIES

Secondary, Rural – Aggre. Surface	\$202,146.14	per lane mile.
Secondary, Rural – Surface Treated	\$227,663.42	per lane mile.
Secondary, Rural – Asphalt Paved	\$249,560.71	per lane mile.
Secondary, Urban – Asphalt Paved	\$477,871.46	per lane mile.

### PRIMARY

Primary, Rural – Asphalt Paved	\$800,982.45	per lane mile.
Primary, Rural – Concrete Paved	\$956,913.59	per lane mile.
Primary, Urban – Asphalt	\$809,826.51	per lane mile.
Primary, Urban – Concrete	\$943,244.97	per lane mile.

### INTERSTATE

Interstate, Rural – Asphalt	\$1,715,426.83	per lane mile.
Interstate, Rural – Concrete	\$1,896,670.94	per lane mile.
Interstate, Urban – Asphalt	\$2,228,905.92	per lane mile.
Interstate, Urban – Concrete	\$2,380,768.78	per lane mile.

Roadway Values Report  
Concerning this Report  
October 2000

The goal of this report is to determine the value of the Virginia Department of Transportation's highway system. In order to set a value, short of a lengthy inventory in the field, it is necessary to set a responsible *average value* for each *typical lane mile* of roadway. A "rule of thumb" value. The values established are actual roadway values. They do not include the "Real Property" (right-of-way), nor do they include bridge structures. They do however include box culverts.

The first object in determining value was to determine road types. As demonstrated in the "workbooks" (Appendix A), twelve roadway types or categories were established. These encompass four genre of road surface that are Aggregate surface (dirt roads), surface treated (tar & chip), asphalt concrete (blacktop), and concrete. There are three categories, which are Secondary, Primary, and Interstate. In addition there are two classifications, or domains of roadway: Rural and Urban. The three categories were used to establish four sub-categories within each grouping. They are:

Secondary:

- Secondary Rural, Aggregate. Surface.
- Secondary Rural, Surface Treated.
- Secondary Rural, Asphalt Concrete.
- Secondary Rural, Urban (Asphalt Concrete)

Primary:

- Primary Rural, Asphalt Paved.
- Primary Rural, Concrete Paved.
- Primary Urban, Asphalt Paved.
- Primary Urban, Concrete Paved.

Interstate:

- Interstate Rural, Asphalt Paved.
- Interstate Rural, Concrete Paved
- Interstate Urban, Asphalt Paved.
- Interstate Urban, Concrete Paved.

Once the categories and sub-categories were established, a determination of what comprises a roadway was made. Ten items were determined to comprise a roadway. They are:

- Temporary Safety Items
- Grading
- Drainage
- Pavement (wearing surface)
- Shoulders and Medians
- Roadside Development
- Storm-water Management
- Utilities
- Signals and Signs
- Surveys and Mobilization

These ten items were then sub-divided further into more than fifty *typical items*. Those in turn consisted of "composite" or lump- sum items. Appendix A is the presentation

form of this data and is contained in an electronic file entitled "Road Costs 00-01.xls" for the perusal of interested persons.

Given a goal and a series of items to research, an outline of operation was made, wherein, actual roadway contracts awarded within the last year (June 1999 through June 2000) were used. This would provide the latest materials types, the latest design and the most recent costs. It was decided to use no less than ten lane miles for a typical sampling of projects that met the criteria established under each road type. Because Virginia "has it all, from mountains to shores" a base typical was decided upon which calls for rolling terrain with given roadway typical sections. Within this criteria a broad spectrum of projects statewide were researched. The samples were taken in all districts, where possible, and used to establish the *typical lane mile* of roadway in each category. Projects with exceptional characteristics, unusual or non-standard aspects were rejected. Only the "norm" for the roadway category in question was used.

The Location and Design Division was very helpful in providing *Typical Cross-Sections* and typical weight values of the roadway material types and the average weights and areas for the typical roadway project. See Appendix D for the "Typical Sections" used, and in "Appendix C" (Data Profiles.xls) see the worksheet "Determination of Quantities" which outlines the asphalt weights, measures, concrete, and other items for areas, dimensions, and weight calculations.

Given the criteria, and the typical roadway type, ten roadways were found to suit the Secondary Roads categories. For details and a project listing see the Data Profiles in Appendix C. There are twenty-six lane miles in the sampling. For Secondary Urban projects ten samples were selected with greater than ten lane miles. Primaries contain a sampling of twenty-five miles; Primary Urban contains a sampling of thirty-three miles. In the Interstate Rural Category there are twenty-three sample lane miles and in the Interstate Urban category there are seventeen lane miles.

The samples were ranked and an average item listing under the family of items listed above was then evaluated and a *base average* of quantities was instituted per lane mile of roadway. Within the data profiles there are more than twenty-five items sampled and averaged. Many of the items are built on composite items; i.e. Traffic signals, signing complexes, certain drainage structures, etc. A typical sheet entitled composites is contained in the Data Profile workbook. This data was processed to find the component's averages for a typical lane mile of roadway.

When the sampling and data processing was complete, pricing was the next target. As noted above Virginia has as many fiscal regions as she does physical areas. As with real property values the value of roadways vary district to district. Since the deviation exists, the problem of pricing, and price differentials, needed a solution. Reviewing certain files, maintained by the division, it was determined that Suffolk district was the district that best represented the base cost per lane mile of roadway. Therefore Suffolk was decided to represent the *base cost* with all other districts as deviants from that base price.

Using the "Quarterly Trends" document as a guideline, a table of average costs for the most used standard items was built to create a construction cost unit for each district. See Appendix B, District Deviations for details.

Thereafter a *low bid history* was drawn from Trns©Port for each district. The prices used to create the cost unit were listed and added district by district. Each district has the same item sampling and the cost unit can easily be noted. Thereafter a simple percent deviation from the base (Suffolk) was determined.

When applying the district cost, a deviation factor was applied as shown on the bottom of the report's first page and in the result row of Appendix B. This percent deviation was used in order to present the information in as concise and economic manner

as possible. Statewide and district by district there are one hundred eight roadway and price deviations. These are demonstrated in the forgoing report district by district and road category.