Transportation and Economic Development:
Evaluating Criteria for Highway Project Selection

Final Report: Appendix III
The report written by Prof. Yorgos J. Stephanedes contains nine volumes. Copies of the report may be obtained in its entirety or by separate volume. The title of each volume is as follows:

1. TRANSPORTATION AND ECONOMIC DEVELOPMENT
   Final Report - Executive Summary

2. TRANSPORTATION AND ECONOMIC DEVELOPMENT
   Final Report

3. TRANSPORTATION AND ECONOMIC DEVELOPMENT:
   THE GEOGRAPHICAL LITERATURE
   Final Report - Appendix I

4. TRANSPORTATION AND ECONOMIC DEVELOPMENT:
   TRANSPORTATION AND THE MINNESOTA ECONOMY;
   TRANSPORTATION/ECONOMY LITERATURE
   Final Report - Appendix II

5. TRANSPORTATION AND ECONOMIC DEVELOPMENT:
   EVALUATING CRITERIA FOR HIGHWAY PROJECT SELECTION
   Final Report - Appendix III

6. TRANSPORTATION AND ECONOMIC DEVELOPMENT:
   THE LINK BETWEEN HIGHWAY INVESTMENT AND ECONOMIC
   DEVELOPMENT - A TIME-SERIES INVESTIGATION
   Final Report - Appendix IV

7. TRANSPORTATION AND ECONOMIC DEVELOPMENT:
   THE LINK BETWEEN HIGHWAY INVESTMENT AND ECONOMIC
   DEVELOPMENT - A TIME-SERIES INVESTIGATION:
   SPECIFIC ECONOMIC SECTORS
   Final Report - Appendix V

8. TRANSPORTATION AND ECONOMIC DEVELOPMENT:
   HEURISTIC DECISION FRAMEWORK FOR
   UPGRADING HIGHWAY WEIGHT LIMITS
   Final Report - Appendix VI

9. TRANSPORTATION AND ECONOMIC DEVELOPMENT:
   SIMULATION OF HIGHWAY INVESTMENT IMPACTS ON
   THE FORESTRY SECTOR IN NORTHEAST MINNESOTA
   Final Report - Appendix VII

Additional copies may be obtained by writing to:

Minnesota Department of Transportation
Research Administration & Development Section
Materials & Research Laboratory
1400 Gervais Ave.
Maplewood, MN 55109
A time series methodology is developed that differentiates the effects of highways on development from the effects of development on highways. This methodology uses pooled time-series and cross-sectional data on highway expenditures and county employment for the 87 Minnesota counties and all 9 economic sectors over the 25-year period 1957-1982 and includes classification of counties based on access, demographic and socioeconomic features. Results from vector autoregressions are tested against modern causality tests of Granger-Sims type. In the wholesale and natural-resource-based service sectors (e.g., tourism), increased highway expenditures result in long-term employment increases. While regionally very substantial, the impacts are distributional, i.e., the statewide impact is negligible. Government role is mostly reactive, increasing funding to counties whose economy is increasing, except in rural areas where government also attempts to stimulate declining economies. Funding decisions are highly sensitive to changes in the economy, especially in rural areas, and (as our evaluation of the Minnesota Department of Transportation [Mn/DOT] project selection process indicates) are primarily influenced by the District recommendation. Further, a new B/C project selection process is developed and tested on highway weight restriction policies in Northeast Minnesota. Both simulation with large I/O model and comparison with actual funding decisions made independently by Mn/DOT indicate agreement with our results. An extensive literature review and 175 references are included.

This report consists of nine separate publications: an executive summary, the final report and seven appendices. The publications are listed on the following page.
TRANSPORTATION AND ECONOMIC DEVELOPMENT:
EVALUATING CRITERIA FOR HIGHWAY PROJECT SELECTION

Final Report - Appendix III

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Submitted to
Research Administration and Development Section
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Minnesota Department of Transportation

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This report represents the results of research conducted by the author and does not necessarily reflect the official views or policy of Mn/DOT. This report does not contain a standard or specified technique.
1. INTRODUCTION

Two are the major objectives of this section. First, to determine the major factors that influence the decision of the Mn/DOT on whether to fund candidate highway projects. Second, to determine the correlation between funding amount and funding criteria.

To accomplish the first objective, we analyze the data from the recent 1985 decisions by the Mn/DOT on major construction and reconstruction projects for 1990 and 1991, and reconditioning and resurfacing for 1987 and 1988. We also evaluate the selection criteria ("point system") now followed by the Mn/DOT. In particular, we compare the importance of these criteria as revealed by the funding decisions to their importance as stated by the Mn/DOT. In determining the major factors that influenced the funding decision, we place particular emphasis in identifying factors to which the decision is particularly sensitive. The project selection process amplifies any measurement inaccuracies in such factors, and this may result in unintended modifications in the funding decision.

To accomplish the second objective, i.e., to answer the question, "given that a project is selected, how do these factors influence the amount of funding?", we use data from the periods 1972-1976 and 1979-1985. Because of data limitations, the analysis considers all project categories together.

In working with the above objectives, we are especially concerned with an issue of major interest to the Mn/DOT, i.e., determining the total influence of ADT (or ADT-related factors) on the highway project selection process. (The
average daily traffic, averaged over a full year, and referred to as the annual average daily traffic, or AADT, measured in vehicles per day, is a value often used in forecasting and planning.) A second question that concerns Mn/DOT, and which we address here, deals with the possible need for the Mn/DOT to include an economic indicator with the set of factors it uses in the process. Of course, addressing this question is intimately related to determining whether Mn/DOT already includes, implicitly or explicitly, an economic factor in the process. In addition, this question is related to determining the relationship between highway investment and economic development over time. For instance, it could be argued that, if highway investment does not influence economic development, then there is no need for adding economic indicators in the selection process. It could be similarly argued that there is a need for adding such indicators if economic development does not influence highway investment already. The relationship between highway investment and economic development over time is analyzed in greater depth in another section of the final report.

As a final note of caution, we warn the reader that the findings in this section represent correlation results from a limited set of data and do not provide any indication regarding the direction of influence between any given variables. Results from time-series analysis that also test for the direction of influence are included elsewhere in this report.

2. PROBABILITY OF FUNDING

While the actual decision for selecting a project for funding is binary, it is possible to develop a formula that indicates the probability that a project is selected based on the recent selection data on '87-'91 projects. Based on this data set of limited size, our specific objectives in this analysis were:
1. Determine the actual importance of each point category (see Appendix for point summary) and compare it with its importance as stated by Mn/DOT. Do this for comparison purposes, even though certain point categories may not be statistically significant for project selection.

2. Determine the factors, both non-point related and generic components of the point categories, that affect project selection.

3. Determine, to the extent possible, the importance of ADT or ADT-related factors, by including them explicitly in the project selection formula.

2.1 MAJOR CONSTRUCTION

**Point analysis**

From the data, \( P \), the percent probability (scale 0-100) of funding is a function of the selection points as follows (t-statistic in parentheses; generally, increasing t values indicate increasing statistical significance of the corresponding variable):

\[
(1) \quad P = -195 + 2.2 \text{GMpt} + 7.7 \text{CEpt} + 3.7 \text{PMpt} + 14 \text{FCpt} + 5.2 \text{SRpt}
\]

\[
(3.5) \quad (1.1) \quad (3.8) \quad (1.4) \quad (2.5) \quad (2.0)
\]

\( R^2 = 55\% \)

The data (see t-statistics above) indicate that CE pts is the most significant point factor for project selection.

Below are, for comparison purposes, the actual contributions of all evaluation components according to the above formula (i.e., from the data) and as stated by Mn/DOT:

<table>
<thead>
<tr>
<th>Component</th>
<th>Actual</th>
<th>Stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM pts</td>
<td>7%*</td>
<td>20%</td>
</tr>
<tr>
<td>CE pts</td>
<td>23%</td>
<td>20%</td>
</tr>
<tr>
<td>PM pts</td>
<td>11%</td>
<td>5%</td>
</tr>
<tr>
<td>FC pts</td>
<td>43%</td>
<td>20%</td>
</tr>
<tr>
<td>SR pts</td>
<td>16%</td>
<td>35%</td>
</tr>
</tbody>
</table>

\* \( 2.2/(2.2+7.7+3.7+14+5.2) = 2.2/32.8 = 7\% \)
Contribution of non-point, generic factors and ADT

We next determined whether variables other than the selection points influence the project selection. Our analysis indicated that D, the priority rating by Districts (1=highest), CPM (Cost Per Mile in $M/mi.), and SLR are the most important such factors. [Note that CE = (90-SRA)*FADT/CPM.] We present below three formulas (eqs. 2-4), each of which can alternatively be used to indicate how these factors affect the probability of funding. The formulas explicitly include ADT or Forecast ADT (FADT), in conjunction with the Commercial ADT percentage (0<CADT<1) and CPM:

\[
\begin{align*}
(2) \quad p &= 229 - 15 \cdot SLR - 0.0066 \cdot CPM - 7.8 \cdot D + 0.012 \cdot ADT \cdot CADT \\
& (2.3) \quad (1.4) \quad (2.5) \quad (4.3) \quad (1.5) \\
& \quad (R^2 = 48\%) \\
(3) \quad p &= 215 - 15.3 \cdot SLR + 1.9 \cdot ADT/CPM - 8.1 \cdot D \\
& (2.3) \quad (1.5) \quad (1.4) \quad (4.3) \\
& \quad (R^2 = 41\%) \\
(4) \quad p &= 217 - 15.8 \cdot SLR + 1.4 \cdot FADT/CPM - 8.1 \cdot D \\
& (2.3) \quad (1.6) \quad (1.6) \quad (4.3) \\
& \quad (R^2 = 42\%) \\
(5) \quad p &= 51 + 0.00011 \cdot ADT \\
& (4.4) \quad (0.15) \\
& \quad (R^2 = 0\%)
\end{align*}
\]

To be sure, we do not recommend employment of eqn. (5), which has been included only for completeness.

Conclusion

From the data, we conclude that the most important factors for project selection are:

- District priority rating, D
- Cost per mile, CPM
- ADT (or Forecast ADT) times Commercial traffic percentage, ADT*CADT (or FADT*CADT)
- ADT/CPM (or FADT/CPM)
- SLR
2.2 RECONSTRUCTION

Point Analysis

From the data, \( P \), the percent probability of funding is a function of the selection points as follows:

\[
P = -79 + 7.8 \text{ SRpt} + 0.59 \text{ PMpt} + 1.4 \text{ GMpt} + 4.7 \text{ FCpt} + 4.5 \text{ CEpt}
\]

\[
(6) \quad (2.8) \quad (3.7) \quad (.38) \quad (.80) \quad (1.5) \quad (2.4) \quad (R^2 = 39%)
\]

[Note: The reader should not confuse the contribution of a factor with the significance of that factor. For instance, the data indicate that \( PM \) pts made a 3% contribution to project selection. However, the low t-statistic (0.38) indicates that \( PM \) points was not consistently important in project selection and, therefore, that we have very little confidence in it, i.e., it is not significant.]

Below are, for comparison purposes, the actual contributions of all evaluation components according to the above formula (i.e., from the data) and as stated by Mn/DOT:

<table>
<thead>
<tr>
<th>CONTRIBUTION</th>
<th>actual</th>
<th>stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR pts</td>
<td>41%</td>
<td>35%</td>
</tr>
<tr>
<td>PM pts</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>GM pts</td>
<td>7%</td>
<td>20%</td>
</tr>
<tr>
<td>FC pts</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>CE pts</td>
<td>24%</td>
<td>20%</td>
</tr>
</tbody>
</table>

As some point categories are not significant, the above equation is only offered for completeness.

Non-point, other generic factors and ADT

We next develop formulas that include the factors that, as the data indicate, are significant in project selection. The most significant such factors are \( D \), the District rating, MFR, the Marginal Funding Ratio (defined as the funding for the district without the proposed project divided by the average 5-year (1980-85) funding for the district), and ADT/CPM. We included generic
factors related to points, such as SRA, the adjusted SR. The following alternative formulas were developed:

\[(7) \quad P = 106 + 0.0014 \cdot ADT - 9.6 \cdot D - 29 \cdot MFR \quad (R^2=31\%) \]

\[(8) \quad P = 185 - 1.5 \cdot SRA - 8.3 \cdot D - 26 \cdot MFR + 1.3 \cdot ADT/CPM \quad (R^2=39\%) \]

\[(9) \quad P = 97 - 8.8 \cdot D - 27 \cdot MFR + (8.5 - 0.11 \cdot ASR) \cdot (ADT/CPM) \quad (R^2=37\%) \]

and, for completeness,

\[(10) \quad P = 31 + 0.0024 \cdot ADT \quad (R^2=4\%) \]

**Conclusion**

From the above, the most important factors for reconstruction project selection are:

- District rating, D
- Adjusted SR, SRA
- ADT/CPM
- SRA (ADT/CPM)
- Marginal funding ratio, MFR.

### 2.3 RECONDITIONING

**Point analysis**

From the recent data on '88 reconditioning projects, the probability of funding is a function of the selection points as follows:

\[(11) \quad P = -30 + 6 \cdot CRpt + 1 \cdot FCpt + 5.3 \cdot CEpt \quad (R^2=26\%) \]

Below are the actual contributions of each evaluation component according to the above formula (i.e., from the data) and as stated by Mn/DOT:

<table>
<thead>
<tr>
<th>CONTRIBUTION</th>
<th>actual</th>
<th>stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR pts</td>
<td>48%</td>
<td>70%</td>
</tr>
<tr>
<td>FC pts</td>
<td>9%</td>
<td>10%</td>
</tr>
<tr>
<td>CE pts</td>
<td>43%</td>
<td>20%</td>
</tr>
</tbody>
</table>
The data indicate that the FC pts are not significant in the project selection process (t-statistic = 0.29 is too low).

**Non-point, other generic factors and ADT**

We proceeded by determining whether variables other than points influence the project selection. Our analysis indicated a stronger selection formula when we include D (priority rating by Districts, 1 = highest), ADT, CR, ADT/CPM, CR (ADT/CPM), MFR, and U (urban dummy = 1 if project in urban area; 0 else). The following alternative formulas were developed:

\[(12) \quad p = 52 + 0.0054 \text{ADT} - 7.1 \text{D} - 23 \text{MFR} \quad (R^2 = 30\%)
\]

\[(13) \quad p = 162 + 0.0032 \text{ADT} - 6.9 \text{D} - 13 \text{MFR} - 40 \text{CR} \quad (R^2 = 37\%)
\]

\[(14) \quad p = 46 + 24 \text{U} - 6.2 \text{D} + (4.5-1.7 \text{CR})(\text{ADT/CPM}) \quad (R^2 = 39\%)
\]

and, for completeness,

\[(15) \quad p = 12 + 0.0039 \text{ADT} \quad (R^2 = 10\%)
\]

**Conclusion**

The data indicate that the most important factors for reconditioning project selection are:

- District priority, D
- CR
- ADT/CPM
- ADT
- MFR
- Urban location indicator, U.
2.4 RESURFACING

Point analysis

Our analysis of the data from resurfacing projects ('87) indicates that the probability of project selection for funding is a function of the selection points as follows:

\[(16) \quad P(\text{fund}) = -57 + 7.9 \text{CRpt} + 4.3 \text{FCpt} + 3.3 \text{CEpt} \]

\[\text{(3.2)} \quad \text{(5.3)} \quad \text{(2.0)} \quad \text{(2.4)} \]

\[(R^2=46\%)\]

The actual contribution of each component, compared to the stated one is:

<table>
<thead>
<tr>
<th>CONTRIBUTION</th>
<th>actual</th>
<th>stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR pts</td>
<td>51%</td>
<td>70%</td>
</tr>
<tr>
<td>FC pts</td>
<td>28%</td>
<td>10%</td>
</tr>
<tr>
<td>CE pts</td>
<td>21%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Non-point, generic factors and ADT

A stronger selection formula includes the District priority rating, CR, ADT, and ADT/CPM as the following alternative formulas indicate:

\[(17) \quad P = 225 - 66 \text{CR} + 0.0016 \text{ADT} - 2.9 \text{D} \]

\[\text{(9.4)} \quad \text{(8.2)} \quad \text{(3.6)} \quad \text{(3.9)} \]

\[(R^2=52\%)\]

\[(18) \quad P = 238 - 69 \text{CR} + 0.19 \text{ADT/CPM} - 3.2 \text{D} \]

\[\text{(10.4)} \quad \text{(8.9)} \quad \text{(4.1)} \quad \text{(4.3)} \]

\[(R^2=54\%)\]

and, for completeness,

\[(19) \quad P = 23 + 0.0019 \text{ADT} \]

\[\text{(3.7)} \quad \text{(3.4)} \]

\[(R^2=11\%)\]

Conclusion

The data indicate that the most important factors for resurfacing project selection are:

- CR points
- District priority, D
- ADT/CPM
- ADT
2.5 SUMMARY

Point factors

When comparing the actual contributions of all evaluation components as indicated from the data to the contributions stated by the Mn/DOT, the data indicate that Mn/DOT generally adheres to the major directions of the stated criteria. In particular, in the Reconstruction category, the discrepancy between stated and actual importance of the criteria is almost nil. On the other hand, in both Major Construction and Reconstruction, the importance of GM points is much lower than stated.

Of all the point components, CE and SR points are most significant in Major Construction and Reconstruction, while CR points is most significant in Reconditioning and Resurfacing. GM and PM points are not significant.

The funding decision is very sensitive to FC points in Major Construction and Reconstruction, and to CR points in Reconditioning and Resurfacing. This implies the need for extra care to ensure high accuracy, so as to avoid the magnification of possible inaccuracies in those cases. This is especially important for CR points where a measurement error can arise.

District priority rating

For all project categories, the District priority is the most consistently significant factor. In fact, the contribution of the District priority in explaining the funding decision often equals that of all other factors considered together. Furthermore, the funding decision is rather sensitive to the District priority; in particular, if the District raises its priority rating by a point (scale 1-10), the probability of funding is similarly raised by approximately 10 points (scale 0-100).
ADT and ADT-related factors

ADT is a significant factor in reconditioning and resurfacing and is almost irrelevant for major construction decisions. However, ADT-related factors are often more significant than ADT. For instance, ADT times Commercial ADT share (in major construction), and ADT divided by Cost/mile (in all cases) are important to the funding decision.

The sensitivity of funding to ADT is highest in reconditioning, and lowest in major construction. In particular, on a 0-100 point probability scale, a 1000 car increase can raise the funding probability 2 to 6 points in reconditioning, and 1 to 2 points in reconstruction and resurfacing; however, in major construction a 10,000 car increase would be needed to increase the probability of funding a typical project by almost 1 point.

Other factors

Additional factors important to the funding decision include the following:

- Adjusted SR  (major construction and reconstruction)
- SLR  (major construction)
- CR  (reconditioning and resurfacing)
- Marginal Funding Ratio  (reconditioning)
- Urban dummy  (reconditioning)

It is important to note that the funding decision is highly sensitive to changes in SR and CR, and can magnify 2 to 5 times any error in measuring those two factors. Of these, CR is the most critical, as also stated in our earlier discussion. As an example, a discrepancy of only one tenth of a point can shift the probability of funding a typical resurfacing project by 7 points on a 0-100 probability scale.
3. DETERMINING THE AMOUNT OF FUNDING PER PROJECT MILE

3.1 The role of ADT

Remarkably, the relationship between ADT and funding per mile has remained stable since 1972. As expected, this relationship has been positive, i.e., higher ADT corresponds to higher funding per mile. While the statistical significance of the relationship is low (probably as a result of the small size of the data set), it is consistent and indicates an effect that remains well within a narrow range of values. In particular, for every 10 percent increase in ADT on a highway to be funded, we can expect a 6 to 8 percent corresponding increase in funds per mile for that project. Examples illustrating this rule are presented in the Appendix.

3.2 The role of Condition Rating

We find that the relationship between CR (CR data from 1980) and funding is negative as expected, i.e., higher CR corresponds to lower funding per mile. In particular, for every 10 percent increase in CR on a highway to be funded, we can expect a 30 to 60 percent corresponding decrease in funds per mile for that project.

For the average project in this period, the above rule would imply that a one-tenth-point error in measuring CR could result in a funding difference of up to 18,000 $ per mile. For just one typical 25-mile project, this difference could reach .45 $Million.

3.3 Sensitivity to measurement errors

The project selection process is designed to be extremely sensitive to the Condition Rating. This is a highly unstable design that can substantially magnify any small inaccuracies in CR measurements and propagate them into the funding decisions. It is, therefore, crucial that high accuracy be maintained in the CR data.
3.4 The role of economic indicators

The data indicate a positive relationship between funding and either income or employment. This implies that more highway funds become available to areas of higher income and/or employment. This was expected since a positive relationship has already been found between funding/mile and both ADT and Commercial ADT, economic indicators that are substantially correlated with income (Correlation between ADT and Income = 52 to 66%) and are already included in the project selection process.

Regarding the issue of the possible need for one or more additional economic indicators in the project selection criteria, it would first be necessary to decide on the mission of such indicators. Such a mission could be of two major kinds:

a) The new economic indicators could shift the focus of Mn/DOT funding to low-income low-employment areas hoping to promote economic development. Two major points are made regarding this option. First, Mn/DOT would have to indicate this is a formal policy objective. Further, even if Mn/DOT wished to pursue such an objective, the potential of such a policy would be substantially limited as other sections of the final report indicate in more detail.

b) The new economic indicators could continue focusing on areas with a healthy or improving economy. In such case, additional economic indicators could enrich the selection process by providing information not currently considered. For instance, even Income, which is already correlated with ADT could be included to contribute information not already shared with ADT. Nevertheless, it is necessary to first decide on the mission of the needed indicator. Examples of such mission could include the growth rate of the economy of the area, dominance over
surrounding areas, the consistency with which economic indicators of an area have remained healthy over time, percent employment in export-oriented economic sectors, percent agricultural employment, credit rating, and other measures of economic vitality of a community. In addition, it is necessary to examine the potential of such a policy, an issue discussed elsewhere in the report in more detail.

3.5 Additional data needs

Additional data should be available on generic factors that systematically influence the condition of the pavement such as cold weather characteristics, soil type and history of pavement use. Information on cost/benefit results of alternative highway plans is also needed. Such information would include, for instance, evaluation of advanced technologies to monitor condition and use of the road; and evaluation of alternative weight restrictions in combination with pavement upgrading from a long-term investment point of view. The last item is discussed in some detail elsewhere in the report.
APPENDIX

A.1 THE ROLE OF ADT IN DETERMINING AMOUNT OF FUNDING PER PROJECT MILE

The relationship between ADT and funding per mile indicates that for every 10 percent increase in ADT on a highway to be funded, we can expect a 6 to 8 percent corresponding increase in funds per mile for that project. Examples illustrating this rule are presented below.

Example 1

During the period 1972-76, the data indicate that

\[ \text{Funding (\$) per mile} = 5000 + 7 \times \text{ADT} \]  

With an average ADT = 2100 for that period, eqn. (1) implies that

\[ \text{funding per mile} = 5000 + 7 \times (2100) = 19700 \$ \] for an "average" project.

According to the above rule, a project with an ADT that is 10% higher, i.e.,

\[ \text{ADT} = 2100 + 10\% \times (2100) = 2100 + 210 = 2310 \]

would be expected to be funded at 8% higher, i.e.,

\[ \text{funding per mile} = 19700 + 8\% \times (19700) = 19700 + 1576 = 21276 \$ \].

Example 2

For the period 1979-85, the data indicate that

\[ \text{funding per mile} = 30000 + 15 \times \text{ADT} \]  

With an average ADT = 2700 for that period, we use eqn. (2) to find

\[ \text{funding per mile} = 30000 + 15 \times (2700) = 70500 \]

for an "average" project of that period. Using the above rule, a project with a 10% higher ADT would be funded at a 6% higher level, i.e.:

\[ \text{ADT} = 2700 + 10\% \times (2700) = 2700 + 270 = 2970 \]

would correspond to
$/\text{mile} = 70500 + 6\% \times (70500) = 70500 + 4230 = 74730.

We note that, in Example 1, an ADT increase of 210 corresponds to an increase of 1576$/mi or, equivalently, 1000 more cars correspond to an increase of 1576 \times (1000/210) = 7500$ per mile. From Example 2, however, an ADT increase of 270 corresponds to an increase of 4230$/mi or, equivalently, 1000 more cars correspond to an increase of 4230 \times (1000/270) = 15700$ per mile. While the two numbers (7500 and 15700) differ because of inflation, they are approximately same in real terms as they both follow the above stated "rule of 6 to 8 percent."
A.2 POINT CONVERSION SUMMARY

| Points | CR  | Functional Class | Cost Effectiveness | Weight |  
|--------|-----|-----------------|--------------------|--|---|---|---|---|---|---|---|
|        |     |                 | Major Const & Reconst | 70%  | 10-20% | 20% | 20% | 35% | 5% | 20% |
| 0      | >3.2| ---             | ---                 | ---   | <50    | <8  | >80 | <100 | <200 |
| 1      |     | ---             | <50                 | ---   | 50-149 | 8-15 | 76-80 | <100 | <200 |
| 2      | 3.1-3.2 | ---             | 50-149 | 8-15 | 76-80 | <100 | <200 |
| 3      |     | ---             | 16-23              | ---   | ---   | 71-75 | --- | --- | --- |
| 4      | 2.9-3.0 | Collectors      | 150-249           | 24-31 | 66-70 | 100-199 | 200-399 |
| 5      |     | ---             | 32-39              | ---   | ---   | 61-65 | --- | --- | --- |
| 6      | 2.7-2.8 | ---             | 250-349           | 40-47 | 56-60 | 200-299 | 400-599 |
| 7      | 2.5-2.6 | Minor Arterials | ---               | 48-55 | ---   | --- | --- | --- | --- |
| 8      | 2.3-2.4 | ---             | 350-499           | 56-63 | 51-55 | 300-399 | 600-799 |
| 9      | 2.1-2.2 | ---             | 64-71             | ---   | ---   | --- | --- | --- | --- |
| 10     | <2.1 | Principle Arterials | >500             | >71   | <50   | >400 | >800 | --- | --- |

*e.g., Resurf. and Recondit.: 70% CR pts + 10% FC pts + 20% CE pts = 100%*