

**SENATE
STATE OF MINNESOTA
NINETY-THIRD SESSION**

S.F. No. 4896

(SENATE AUTHORS: CARLSON and Dibble)

DATE
03/13/2024

D-PG
12188

Introduction and first reading
Referred to Transportation
See HF5247

OFFICIAL STATUS

1.1 A bill for an act
1.2 relating to transportation; amending requirements governing pavement life-cycle
1.3 cost analyses; requiring a report; amending Minnesota Statutes 2022, section
1.4 174.185.

1.5 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

1.6 Section 1. Minnesota Statutes 2022, section 174.185, is amended to read:

1.7 **174.185 PAVEMENT LIFE-CYCLE COST ANALYSIS.**

1.8 Subdivision 1. **Definitions.** For the purposes of this section, the following definitions
1.9 apply.

1.10 ~~(a) "Life-cycle cost" is the sum of the cost of the initial pavement project and all~~
1.11 ~~anticipated costs for maintenance, repair, and resurfacing over the life of the pavement.~~
1.12 ~~Anticipated costs must be based on Minnesota's actual or reasonably projected maintenance,~~
1.13 ~~repair, and resurfacing schedules, and costs determined by the Department of Transportation~~
1.14 ~~district personnel based upon recently awarded local projects and experience with local~~
1.15 ~~material costs.~~

1.16 ~~(b) (a) "Life-cycle cost analysis" is or "analysis" means a comparison of life-cycle costs~~
1.17 ~~among competing paving materials using equal design lives and equal comparison periods.~~
1.18 process for evaluating the total economic worth of a usable project segment by analyzing
1.19 initial costs and discounted future costs, such as maintenance, user costs, reconstruction,
1.20 rehabilitation, restoring, and resurfacing costs over the life of the project segment.

1.21 (b) "Minimum requirements" means a combination of pavement, base, and subbase
1.22 materials that minimizes the total system cost to achieve the specified design performance

2.1 requirements. Design performance requirements are based on design traffic volumes,
 2.2 reliability, standard deviation, pavement structural characteristics, and various material
 2.3 properties for structural design.

2.4 (c) "Pavement" means any material used for paved traffic lanes, typically asphalt or
 2.5 concrete, including the underlying materials inherent to each pavement alternative considered.

2.6 (d) "Rounded value" means a measurement that is rounded to the nearest half-inch
 2.7 increment.

2.8 (e) "Shoulder" means the portion of the highway that is contiguous with the regularly
 2.9 traveled portion of the highway, outside of the edge of the pavement, and for accommodation
 2.10 of stopped vehicles, emergency use, and lateral support of base and surface courses.

2.11 (f) "Substantial plan development" means the point in time during the plan development
 2.12 process after which any further activities would preclude any of the feasible alternatives
 2.13 from being selected or constructed.

2.14 (g) "Superfluous materials" means materials that are in excess of rounded values and
 2.15 that are not necessary to meet the minimum requirements for a feasible alternative.

2.16 **Subd. 2. Required analysis.** (a) For each project in the reconditioning, resurfacing, and
 2.17 road repair funding categories any project with 60,000 or more square yards of paving,
 2.18 including for the shoulder, the commissioner shall must perform a life-cycle cost analysis
 2.19 and shall document the lowest life-cycle costs and all alternatives considered. The
 2.20 commissioner shall document the chosen pavement strategy and, if the lowest life cycle is
 2.21 not selected, document the justification for the chosen strategy. A life-cycle cost analysis
 2.22 is required for projects to be constructed after July 1, 2011. and document the chosen
 2.23 pavement strategy as provided in this section. The commissioner must perform the life-cycle
 2.24 cost analysis prior to substantial plan development.

2.25 (b) When conducting a life-cycle cost analysis, the commissioner must:

2.26 (1) derive initial and future costs from Minnesota-based historical data of roadways with
 2.27 similar characteristics, including but not limited to similar geographical location, rural or
 2.28 urban classification, traffic volumes, construction practices, staging, and vehicle classification
 2.29 percentages;

2.30 (2) determine the analysis period based on the longest design life of all feasible
 2.31 alternatives or 60 years, whichever is longer;

2.32 (3) compensate for any life added or lost due to rounding if pavement thickness is rounded
 2.33 up or down;

3.1 (4) ensure that each feasible alternative being considered in the analysis meets the
3.2 minimum requirements for that alternative and must consider only the pavement, base, and
3.3 subbase materials that are required to meet the minimum criteria for that alternative;

3.4 (5) identify all feasible alternatives, including a full range of rehabilitation strategies for
3.5 both rigid and flexible pavements;

3.6 (6) include agency costs, including but not limited to initial pavement, future rehabilitation
3.7 and maintenance projects, overhead, design, contract administration, and routine maintenance;

3.8 (7) include mobilization costs related to construction, maintenance, or rehabilitation;

3.9 (8) include costs for traffic control to protect workers and the public during each
3.10 construction, maintenance, or rehabilitation activity in the analysis;

3.11 (9) include evaluation of greenhouse gas emissions through the entire analysis period,
3.12 including emissions generated during material production and by users of the road;

3.13 (10) identify and use realistic timing of future maintenance and construction practices
3.14 using similar characteristics, including but not limited to similar geographical location, rural
3.15 or urban classification, traffic volumes, construction practices, staging, and vehicle
3.16 classification percentages;

3.17 (11) for each feasible alternative with residual service life at the end of the analysis
3.18 period, calculate the value of any residual service life and include the value as a credit in
3.19 the final year of the analysis period;

3.20 (12) add the annual excess fuel consumption costs, as calculated in subdivision 2a, as
3.21 an annual pavement cost;

3.22 (13) include an explanation of the methodology used to produce the cost estimate and
3.23 why that method was selected; and

3.24 (14) include an explanation of the timing selected of rehabilitation and maintenance and
3.25 why that timing was selected.

3.26 (c) The commissioner must not include the following in a life-cycle cost analysis:

3.27 (1) elements that are the same for all alternatives;

3.28 (2) life-cycle calculations for shoulder pavement, shoulder base, or shoulder subbase;
3.29 and

3.30 (3) any superfluous material that is included as part of the feasible alternative but is not
3.31 required to meet the minimum requirements of the feasible alternative, including any material

4.1 that may be included due to the designer's preference or recommendation in the department's
4.2 Pavement Design Manual. This clause does not preclude the commissioner from selecting
4.3 a pavement strategy that uses superfluous materials, but the superfluous materials must not
4.4 be a factor in making the selection.

4.5 Subd. 2a. **Excess fuel consumption calculation.** (a) For purposes of this subdivision,
4.6 the following terms have the meanings given:

4.7 (1) "diesel fuel price" means the Midwest nonhighway diesel fuel price effective for the
4.8 date the calculation is performed as provided by the federal Energy Information
4.9 Administration;

4.10 (2) "gasoline fuel price" means the Midwest regular gasoline price effective for the date
4.11 the calculation is performed as provided by the federal Energy Information Administration;

4.12 (3) "heavy commercial annual average daily traffic" or "HCAADT" means the heavy
4.13 commercial annual average daily traffic provided by the department's data and based on the
4.14 traffic forecasting and analysis system;

4.15 (4) "heavy-duty fuel savings factor" means the percentage of rigid pavement savings
4.16 anticipated for heavy commercial vehicles as provided by department research, state or
4.17 federal agencies, or relevant academic research projects;

4.18 (5) "heavy-duty MPG" means the latest fleet average miles per gallon of heavy-duty,
4.19 short-wheelbase vehicles as provided by the federal Energy Information Administration;

4.20 (6) "light-duty fuel savings factor" means the percentage of rigid pavement savings
4.21 anticipated for passenger vehicles as provided by department research, state or federal
4.22 agencies, or relevant academic research projects;

4.23 (7) "light-duty MPG" means the latest fleet average for miles per gallon of light-duty,
4.24 short-wheelbase vehicles as provided by the federal Energy Information Administration;

4.25 (8) "passenger annual average daily traffic" or "PAADT" means the passenger annual
4.26 average daily traffic provided by the department's data and based on the traffic forecasting
4.27 and analysis system; and

4.28 (9) "project length" means the centerline miles for the project.

4.29 (b) The commissioner must determine the annual excess fuel consumption cost as
4.30 provided in this subdivision. The commissioner must use the same HCAADT or PAADT
4.31 for the duration of each analysis period.

5.1 (c) The passenger excess cost is equal to the product of PAADT, gasoline fuel price,
5.2 light-duty fuel savings factor, project length, and 365 divided by light-duty MPG.

5.3 (d) The heavy commercial excess cost is equal to the product of HCAADT, diesel fuel
5.4 price, heavy-duty fuel savings factor, project length, and 365 divided by heavy-duty MPG.

5.5 (e) The annual excess fuel consumption cost is calculated as the sum of passenger excess
5.6 cost and heavy commercial excess cost.

5.7 Subd. 2b. **Review and collaboration.** (a) Before finalizing a pavement selection, the
5.8 commissioner must post a draft of the life-cycle cost analysis and the draft pavement selection
5.9 on the department's Office of Materials and Road Research website for 21 days. During
5.10 this period, the commissioner must allow industry association representatives to submit
5.11 questions and comments. The commissioner must collaborate with the person who submitted
5.12 the question or comment, where necessary, to ensure the commissioner fully understands
5.13 the question or comment. The commissioner must respond to each comment or question in
5.14 writing, which must include a description of any associated changes that will be made to
5.15 the life-cycle cost analysis.

5.16 (b) After the review period under paragraph (a) closes, the commissioner must make
5.17 revisions to the life-cycle cost analysis in response to questions or comments received. If
5.18 the commissioner revises the type of pavement from concrete to asphalt or from asphalt to
5.19 concrete, the commissioner must post the revised life-cycle cost analysis for review in
5.20 accordance with the requirements under paragraph (a).

5.21 Subd. 2c. **Selection.** (a) After the review period required in subdivision 2b and any
5.22 subsequent changes to the analysis, the commissioner must select the pavement strategy
5.23 and prepare a document of justification. At a minimum, the document of justification must:

5.24 (1) explain why the pavement strategy was selected;

5.25 (2) if the lowest life-cycle cost is not selected, justify why a strategy with a higher
5.26 life-cycle cost was selected;

5.27 (3) include all comments and questions received during the review period and the
5.28 commissioner's responses to each; and

5.29 (4) identify any superfluous materials, quantify the superfluous materials' associated
5.30 costs, and provide the rationale for the superfluous materials' inclusion.

5.31 (b) The commissioner must submit the analysis and document of justification to a licensed
5.32 professional engineer for review. A life-cycle cost analysis is not considered final until it

6.1 is certified and signed by a licensed professional engineer as provided by Minnesota Rules,
6.2 part 1800.4200.

6.3 (c) For all projects that began construction on or after January 1, 2024, the commissioner
6.4 must store all life-cycle cost analyses and documents of justification on the department's
6.5 website in a manner that allows the public to easily access the documents.

6.6 (d) After completing the certification and signature requirements in paragraph (b) and
6.7 the posting requirements in paragraph (c), the commissioner may advance the project to
6.8 substantial plan development.

6.9 Subd. 3. **Report.** The commissioner ~~shall~~ must report by January 31 annually to the
6.10 chairs and ranking minority members of the senate and house of representatives committees
6.11 with jurisdiction over transportation finance on life-cycle cost analyses under this section.
6.12 At a minimum, the report must include information on the results of the analyses required
6.13 in under subdivision 2, the public review under subdivision 2b, and the final selection and
6.14 document of justification under subdivision 2c.

6.15 **EFFECTIVE DATE.** This section is effective July 1, 2025.