

**SB**

**226**



# SENATOR DAVE DONLEY

ALASKA STATE LEGISLATURE

## MEMORANDUM

To: Senator Cowdrey, Chair  
Senate Transportation Committee

From: Senator Dave Donley 

Date: January 29, 2002

Re: Senate Bill 226

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I request that Senate Bill 226, an act requiring highways to be designed and constructed so that they will adequately serve anticipated traffic levels for the next 30 years; and providing for an effective date, be scheduled for a hearing in the Transportation Committee at your earliest convenience.

Senate Bill 226 would require the Department of Transportation and Public Facilities to require design criteria of 30 years of use with consideration for anticipated traffic levels. Currently, the DOT/PF regulations state that road projects should be designed for 20 years of use. The intention is that the use period begins with actual construction completion and the public having use of the road. Current interpretation of the 20-year period is that the period begins when the project is nominated in the long-range plan. The average time for a project to be completed is about 8-11 years (an average of 6 years moving up the priority list and then 3-5 years for design and construction). This leaves only ten years or so of actual use in the 20-year time period. The bill increases the planning horizon so that the actual use period is at least the 20 years as intended.

I have included a copy of the bill and the sponsor statement for your review.

Thank you in advance for your consideration of this request. If you or your staff should have any questions, please contact myself or Phil Cutler of my staff at 465-3892.

DD/pc

**Co-Chair: Senate Finance Committee**

**Vice-Chair: Senate Judiciary Committee**

**Member: Legislative Budget and Audit Committee • Legislative Council**

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[www.akrepublicans.org/Donley.htm](http://www.akrepublicans.org/Donley.htm) • [www.legis.state.ak.us/senate/donley/htm](http://www.legis.state.ak.us/senate/donley/htm)

## Sponsor Statement

### Sponsor Substitute for Senate Bill 226

"Requiring Highways to be Designed and Constructed for 30 Years Life"

Senate Bill 226 would require the Department of Transportation and Public Facilities to require road improvements to be designed to last for at least 30 years. Currently, the DOT/PF regulations state that road projects should be designed for 20 years of use.

Current interpretation of the 20-year period is that the period begins when the project is **nominated** in the long-range plan. The average time for a project to be completed is about 8-11 years (6 years moving up the priority list and then 3-5 years for design and construction). That leaves only 10 years of use within the 20-year time period. The bill increases the planning horizon so that the actual use period will hopefully be at least 20 years.

SB226 would amend AS 19.10.160 "Standard plans and specifications" to include language that directs the Department to design and construct highways that will adequately serve the planned future traffic for the next 30 years with criteria that include meeting current safety and durability standards, as well as providing for economical maintenance in the future.

Federal law requires that federally funded projects be designed for at least 20 years use. The Federal law does not limit longer periods for design and use.

DD:pc



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ALASKA STATE LEGISLATURE

## Sponsor Statement

### Sponsor Substitute for Senate Bill 226

**"Requiring Highways to be Designed and Constructed for at least 30 Years Life"**

Senate Bill 226 would require the Department of Transportation and Public Facilities to require design and construction of major upgrades and new roads to last for at least 30 years. Currently, the DOT/PF regulations state that road projects should be designed for 20 years of use. Maintenance projects would not have to meet these criteria, nor would road projects outside major metropolitan areas.

Current interpretation of the 20-year period is that the period begins when the project's Environmental Impact Statement process is completed. The average time for a project to be ready for the public's use from that point is about 8-11 years (5-6 years moving up the priority list and then 3-5 years for design and construction). That leaves only 10 years of use within the required 20-year time period. The bill increases the planning horizon so that the actual use period will hopefully be at least 20 years.

SB226 would amend AS 19.10.160 "Standard plans and specifications" to include language that directs the Department to design and construct highways that will adequately serve the planned future traffic for at least the next 30 years with criteria that include meeting current safety and durability standards, as well as providing for economical maintenance in the future.

Federal regulations require that federally funded major upgrades and new roads be designed for 20-30 years of use while bridges must last at least 50 years. The Federal law does not forbid longer periods for design and use.

DD:pc

**Co-Chair: Senate Finance Committee**

**Vice-Chair: Senate Judiciary Committee**

**Member: Legislative Budget and Audit Committee • Legislative Council**

22-LS0993\O  
Utermohle  
2/12/02

**CS FOR SPONSOR SUBSTITUTE FOR SENATE BILL NO. 226( )**  
**IN THE LEGISLATURE OF THE STATE OF ALASKA**  
**TWENTY-SECOND LEGISLATURE - SECOND SESSION**

**BY**

**Offered:**  
**Referred:**

**Sponsor(s): SENATORS DONLEY, Cowdery, Phillips**

**A BILL**

**FOR AN ACT ENTITLED**

1 **"An Act requiring certain highway projects to be designed and constructed so that the**  
2 **highways will adequately serve anticipated traffic levels for at least the next 30 years;**  
3 **and providing for an effective date."**

4 **BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:**

5 **\* Section 1. AS 19.10.160 is amended by adding a new subsection to read:**

6 (b) After December 31, 2002, plans and specifications for proposed major  
7 upgrade and new construction projects for highways in metropolitan areas must  
8 provide for the design and construction of highways that will adequately serve the  
9 planned future traffic for at least the next 30 years in a manner that is conducive to  
10 safety, durability, and economy of maintenance. This subsection does not apply to  
11 plans and specifications for highway maintenance projects.

12 **\* Sec. 2. This Act takes effect January 1, 2003.**

**A POLICY  
on  
GEOMETRIC DESIGN  
of  
HIGHWAYS  
and  
STREETS**

**2001**



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ISBN: 1-56051-156-7

## **Projection of Future Traffic Demands**

Geometric design of new highways or improvements to existing highways should not usually be based on current traffic volumes alone, but should consider future traffic volumes expected to use the facility. A highway should be designed to accommodate the traffic volume that is likely to occur within the design life of the facility.

It is difficult to define the life of a highway because major segments may have different lengths of physical life. Each segment is subject to variations in estimated life expectancy for reasons not readily subject to analysis, such as obsolescence or unexpected radical changes in land use, with the resulting changes in traffic volumes, patterns, and demands. Right-of-way and grading may be considered to have a physical life expectancy of 100 years; minor drainage structures and base courses, 50 years; bridges, 25 to 100 years; resurfacing, 10 years; and pavement structure, 20 to 30 years, assuming adequate maintenance and no allowance for obsolescence. Bridge life may vary depending on the cumulative frequency of heavy loads. Pavement life can vary widely, depending largely on initial expenditures and the repetition of heavy axle loads.

The assumption of no allowance for functional obsolescence is open to serious debate. The principal causes of obsolescence are reduction in the traffic operational level of service resulting from increases in the number of intersections and driveways, and increases in traffic demand beyond the design capacity. With freeways, which have full access control and no at-grade crossings, obsolescence due to increased number of intersections and driveways can be eliminated. On other highway types, obsolescence due to addition of intersections and driveways is much more difficult to forestall; this occurs particularly in urban and suburban areas, but may occur in rural areas as well.

It is a moot question whether the design capacity of a highway should be based on its life expectancy. The decision is greatly influenced by economics. For example, a highway might be designed for traffic volumes 50 years hence with the expectation that the pavement structure would be restored in 20 to 25 years. However, if the added cost of a 50-year design over a design with a 25-year life expectancy is appreciable, it may be imprudent to make a further investment providing capacity that will not be needed for at least 25 years. The construction cost savings could be used to construct another currently needed highway project. Furthermore, the cost of increased maintenance for the larger highway would be avoided for at least 25 years. Also, most highways are capable of handling higher traffic volumes than their design volume indicates, but this may cause more inconvenience, such as a reduction in speed and less maneuverability.

For example, a four-lane divided highway with a design ADT of 10,000 or 15,000 vehicles per day could handle two or three times that design volume depending on several factors discussed later. Thus, the four-lane divided highway could adequately serve traffic long after the design year and, in many cases, indefinitely.

In a practical sense, the design volume should be a value that can be estimated with reasonable accuracy. Many highway engineers believe the maximum design period is in the range of 15 to 24 years. Therefore, a period of 20 years is widely used as a basis for design. Traffic

cannot usually be forecast accurately beyond this period on a specific facility because of probable changes in the general regional economy, population, and land development along the highway, which cannot be predicted with any degree of assurance.

Estimating traffic volumes for a 20-year design period may not be appropriate for many reconstruction or rehabilitation projects. These projects may be developed on the basis of a shorter design period (5 to 10 years) because of the uncertainties of predicting traffic and funding constraints.

## **Speed**

Speed is one of the most important factors considered by a traveler in selecting alternative routes or transportation modes. Travelers assess the value of a transportation facility in moving people and goods by its convenience and economy, which are directly related to its speed. The attractiveness of a public transportation system or a new highway are each weighed by the traveler in terms of time, convenience, and money saved. Hence, the desirability of rapid transit may well rest with how rapid it actually is. The speed of vehicles on a road or highway depends, in addition to capabilities of the drivers and their vehicles, upon four general conditions: the physical characteristics of the highway and the amount of roadside interference, the weather, the presence of other vehicles, and the speed limitations (established either by law or by traffic control devices). Although any one of these factors may govern travel speed, the effect of these general conditions is usually interrelated.

The objective in design of any engineered facility used by the public is to satisfy the public's demand for service in a safe and economical manner. The facility should, therefore, accommodate nearly all demands with reasonable adequacy and also should not fail under severe or extreme traffic demands. Therefore, highways should be designed to operate at a speed that satisfies nearly all drivers. Because only a small percentage of drivers travel at extremely high speed, it is not economically practical to design for them. They can use the highway, of course, but will be constrained to travel at speeds less than they consider desirable. On the other hand, the speed chosen for design should not be that used by drivers under unfavorable conditions, such as inclement weather, because the highway would then be inefficient, and possibly unsafe, for drivers under favorable conditions, and would not satisfy reasonable public expectations for the facility.

### **Operating Speed**

Operating speed is the speed at which drivers are observed operating their vehicles during free-flow conditions. The 85th percentile of the distribution of observed speeds is the most frequently used measure of the operating speed associated with a particular location or geometric feature.



OFFICIAL BUSINESS

Alaska State Legislature  
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**FOR YOUR IMMEDIATE ATTENTION**

DATE: January 14, 2002  
TO: Transportation Committee  
(Senator Cowdery, Room 205)  
FROM: Office of the Senate Secretary  
SUBJ: Sponsor Substitute

1-14-02  
Kim  
done ✓

A Sponsor Substitute has been introduced for the following bill/resolution pending in your Committee:

**RETRIEVE**

**SENATE BILL NO. 226**

"An Act relating to the statewide transportation improvement program; and providing for an effective date."

Please pull this bill/resolution folder from your files and give to the page. The bill/resolution may be returned to you with the Sponsor Substitute.

Thank you.



# SENATOR DAVE DONLEY

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22-LS0993\O  
Utermohle  
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