

## Chapter Trans 210

### MAJOR HIGHWAY PROJECT NUMERICAL EVALUATION PROCESS

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**Trans 210.01 Purpose.** In accordance with s. 85.05, Stats., this chapter sets forth the process and criteria used by the department to numerically evaluate projects considered for enumeration. This process for evaluating candidate major highway projects is used to advise the transportation projects commission. This chapter establishes a minimum score that a project shall meet or exceed in order to be eligible for recommendation to the transportation projects commission.

**History:** Cr. Register, January, 1999, No. 517, eff. 2-1-99.

**Trans 210.02 Applicability.** The procedures in this chapter shall be applied to projects being considered for enumeration as major highway projects by the department.

**History:** Cr. Register, January, 1999, No. 517, eff. 2-1-99.

**Trans 210.03 Definitions.** In this chapter:

(1) “Department” means the Wisconsin department of transportation.

(2) “Major highway project” has the meaning given in s. 84.013 (1)(a), Stats.

(3) “Transportation projects commission” has the meaning given in s. 13.489, Stats.

(4) “Level of service” or “LOS” means the ability of the facility to satisfy both existing and future travel demand. Six levels of service are defined for each type of highway facility ranging from A to F, with LOS A representing the best operating conditions and LOS F the worst.

**History:** Cr. Register, January, 1999, No. 517, eff. 2-1-99.

**Trans 210.04 Goals.** The department shall use this process to evaluate a proposed major highway project in terms of its ability to enhance Wisconsin’s economy, improve highway service, improve highway safety, minimize environmental impacts, and serve community objectives.

**History:** Cr. Register, January, 1999, No. 517, eff. 2-1-99.

**Trans 210.05 Minimum requirement.** Proposed major highway projects having traffic flow or safety deficiencies shall receive a minimum requirement score of 10 points. Only these projects shall be eligible for recommendation to the transportation projects commission. Traffic flow or safety deficiencies shall exist if either of the following conditions are satisfied:

(1) The predicted level of service on significant portions of the highway shall be worse than level of service C. Department engineers shall use the appropriate methodologies to determine the projected level of service that is predicted to exist 20 years from the year of the analysis.

**Note:** Department engineers will use the procedures outlined in the general design consideration guidelines in Chapter 11, Section 5 of the *Facilities Development Manual* published by the Wisconsin Department of Transportation to determine the level of highway service. Copies of the manual may be obtained by writing to or calling the Division of Investment Management, Bureau of State Highway Programs, P.O. Box 7913, Room 933, Madison, WI 53707-7913, (608) 267-7715.

(2) Safety on significant portions of the highway shall be

worse than the statewide average for a similar highway type. Safety shall be identified by the number of crashes or the severity of crashes using any one of the following:

(a) The crash rate, which shall be calculated by the total number of crashes divided by the number of hundred million vehicle miles traveled over the length of the highway segments.

(b) Severity proportion, which shall be calculated by dividing the number of fatality and incapacitating injury crashes by total crashes over the length of the highway segments.

**Note:** The crash rates and severity proportions are objective measures which are based on principles found in the *Highway Safety Evaluation Procedural Guide*, Docket No. FHWA-TS-81-219, published by the Federal Highway Administration. A copy of the Guide can be reviewed by writing or calling the Safety and Traffic Operations Engineer at the Federal Highway Administration, 567 D’Onofrio Drive, Madison, WI 53719, (608) 829-7519.

**History:** Cr. Register, January, 1999, No. 517, eff. 2-1-99.

**Trans 210.06 Measures.** Measures shall be used to quantify the effect of the proposed major highway project on the highway system or the communities that will be affected by the project. These measures shall contribute points beyond the minimum score and will be used to place projects in relative rank order. The department shall numerically evaluate proposed major highway projects in the following 5 categories:

(1) **ECONOMIC MEASURE.** (a) The department shall evaluate each proposed major highway project’s ability to increase the competitiveness of the existing businesses through all of the following:

1. Comparison of the reduction in long-term travel costs to the cost of constructing and maintaining the proposed major highway project. The reduction in travel costs may include, but is not limited to, vehicle operating cost savings, travel time savings and accident savings. The calculation of the score for this economic measure component shall be based on each proposed major highway project’s points relative to the proposed major highway project with the highest number of points in this category. These points shall contribute to 37.5% of the total 100 points allowable for the economic measure score. The following formula shall be used to determine the score for this component:

$$\text{Benefit Cost Ratio Score} = [(B/C) / (B/C_{\text{max}})](100) (.375)$$

where:

$B/C$  = the ratio of reduction in long-term travel costs to the cost of constructing and maintaining the proposed major highway project.

$B/C_{\text{max}}$  = the highest ratio of reduction in long-term travel costs to the cost of construction and maintenance for any proposed major highway project under consideration for enumeration in that year.

2. Evaluation of the existing businesses that will benefit from the proposed major highway project, which may be measured by the number of business entities, and the amount of employment, population and tourism in the proposed or existing highway corridor. Greater consideration shall be given to businesses that are

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projected to have significant growth over a majority of the life of the proposed highway project.

(b) An evaluation shall be made for the proposed major highway project's ability to attract new businesses through:

1. Consideration of the proposed major highway project's potential to increase the productivity of industry along the highway corridor.

2. Consideration of the business redistribution potential of the proposed major highway project. Greater consideration shall be given to proposed major highway projects that do not redistribute growth from one part of the state to another, and to projects that contain businesses with the ability to attract business from outside of the state.

3. Consideration of the economic development strengths of the communities served by the project. Greater consideration shall be given to communities that are sufficiently organized to capitalize on the economic opportunities associated with the proposed major highway project.

4. Consideration of unique regional differences in the economic need and abilities of the communities affected by the proposed major highway project.

(c) An evaluation shall be made of the proposed major highway project's ability to improve connections between economic centers. Greater consideration shall be given to those routes that are either part of Wisconsin's corridors 2020 network of quality highways, or part of the national highway system.

**Note:** Copies of Corridors 2020 or National Highway System maps can be obtained by writing to or calling the Division of Investment Management, Bureau of State Highway Programs, P. O. Box 7913, Room 933, Madison, WI 53707-7913, (608) 267-7715.

**(2) TRAFFIC FLOW MEASURE.** (a) The department shall evaluate the existing and predicted traffic flow on the highway system that will be affected by the proposed major highway project. Traffic flow shall be measured using accepted engineering practices to compute the level of service on the highway system segments, and may consider traffic density, travel speed or time delayed and other related factors.

(b) Greater consideration shall be given to the severity of congestion and to the amount of traffic that is on the existing highway system segments that would be affected by the proposed major highway project.

(c) The calculation of the traffic flow measure points shall be based on a combination of the existing and predicted levels of service, weights for the levels of service and the number of existing and predicted vehicle miles traveled on the highway segments affected by the proposed major highway project. Points will be calculated for individual highway segments within the highway system affected by the major highway project. The total points for the major highway project is equal to the sum of the points for the highway segments. The following formula shall be used to determine the traffic flow measure points:

$$\begin{aligned} \text{Traffic Flow Measure Points} = & \\ & \Sigma [ (\text{LOS}_0) (W) (\% \text{HMVMT}_0) (2/3) ] + \\ & \Sigma [ (\text{LOS}_{10}) (W) (\% \text{HMVMT}_{10}) (1/3) ] \end{aligned}$$

where:

$\text{LOS}_0$  = the numeric value of the existing level of service on the highway segment.

$\text{LOS}_{10}$  = the numeric value of level of service that is predicted to exist on the highway segment 10 years from the analysis year. The following table shows the numeric LOS values.

| LOS Letter Value | LOS Numeric Value |
|------------------|-------------------|
| LOS A            | 1.01 to 2.00      |
| LOS B            | 2.01 to 3.00      |
| LOS C            | 3.01 to 4.00      |
| LOS D            | 4.01 to 5.00      |
| LOS E            | 5.01 to 6.00      |
| LOS F            | greater than 6.01 |

W = weight applied to LOS numerical values, based on the following categories of LOS:

| LOS               | W    |
|-------------------|------|
| 1.00 to 4.00      | 0.00 |
| 4.01 to 4.50      | 0.40 |
| 4.51 to 5.00      | 0.55 |
| 5.01 to 5.50      | 0.70 |
| 5.51 to 6.00      | 0.85 |
| greater than 6.01 | 1.00 |

$\% \text{HMVMT}_0$  = hundred million vehicle miles traveled over the highway segment for the existing year divided by the hundred million vehicle miles traveled over the affected highway system for the existing year.

$\% \text{HMVMT}_{10}$  = hundred million vehicle miles predicted to occur over the highway segment in the 10<sup>th</sup> year from the analysis year, divided by the hundred million vehicle miles predicted to occur over the affected highway system in the 10<sup>th</sup> year from the analysis year.

(d) The calculation of the traffic flow measure score shall be based on each proposed major highway project's traffic flow points relative to the proposed major highway project with the highest number of traffic flow points. The following formula shall be used to determine the traffic flow measure score:

$$\text{Traffic Flow Measure Score} = (\text{Traffic Flow Points} / \text{Traffic Flow Points}_{\text{max}}) (100)$$

where:

Traffic Flow Points = the traffic flow measure points for the proposed major highway project, as computed using procedures in sub. (2)(c).

$\text{Traffic Flow Points}_{\text{max}}$  = the highest number of traffic flow measure points given to any proposed major highway project under consideration for enumeration in that year, as computed using procedures in sub. (2) (c).

**Note:** Department engineers will use the procedures outlined in the general design consideration guidelines in Chapter 11, Section 5 of the *Facilities Development Manual* published by the Wisconsin Department of Transportation to determine the level of highway service. Copies of the manual may be obtained by writing to or calling the Division of Investment Management, Bureau of State Highway Programs, P. O. Box 7913, Room 933, Madison, WI 53707-7913, (608) 267-7715.

**(3) SAFETY MEASURE.** (a) The department shall evaluate the number of crashes as well as the severity of the crashes that exist on the highway system affected by the proposed major highway project through:

1. Determining the crash rate which shall be calculated by the total number of crashes divided by the number of hundred million vehicle miles traveled over the length of the highway system segments.

2. Computing the severity proportion which shall be calculated by dividing the number of fatality and incapacitating injury crashes by the total crashes on the highway system segments.

(b) Consideration shall be given to those crash rates and severity proportions that are significantly above the statewide average for similar highway types.

(c) An evaluation of the number and severity of crashes shall

include as many historical years as necessary to determine a reliable average.

(d) An evaluation shall be made to determine if the proposed major highway project will affect the safety of pedestrians and bicyclists. A proposed project that will increase speeds on the existing highway without providing for improved pedestrian and bicyclists facilities will be scored lower.

(e) The calculation of the safety measure points shall be based on the crash rate, severity proportion, and the hundred million vehicle miles traveled on the highway segments affected by the proposed major highway project. Points will be calculated for individual highway segments within the highway system affected by the major highway project. The total points for the major highway project is equal to the sum of the points for the highway segments. The following formula shall be used to determine the safety measure points:

Safety Measure Points =

$$\Sigma [ (CR + SP) (\%HMVMT) (100) ] - P$$

where:

CR = the crash rate points given for crash rates that are significantly above the statewide average for similar highway types. The following table shows the points given for the categorical ranges of crash rates.

| Crash Rate   | CR   |
|--|------|
| less than .99 standard deviations above the mean     | .00  |
| 1.00 to 1.49 standard deviations above the mean      | .50  |
| 1.50 to 1.99 standard deviations above the mean      | .75  |
| greater than 2.00 standard deviations above the mean | 1.00 |

SP = the severity proportion points given for severity proportions that are significantly above the statewide average for similar highway types. The following table shows the points given for the categorical ranges of severity proportions.

| Severity Proportion                                  | SP   |
|--|------|
| less than .99 standard deviations above the mean     | .00  |
| 1.00 to 1.49 standard deviations above the mean      | .50  |
| 1.50 to 1.99 standard deviations above the mean      | .75  |
| greater than 2.00 standard deviations above the mean | 1.00 |

%HMVMT = hundred million vehicle miles traveled over the highway segment for the existing year divided by the hundred million vehicle miles traveled over the affected highway system for the existing year.

P = 10 if the highway is currently used by pedestrians or bicycles, and will result in increased speeds on the existing facility without providing for improved bicycle and pedestrian facilities, or = 0 for those projects that are not used by bicycles and pedestrians, or will not result in increased speeds, or where improved bicycle and pedestrian facilities are planned.

(f) The calculation of the safety measure score shall be based on each proposed major highway project's safety measure points relative to the proposed major highway project with the highest number of safety points. The following formula shall be used to determine the safety measure score.

Safety Measure Score = (Safety Points/ Safety Points<sub>max</sub>) (100)

where:

Safety Points = the safety measure points for the proposed major highway project, as computed using procedures in par. (e).

Safety Points<sub>max</sub> = the highest number of safety measure points given to any proposed major highway project under consideration for enumeration in that year, as computed using procedures in par. (e).

**Note:** The crash rates and severity proportions are objective measures which are based on principles found in the *Highway Safety Evaluation Procedural Guide*, Docket No. FHWA-TS-81-219, published by the Federal Highway Administration. A copy of the Guide can be reviewed by writing or calling the Safety and Traffic Operations Engineer at the Federal Highway Administration, 567 D'Onofrio Drive, Madison, WI 53719, (608) 829-7519.

(4) ENVIRONMENTAL MEASURE. (a) The department shall evaluate environmental considerations associated with the proposed major highway project through a draft environmental impact statement or environmental assessment. The draft environmental impact statement or environmental assessment shall provide summary information which shall be used to determine the potential net effects the proposed major highway project may have on environmental resources.

(b) The net environmental effects will be computed by comparing the potential effects of the build alternatives to the no build alternative.

(c) A proposed major highway project that will affect relatively more natural resources including, but not limited to, wetlands, uplands, flood plains, stream crossings and endangered species, shall be scored lower.

(d) A proposed major highway project that will affect relatively more physical resources including, but not limited to, air quality, sound quality, and contaminated sites, shall be scored lower.

(e) A proposed major highway project that will affect relatively more socio-economic resources including, but not limited to, agricultural land, park land, residential and business development, shall be scored lower.

(f) A proposed major highway project that will affect relatively more cultural resources including, but not limited to, historic properties and archeological sites, shall be scored lower.

**Note:** Environmental data will be collected from the environmental summary matrix provided in the draft environmental impact statement or the environmental assessment for specific impacts which apply to natural, physical, socio-economic and cultural resources.

(5) COMMUNITY INPUT MEASURE. (a) The department shall evaluate community support or opposition to a proposed major highway project through:

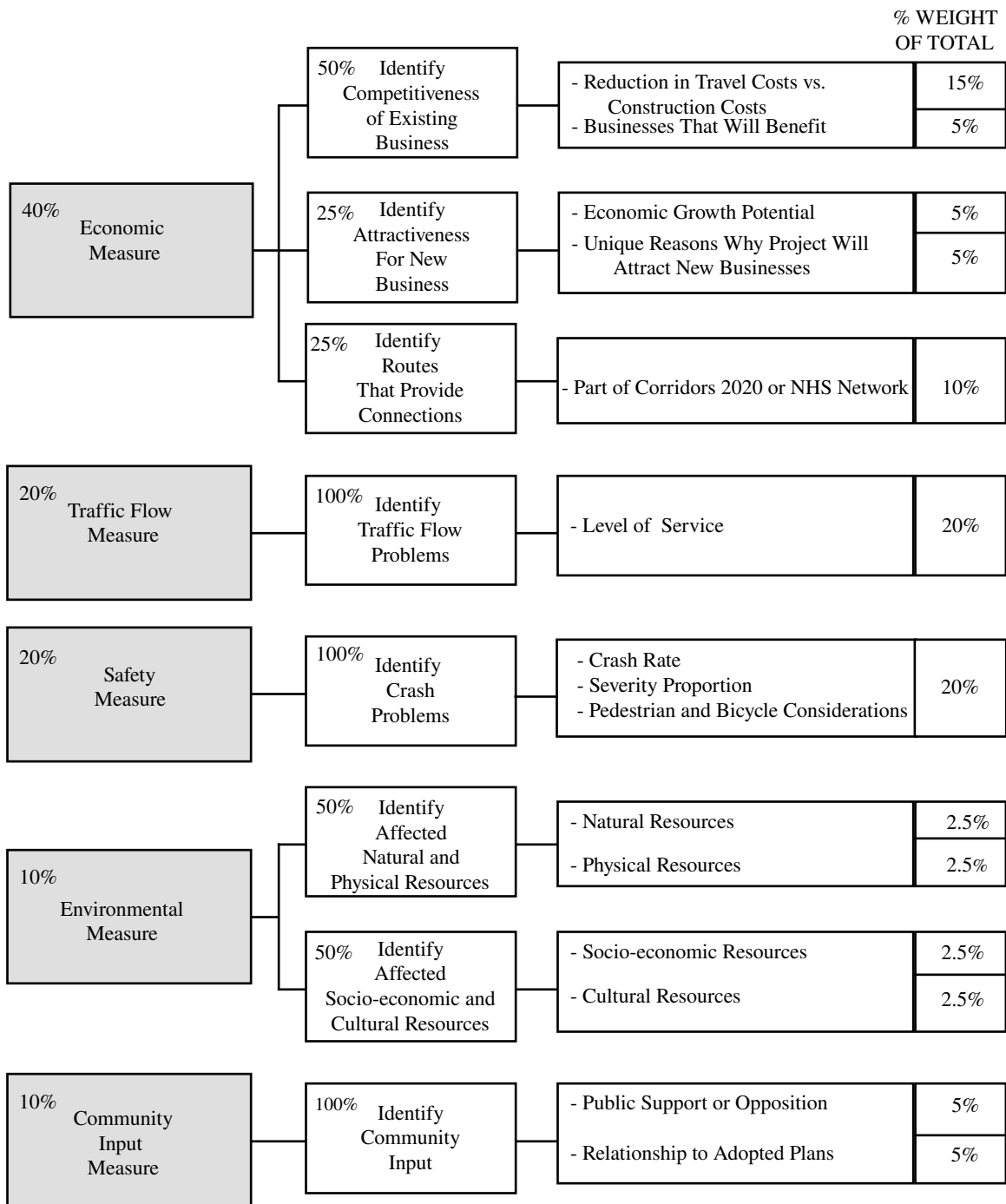
1. Determining community support or opposition from local and regional officials, associations, merchants and residents through informational hearings and correspondence. Greater consideration shall be given for input that is based on the project's overall impact on the community or region.

2. Determining if the proposed major highway project is consistent with metropolitan, local or regional transportation plans that have been adopted or reaffirmed in the last 5 years. A transportation plan may include a comprehensive plan that contains a transportation component.

**History:** Cr. Register, January, 1999, No. 517, eff. 2-1-99.

**Trans 210.07 Weights applied to measures.** Weights for each of the 5 measures shall be included in the calculation of the composite score as described in s. Trans 210.08. Where necessary, sub-weights shall be applied to components of the measures prior to the determination of the score for the overall measure. The values and effect of both the overall measure weights and the component sub-weights are shown in Figure 1.

**FIGURE 1  
WEIGHTS APPLIED TO MEASURES**



History: Cr. Register, January, 1999, No. 517, eff. 2-1-99.

**Trans 210.08 Composite score. (1)** COMPUTATION OF COMPOSITE SCORE. A combination of the 5 measures, weights for each of the measures and the minimum requirement shall be used to calculate a composite score for each proposed major highway project. Each measure shall have a maximum score of 100 points. The composite score shall have a maximum of 110 points. The following formula shall be used to determine the composite scores:

Composite Score =  $\beta_0$ (10 +  $\beta_1$  economic measure score +  $\beta_2$  traffic flow measure score +  $\beta_3$  safety measure score +  $\beta_4$  environmental measure score +  $\beta_5$  community input measure score)

where:

$\beta_0 = 1$  if the minimum requirements are met for either traf-

fic flow or safety, or = 0 if the minimum requirements are not met for traffic flow and safety.

$\beta_1$  = weight for the economic measure which shall be .40

$\beta_2$  = weight for the traffic flow measure which shall be .20

$\beta_3$  = weight for the safety measure which shall be .20

$\beta_4$  = weight for the environmental measure which shall be .10

$\beta_5$  = weight for the community input measure which shall be .10

**(2) MINIMUM ALLOWABLE SCORE.** The minimum allowable score for a composite score is 10 points. Only those projects which have greater than 10 points may be recommended by the department to the transportation projects commission.

**History:** Cr. Register, January, 1999, No. 517, eff. 2-1-99.