

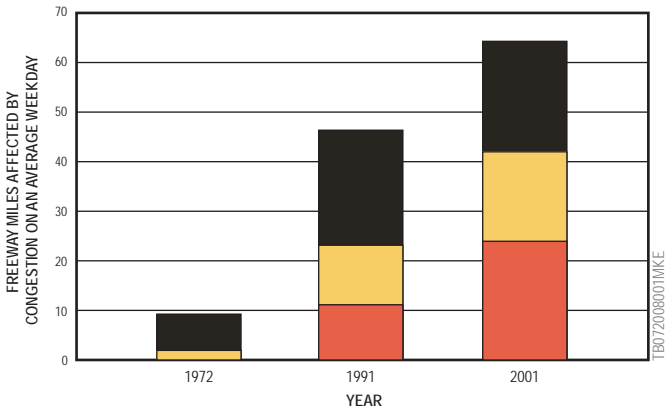
Project Limit

Exhibit 1-1 Project Limits

Zoo Interchange Corridor Study | ID 1060-33-01 | Milwaukee County

TB072008001MKE 1.1_Project_Limits_v6 06.30.11 cae/sls/mjl





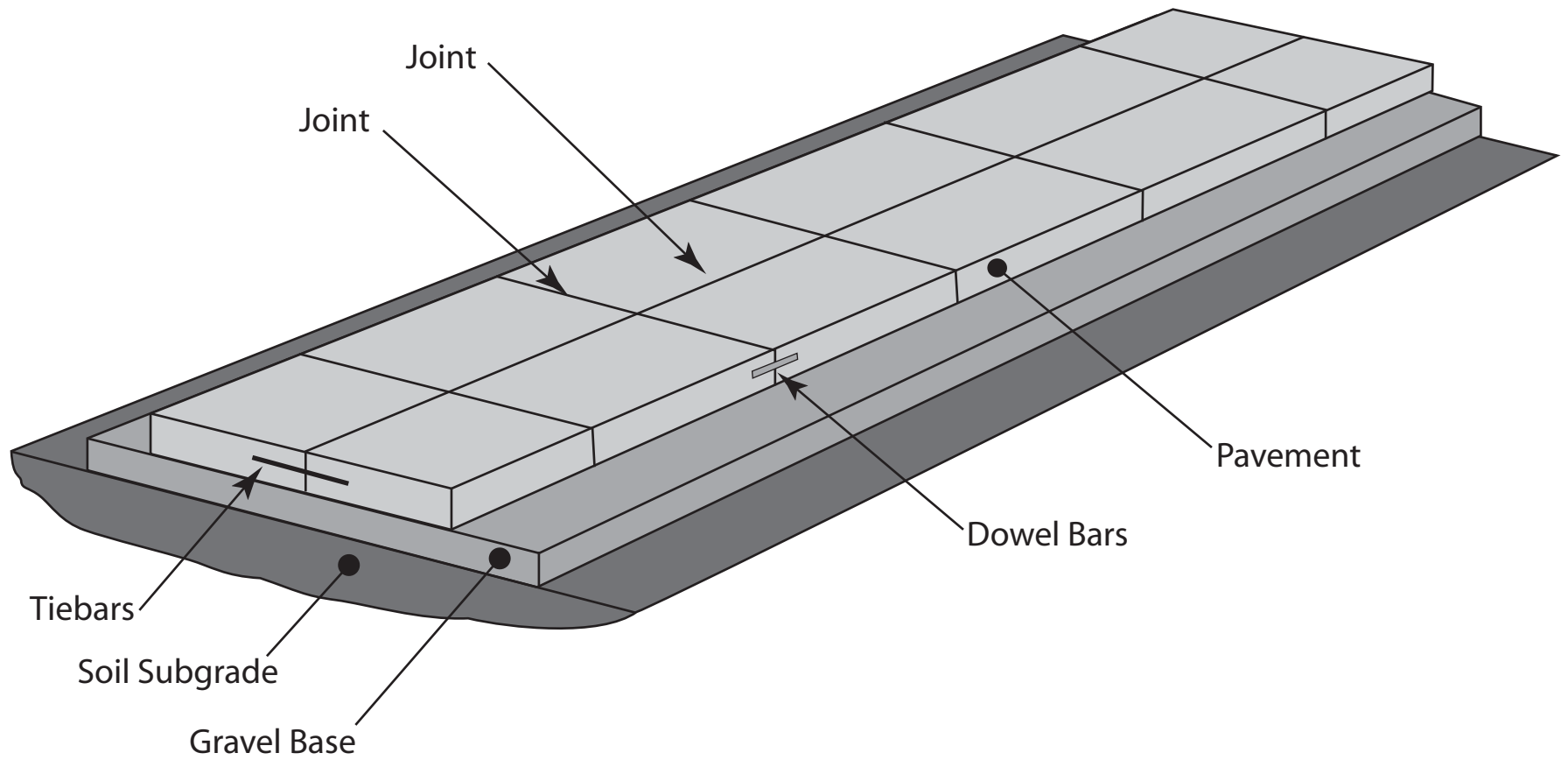


Exhibit 1-4 Basic Pavement Components

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TB072008001MKE 1.4_Basic_Pavement_Components_v3 11.01.10 cae/mjl



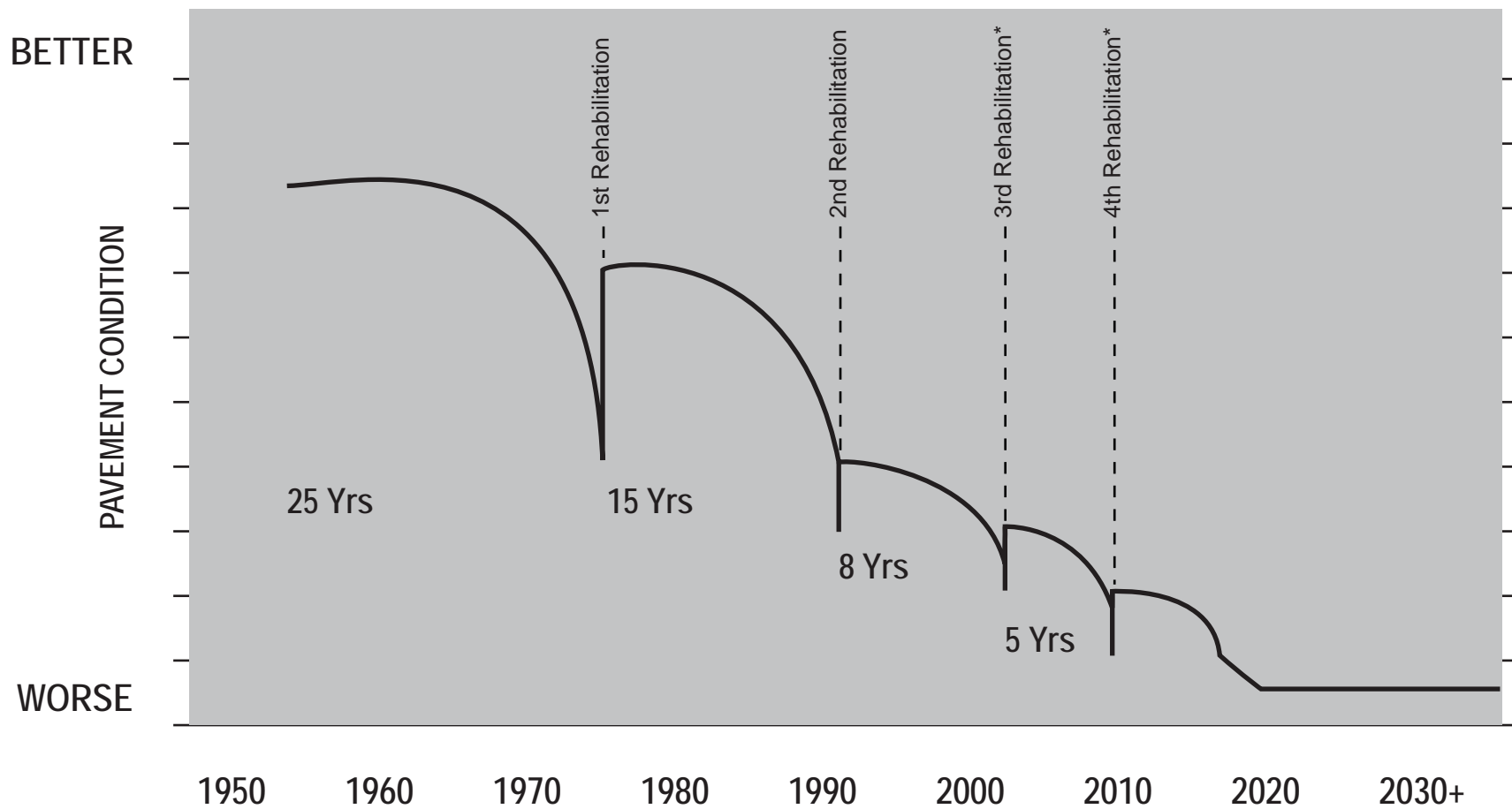


Exhibit 1-5
Number of Pavement Overlays

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TB072008001MKE 1.5_Number_Pavement_Overlays_v5 11.01.10 cae/mjl





* Many states decide to reconstruct in place of further rehabilitations.

Exhibit 1-6 Pavement Life

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TB072008001MKE 1.6_Pavement_Life_v4 12.1.10 cael/mjl

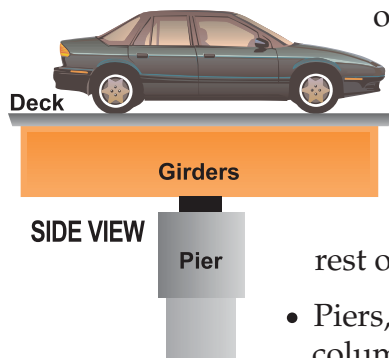


Bridge Terminology

There are several types of construction designs for bridges.

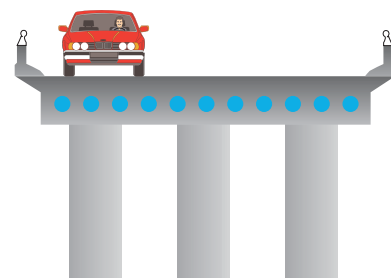
Most Wisconsin bridges have:

- Decks, the top surface of the bridge on which you drive
- Girders, the horizontal spans that rest on the piers
- Piers, the vertical columns that support the girders



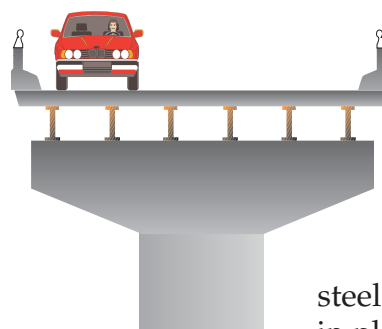
Concrete voided slab

Thinner than box girder bridges and the “box” is divided into cells.



Steel or concrete girder

A beam that supports the deck in traditional bridge design. Steel girder bridges are simple and economical. When the deck wears out, it can be removed and replaced. The steel girders remain in place.



Construction used in the Zoo Interchange

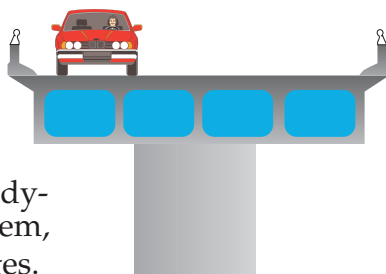
Concrete box girder

A long hollow concrete girder or “box” that rests on top of the piers. Instead of having a deck that rests on top of girders, the deck is part of one large girder.

Older box girder bridges, two of which still remain on the study-area freeway system, have disadvantages.

The main one is that the deck can’t be replaced separately from the rest of the box because the deck is a part of the bridge’s structure.

If the deck is removed the whole box could collapse.



Reinforcing Bars

Concrete is typically poured over a lattice of steel reinforcing bars called “rebar.” Rebar gives concrete its strength and is used in concrete piers, girders, and decks. When cracks form in the deck allowing water to come in contact with the rebar, the rebar rusts and the concrete comes apart. This is what is happening in the Zoo Interchange. New bridges have coated rebar to reduce rusting.

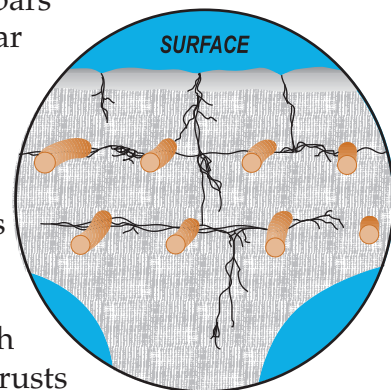
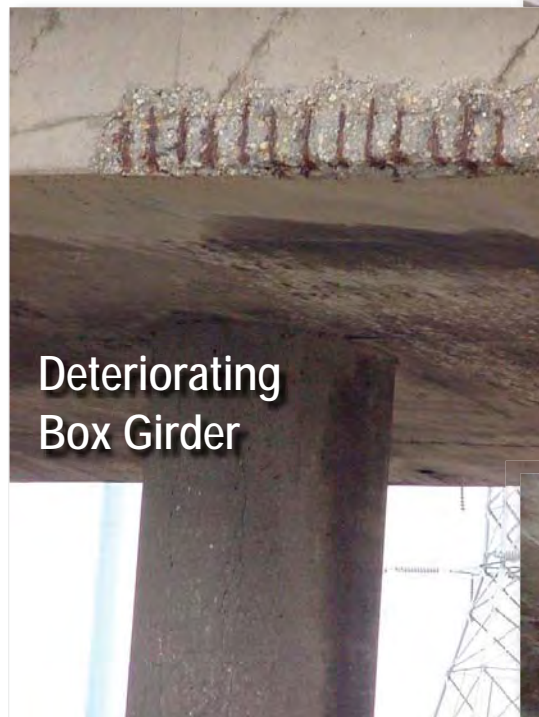


Exhibit 1-7 Bridge Terminology



Deteriorating
Box Girder



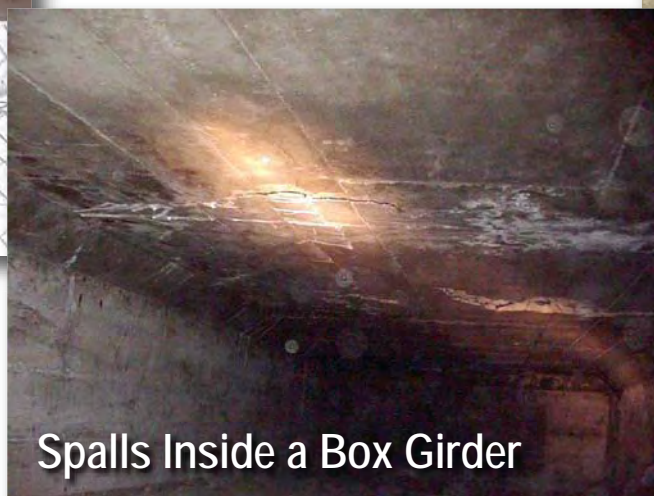
Deteriorating
Box Girder Bridge



Spall and Exposed Rebar



Surface Deterioration



Spalls Inside a Box Girder

Exhibit 1-8 Bridge Deterioration

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TB072008001MKE 1.8_Bridge_Deterioration_v3 11.01.10 caelmjl



Southbound to Eastbound Ramp Bridge Rehabilitation Fall 2007

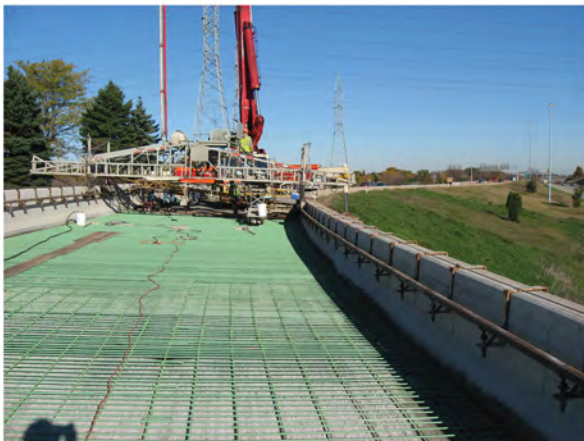


Exhibit 1-9 Bridge Rehabilitation

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TB072008001MKE 1.9_Bridge_Rehabilitation_v3 11.01.10 cae/mjl





Exhibit 1-10 Bridge Deficiencies

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TB072008001MKE 1.10_Bridge_Deficiencies_8 11.1.10 cae/mjl



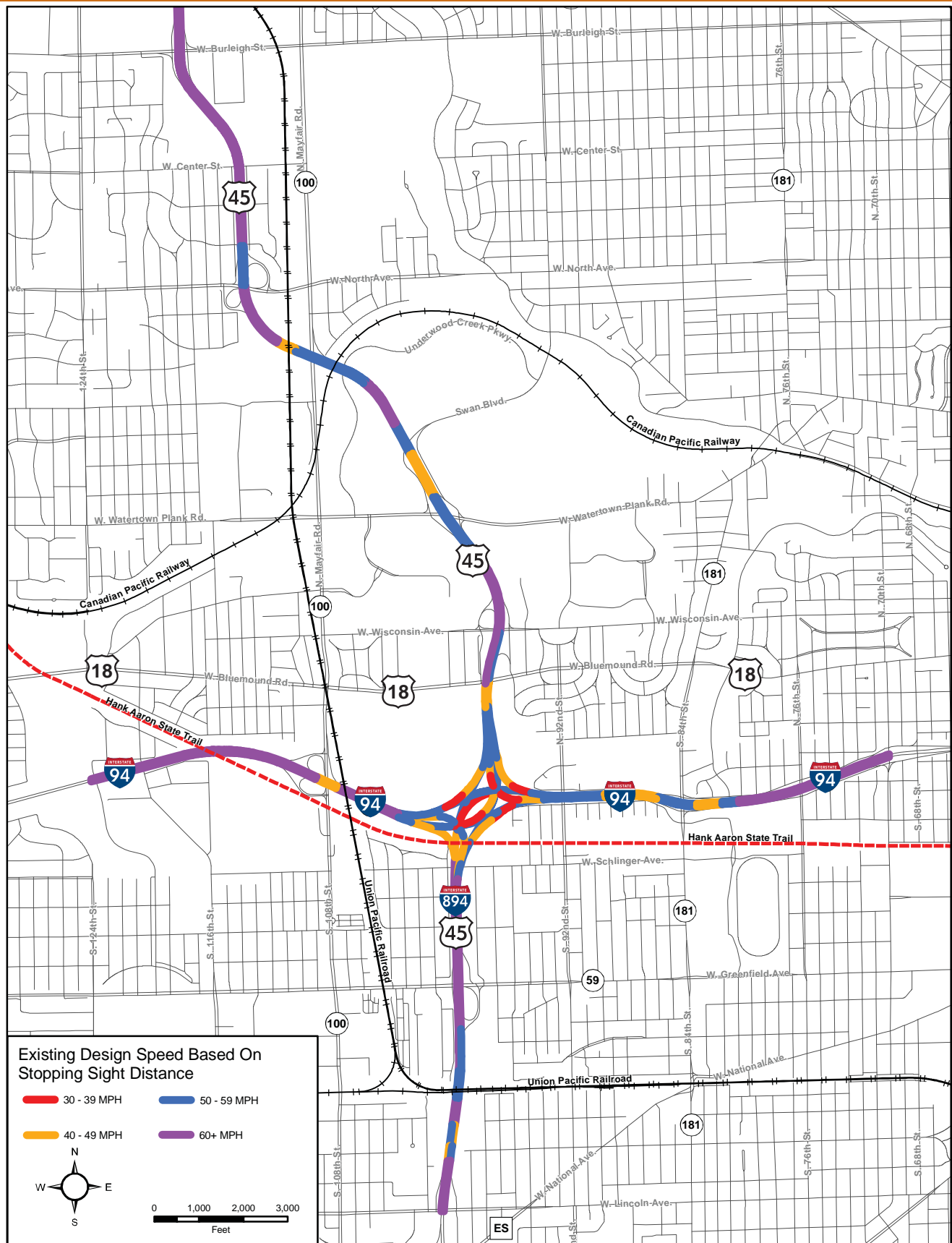


Exhibit 1-12
Existing Design Speed Based on Stopping Sight Distance

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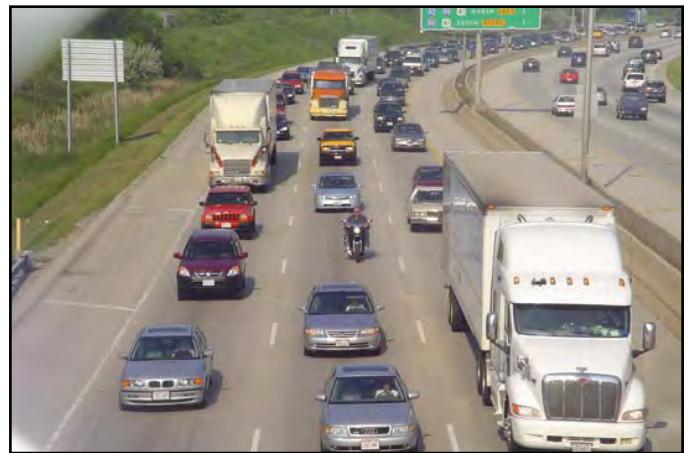
Level of Service A



Level of Service D



Level of Service B



Level of Service E



Level of Service C



Level of Service F

Exhibit 1-13 Levels of Service Examples

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TB072008001MKE 1.13_Levels_of_Service_Examples_v3 11.02.10 caefmjl



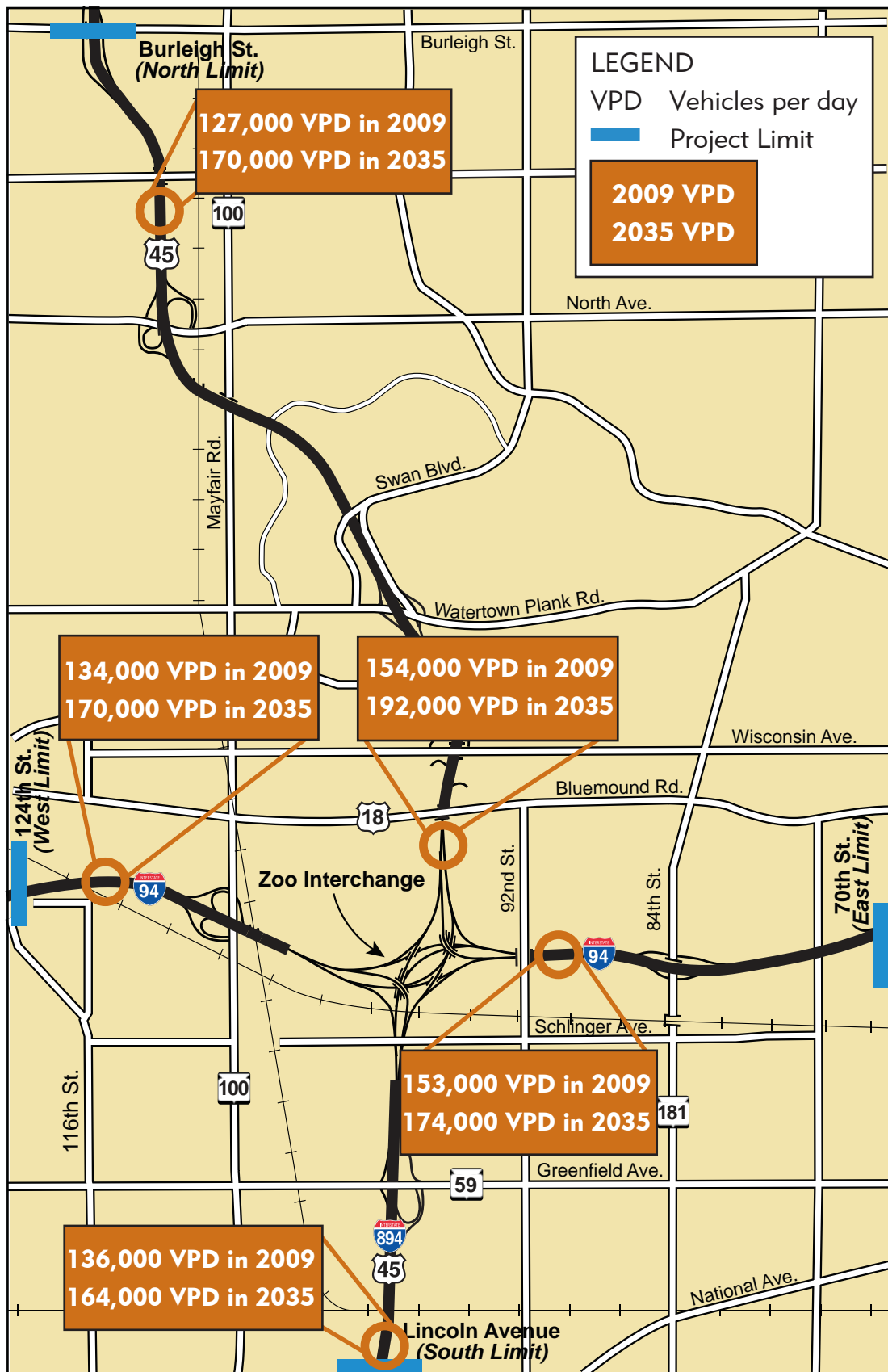


Exhibit 1-14
 Existing and Future Traffic Volumes (VPD)



Exhibit 1-15
Existing Traffic Operations -
Morning Peak Hour (7 to 8 a.m.)



Exhibit 1-16

Existing Traffic Operations -
Evening Peak Hour (4:30 to 5:30 p.m.)

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TB072008001MKE 1.16_Existing_Traffic_Operations_PM_Peak_Hours_v5 11.02.10 cae/mjl





Exhibit 1-17
Major Traffic Generators

