Agenda Item 3

Consideration of Recommendation that Preliminary Recommended Plan for Freeway System Reconstruction Include Design and Design-Related Safety Improvements
Process for Developing Preliminary and Final Recommended Plan for Freeway System Reconstruction

- Advisory Committee determination as to whether preliminary recommended plan should include system design and design-related safety improvements

- Advisory Committee determination as to whether preliminary recommended plan should include additional lanes on freeway system and if so, to what extent

- Staff conduct of process to obtain feedback on preliminary plan
  - County boards/committees and executives
  - Municipalities
  - State legislators
  - Business, community, and other groups
  - Public informational meetings and hearings
Process for Developing Preliminary and Final Recommended Plan for Freeway System Reconstruction — continued

- Advisory Committee determination as to the content of the final plan taking into account the feedback received on preliminary plan
- Submittal of final plan for formal adoption by each county board and executive
- Amendment of regional transportation plan by SEWRPC
- Submittal of plan to WisDOT Secretary
Elements of Freeway System Design and Design-Related Safety Improvements

- Improve freeway system interchanges
  - Reconfigure freeway-to-freeway system interchanges
    - Relocate left hand on- and off-ramps to right hand side of freeway
    - Minimize lane drops and provide route continuity
    - Improve freeway-to-freeway ramps to provide ramp speeds that are closer to freeway mainline speeds
  - Address closely spaced service interchanges with grade-separated or collector-distributor roadways
Elements of Freeway System Design and Design-Related Safety Improvements—continued

- **Improve freeway system service interchanges**
  - Improve ramp terminal spacing and tapers
  - Separate ramps from frontage roads in Kenosha and Racine Counties

- **Freeway mainline**
  - Improve freeway horizontal and vertical curvature, grades, and vertical clearance to meet standards
  - Provide full inside and outside shoulders
  - Provide selected auxiliary lanes to address closely spaced interchanges
Freeway System Traffic Safety—Design and Design-Related Safety Improvements

- Improvement in freeway traffic safety expected
  - Reduced lane changing
  - Speeds on freeway-to-freeway ramps closer to mainline speeds
  - Adequate stopping and decision sight distances
  - Improved service interchange entrance and exit ramps
  - Elimination of obsolete rural service interchange designs
Freeway System Forecast Year 2020
Traffic Congestion—Design and Design-Related Safety Improvements

- Rebuilding the freeway system only with design and safety improvements may not be expected to permit avoiding an increase in traffic congestion
  - **Extent**
    - Miles of freeway system affected by congestion would increase from 65 miles and 24 percent of system to 122 miles and 45 percent of system
  - **Severity**
    - Miles of freeway system affected by extreme congestion (stop-and-go, bumper-to-bumper traffic with speeds of 20 to 30 mph or less) would increase from 27 miles, or 10 percent of system, to 42 miles and 16 percent

- **Comparison to Replace-In-Kind Freeway Reconstruction Alternative**
  - Reduction in severity of traffic congestion but only within freeway-to-freeway system interchanges
Construction Costs—Design and Design-Related Safety Improvements

- Rebuilding with Design and Design-Related Safety Improvements represents a significant increase in cost compared to Replace-in-Kind
  - $5.5 billion as compared to $3.4 billion
  - $2.1 billion or 62 percent more

- However, consider the two freeway segments which have undergone preliminary engineering—Marquette Interchange in Milwaukee County and IH 94 in Kenosha and Racine Counties
  - Represent nearly 40 percent of construction cost increment
  - Design and design-related safety improvements endorsed in preliminary engineering
Right-of-Way Acquisition Needs—Design and Design-Related Safety Improvements

- Rebuilding the freeway system with design and design-related safety improvements
  - 577 acres
  - 167 residences
  - 23 commercial/industrial buildings
  - 2 governmental/institutional buildings

- More than 50 percent of the necessary right-of-way for land and commercial/industrial buildings has already been approved through preliminary engineering and environmental assessment

- Needed right-of-way represents a 5 percent expansion of freeway right-of-way and additional 0.03 percent of Region to be dedicated for freeway purposes
Rebuild with Design and Design-Related Safety Improvements

- Will require freeway right-of-way expansion into 68 acres of PEC, including 29 acres of wetlands, and another 9 acres of wetlands outside Region’s PEC (represents 0.02 percent of Region’s PEC and 0.01 percent of Region’s wetlands)
- Some wetlands proposed to be acquired would not be “lost,” but would be located within the expanded freeway right-of-way. All wetland loss would be mitigated
- Over 65 percent of the impact on PEC and wetlands is along IH 94 in Kenosha and Racine Counties and has already undergone preliminary engineering and environmental assessment
Consideration of Recommendation that Design and Design-Related Safety Improvements Be Included in the Preliminary Recommended Plan for Freeway System Reconstruction

- Recommended by Commission staff and Technical Subcommittee
- Preliminary regional plan for freeway system reconstruction
  - Include systemwide design and design-related safety improvements
    - To be considered in detail in preliminary engineering and environmental studies, which will examine options and ultimately determine the improvements to be incorporated in the reconstruction of the freeway system
    - Preliminary engineering complete for IH 94 in Kenosha and Racine Counties, and for the Marquette Interchange includes design and design-related safety improvements representing about 40 percent of systemwide construction costs and 50 percent of system right-of-way needs
Agenda Item 4

Consideration of Incremental Costs and Impacts of Freeway System Reconstruction Alternatives Which Would Rebuild with Design and Design-Related Safety Improvements and Additional Lanes
Outline Overview

- Consider incremental cost and impacts of additional lanes
  - Construction costs
  - Right-of-way needs
  - Traffic congestion
  - Traffic safety
  - Air pollutant emissions
  - Motor fuel consumption
  - Land use impacts
  - Induced travel

Reminder: System planning estimates of costs and impacts. Firm estimates would be made in preliminary engineering.
Freeway Reconstruction Alternative With Design and Design-Related Safety Improvements and Additional Lanes

- **Proposed Additional Lanes**
  - 127 miles, or 47 percent, of the regional freeway system
  - Address existing and forecast traffic congestion
  - Most proposed lane additions are:
    - 6 lanes to 8 lanes
    - 4 lanes to 6 lanes

Potential Additional Traffic Lanes
Estimated Incremental Construction Costs--Freeway Reconstruction with Additional Lanes

- Adding freeway lanes would marginally increase freeway system reconstruction costs
  - $700 million to add lanes
  - 13 percent more than the base reconstruction costs
Right-of-Way Acquisition Needs—Freeway Reconstruction with Additional Lanes

- Adding freeway lanes would entail an additional increment of right-of-way
  - 82 acres
  - 65 residences
  - 7 commercial buildings
  - 3 governmental/institutional buildings

- Represents a relatively modest increase in right-of-way (less than 1 percent expansion of freeway right-of-way and less than additional 0.01 percent of Region dedicated to freeway purposes)
## Right-of-Way Acquisition Needs Increment—Freeway Reconstruction with Additional Lanes

### Major Areas of the Right-of-Way Acquisition Need Increment

<table>
<thead>
<tr>
<th>Area Description</th>
<th>Acres</th>
<th>Residences</th>
<th>Commercial/ Industrial Buildings</th>
<th>Governmental/ Institutional Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>IH 43 between Silver Spring Drive and STH 60 (14 miles)</td>
<td>25</td>
<td>20</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Marquette Interchange (6 miles)</td>
<td>21</td>
<td>17</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>IH 94 between Zoo and Stadium Interchanges (2 miles)</td>
<td>5</td>
<td>18</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IH 94 between STH 16 and Zoo Interchange (10 miles)</td>
<td>5</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Remainder of Freeway System Proposed for Widening (95 miles)</td>
<td>26</td>
<td>6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>82</strong></td>
<td><strong>64</strong></td>
<td><strong>8</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>
Right-of-Way Acquisition Needs Increment—Freeway Reconstruction with Additional Lanes—Primary Environmental Corridors (PEC) and Wetlands

- Adding lanes would require for freeway right-of-way an additional 7 acres of PEC, including 4 acres of wetlands, and another 1 acre of isolated wetlands outside the Region’s PEC (represents 0.002 percent of PEC and 0.001 percent of Region’s wetlands).

- Some wetlands proposed to be acquired would not be “lost,” but would be located within the expanded freeway right-of-way. All wetland loss would be mitigated.
Freeway Traffic Congestion—Reconstruction with Additional Lanes

- Rebuilding the freeway system with design and design-related safety improvements and with additional lanes may be expected to permit avoiding a substantial increase in traffic congestion

  - **Extent**
    - Miles of freeway system affected by congestion would decline from 65 miles and 24 percent of system in year 1999 to 58 miles and 21 percent of system in year 2020

  - **Severity**
    - Miles of freeway system affected by extreme congestion would remain about the same—27 miles and 10 percent of system. Miles of freeway system affected by severe congestion would decline from 26 miles or 10 percent of system to 17 miles or 6 percent of system.
    - Freeway segments which remain congested even with additional lanes will experience less severe congestion and fewer hours of congestion.

- **Reduced Traffic on Surface Arterial Streets**
  - Provision of additional traffic-carrying capacity on freeway system would permit a reduction in the future increase of traffic onsurface streets.
Comparison of Existing 1999 and Forecast Year 2020 Traffic Congestion Under Freeway Reconstruction Alternatives

- Existing 1999
- Forecast Year 2020 Replace-In-Kind Freeway Reconstruction Alternative
- Forecast Year 2020 Freeway Reconstruction Alternative with Design and Design-Related Safety Improvements
- Forecast Year 2020 Freeway Reconstruction Alternative with Design and Design-Related Safety Improvements and Additional Lanes

Bar chart showing congestion levels for different years and alternatives.

- MODERATE CONGESTION
- SEVERE CONGESTION
- EXTREME CONGESTION
Traffic Congestion—Forecast Year 2020
Under Freeway Reconstruction Alternatives

Freeway Reconstruction Alternative
with Design and Design-Related Safety Improvements

Freeway Reconstruction Alternative
with Design and Design-Related Safety Improvements and Additional Lanes

<table>
<thead>
<tr>
<th>MOST SEVERE LEVEL OF WEEKDAY HOURS OF CONGESTION EXPERIENCED</th>
<th>ESTIMATED HOURS OF CONGESTION ON AN AVERAGE WEEKDAY</th>
<th>ESTIMATED AVERAGE WEEKDAY HOURS OF CONGESTION BY CONGESTION LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;NO CONGESTION&quot;</td>
<td>&quot;NO CONGESTION&quot;</td>
<td>&quot;NO CONGESTION&quot;</td>
</tr>
<tr>
<td>MODERATE</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>MODERATE</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>SEVERE</td>
<td>3</td>
<td>1 2</td>
</tr>
<tr>
<td>SEVERE</td>
<td>4</td>
<td>2 2</td>
</tr>
<tr>
<td>EXTREME</td>
<td>6</td>
<td>1 2 3</td>
</tr>
<tr>
<td>EXTREME</td>
<td>8</td>
<td>1 3 4</td>
</tr>
<tr>
<td>EXTREME</td>
<td>11</td>
<td>2 4 5</td>
</tr>
<tr>
<td>EXTREME</td>
<td>13</td>
<td>2 5 6</td>
</tr>
<tr>
<td>EXTREME</td>
<td>14</td>
<td>2 5 7</td>
</tr>
<tr>
<td>EXTREME</td>
<td>15</td>
<td>3 5 7</td>
</tr>
<tr>
<td>EXTREME</td>
<td>16</td>
<td>4 5 7</td>
</tr>
<tr>
<td>EXTREME</td>
<td>17</td>
<td>4 6 7</td>
</tr>
</tbody>
</table>

Note: Color represents most severe level of congestion experienced for at least one hour in each direction on an average weekday.
Reduced Levels of Congestion on Freeway Segments that Will Remain Congested Even With Additional Lanes

<table>
<thead>
<tr>
<th>Segment</th>
<th>Year</th>
<th>Weekday Hours of Congestion In Each Direction</th>
<th>Estimated Level of Congestion by Hour of Weekday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Extreme</td>
</tr>
<tr>
<td>IH 43/94 from Mitchell Interchange to Marquette Interchange</td>
<td>1999 Existing</td>
<td>4</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>2020 Design</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Improvements</td>
<td>Only</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2020 Design</td>
<td>4</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Improvements</td>
<td>Only</td>
<td></td>
</tr>
<tr>
<td>USH 45 from North Interchange to Zoo</td>
<td>1999 Existing</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2020 Design</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Improvements</td>
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<tr>
<td></td>
<td>2020 Design</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Improvements</td>
<td>Only</td>
<td></td>
</tr>
<tr>
<td>IH 94 from Zoo Interchange to Marquette</td>
<td>1999 Existing</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2020 Design</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Improvements</td>
<td>Only</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2020 Design</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Improvements</td>
<td>Only</td>
<td></td>
</tr>
</tbody>
</table>

Level of Congestion
- Extreme
- Severe
- Moderate
Impacts on Surface Arterial Street Traffic Volume and Congestion—Freeway Reconstruction with Additional Lanes

- Rebuilding the freeway system with additional lanes may be expected to reduce traffic volume and congestion on surface arterial streets
  - Overall reduction regionwide would approximate 1,400,000 vehicle-miles on an average weekday, or 5 percent of total weekday surface arterial traffic
  - Selected surface arterial traffic volume reductions
    - Bluemound Road/Wisconsin Avenue - 3,000 to 7,000 vehicles per weekday
    - Greenfield Avenue - 2,000 to 4,000 vehicles per weekday
    - National Avenue - 1,000 to 3,000 vehicles per weekday
    - North Avenue - 1,000 to 3,000 vehicles per weekday
    - Silver Spring Drive - 1,000 to 3,000 vehicles per weekday
    - STH 100 - 3,000 to 9,000 vehicles per weekday
    - 60th Street/Hawley Road - 1,000 to 3,000 vehicles per weekday
Freeway Traffic Safety—Freeway Reconstruction with Additional Lanes

- Additional improvement in freeway traffic safety expected with additional lanes
  - The rear-end crash rates on congested freeway segments in Southeastern Wisconsin are from 5 to 15 times higher than that of uncongested freeway segments
  - Adding freeway lanes should avoid an increase in the rear-end crash rate on some freeway segments, and result in reduced rates on other segments
Estimated Impact of Freeway Reconstruction with Additional Lanes on Air Quality/Air Pollutant Emissions and Motor Fuel Consumption

- Whether the freeway system is rebuilt with or without additional lanes will have a negligible impact on the level of transportation system ozone-related and other air pollutant emissions and air quality, and also vehicle motor fuel consumption.

- Transportation system derived ozone-related air pollutant emissions have been significantly declining, and are projected to continue to decline. This is principally a result of new motor vehicle standards for air pollutant emissions—“tailpipe technology”
## Comparison of Estimated Air Pollutant Emissions under Freeway Reconstruction Alternatives—Forecast Year 2020

Southeastern Wisconsin (7 County) Year 2020 Forecast Air Pollutant Emissions (Tons per Hot Summer Weekday)

<table>
<thead>
<tr>
<th>Freeway Reconstruction Alternative</th>
<th>Volatile Organic Compounds</th>
<th>Nitrogen Oxides</th>
<th>Carbon Monoxide</th>
<th>Carbon Dioxide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and Design-Related Safety Improvements</td>
<td>24.1</td>
<td>48.5</td>
<td>217.3</td>
<td>19,326.6</td>
</tr>
<tr>
<td>Design and Design-Related Safety Improvements and Additional Lanes</td>
<td>24.0</td>
<td>49.6</td>
<td>217.3</td>
<td>19,218.5</td>
</tr>
</tbody>
</table>
Southeastern Wisconsin Six County Severe Ozone Non-Attainment Area Transportation System Ozone-Related Air Pollutant Emissions

Transportation Volatile Organic Compounds (VOC)

<table>
<thead>
<tr>
<th>Year</th>
<th>1990</th>
<th>1999</th>
<th>2007</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons per Hot Summer Weekday</td>
<td>147</td>
<td>53</td>
<td>29</td>
<td>19</td>
</tr>
</tbody>
</table>

Transportation Nitrogen Oxides (NOx)

<table>
<thead>
<tr>
<th>Year</th>
<th>1990</th>
<th>1999</th>
<th>2007</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons per Hot Summer Weekday</td>
<td>112</td>
<td>108</td>
<td>70</td>
<td>43</td>
</tr>
</tbody>
</table>

NOTE: Wisconsin Department of Natural Resources State Implementation Plan for Ozone Air Quality Standard Attainment has emission budgets for the year 2007 of 32 tons for VOC and 71 tons for NOx.
Comparison of Estimated Vehicle Motor Fuel Consumption under Freeway Reconstruction Alternatives—Forecast Year 2020

<table>
<thead>
<tr>
<th>Freeway Reconstruction Alternative</th>
<th>Fuel Consumption (Gallons per Average Weekday)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and Design-Related Safety Improvements</td>
<td>1,933,000</td>
</tr>
<tr>
<td>Design and Design-Related Safety Improvements and Additional Lanes</td>
<td>1,922,000</td>
</tr>
</tbody>
</table>
Land Use Impacts—Freeway Reconstruction with Additional Lanes

Transportation is one of many possible causes of urban decentralization, and is not generally considered the principal cause. Variety of factors have contributed to decentralization:

- Rising incomes and attendant affluence
- Preferences for single family homes and larger lots
- Cost of living
- Schools
- Environmental amenities
- Pace of life
- Perceived and/or actual crime and safety
- Societal changes
- Industrial restructuring
- Information technology
Potential effect of transportation on decentralization is complex

Those concerned about decentralization often argue that policies which significantly reduce or eliminate congestion may contribute to decisions by businesses and residents to locate further out on the periphery.

It may also be argued that policies which tolerate significant increases in congestion may contribute to an acceleration of the decentralization of businesses and residents, as well as declines in regional economic growth.
Land Use Impacts—continued

- Congestion impacts of freeway reconstruction alternatives
  - Reconstruction of the freeway system with design and design-related safety improvements only would tolerate a significant increase in freeway traffic congestion
  - Reconstruction of the freeway system with design and design-related safety improvements and additional lanes would be expected to result in a modest reduction in freeway traffic congestion from current levels of congestion
Land Use Impacts—continued

- Potential land use impacts of freeway reconstruction with additional lanes
  - It is reasonable to conclude that reconstructing the freeway system with additional lanes may not be expected to be a significant cause of, or contributor to, urban decentralization or centralization in southeastern Wisconsin
Induced Travel—Freeway Reconstruction with Additional Lanes

- Some will argue that adding freeway lanes will simply induce additional travel and thereby offset anticipated congestion reduction benefits.
Considerations Concerning Induced Travel

- Travel is influenced by time and cost
  - Commuters search out the fastest route
  - Cost affects choice of auto vs. public transit

- Travel is a derived demand
  - Travel is rarely made solely for the purpose of travel, but for the purposes of:
    - Work
    - School
    - Medical and dental appointments
    - Other personal business
    - Shopping
    - Social and recreational activities
Considerations Concerning Induced Travel—continued

- Theoretically, travel could change in response to time and cost in a number of ways:
  - Route
  - Time of travel
  - Mode
  - Distance
  - Amount of travel
Considerations Concerning Induced Travel—continued

- Commission travel simulation models and attendant travel and traffic volume and congestion forecasts address all the changes in travel with the exception of amount of travel
  - Standard practice
  - Why?
    - Trips to work and school, as well as to/from medical and dental appointments and other personal business cannot reasonably be expected to vary with level of congestion or cost
    - Trips for social and recreational purposes and shopping are typically made during mid-day and evening off-peak periods or weekends when congestion is not present, or is not severe
Induced Travel—Southeastern Wisconsin: 1972 to 1991

- The freeway system was nearly complete in 1972, with most opened to traffic in late 1960s and early 1970s
  - Eliminated nearly all existing traffic congestion
  - Significantly reduced both peak period and off-peak period travel times
65 percent traffic growth 1972-1991

- 32 percent of that growth – increases in households and employment
- 15 percent of that growth – declines in ridesharing and vehicle occupancy
- 1 percent of that growth – decline in transit use
- 17 percent of that growth – increase in trip length

Potential factors in increase in trip length

- Reduction in congestion and travel time
- Decline in out-of-pocket auto operating costs (2.9¢ per mile in 1972 and 1.7¢ per mile in 1991 in constant 1972 dollars)
- Changing lifestyles – two-worker households
- Increases in income
Induced Travel—Southeastern Freeway System Reconstruction with Design and Design-Related Safety Improvements and Additional Lanes

- Adding freeway lanes is expected to result in levels of congestion in the year 2020 which are about the same as current levels of congestion
  - Therefore, adding freeway lanes should not induce more travel over the existing situation
Summary-Freeway Reconstruction Alternative with Additional Lanes

- A marginal increase in freeway system reconstruction costs
  - $6.2 billion as compared to $5.5 billion, or 13 percent more

- Relatively modest additional right-of-way acquisition needs. Less than a 1 percent expansion of freeway right-of-way and additional 0.01 percent of Region to be dedicated for freeway purposes

- Permit avoiding a substantial increase in traffic congestion
  - Miles of congested freeways to decline from 65 miles and 24 percent of system in 1999 to 58 miles and 21 percent of system by 2020
  - Miles of freeway system affected by extreme or severe congestion to decline from 53 miles or 20 percent of system in 1999 to 43 miles or 16 percent of system in 2020
  - Reduced traffic on surface arterial streets
Summary—Freeway Reconstruction Alternative with Additional Lanes—continued

- Safety problems due to traffic congestion would be addressed—rear-end crash rates are 5 to 15 times higher on congested freeway segments.

- Negligible impact on the level of transportation system ozone-related and other air pollutant emissions and air quality, and also vehicle motor fuel consumption.

- Little or no effect on land use is anticipated, as rebuilding freeway system with additional lanes may be expected to provide little change—a minor reduction—from existing levels of congestion.

- Also not expected to “induce” additional travel, because again rebuilding freeway system with additional lanes may be expected to provide little change—a minor reduction—from existing levels of congestion.
Remainder of Meeting

- Discussion of freeway reconstruction with additional lanes

- Identification of additional alternatives for consideration that would remove widening with additional lanes from selected freeway segments

Next Meeting

- Consider additional alternatives and/or complete preliminary plan recommendations