

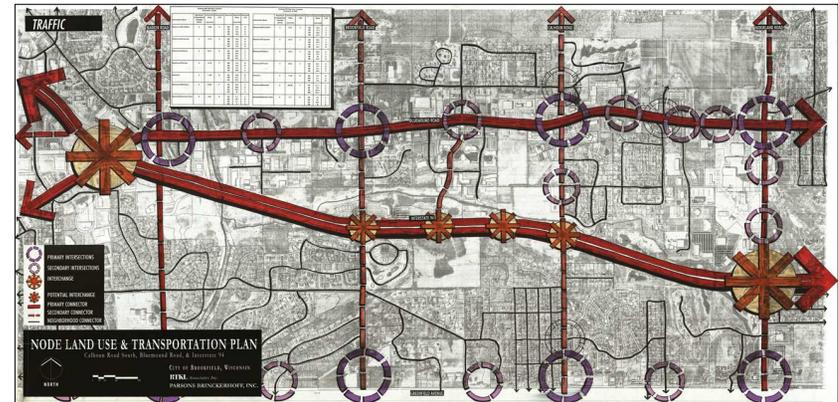
## TRAFFIC AND TRANSPORTATION

A traffic analysis of existing conditions was prepared in November 2000 for major intersections within the study area using the CORSIM model. CORSIM modeling simulates traffic and traffic-control systems on integrated networks of freeway and surface streets, using commonly accepted vehicle and driver behavior models. CORSIM combines two of the most widely used traffic simulation models - NETSIM for surface streets and FRESIM for freeways. The results indicated that the current level of service (LOS) is satisfactory for all intersections except for Bluemound Road/Moorland Road. The PM peak hour turning movements at this intersection operate at LOS "F". This is unsatisfactory and conditions will not improve as traffic volumes increase. High traffic volumes presently exist on Moorland Road between I-94 and Bluemound Road.

In addition, the short weaving distance between I-94 and the east entrance to Brookfield Square results in an unsafe section of roadway that is prone to a high number of accidents. The number of crashes (accidents) within the study area generally exceeds the statewide average for crashes in an urban area. The 1998 crash data from the Wisconsin Department of Transportation for the area of Bluemound Road between Brookfield Road and Calhoun Road is 667 accidents per 100 million vehicle miles. This compares to the statewide average for an urban State Highway (STH) of 293 accidents per 100 million vehicle miles. Similarly, the intersection crash data for the study area also indicates a number generally above the statewide average. In the case of urban intersections, the statewide average is 0.7 per million vehicles entering the intersection. Intersection crash data from the Wisconsin Department of Transportation for Bluemound Road in 1998 is as follows:

Brookfield Road = 1.03  
 Woelfel Road/Corporate Drive = 0.57  
 Calhoun Road = 2.02  
 Thomas Drive = 0.40  
 Executive Drive = 0.77  
 Brookfield Square Entrance = 0.05  
 Moorland Road = 1.42

These numbers indicate that the secondary intersections with lower traffic volumes along Bluemound are only slightly above or below the state average; however, the data for Brookfield, Calhoun, and Moorland Roads is significant. These three roadways range from 1.5 to nearly 3 times the state average. The increased accident rate at these intersections will only get worse as traffic volumes increase.

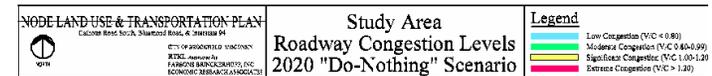
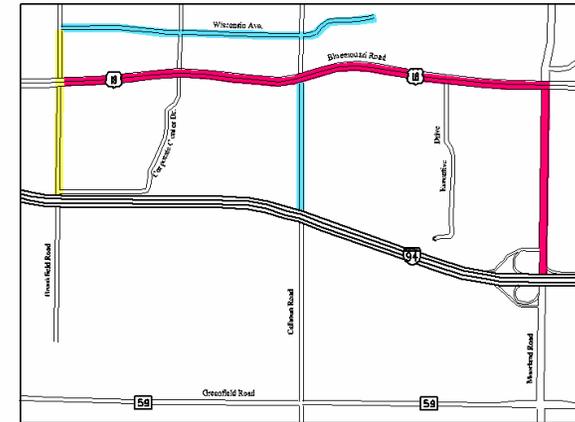


## EVALUATION OF THE EXISTING ROADWAY SYSTEM

Currently, traffic entering/leaving the study area is concentrated on Moorland Road and on Bluemound Road. This traffic primarily originates from the I-94 interchange and from densely populated areas north and south of I-94 within and outside Brookfield. This creates a considerable amount of congestion on Moorland Road, especially at I-94, and at Bluemound Road.

To alleviate traffic congestion both now and in the future, a series of improvements were considered that would redistribute traffic within the study area, thereby improving operating conditions at the Bluemound Road/Moorland Road intersection, as well as providing enhanced access to the western portions of the study area from I-94. It is important to note that although a number of alternative roadways were proposed to alleviate traffic and form a grid series of east-west and north-south streets, these alternatives were not well received by the stakeholders and removed from consideration.

For the 2020 "No New Interchange" transportation alternative, inclusive of only local street improvements (see Figure), Bluemound Road between Brookfield Road and Moorland Road is expected to operate at extreme congestion levels. Extreme congestion also is anticipated on Moorland Road from I-94 to Bluemound Road. In addition, Brookfield Road between I-94 and Wisconsin Avenue will operate at significant congestion levels. Although the cost for improving only local streets is the lowest cost of all alternatives at \$35 million, traffic conditions are expected to be extremely congested and unsafe.



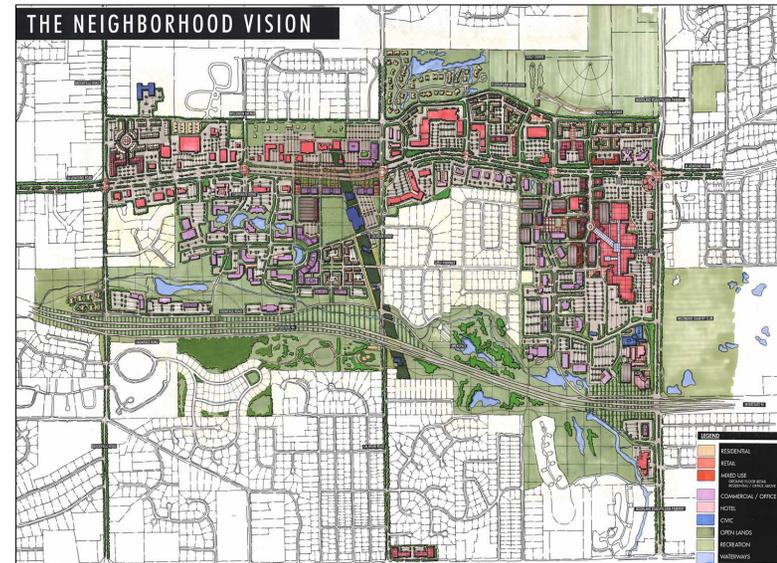
## TRANSPORTATION ELEMENTS OF THE PLAN

The final neighborhood vision provides a split diamond interchange between Calhoun Road and Brookfield Road. This road will provide both highway connectivity and service road frontage. These service roads generally parallel Interstate 94 and would connect to the existing Corporate Lakes development and the undeveloped land south of Interstate 94. This plan provides a local street framework on the Ruby Farms property that includes a Golf Parkway extension west of Calhoun Road, and other interconnected local streets.

In order to improve the flow of traffic along Bluemound Road, certain median closures, the addition/expansion of slip (frontage/service) roads, and connections to serve local properties are proposed.

An important element is the reconfiguration of the existing Moorland Road/I-94 interchange as a tight (urban) diamond interchange. This redeveloped interchange provides for a greater dimension between the mall entrance road and the off/on ramps, as well as improved traffic management. This compressed diamond would also provide an “urban connector” with direct access from the westbound off ramp, connecting with Executive Drive.

Additional concepts include: 1) limited connections to Bluemound Road, Wisconsin Avenue, and Ruby Farms/WTMJ property; 2) the removal of the portion of South Dechant Road which connects Lillian Road to the slip road leading to Bluemound Road; and 3) Golf Parkway will not continue through to the Brookfield Square Mall. A pedestrian access way from the neighborhood at the east end of Golf Parkway to the mall will be maintained and enhanced.

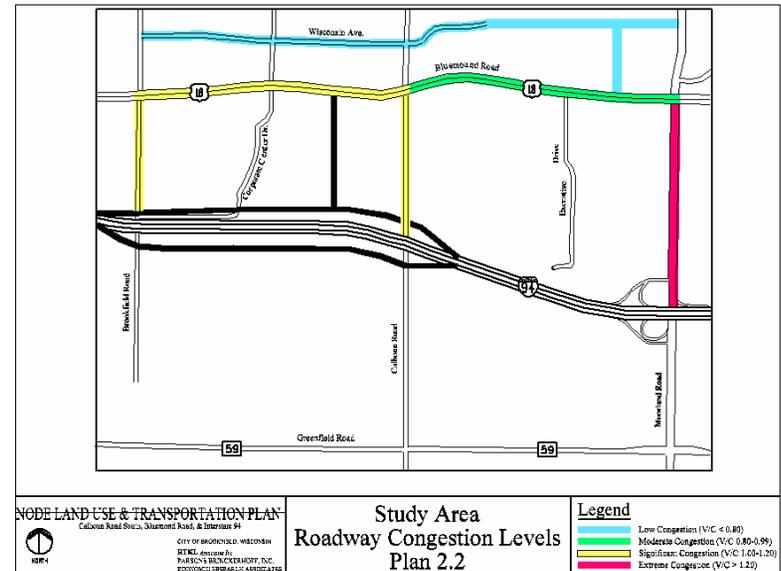


### TRAVEL DEMAND FORECASTING

In order to evaluate future traffic operations throughout the study area, it was necessary to understand the affects of proposed changes in land use, in addition to revisions to the transportation network on future travel demand and distribution. To accomplish this, the study team worked closely with the Southeastern Wisconsin Regional Planning Commission (SEWRPC) in the preparation of long-range travel demand forecasting using the TRANPLAN regional travel demand model. The TRANPLAN model is capable of preparing a forecast of traffic volumes on area roadways given forecasted socio-economic and land use data, and based on average trip distances, levels of congestion, roadway configuration, classification and speed.

A number of alternatives were evaluated using the TRANPLAN model in order to assess the relative benefits of proposed infrastructure improvements. Once modeling of the proposed Transportation Plan was complete, the Average Daily Traffic (ADT) forecasts output from the TRANPLAN model were converted to peak hour intersection turning movements based on existing turning movements, observed peak period and directionality factors, and on anticipated shifts in traffic flow due to reconfiguration of the transportation network. The peak hour turning movement volume forecasts were utilized to evaluate and make recommendations for improvements on an intersection-specific basis using the CORSIM traffic simulation program.

It is important to note that a minor change to the planned land use was proposed after TRANPLAN modeling was complete. The change involved an increase in the retail and residential land use density at Moorland Road and at Calhoun Road. Overall this amounts to an additional three percent increase in trips generated by these developments. The increase in trips at Brookfield Square will increase traffic on Bluemound Road and Moorland Road. This increase in trips will need to be analyzed as development occurs to determine the net effect on traffic volumes, but there will be an increase in congestion on these two streets. The increase in retail units for the parcel west of Calhoun Road, between Bluemound Road and I-94, will result in a marginal change in traffic generation. It was determined that this increase would not impact the results of the transportation evaluation at this level of analysis.



## RESULTS AND RECOMMENDATIONS

The 2020 traffic projections for the proposed transportation plan serving the neighborhood vision indicate that the addition of the split diamond interchange between Calhoun and Brookfield Roads is expected to induce significant growth in traffic on those two facilities. Growth of 100% and 92% is anticipated on Calhoun and Brookfield Roads, respectively, between I-94 and Bluemound Road. Although this represents a significant level of growth, further evaluation shows that with minor improvements, traffic operations are forecasted to remain at acceptable levels at major intersections. In addition, the traffic growth experienced on these roadways will significantly reduce travel burden to and from I-94 on Moorland Road. Under the 2020 recommended transportation plan, the increase in traffic on Moorland Road, projected at 24%, is significantly less than the projected traffic without the addition of the split diamond interchange.

The modeling shows conclusively that the development of the split diamond interchange provides a superior balance of traffic flow to the east and west as compared to the existing condition, thereby reducing demand on major arterials, such as Bluemound Road and Moorland Road, as well. Traffic on Bluemound Road between Brookfield Road and Calhoun Road will be approximately 3% less than the current (1997) traffic. Traffic volumes on Bluemound Road between Calhoun Road and Moorland Road will decrease by approximately 20% from 1997 levels.

The key intersection within the study area, Moorland Road/Pilgrim Pkwy/Bluemound Road is anticipated to continue to experience significant congestion through the planning horizon without implementing certain improvements. Possible enhancements at this location may include construction of wider median space for pedestrian refuge (to enable enhancement of signal timing), as well as extension of left-turn storage. However, the proposed split-diamond interchange is anticipated to greatly alleviate demand at this intersection, which otherwise may become unmanageable without major reconstruction.

Finally, an evaluation of the proposed reconfiguration of the I-94/Moorland Road interchange was conducted. Under the proposed plan, this partially-directional interchange would be reconfigured as a simple tight-diamond, thereby enhancing separation of the ramp terminals and the Brookfield Square shopping center entrance, and reducing weaving (lane changing) issues. The analysis shows that although this reconfiguration may be viable, it would require additional left turn lanes on Moorland Road resulting in a wider median and consequently revisions to the I-94 overpass structures. Other possible enhancements include extending the eastbound ramp metering devices to provide additional storage along the on-ramp for I-94 eastbound entering vehicles, and increasing the length of the westbound exit ramp to accommodate a split-ramp that directs westbound exiting traffic to either the urban connector or to Moorland Road. Other potential configurations to condense this interchange include the Single-Point Urban Interchange (SPUI), which involves construction of curved ramps for left-turning traffic that bring all major movements to a single intersection in the center of the interchange. Although this configuration may provide some operational benefits at this location, SPUI's are typically more expensive to construct, as they require significantly increased bridge length. The estimated construction cost for transportation options are as follows:

Local Streets will be approximately \$35 million.

Local Streets plus the split diamond interchange will be approximately \$64 million, plus additional cost for the following:

- Relocation of existing homes/apartments west of Brookfield Road on both sides of I-94; cost for acquisition and relocation is unknown.
- Executive Drive construction from a point south of Bluemound to Wisconsin Avenue = \$2.2 million.
- Urban Connector from I-94 to Executive Drive = \$7.5 million.