



**Division of Engineering**

5800 Shier-Rings Road · Dublin, Ohio 43016  
Phone: 614-410-4600 · Fax: 614-410-4747

**CITY OF DUBLIN**

# Memo

**TO:** Members of Dublin City Council and Planning and Zoning Commission  
**FROM:** Jean-Ellen M. Willis, PE, Engineering Manager– Transportation  
Carson C. Combs, AICP, Senior Planner  
**DATE:** January 19, 2007  
**RE:** **Round 2 Travel Demand Modeling Results**

## EXECUTIVE SUMMARY

The November 28, 2006 Model Variables Report outlined the land use scenarios and discussed the future baseline network. The future baseline network included the roadway improvements in the area that have financial commitment to be constructed by 2030. The extension of Houchard Road to Mitchell Dewitt Road was added to this future baseline network. Houchard extension would connect with the extension of Tuttle Crossing Boulevard at Houchard Road. Following the November 28, 2006 report, the joint working group concurred with the staff recommendation that Land Use Scenario Two (also called the Mid Range scenario) be used to determine the future transportation network for Dublin.

The December, 29, 2006 memorandum on the expected transportation modeling (Round 2), discussed the various network modifications included in eleven travel demand model runs for this study. These model runs included four groups of projects that were layered on to the baseline network. Within these groups, roadway alternatives were evaluated to determine the amount of improvement that should be made to the Dublin transportation system. The variables in the network analysis were:

- If building a new bridge, should it be located at Tuttle Road, Tuller Road, or Memorial Drive?
- Should Post Road between Avery-Muirfield Drive and Emerald Parkway be widened, redirected to Commerce Parkway, or left alone?
- Should a Bright Road cul-de-sac occur near Riverside Drive or near Emerald Parkway/Sawmill Road?

The analysis contained in this report found that the Memorial Drive and Tuller Road bridge locations are more desirable than the Tuttle Road Bridge. The Tuttle Road Bridge would have the lowest amount of crossing traffic and would be disruptive to the surrounding residential area. Further, the relatively low traffic on the Tuttle Road Bridge is the result of

its proximity to Hayden Run Bridge and the lack of a connection to an east–west route east of Riverside Drive.

The Memorial Drive and Tuller Road bridge crossings coupled with some roadway extensions, would improve the east-west traffic flows in the community. Comparing the Tuller Road and Memorial Drive bridges, the Memorial Drive Bridge was recommended because the bridge crossing provides another bridge between Glick Road and Emerald Parkway – a distance of 3.2 miles. The proposed Memorial Bridge is 1 mile south of the Glick Road bridge and 2.2 miles north of Emerald Parkway.

The proposed Tuller Road Bridge is 600 feet south of the Emerald Parkway Bridge. It would be about a half mile north of the S.R. 161 (Bridge Street) Bridge. The benefit is greater from an emergency response services standpoint to locate a river crossing between Emerald Parkway and Glick Road bridges. The additional bridge at Memorial Drive yields travel time and proximity benefits as noted by Chief Woo of the Washington Township Fire Department. Therefore, the Memorial Drive Bridge was carried forward through the modeling efforts.

Tuller Road Bridge was an attractive option to the modeled traffic. However, it brought with it 800 vehicles in each direction in the PM peak hour to Dublin Road. Regarding the Tuller Bridge alternative, the problem seen today in the PM peak hour on Riverside Drive between the Tuller Road and Emerald Parkway intersections would likely occur between the Tuller Road (proposed bridge) and Emerald Parkway intersections on Dublin Road. Most of the traffic coming from Tuller Road desires to go north or west once they cross the river. This will occur if they cross on either the Emerald Parkway or Tuller Road bridges. These traffic loads would require extension of the 4 lane section of Dublin Road to the south approximately 500 feet. Extension of Dublin Road's 4 lane section into Historic Dublin or farther north is not anticipated. This complication does not exist on Dublin Road in the Memorial Drive Bridge alternative.

The Post Road analysis revealed that Post Road could be redirected to Commerce Parkway if Perimeter Drive is widened between Emerald Parkway and Avery-Muirfield Drive. A widened Perimeter Drive is able to handle the additional traffic if widened. If Perimeter Drive is not widened, and Post Road was redirected to Commerce Parkway, Perimeter Drive would handle about half of the traffic with the other traffic using Tara Hill Drive instead. As such, the alternative to widen Perimeter Drive and redirect Post Road to Commerce Parkway was selected to use with subsequent model runs. The primary reason is to remain consistent with previous decisions on Coffman Park. To accomplish the desire of park expansion to the south side of Post Road, Perimeter Drive would need to be widened for traffic not to shift to Tara Hill Drive.

The Bright Road cul-de-sac at Riverside Drive is recommended. Analysis this based on crash severity statistics and few traffic diversion impacts to other routes. This change could be accommodated by the roadway network. In this alternative, the residents on Bright Road would have to use the Emerald Parkway and Sawmill Road intersections with the absence of direct access to Riverside Drive. The Sawmill Road/Bright Road intersection

was forecast to function at a failing level regardless of the additional traffic due to the cul-de-sac at Riverside Drive.

This report evaluates the impact of various transportation networks on the roadways important to moving traffic in Dublin. The various transportation networks were discussed in the December 29, 2006 meeting recap memo to the members of the Dublin City Council and Planning Commission. The report initially discusses the impact of freeway improvements to the Dublin roadways. The Ohio Department of Transportation (ODOT) and Mid-Ohio Regional Planning Commission (MORPC) have identified sufficient freeway improvements for the northwest area in the long range plan I-270/U.S. 33 Northwest Freeway Study. This study recommends that I-270 be widened to 4 lanes in each direction and U.S. 33 to 3 lanes in each direction from I-270 to U.S. 42. These improvements, coupled with interchange improvements, improve traffic flow on Dublin's roadways.

It should also be noted that redistribution of traffic that moves from one arterial to another must be looked at in a context. For example, a comment that 200 vehicles move from Memorial Drive to Brand Road in the PM peak hour is more significant to those roadways than a shift of the same amount to Emerald Parkway or I-270. The following table shows the carrying capacity (Level of Service E) for 1 directional lane of traffic for roads in the Dublin model. For roads with additional through lanes, such as Emerald Parkway, the 850 vehicles are multiplied by 2 for a total of 1,700 vehicles at capacity for each direction for the peak hour. The Dublin travel demand model takes the number of lanes and speed of the roadway into account when it assigns traffic in the model.

Roadway Type	Single Lane Peak Hr. Capacity	Roads in Class
Interstate/Expressway	2,150 / 2,000	I-270/ U.S. 33
Major Road (Arterials)	850	Emerald Parkway, Sawmill Road, Frantz Road
Minor Road (Collectors)	720	Industrial Parkway, Post Road, Glick Road, Brand Road, Memorial Drive
Local Road	550	Most local roads in Dublin

The majority of the analysis in this report discusses the PM peak hour unless stated otherwise. The final thoroughfare plan includes an AM peak hour analysis as well as a PM analysis.

The resulting transportation system was analyzed and results were documented in section 3 of this report. The regional improvements coupled with other improvements in Group IV improved the flow of traffic without overload of nearby roads in Dublin.

## Table of Contents

EXECUTIVE SUMMARY	ES1
TECHNICAL REPORT	1
1. Review of previous transportation discussions	1
A. Modify Land Use Scenario Two	1
B. Houchard Road Extension Network as the Future Baseline	2
C. Accept Northwest I-270/U.S. 33 Recommendations Without the Davidson Road/I-270 Interchange	2
D. Preserved/Constrained Roadways	4
E. Project Variables in the Analysis of the Transportation System	5
2. Model Results of Alternative Improvements	6
A. Transportation Impact of Land Use Scenario 2 Modification	6
B. Transportation Impact of Regional Projects on Dublin	7
C. I-270 at Davidson Road Interchange Impacts	8
D. Evaluation of Scioto River Bridge Alternative Locations	11
Tuller Road Bridge and Connector	12
Memorial Drive Bridge and Extension	13
Tuttle Road Bridge	14
Bridge Option Comparison	15
E. Post Road Alternatives	18
Existing Post Road	19
Post Road Redirected to Commerce Parkway	19
Post Road Widened	20
Post Road Existing, Perimeter Drive Widened, Frantz-Emerald-Tuller Connector	23
Post Road Redirected at Commerce Parkway, Perimeter Drive Widened, Frantz-Emerald-Tuller Connector	24
Conclusion: Post Road Alternatives	26
F. Bright Road Alternative	29
Bright Road Cul-de-Sac to the East: Emerald Parkway/Sawmill Road	29
Bright Road Cul-de-Sac to the West: Riverside Drive	30
3. Anticipated Dublin Thoroughfare/Transportation Plan	33
A. Critical Improvements	33
B. Draft Dublin Thoroughfare/Transportation Plan	33
Other Considerations for the Thoroughfare Plan	39
4. Conclusions	40
5. Next Steps	40

# TECHNICAL REPORT

## 1. Review of previous transportation discussions

On December 4, 2006, recommended land use and transportation network scenarios were presented to the joint working group. In addition to the basic scenarios, a series of assumed transportation conditions and improvements received consensus. Further agreement was reached to test potential network variables/constraints in an effort to understand the potential impacts of each project to the larger transportation network. No decisions were made to adopt any of the project variables or constraints. The remainder of this section reviews the direction provided to date.

An analysis was performed for the PM peak hour traffic volumes to determine the intersection capacity impact of the alternatives under consideration. The measure reported on the following graphics is the Level of Service (LOS), which is a function of the amount of delay that would be expected to be experienced at the intersection for the projected traffic volumes. In addition to LOS, a review of the Intersection Capacity Utilization was also performed to determine in more detail, the level of congestion that is experienced at each intersection. For example an intersection may operate at LOS F and have an Intersection Capacity Utilization of 100 percent, which would mean that intersection is just reaching its capacity in 2030. However, an Intersection Capacity Utilization of 150 percent would mean that the intersection is not capable of handling all of the demand that is expected to be placed on it (extreme delays), indicating a true bottleneck in the system that should be addressed. For the purposes of this analysis, we have assumed that intersection turn lane improvements could be made for the 2030 scenario to optimize intersection operations.

### A. Modify Land Use Scenario Two

To briefly recap, on December 4, 2006, the joint working group endorsed Land Use Scenario Two (Mid-Range scenario) as the preferred plan for growth in Dublin. During the discussion, it was suggested that office development coupled with industrial and residential uses along Industrial Parkway be included in the Mid-Range land use scenario.

In order to modify the plan, staff converted 4.22 million square feet of industrial use to 5.37 million square feet of office use on both sides of Industrial Parkway near Mitchell-Dewitt Road in Union County. This was deemed to be the preferred location for office development assuming that a new U.S. 33/Mitchell Dewitt Road interchange would be built.

Since office development attracts more employees to the work site than industrial development, this change equates to an additional 10,294 employees in the Industrial Parkway corridor for the modeling horizon year 2030. The modified Land Use Scenario Two has been used in subsequent model runs.

## B. Houchard Road Extension Network as the Future Baseline

The joint working group chose a network that includes all committed projects in the region and a new roadway that connects Tuttle Crossing Boulevard with Houchard Road. This network was accepted as the future baseline network against which all other alternatives will be compared. This network, shown in Figure 1, extends Tuttle Crossing Boulevard west and ties into Houchard Road. At its existing northern terminus, Houchard Road is then extended to intersect with Mitchell-Dewitt Road and Industrial Parkway. Other improvements include modification to the I-270/U.S. 33 interchange, widening of U.S. 33 between I-270 and Avery Road, and other projects shown in the graphic.

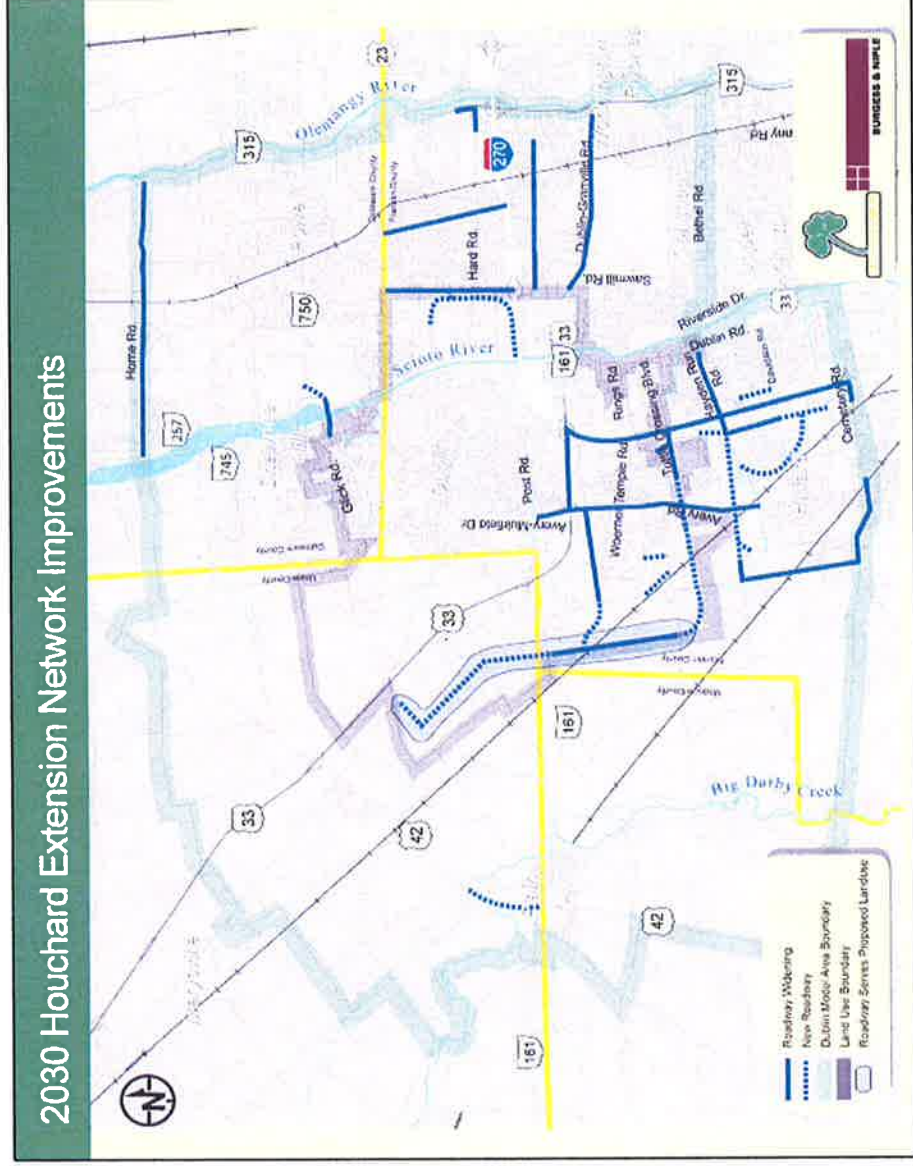
The Houchard Extension Network is important because it includes the improvements that have a commitment to be constructed by 2030. The need for more improvements will be documented in the thoroughfare/transportation plan. However, programming of the improvements and seeking the actual funding needed must occur to ensure that these improvements are built by the horizon year.

The Houchard Extension Network is also important because it is the minimum transportation network that is assumed to exist in year 2030. This network will be compared against the 11 model runs described in the December 29, 2006 memorandum. The effectiveness of congestion relief for the improvements associated with the 11 model runs was determined by comparison against the Houchard Extension Network.

## C. Accept Northwest I-270/U.S. 33 Recommendations Without the Davidson Road/I-270 Interchange

Projects for the Dublin area emerging from the I-270/U.S. 33 Northwest Freeway Study were evaluated to show the benefits to the Dublin transportation system. The widening of I-270 to 8 through lanes, widening of U.S. 33 to 6 lanes west of the Avery-Muirfield Drive interchange, new Mitchell-Dewitt interchange, and the other interchange improvements attracts more traffic to the freeways. U.S. 33 between Avery-Muirfield Drive and I-270 is assumed to be 6 lanes in the Houchard Extension Network. The Davidson Road interchange at I-270 was analyzed to quantify the impacts of it at the Tuttle Crossing Boulevard interchange with I-270 but will not be included as an improvement in subsequent model runs. It is not intended to include a Davidson Road interchange on the final thoroughfare plan.

Figure 1: Houchard Extension Network – Baseline Roadway Network



Improvements in the alternative (Figure 2) are the following:

1. U.S. 33 widening to 6 lanes (U.S. 42 to Avery-Muirfield Drive)
2. U.S. 42 widening to 4 lanes
3. Industrial Parkway widening to 4 lanes
4. U.S. 33 interchange at Mitchell-Dewitt Road
5. U.S. 33 interchange modifications at U.S. 42, Post Road, Avery Road, and I-270
6. Widen S.R. 161 to 4 lanes west of U.S. 33
7. Widen Cosgray Road to 4 lanes
8. I-270 Davidson Road interchange analysis (not included in subsequent model runs)
9. I-270 Interchange improvements: U.S. 33, Tuttle Crossing Boulevard, and Cemetery Road
10. Frantz Road/Post Road/U.S. 33 intersection improvement

The growth in travel on the freeways will benefit Dublin's local arteries such as Emerald Parkway, Avery-Muirfield Drive and Avery Road south of U.S. 33, Dublin