Chapter Four: TRANSPORTATION

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~~I.~~ EXISTING CONDITIONS

Within the Columbus Metropolitan Statistical Area (MSA), Dublin has a strong north-south road network that converges on downtown Columbus. In contrast, the area has an underdeveloped east-west road network, based in large part on the expense involved in bridging the Scioto River. This pattern continues to constrain movement and development within the ~~City~~city.

The ~~2006 Public Opinion and Citizen Satisfaction Research Survey was conducted to rate the City on basic services provided to residents. Since the 1999 Thoroughfare Plan was adopted, t~~There have been significant improvements made to the transportation network between 2000 and 2010. These enhancements are reflected in the improved transportation ratings by respondents to the City's recent Resident Satisfaction Surveys. ~~,~~ From 2006 through 2010, between 84 and 87 percent of respondents rated ~~86 percent of which felt that~~ Dublin's traffic and roadways ~~were~~ as excellent or good, (compared to 80.7 percent in both 2004 and 2002, and only 58.7 percent in 2000). The 2010 survey also indicated 86 percent excellent/good ratings for the ease of traffic flow on the city's modern roundabouts, compared to 76 percent in 2008 and 74.2 percent in 2006. Although transportation received an "excellent/good" rating in recent surveys, responses also indicate that ~~much~~ improvement to the road system remains a priority. Improving traffic and roadways is consistently indicated as one of the top ~~was indicated as the second most important~~ goals for the community. ~~Please refer to *Appendix I* for a summary of the 2006 Public Opinion and Citizen Satisfaction Research Survey.~~

This chapter outlines existing traffic conditions, traffic volumes, identified capacity problems and planned roadway improvements. ~~It should be noted that efforts to model and develop the Thoroughfare Plan were initiated in late 2004, and "existing" reflects traffic conditions at that time.~~

~~A.~~ Traffic Volumes and Capacity Issues

A variety of sources of traffic data ~~were utilized~~ are used to study Dublin's transportation system including traffic count inventories from the Ohio Department of Transportation (ODOT); Franklin, Delaware, and Union Counties; the Mid-Ohio

Regional Planning Commission (MORPC); and the City of Dublin. These available counts were supplemented with 16 additional targeted inventories that consisted of 11 total weekday traffic counts and five AM and PM peak hour turning movement counts. AM and PM peak hour volumes were defined for all count locations. Collected data was used to validate the ~~TP+/~~Cube/Voyager travel demand computer model developed for the planning process. Please refer to ~~*Section II.*~~ *PROJECTIONS* for more information on the travel demand modeling process.

Based on the inventories, the heaviest used roadways in the modeling area are identified ~~in Table 4.1~~below~~.~~. Bridges that cross the Scioto River south of Glick Road also experience high traffic volumes. (~~It should be noted that a~~Although Sawmill Road is listed, it is located along Dublin's eastern edge and is a roadway controlled and maintained by the City of Columbus.) ~~Bridges that cross the Scioto River south of Glick Road also experience high traffic volumes.~~

At present, drivers experience congestion and delays at several locations based on units~~.~~ ~~Units~~ of measurement ~~for congestion~~ known as ~~are~~ *Level*s *of Service* and *Volume to Capacity Ratio*s ~~and are described in detail on page 165~~. Those roadway segments ~~primary locations~~ where the limits of these measures are stressed or exceeded and the general causes ~~existing traffic demand exceeds capacity~~ include the following ~~roadway segments~~:

- I-270 north and east of the U.S. 33/SR 161 interchange, including weaving problems on I-270 at the interchange;
- SR 161 between Hyland-Croy Road and Cosgray Road: ~~due to the~~ U.S. 33 freeway ramps and insufficient through and turning lanes during the PM peak hour;
- Glick Road and Dublin Road intersection during the PM peak hour: ~~due to~~ lack of turning lanes and intersection capacity;
- Avery-Muirfield Drive corridor along the Post Road, Perimeter Drive, and Perimeter Loop Road intersections: ~~due to~~ weaving conflicts to access commercial areas, intersection spacing problems, U.S. 33/SR 161 ramp back-ups and through traffic to access Dublin's northern neighborhoods;
- Frantz Road at its intersections with U.S. 33/SR 161 and Metro Place North: ~~due to~~ high employment traffic volumes;
- Sawmill Road from Bethel Road to Hard Road, including major problems at the I-270 interchange: ~~due to~~ lane restrictions north of the Interstate;
- Frantz Road between Tuttle Crossing Boulevard and Hayden Run Road: ~~due to~~ commercial traffic and congestion points at the Hayden Run Bridge; and
- Riverside Drive (U.S. 33) south of SR 161 to Fishinger Road:~~,~~ ~~which has~~ scenic character along the River with two lanes of travel and limited left turn lanes.

While t~~T~~hese capacity problems are primarily experienced during the traditional commuter rush (peak) hours, ~~.~~ ~~However~~lunch hour congestion is felt ~~, congestion and delays also occur~~ in the areas of Frantz Road, Avery-Muirfield Drive and U.S. 33/SR 161 ~~during lunch hours~~. In addition, extreme weekend congestion and delays are experienced along the Sawmill Road and Powell Road corridors because of the ~~on weekends, due primarily to~~ the adjacent retail activity and the Columbus Zoo ~~exits~~.

Other e~~E~~xtreme congestion with stop-and-go conditions are encountered on many weekday evenings (especially Friday) along the I-270 North Outerbelt through Dublin. When this happens, drivers often divert to Dublin's ~~the~~ internal streets

~~system~~, placing an increased demand especially on river crossings. ~~Typically~~This can create significant delay and congestion across~~,~~ the entire roadway system ~~will then experience significant delay and congestion~~.

While U.S. 33 and I-270 provide access for trips that start or end within Dublin, they also carry high volumes of traffic through the ~~City~~city. ~~In addition, roadways such as~~ Dublin Road, Riverside Drive, Sawmill Road, Avery Road, and U.S. 33 are also part of the regional road network. As new developments occur in Union and Delaware Counties, a significant portion of the traffic generated will be attracted ~~oriented~~ to ~~toward~~ Dublin's I-270 and U.S. 33 interchanges or other areas along I-270. This regional ~~through~~ traffic ~~will~~ absorb~~s~~ a portion~~s~~ of available roadway capacity for ~~within~~ the Dublin area.

~~B.~~ Planned and Programmed Roadway Improvements

Of the ~~The 2007 Thoroughfare Plan (Map 4.4) shows~~ several proposed and/or planned roadway improvements ~~s~~shown in the Thoroughfare Plan, ~~. While~~ some ~~projects~~ have been ~~completed,~~completed; others are under construction or are being designed. These proposed or planned facilities include the following:

- Emerald Parkway east from Riverside Drive to ~~Hard Road~~Wright's Run~~.~~ (under design and acquisition underway~~and partially under construction~~);
- Emerald Parkway widening, from Tuttle Crossing Boulevard to Glendon Court (construction underway);
- ~~Hospital Drive from Avery-Muirfield Drive to Perimeter Drive. (complete with anticipated opening in January 2008)~~
- U.S. 33/SR 161 interchange improvements. (under final design with construction ~~anticipated~~ delayed until funding partners found~~in 2008-2010~~);
- ~~Industrial Parkway relocation. (under final design with construction anticipated in 2008-2009)~~
- ~~Village Parkway extension westward from Dublin Center Drive to connect with the Shamrock Boulevard extension. (under construction in 2007)~~
- ~~Central Ohio Innovation Center (COIC)~~ West Innovation District internal roadway network~~.~~ (planned);
- Tuttle Crossing Boulevard extension to Avery Road and further to the west to connect with Houchard Road west of Amlin~~.~~ (planned);
- ~~Stoneridge Lane extension west to Dale Drive. (planned)~~ Bridge Street District grid street system (planned);
- ~~Redirection of Post Road to Commerce Parkway. (planned)~~
- Wyandotte Woods Boulevard extension to Emerald Parkway~~.~~ (planned); and
- ~~Eiterman Road extension south to Rings Road. (completed in 2007)~~
- ~~Westbound ingress only lane from U.S. 33 off-ramp intersection at Avery-Muirfield Drive to Hospital Drive. (planned)~~

~~• Tuttle Crossing Boulevard widening from Wilcox Road to Emerald Parkway. (under design with construction anticipated in 2008-2009)~~

- Avery Road widening from U.S. 33/SR 161 interchange south to ~~City~~city corporate line~~.~~ (first phase ~~under construction in 2007~~complete, remaining phases planned).

In addition to the work being undertaken by Dublin, ~~other agencies including~~ the City of Hilliard, City of Columbus, Franklin County, Delaware County and ODOT, have scheduled ~~or completed~~ several roadway improvement projects, including the following:

~~• Powell Road realignment with Glick Road around the Columbus Zoo. (under construction in 2007)~~

~~• Britton Parkway extension south of Tuttle Crossing Boulevard to Hayden Run Road. (completed)~~

- Sawmill Parkway extension north from its existing northern terminus at Home Road north to Airport Road~~.~~ (under final design);

~~• Riggins Road extension from Britton Parkway west to Hayden Run Roadplanned~~

- Riggins Road extension from Wilcox Road west to Avery Road~~.~~ (planned);

- Hayden Run Boulevard extension from existing terminus west of the CSX railroad tracks to Avery Road~~.~~ (planned);

- I-270 improvements widening from I-70 to U.S. 33 to the outside, creating a four lane basic roadway section in each direction~~.~~ (planned);

- I-270 reconstruction from the Roberts Road interchange south to U.S. 62 in Grove City~~.~~ ~~widening from I-70 to U.S. 33 to the outside, creating a four-lane basic roadway section in each direction.~~ (~~planned~~under construction);

- I-270/U.S. 33 interchange improvements to be constructed in phases~~.~~ (planned);

- U.S. 33/Avery-Muirfield Drive interchange improvements~~.~~ (planned);

- U.S. 33/McKitrick Road interchange construction~~.~~ (planned); and

- U.S. 33 widening from I-270 to Avery-Muirfield Drive to the outside, creating a four-lane basic roadway section with auxiliary lanes in each direction~~.~~ (planned).

Of greatest regional significance is the planned widening and interchange improvements of the Outerbelt on the northwest side of the greater Columbus area. Congestion along I-270 and U.S. 33/SR 161 is moderate to severe and will worsen as traffic volumes increase over the next 25 years. Two freeway segments currently operate at a Level of Service (LOS) "E" during the PM peak hour: westbound lanes of U.S. 33/SR 161 between I-270 and Avery-Muirfield Drive and the westbound lanes of I-270 between Sawmill Road and U.S. 33.

While new development has created thousands of jobs, it has also caused transportation challenges. The I-270 widening projects will assist in relieving the associated congestion with ~~.~~ ~~T~~two new lanes in each direction, with auxiliary lanes, ~~are~~

planned for the corridor on the northwest side. The new lanes will be ~~added to the~~ outside ~~of~~ the existing lanes first, and then to the inside in order to retain the width of the median for as long as possible and to minimize expenses by purchasing rights-of-way earlier.

In addition to the freeway widening, several interchange improvements~~,are anticipated for the area.~~ ~~The~~ the I-270/Cemetery Road, ~~the~~ I-270/Tuttle Crossing Boulevard, and the I-270/U.S. 33/SR 161 interchanges are all expected ~~to be improved~~ in the next 25 years. In particular the I-270/U.S. 33/SR 161 interchange has received priority status by ODOT, with the possibility of construction beginning in the next five years. Additionally, ODOT has identified the U.S. 33/SR 161 interchanges at Avery-Muirfield Drive, McKitrick Road, and U.S. 42 ~~are all identified by ODOT~~ for construction in the future ~~by the year 2020~~. Timing of these~~hese~~ improvements ~~will likely be delayed~~is uncertain given the lack of predictability ~~current status~~ of transportation funding in the State of Ohio. The City of Dublin actively cooperates ~~continually works~~ with ODOT ~~the Ohio Department of Transportation~~ and other state and federal leaders to advance these important projects.

Each of t~~T~~hese improvements ~~projects described above are~~is necessary even with the widening of ~~though~~ I-270 ~~has recently been widened~~ to three lanes in this area; it ~~. It~~ was clear ~~realized at the time of construction of the~~ that this widening alone ~~three existing through lanes that they would~~ could not totally solve the mobility problems in the northwest~~ern~~ corridor. Added to this is the need for other general ~~In addition,~~ improvements ~~must also be made~~ to crossroads and other roadways on the surface street system. ~~Beyond this,~~ MORPC is preparing to meet these needs by coordinating regional efforts to manage and reduce the demand for travel through increased transit service and travel demand management strategies that can ~~by~~ eliminat~~e~~ing trips or change when~~ing~~ ~~the time of day~~ those ~~the~~ trips occur.

~~C.~~ Bicycle Facilities

Bicyclists differ widely in their abilities and in their preferences for riding environments. ~~Recognizing these differences as well as the potential benefits of a bike-accessible community, City Council formed the Bicycle Advisory Task Force (BATF) in fall of 2009 to provide assistance in identifying potential bicycle facilities.~~ In general, bicycle trip purposes can be divided into two broad types: recreation and transportation, each of which has its own unique character. Recognizing these differences as well as the potential benefits of a bike-accessible community, City Council formed the Bicycle Advisory Task Force (BATF) in fall of 2009 to provide assistance in identifying potential bicycle facilities.

For the recreational rider Dublin has an extensive network of ~~bikeways serving the recreational rider (refer to *Map 4.10 Bikeway Plan*). The~~ over 110~~88~~-mile~~s~~ of public bikeways ~~system~~ connect~~ings~~ many local schools, parks and destinations. ~~,~~ ~~while the~~ Muirfield Village ~~development~~ in northern Dublin adds an additional 22 miles of ~~in~~ its own private system.

~~When identifying potential bikeways, the~~This network reflects the emphasis the City ~~City~~city ~~has placed primary emphasis~~ on linking local destination points and ultimately will complete~~ing~~ an extensive ~~the existing~~ network ~~of when identifying potential~~ bikeways.

For bicycle transportation Dublin ~~also~~ has ~~a few~~ regional and commuter bike routes that traverse the ~~City~~city. ~~These bike routes,~~ serv~~inge~~ as links between destinations ~~and~~ as well as connect~~ing~~ Dublin with other communities in the region. The BATF helped identify ~~E~~existing and potential bikeway corridors and routes ~~have been identified~~in the ~~City~~city which are ~~as~~ part of the Greater Columbus regional bikeway system and ~~are~~ included in the MORPC *Regional Bicycle Transportation Facilities Plan*.

Implementation of the bikeway system is achieved through ~~City~~city development regulations and funding mechanisms. Generally, Dublin's subdivision regulations require that sidewalks be constructed on both sides of all streets. If a proposed development includes property for which a bike path is proposed, the construction of the bike path is substituted for the usual length of the sidewalk. Generally, the City's bike path design standards specify a minimum pavement width of eight feet.

The ~~City~~City works to connect existing bikeways with future bikeways within rights-of-way or easements. An annual bike path project list is submitted to City Council for appropriation; additional bikeway facilities can be funded separately. ~~Generally, the Citycity's bike path design standards specify a minimum pavement width of eight feet.~~

~~II.~~ PROJECTIONS

The Community Plan focuses on future impacts and future conditions within Dublin. Estimating traffic in future years ~~for the Dublin area~~ was accomplished through a computer model (Cube/Voyager) ~~travel demand forecasting process~~ that ~~models~~ estimates traveler characteristics, quantified using information from MORPC and survey and land use data from Dublin, ~~travel behavior (how many trips are made, to which destinations, at what times, etc.). Using information from MORPC and survey data from Dublin, these traveler characteristics were quantified. The computer model (TP+/Cube/Voyager) uses this information, combined with land use data,~~ to ~~estimate~~ project when and where vehicles will travel.

~~An overall~~The study area for projections is subdivided into smaller geographic areas called Traffic Analysis Zones~~,~~ (TAZ) ~~for the travel demand analysis~~. Using land use densities for t~~T~~he anticipated future land use, ~~is then defined for each TAZ. The land use densities are translated into~~ residential population and employment information are calculated for each TAZ, which then determines the number of trips to be assigned to the roadway network.

~~The t~~Travel demand modeling ~~work~~ is traditionally a four-step process: 1) trip generation~~;~~, 2) trip distribution~~;~~, 3) mode choice (method of travel, e.g. transit, personal vehicle, etc.); ~~choice~~ and ~~finally~~ 4) trip assignment. The *Transportation Planning Handbook, Second Edition*, published by the Institute of Transportation Engineers, generally describes ~~provides the following definitions for~~ each of these ~~four~~ steps ~~in the process~~.

Trip generation: predicts the number of person trip ends (travel to and travel from) ~~that are generated by and attracted~~ to each defined zone in a study area.

Trip distribution: connects trip ends ~~(productions and attractions)~~ estimated in the trip generation ~~model~~ to determine travel ~~trip interchanges~~ between TAZs. ~~each zonal pair.~~

Mode choice: determines the method of transportation ~~modes~~ that will be used to travel on between each TAZ~~zonal interchange~~.

Trip assignment: assigns trips to specific highway or transit routes and determines the resulting highway volumes and transit ridership.

~~A.~~ Planning Process

As noted above, t~~T~~he travel demand model ~~included~~ includes land use data for ~~several hundred small land use areas. Each small area, or~~ each Traffic Analysis Zone (TAZ), which ~~was~~ is then tested ~~for~~ against future conditions. For Dublin, t~~T~~he land use information for each zone ~~was based on the Mid-Range Scenario on Map 4.1~~is based on the development scenario used to create the ~~Dublin's~~ Future Land Use Map. Using vehicle trips projected for Dublin's development in approximately 20 years~~Through an iterative process~~, the highway network ~~was~~ is adjusted by adding or reducing lanes until the network functions appropriately~~best accommodated accommodates vehicle trips projected for Dublin's development in 2030approximately 20 years~~. The updated transportation demand model is the basis for the Thoroughfare Plan, which represents the road network necessary to address the community's 2035 mobility needs. The Thoroughfare Plan also indicates the number of lanes needed to accommodate expected traffic levels in 2035.

The initial transportation modeling effort ~~was~~ undertaken for the 2007 Community Plan update ~~existing conditions (2004) and the~~included a year 2030 planning horizon~~, which accounts for expected development to that year~~. The 2030 testing was done to coincide with the fiscal analysis and yielded important information on phasing considerations and costs associated with the required network improvements. The model was updated in 2012 to incorporate MORPC's new 2035 horizon year and adjustments to Dublin's Future Land Use Plan based on the Bridge Street District and West Innovation District planning efforts. A separate fiscal analysis was ~~also~~ conducted for the Bridge Street District in 2012, providing additional guidance for phasing of street network improvements in this area.

Focusing on year 2035 levels was necessary to ensure consistency with the planning efforts of other transportation agencies, including MORPC and ODOT, as the region's future transportation projects originate in planning and programming documents assembled by these two agencies. Using a 2035 horizon year and significant network analysis provides Dublin an advantage in pursuing federal and state funding for future projects.

~~It is also the~~The updated transportation demand model is the ~~basis for the Thoroughfare Plan shown on Map 4.5, which represents the road network necessary to address the community's 2030~~ 2035 mobility needs~~. Map 4.6~~The Thoroughfare Plan ~~also illustrates~~ indicates ~~the number of lanes needed to accommodate expected traffic levels in 2030~~2035~~.~~

The components of the future network ~~are outlined in Section III of this chapter and~~ include~~s~~ a listing of projects recommended to address congestion in the Dublin area through ~~2030~~2035. Due to the modest pace of development within the study area related to economic conditions over the past five years, many of the improvements originally identified as necessary by the 2007 Plan's horizon year of 2030 ~~are~~have been extended to the new horizon year. ~~It was important to focus on year 2030~~ 2035 ~~levels to ensure consistency with the planning efforts of other agencies including MORPC and ODOT. The region's future transportation projects originate in planning and programming documents assembled by these two agencies. By using a 2030~~ 2035 ~~horizon year and significant network analysis, Dublin will have~~has ~~an advantage over other communities in pursuing federal and state funding for future projects.~~

During the 2007 Plan update, ~~A~~a policy determination was made as part of the planning process to limit the maximum number of through lanes to two in each direction for Dublin collectors and arterials. This ~~limitation~~ policy balances roadway capacity with aesthetics, pedestrian orientation, and other quality of life considerations ~~in Dublin~~. Thus, as travel demand increases, some corridors may be challenged to achieve acceptable levels of operation.

~~In~~ During the 2007 planning process it was determined that ~~the case of~~ Dublin Road~~, the corridor~~ will remain constrained as a two-lane roadway regardless of how congested it becomes.

As such, motorists will have to choose whether to remain on Dublin Road or select an alternate route. Dublin's overall system is comprehensive and robust and provides many alternate routes for most trip origins and destinations.

Some congested corridors will remain in ~~2030~~2035. The Avery-Muirfield Drive corridor, Dublin Road, and U.S. 33/SR 161 (inside I-270) will continue to experience congestion during ~~the~~ peak hours and ~~. It is in these locations that~~ additional traffic operational enhancements must be considered. Given Dublin's growth areas to the west, roadways on the periphery of the city and other important segments were sized by number of lanes with consideration of the full build-out impacts of these changing areas. ~~In addition to these congestion points,~~ Lland use considerations for the full build-out of Dublin ~~by 2050~~ will require ~~additional~~ future analysis of and improvements to ~~and additional analysis of~~ the Dublin transportation system ~~in the future~~. ~~Given Dublin's growth areas to the north and west, roadways on the periphery of the Citycity and others important segments were sized by number of lanes with consideration of the full build-out impacts of these changing areas.~~

~~B.~~ Transportation Network

~~Initial~~ Previous travel demand modeling ~~efforts~~ used the roadway network in the ~~adopted~~ 1999 Thoroughfare Plan ~~(amended June 18, 2007)~~. Since this ~~This~~ original network was found to be inadequate to handle the traffic associated with year 2030 development, ~~and~~ it was enhanced by adding lanes to certain roadway segments. The planning ~~is~~ process for these improvements included community input and respected community sentiments to limit road widening to acceptable widths. In this sense, it represents the maximum feasible network.

Adjustments were also made to consider transportation plans of adjacent municipalities; ~~. T~~the network was ~~further~~ modified to recognize and coordinate with planning efforts of Union, Delaware, and Franklin Counties.

The travel estimates for the 2007 Community Plan's preferred Mid-Range Scenario ~~discussed in *Chapter 3 – Land Use*~~ used a network that assumed several key improvements~~. Map 4.2 shows projects included in this roadway network~~ that added capacity to the transportation network by widening existing routes or adding new road segments. These 'base network improvements,' some of which ~~have been~~were completed ~~over the past five years~~, were also used in the 2012 model update.

Future projects important to Dublin include: the widening of I-270 ~~to~~ from six to eight lanes ~~from the existing six lanes~~; Avery Road widening to four lanes south of Shier Rings Road; U.S. 33 widening between I-270 and Avery-Muirfield Drive; Tuttle Crossing Boulevard widening between I-270 and Wilcox Road; Tuttle Crossing Boulevard extension to Houchard Road; Houchard Road widening and northward extension into Union County; and the connection of Emerald Parkway to Sawmill Road.

~~Beyond these initial improvements, four groups of additional roadway projects were identified: Group I projects resulting from the I-270 Major Impact Study (MIS) known as the 2006 Northwest Freeway Study; Group II projects resulting from area plan concepts in *Chapter 3 – Land Use*; Group III as other projects in Dublin such as potential bridge locations or other development ideas not included in the area plans; and finally, Group IV projects resulting from travel demand modeling to increase capacity.~~

Several roadway networks and land use assumptions were analyzed for transportation impacts to the overall roadway network. The ~~study~~ studies identified the benefits and consequences of the various alternatives ~~under consideration~~. In summary, the projects that are needed for the Dublin system to service travel demands include the ~~following~~ projects ~~as shown~~are described as ~~in~~ Group~~s~~ I through ~~IV~~ V, depending on their source and purpose ~~in Table 4.2~~below.~~:~~

Group I Projects are those recommended projects from the I-270/U.S. 33 Northwest Freeway Study. These projects will draw more traffic to the freeway system ~~than without the improvements~~and away from the surface street system. In particular, the addition of ~~the~~an interchange with U.S. 33 at Mitchell-Dewitt Road ~~interchange~~ is appropriately located to serve the burgeoning development that will occur in Union County. Traffic results given Dublin's projected growth are expected to be much worse for ~~the~~ Dublin's arterial system ~~area~~ if the freeway and interchange improvements are not implemented. ~~Given Dublin's projected growth, substantially more traffic would be included on the arterial system.~~

Group II Projects are improvements that will improve mobility within ~~the~~ described localized areas ~~described~~. These projects should be strongly pursued in conjunction with development. In particular, the Hyland-Croy Road extension to Home Road (within Jerome Township) is vitally important to mobility for northwestern portions of the modeling area.

Group III Projects are improvements at various locations due to safety and crash severity concerns such as the Post Road realignment to Commerce Parkway, with Perimeter Drive widened to four lanes from Avery-Muirfield Drive to Emerald Parkway; and the cul-de-sac on Bright Road at Riverside Drive ~~due to safety and crash severity concerns~~.

Group IV Projects are additional improvements resulting from the travel demand analysis. These projects benefit the performance of the overall Dublin area and have ~~large~~ significant impacts on their immediate areas.

Group V Projects are improvements that create a grid street network in the Bridge Street District and include the possibility of a new 2-lane bridge crossing the Scioto River. These projects and streetscapes create a truly multi-modal transportation system by including amenities to support transit ridership, pedestrians, and cyclists.

~~C.~~ Projected Traffic Operations

~~Maps 4.3 and 4.4 show the AM and PM peak~~ Peak hour levels of service (AM and PM) on the Thoroughfare Plan network were analyzed as part of the travel demand model. When all of the improvements from the ~~four~~ five project groups are combined, the travel demand model shows that traffic (as intended by design) is drawn to the widened roads; ~~. In addition to freeways attracting more traffic,~~ the widening of U.S. 42 and Hyland-Croy Road and the extension of Hyland-Croy Road increases traffic on these roadways. These improvements ~~widenings~~ enable traffic reductions on adjacent roads such as ~~like~~ Avery Road and Muirfield Drive ~~to have reductions in traffic when compared without the improvements~~.

The greater development densities planned for the Bridge Street District created the need to rethink the transportation network not just w~~W~~ithin the Bridge Street District but for the entire network. ~~,t~~The planned grid street network in the District is expected to improve traffic operations by giving travelers more ~~mode~~transit, bike, and walking choices, and interconnected through-streets to disperse traffic across numerous roadways. ~~A new bridge is included in the roadway network between SR 161/Bridge Street and the I-270 overpass that will serve to provide additional connectivity within the District; however, modeling suggests that this bridge will not significantly affect traffic volumes on SR 161/Bridge Street.~~ Due to the interconnectivity of the grid street network, ~~the~~an additional bridge* connection, the emphasis on multi-modal travel, and the high density, mixed –use development pattern, modeling results indicate the potential for up to a 40 percent~~%~~ internal 'capture rate' of vehicle trips, meaning that 40 percent~~%~~ of trips will remain within the District and/or will ~~not~~ be made using something other than an automobile (e.g. walking, biking or transit~~telecommuting instead~~).

*A new bridge is included in the roadway network between SR 161/Bridge Street and the I-270 overpass that will serve to provide additional connectivity within the District; however, modeling suggests that this bridge will not significantly affect traffic volumes on SR 161/Bridge Street.

~~D.~~ Levels of Service

A ~~The purpose of establishing a~~ level of service (LOS) system is used to characterize ~~to adopt operational definitions for~~ those driving conditions that motorists routinely experience and recognize; how long is a vehicle stopped at a traffic signal, or how slow is traffic moving. The LOS is a rating system for roadways that measures ~~operational~~ these ~~conditions in~~ traffic conditions and motorists' perceptions. The individual LOS is described ~~characterized~~ by factors such as speed and travel time, freedom to maneuver, traffic interruptions, and driver comfort and convenience.

Six LOS categories are commonly defined by ~~. Each is given~~ a letter designation from "A" to "F," similar to a report card, with LOS "A" representing the best operating conditions and LOS "F" depicting the worst~~, as defined below:~~.

"A" is the best operating condition with a free flow in which there is little or no restriction on speed or maneuverability. At intersections, there is little or no delay.

"B" represents a condition of stable traffic flow, but ~~operating~~ speeds are slower ~~is beginning to be restricted~~. Short traffic delays occur at intersections.

"C" is still a condition of stable flow, but most drivers are less able ~~becoming restricted in their freedom~~ to drive at the speeds at which they feel comfortable, ~~select speed,~~ and find it difficult to change lanes or pass other vehicles. Intersections experience average traffic delays.

"D" approaches unstable flow. Operating speeds are tolerable to the driver, but are subject to considerable and sudden variation. Freedom to maneuver is limited and driving comfort is low, as the probability of accidents has increased. Long traffic delays are experienced at intersections.

"E" represents a maximum roadway capacity for vehicles. ~~Operation in this zone~~Traffic is unstable, speeds and ease of driving~~flow rates~~ fluctuate, and drivers have ~~there is~~ little ability to ~~independence~~ select ~~of~~ speed ~~selection~~ or maneuverability. Driving comfort is low and accident potential high. Vehicles are close together and speeds can fluctuate quickly. ~~The distance between vehicles is short and operating speeds are subject to rapid fluctuation.~~ Very long traffic delays are experienced at intersections.

"F" is the worst operating condition. Speed and rate of traffic flow may drop to zero for short time periods. Extreme delays are experienced at intersections. This may cause severe congestion, affecting other adjacent roadways.

Volume-to-Capacity (V/C) ratios are used to define LOS along the ~~on the thoroughfare~~ street network ~~links~~. These ratios are calculated by dividing ~~the modeled~~ traffic volume ~~on the link~~ by the defined capacity of the selected portion of the roadway~~link~~. The V/C ratios relate to LOS as follows:

- LOS "A" through "C": V/C is less than 77 percent; i.e. t~~T~~he roadway is carrying up to 77 percent of its capacity~~has capacity to carry additional traffic~~.
- LOS "D": V/C ranges from 78 percent to 91 percent; t~~T~~he roadway is nearing capacity.
- LOS "E": V/C ranges between 92 percent to 100 percent; t~~T~~he roadway has reached capacity and is being utilized to its maximum design.

- LOS "F": V/C is greater than 100 percent; ~~Traffic~~ traffic now exceeds the capacity of the roadway.

~~E.~~ AM Peak Hour

As estimated by traffic modeling, AM peak hour traffic ~~During~~ the year ~~2030~~ 2035 AM ~~peak hour,~~ has volume-to-capacity ratios (see Levels of Service) ~~for the network links, as expressed in terms of levels of service,~~ are generally acceptable. Certain areas will experience high levels of congestion. In some cases this is purposely balancing larger community goals with traffic goals. In other locations with low levels of service, corridors provide access to freeways (U.S. 33/SR 161 and I-270) and service the business corridors with significant concentrations of employment.

- High congestion levels are ~~shown~~ projected in the southbound direction on Dublin Road south from Memorial Drive through the Historic Dublin to Rings Road. A policy decision was made ~~It was decided early on in the comprehensive planning process~~ to preserve the character and number of lanes on existing Dublin Road to maintain its ~~. This corridor is very important to Dublin from~~ historic qualities and quality of life ~~perspectives~~ to the residents who travel this roadway.
  ~~Thus, this is a case of balancing larger community goals with traffic goals. As shown on Map 4.3, other locations with low levels of service are primarily concentrated along corridors providing access to freeways (U.S. 33/SR 161 and I-270) and those servicing the business corridors.~~
- Coffman Road between Brand Road and Emerald Parkway and Emerald Parkway from Coffman Road to Perimeter Drive ~~show~~ are projected at LOS "F" ~~congestion~~ in the southbound direction during morning rush hour. The intersection of Brand and Coffman Roads is also LOS "F" for the morning peak hour indicating the need for intersection improvements at this location.

- The Avery-Muirfield Drive corridor also exhibits LOS "F" ~~in~~ for ~~the~~ southbound traffic~~direction~~. The ~~service interchange at~~ U.S. 33/SR 161 interchange, combined with commercial development along the corridor, provides traffic volumes that challenge the existing 4/5 through lane configuration. Even if ~~the maximum roadway footprint policy was violated,~~ an additional through lane was added in each direction there would still be ~~provide~~ poor service levels. Intersection improvement projects should ~~are anticipated to~~ help, but not solve, congestion along the roadway ~~the situation along road segments~~ and at the intersections with Perimeter Drive and Perimeter Loop Road. The U.S. 33/SR 161 westbound ramp intersection is also LOS "F" in the AM, while the Perimeter Loop Road and the Perimeter Drive intersections are in the LOS "D" range.

- Avery Road south of U.S. 33/SR 161 modeled as LOS "E" in the AM southbound peak hour ~~in the southbound direction~~. Improvements to the intersection of Avery Road and Woerner Temple Road are also needed by ~~2030~~ 2035 to address ~~forecasted~~ congestion ~~at this area~~.

- Non-freeway sections of U.S. 33/SR 161 from Frantz Road to Dublin Road ~~carries~~ carry a high volume of traffic during the morning commute ~~when considering the existing number of available lanes~~. This corridor along with Frantz Road, services many higher density employment ~~commercial~~ and residential destinations in Dublin, including Metro Center.

In the year ~~2030~~2035, other congested intersections include Emerald Parkway at Post Road; Post Road/Frantz Road and SR 161 (inside I-270); Riverside Drive at SR 161; and Bridge and High Streets in Historic Dublin. While not surprising, modeling results indicate the need for system upgrades ~~in the future~~. Based on the transportation analysis completed for the Bridge Street District, significantly expanding the size of the intersection of Bridge Street at High Street will not help

ease congestion from future regional growth; a pedestrian-scaled intersection, however, will preserve walkability while acting as a deterrent to some regional trips with no real effect on congestion.

~~F.~~ PM Peak Hour

During the ~~2030~~ 2035 PM peak hour, volume-to-capacity ratios for network links as expressed in terms of levels of service are generally acceptable; however, the PM peak hour typically experiences poorer levels of service than the AM peak.

- High congestion levels are ~~shown~~ projected in the southbound direction along Dublin Road south from Memorial Drive through the Historic District to Rings Road. A policy decision was made to preserve the character and number of lanes on existing Dublin Road to maintain its scenic and historic qualities and quality of life to the residents who travel this roadway.~~Early in the planning process, policy decisions were made to preserve the character and number of lanes on existing Dublin Road due to the scenic and historic importance of the corridor.~~

- Coffman Road from Brand Road to Emerald Parkway and Emerald Parkway between Coffman Road and Perimeter Drive exhibit LOS "E" and "F" congestion in the northbound direction during the afternoon rush hour. The intersection of Brand and Coffman Roads is in the LOS range "A-C" in the PM peak hour.

- The Avery-Muirfield Drive corridor also ~~shows~~ exhibits LOS "F" for the link in the northbound direction. The U.S. 33/SR 161 interchange, combined with commercial development along the corridor, provides traffic volumes that challenge the existing 4/5 through lane configuration. Even if an additional through lane was added in each direction there would still be poor service levels. ~~The service interchange at U.S. 33/SR 161, combined with the commercial development along the corridor, again provides traffic volumes that challenge the existing 4/5 through lane configuration. Service levels remain poor despite the modeling of an additional lane in each direction.~~ As in the AM, intersection improvement projects are anticipated to ~~improve~~ease, but not totally solve the situation along road segments at the intersections of Perimeter Drive and Perimeter Loop Road. The U.S. 33/SR 161 west bound off ramp and the Perimeter Loop Road intersections were modeled at a LOS "F". ~~in the PM, as indicated on Map 4.4.~~ Avery-Muirfield Drive at Perimeter Drive operates at LOS "E". ~~in the PM.~~

- Avery Road south of U.S. 33/SR 161 to Tuttle Crossing Boulevard also ~~shows~~ exhibits poor service, with a LOS "F" in the PM peak hour in both the north and south bound directions. Improvements to the intersection of Avery Road at Woerner Temple Road are needed by ~~2030~~ 2035 to address ~~forecasted~~ congestion ~~at this location~~.

- The non-freeway section of U.S. 33/SR 161 from Frantz Road to Dublin Road carries high traffic volumes ~~when compared to the number of available lanes~~ during the PM peak hour. This corridor along with Frantz Road, serv~~ic~~es many higher density commercial and residential destinations in Dublin. Motorists using Frantz Road from U.S. 33/SR 161 to Rings Road also will experience heavy LOS "F" congestion in the future PM peak hour.

In the year ~~2030~~2035, other congested intersections will include: Post Road/Frantz Road and SR 161 (inside I-270), Bridge and High Streets in Historic Dublin, Riverside Drive and SR 161, and Emerald Parkway and Riverside Drive. As stated earlier, based on the transportation analysis completed for the Bridge Street District, significantly expanding the size of the intersection of Bridge Street at High Street will not help ease congestion from future regional growth; a pedestrian-scaled intersection, however, will preserve walkability while acting as a deterrent to some regional trips with no real effect on congestion.

~~As shown on Map 4.4, t~~The low levels of service for the PM peak hour are nearly the same as those corridors in the AM peak period, generally in the reverse direction, and are those located along freeways (U.S. 33/SR 161 and I-270), and in major commercial areas.

~~III.~~ THE TRANSPORTATION PLAN

The Community Plan is the key policy document for decision-making about Dublin's built and natural environments. The Community Plan text and associated maps contain detailed recommendations for ~~future~~ development including the appropriate location and density/intensity of residential and commercial uses; the general location and character of roads; the general location of parks, open space and public buildings; and the general sites for and extent of public water and sanitary sewer utilities. It also contains recommendations to guide development strategies for the unincorporated areas to the northwest and southwest of Dublin.

Throughout this Plan, recommendations are based upon a review of existing conditions and evaluation of future development scenarios for their impacts on infrastructure, roads and the ~~City~~city's fiscal health. Dublin's ability to maintain its high quality of services and quality of life is dependent upon careful review of development proposals for conformance with the Community Plan. The Transportation Plan and the Land Use Plan ~~(see *Chapter 3 – Land Use*)~~ form the foundation of the Community Plan ~~document~~. The Thoroughfare Plan ~~, as shown on Map 4.5 and described in Table 4.3,~~ is the primary reference tool within the Transportation Plan, while the Future Land Use Map ~~(Map 3.3)~~ is the primary planning instrument within the Land Use Plan. Both of these primary planning elements provide the foundation to guide decision-making regarding the appropriateness of development proposals and infrastructure improvements necessary to support ~~future~~ development.

~~A.~~ The Thoroughfare Plan

The Thoroughfare Plan is composed of two elements: ~~(~~1) ~~Map 4.5~~a map showing existing and planned roads by functional classification and right-of-way width~~;~~ and ~~(~~2) an associated ~~Table 4.3~~table that describes each roadway and its planned improvements, including number of lanes. The roadway network shown ~~on Map 4.6~~ in the Thoroughfare Plan map (above) ~~graphically~~ identifies the number of lanes needed to accommodate year ~~2030~~ 2035 development in Dublin.

~~Table 4.3~~The Thoroughfare Plan table in more detail lists the improvements to the existing network along with the ~~. The~~ functional classification of each roadway and the number of existing lanes in ~~are shown. The table also shows the number of lanes in~~ both directions. If the number of lanes is followed by a "D", this indicates roadways with a barrier median~~, thus yielding~~ a "~~divided~~Divided" roadway. An odd number (3, 5) indicates an "undivided" roadway with center left turn lanes, as needed. While t~~Typcial~~Typical right-of-way widths are ~~also~~ shown a~~. It should be noted that a~~dditional right-of-way may be necessary to properly accommodate required number of lanes, pedestrian and bicycle facilities, and roadway geometrics. ~~For more information regarding the Transportation Plan, maps, policies and intent, please contact the City of Dublin Engineering Department.~~

Functional Classification of Roadways

For thoroughfare planning and design purposes, roads are generally classified by function and have two purposes: to provide mobility and to provide access to property. The four functional roadway classifications used as part of the

Community Plan are major arterials, minor arterials, collector streets and local streets. The road hierarchy ~~from most to least important~~ is as follows ~~(See Figure 4.1)~~:

Major arterials serve the major activity centers of urbanized areas, and carry the highest traffic volumes ~~corridors~~ and ~~the~~ longest trips. This type of facility provides service for significant intra-area travel (such as between ~~central business districts~~business centers and outlying residential areas), travel between major inner-city communities, and commutes between major suburban centers. Frequently, the major arterial system ~~carries intra-urban and inter-city~~supports major transit ~~bus~~ routes. Priority is given to providing travel rather than s~~S~~ervice to abutting land ~~is subordinate to travel service~~. The major arterial system is further ~~stratified~~ segmented by: ~~(~~1) interstates~~,~~ ~~(~~2) other freeways~~,~~ and ~~(~~3) other major roadways (with partial or no control of access).

Minor arterials ~~inter~~connect ~~with~~ and support ~~augment~~ the major arterial system by ~~. This type of facility will~~ accommodat~~inge~~ trips of moderate length at a somewhat lesser ~~lower~~ level of mobility than major arterials. This system places shifts to more emphasis on ~~land~~ access to land uses and may carry local bus routes, but ideally does not penetrate identifiable neighborhoods.

Collector streets provide both access to property and traffic circulation within residential neighborhoods and commercial or industrial areas. This system collects traffic from local streets such as those through ~~, accessing the~~ residential neighborhoods, and disperses it to the arterial system. The collector street system may also carry local bus routes where appropriate.

Local streets are all other streets. ~~comprise all facilities not found in one of the higher systems.~~ The priority is ~~se~~ providing ~~primarily facilitate~~ direct access to abutting land and providing local connections to the remainder of the street ~~higher order~~ systems. They offer the lowest level of mobility and usually contain no commuter bus routes. ~~Service to t~~Through-traffic ~~movement~~ usually is deliberately discouraged.

The Bridge Street District uses a slightly different classification system for the roadways in this area. Instead, within the District, the streets are organized into "families" which group streets that share similar characteristics and which may almost interchangeably be located in various parts of the District. Within the larger families are groups of streets with similar characteristics, grouped as street types. The intent of the street family designation is to provide a wide range of street types to accommodate different land use contexts and transportation needs within a broader framework of walkable, urban street character.

Corridor Connector Streets: The corridor connector street family provides a series of street types that balance non-motorized and vehicular travel options along high-capacity thoroughfares. This street family serves multiple types of development and provides crosstown connections, while accommodating various transitions in land use and street character.

District Connector Streets: The district connector street family provides a series of high to medium capacity streets that serve a wide variety of uses and development densities. District connector streets provide connections between districts throughout the Bridge Street District particularly along high-visibility frontages, and typically serve as prime locations for destination-oriented development such as shopping corridors.

Neighborhood Streets: The neighborhood street family provides a series of low to medium capacity streets serving a wide variety of land use characters, but most often serve residential areas or neighborhood-serving commercial uses.

Neighborhood streets provide a finer-grained network of street connections that allow for multiple, interconnected travel routes, but typically serve more localized destinations rather than cross-corridor travel.

Alleys and Service Streets: Alleys and service streets are very low capacity, low speed streets located to the rear of lots that minimize driveway interruptions for pedestrians. Alleys and service streets provide access to parking facilities, loading facilities, and service areas for refuse and utilities. If certain design parameters are used, alleys may also serve as mid-block pedestrianways.

~~B. 2007-2030~~ Roadway Improvements by Lead Sponsor

Many of the projects identified in the Thoroughfare Plan are outside of Dublin's jurisdiction. ~~Map 4.7 shows~~The Thoroughfare Plan map (above) identifies improvements by lead sponsor agency, whether the City of Dublin, the City of Columbus, the City of Hilliard, Franklin County, Union County, or possibly Delaware County. Many projects outside the corporation limits of Dublin have a substantial impact for Dublin's residents or employees. Participation by Dublin for some projects near the ~~City~~city's borders may be prudent to improve mobility to homes and major employment centers.

~~C.~~ Phasing of Roadway Improvements

As a basis for the fiscal analysis, ~~a~~ phasing of roadway improvements ~~was~~ is defined for the year ~~2030~~ 2035 roadway network. ~~Expected~~ Relative phasing of projects is ~~illustrated on Map 4.8~~identified in the Thoroughfare Plan map (above). Improvements identified for ~~the period between 2007 and 2011~~ design or construction within ~~the~~successive ~~next~~ five year windows~~s~~ are recognized in the City's annual ~~2007-2011~~Capital Improvements Program (CIP) or are anticipated to be constructed by developers.

~~V.~~ PUBLIC TRANSPORTATION

The Central Ohio Transit Authority (COTA) provides transportation alternatives for Dublin and the Greater Columbus area. The regional agency strives to be the transportation provider for Central Ohio… "with safe, reliable, convenient, affordable and user-friendly transportation for every resident and visitor." COTA is funded primarily by sales tax, but ~~also~~ receives additional financial support through passenger fares, federal and state assistance, interest payments and other financial mechanisms. In 1993, COTA and the Mid-Ohio Regional Planning Commission (MORPC) prepared a comprehensive *Long-Range System Plan* that defined transit needs for the region. In 2006, the COTA Board of Trustees adopted its Long-Range Transit Plan: 2006 to 2030, outlining the agency's service goals for the next 25 years. ~~More recently in~~In ~~August 2006~~April 2012, ~~the~~ COTA ~~Board of Trustees~~ adopted the ~~report,~~ 2012-2035 *Long-Range Transit Plan~~: 2006 to 2030~~*, ~~outlining its four~~updating its major ~~future~~ objectives:

- ***Fixed-Route Bus Service:*** Expansion of the transit system's fixed-route ~~bus service~~ 'backbone' throughout Central Ohio, including express, local, crosstown and neighborhood circulator lines. System improvements also include new and updated park and ride facilities and a 'Bus on Shoulder' program between COTA and the Ohio Department of Transportation (ODOT) to allow bus use of freeway shoulders during congested periods.
- ***Mobility Services:*** Increased services for the general public and for diverse markets such as the elderly, disabled, and low-income individuals who need transportation to work, job training, and childcare. This includes improvements to COTA's 'Mainstream' service, a shared-ride, door-to-door option for persons with disabilities (paratransit).

- ***Intelligent Transportation Systems:*** Introduction of technologies to make transit more convenient and user-friendly, such as the use of variable message signs at park and rides and shelters, itinerary-planning features for Ssmartphones and other mobile devices, and real-time transit performance reporting.

- ***Strategic Transit Investments:*** Planning for future transit investments (transit centers, park and rides, acquisition of rights-of-way in strategic corridors and other transit initiatives). This includes investments in alternative transit modes such as fixed-guideway options (Bus Rapid Transit, light rail, commuter rail, etc.)

.

- ***Customer Services, Amenities and Public Outreach:*** Improvements to public understanding of the transit system and ease of ridership through a variety of means, such as providing alternative methods for purchasing bus passes, improved bus stop signage and shelter amenities, and maintenance of a modern bus fleet.

Dublin is a major employment center within the Columbus metropolitan region, and most routes are intended to link the ~~City~~city's largest corporate residents. Current bus lines include ~~three~~ four express routes, one local route, and two ~~a seasonal~~ crosstown routes, one of which provides seasonal access to the Columbus Zoo. These include two new bus lines added by COTA in 2012 (one express and one crosstown) with service to Sawmill Road on Dublin's eastern border. COTA also operates a ~~P~~park and ~~R~~ride facility at Dale Drive in the Bridge Street District.

According to COTA's projections, the Dublin area, along with other suburban locations, is expected to have ~~the greatest~~a significant level of future population and employment growth for the metropolitan transit planning area. Based upon these expected trends~~, a significant~~ increased ~~in~~ service to Dublin is proposed. ~~Adopted plans~~The Long Range Transit Plan recommends the extension of two express lines to Dublin from downtown Columbus; one providing access to the Dublin Methodist Hospital via I-270 and U.S. 33, and another along Sawmill Road via ~~State Route~~SR 315 and I-270. Two new park and ride facilities are proposed, one at the terminus of each new express line. ~~three additional crosstown routes to provide better suburb-to-suburb service, a new local route for residents and a new express route for commuters to downtown Columbus. Expansion of services routes is focused near the Dublin Methodist Hospital, and a future park-and-ride facility is expected to complement the existing Dale Drive location. Two additional park-and-ride locations are proposed south of Dublin in the Hayden Run corridor, and three LINK routes are proposed in the Tuttle Crossing, Hayden Run and Sawmill areas.~~

As further discussed in ~~*Chapter 8 – Demographics*~~, Dublin's transportation patterns are largely shaped by its employment base. Every weekday, the ~~City nearly doubles in size~~ city's daytime population (approximately 65,000) exceeds its residential population (approximately 43,000) as workers from throughout Central Ohio travel to Dublin; likewise, Dublin residents commute to professional and managerial jobs in downtown Columbus and other suburban centers. The ability to have transportation options for workers, particularly in the service sector, will be an important consideration for Dublin's future ability to attract and maintain corporations and small businesses alike. Providing additional ride opportunities to the downtown area will also add additional flexibility for travel options.

As Dublin continues to expand and mature, both transportation and land use policies should address the need to preserve future transit options. ~~The encouragement of c~~Circulator routes between major employment nodes, shopping areas and entertainment centers within the ~~City~~ city should be considered as the need arises. ~~Areas such as the SR 161 corridor should be targeted for higher density development to facilitate ridership within the City core, and consideration should be given to locations for future transit centers and park-and-ride facilities. Given Dublin's recent planning efforts in the Bridge Street~~

~~District, including the rezoning of~~With over 800 acres of land for high density, mixed use urban development Bridge Street District, it will be important for the C~~c~~ity to work with COTA to plan for additional transit service in this area, particularly along the SR 161/Bridge Street corridor. Efforts should also be made to maintain open space corridors in the Southwest Area and ~~U.S. 33 Corridor Area~~the West Innovation District that will permit the integration of additional long-term rail options (spurs, station locations, etc.) as the region urbanizes and Dublin is no longer located on the suburban fringe.

~~V.~~ THE BIKEWAY PLAN

The City of Dublin plans for bicycle facilities in conjunction with ~~planning for~~ other transportation modes. Bikeways should be ~~adequately~~ located and designed to provide links to ~~traffic generators such as~~ schools, parks, civic uses, shopping centers, major residential neighborhoods and employment centers. A bicycle network should ~~also~~ include more than one type of facility to meet the needs of a variety of riders with different skill levels. Existing roadways should serve as the base system to provide for the travel needs of cyclists. Bicycle paths and lanes, especially in scenic corridors, parks and areas where access is limited, should supplement ~~augment~~ the network. Throughout this Plan, the term '*bikeway*' is used as a common word to define any road, path or route that is specifically designated for bicycle travel. It may be designated for the exclusive use of bicycles or be shared with other transportation modes. The following are more specific definitions of bikeway components:

- Generally, a *bike path* is a separate off-street path. It may be constructed next to existing roadways or along longer, relatively uninterrupted corridor elements, such rivers, utility rights-of-way, or abandoned railroad rights-of-way to connections within and between neighborhoods or within and between parks. In Dublin, ~~bike~~ these ~~paths~~ are typically designed for shared use by non-motorized travel modes (e.g. biking, walking, jogging, rollerblading, etc.) and are ~~also~~ referred to as *multi-use paths.*
- A *bike lane* is a portion of a roadway that has been designated by striping, signing and/or pavement markings for the preferential or exclusive use of bicycles.
- A *signed/shared bike route* is designated by sign~~sage~~ along roadways to indicate their appropriateness for bicycle travel, usually within a normal width vehicular travel lane ~~no other bicycle related improvements~~. These are often part of a destination-oriented route system, and may be linked to route segments comprised of other bikeway types.
- A *sharrow* is a variation on signed/shared lanes where arrows or chevrons (pavement markings) on normal width or wide curb lanes serve to alert motorists to expect and be observant of cyclists.
- A *cycle track* is an exclusive bicycle facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. Cycle tracks can be either one-way or two-way, are separated from vehicles and pedestrians by pavement markings or coloring, bollards, curbs/medians or a combination of these elements.
- The term *bicycle facility* is used to denote improvements and provisions made to accommodate or encourage bicycling such as bicycle racks, lockers and employer-provided showers.

City Council formed the Bicycle Advisory Task Force (BATF) in fall of 2009 to identify potential bicycle facilities, including on-road as well as off-road bikeway improvements~~-~~. The ~~future~~ bikeway system will continue to be developed to ~~connect to and~~ continue the existing system. This system ~~network~~ helps to unite~~s~~ the ~~City~~city and provide~~s~~ access to ~~both~~

~~existing and proposed~~ parks, schools, community facilities, shopping areas and employment centers. The regional network provides commuting routes to Columbus, access to regional bikeways (such as the Ohio Rails-to-Trails system) and links to regional recreation facilities such as the Columbus Zoo and Antrim Park. ~~Map 4.10 provides a general illustration of Dublin's existing and proposed bikeway system, including regional bikeway connections.~~ For more information, please refer to the *Dublin Parks and Recreation Master Plan* and the MORPC *Regional Bikeway Plan* or other applicable planning documents, such as the *2011 Bicycle Advisory Task Force report*.

~~VI.~~ ROADWAY CHARACTER

Roadway character is defined by the ~~overall~~ visual experience created by the design of the roadway as well as the physical elements adjacent to ~~the roadway~~it. Character types vary greatly and can evoke a variety of responses that create an immediate psychological effect on motorists and pedestrians. These effects can persist to create long-lasting impressions for residents and visitors about the ~~City~~city and Dublin's community values. For example, many visitors to the region travel I-270 through the city, and their impression of Dublin may be formed solely by their experience driving that freeway segment. Components that contribute to the definition of roadway character include: road design and construction standards; setbacks and buffering between adjacent uses; building types and architectural styles; signs; landscaping within the right-of-way and adjacent areas, design quality of the pedestrian realm, and the ~~basic underlying~~ natural ~~geographic~~ qualities of the area.

As a development tool, the Community Plan identifies the desired roadway character of major thoroughfares throughout Dublin and the surrounding planning area. These designations assist in the preservation of existing character and guide future development and the long-term improvement of Dublin's roadways. Some road corridors are particularly scenic and their existing character should be ~~protected~~ well managed during zoning and development requests, while others should be targeted for enhancement as growth occurs.

Preserving and creating ~~road~~ roadway character begins by defining a vision for how a particular road should look and feel and continues by determining what elements are needed to carry out the vision. Dublin's major thoroughfares generally include visual quality that falls within four major categories: *Rural Character*, *River Corridor Character*, ~~*Village Character and*~~ *Traditional Dublin Character, and Urban/Village Character*. Each category includes a description of the elements commonly present that contribute to specific roadway character type. The Community Plan provides ~~a determination of~~guidance as to what major elements should be incorporated to achieve the vision. ~~Major~~Individual roadways ~~that travel throughout the city~~ may change in character along the way; some segments may serve as transitional corridors, with unique and distinctive combinations of recommended design elements.

Rural Character

This character results from the cultural and historic use of the region for agricultural purposes. The roadways are typical of unincorporated areas or old township roads and are informal, evoking a sense of the past prior to development and include the following:

- Application of generous setbacks ranging from 100 to 200 feet;
- Integration of open views and vistas into adjacent development perhaps greater than 200 feet in some areas to increase the sense of openness;

- Provision of informal landscaping that focuses on native plant species and naturalized forms (meadows, wildflowers, grasses, wetland areas etc.);
- Use of trees, fencerows and woodland plantings to provide additional screening and sense of enclosure;
- Preservation of historic farmsteads, barns or outbuildings that emphasize the agrarian history of the area;
- Creation of meandering bike paths and sidewalks that are informally designed as to not be entirely visible from the roadway;
- Design of naturalized ponds with aquatic plants and informal edges;
- Use of stone walls and split rail fences that are traditionally used in the countryside;
- Integration of "rural" road design that may include berms, swales and/or variable medians; and
- Provision of shared entrances to minimize curbcuts and maintain openness.

River Corridor Character

This character is primarily the result of natural processes on the land over the course of many years. The river corridor possesses dramatic topographical changes, is heavily wooded and includes the Scioto River and its tributaries.

- Use of modest setbacks ranging from 60 to 100 feet;
- Creation of roadway width and alignment to follow stream corridors or respond to existing natural features;
- Use of woodland plantings and incorporation of landforms to create topographic change and shape views;
- Integration of stone walls and stone outcrops to provide ties to surrounding topography;
- Design of informal water features to blend with the surrounding character of the river corridor;
- Use of swales and berms instead of constructed curb and gutter for informal feel; and
- Installation of informal landscape designs to enhance the natural appearance along the river corridor.

Traditional Dublin Character

This character exemplifies the high quality standards by which Dublin's primary roadways have been designed, built and landscaped over the past several decades to provide a very formalized and maintained roadway.

- Use of 100-foot setbacks or equivalent to blend with surrounding developments;
- Design of curvilinear roads with landscaped medians and meandering bike paths;
- Installation of formal, maintained landscape treatments;

- Focus on ponds and water features with maintained and/or hardscaped edges;
- Use of variable mounding with landscaping to screen uses along roadways; and
- Primarily curb and gutter design, but may include swales and berms.

~~*Village Character*~~

~~This character is based on traditional village development that includes street patterns of regularly spaced blocks in a grid pattern framed by richly detailed architecture. The scale is highly pedestrian, with cars and people sharing limited space.~~

- ~~Provision of smaller building setbacks ranging from 0 to 25 feet~~
- ~~Use of pedestrian-oriented streetscapes with narrower travel lanes and on-street parking~~
- ~~Creation of grid-like street pattern to enhance ability to walk~~
- ~~Design of off-street parking to the side and rear of buildings~~
- ~~Integration of service alleys and rear garage access to improve pedestrian character of streets~~
- ~~Creation of formal pedestrian sidewalks~~
- ~~Use of small parks, plazas, and public spaces to provide character~~
- ~~Focus on architectural detailing and pedestrian-scale signs~~
- ~~Integration of street lights and furniture (benches, waste receptacles, bike racks, etc.)~~
- ~~Use of picket fences, wrought iron, gates, arbors or similar elements to add detailing~~

Urban/Village Character

Streets are a community's "front porch." They are the city's most common form of open space, providing important opportunities for entertainment, recreation, and gathering. In Historic Dublin and more densely developed areas, streets serve as public gathering places and venues for commercial activity. Streets characterized as urban safely accommodate bicyclists and pedestrians to encourage non-motorized forms of travel; the scale is highly pedestrian with cars and people sharing limited space. The urban street character is based on traditional village and modern mixed use development patterns that include grid street networks with regularly spaced blocks framed by richly detailed architecture. In addition, Urban Character streets:

- -Apply street designs that are sensitive to the surrounding land uses and development context;
- Create a grid-like street pattern to distribute traffic and allow pedestrians to walk to destinations using multiple routes;

- Use narrower streets and travel lanes to reduce travel speeds;
- Include on-street parking to provide a physical and psychological buffer between travel lanes and sidewalks, reducing the perceived travel lane widths for vehicles and making pedestrians feel safer on sidewalks;
- Are designed with off-street parking to the side and rear of buildings;
- Include service alleys and side or rear garage access to improve pedestrian character of streets;
- Are typically designed to accommodate safe bicycle travel within standard vehicular travel lanes; separate bikeway facilities (e.g. cycle tracks, sharrows and/or bike lanes) may be appropriate on higher volume roadways or as part of designated bicycle routes;
- Provide transit facilities and sidewalk curb extensions at bus stops;
- Provide smaller building setbacks ranging from 0 to 25 feet to enhance the relationship between buildings and the streetscape; setback areas may be designed as an extension of the streetscape, landscape areas or patios, as appropriate to the development context;
- Are framed by buildings designed with ground story transparency (*i.e.* windows), main entrances connected to sidewalks, and a high degree of architectural detailing to create an inviting, pedestrian-friendly walking experience;
- Offer sidewalk widths appropriate for the activities and pedestrian volumes along the street, while at a minimum providing sidewalks with universally accessible widths, cross-slopes, grades, and surfaces;
- Contain pedestrian-scaled street lighting in addition to roadway lighting;
- Include street trees and planting zones to buffer pedestrians from traffic, provide shade and visually soften hardscape areas;
- Use small parks, plazas, patios, and public spaces to provide character along the streetscape and reinforce the street's role as a gathering space as well as a transportation route;
- Provide pedestrian amenities such as seating, news racks, recycling bins, water fountains, outdoor cafes, retail displays, and public art;
- Are complemented by pedestrian-oriented signs integrated with adjacent architecture;
- Integrate sustainable stormwater management within the streetscape using curb inlets, bioretention swales, tree and planter boxes, and permeable pavements; and
- Are framed by low masonry 'street walls', wrought iron fences, hedges, picket fences and gates, arbors or similar elements as appropriate to the village or urban setting, to add detailing and to help define the street's public realm where buildings are not immediately adjacent to the sidewalk (such as along parking areas).

~~VII.~~ OBJECTIVES AND STRATEGIES

Refer to S:\2012 Community Plan Amendment\CP Chapters\4 – Transportation\Chapter Four Objectives - Redline Draft.docx