CITY OF FRANKLIN
TENNESSEE

2016 REVISONS TO
2014 ROAD IMPACT FEE STUDY

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Public Review Draft

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INTRODUCTION AND SUMMARY

The City of Franklin's current road impact fee is city-wide and covers only the cost of arterial roads. The road impact fee update study completed in 2014 calculated an option to include collector roads as well. It recommended that if collector road costs are included in the fee, the City should consider dividing its jurisdiction into four benefit districts in order to recognize the more localized benefit of collector roads. The City has not yet adopted updated road impact fees based on the 2014 study, but is interested in the possibility of imposing fees for collector roads in the northwest and/or southwest parts of the city, where the collector road system is relatively undeveloped.

The consultant's recommendation is to make revisions to the 2014 study in order to enable the City to charge a collector road impact fee in selected quadrants of the city. The revisions to the 2014 study included in this report redefine the four collector road fee benefit districts proposed in that study into collector road impact fee service areas.

A service area is the area primarily served by the improvements, and is the geographic level at which the fees are calculated. A benefit district, in contrast, is simply a subarea of a service area where fees collected are earmarked to be spent. In order to treat the four quadrants as service areas, it is necessary to conduct an existing level of service analysis for each area. Consequently, this report adds a level of service analysis for each of the four potential service areas.

The resulting collector road impact fees would be the same for all four of the potential collector road impact fee service areas. There are four primary inputs into the consumption-based road impact fee methodology used in the 2014 study:

1. cost per unit of capacity (VMC);
2. level of service (VMC/VMT);
3. travel demand (VMT) per unit of development; and
4. revenue credit per VMT.

There are no differences in any of these inputs by service area, for the following reasons.

(1) The cost per VMC will be essentially the same for all four areas. Construction costs should be relatively similar for all four areas, and right-of-way costs are highly variable from one project to the next, so that an average city-wide estimate is the most reasonable.

(2) The consumption-based methodology uses a system-wide level of service, expressed as a minimum one-to-one ratio of vehicle-miles of capacity (VMC) to vehicle-miles of travel (VMT). This report confirms that the existing level of service in each of the four areas exceeds a 1.00 VMC/VMT ratio.

(3) National travel demand data by land use type from the Institute of Transportation Engineers (ITE) are used in most road impact fee studies, because more localized data are generally not available. If it is reasonable to rely on national travel demand data at the jurisdiction level, it is also reasonable to rely on national travel demand data for subareas of a jurisdiction.

(4) Revenue credits are appropriately calculated at the city-wide level. Most dedicated funding for major road improvements in Franklin comes from motor fuel taxes. Motor fuel taxes will be generated by new development proportional to travel demand, which does not differ by service area, as noted above.

In sum, this report revises the 2014 *Road Impact Fee Update* study to support charging collector road impact fees in one or more quadrants of the city.

Summary of Revisions to 2014 Study

A comprehensive road impact fee update was prepared by this consultant for the City of Franklin in 2014. This report is a slightly revised version of the *Road Impact Fee Update* study that the consultant prepared in March 2014. No changes to data inputs are made, and the methodology is unchanged from the 2014 study. Minor changes are made to accommodate the City's desire to have the option of imposing collector road impact fees only in the west, only in the northwest, or only in the southwest areas of the city. The following changes were made to accommodate the City's intention to charge collector road impact fees only in certain areas of the city.

Show collector fee. The 2014 road impact fee study calculated two alternatives: (1) a city-wide arterial road fee, and (2) a city-wide road fee that includes the costs of both arterials and collector roads. The 2014 study did not specifically calculate a separate, city-wide collector road fee, although such a fee is implied. The collector fee is simply the difference between the arterial road fee and the fee for all major roads. Consequently, this revised version provides an additional table to show the collector road fee option.

Implement collector service areas. The collector road fees implied in the 2014 study were determined at the city-wide level. Four quadrants were proposed as "benefit districts" that could be used to earmark funds collected in an area to be spent in the same area in the event that the "all major road" option was chosen. However, to charge a fee only in a certain area requires some analysis to ensure that the fees charged reflect the demand and cost characteristics of the area, and that the fees do not exceed the existing level of service in the area. Meeting these requirements qualifies an area to be a "service area," in impact fee terminology. Impact fees determined for a service area may be charged in that area, even if they are not charged in other areas of the city. Consequently, this revised study adds a new "Service Area" chapter to provide the necessary analysis.

Approach and Findings

The 2014 study revised the road impact fee calculations by incorporating the most current data, including the most recent road improvement costs and the latest version of the *Trip Generation* manual. The inclusion of collector roads in the road impact fee was the major policy option provided in the 2014 update. The inclusion of collector roads would increase the maximum fees by an average of about 91%. It would also require the City to provide credit against the fees for developer's who dedicate right-of-way or construct collectors within their subdivisions. Finally, it would require the restriction of about 40.5% of the fees collected to be earmarked to be spent in the same benefit district in which it was paid.

The revisions to the 2014 study made in this report determine separate collector road fees that could be charged in one or more collector road service areas, corresponding to the 2014 study benefit district boundaries. Based on the analysis provided in this report, the fees would be the same for all of the service areas. The potential collector road impact fees are shown in Table 1.

Table 1. Potential Collector Road Impact Fees

Land Use Type	Unit	Fee/Unit
Single-Family Detached	Dwelling	$3,340
Multi-Family	Dwelling	$2,121
Mobile Home Park	Site	$1,592
Congregate Care Facility	Dwelling	$743
Hotel/Motel	Room	$1,750
Retail/Commercial		
Shopping Center/Gen. Retail	1,000 sq. ft.	$4,394
Restaurant, Quality	1,000 sq. ft.	$8,186
Restaurant, Fast Food	1,000 sq. ft.	$11,862
Office/Institutional	1,000 sq. ft.	
Office, General	1,000 sq. ft.	$3,170
Hospital	1,000 sq. ft.	$3,653
Nursing Home	1,000 sq. ft.	$2,099
Church	1,000 sq. ft.	$2,218
Elementary/Sec. School	1,000 sq. ft.	$1,091
Industrial		
Manufacturing	1,000 sq. ft.	$1,389
Industrial Park	1,000 sq. ft.	$2,484
Business Park	1,000 sq. ft.	$4,519
Warehouse	1,000 sq. ft.	$1,294
Mini-Warehouse	1,000 sq. ft.	$602

Source: Table 21.

The 2014 update proposed two significant changes to the methodology: design costs were added to construction and ROW costs, and the debt credit was eliminated. Design costs are a necessary component of road improvements, averaging about 6% of total project costs. The debt credit was eliminated in the 2014 update because the City's outstanding road-related debt was for previous arterial street improvements that had created excess capacity for growth, and because road impact fees are being used to retire this debt.

The updated arterial fees are generally somewhat higher than current fees, although there is some variation by land use based on updated travel demand factors (trip generation rates and average trip lengths). The increase is primarily due to increased construction costs and the addition of design costs. If collector roads are added to the city-wide arterial road fee, the resulting fee for all major roads would be significantly higher than the current arterial road fee for all land use categories, as shown in Table 2 below.

Table 2. Comparison of Current and Updated Fees for Arterials and All Major Roads

Land Use Type	Unit	Current Fee (Arterials)	Arterials Only: Updated Fee	Arterials Only: Percent Change	All Major Roads: Potential Fee	All Major Roads: Percent Change
Single-Family Detached	Dwelling	$4,227	$4,911	16%	$8,251	95%
Multi-Family	Dwelling	$2,766	$3,112	13%	$5,233	89%
Mobile Home Park	Site	$2,079	$2,338	12%	$3,930	89%
Congregate Care Facility	Dwelling	$943	$1,093	16%	$1,836	95%
Hotel/Motel	Room	$2,350	$2,567	9%	$4,317	84%
Retail/Commercial						
Shopping Center/Gen. Retail	1,000 sq. ft.	$5,996	$6,484	8%	$10,878	81%
Restaurant, Quality	1,000 sq. ft.	$11,104	$12,069	9%	$20,255	82%
Restaurant, Fast Food	1,000 sq. ft.	$16,171	$17,442	8%	$29,304	81%
Office/Institutional						
Office, General	1,000 sq. ft.	$4,045	$4,632	15%	$7,802	93%
Hospital	1,000 sq. ft.	$5,779	$5,359	-7%	$9,012	56%
Nursing Home	1,000 sq. ft.	$2,654	$3,082	16%	$5,181	95%
Church	1,000 sq. ft.	$2,406	$3,258	35%	$5,476	128%
Elementary/Sec. School	1,000 sq. ft.	$1,185	$1,606	36%	$2,697	128%
Industrial						
Manufacturing	1,000 sq. ft.	$1,776	$2,030	14%	$3,419	93%
Industrial Park	1,000 sq. ft.	$3,237	$3,636	12%	$6,120	89%
Business Park	1,000 sq. ft.	$5,934	$6,613	11%	$11,132	88%
Warehouse	1,000 sq. ft.	$1,655	$1,893	14%	$3,187	93%
Mini-Warehouse	1,000 sq. ft.	$809	$885	9%	$1,487	84%

Source: Current fees from Table 3; updated and potential fees from Table 20.

Policy Options

Whether to include collector roads in the road impact fee was the major policy option provided in the 2014 update. While adding collectors would result in higher fees, it would also require the City to provide developer credits against the fees for collector right-of-way dedication and construction. In addition, it would require that a significant portion of the fees collected be earmarked to be spent in the same benefit district in which it was paid. The 2014 study recommended against including collectors in a city-wide road impact fee. The study suggested that the City should weigh the potential additional revenue against (a) the fact that much of the potential "revenue" increase would consist of developer credits for collectors that developers would have installed anyway, and (b) determining the amounts of individual developer credits and tracking them would impose significant administrative costs

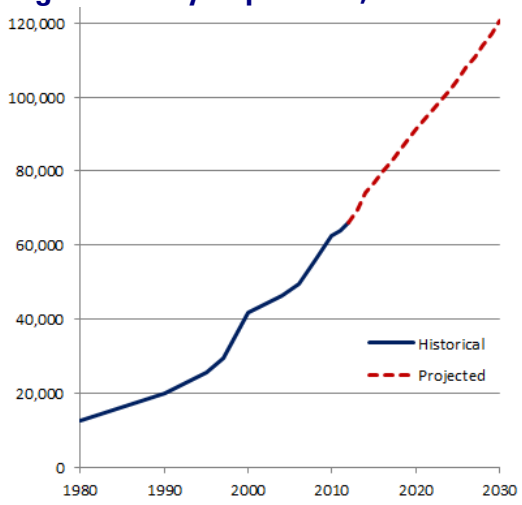
The City has now determined that there may be a benefit to imposing collector road impact fees in certain areas on the western side of the city, where the collector road system is underdeveloped and where developers are less likely to construct improvement. Consequently, these revisions to the 2014 study add the option of imposing a separate collector road impact fee in one or more service areas, which correspond to the benefit districts proposed in the 2014 study.

BACKGROUND AND LEGAL FRAMEWORK

Growth Context

Impact fees are most appropriate for communities that are experiencing rapid growth. The City of Franklin added over 20,000 new residents in each of the last two decades, and is projected to add about 29,000 more in each of the next two decades, as illustrated in Figure 1.[1] This strong growth will necessitate numerous capacity-expanding improvements to the major roadway system. The City's *Major Thoroughfare Plan* projects that the population of the city and its urban growth area will increase from 74,650 in 2008 to 138,819 by 2035, and recommends 80 road construction and road widening projects, most of which will expand capacity to accommodate the resulting increase in traffic.[2]

Figure 1. City Population, 1980-2030



Background

Impact fees are charges that are assessed on new development to help pay for the capital facility costs they impose on the community. Unlike other types of developer exactions, impact fees are based on a standard formula and a pre-determined fee schedule. Essentially, impact fees require that each new residential or commercial project pay its pro-rata share of the cost of new infrastructure facilities required to serve that development.

The City of Franklin has assessed road impact fees since 1988. The road impact fee ordinance requires the City to "revise the road impact fee study and the schedule of impact fees at least once every five years." In addition, when the impact fees were reviewed in 2005, the Board requested subsequent reviews every two to three years. The purpose of this study is to update the City of Franklin's road impact fee based on the most appropriate methodology and the most current data.

In 1987, the City of Franklin sought and obtained authority from the Tennessee legislature to enact road impact fees. That same year, Duncan Associates was commissioned to prepare an impact fee study to calculate the maximum road impact fees that the City could charge. Ordinance 1037 enacting road impact fees was adopted by the City in June of 1988. The fees were adopted at 60 percent of the maximum fees calculated in the original study.

Duncan Associates prepared five subsequent updates of Franklin's road impact fees, as described below.

[1] City of Franklin, Planning and Sustainability Department, *2012 Development Report*.
[2] Wilbur Smith and Associates, *City of Franklin Major Thoroughfare Plan*, adopted September 23, 2010.

2000. Twelve years after the initial adoption, the City updated the road impact fees, based on a study prepared in 2000. The updated fees were adopted in July 2000 with the increase phased in over two years. No significant changes to the methodology were made in this update.

2005. Five years later, the road fees were updated based on a new study. No significant changes to the methodology were made in this update.

2007. Prior to the 2007 update, the road fees were based the cost of arterial roads, excluding I-65 and the Mack Hatcher expressway, and were based on peak hour travel. The 2007 update added Mack Hatcher to the definition of the major road system and based the fees on average daily travel.

2010-2013. Fees calculated in a study by Duncan Associates in 2010 were adopted in 2011, but phased in over two years (25% on July 1, 2011, 65% on July 1, 2012, and 100% of July 1, 2013). The 2010 update provided the options of including right-of-way (ROW) costs and adding collector costs. The City opted to add ROW costs but to continue to exclude collectors.

2014. A study prepared in 2014 continued to include ROW costs, and calculated an option that would add the cost of collector roads. The fee schedules have not been modified based on the 2014 study.

The fees that have been in effect from 2005 to present are summarized in Table 3.

Table 3. History of Road Impact Fees, 2005-2013

Land Use Type	Unit	2005	2007	2011	2012	2013
Single-Family Detached	Dwelling	$1,617	$2,191	$2,700	$3,514	$4,227
Multi-Family	Dwelling	$896	$1,537	$1,844	$2,336	$2,766
Mobile Home Park	Site	$1,003	$1,144	$1,378	$1,752	$2,079
Congregate Care Facility	Dwelling	$221	$440	$566	$767	$943
Hotel/Motel	Room	$649	$1,126	$1,432	$1,922	$2,350
Retail/Commercial						
Shopping Center/Gen. Retail	1,000 sq. ft.	$3,508	$2,681	$3,510	$4,836	$5,996
Restaurant, Quality	1,000 sq. ft.	$3,773	$4,964	$6,499	$8,955	$11,104
Restaurant, Fast Food	1,000 sq. ft.	$5,609	$7,177	$9,426	$13,023	$16,171
Office/Institutional	1,000 sq. ft.					
Office, General	1,000 sq. ft.	$2,716	$1,891	$2,430	$3,291	$4,045
Hospital	1,000 sq. ft.	$1,199	$2,867	$3,595	$4,760	$5,779
Nursing Home	1,000 sq. ft.	$449	$996	$1,411	$2,074	$2,654
Church	1,000 sq. ft.	$754	$1,127	$1,447	$1,958	$2,406
Elementary/Sec. School	1,000 sq. ft.	$749	$543	$704	$960	$1,185
Industrial						
Manufacturing	1,000 sq. ft.	$1,529	$830	$1,067	$1,445	$1,776
Industrial Park	1,000 sq. ft.	$1,497	$1,513	$1,944	$2,634	$3,237
Business Park	1,000 sq. ft.	$1,998	$2,773	$3,563	$4,828	$5,934
Warehouse	1,000 sq. ft.	$704	$1,078	$1,222	$1,453	$1,655
Mini-Warehouse	1,000 sq. ft.	$417	$388	$493	$662	$809

Notes: Fees effective July 1, 2011 based on 25% of increase from 2007 fees to 2013 fees; fees effective July 1 2012 based on 65% of increase from 2007 fees to 2013 fees; fees effective July 1, 2013 based on Duncan Associates, *Road Impact Fee Update*, November 2010 (which included right-of-way costs).

Legal Framework

Franklin received special authorization to impose a road impact fee from House Bill 1311, which was passed during the 1987 session of the Tennessee legislature. While Franklin's authorizing act provides a broad grant of authority, impact fees must also comply with constitutional standards that have been developed by the courts to ensure that local governments do not abuse their power to regulate the development of land. The courts have gradually developed guidelines for constitutionally valid impact fees, based on a "rational nexus" that must exist between the regulatory fee or exaction and the activity that is being regulated. The standards set by court cases generally require that an impact fee meet a two-part test:

1) The fees must be proportional to the need for new facilities created by the new development; and

2) The expenditure of impact fee revenues must provide benefit to the fee-paying development.

Impact fees for various types of developments should be proportional to the impact of each development on the need to construct additional or expanded facilities. The fees do not have to recover the full cost, but if the fees are reduced by a percentage from the full cost, the percentage reduction should apply evenly to all types of developments.

Impact fees were pioneered by local governments long before state legislatures passed explicit enabling acts. The authority to adopt such fees was found in local government's "police power" to regulate development so as to protect the health, safety and welfare of its citizens. Developers challenged early impact fees, and state court decisions gradually developed a body of case law setting out the standards that should govern impact fees. This section spells out our understanding of the general principles of impact fees and some implications for calculating Franklin's impact fees.

A fundamental principle of impact fees, rooted in both case law and norms of equity, is that impact fees should not charge new development for a higher level of service than is provided to existing development. While the impact fees could be based on a higher level of service than the one existing at the time of the adoption of the fees, two things are required if this is done. First, another source of funding other than impact fees must be identified and committed to fund the capacity deficiency created by the higher level of service. Second, the impact fees must generally be reduced to ensure that new development does not pay twice for the same level of service, once through impact fees and again through general taxes that are used to remedy the capacity deficiency for existing development. In order to avoid these complications, our general practice is to base the impact fees on the existing level of service.

A corollary principle is that new development should not have to pay twice for the same level of service. As noted above, if impact fees are based on a higher-than-existing level of service, the fees should be reduced by a credit that accounts for the contribution of new development toward remedying the existing deficiencies. A similar situation arises when the existing level of service has not been fully paid for. Outstanding debt on existing facilities that are counted in the existing level of service will be retired, in part, by revenues generated from new development. To avoid requiring new development to pay more than its proportional share, impact fees should be reduced to account for future tax payments that will retire outstanding debt on existing facilities.

In general, credit against impact fees is not required for funding that has historically been used for, or that is committed to be used for growth-related, capacity-expanding improvements. While new development may contribute toward such funding, so does existing development, and both existing and new development benefit from the higher level of service that the additional funding makes possible. However, consistent with past studies and standard impact fee practice, credit is provided in this update for State and Federal funding.

The City's road impact fee ordinance allows developers to receive offsets against their impact fees for right-of-way (ROW) dedication or construction of a thoroughfare shown on the Major Thoroughfare Plan map. Prior to the 2010 update, ROW costs had been excluded from the impact fee calculation, because the City required developers to dedicate a minimum of 60-foot ROW width without credit against the impact fee. The City is now obligated to provide credit for ROW dedication. If collectors are included in the fee, or in areas where a separate collector road fees is charged, developers will also need to receive credit for ROW dedications and improvements for collector road dedications and improvements.

BENEFIT DISTRICTS

The 2014 study proposed benefit districts to acknowledge that including city-wide collector road costs in the existing arterial road impact fee this would include costs for collectors, which serve a more limited area than arterials, thus ensuring a stronger nexus between fee payment and benefit received. The current revisions add a new chapter on 'Service Areas," which follows this chapter and addresses the option of assessing a separate collector road impact fee in selected areas of the city. The remainder of this chapter is unchanged from the original 2014 study.

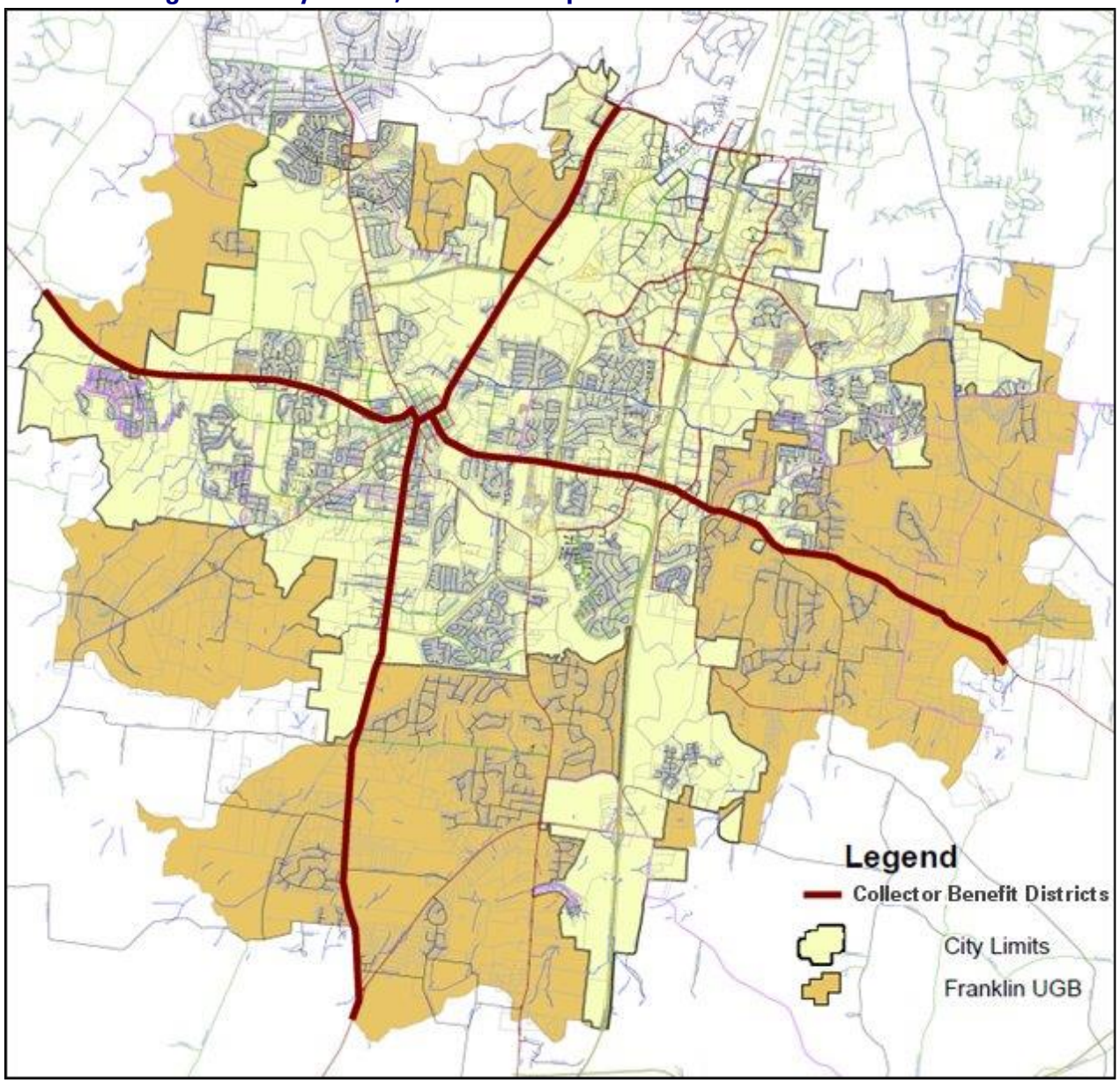
Impact fee case law states that impact fees must be spent so as to provide a reasonable benefit to the fee-paying development. One way of ensuring reasonable benefit is to create multiple benefit districts to ensure that the development fees paid by a development are spent closer to the development than would be the case under a single jurisdiction-wide benefit district. The need for multiple benefit districts increases with the geographic size of the community. On the other hand, the larger the number of benefit districts, the more difficult it is to accumulate sufficient funds in any one district to make any significant improvements. Deciding on the appropriate number and location of benefit districts requires balancing the need to show reasonable benefit to fee payers with the need to maintain sufficient flexibility in impact fee expenditures to address priority improvement needs.

The City's current impact fee ordinance designates the entire area within the corporate boundaries as a single benefit district. The fact that the City's road impact fees are currently limited to funding improvements to major thoroughfares strengthens the case for a single benefit district. Major thoroughfares are designed to move traffic from one part of the city to another, and the entire network acts as an integrated system.

In the event that the City decided to expand the road impact fee to cover collector roads, the City should consider dividing its jurisdiction into multiple benefit districts in order to recognize the more localized benefit of collector roads. These benefit districts would earmark the collector portion of the fee to be spent in the same area of the city in which they were collected, while the arterial portion of the fee could still be spent city-wide. While many benefit district configurations are possible, one option would be to divide the city into quadrants defined by US 31 and SR 96, as shown in Figure 2.

If collectors are included, the collector portion would be about 41% of the total fee. This amount could be adopted as a separate fee, with the collector fee earmarked to be spent only on collectors in the same benefit district. Alternatively, a single road fee could be retained, with the collector percentage of the fee paid earmarked to be spent on major road improvements (arterials or collectors) in the benefit district, with the rest of the fee paid put in an account that could be spent anywhere in the city.

Figure 2. City Limits, UGB and Proposed Collector Benefit Districts



SERVICE AREAS

This new chapter has been added to the 2014 study to address the option of imposing a separate collector road impact fee in one or more designated subareas of the city. Assessing a fee in only part of the City's jurisdiction requires some additional analysis beyond that provided in the original 2014 study, and this chapter provides that analysis.

Service Area Structure

The proposed service areas for a separate collector road impact fee are the same as the benefit districts proposed in the 2014 study (see Figure 2 on the previous page). The four potential collector road impact fee service areas would each also be a benefit district. The benefit districts were designed to reflect a reasonable nexus between collector road impacts and benefit from improvements, and are therefore also suited to be service areas for a separate collector road impact fee.

Level of Service Analysis

The consumption-based approach used in this study does not calculate the cost to have all roadways functioning at LOS C, only the cost to replace capacity consumed so that a 1:1 ratio of capacity to demand is maintained system-wide. Dividing the road capacity (vehicle-miles of capacity or VMC) by demand (vehicle-miles of travel or VMT) yields the actual system-wide VMC/VMT ratios for the arterial system, the collector road system for specified service areas, and for the major road system as a whole (arterials plus collectors). As shown in Table 4, the major roadway system provides 1.12 units of capacity for every unit of demand on the arterial system, and 1.23 if collector roads are included in the city-wide road fee.

Table 4 has been relocated to this new chapter and expanded from the 2014 study to show levels of service (VMC/VMT ratios) for potential collector road impact fee service areas. This analysis is based on the addition of collector service areas to the major road inventory in Table 22 (see Appendix). Table 4 shows that the actual existing level of service for collector roads in each of the potential service areas is greater than the 1.00 ratio on which the standard consumption-based road fees calculated in this report are based. This analysis demonstrates that the proposed collector road impact fees are not based on a level of service that exceeds the existing level of service in any of the potential collector road impact fee service areas.

Table 4. Existing Roadway Levels of Service

Functional Class	Total VMC	Total VMT	VMC/VMT
Arterials/Expressways	980,344	874,929	1.12
Collectors, NW Area	98,971	84,150	1.18
Collectors, SW Area	110,747	69,710	1.59
Collectors, NE Area	134,932	69,353	1.95
Collectors, SE Area	116,631	32,131	3.63
Total Major Roads	1,441,625	1,170,660	1.23

Source: Estimated total daily VMT from Table 6; actual total daily VMC from Table 22 in the Appendix.

Potential Fee Differences by Service Area

These revisions use the city-wide fee calculation provided in the 2014 study as a reasonable proxy for the cost of new development on the collector road system within each collector road service area. For all of the inputs (costs, revenue credits and travel demand), the city-wide figures appear to be reasonable for each area, and differential data by area are not available, as explained below.

Road costs. At the time of the 2014 study, there were only two recent collector road improvements that could provide recent collector road cost data. Insufficient data are available to determine differences in collector road improvement costs by service area. There is also reason to believe that the city-wide costs are reasonable for all four areas. Construction costs are unlikely to vary significantly by area, and right-of-way costs are highly variable from one project to another, making recent city-wide average costs the best available.

Revenue credits. In the 2014 study, revenue credits were calculated at the city-wide level to account for potential outside funding, most of which derives from state, local and federal motor fuel taxes, some of which will be generated by new development. All of the credit was attributed to the arterial fee, due to the fact that all recent funding had been for arterial improvements. New development in each collector road service area will receive credit for all of their future gas tax payments that will be used for capacity-expanding road improvements via the arterial road impact fee credit. Consequently, a separate calculation of a collector road impact fee revenue credit for individual service areas is not warranted.

Travel demand. National travel demand data by land use type from the Institute of Transportation Engineers (ITE) are used in most road impact fee studies, because more localized data are generally not available. If it is reasonable to rely on national travel demand data at the jurisdiction level, it is also reasonable to rely on national travel demand data for subareas of a jurisdiction.

Summary

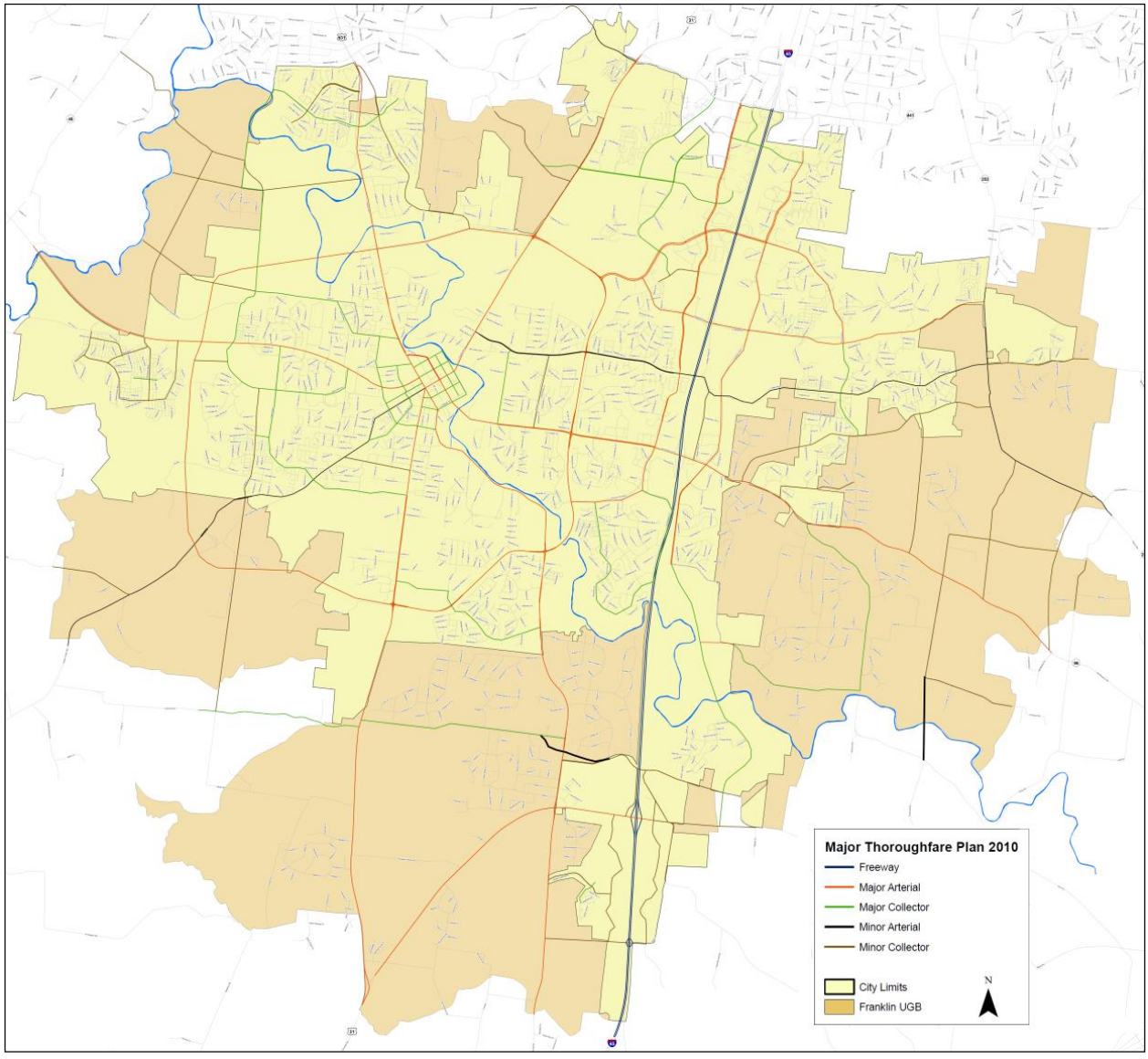
The City can assess collector road impact fees in one or more service areas corresponding to four quadrants of the city defined by US 31 and SR 96. It is reasonable to use city-wide data on road improvement costs, revenue credits and travel demand in the development of collector road impact fees for each of these subareas of the city.

MAJOR ROADWAY SYSTEM

A road impact fee system should include a clear definition of the major roadway system that is to be funded with the impact fees. In the City's current ordinance, the use of impact fee proceeds is restricted to arterial road improvements, which is defined as "any capital improvement, including but not limited to new roads, additional lanes, widened lanes, intersection improvements, turn lanes, bridges, traffic signals, intelligent transportation system (ITS) improvements, and associated drainage facilities, that expands the capacity of the city's arterial road system." The arterial road system is defined as "all existing and planned arterials, excluding Interstate 65, identified on the city's adopted Major Thoroughfare Plan map." The major roadway system includes State roads as well as City roads. The current ordinance and impact fee excludes major and minor collector roads from the impact fee calculations. As mentioned in the introduction, this study includes the option of expanding the impact fee to include collector roads. Including collector roads in the calculation of the impact fee in this update will allow the City to program future impact fee revenue for planned collector road improvements. If this option is adopted, the City would need to amend the impact fee ordinance to allow for the expenditure of impact fee funds for major and minor collector road improvements by amending the definition of major roadway system.

The major roadway system is thus currently defined as existing and planned arterials identified on the adopted Major Thoroughfare Plan map (see Figure 3 on the following page) within the city limits. Interstate 65, which primarily serves through traffic rather than local traffic, is excluded from the arterial roadway system to be funded with the road impact fees. The Major Thoroughfare Plan map also identifies the major and minor collector roads that are included in this update. Currently, capacity-expanding improvements include any improvements to arterial roadways, including signalization and intersection improvements, which primarily have the effect of expanding capacity of the arterial roadway system, rather than providing greater access to a particular development or promoting safety.

Figure 3. Major Thoroughfare Plan Map



METHODOLOGY

Key components of the road impact fee methodology described in this chapter include service units, roadway capacity and the overall formula for calculating the fees. Subsequent chapters address the travel demand schedule, cost per service unit and net cost per service unit (revenue credits). The final chapter presents the updated road impact fee schedule.

Service Units

Service units create the link between supply (roadway capacity) and demand (traffic generated by new development). An appropriate service unit basis for road impact fees is vehicle-miles of travel (VMT). Vehicle-miles is a combination of the number of vehicles traveling during a given time period and the distance (in miles) that these vehicles travel.

The two time periods most often used in traffic analysis are the 24-hour day (average daily trips or ADT) and the single hour of the day with the highest traffic volume (peak hour trips or PHT). As in the prior impact fee study, this update utilizes the ADT for calculating the road cost component of the impact fee and ADT for calculating the credit component of the impact fee. While peak hour trip (PHT) generation rates are appropriate for assessing the impact of a new development on the need for road improvements during the evening peak hour, they tend to be more variable than average daily trips depending on size and demographic make-up of a community. Average daily trips is also the best measure for the amount of motor fuel tax that will be generated by new development, which is used to calculate the revenue credit for each land use type. The Tennessee Department of Transportation measures traffic counts on major roads using average daily trips; as a result, utilizing the ADT for both the cost and credit component of the impact fee eliminates the need to convert available traffic counts and projected volumes into PHT. For these reasons, we recommend continuing to use average daily VMT as the service unit for the road impact fee update.

Roadway Capacity

Nationally-accepted transportation levels of service (LOS) categories have been developed by the transportation engineering profession. Six categories, ranging from LOS A to LOS F, generally describe driving conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. LOS A represents free flow, while LOS F represents the breakdown of traffic flow, characterized by stop-and-go conditions.

In contrast to LOS, service volume capacity is a quantitative measure, expressed in terms of the rate of flow (vehicles passing a point during a period of time). Service volume capacity represents the maximum rate of flow that can be accommodated by a particular type of roadway while still maintaining a specified LOS. The service volume capacity at LOS E represents the maximum volume that can be accommodated before the flow breaks down into stop-and-go conditions that characterize LOS F, and thus represents the ultimate capacity of the roadway.

As stated in the City's *Major Thoroughfare Plan*, LOS C is generally considered to be the minimum acceptable LOS for the City of Franklin. This is consistent with the City's road impact fees, which are based on LOS C. The City's 2004 *Major Thoroughfare Plan Update* identifies maximum daily service volumes at LOS C that are appropriate for planning purposes for a wide variety of roadway facilities (see Table 5).

Table 5. Road Capacity by Classification

Functional Classification	No. of Lanes	Vehicles/Day (LOS C)	Capacity/ Lane
Collector	2	9,100	4,550
Collector	3	11,300	3,767
Collector	4	14,900	3,725
Collector	5	19,000	3,800
Arterial	2	11,600	5,800
Arterial	3	14,400	4,800
Arterial	4	19,000	4,750
Arterial	5	21,900	4,380
Expressway	2	28,100	14,050
Expressway	4	56,200	14,050
Expressway	6	84,300	14,050

Source: RPM Transportation Consultants, *City of Franklin Major Thoroughfare Plan Update*, August 2004.

Formula

The methodology used in Franklin's current road impact fee system is based on a "consumption-based" approach. The consumption-based model simply charges a new development the cost of replacing the capacity that it consumes on the major roadway system. That is, for every vehicle-mile of travel (VMT) generated by the development, the road impact fee charges the net cost to construct an additional vehicle-mile of capacity (VMC). The consumption-based methodology is maintained in this update, and credits continue to be provided for outstanding road-related debt and outside funding.

Since travel is never evenly distributed throughout a roadway system, actual roadway systems require more than one unit of capacity for every unit of demand in order for the system to function at an acceptable level of service. Suppose for example, that the City completes a major arterial widening project. The completed arterial is likely to have a significant amount of excess capacity for some period of time. If the entire system has just enough capacity to accommodate all of the vehicle-miles of travel, then the excess capacity on this segment must be balanced by another segment being over-capacity. Clearly, roadway systems in the real world need more total aggregate capacity than the total aggregate demand, because the traffic does not always precisely match the available capacity. Consequently, the standard consumption-based model generally underestimates the full cost of accommodating new development at the existing level of service. Nevertheless, it is a conservative, legally-defensible methodology that is simpler to update and provides more flexibility in the expenditure of funds than the alternative improvements-driven approach.

In most rapidly growing communities, some of the roadways will be experiencing an unacceptable level of congestion at any given point in time. However, it is not necessary to address segment-specific existing deficiencies in a consumption-based system, which, unlike an improvements-driven system, is not designed to recover the full costs to maintain the desired LOS on all roadway segments. Instead, it is only designed to maintain a minimum one-to-one overall ratio between system demand and system capacity. As discussed above, virtually all major roadway systems have more capacity (VMC) than demand (VMT) on a system-wide basis. Consequently, under a consumption-based system, the level of service standard is really a system-wide VMC/VMT ratio of 1.00. Since Franklin's major roadway system currently operates at better than this level of service (see Table 4 on page 11), there are no existing deficiencies on a system-wide basis.

The recommended impact fee formula is presented in Figure 4.

Figure 4. Road Impact Fee Formula

Impact Fee	=	**VMT x NET COST/VMT**
VMT	=	TRIPS x %NEW x LENGTH ÷ 2
NET COST/VMT	=	COST/VMC x VMC/VMT - CREDIT/VMT
Where:		
TRIPS	=	Trip ends during an average weekday
2	=	Dividing by two avoids double-counting trips for origin and destination
% NEW	=	Percent of trips that are primary trips, as opposed to pass-by or diverted-linked trips
LENGTH	=	Average length of a trip on the major road system
COST/VMC	=	Average cost to add a new daily vehicle-mile of capacity
VMC/VMT	=	System-wide ratio of VMC to VMT on major road system (assumed 1:1)
CREDIT/VMT	=	Revenue credit per VMT

TRAVEL DEMAND SCHEDULE

The travel demand generated by specific land use types is a product of three factors: 1) trip generation, 2) percent primary trips and 3) trip length. The first two factors are well documented in the professional literature, and the average trip generation characteristics identified in studies of communities around the nation should be reasonably representative of trip generation characteristics in Franklin. In contrast, trip lengths are much more likely to vary between communities, depending on the geographic size and shape of the community and its major roadway system.

Trip Generation

Trip generation rates were based on information published in the most recent edition of the Institute of Transportation Engineers' (ITE) Trip Generation manual. Trip generation rates represent trip ends, or driveway crossings from the site of a land use. Thus, a one-way trip from home to work counts as one trip end for the residence and one trip end for the work place. To avoid over-counting, all trip rates have been divided by two. This places the burden of travel equally between the origin and destination of the trip and eliminates double-charging for any particular trip.

Primary Trip Factor

Trip rates also need to be adjusted by a "primary trip factor" to exclude pass-by and diverted trips. This adjustment is intended to reduce the possibility of over-counting additional travel induced by the new development. Pass-by trips are those trips that are already on a particular route for a different purpose and simply stop at a development on that route. For example, a stop at a convenience store on the way home from the office is a pass-by trip for the convenience store. A pass-by trip does not create an additional burden on the street system and therefore should not be counted in the assessment of impact fees. A diverted-linked trip is similar to a pass-by trip, but a diversion is made from the regular route to make an interim stop. The reduction for pass-by and diverted trips utilized in this study was drawn from the ITE *Trip Generation Handbook* and other published information.

Average Trip Length

The average trip length is the most difficult travel demand factor to determine. In the context of a road impact fee using a consumption-based methodology, the relevant input is the average length of a trip on the major roadway system within the city limits. The starting point is national data for average trip length for specific land uses and trip purposes. However, these national trip lengths are likely to be unrepresentative of travel on the City's major roadway system. An adjustment factor can be derived by dividing the VMT actually observed on the major roadway system by the VMT that would be expected using national average trip lengths and trip generation rates.

The first step in developing the adjustment factor for the local trip length is to estimate the total VMT that would be expected on Franklin's major roadway system based on national travel demand characteristics. Existing land use data for the City were compiled using information from the Franklin Planning Department.

Existing land uses are multiplied by trip generation rates, percent primary trips and average trip lengths and summed to estimate total city-wide VMT. As shown in Table 6, existing land uses within the city limits, using national trip length data, would be expected to generate approximately 2.28 million VMT every day.

Table 6. Expected Vehicle-Miles of Travel

Land Use Type	Unit	Existing Units	Trip Rates	Primary Trips	Daily Trips	Length (miles)	Daily VMT
Single-Family Detached	Dwelling	16,746	4.76	100%	79,711	9.16	730,153
Multi-Family	Dwelling	11,080	3.33	100%	36,896	8.30	306,237
Mobile Home	Dwelling	408	2.50	100%	1,020	8.30	8,466
Gen. Retail/Commercial	1,000 sq. ft.	12,320	21.35	43%	113,104	6.27	709,162
Office/Institutional	1,000 sq. ft.	8,479	5.52	75%	35,103	9.96	349,626
Industrial/Warehouse	1,000 sq. ft.	5,334	3.42	95%	17,330	9.96	172,607
Total					283,164		2,276,251

Source: Existing residential and nonresidential units from City of Franklin, *2012 Development Report*, December 2012; daily trip rates and primary trip factors from Table 10; daily trips is product of trip rate and primary trips; national average trip length from Table 9; daily VMT is product of trips and trip length.

The next step in developing the local trip length adjustment factor is to determine actual daily VMT on the City's major roadway system. An inventory of the existing major roadway system was prepared as part of this study (see Table 22 in the Appendix). Roadway segment lengths and recent traffic volumes are used to estimate actual daily VMT. Since counts were not available for all segments, total VMT must be estimated from VMT for segments for which counts are available. As shown in Table 7, the City's major roadway system has an estimated 1.17 million total daily VMT.

Table 7. Actual Existing Vehicle-Miles of Travel

Functional Classification	Road Segments w/Counts			Total Ln-Mi.	Total VMT
	VMT	Ln-Mi.	Veh./Ln		
Expressway	138,462	17.60	7,867	17.60	138,459
Other Arterial	613,824	121.27	5,062	145.49	736,470
Subtotal, Arterials	752,286				874,929
Collectors, NW Area	36,649	9.76	3,755	22.41	84,150
Collectors, SW Area	34,649	12.10	2,864	24.34	69,710
Collectors, NE Area	24,691	12.10	2,041	33.98	69,353
Collectors, SE Area	1,754	1.44	1,218	26.38	32,131
Subtotal, Collectors	97,743	35.40	2,761	107.11	295,731
Total	850,028				1,170,660

Source: VMT and lane-miles of segments with traffic counts and total lane-miles from Table 22 in the Appendix; vehicles per lane is VMT on segments with counts divided by lane-miles with counts; total VMT is product of vehicles per lane and total lane-miles.

It should be noted that the collector road VMT for the four service areas sum to less than the collector subtotal, which is derived by multiplying average vehicle trips per lane by total lane-miles. This is attributed to the small sample size of recent traffic counts in the southeast area. Using the weighted average vehicles per lane corrects for this under-estimate of VMT for the southeast area.

Comparing the results of the last two tables, it can be seen that expected VMT using existing land use data and national travel demand characteristics significantly over-estimates VMT actually observed on the major roadway system. This result is not surprising, since the VMT estimate does not include travel on local roads, the Interstate or on any roadways outside of the Franklin city limits. Consequently, it is necessary to develop an adjustment factor to account for this variation. The local travel demand adjustment factor is the ratio of actual to expected VMT on the major roadway system. As shown in Table 8, the national average trip length should be multiplied by a local adjustment factor of 0.384 if the major road system continues to be defined as arterials, and 0.514 if collector roads are included in the impact fee. The difference between the two adjustment factors reflects the share of traffic attributable to collector roads.

Table 8. Local Trip Length Adjustment Factors

	Arterials Only	All Major Roads
Actual Daily Vehicle-Miles of Travel (VMT)	874,929	1,170,660
÷ Expected Daily Vehicle-Miles of Travel (VMT)	2,276,251	2,276,251
Local Adjustment Factor	0.384	0.514

Source: Actual VMT from Table 7; expected VMT from Table 6.

The national average trip lengths derived from the U.S. Department of Transportation's 2009 *National Household Travel Survey* for a variety of trip purposes, including home-to-work, doctor/dentist, school/church, shopping, and other personal trips, have been adjusted by the local trip length adjustment factor. Since this study provides an option to include collector roads, the study will include two separate travel demand schedules: one that reflects travel on arterial roads only and one that reflects travel on both arterial and collector roads. The localized trip lengths are shown in Table 9.

Table 9. Average Trip Length by Trip Purpose

		Arterials Only		All Major Roads	
Trip Purpose	National Trip Length (miles)	Local Adjustment Factor	Local Trip Length (miles)	Local Adjustment Factor	Local Trip Length (miles)
To or from work	11.98	0.384	4.60	0.514	6.16
Office/Industrial	9.96	0.384	3.82	0.514	5.12
Medical/Dental	9.61	0.384	3.69	0.514	4.94
Average	9.28	0.384	3.56	0.514	4.77
Single-Family Det.	9.16	0.384	3.52	0.514	4.71
Multi-Family	8.30	0.384	3.19	0.514	4.27
School/Church	8.47	0.384	3.25	0.514	4.35
Family/Personal	6.61	0.384	2.54	0.514	3.40
Shopping	6.27	0.384	2.41	0.514	3.22

Source: National trip lengths from U.S. Department of Transportation, *National Household Travel Survey*, 2009 (office/industrial is 25% work trip length and 75% average trip length); local adjustment factors from Table 8.

Travel Demand Schedule

The result of combining trip generation rates, primary trip factors and average trip lengths is a travel demand table that establishes the vehicle-miles of travel (VMT) during the average weekday generated by various land use types per unit of development. The recommended travel demand schedules associated with both of the road impact fee options are presented in Table 10.

Table 10. Travel Demand by Land Use

		Daily	%	Arterials Only		All Major Roads	
Land Use Type	Unit	Trips/ Unit	Primary Trips	Trip Length	Daily VMT	Trip Length	Daily VMT
Single-Family Detached	Dwelling	4.76	100%	3.52	16.76	4.71	22.42
Multi-Family	Dwelling	3.33	100%	3.19	10.62	4.27	14.22
Mobile Home Park	Site	2.50	100%	3.19	7.98	4.27	10.68
Congregate Care Facility	Dwelling	1.01	100%	3.69	3.73	4.94	4.99
Hotel/Motel	Room	3.45	100%	2.54	8.76	3.40	11.73
Retail/Commercial							
Shopping Center/Gen. Retail	1,000 sq. ft.	21.35	43%	2.41	22.13	3.22	29.56
Restaurant, Quality	1,000 sq. ft.	44.98	38%	2.41	41.19	3.22	55.04
Restaurant, Fast Food	1,000 sq. ft.	248.06	30%	0.80	59.53	1.07	79.63
Office/Institutional	1,000 sq. ft.						
Office, General	1,000 sq. ft.	5.52	75%	3.82	15.81	5.12	21.20
Hospital	1,000 sq. ft.	6.61	75%	3.69	18.29	4.94	24.49
Nursing Home	1,000 sq. ft.	3.80	75%	3.69	10.52	4.94	14.08
Church	1,000 sq. ft.	4.56	75%	3.25	11.12	4.35	14.88
Elementary/Sec. School	1,000 sq. ft.	7.02	24%	3.25	5.48	4.35	7.33
Industrial	1,000 sq. ft.						
Manufacturing	1,000 sq. ft.	1.91	95%	3.82	6.93	5.12	9.29
Industrial Park	1,000 sq. ft.	3.42	95%	3.82	12.41	5.12	16.63
Business Park	1,000 sq. ft.	6.22	95%	3.82	22.57	5.12	30.25
Warehouse	1,000 sq. ft.	1.78	95%	3.82	6.46	5.12	8.66
Mini-Warehouse	1,000 sq. ft.	1.25	95%	2.54	3.02	3.40	4.04

Source: Trips are ½ of average daily trip ends on a weekday from ITE, *Trip Generation*, 9th ed., 2012 (hotel/motel based on average of two; elementary/secondary based on average of elementary, middle and high school); percent of all trips that are primary trips from ITE, *Trip Generation Handbook*, June 2004; primary trip percentage for schools based on Preston Hitchens, "Trip Generation for Day Care Centers," ITE *1990 Compendium of Technical Papers*, 1990); average trip length from Table 9 (fast food restaurant assumes one-third shopping trip length).

COST PER SERVICE UNIT

The cost per vehicle-mile in this update is based on a set of recent actual major road construction projects that add capacity to the roadway system. Unlike the previous update, the road construction costs include the costs of design. Recent road improvement project costs are summarized in Table 11. These recent projects added lanes and measurable capacity to the roadway system.

Table 11. Road Improvement Costs

Project Name	Improvement	Year	Design/ Construction	ROW	Total Cost
Carothers Pkwy, S Carothers-Ladd Pk	New 2 Lane	2014	$13,818,227	$344,000	$14,162,227
Carothers Pkwy, Liberty Pike-McEwen	New 4 Lane	2009	$6,628,430	$4,000,000	$10,628,430
Mack Hatcher, Hillsoboro-SR 96 W	New 4 Lane	2012	$73,500,000	$12,500,000	$86,000,000
McEwen, Carothers-Cool Spgs	New 4 Lane	2012	$10,172,167	$1,770,384	$11,942,551
McEwen, Cool Spgs-Jordan	Widen 3-5 Lns	2009	$1,444,450	$237,680	$1,682,130
McEwen Dr Temporary Connector	New 4 Lane	2013	$2,263,322	$361,253	$2,624,575
S Carothers Parkway	New 4 Lane	2012	$16,335,000	$1,942,000	$18,277,000
Subtotal, Arterial			$107,826,596	$19,213,317	$145,316,913
3rd Ave N, N Margin-5th Ave	New 2 Lane	2014	$4,856,330	$186,500	$5,042,830
Nichol Mill Ln, Seaboard-Mallory	New 2 Lane	2012	$1,372,742	$800,975	$2,173,717
Subtotal, Collectors			$6,229,072	$987,475	$7,216,547
Total, All Major Roads			$114,055,668	$20,200,792	$152,533,460

Source: City of Franklin, Engineering Department.

The average cost to create an additional lane-mile of roadway can be derived by dividing the cost of the recent capacity-expanding road improvement projects by the additional lane-miles created by the improvements. Based on the cost of recent and current arterial and collector road improvements, the average costs per lane-mile are calculated in Table 12.

Table 12. Road Improvement Cost per Lane-Mile

Project Name	Miles	New Lanes	Lane-Miles	Total Cost	Cost per Lane-Mile
Carothers Pkwy, S Carothers-Ladd Pk	2.00	2	4.00	$14,162,227	$3,540,557
Carothers Pkwy, Liberty Pike-McEwen	0.74	4	2.96	$10,628,430	$3,590,686
Mack Hatcher, Hillsoboro-SR 96 W	3.22	4	12.88	$86,000,000	$6,677,019
McEwen, Carothers-Cool Spgs	0.97	4	3.88	$11,942,551	$3,077,977
McEwen, Cool Spgs-Jordan	0.15	2	0.30	$1,682,130	$5,607,100
McEwen Dr Temporary Connector	0.33	4	1.32	$2,624,575	$1,988,314
S Carothers Parkway	1.70	4	6.80	$18,277,000	$2,687,794
Subtotal, Arterial	7.41		32.14	$145,316,913	$4,521,373
3rd Ave N, N Margin-5th Ave	0.26	2	0.52	$5,042,830	$9,697,749
Nichol Mill Ln, Seaboard-Mallory	0.37	2	0.74	$2,173,717	$2,937,455
Subtotal, Collectors	0.63		1.26	$7,216,547	$5,727,418
Total, All Major Roads	8.04		33.40	$152,533,460	$4,566,870

Source: Miles and number of lanes from City of Franklin Engineering Department; lane-miles is product of new lanes and miles; total cost from Table 11; cost per lane-mile is cost divided by lane-miles.

The average cost per unit of capacity added to the major roadway system can be determined by dividing the average cost of a new lane-mile by the average daily capacity per lane at LOS C. The average daily capacities per new lane added by the set of recent projects are calculated in Table 13.

Table 13. Average Capacity per Lane

Project Name	Improvement	Miles	New Capacity	New VMC	New Ln-Mi.	Capacity/ Lane
Carothers Pkwy, S Carothers-Ladd Pk	New 2 Lane	2.00	9,100	18,200	4.00	4,550
Carothers Pkwy, Liberty Pike-McEwen	New 4 Lane	0.74	19,000	14,060	2.96	4,750
Mack Hatcher, Hillsoboro-SR 96 W	New 4 Lane	3.22	56,200	180,964	12.88	14,050
McEwen, Carothers-Cool Spgs	New 4 Lane	0.97	19,000	18,430	3.88	4,750
McEwen, Cool Spgs-Jordan	Widen 3-5 Lns	0.15	7,500	1,125	0.30	3,750
McEwen Dr Temporary Connector	New 4 Lane	0.33	19,000	6,270	1.32	4,750
S Carothers Parkway	New 4 Lane	1.70	19,000	32,300	6.80	4,750
Subtotal, Arterial		9.11		271,349	32.14	8,443
3rd Ave N, N Margin-5th Ave	New 2 Lane	0.26	9,100	2,366	0.52	4,550
Nichol Mill Ln, Seaboard-Mallory	New 2 Lane	0.37	9,100	3,367	0.74	4,550
Subtotal, Collectors		0.63		5,733	1.26	4,550
Total, All Major Roads		9.74		277,082	33.40	8,296

Source: Improvement length and new lane-miles from Table 12; new capacity added derived from Table 5; new VMC is product of miles and new capacity; capacity per lane is new VMC divided by new lane-miles.

The cost per service unit is calculated by dividing the average cost per lane-mile by the average daily capacity added. As shown in Table 14, the arterial cost per service unit is $536 per VMC. If collectors are included, the major road cost per service unit is $550 per VMC.

Table 14. Cost per Vehicle-Mile of Capacity

Arterials Only	
Average Cost per Lane-Mile	$4,521,373
÷ Average Daily Capacity per Lane at LOS C	8,443
Arterial Cost per Vehicle-Mile of Capacity (VMC)	$536
All Major Roads	
Average Cost per Lane-Mile	$4,566,870
÷ Average Daily Capacity per Lane at LOS C	8,296
Major Road Cost per Vehicle-Mile of Capacity (VMC)	$550

Source: Average cost per lane-mile from Table 12; average daily capacity per lane from Table 13.

NET COST PER SERVICE UNIT

As discussed in the Legal Framework chapter, credit is due against impact fees under three situations: (1) there are existing deficiencies, (2) there is outstanding debt on facilities serving existing development, or (3) there are dedicated local revenues or outside funding for the same improvements. These are each addressed below. The resulting revenue credits are deducted from the cost per service unit calculated in the previous chapter in the final section of this chapter to calculate the net cost per service unit.

Existing Deficiencies

From an impact fee perspective, there are no existing deficiencies. The fees are based on a system-wide level of service, defined as a 1-to-1 ratio of system-wide capacity (VMC) to system-wide demand (VMT). There are no existing deficiencies on a system-wide basis as long as the VMC/VMT ratio is greater than 1.00. The actual existing major roadway level of service is a 1.12 VMC/VMT ratio for arterials, and a ratio of between 1.18 and 3.63 for collector roads (see Table 4 above). Because the fees are based on a LOS that is lower than the actual existing LOS, no deficiency credit is warranted.

Outstanding Debt

The City of Franklin currently has seven outstanding debt issues that have been used to fund improvements on the arterial system. As shown in Table 15, the road-related balance for these outstanding debt issues is $41.3 million.

Table 15. Outstanding Road Debt Issues

Bond Issue	Outstanding Balance	Road-Related	Road-Related Balance
General Obligation Refunding Bonds 2004	$1,375,000	55.0%	$756,250
County Club & McEwen Reimbursement 2005	$2,715,000	45.0%	$1,221,750
Capital Improvement Bonds 2007	$20,000,000	43.0%	$8,600,000
Capital Improvement Bonds 2009A	$8,060,000	34.6%	$2,788,760
Capital Improvement Bonds 2009B	$30,625,000	34.6%	$10,596,250
Capital Improvement Bonds 2010	$15,725,000	40.0%	$6,290,000
Capital Improvement Refunding Bonds 2012	$21,710,000	51.0%	$11,072,100
Outstanding Road Debt	$100,210,000		$41,325,110

Source: City of Franklin, December 19, 2013.

In cases where outstanding debt is for improvements that are serving existing development, a credit is due for future taxes that new development will generate that will be used to retire that debt. In the case of Franklin's road impact fees, however, no such credit is warranted. As noted above, the road fees are based on a lower level of service. The cost of the excess capacity in the arterial system alone is significantly greater than the amount of the outstanding road-related debt. The replacement value of the excess arterial capacity is $56.5 million (see Table 16 below), compared to only $41.3 million in outstanding debt.

From the facts presented above, it is clear that the outstanding road debt is for improvements that have built excess capacity into the system to accommodate growth, not improvements that are serving existing development at the level of service on which the impact fees are based. In addition, new development will not be paying the debt. The City is using road impact fees, not ad valorem taxes or general funds, to retire the road-related debt. For these reasons, no debt credit against the road impact fees is warranted.

Table 16. Replacement Value of Excess Arterial Capacity

Existing Arterial Vehicle-Miles of Capacity (VMC)	980,344
– Existing Arterial Vehicle-Miles of Travel (VMT)	-874,929
Existing Excess Arterial Capacity (VMC)	105,415
x Average Arterial Cost per VMC	$536
Replacement Cost of Arterial Excess Capacity	$56,502,440

Source: Arterial VMC and VMT from Table 4; cost per VMC from Table 14.

Outside Funding

The amount of intergovernmental revenue that is applied toward funding capacity-expanding capital improvements in Franklin is based on anticipated funding over a 7-year period covered by the last two adopted regional Transportation Improvement Programs. Only improvements that are both capacity-expanding and on the major road network are eligible for credit. For example, improvements on I-65 unrelated to the major roadway system that the fees are designed to fund. The non-local share includes funds programmed from the portion of State gas tax revenues that the City receives through the State Street Aid program. The improvements and funding are summarized in Table 17 below. The creditable funding over the 7-year period totaled $116.7 million.

Table 17. Road Improvements and Funding, FY 2011-2017

			Non-Local Cost	
Project Name	Description	Total Cost	Total	Creditable
Columbia South, Downs to SR 397	New Road	$5,000,000	$0	$0
Franklin Greenway	Multi-Use Path	$1,147,500	$630,000	$0
Franklin Traffic Operations	ITS Infrastructure	$6,000,000	$4,800,000	$4,800,000
Goose Creek Bypass at I-65	New Interchange	$30,000,000	$30,000,000	$0
Goose Creek Bypass	New Road	$2,050,000	$0	$0
Hillsboro Rd, Hwy 96-M. Hatcher	New Road	$25,000,000	$1,250,000	$1,250,000
I-65 Widening from SR 96-SR840	Freeway Widening	$70,000,000	$70,000,000	$0
Mack Hatcher NE Widening	Widen Road	$15,800,000	$15,800,000	$15,800,000
Mack Hatcher NW Extension	Extend Existing Road	$76,500,000	$76,500,000	$76,500,000
Mack Hatcher SE Widening	Widen Road	$15,000,000	$15,000,000	$15,000,000
McEwen Drive Phase 3	Widen Existing Road	$15,000,000	$0	$0
McEwen Drive Phase 4	Widen Existing Road	$17,500,000	$0	$0
McEwen Drive Extension	Extend Existing Road	$12,500,000	$0	$0
Lewisburg Pike, SR 397-Donnellson	Widen Existing Road	$2,800,000	$0	$0
Lewisburg Pike, Donnellson-Old Peyton	Widen Existing Road	$1,000,000	$0	$0
Lewisburg Pike, Old Peyton-Goose Ck	Widen to 4 Lane Divided	$8,010,000	$0	$0
Lewisburg Pike, I-65 to 0.3 mi. west	Widen 2-4 lanes	$1,500,000	$1,500,000	$1,500,000
Franklin ITS Infrastructure	ITS infrastructure	$2,300,000	$1,840,000	$1,840,000
Total, FY 2011-2017		$307,107,500	$217,320,000	$116,690,000

Source: Nashville Area Metropolitan Planning Organization, *Transportation Improvement Program ,FY 2011-2014* and *FY 2014-2017*.

The State and Federal funding credit is shown in Table 18. At the current cost of borrowing, the present value of State and Federal funding revenue that can be anticipated over the next 20 years, which is the typical long-term debt repayment period, is about $243 per daily vehicle-mile of travel on the arterial system, and $182 per VMT when collectors are included.

Table 18. State/Federal Funding Credit

	Arterials Only	All Major Roads
Total Federal/State Capacity Funding, FY 2011-2016	$116,690,000	$116,690,000
÷ Years	7	7
Annual Federal/State Capacity Funding	$16,670,000	$16,670,000
÷ Daily Vehicle-Miles of Travel (VMT)	874,929	1,170,660
Average Annual Funding per VMT	$19.05	$14.24
x Net Present Value Factor (20 Years @ 4.73%)	12.75	12.75
State/Federal Funding Credit per VMT	$243	$182

Source: Total Federal/State capacity funding from Table 17; daily VMT from Table 7; present value factor based on 20 years at 4.73% discount rate based on average interest rate on state and local bonds in December 2013 from the Federal Reserve at http://www.federalreserve.gov/releases/ h15/data.htm.

Net Cost Summary

As shown in Table 19, reducing the cost per service unit associated by the State and Federal funding credit leaves a net cost of $293 per VMT for the arterial system and $368 per VMT if collectors are included.

Table 19. Net Cost per Vehicle-Mile of Travel

Average Cost per VMT, Arterials Only	$536
– State/Federal Funding Credit per VMT	-$243
Arterial Net Cost per Daily VMT	$293
Average Cost per VMT, All Major Roads	$550
– State/Federal Funding Credit per VMT	-$182
All Major Roads Net Cost per Daily VMT	$368

Source: Average cost per VMT based on cost per VMC from Table 14; State/Federal funding credit from Table 18.

POTENTIAL FEE SCHEDULES

The net cost per unit of development is the product of daily vehicle-miles of travel generated by a unit of development and the net cost per VMT. The option of including collector roadways in this update results in two potential impact fee schedules. The final two columns in Table 20 present the updated fees for arterials only and for the total major roadway system, including collector roads.

Table 20. Potential Fee Schedules, Arterial and All Major Roads

		VMT/Unit		Net Cost/VMT		Potential Fee	
Land Use Type	Unit	Arterials	Total	Arterials	Total	Arterials	Total
Single-Family Detached	Dwelling	16.76	22.42	$293	$368	$4,911	$8,251
Multi-Family	Dwelling	10.62	14.22	$293	$368	$3,112	$5,233
Mobile Home Park	Site	7.98	10.68	$293	$368	$2,338	$3,930
Congregate Care Facility	Dwelling	3.73	4.99	$293	$368	$1,093	$1,836
Hotel/Motel	Room	8.76	11.73	$293	$368	$2,567	$4,317
Retail/Commercial							
Shopping Center/Gen. Retail	1,000 sq. ft.	22.13	29.56	$293	$368	$6,484	$10,878
Restaurant, Quality	1,000 sq. ft.	41.19	55.04	$293	$368	$12,069	$20,255
Restaurant, Fast Food	1,000 sq. ft.	59.53	79.63	$293	$368	$17,442	$29,304
Office/Institutional	1,000 sq. ft.						
Office, General	1,000 sq. ft.	15.81	21.20	$293	$368	$4,632	$7,802
Hospital	1,000 sq. ft.	18.29	24.49	$293	$368	$5,359	$9,012
Nursing Home	1,000 sq. ft.	10.52	14.08	$293	$368	$3,082	$5,181
Church	1,000 sq. ft.	11.12	14.88	$293	$368	$3,258	$5,476
Elementary/Sec. School	1,000 sq. ft.	5.48	7.33	$293	$368	$1,606	$2,697
Industrial							
Manufacturing	1,000 sq. ft.	6.93	9.29	$293	$368	$2,030	$3,419
Industrial Park	1,000 sq. ft.	12.41	16.63	$293	$368	$3,636	$6,120
Business Park	1,000 sq. ft.	22.57	30.25	$293	$368	$6,613	$11,132
Warehouse	1,000 sq. ft.	6.46	8.66	$293	$368	$1,893	$3,187
Mini-Warehouse	1,000 sq. ft.	3.02	4.04	$293	$368	$885	$1,487

Source: Daily VMT per unit from Table 10; net cost per VMT from Table 19.

The collector road impact fee is the difference between the fee for all major roads and the fee for arterial roads only. The potential collector road fees are shown in Table 21 on the following page.

Table 21. Potential Fee Schedule, Collector Roads

Land Use Type	Unit	Fee for All Major Roads	Fee for Arterials	Fee for Collectors
Single-Family Detached	Dwelling	$8,251	$4,911	$3,340
Multi-Family	Dwelling	$5,233	$3,112	$2,121
Mobile Home Park	Site	$3,930	$2,338	$1,592
Congregate Care Facility	Dwelling	$1,836	$1,093	$743
Hotel/Motel	Room	$4,317	$2,567	$1,750
Retail/Commercial				
Shopping Center/Gen. Retail	1,000 sq. ft.	$10,878	$6,484	$4,394
Restaurant, Quality	1,000 sq. ft.	$20,255	$12,069	$8,186
Restaurant, Fast Food	1,000 sq. ft.	$29,304	$17,442	$11,862
Office/Institutional	1,000 sq. ft.			
Office, General	1,000 sq. ft.	$7,802	$4,632	$3,170
Hospital	1,000 sq. ft.	$9,012	$5,359	$3,653
Nursing Home	1,000 sq. ft.	$5,181	$3,082	$2,099
Church	1,000 sq. ft.	$5,476	$3,258	$2,218
Elementary/Sec. School	1,000 sq. ft.	$2,697	$1,606	$1,091
Industrial				
Manufacturing	1,000 sq. ft.	$3,419	$2,030	$1,389
Industrial Park	1,000 sq. ft.	$6,120	$3,636	$2,484
Business Park	1,000 sq. ft.	$11,132	$6,613	$4,519
Warehouse	1,000 sq. ft.	$3,187	$1,893	$1,294
Mini-Warehouse	1,000 sq. ft.	$1,487	$885	$602

Source: Potential fees for all major roads and arterial roads from Table 20; potential collector road fee is the difference.

APPENDIX

Table 22. Existing Major Roadway Inventory

Roadway	From	To	Serv. Area	Lns	Mi.	Lane-Miles Total	Lane-Miles w/Ct.	ADT	Cap.	VMC	VMT
Mack Hatcher	Hillsboro Rd	Franklin Rd	City	4	1.70	6.80	6.80	17,933	56,200	95,540	30,486
Mack Hatcher	Franklin Rd	Liberty Pike	City	2	1.50	3.00	3.00	21,950	28,100	42,150	32,925
Mack Hatcher	Liberty Pike	Murfreesboro	City	2	0.85	1.70	1.70	13,340	28,100	23,885	11,339
Mack Hatcher	Murfreesboro	Lewisberg Av	City	2	1.30	2.60	2.60	25,057	28,100	36,530	32,574
Mack Hatcher	Lewisberg Av	Columbia Av	City	2	1.75	3.50	3.50	17,793	28,100	49,175	31,138
Subtotal, Expressways					7.10	17.60	17.60			247,280	138,462
3rd Ave North	Main St	5th Ave N	City	2	0.34	0.68	0.68	4,574	11,600	3,944	1,555
3rd Ave South	Main St	S Margin St	City	2	0.24	0.48	0.48	6,142	11,600	2,784	1,474
5th Ave, N	3rd Ave N	Main St	City	4	0.38	1.52	1.52	17,515	19,000	7,220	6,656
5th Ave, S	Main St	S Margin St	City	2	0.24	0.48	0.48	5,752	11,600	2,784	1,380
Carothers Pkwy	S of Moores Ln	Cool Springs	City	4	1.08	4.32	4.32	22,213	19,000	20,520	23,990
Carothers Pkwy	Cool Springs	Murfreesboro	City	4	2.45	9.80	9.80	11,703	19,000	46,550	28,672
Carothers Pw S	Murfreesboro	S Carothers Rd	City	3	1.12	3.36	3.36	6,040	14,400	16,128	6,765
Carters Cr Pike	Downs Blvd	SW City Limit	City	2	0.86	1.72	1.72	6,591	11,600	9,976	5,668
Columbia Ave	Mack Hatcher	Fairground St	City	3	1.25	3.75	3.75	19,090	14,400	18,000	23,863
Columbia Ave	Fairground St	Five Points	City	3	1.00	3.00	3.00	10,542	14,400	14,400	10,542
Columbia Pike	S Boundary	Mack Hatcher	City	2	1.10	2.20	2.20	15,264	11,600	12,760	16,790
Cool Springs	Mack Hatcher	Carothers Pky	City	4	1.93	7.72	7.72	26,217	19,000	36,670	50,599
Cool Springs	Carothers	E McEwen Dr	City	4	1.35	5.40	-	-	19,000	25,650	-
Franklin Rd	E Main St	Mack Hatcher	City	2	1.59	3.18	3.18	16,392	11,600	18,444	26,063
Franklin Rd	Mack Hatcher	Moores Lane	City	2	2.11	4.22	4.22	12,975	11,600	24,476	27,377
Goose Creek By	Lewisburg Pike	I-65	City	4	0.84	3.36	3.36	13,685	19,000	15,960	11,495
Hwy 96 W	W Bndry	11th Ave	City	2	2.72	5.44	5.44	17,541	11,600	31,552	47,712
Hwy 96 W	11th Ave	5th Ave	City	3	0.43	1.29	1.29	18,962	14,400	6,192	8,154
Hillsboro Rd	3rd Ave N	Mack Hatcher	City	3	1.12	3.36	3.36	17,515	14,400	16,128	19,617
Hillsboro Rd	Mack Hatcher	Fieldstone Pw	City	5	1.00	5.00	5.00	16,740	21,900	21,900	16,740
Hillsboro Rd	Fieldstone Pw	N Boundary	City	5	0.93	4.65	4.65	18,710	21,900	20,367	17,400
Lewisburg Ave	S Margin St	Mack Hatcher	City	2	2.10	4.20	4.20	5,165	11,600	24,360	10,847
Lewisburg Pike	Mack Hatcher	Bowman Rd	City	2	1.09	2.18	2.18	9,359	11,600	12,644	10,201
Lewisburg Pike	Old Peytonsville	Goose Cr Byps	City	4	0.55	2.20	-	-	19,000	10,450	-
Liberty Pike	Waverly Pl	Turning Wheel	City	2	1.47	2.94	-	-	11,600	17,052	-
Liberty Pike	Turning Wheel	Carothers Pky	City	2	0.86	1.72	-	-	11,600	9,976	-
Liberty Pike	Carothers Pky	Mallory Lane	City	4	0.51	2.04	-	-	19,000	9,690	-
Liberty Pike	Mallory Lane	Mack Hatcher	City	3	0.95	2.85	2.85	14,238	14,400	13,680	13,526
Liberty Pike	Mack Hatcher	Franklin Rd	City	3	1.15	3.45	3.45	7,528	14,400	16,560	8,657
Main St	1st Ave S	5th Ave	City	2	0.34	0.68	0.68	10,362	11,600	3,944	3,523
W Main St	5th Ave	11th Ave	City	2	0.43	0.86	0.86	7,389	11,600	4,988	3,177
W Main St	11th Ave	Downs Blvd	City	2	1.11	2.22	2.22	7,692	11,600	12,876	8,538
Mallory Lane	Moores Lane	Cool Springs	City	4	1.36	5.44	5.44	24,542	19,000	25,840	33,377
Mallory Lane	Cool Springs	Liberty Pike	City	4	1.50	6.00	6.00	18,279	19,000	28,500	27,419
W McEwen Dr	Cool Springs	I-65	City	4	0.93	3.72	-	-	19,000	17,670	-
E McEwen Dr	I-65	Cool Springs	City	4	1.38	5.52	-	-	19,000	26,220	-
E McEwen Dr	Cool Springs	Wilson Pike	City	2	1.55	3.10	3.10	6,442	11,600	17,980	9,985

Continued on next page

Table 22. Existing Major Roadway Inventory, continued

Roadway	From	To	Serv. Area	Lns	Mi.	Lane-Miles Total	Lane-Miles w/Ct.	ADT	Cap.	VMC	VMT
Murfreesboro Rd	S Margin St	Mack Hatcher	City	2	1.32	2.64	2.64	17,935	11,600	15,312	23,674
Murfreesboro Rd	Mack Hatcher	I-65	City	5	1.13	5.65	5.65	24,796	21,900	24,747	28,019
Murfreesboro Rd	I-65	E Boundary	City	2	1.87	3.74	3.74	23,343	11,600	21,692	43,651
Peytonsville Rd	I-65	Long Lane	City	4	0.17	0.68	-	-	19,000	3,230	-
N Royal Oaks	Liberty Pike	Hwy 96	City	3	0.81	2.43	2.43	15,077	14,400	11,664	12,212
S Royal Oaks	Hwy 96	Mack Hatcher	City	4	1.18	4.72	4.72	19,435	19,000	22,420	22,933
Wilson Pike	N Boundary	Clovercroft Rd	City	2	0.79	1.58	1.58	1,987	11,600	9,164	1,570
Subtotal, Major and Minor Arterials					48.63	145.49	121.27			733,064	613,824
1st Ave N	Bridge St	E. Main St	NW	2	0.12	0.24	-	-	9,100	1,092	-
1st Ave S	E. Main St	S. Margin St	SE	2	0.24	0.48	0.48	3,000	9,100	2,184	720
2nd Ave N	Main St	N Margin St	NW	2	0.24	0.48	-	-	9,100	2,184	-
2nd Ave S	Main St	S. Margin St	SE	2	0.24	0.48	0.48	2,054	9,100	2,184	493
4th Ave N	3rd Ave N	Main St	NW	2	0.37	0.74	-	-	9,100	3,367	-
4th Ave S	Main St	S. Margin St	SE	2	0.24	0.48	0.48	2,253	9,100	2,184	541
9th Ave N	Mt Hope St	SR 96 W	NW	2	0.22	0.44	0.44	2,207	9,100	2,002	486
9th Ave S	SR 96 W	Columbia Ave	SW	2	0.32	0.64	0.64	2,207	9,100	2,912	706
11th Ave, N	Mount Hope	SR 96 W	NW	2	0.20	0.40	0.40	4,338	9,100	1,820	868
11th Ave, S	SR 96 W	Natchez St	SW	2	0.42	0.84	0.84	4,338	9,100	3,822	1,822
Acadia Ave	Championship	Jewell Ave	SW	2	0.59	1.18	-	-	9,100	5,369	-
Addison Ave	Stonewater Bld	State Blvd	SW	2	0.42	0.84	-	-	9,100	3,822	-
Aspen Grove Dr	Jordan Rd	Seaboard Ln	NE	3	0.54	1.62	-	-	11,300	6,102	-
Bakers Bridge Ave	W Terminus	Traffic Circle	NE	4	1.16	4.64	-	-	14,900	17,284	-
Bakers Bridge Ave	Mallory Ln	Carothers Pkwy	NE	4	0.77	3.08	-	-	14,900	11,473	-
Battle Ave	Columbia Ave	W Main St	SW	2	0.68	1.36	1.36	3,666	9,100	6,188	2,493
Boyd Mill Ave	SR 96 W	SR 96 W	SW	2	1.75	3.50	3.50	4,092	9,100	15,925	7,161
Bridge St.	5th Ave N	1st Ave N	NW	2	0.33	0.66	-	-	9,100	3,003	-
Carlisle Ln	SR 96 W	Del Rio Pike	NW	2	0.62	1.24	-	-	9,100	5,642	-
S Carothers Rd	Carothers Pwy	City Limits	SE	2	0.34	0.68	-	-	9,100	3,094	-
Championship Bvd	Stonewater	Acadia	SW	2	0.80	1.60	-	-	9,100	7,280	-
Chester Stevens Rd	SR 96E	East City Limits	NE	2	0.61	1.22	-	-	9,100	5,551	-
Church St	Columbia Ave	1st Ave N	SE	2	0.42	0.84	-	-	9,100	3,822	-
Clovercroft Rd	E City Limits	Wilson Pike	NE	2	0.89	1.78	1.78	3,218	9,100	8,099	2,864
Clovercroft Rd	City Limits	City Limits	NE	2	1.00	2.00	2.00	3,155	9,100	9,100	3,155
Cotton Ln	Del Rio Pike	N City Limits	NW	2	0.18	0.36	-	-	9,100	1,638	-
Crossroads Blvd	Seaboard Ln	City Limits	NE	3	0.24	0.72	-	-	11,300	2,712	-
Del Rio Pike	5th Ave N	Cotton Ln	NW	2	3.21	6.42	6.42	8,519	9,100	29,211	27,346
Donelson Crk Pwy	Southeast Pkwy	Lewisburg Pike	SE	2	1.24	2.48	-	-	9,100	11,284	-
Downs Blvd	Columbia Ave	SR 96 W	SW	2	2.67	5.34	5.34	8,224	9,100	24,297	21,958
Eddy Lane	Liberty Park	Murfreesboro	NE	2	0.77	1.54	1.54	2,126	9,100	7,007	1,637
Fair St	11th Ave N	9th Ave N	SW	2	0.42	0.84	-	-	9,100	3,822	-
Fieldstone Pwy	Bexley Park Dr	Hillsboro Rd	NW	3	0.53	1.59	-	-	11,300	5,989	-
Fieldstone Pwy	Hillsboro Rd	Lexington Pkwy	NW	4	0.53	2.12	-	-	14,900	7,897	-
Fieldstone Pwy	Lexington Pkwy	Cotton Ln	WN	2	0.42	0.84	-	-	9,100	3,822	-
Forest Xing Blvd	S Royal Oaks	Riverview Dr	SE	4	0.46	1.84	-	-	14,900	6,854	-
E Fowlkes St	Lewisburg Ave	Columbia Ave	SE	2	0.15	0.30	-	-	9,100	1,365	-
W Fowlkes St	Columbia Ave	Natchez St	SW	2	0.21	0.42	0.42	2,424	9,100	1,911	509
Galleria Blvd	Bakers Brdg Av	Moorse Ln	NE	3	0.38	1.14	-	-	11,300	4,294	-
Gen. Patton Dr	City Limits	Mallory Station	NE	3	0.60	1.80	-	-	11,300	6,780	-
Horton Ln	Boyd Mill	Main	SW	2	1.15	2.30	-	-	9,100	10,465	-

Continued on next page

Table 22. Existing Major Roadway Inventory, continued

Roadway	From	To	Serv. Area	Lns	Mi.	Lane-Miles Total	Lane-Miles w/Ct.	ADT	Cap.	VMC	VMT
Jewell Ave	Cormac St	Townsend Blvd	SE	2	0.53	1.06	-	-	9,100	4,823	-
Jordan Rd	Mallory Ln	Aspen Grove Dr	NE	2	0.31	0.62	-	-	9,100	2,821	-
Long Ln	Peytonsville Rd	City Limits	SE	2	2.07	4.14	-	-	9,100	18,837	-
Lynnwood Way	Franklin Rd	West City Limits	NW	2	0.59	1.18	1.18	9,486	9,100	5,369	5,597
Magnolia Dr	Del Rio Pike	Mt Hope St	NW	2	0.32	0.64	0.64	5,333	9,100	2,912	1,707
Mallory Sta. Rd	Franklin Rd	Mallory Ln	NE	3	1.49	4.47	4.47	10,490	11,300	16,837	15,630
N Margin St.	5th Ave N	2nd Ave N	NW	2	0.26	0.52	-	-	9,100	2,366	-
S Margin St.	Columbia Ave	5th Ave S	SE	2	0.16	0.32	-	-	9,100	1,456	-
S Margin St.	5th Ave S	1st Ave S	SE	2	0.35	0.70	-	-	9,100	3,185	-
Mount Hope St	5th Ave N	11th Ave N	NW	2	0.34	0.68	0.68	1,902	9,100	3,094	647
Natchez St	W Main St	9th Ave S	SW	2	0.57	1.14	-	-	9,100	5,187	-
Oak Meadow Dr	Royal Oaks	Country Wood	SE	3	0.80	2.40	-	-	11,300	9,040	-
Old Peytonsville	Lewisburg Pike	Goose Ck Bypass	SE	2	1.38	2.76	-	-	9,100	12,558	-
Oxford Glenn	E McEwen Dr	Clovercroft Rd	NE	2	1.08	2.16	-	-	9,100	9,828	-
Peytonsville Rd	Long Lane	South City Limits	SE	2	0.80	1.60	-	-	9,100	7,280	-
Ralston Ln	SR 96 E	Liberty Pike	NE	3	0.77	2.31	2.31	1,824	11,300	8,701	1,404
River View Dr	Forest Crossing	Country Wood	SE	2	1.79	3.58	-	-	9,100	16,289	-
Seaboard Ln	Aspen Grove Dr	Bakers Bridge Av	NE	3	1.32	3.96	-	-	11,300	14,916	-
S Springs Dr	Perimeter Dr	Mallory Ln	NE	4	0.23	0.92	-	-	14,900	3,427	-
Southeast Pkwy	Donelson Ck Pw	Columbia Ave	SE	2	0.55	1.10	-	-	9,100	5,005	-
Spencer Crk Rd	Spencer Crk Ps	Mack Hatcher	NW	2	1.93	3.86	-	-	9,100	17,563	-
State Blvd	Championship	Westhaven	SW	2	0.44	0.88	-	-	9,100	4,004	-
Stonewater Blvd	Fleetwood Dr	SR 96 W	SW	2	0.54	1.08	-	-	9,100	4,914	-
Stream Valley Bvd	Lewisburg Pike	Streamside Ln	SE	2	0.57	1.14	-	-	9,100	5,187	-
Townsend Blvd	Cheltenham Av	Jewell Ave	SW	2	0.41	0.82	-	-	9,100	3,731	-
Westhaven Blvd	Acadia Ave	SR 96 W	SW	2	0.67	1.34	-	-	9,100	6,097	-
Willowsprings Dr	Horton Ln	Boyd Mill Ave	SW	2	0.11	0.22	-	-	9,100	1,001	-
Collectors, Northwest District					10.41	22.41	9.76			98,971	36,649
Collectors, Southwest District					12.17	24.34	12.10			110,747	34,649
Collectors, Northeast District					12.16	33.98	12.10			134,932	24,691
Collectors, Southeast District					12.33	26.38	1.44			116,631	1,754
Subtotal, Major and Minor Collectors					47.07	107.11	35.40			461,281	97,743
Total					102.80	270.20	174.27			1,441,625	850,028

Source: Segment descriptions, lanes and miles from City of Franklin Engineering Department, December 19, 2013; collector road service areas from Duncan Associates based on review of Google maps; average daily traffic counts (ADT) from Tennessee Department of Transportation traffic history (http://www.tdot.state.tn.us/traffichistory/), 2013; "w/ct." indicates lane-miles for which counts are available; "VMT" is vehicle-miles of travel, which is product of miles and ADT for segments with counts; "VMC" is vehicle-miles of capacity, which is product of daily capacity and ADT.